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Agriculture and Rural Development

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ABBREVIATIONS

ADBP	Agricultural Development Bank of Pakistan
AEARP	Agricultural Extension and Adaptive Research Project
AEZ	Agri-export zone
AKRSP	Aga Khan Rural Support Programme
BARI	Bangladesh Agricultural Research Institute
BHES	Bangladesh Household Expenditure Survey
CARP	Council for Agricultural Research Policy
CD-ROM	compact disk with read-only memory
CDP	Community Development Programmes
COPS	Cost of Production Surveys
CPIAL	Consumer Price Index for Agricultural Labourers
CSO	Central Statistical Organisation
CWE	Cooperative Wholesale Establishment
DAPH	Department of Animal Production and Health
DATC	District Agricultural Training Centers
DLS	Department of Livestock Services
DOA	Department of Agriculture
DES	Dietary Energy Supply
FAO	Food and Agriculture Organization
FBI	Farm business incomes
FCI	Food Corporation of India
GATT	General Agreement on Tariffs and Trade
GDI	Gender-related Development Index
GDP	Gross Domestic Product
GEM	Gender Empowerment Measure
GMO	Genetically Modified Organisms
GVO	Gross value of output
HDI	Human Development Index
HLP	Hired labour payments
HPI	Human Poverty Index
HYV	High yielding varieties
IAAS	Institute of Agriculture and Animal Science
ICAR	Indian Council of Agricultural Research
IDP	Infrastructure Development Programmes
IRDP	Integrated Rural Development Programmes
IFPRI	International Food Policy Research Institute
LFPR	Labour force participation rates
MPCS	Multi-Purpose Cooperative Societies
MT	Metric tons
NABARD	National Bank for Agriculture and Rural Development
NAEP	National Agricultural Extension Project
NARC	Nepal Agriculture Research Council
NARS	National Agricultural Research System
NATCC	National Agricultural Technical Coordination Committee
NDP	National domestic product
NFC	Nepal Food Corporation
NGO	Non-governmental organisation
NRSP	National Rural Support Programme
NSS	National Sample Survey
OECD	Organisation for Economic Cooperation and Development
PARC	Pakistan Agricultural Research Council
PCRW	Production credit for rural women
PDS	Public distribution system
RCIW	Rural Community Infrastructure Works
REA	Revised extension approach
RPW	Rural public works
SAU	State agricultural universities
SEZ	Special economic zone
SHG	Self-help group
STC	State trading corporation
STE	State trading enterprises
TFP	Total factor productivity
T & V	Training and Visit system
UPOV	Union for the Protection of New Varieties of Plants
WRPO	Water Resource Planning Organisation
WTO	World Trade Organization

Foreword

Agriculture, the major source of livelihood for South Asia's population as well as the backbone of the industrial and trading systems, has not been receiving as much policy attention as this sector deserves. Under the policies for globalisation, governments have been framing and implementing policies focused on macroeconomic balance and growth strategies for industrial and service sectors. The agricultural sector has been deriving some indirect benefits from these policies, but it has also been subjected to unfair international competition and inequitable domestic policies.

Our purpose in this Report has been to assess the extent and performance of agriculture on economic growth and human development in South Asia. Our efforts, however, have been somewhat limited by the lack of availability of up to date data. To analyse this sector is to collect and compare data on production and productivity of various crops, their performance over the years, and their impact on rural population and human development. But this was no easy task. Every source of data gives different numbers based on different methodology and definitions used. Thus our first task was to harmonise the statistics used. But there might still be some numbers that do not match. For those inadequacies, our apologies.

The Report presents the experience of five South Asian countries, India, Bangladesh, Pakistan, Nepal and Sri Lanka. The questions the Report raises and tries to answer are: What has been the experience of South Asia's agriculture since the Green Revolution in the 1960s? Why have the high levels of agricultural growth achieved at that time failed to substantially raise economic growth, improve human development, and reduce South Asia's poverty? What is the appropriate role of agriculture in a poverty alleviation and growth strategy? Did the South Asian governments play efficient and equitable roles in transforming agriculture into an engine of rural transformation? And, what will it take for South Asia to develop policies for agriculture that increase productivity of the poor and improve the quality of life in rural areas?

The Report contains ten chapters, in addition to the Overview. Chapter 1 starts with a ten-year review of human development indicators of South Asia. Chapter 2 introduces the theme of this year's Report by presenting a conceptual framework for agriculture and human development. Chapter 3 provides a historical perspective on South Asia's agriculture. Chapter 4 analyses the performance of this sector. Chapter 5 presents an in depth overview of rural development programmes in South Asia. Chapter 6 discusses the issues of food security. Chapter 7 profiles the gender picture in South Asian agriculture. Chapter 8 addresses the issues of agricultural marketing and trade. Chapter 9 provides summaries of national experiences starting with an analytical overview of India's agriculture. And finally, in Chapter 10, the Report proposes an agenda that identifies the most pressing policy and institutional changes required to achieve human-centred agricultural development in South Asia.

Under the chairmanship of Sartaj Aziz, an Advisory Committee was set up to guide the work of the Report. Other members of the Committee were Fateh Chaudhri, A.R. Kemal, Amir Mohammad and S.M. Naseem. Under the leadership and guidance of Sartaj Aziz, the members of the Advisory Committee took the responsibility of assisting the research staff. Two members, A.R. Kemal and

S.M. Naseem, went beyond assisting the staff to writing two chapters themselves, Chapter 8 and Chapter 5 respectively. The chairman, Sartaj Aziz, with his years of experience, expertise and world-wide knowledge of agriculture, meticulously guided the preparation of the Report. No words can express my deep gratitude to him for his efforts.

The process of preparing this Report has also benefitted tremendously from the country case studies prepared by M. Asaduzzaman (Bangladesh), Jayati Ghosh (India), Yasin Janjua (Pakistan), Saman Kelegama (Sri Lanka), and Madan Pariyar (Nepal). To all of them, I owe a debt of gratitude.

I would like to acknowledge the contribution of Canadian International Development Agency (CIDA) for its consistent support of the Centre. CIDA has been on the forefront in supporting and advocating for the cause of social justice in South Asia, as well as in other developing regions. A special thanks to Evan Due, CIDA Representative in Pakistan, for the many ways he tried to help this Report. I would also like to put on record my very grateful thanks to Norwegian Agency for International Development (NORAD) and UNDP for their continuing financial support for the Centre's annual report. I would like to express my special thanks to Anne Woodbridge of CIDA Pakistan and Tahira Abdullah of UNFPA for reading and making comments on an early draft of Chapter 7 that discusses the situation of women in South Asia's agriculture. As always, the Report has benefited from the field offices of UNDP in South Asia, particularly Onder Yucer, Brenda McSweeney and Henning Karcher, UNDP Representatives in Pakistan, India and Nepal.

The research team at the Centre worked hard and for long hours to complete this Report. I must recognise in particular Sarfraz Qureshi for providing support at each stage of the preparation of the Report. Sadia Malik and Yasin Janjua spent their summer holidays in Pakistan working on the Report. They provided substantive assistance to me at the final stage of writing the Report. I thank Tazeen Fasih for preparing the first annotated outline of the Report. The research team, consisting of Umer Khalid, Zainab Kizilbash, Taha Mustafa, Lubna Shahnaz and Hyder Yusafzai, collected and compiled data and prepared tables and charts, besides preparing background notes. My special thanks to Taha Mustafa for also composing and designing the Report, and Malia Asim for handling the administrative details.

Islamabad
15 July 2002

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About the Mahbub ul Haq Human Development Centre

Mahbub ul Haq Human Development Centre was set up in November 1995 in Islamabad, Pakistan by the late Dr Mahbub ul Haq, founder and chief architect of UNDP Human Development Reports. With a special focus on South Asia, the Centre is a policy research institute and think tank, committed to the promotion of the human development paradigm as a powerful tool for informing people-centered development policy nationally and regionally, in order to reduce human deprivation.

The Centre organises professional research, policy studies and seminars on issues of economic and social development as they affect people's well being. Believing in the shared histories of the people of this region and in their shared destinies, Dr Haq was convinced of the need for cooperation among the seven countries of the region. His vision extended to a comparative analysis of the region with the outside world, providing a yardstick for the progress achieved by South Asia in terms of socio-economic development. The Centre's research work is presented annually through a Report titled, *Human Development in South Asia.*

Continuing Mahbub ul Haq's legacy, the Centre provides a unique perspective in three ways: first, by analysing the process of human development, the analytical work of the Centre puts people at the centre of economic, political and social policies; second, the South Asia regional focus of the Centre enables a rich examination of issues of regional importance; and third, the Centre's comparative analysis provides a yardstick for the progress and setbacks of South Asia *vis-à-vis* the rest of the world.

The current activities of the Centre include: preparation of annual reports on *Human Development in South Asia;* preparation and publication of a journal, *Mahbub ul Haq Human Development Review*; preparation of policy papers and research reports on poverty reduction strategies; organisation of seminars and conferences on global and regional human development issues, South Asian cooperation, peace in the region and women's empowerment. The Centre also organises an annual Mahbub ul Haq Memorial Seminar and a Mahbub ul Haq Lecture.

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Overview

This Report is about the most important economic sector in South Asia, agriculture, and its link to human development. It is about the livelihoods of the vast majority of South Asians, and how those livelihoods are being wiped out by the winds of change. It is about women in South Asia, and their daily struggle for survival in the face of declining income and opportunities. It is about unfulfilled promises in rural development programmes that left most people wondering about the real commitment of development policy makers and practitioners. It is also about the stunning performance of South Asia's agriculture, and the lost opportunity of governments for failing to translate these productivity gains from Green Revolution into substantially reducing poverty in the region. And, above all, it is about the delink between South Asia's economic policies and its people's lives.

Strong economic growth is a prerequisite for human development in a country as it provides the required resources for improving the capability of people through better education, health and other social services, as well as improving income-earning opportunities. However, the benefits of economic growth have to be equitably distributed through progressive public policy initiatives to achieve maximum welfare gains for all people, irrespective of class, caste or gender. This was the message of the founder of the Centre, Mahbub ul Haq, and the focus of the Centre's annual human development reports. The theme of this year's Report, Agriculture and Human Development, is also based on the belief that an equitable growth of gross domestic product (GDP) is not only good for the economy it is also good for the country as a whole, as it improves the wellbeing of all people—poor and rich alike.

There is now strong evidence that the developing countries which have achieved sustained economic growth are generally the countries in which the rate of agricultural growth exceeded population growth. Even countries which followed an explicit development strategy based on industrialisation found very soon that without an expanding agriculture sector, the urban labour force would not be able to buy its food at reasonable prices, the supply of raw materials could not be assured for many industries, and the bulk of the population living in rural areas would not have the purchasing power to buy goods produced by the industrial sector. Rapid agricultural growth, on the other hand, can stimulate and thus sustain the pace of industrial growth, thus setting into motion a mutually reinforcing process of sustained economic growth.

However agricultural growth, even when stimulated by investment in irrigation, rural infrastructure and agricultural research, is constrained by the availability of land and water, by the pattern of land holdings and by the inevitable variation in climate and rainfall. There are also demand constraints because international markets are flooded by the subsidised agricultural exports from developed countries.

This analytical research of South Asia's agriculture has been based on a huge amount of quantitative data on production and productivity of agricultural outputs, and prices and use of inputs, as well as data on employment, wages and women's role in agriculture. Based on this statistical analysis, the Report presents with several messages:

The first message is that high levels of human development cannot be achieved

Benefits of economic growth have to be equitably distributed through progressive public policy initiatives to achieve maximum welfare gains

Small farms should be the centre of the revival of agriculture and rural development

if development priorities do not focus on the occupation of the majority of the people—farm and non-farm employment, and where they live—rural areas.

Second, policies for food security have focused on the welfare approach and not on the empowerment of people. Access to and availability of food must go hand in hand with the ability of people to purchase food.

Third, as South Asian agriculture is facing cultivable land constraints as well as negative consequences of over dependence on chemical inputs, future agricultural productivity increases must come from advancement of agricultural research, technology and extension services.

Fourth, small farms should be the centre of the revival of agriculture and rural development. The incentive system that is being provided to corporate farming in South Asia should not be at the expense of the vast majority of the rural populace.

Fifth, South Asian agricultural marketing and trading systems have not been effective and efficient due to both internal constraints as well as inequitable external trading environment.

Agriculture has always been the mainstay of South Asian economies. Although the region has undergone a major structural change during the past three decades, yet the agricultural sector still contributes around 25 per cent in the total GDP against 45 per cent in 1960. In general, agricultural growth in South Asia contributed positively towards overall economic development. Periods of high agricultural growth were more or less associated with high levels of overall economic growth. However, agricultural growth in South Asia has fueled a slower growth in overall economy compared to other regions. For instance, a 3 per cent growth in the agricultural sector between 1980-2000 led to a 5 per cent growth in the overall economy in South Asia, whereas the same 3 per cent agricultural growth led to 7 per cent GDP growth in East Asia and the Pacific region.

Within the overall framework of agriculture and human development, the Report raises several critical questions such as, what is the appropriate role of agriculture and rural development in poverty alleviation? Did the pattern of agricultural development in South Asia play such a role? If not, what policies and institutional failures were responsible for this? What was the impact of structural changes in agriculture on growth, employment and poverty reduction? The broad-based pattern of rural non-farm transformation spreads the benefits of agricultural growth widely across different groups in rural areas. Did it happen in South Asia? The role of government in this transformation is critical in realising its beneficial impact on poverty alleviation, job creation and quality of life in rural areas. Did the South Asian governments play this role efficiently and equitably? The analyses in ten chapters of this Report focus on these and other issues with a hope that the policy makers and development professionals rethink the real purpose of development.

During the decade of the 1990s, South Asia has achieved much progress in human development as well as in agricultural development. But this progress has neither been adequate nor equitable in lifting the region's half a billion people out of poverty

The Report starts with a ten-year review of human development indicators of the region. The analysis shows that the region has made encouraging progress in many areas. Sri Lanka and India are already in the medium category of human development. Pakistan and Bangladesh are poised to graduate to medium human development category. The overall Human Development Index (HDI) of South Asia improved substantially over the nineties. Despite this progress, the region still faces major challenges.

- Life expectancy, at 63 years, has registered an increase of 5 years during the past decade. Yet it is still among the lowest in the world, second only to Sub-Saharan Africa.

- The infant mortality rates have declined by 29 percentage points. But at the same time 69 infants out of 1000 still die before reaching the age of five.

- The rates of child immunisation have improved substantially over the nineties, but at the same time the region is host to the highest proportion of underweight, stunted and wasted children in the entire world.

- Nearly half of the children under the age of five are chronically malnourished in South Asia.

- Adult literacy rate has increased from 44 per cent in 1990 to 54 per cent in 1999. But a large number of children, estimated to be 39 million, lack even primary education.

- Two-thirds of the illiterate adults are women, and two-thirds of the out-of-school children are girls. This is despite the fact that the enrolment rates of girls are going up faster than those for boys across the region.

This disparity in the performance of various indicators reiterates the message of earlier reports on *Human Development in South Asia* that the real challenge of human development lies here in South Asia.

High agricultural productivity, achieved during the Green Revolution period, could not be sustained during the 1980s and 1990s due to rising population, declining resource bases, increasing environmental costs, and inadequate policy attention to these issues.

If agricultural growth is sufficiently high and is broad-based, it generates income and employment which are a necessary condition to improve human wellbeing in rural areas. A historical analysis of South Asia's agricultural development shows the performance of the agricultural sector over five decades and the policy failures that contributed to its lack of sustainability.

The first decade of the independent South Asia did not witness any major improvement in the agricultural sector. The balance between increasing food needs and food supply had remained precarious. Food aid was used to import food from the donor countries whenever there was a shortfall in domestic food production. Expectations in independent South Asia of achieving prosperity for the majority of its population were high. The task of rehabilitation and development of the economies was, however, a big challenge to the policy-makers. The colonial rule over a prolonged period had resulted in the persistence of extreme poverty in the region.

The second decade, however, saw the advent of the Green Revolution. As a result of the introduction of high yielding varieties of wheat and rice, the Malthusian spectre of rapid population growth, famine and widespread death from starvation was averted in South Asia. The expansion in irrigation, impressive technological advances and policies and institutions to support agriculture had led to a sustained overall increase in agricultural production.

The decade of the 1980s saw the successful diversification of agriculture from cereal to cash crops, like cotton and oilseeds and also to horticulture and livestock. While this diversification helped to sustain the overall rate of agricultural growth in the 1980s and 1990s, the constraints arising from the patterns of land ownership and unequal access to irrigation water began to surface.

Today, South Asia is faced with major challenges. Negative social and

Negative social and environmental effects of the Green Revolution have erased some of the positive gains

The decade of the nineties is characterised by rising poverty in South Asia

environmental effects of the Green Revolution have erased some of the positive gains. The high rate of population growth has exceeded the population supporting capacity of the ecological system in the Sub-continent. Life support systems of land, water, forests and bio-diversity are threatened by the nature of agricultural change experienced in the region. There is an increasing feminisation of poverty and gender inequity in rural South Asia. Employment growth in agriculture has been slow relative to the increase in the rural labour force. The non-farm economy has not been able to pull out labour from agriculture significantly. Labour productivity has stagnated and income gains per capita have been small.

The paradox in South Asia lies in the fact that despite achieving a higher rate of agricultural growth than the rate of population growth, the region has failed to translate this achievement into reduced poverty.

The Report presents a comparative analysis of agricultural performance in South Asia, over a period of twenty years, from 1980 to 1999, showing the relative contribution to productivity of land, labour, irrigation, fertiliser, tractor use and of research and extension. However, the decade of the nineties is characterised by rising poverty in South Asia. The number of people living on less than $1 a day increased from 495 million in 1990 to over 530 million at the end of the decade. An analysis of the sources of productivity in South Asia shows that the expansion of agricultural land has contributed very little to output growth. In fact during 1990-99, growth in agricultural land was negative in some countries such as India and Bangladesh. Rising population has exerted tremendous pressure on cultivable land. The decline in cultivable land has led most countries in South Asia to increase their cropping intensity.

Trends in irrigated area show that most of the South Asian countries have only less than half of their agricultural area covered by irrigation. Pakistan is the only exception to this trend: by 1999, it had a remarkable 82 per cent of its agricultural area covered by irrigation. The cost of new irrigation is high in many countries including India and Sri Lanka, giving rise to negative growth in irrigated area.

The agricultural labour force increased faster than agricultural land. As a result, land to labour ratios declined in all countries during the past two decades. Land and labour productivity increased consistently throughout South Asia but the growth in labour productivity was lower than the growth in land productivity particularly during the last two decades. This low growth of labour productivity, compared to land productivity, indicates increasing mechanisation of South Asian agriculture. The total factor productivity in South Asian countries has generally been low compared to other Asian economies. The most important factor contributing to this is the low investment in agricultural research and extension. Most governments in South Asia, except India, have been investing very little in agricultural research.

The objectives and designs of rural development programmes have varied with changing political interests rather than a genuine desire to uplift the poor and create an enriching rural life.

A common feature of the inadequacy of the rural development efforts in South Asia is the low level and inappropriate composition of public expenditures for rural development. These diminishing levels of expenditures are often misguided and misdirected. To promote growth these need to be reoriented and, in many cases, raised. A related problem, often inadequately researched, is the leakage of a large part of the funds allocated for

these programmes to elite groups who manage to capture most of the benefits intended for the poor and the rural population at large. Several decades of deteriorating levels and composition of public expenditure and a high degree of political intervention in the rural sector have contributed to the erosion of the foundation for more rapid and sustained rural growth and poverty reduction.

However, the success of rural development programs in South Asia has depended not only on how much the state has spent on them, but also on the way they have been organised and the extent to which the intended beneficiaries have been involved in them, both in design and implementation. Participatory approaches to rural development, where they have been adopted, have generally shown promising results in targeting the poor and in providing sustainable livelihoods to them. Experiences in water (irrigation and drinking water), watershed and forestry management, micro-credit, rural infrastructure and income-generating activities in Bangladesh, India, Nepal, Pakistan and Sri Lanka are producing encouraging results in empowering communities and increasing household incomes. Government and non-governmental organisations need to play only facilitating roles leaving the communities to take over and manage activities that are essential for rural revival.

Currently, over 500 million South Asians live in absolute poverty, which is 40 per cent of the world's poor, and over 300 million are chronically malnourished. This despite the fact that the largest South Asian countries have got food stocks that are way above their requirements.

In the past 35 years, the achievement of higher agricultural growth rate to accomplish the objective of food self-sufficiency and higher return to farmers remained the major policy goals of the South Asian countries. The Green Revolution encouraged the Asian countries to undertake massive investments in the agriculture sector and pursue policies to accelerate the growth process. Consequently, South Asian countries were able to avoid famines and reduce the severity of poverty in the world's most densely populated region. The Green Revolution also helped improve general living standards of a large proportion of the people in Asian countries. This performance came about within the controlled market structures and with significant government interventions. Yet about one third of the population of the region is still below the poverty line.

Over the years, one of the major concerns of South Asian governments has been to ensure food security to their huge numbers of low-income and no-income people. Through state trading enterprises, governments purchased food from producers and distributed throughout the country by using public food distribution channels. But this policy to provide cheap food by subsidising mostly the urban consumers has had an adverse impact on food production, income of farmers and on rural areas in general.

Poverty in South Asia is mostly a rural phenomenon. In India, three out of every four poor persons live in rural areas. Most governments have been addressing the problem of food security through various welfare programmes, including food stamps. These programmes are not only inefficient, they are very costly as they tend to encourage corrupt practices. They are also not a long-term solution to food security or alleviation of poverty.

The majority of the 70 per cent South Asians who live in rural areas are women. They are responsible for producing food, yet they have the least access to means of production, and receive the lowest wages, if at all.

Poverty in South Asia is mostly a rural phenomenon

Women are the invisible and unrecognised backbone of South Asian agriculture

Women are the invisible and unrecognised backbone of South Asian agriculture. The significance of their role can be gauged not only by high female participation rates in farm and non-farm activities in rural areas, but also by their intimate connection to rural customs, traditions and values. Women in South Asia keep the rural way of life alive, and they also suffer for it. Cases of discrimination and violence against women in South Asia's rural areas, dominated by a feudal mindset, continue despite the work of thousands of committed women's groups throughout the region.

The number of rural women living in absolute poverty has risen during the 1990s. Women farmers and agricultural workers know least about how to improve the productivity of land with modern inputs and technology as extension services are available mostly to men. Migration by rural men to urban areas, or overseas, to escape poverty has increased the number of women who have to carry the full burden of earning income and managing households for their families in rural areas and in agriculture, but there have been very few government strategies and facilities to enable women to manage these responsibilities.

The Report analyses the role of women in South Asian agriculture. The enormity of this role can simply be underscored by the fact that out of total employed population involved in agriculture, the proportion of women exceeds that of men. The involvement of women in agriculture is spread over a large number of activities. In fact they perform more tasks than men. They are involved in all operations pertaining to livestock management, crop production such as sowing, transplanting, weeding, harvesting as well as post-harvest operations such as threshing, winnowing, drying, grinding, husking and storage. Unlike their male counterparts, their tasks are not only limited to agricultural activities: they are also responsible for fetching water and fuel, cooking, cleaning, maintaining house and taking care of the young and old. It has been estimated that the daily workload of a working class village woman in South Asia stretches from 12 to 16 hours.

The participation of women in agriculture is consistently expanding in South Asia. All countries in the region have experienced an increase in their female labour force participation in agriculture which is higher than the rate of increase of male labour force. Two main reasons are contributing to this trend: Firstly, rising poverty has led an increasing number of men from rural areas to out-migrate to urban areas and abroad in search of better income-earning opportunities; and secondly, some countries in South Asia have seen an increase in smaller land holdings. When land holdings are small, hiring additional workers becomes inefficient and female family members are forced to fulfill labour requirements.

Despite the critical contribution of women in agriculture, their presence is largely invisible in national accounting systems with few statistics reflecting their actual contribution to agricultural output and rural employment. Female employment rates, recorded by official sources, are usually low because of arbitrary definitions of employment. If definitions are revised and all activities for which women are traditionally responsible are incorporated, a huge difference in activity rates can be noticed. Not only does the contribution of women in agriculture go unnoticed, but also they are denied access to resources like income, land and credit. Women are generally paid lower wages than those paid to men. In Pakistan for instance, women in rural areas are paid 59 per cent of what men make. Their counterparts in Bangladesh fare better, earning 71 per cent of men's wages.

Women are also generally denied the right to own land. The infringement of rights takes on various dimensions, such as legal, social and monetary. For

instance, women may have the legal right to own land but they may forego their rights to prevent themselves from being expelled from their brothers' homes or being made the object of social reproach. Even when they do own land, they may not have actual control over it. The lack of effective land ownership prevents women from gaining access to a number of agricultural support services, for example, credit, input supplies and agricultural extension services.

The emerging multilateral trading system under WTO has far-reaching implications for food security in South Asia. To provide better access to food, it is necessary to increase the income of poor people.

Better access to food depends on well-functioning markets and distribution networks, better infrastructure, adequate income and honest public servants. If agricultural markets are liberalised, the ability of countries to obtain affordable food supplies will depend on the countries' ability to produce or purchase food. This ability, in turn, will depend on their competitiveness in world markets for non-agricultural as well as agricultural products.

The process of trade liberalisation in most of the South Asian economies has begun only recently. After independence, India pursued inward-oriented policies. Pakistan in the beginning followed outward-oriented policies based on private sector development, but later on changed this policy. By the 1970s, almost all the countries in the region were pursuing inward-oriented policies, giving more authority to state in determining development priorities. But by the late 1980s, most South Asian countries started pursuing outward-oriented policies, and during the 1990s, almost all South Asian countries have become more integrated into the world trading system than ever before.

The conclusion of the Uruguay Round of trade negotiations heralded a new era of liberal trade. Trade liberalisation is based on the general assumption that it would help improve the income levels of the developing countries in various ways. The main driving force behind that would be the comparative advantage in production of various agricultural commodities enjoyed by the developing countries. Consequently, there would be greater demand for their exports resulting in an expansion of output of tradable commodities leading to higher income. And this process will have positive impact on food security. Moreover, trade would also result in higher foreign investments in developing countries and transfer of better technologies. However, there are reservations about whether the developing countries would be able to benefit from free trade in the face of large subsidies by developed countries, and even if there are potential benefits then which group within these countries would share those benefits. It is being argued that the major beneficiary would be the commercial farms, while the South Asian agricultural system is dominated by small subsistence farmers who often lack necessary resources to produce exportable surpluses.

The South Asian economies have witnessed sharp structural changes over the years. Although the share of agriculture in GDP has declined in all the countries of the region, the agriculture sector continues to play a dominant role in the economy in view of the huge number of people that are dependent on this sector for income and employment, and the importance of agricultural produce both for food security as well as providing raw materials for industries and exports. However, the composition of exports has gradually shifted from primary commodities towards manufactured goods.

To benefit from globalisation, it is essential on the part of the developing countries to improve the management

The multilateral trading system under WTO has far-reaching implications for food security in South Asia

capacity of the farming community, invest in physical infrastructure and communication, improve agricultural marketing. And, above all, provide support to traditional subsistence farmers to ensure food security of the poor, which has always been a stated objective of agricultural policies in the region.

In conclusion, agricultural sector in South Asia suffers from some critical problems that are common across the region. These are:

- Investment in agriculture by both public and private sectors is inadequate and is not helping agriculture to play an important role in the overall growth of the economy

- Despite the critical importance of research and extension in raising agricultural productivity, the resources allocated for this purpose are inadequate and are being used inefficiently. The broken link between research and extension system is one of the major problems in raising agricultural productivity.

- Lack of legal framework to define property rights and delay in land reforms has adversely affected the access of small farmers to credit.

- Agricultural prices, indirect and implicit taxation, and subsidy policies have led to inefficient resource allocations.

- The small farmer and landless poor have suffered because of either wrong policies or the inequitable application of good policies.

- The irrigation practices are very old and lack efficient use and maintenance.

- The Green Revolution created second-generation problems due to the excessive use of farm machinery and pesticides. Substantial amount of arable land was lost due to increasing environmental degradation including soil erosion, water-logging and salinity.

- The macroeconomic framework in many South Asian countries is not favourable to agriculture and has not therefor led to more rapid socio-economic development.

Major reforms in these areas need to be taken up in order to build a foundation of sustainable agriculture and human development in the region.

Chapter 1

Ten years of Human Development in South Asia

'Human Development Reports challenged some conventional wisdom, exploded some myths and reached some important policy conclusions:

First, it is wrong to suggest that the development process has failed in most developing countries. Judged by real indicators of human development, developing countries have achieved much progress. But the record is uneven between regions and countries.

Second, it is wrong to suggest that economic growth is unnecessary for human development. No sustained improvement in human well-being is possible without growth. But it is also wrong to suggest that high economic growth rates will automatically translate into higher levels of human development.

Third, it is conceptually and practically wrong to regard poverty alleviation as a goal distinct from human development. Most poverty can be explained by inadequate access to income, assets, credit, social services and job opportunities.

Fourth, it is wrong to suggest that developing countries lack enough resources to address their human development goals. In reality, considerable potential exists for restructuring present priorities in their national budgets and in foreign assistance allocations.

Fifth, it is wrong to pretend that markets alone can deliver balanced patterns of economic growth and human development. There must be a judicious mix of market efficiency and social compassion.'

– Mahbub ul Haq [*]

The concept of human development, as developed and articulated by Mahbub ul Haq through the UNDP Human Development Reports and human development indices in the nineties, brought about a major shift in development thinking. Development began to be seen in a much broader context. In the post Second World War period, development was seen merely in terms of economic growth; countries with high rates of economic growth were seen to be rapidly developing, while little attention was paid to rising income inequality within and among countries. Being concerned with only the attainment of high rates of growth of Gross Domestic Product (GDP) and improvement in other macro-economic indicators, the policy makers assumed that the effects of higher economic growth would trickle down to the poor. Mahbub ul Haq challenged this conventional wisdom and asserted that there were no automatic link between economic growth and human development. Economic growth is a necessary, but not a sufficient, condition for human progress. Governments need to actively focus on human development goals, and direct and use their resources efficiently, so that economic growth leads to the empowerment of people and poverty alleviation. People's needs and their aspirations must be at the centre of all development efforts, asserted Haq.

The first Human Development Report published in 1990 focussed on how growth failed to translate into improved human lives in many developing countries. The most critical human development indicators, the Report noted, were for people to live a long and healthy life, to be educated and to have access to resources needed for a decent standard of living. If these essential needs are not met, people are deprived of many other opportunities that are supposed to be available in a well-functioned democratic society. The Human Development Index, constructed as a measure of human development, consists of these three components: longevity, knowledge and decent standard living. For longevity, life expectancy at birth is used as a proxy;

Figure 1.1 HDI trends over the 1990s

Source: UNDP Human Development Reports, various issues.

similarly for knowledge, literacy rate and a combination of primary, secondary and tertiary enrolment are used as a proxy; and to measure a decent standard of living, GDP per capita, measured in terms of real purchasing power (PPP US$), is used. According to their performance in the above Human Development Index (HDI), countries are ranked in three categories, low, medium and high human development countries.

Human development in South Asia during the 1990s

South Asia is one of the most unique regions in the world in the sense that there is a yawning gap between the great potential that this region possesses and its realisation. With fertile lands, fresh water resources, diverse climate and a dynamic people, this region could have done much better on economic and social development fronts, yet the reality is that colossal human deprivation prevails in the region. The region is now home to nearly 22 per cent of the world's population but 40 per cent of the world's absolute poor subsisting on less $1 dollar a day (515 million). The GDP per capita (in PPP$) of the region is US $2000, while that of the East Asia and Pacific region is US $3950 and that of Latin American and the Caribbean region is US $6880. On a global scale, South Asia ranks the lowest as far as literacy is concerned with only 54 per cent of the population literate, whereas in Sub-Saharan Africa the proportion of literate people is 60 per cent.

As the previous reports of this Centre point out, the real challenge of human development lies in South Asia. Though South Asia has made encouraging progress in some areas, yet it has a long way to go to achieve a level of human development that is commensurate with its potential. To compare with other developing regions' human development indicators during the last decade, South Asia ranks only above Sub-Saharan Africa, but below Latin America and the Caribbean and South East Asia (figure 1.1).

The Human Development Index for South Asia shows continuous improvement over the 1990s (figure 1.1). Latin America and the Caribbean countries show a declining HDI trend, dropping from a peak of 0.82 in 1992 to 0.78 in 2000, shifting the region from the high human development category to the medium category[1]. South East Asian countries show an increasing trend of HDI during the nineties and their HDI values are the second highest after the Latin American countries, ranging between 0.600 and 0.700. The Arab States show uniform HDI values during the nineties.

Comparing the percentage changes in HDI for different regions of the world, South Asia shows the highest improvement in HDI of about 26 per cent in during the nineties (figure 1.2), while Sub-Saharan Africa had the second highest growth rate of HDI (at 21 per cent) during the same

Figure 1.2 Percentage change in HDI over the 1990s

Source: Extrapolated using data from UNDP Human Development Reports.

period. Latin American and Caribbean countries on the other hand, experienced a decline in human development, as shown by their negative HDI growth rate (around 7 per cent). Furthermore, the Arab States show a very low growth of HDI during the nineties, around one per cent. The HDI of South East Asian countries increased by only around 12 per cent during this period.

This inter-regional comparison highlights the fact that South Asia has experienced one of the highest percentage increases in HDI, signifying a substantial improvement in human development during the nineties. Furthermore, it needs to be pointed out that by the later half of the nineties, South Asia had entered the medium human development bracket (figure 1.1). A close look at HDI trends within the region reveals some interesting facts.

- The HDI values of all South Asian countries have been consistently improving during the nineties (annex table 1), with the exception of Pakistan and Bhutan during 1998-99.
- The HDI rankings of South Asian countries show a declining trend initially for most of the countries, but during the last two years, the rankings of almost all the countries improved noticeably, indicating an improvement in the level of human development (annex table 2).
- The improvement of HDI ranks during the nineties was most prominent in case of Maldives and Bhutan.

The construction of HDI since its inception in 1990 has undergone some methodological changes. The HDI values are, therefore, not strictly comparable across the years. A clearer picture of changes in HDI of the South Asian countries over the years can be obtained by using the same data series and methodology to compute the index (table 1.1).

The HDI values show an increasing trend for all South Asian countries (table 1.1). However, the level of human development varies considerably between different countries, with Bangladesh and Nepal being at the bottom. Sri Lanka, on the other hand has HDI values far in excess of the regional average, indicating its relatively advanced level of human development. There has also been marked differences within countries. The HDI values of the Indian states of Bihar and Uttar Pradesh are much lower than that of the southern state of Kerala. In Nepal, there is a marked difference between the HDI of rural and urban areas. In Pakistan, HDI by provinces and by rural and urban areas have not been constructed yet, but several efforts are underway.

As regards the percentage increase in human development indicators in the nineties, the highest increase has been experienced by Nepal, whereas the lowest by Sri Lanka (figure 1.3). The percentage increase in human development during the second half of the nineties, however, is seen to be much lower than the first half for all countries in the region (figure 1.4).

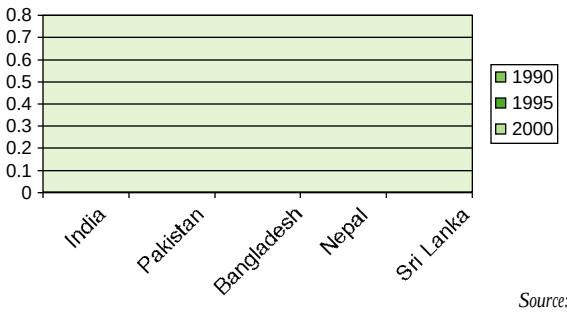
Table 1.1 HDI values for South Asian countries (based on Table 2 of UNDP 2002)

Year	India	Pakistan	Bangla-desh	Nepal	Sri Lanka
1990	0.511	0.442	0.414	0.416	0.697
1995	0.545	0.473	0.443	0.453	0.719
2000	0.577	0.499	0.47	0.490	0.741

Source : UNDP 2002.

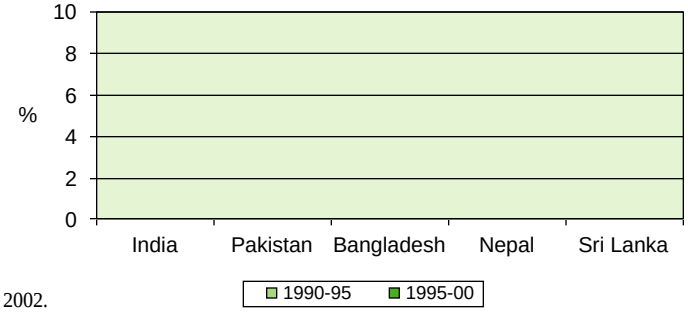
There has been some progress in Human Development in South Asia over the 90s

Figure 1.3 HDI over the 1990s



... but at a falling pace: growth in HDI declined during the second half of the decade

Figure 1.4 Percentage increase in South Asia during the 1990s



Source: UNDP 2002.

Table 1.2 Life expectancy at birth (years) in South Asia

	1990	2000
India	59.1	63.3
Pakistan	57.7	60.0
Bangladesh	51.8	59.4
Nepal	52.2	58.6
Sri Lanka	70.9	72.1
South Asia	58	63

Source: UNDP 1992a, 2002.

Trends in human development indicators

1. Longevity

In the construction of the Human Development Index (HDI), life expectancy at birth is used as a proxy for the first dimension of human development—longevity. It is a common belief that a long life in itself is valuable for an individual and that various indirect benefits (like good health, adequate nutrition, etc) are closely linked with it. It serves as a good measure in the absence of comprehensive data on people's health and nutritional status.

During the nineties, the life expectancy of South Asians registered an average increase of 5 years. People in South Asia can now expect to live longer than they used to at the start of the decade (table 1.2). However, South Asia still has a long way to go: the life expectancy in South Asia is still among the lowest in the entire world, second only to Sub-Saharan Africa.

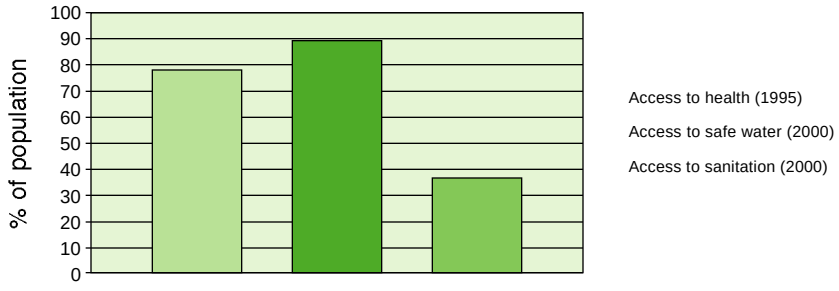
Within South Asia itself, considerable variation can be seen within individual countries, with people in Sri Lanka living up to 72 years, while those in Nepal expecting to live for up to 59 years only. In Bangladesh, the life expectancy increased by nearly 8 years between 1990 and 2000—the highest increase in the region. People in India can now expect to live 3 years longer on average than they did a decade ago.

Multiple factors are responsible for increasing the life expectancy for the South Asians, the major factor being the improvement in the health systems in the region. The performance and coverage of health systems in South Asia showed a marked improvement over the previous decade with a greater proportion of population having access to basic health facilities (figure 1.5). Data from the mid-nineties show that 78 per cent of the population had access to health services, whereas, by the beginning of the 21st century more than 88 per cent of population had access to safe drinking water. Access to safe water is very important in the South Asian context as most of the diseases prevalent in the region are waterborne which take a heavy toll on life. Access to sanitation facilities however, is sill low at 37 per cent.

The infant mortality rates have declined substantially during the nineties due to improvements in the health systems in all the South Asian countries. The number of children dying at birth has been brought down significantly. Similarly, the number of children dying before reaching the age of five has been brought down in all countries of the region. This can mainly be attributed to an improved immunisation coverage in most countries of South Asia.

By the start of the 21st century, 29 per cent less children died at birth than they did a decade ago (table 1.3). Nepal and Bangladesh have seen the highest fall in infant mortality, with infant mortality declining by more than 50 per cent in case of Bangladesh. Infant mortality rate has declined by nearly 27 per cent in India. It is interesting to note that at the start of the nineties, the infant mortality in Bangladesh, Nepal and Bhutan was higher than it was in Pakistan, but by 2000, Pakistan had the highest infant mortality in the region while the other countries had improved their positions. Sri Lanka's infant mortality rate of 17 out of 1000 births was the lowest in the region, way below the regional average of 69. However, 25 per cent (more than 9 million) of all the new born babies in South Asia are of low birth weight[2].

Figure 1.5 Access to health and other facilities in South Asia



Source: MHHDC 2001.

Furthermore, only 36 per cent of births in the region are assisted by a skilled health attendant—the lowest in the world, even lower than Sub-Saharan Africa at 42 per cent.

The under five mortality rate has declined by more than 33 per cent in the region during the nineties. Of every 1000 children born in South Asia, by the start of the 21st century, 95 did not reach the age of five on average, down from 147 children in 1990. This number was highest in Pakistan where 110 out of 1000 children still died before reaching the age of five, although this figure had declined by 30 per cent during the nineties. Under-five mortality was halved in Bangladesh during this period. In India, the most populous country of the region, under-five mortality had gone down from 142 in the beginning of the decade to 96 children by 2000, a drop of more than 32 per cent.

Public expenditure in the health sector varies considerably across different countries of South Asia. In terms of public expenditure on health as a percentage of GDP, Maldives spent the highest amount at 5.1 per cent in 1998 (table 1.4) whereas Pakistan and India spent the lowest amount on health: 0.9 and 0.8 per cent of their GDP, respectively. Overall, however, the level of public expenditure on health remained the same in South Asia during the nineties at 1 per cent.

Child immunisation rates improved substantially in the region during the nineties. Compared to the eighties when only a small percentage of population of the region was immunised against deadly diseases like TB and DPT; the nineties saw a marked improvement in the coverage and spread of child immunisation programmes. By mid-nineties, around 79 per cent of one year olds were fully immunised against tuberculosis (table 1.5). This contrasts favourably with only 13 per cent immunisation achieved at the start of the eighties. Bangladesh made a remarkable progress in immunisation against tuberculosis achieving 91 per cent immunisation by 1998; up from one per cent at the beginning of the eighties. However, the prevalence of TB was still on the high side in some countries of the region, e.g., Bangladesh and Nepal, where 246 and 211 in 1000 people, respectively were infected with the disease in 1997[3]. By 1997-99, 57 per cent of the one-year olds in South Asia were immunised against measles; an increase of 56 percentage points from 1980.

- The above analyses show that South Asia has made encouraging progress in some areas of health such as child immunisation rates and a decline in infant and under-five mortality rates, yet it has a long way to go in other areas of health. Malnutrition is still an over-whelming problem throughout South Asia especially amongst the vulnerable groups: infants, pre-school children, pregnant and lactating mothers. Nearly 30 per cent of the

Table 1.3 Infant and child mortality rates in South Asia

(per 1000 live births)

	Infant mortality rate			Under five mortality rate		
	1990	2000	Decline (%)	1990	2000	Decline (%)
India	94	69	26.6	142	96	32.4
Pakistan	104	85	18.3	158	110	30.4
Bangladesh	114	54	52.6	180	82	54.4
Nepal	123	72	41.5	189	100	47.1
Sri Lanka	26	17	34.6	35	19	45.7
Bhutan	123	77	37.4	189	100	47.1
Maldives	61	59	3.3	85	80	5.9
South Asia	97	69	29	147	95	35

Source: UNDP 1992a, 2002.

Table 1.4 Expenditure on health in South Asian countries

	Public expenditure on health (% of GDP)	
	1990	1998
India	0.9	0.8[a]
Pakistan	1.1	0.9
Bangladesh	0.7	1.7
Nepal	0.8	1.3
Maldives	4.9	5.1
Bhutan	1.7	3.2
Sri Lanka	1.5	1.4
South Asia	1.0	1.0

a: Figure is for the most recent year available between 1995-99.

Source: UNDP 2001a, World Bank 2002a.

Table 1.5 Child immunisation rates

	% fully immunised (One year old children)				
	Tuberculosis		Measles		DPT
	1980	1997-99	1990	1997-99	1997-99
India	14	72	87	55	69
Pakistan	9	73	97	54	58
Bangladesh	1	95	54	66	69
Nepal	43	86	67	73	76
Sri Lanka	63	97	83	95	99
Bhutan	9	90	89	77	88
Maldives	8	98	–	97	97

Source: ESCAP 2002, UNICEF 2001a.

Box 1.1 Balance sheet of human development in South Asia during the nineties

Progress	Deprivation
Life expectancy	
• Average life expectancy increased from 58 years in 1990 to 63 years by 2000.	• The life expectancy in South Asia is still among the lowest in the world second only to Sub-Saharan Africa. • By the year 2000, 95 out of 1000 children on average still died before reaching the age of five.
Health	
• 78 per cent of the population has access to health services.	• The region is host to the highest proportion of underweight, stunted and wasted children in the entire world. • Overall, nearly half of the children under the age of five are chronically malnourished in South Asia.
Food and nutrition	
• The daily supply of calories increased by 10 per cent during the nineties.	• Daily calorie supply of 2379 still below the average for developing countries at 2663.
Education	
• Adult literacy increased by 8 percentage points during the nineties from 42 per cent in 1990 to 54 per cent in 1999.	• The total number of illiterates increased from 366 million in 1990 to 388 million in 1997. • 39 million children lack even primary education.
Income and poverty	
• Income per head grew annually by almost 5 per cent during the nineties.	• South Asia is still home to the largest number of poor people in the world, i.e., 515 million. • GDP per capita of $ 2238 much below the average for developing countries at $ 3783.
Women	
• Female literacy rate had reached 42 per cent by the end of the nineties.	• 365 million women are still illiterate in South Asia. • Women on average earn only 40 per cent of what their male counterparts earn.
Children	
• Infant mortality dropped by around 29 per cent during the nineties.	• Nearly half of the children under the age of five are chronically malnourished in South Asia. • 79 million children suffered from malnutrition.

515,000 women in the world who die every year as a result of pregnancy and childbirth are in South Asia[4]. The number of malnourished children is also high, in fact, the region is host to the highest proportion of underweight, stunted and wasted children in the entire world. Nearly half of the children under the age of five are chronically malnourished in South Asia[5].

2. Knowledge

Education, the second component of HDI is used as a proxy for knowledge. The education index, used in the computation of the HDI, itself consists of two components, i.e., adult literacy (with two-thirds weight) and the combined (for all levels) gross enrolment ratio (with one-thirds weight). It, therefore, gives appropriate weight to all levels of education to capture their movements over time. There is clear evidence that education leads to many social benefits, such as improvements in the standards of hygiene, reduction in infant and child mortality rates, decline in population growth, etc. There are numerous examples from South Asia to support this hypothesis: in urban India, when mothers were educated child mortality rate was as low as 34 per thousand against 82 per thousand for uneducated mothers; in Bangladesh contraceptive use was only 27 per cent among women with no education but was more than 66 per cent for women with more than secondary education[6]. In Pakistan, the incidence of food poverty is almost three times higher in households with no education compared to those with 10 years of education[7].

South Asia has made considerable progress in the field of education. Experiences in some parts of South Asia have been very encouraging. The region entered the nineties with adult literacy rate of 46 per cent, which had reached 54 per cent by the end of the decade, an improvement of 8 percentage points (table 1.6). At the start of the new millennium, Maldives and Sri Lanka had both achieved literacy rates of well over 90 per cent, considerably higher than the regional average of 54 per cent. Nepal and Bangladesh on the other hand, had the lowest literacy rates in the region, although adult literacy had increased by 16 percentage points between 1990-2000. The total number of illiterates in South Asia has increased during the 1990s (table 1.7) despite an increase in enrolment rates in virtually all countries of the region (table 1.8). According to estimates there were 366 million illiterates in South Asia at the beginning of the nineties. India had the highest absolute number of illiterates in the region—a staggering 274 million—nearly one third of its entire population. This was followed by Pakistan where more than 43 million people were not able to read or write. Nearly 40 million people were illiterate in Bangladesh. By 1997, the total number of illiterates in the region had gone up to 388 million. In India, the figure had jumped by more than 10 million, whereas it went up by around 4.1 and 6.5 million in

Table 1.6 Adult literacy rate

	1990			2000			
	Overall	Male	Female	Overall	Male	Female	overall
India	48	62	34	57	68	45	9
Pakistan	35	47	21	43	58	28	8
Bangladesh	35	47	22	41	52	30	6
Nepal	26	38	13	42	60	24	16
Sri Lanka	88	93	84	92	94	89	4
Bhutan	38	–	–	47	–	–	9
Maldives	95	–	–	97	97	97	2
South Asia	46	58.9	31.8	54	65.5	42	8

Source: UNDP 1993, 2002.

Table 1.7 Total number of illiterates in South Asia (in millions)

	1990	1997
Total	366	388
India	274.1	284.8
Pakistan	43.4	47.2
Bangladesh	39.6	46.1
Nepal	7.4	8
Sri Lanka	1.3	1.2
Bhutan	0.6	0.6
Maldives	0.07	0.06

Source: UNESCO 2000.

Table 1.8 Enrolment ratios

	Primary enrolment gross		Secondary enrolment gross	
	1990	1997	1990	1997
India	97	100	44	49
Pakistan	61	74[a]	23	26[b]
Bangladesh	72	92[b]	19	19[c]
Nepal	108	113	33	42
Sri Lanka	106	109	74	75

a: 1996; b; 1995; c: 1993.
Source: UNESCO 2000, MHHDC 2001.

Table 1.9 Public expenditure on education, by GDP and by level

	Public expenditure on education (% of GNP)		Public expenditure by level, 1995-97 (% of all levels)		
	1990	1995-97	Primary	Secondary	Teritary
India	3.5	3.2	39.5	26.5	13.7
Pakistan	3.4	2.7	51.8	27.9	13
Bangladesh	2	2.2	44.8[a]	43.8[a]	7.9[a]
Nepal	–	3.2	45.1	19	19
Sri Lanka	2.7	3.4	–	74.8[b]	9.3

a: Data refer to the Ministry of Education only.
b: Data refer to combined expenditure for pre-primary, primary, and secondary levels.
Source: UNDP Human Development Reports, various issues.

Pakistan and Bangladesh, respectively. On the other hand, the number of illiterates declined in Sri Lanka and Maldives, whereas, it remained almost constant in Bhutan. The three large South Asian countries, Bangladesh, India and Pakistan, were together estimated to account for nearly half (45 per cent) of the world's illiterate adults in 2000, i.e., 387 million people (289 million in India alone) compared to around one-third in 1970[8]. South Asia is one of the regions where the majority of adult females are illiterate, along with the Arab States. Of the 387 million illiterate adults estimated for the three major countries in 2000, more than 61 per cent are females[9].

The enrolment rates for all levels of education have gone up considerably in all countries of the region. However, the enrolment increases have barely kept up with the growth in the population of school-age children. The combined enrolment for all levels of education in South Asia reached around 53 per cent by 1999, up from 37 per cent in 1980[10]. However, Bangladesh, Pakistan and Nepal still have very low levels of combined enrolment, much below the regional average of 53. The gross primary enrolment rates for Pakistan were the lowest in the region both at the start and towards the middle of the nineties despite the fact the Pakistan's expenditure on primary education was the highest in the region (table 1.8 and table 1.9).

Public expenditure on education has declined in India and Pakistan during the nineties, more so in the case of Pakistan (table 1.9). In case of Bangladesh and Sri Lanka, expenditure on education has risen in the later part of the nineties, but Bangladesh allocated only 2.2 per cent of its GNP on education, the lowest figure in the region. The decomposition of public expenditure on education across South Asian countries shows that Pakistan spent the most at the primary level of education. Bangladesh spent the highest at the secondary level although its secondary enrolment rates were the lowest in the region during the nineties, whereas Nepal spent most at the tertiary level. Compared to other regions, the levels of investment in education have been disappointing in South Asia and have barely kept pace with the rising population.

The pupil-teacher ratio at the primary level deteriorated in South Asia (table 1.10) during the first half of the decade but improved in the later part of the decade. However, in case of Pakistan the ratio worsened, signifying a shortage of appropriately qualified teachers at the primary level. This is despite the fact that Pakistan spent the largest amount of its educational budget at the primary level. This signifies deterioration in the quality of primary education in the country. This can be attributed to two things: firstly, the inadequacy of budgetary allocations due to the high rate of population growth and, as a result, increased number of school-age children, and secondly, the efficiency and quality of public spending has been low. In India, on the other hand,

Table 1.10 Pupil teacher ratio at the primary level

	Primary pupil teacher ratio		
	1990	1995	1997-99*
India	61	64	48
Pakistan	41	38	48
Bangladesh	61	71	59
Nepal	39	39	38
Sri Lanka	29	28	30
Bhutan	37	31	41
Maldives	–	31	23
South Asia	58	61	49

* Latest available year.
Source: MHHDC 1998, 2001.

the pupil teacher ratio showed significant improvement through the nineties—there were 48 students per teacher by late nineties compared to 61 students per teacher in 1990.

There is an acute shortage of properly trained teachers in South Asia. Although large parts of the existing teaching force in India, Pakistan and Bangladesh have been formally trained, the quality of teacher training in some countries is, in general, very low. Consequently, the education imparted by them leaves much to be desired. Many teachers have little or no understanding of the materials they teach and are unable to properly motivate their students. The number of female teachers is very low in South Asia: in 1997-98, only 35 per cent of primary teachers were female[11]. The proportion of female teachers at the primary level was as low as 16 per cent in Nepal and as high as 82 per cent in Sri Lanka[12].

3. Decent standard of living

In the construction of the Human Development Index (HDI), GDP per capita is used as a proxy for a decent standard of living. Income is an important means of enlarging the choices available to people: more income means that people can spend more on their own education and health, more healthy and educated people in turn can be more productive and can have greater access to opportunities to improve their lives. However, GDP per capita is only a rough measure to capture the resources at the disposal of people and the choices that are available to them.

The level of real GDP per capita in South Asia is very low compared to other regions (table 1.12). South Asia was just above Sub-Saharan Africa throughout the nineties. In 1990 there was very little difference between the living standards as measured by the real GDP per capita of people in both these regions. This difference had widened somewhat by the year 2000 in favour of South Asia. However, compared with other regions of the world the living standard of South Asia was below average—its real GDP per capita of $2238 is much lower than the average for developing countries at $ 3783. At the same it can also be observed that there was considerable variation between the income levels in all countries of South Asia during the nineties (table 1.11). Both Maldives and Sri Lanka are seen to have much higher levels of income during the 1990s in comparison with other countries of the region. It is interesting to note, however, that in the early nineties, i.e., from 1990 to 1993, Pakistan's real GDP per capita was higher than Maldives—in fact it was second highest after Sri Lanka. By the mid-nineties, its growth in income became stagnant while towards the end it started declining. Overall, Pakistan experienced the lowest growth in per capita income in the whole region during 1990-2000 at 1.2 per cent. India, on the other hand which started from a lower real GDP per capita than Pakistan, had surpassed Pakistan by the end of the nineties; its GDP per capita grew at an average annual rate of 4.1 per cent between 1990 and 2000, indicating its high and sustained economic growth during the 1990s. All the other countries in the region saw GDP per capita growth ranging between 2.4 per cent in case of Nepal to 5.4 per cent in Maldives.

The nineties was characterised by rising income inequalities in all the countries of

Table 1.12 GDP per capita (PPP $) in different regions

	1990	2000
East Asia and Pacific	2400	4290
Latin America & Caribbean	4490	7234
South Asia	1250	2238
Arab states	3380	4793
Sub-Saharan Africa	1200	1690

Source: World Bank Development Indicators.

Table 1.11 GDP per capita (PPP $) and its growth in South Asia

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives
1990	1072	1862	872	920	2405	800	1200
1992	1230	2890	1230	1170	2850	750	1200
1994	1348	2154	1331	1137	3277	1289	2200
1996	1580	1600	1010	1090	2290	–	3140
1998	2077	1615	1361	1157	2979	1536	4083
2000	2358	1928	1602	1327	3530	1412	4485
Growth rate 1990-2000%	4.1	1.2	3	2.4	3.9	3.4	5.4

Source: World Bank, World Development Indicators, various issues, UNDP 2002.

Table 1.13 Comparing indicators of human development (2000)

	HDI	GDI	GEM[a]
India	0.577	0.560	0.24
Pakistan	0.499	0.468	0.176
Bangladesh	0.478	0.468	0.304
Nepal	0.490	0.470	–
Sri Lanka	0.741	0.737	0.321
Bhutan	0.494	0.444[b]	–
Maldives	0.743	0.739	0.342
South Asia	0.560	0.542	0.236
Developing countries	0.654	0.634	n/a

a: 1997.
b: 1998.
Source: MHHDC 2001; UNDP 2000a, 2001a.

Table 1.14 GDI values as per cent of HDI values

	GDI (% of HDI)	Shortfall in GDI (% of HDI)
India	97	3.0
Pakistan	93.8	6.2
Bangladesh	97.7	2.3
Nepal	95.9	4.1
Sri Lanka	99.5	0.5
Bhutan	89.9	0.1
Maldives	99.5	0.5
South Asia	96.8	3.2

Source: UNDP Human Development Reports, various issues.

the region, with the rich getting richer and the poor getting poorer. Figures from the latter half of the nineties show that the richest 20 per cent of the population of all countries of South Asia on average had around 41-46 per cent share in income (figure 1.6), whereas the poorest 20 per cent of the population had roughly 8-10 per cent of the income share. In India, the richest 20 per cent got more than 46 per cent of income leaving only 8 per cent for the poorest 20 per cent.

Much disparity can also be observed between the genders as far as income distribution is concerned. Large disparities exist in the share of males and females in real GDP per capita with the female share being only 39 per cent of the male share[13]. This share is lowest in Pakistan with the female GDP per capita barely 30 per cent of the male, while the highest figure is for Maldives at 59 per cent.

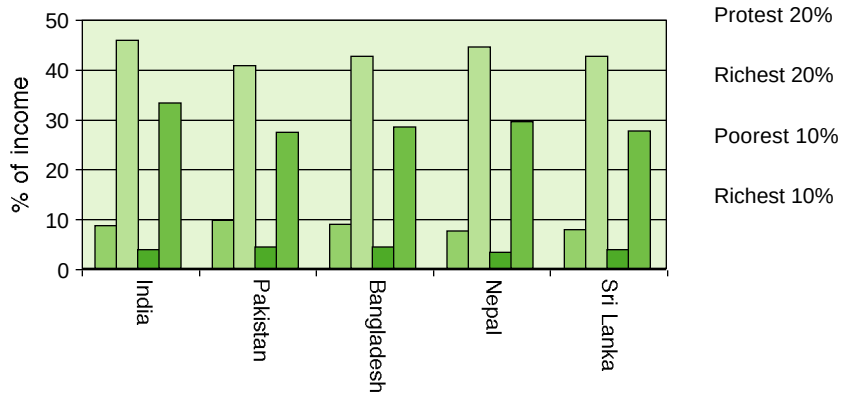
Gender-sensitised HDI

The 1995 Human Development Report, prepared on the eve of the 1995 Beijing Conference on Women, broke new grounds in comparing human development performance of countries from a gender perspective. It raised questions such as, how do women fare in the socio-economic development of a country? Do women have the same access to build their capabilities and to enjoy opportunities as the men? The Report documented the contrast between women's capabilities, which was expanding fast, and opportunities, that remained very limited. Two new indices were constructed: Gender-related Development Index (GDI) and Gender Empowerment Measure (GEM) The GDI measures the unequal achievements of men and women in life expectancy, education and income—the components of HDI. Thus the greater the gender disparity in a country, the lower would be its GDI value as compared to its HDI. Theoretically speaking, if there is no gender discrimination in a country its GDI value would be equal to its HDI value. The GEM on the other hand, reflects the opportunities available to women rather than their capabilities. It captures gender inequalities in the economic and political life of a country.

Thus, together these three indices present a more comprehensive profile of the state of human development in a country. While a country may appear to have achieved a high level of human development, women in that country may still face discrimination in building their capabilities and in gaining access to economic and political opportunities. However, it needs to be pointed out that indices like GDI and GEM cannot be taken as complete measures of gender equality or women's empowerment. Many facets of equity and empowerment such as security, mobility, etc. are not adequately represented by the proxy measures used in these indices.

South Asia had a GDI value of 0.542 at the end of the nineties (table 1.13). This value represents 96.8 per cent of its HDI value of 0.560 (table 1.14). However, within South Asia there were large variations in the HDI, GDI and GEM values, the intra regional comparison reveals that Maldives had the highest GDI whereas Bhutan had the lowest. Both Maldives and Sri Lanka had HDI and GDI values of over 0.7, above the world averages.

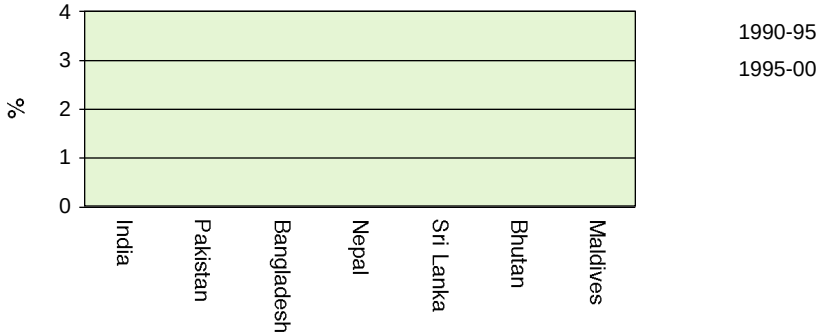
Figure 1.6 Inequality in income distribution



Source: World Bank 2001a.

Their GEM values were much higher than the average for South Asian countries. The shortfall in GDI expressed as a percentage of HDI (table 1.14) shows the extent to which human development was gender biased in different countries of South Asia. Here again, it is observed that in both Sri Lanka and Maldives, the shortfall in GDI was very small, 0.5 per cent, signifying that women in both these countries enjoyed a much more equitable position than their counterparts in other countries of the region. Bhutan and Pakistan had the largest shortfall in GDI at 10.1 and 6.2 per cent respectively (table 14) and Pakistan also had the lowest value of GEM (table 1.13), pointing to the fact that women in Pakistan suffered much discrimination in building their capabilities and gaining access to opportunities. Development in Bangladesh was more equitable, as its shortfall in GDI was only 2.3 per cent of its HDI, women there also had more opportunities available to them as the above value of GEM shows.

Figure 1.7 Population growth in South Asia during the 1990s



Source: MHHDC 2001.

Population growth in South Asia and its impact on human development

The challenge of human development facing South Asia increased in magnitude as its population crossed 1.3 billion by 2000, up from 1.1 billion at the start of the 1990s (table 1.15). The population of India, the most populous country of the region reached the billion mark by 2000, representing nearly 76 per cent of South Asia's population. It has been estimated that India would surpass China as the most populous country in the world by 2015. A comparision of South Asia's population growth during the two halves of the nineties shows that Bhutan experienced the highest growth in population during 1990-95, whereas Maldives recorded the highest growth in the latter half of the decade. Population growth in Pakistan remained high at 2.3 per cent during both periods of the nineties, as the country had one of the highest fertility rates in the region. Sri Lanka, on the other hand, experienced the lowest rate of population growth in both periods of the decade (see figure 1.8).

Towards the end of the 1990s South Asia had become the second most populated region in the world, after East Asia (see table 1.15). It is the most densely populated region with 278 people per sq. km, which compares unfavourably with the population density of East Asia of 115 people per sq. km. The high level of population growth has put tremendous pressure on the resources of the region. The nineties was characterised, in particular, by declining public expenditures on the provision of social services, like health and education to the increasing number of people in South Asia. However, the

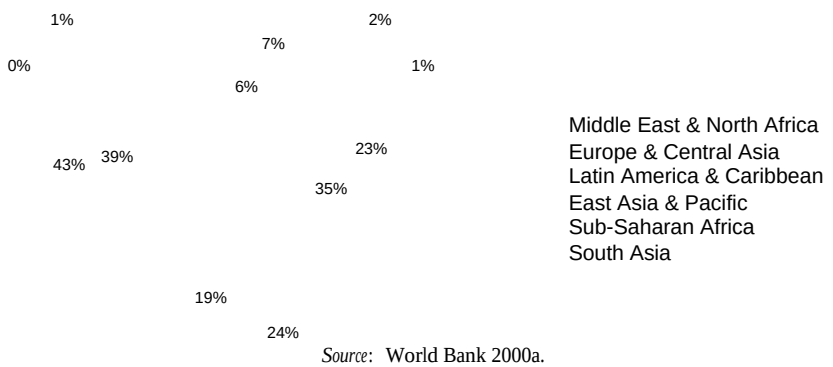
Table 1.15 Population of South Asia

(millions)

	1990	2000
India	851	1014
Pakistan	122	138
Bangladesh	108	129
Nepal	19	24
Sri Lanka	17	19
Bhutan	1.5	2.1
Maldives	0.2	0.3
Total	1119	1326

Source: UN 1999.

Figure 1.8 Distribution of poverty: % living on less than $1 a day—Developing World



Source: World Bank 2000a.

Table 1.16 Poverty in South Asia

	India	Pakistan	Bangladesh	Sri Lanka	Nepal
Population below poverty line (%)					
$ 1 a day (93 PPP US$)					
1989-94	53	12	–	4	–
1995-97	44	31	29	7	38
$ 2 a day					
1995-97	86	85	78	45	83
National poverty line					
1990-94	41	34	43	22	–
1995-97	35	–	35.6	25	42

Source: ADB 2001b, World Bank 2002a.

contribution of non-government organisations (NGOs) and community based organisations (CBOs) in the development of social sectors increased significantly during the decade.

Human development/poverty nexus

Poverty was one of the most serious challenges facing South Asia in the 1990s. The number of people in absolute poverty has risen in South Asia making it home to the largest number of poor in the world. Recent data reveal that out of the 1.3 billion poor people in the world, 515 million lived in South Asia[14]. In India, between 1989-94, more than half the population, 53 per cent, lived on just $ 1 per day (table 1.16). This was true for Nepal as well. In Bangladesh, 29 per cent of the population was living below $ 1 per day in the early part of the nineties. The poverty situation in Pakistan which was only 12 per cent of the population at the start of the 1980s went up to 31 per cent by the later half of the nineties. In India, on the other hand, this figure had declined by more than 10 percentage points by 1995-97 as the Indian economy saw the highest growth rates in the region.

The share of South Asia in global poverty is constantly on the rise. In 1998, 43 per cent of the poor living on less than $ 1 a day were in South Asia against 39 per cent in the beginning of the 1990s. Figure 1.8 shows the distribution of poverty in the developing world. The inner circle represents the distribution in 1990 whereas the outer circle represents the same in 1998. The figure shows clearly that poverty is

Box 1.2 Human Poverty Index

Poverty in its most common definition is thought of as being poverty of income or is seen in terms of consumption. However, poverty is a very broad concept and these definitions do not often capture the other broader dimensions of poverty—the poverty of opportunity. In the context of human development, which is concerned with enlarging people's choices, it is the poverty of opportunity that creates and sustains poverty. The lack of opportunities available to an individual to lead a healthy and productive life, to be able to make informed decisions about his life, to enjoy a decent standard of living, freedom and security, would convey all deprivations.

The human development approach to poverty is based on the concepts of both building capability as well as enhancing opportunities, stating that the poverty of a life lies not merely in the improverished state in which the person actually lives, but also in the lack of real opportunity—due to social constraints as well as personal circumstances—to lead valuable and valued lives. The 1997 UNDP Human Development Report introduced the Human Poverty Index (HPI) as a more comprehensive measure of poverty, more in line with the human development concept. The HPI measures deprivations in the three basic dimensions of human development, captured in the HDI:

- A long and healthy life, as measured by life expectancy at birth.
- Knowledge as measured by the adult literacy rate and combined primary, secondary and tertiary gross enrolment ratio.
- A decent standard of living, as measured by GDP per capita (PPP US$).

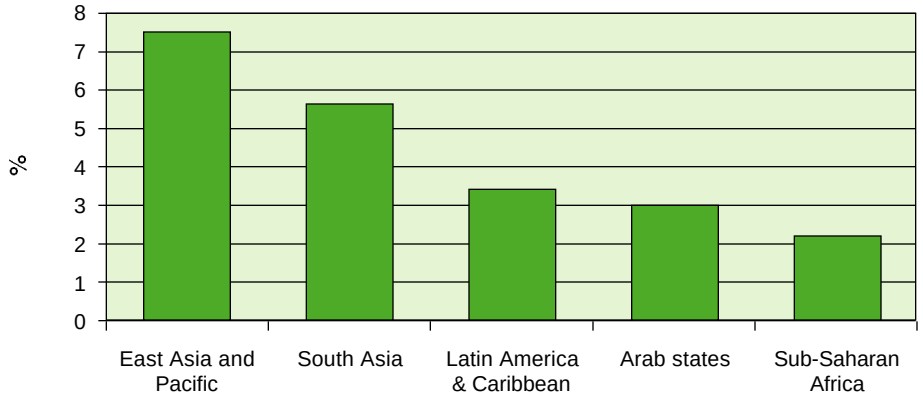
The HPI is thus a more appropriate measure of the poverty of opportunity.

HPI in South Asia

	India	Pakistan	Bangladesh	Nepal	Sri Lanka
1997	35.9	42.1	44.4	51.9	20.4
1998	34.6	40.1	43.6	51.3	20.3
1999	34.3	39.2	43.3	44.2	18.0
2000	33.1	41.0	42.4	43.4	17.6

Source: UNDP Human Development Reports, various issues.

Figure 1.9 GDP growth of different regions during the 1990s



Source: World Bank 2001a.

shifting towards South Asia and Sub-Saharan Africa.

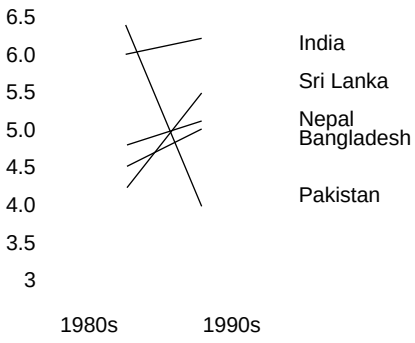
Economic performance and human development in South Asia

The economic performance of the region as a whole during the nineties was encouraging compared with other developing regions (figure 1.9). South Asian growth rate was second highest after East Asia and the Pacific region. Within South Asia, all countries saw significant economic growth with the possible exception of Pakistan (figure 1.10). Its growth rate deteriorated, from over 6 per cent in the eighties to 3.8 per cent in the nineties. The Indian economy saw a growth rate of 6 per cent during the nineties, the highest in the region.

Strong economic growth is a prerequisite for improvement of human development in a country as it provides the required resources for improving the provision of social services as well as income-earning opportunities. However, the benefits of economic growth have to be equitably distributed through progressive public policy initiatives to achieve maximum welfare gains for all people, irrespective of class, caste or gender. This was the message of the founder of the Centre, Mahbub ul Haq, and the focus of the Centre's annual Human Development Reports. Thus the theme of this Report, Agriculture and Human Development is also based on the belief that an equitable GDP growth is not only good for the economy it is also good for the country as a whole, as it improves the wellbeing of all people—poor and rich alike.

There is now strong evidence that the developing countries which have achieved sustained economic growth in the past three decades are generally the countries in which the rate of agricultural growth exceeded population growth. Even countries which followed an explicit development strategy based on to buy its food at reasonable prices, the supply of raw material could not be assured for many industries, and the bulk of the

Figure 1.10 GDP growth rates of South Asian countries



Source: World Bank 2002a.

population living in rural areas would not have the purchasing power to buy goods produced by the industrial sector. Rapid agricultural growth, on the other hand, can stimulate and thus sustain the pace of industrial growth, thus setting into motion a mutually reinforcing process of sustained economic growth.

Agricultural growth, even when stimulated by investment in irrigation, rural infrastructure and agricultural research, is constrained by the availability of land and water, by the pattern of land holdings and by inevitable variation in climate and rainfall. There are also demand constraints because international markets are flooded by subsidised agricultural exports from developed countries. An average agricultural growth rate of 2.5 to 3.0 per cent is considered satisfactory since it means positive per capita growth in agriculture. A sustained growth rate of 4-5 per cent in the agricultural sector is highly satisfactory and in practice very few developing countries have maintained such a rate for any length of period.

By comparison, industrial growth is not constrained by such natural factors, and the demand for industrial products, both in domestic markets and in other countries, has been growing at a much faster rate than that for agricultural products. An industrial growth rate of about 6 per cent per annum is, therefore, necessary to achieve, with an agricultural growth of 3 or 3.5 per cent, an average growth of 5 per cent of GDP. As a result, the share of agriculture in GDP will continue to fall. In South Asia the share of agriculture as a percentage of GDP has, on the average, declined from 40 per cent in the 1980s to 25 per cent in 1997-2000, with Sri Lanka at 20 per cent and Nepal still at 40 per cent (table 1.17).

Conclusion

South Asia has made significant progress in improving its human development indicators during the 1990s:

- The adult literacy rate has increased by 8 percentage points, from 46 to 54 per cent and female literacy by 10 percentage points from 32 per cent in 1990 to 42 per cent in 2000.
- Life expectancy at birth has gone up by five years from 58 to 63 years.
- Infant mortality rate has declined by 29 per cent from 97 to 69 per 1000 live births, and under five mortality by 35 per cent from 147 to 95 per thousand live births.
- Child immunisation programmes now cover 80-90 per cent of the children.
- The daily per capita supply of calories has increased by 10 percent to 2379.

Table 1.17 Agriculture and human development

	Agricultural Growth Rate (as % of GDP 1997-2000	HDI 2000	HPI-1 (%) 2000	Real GDP per capita (PPP US$) 2000
Bangladesh	25	0.478	42.4	1,602
India	25	0.577	33.1	2,358
Nepal	40	0.49	43.4	1,327
Pakistan	26	0.499	41	1,928
Sri Lanka	20	0.741	17.6	3,530
South Asia	25	0.57	–	2,404
Low Human Development Region	32	0.448	–	1,251
Medium Human Development Region	13	0.691	–	4,141
High Human Development Region	2	0.918	–	24,973

Source: World Bank 2002a, FAO 2002d; UNDP 2001a, 2002.

But there is an urgent need to accelerate this progress in the first decade of the 21st century, by further increasing financial allocations for human development, enlarging the role of the civil society, and focusing on low-income communities.

This Report highlights the importance of the agricultural sector for reducing poverty and improving human security. It also explains how the growth of non-agricultural activities in rural areas, from the supply of agricultural inputs to processing of agricultural commodities, raises agricultural productivity, improves net farm income through better marketing, and provides non-farm employment to the landless rural population. This healthy interaction between agriculture and non-agricultural activities in rural areas has been the central objective of successful models of rural development in South Asia.

Annex Table 1: HDI values of South Asian countries during the 1990s

Year	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives
1990	0.309	0.311	0.189	0.170	0.663	0.150	0.497
1992	0.439	0.483	0.364	0.343	0.704	0.305	0.554
1993	0.436	0.442	0.360	0.332	0.698	0.307	0.610
1994	0.446	0.445	0.368	0.347	0.711	0.338	0.611
1995	0.451	0.453	0.371	0.351	0.716	0.347	0.683
1997	0.545	0.508	0.440	0.463	0.721	0.459	0.716
1998	0.563	0.522	0.461	0.474	0.733	0.483	0.725
1999	0.571	0.498	0.470	0.480	0.735	0.477	0.739
2000	0.577	0.499	0.478	0.490	0.741	0.494	0.743

Source: UNDP Human Development Report, various issues.

Annex Table 2: HDI ranks

Year	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives
1990	134	132	147	152	86	159	112
1992	135	132	146	149	90	162	118
1993	135	134	143	151	89	159	107
1994	138	139	144	154	91	155	111
1995	139	138	147	152	90	155	95
1997	132	138	150	144	90	145	93
1998	128	135	146	144	84	142	89
1999	115	127	132	129	81	130	77
2000	124	138	145	142	89	140	84

Source: UNDP Human Development Report, various issues.

Chapter 2

Agriculture and Human Development—A Conceptual Framework

Introduction

It is widely acknowledged that agricultural development has a very healthy effect on human development through rising rural incomes which are partly channeled into social and physical infrastructures in rural areas. However, the positive impact of human development on agricultural production has not yet been fully recognised in policy decisions. This chapter presents an overview of the changing role that was assigned to agriculture in South Asia in the past fifty years, the dramatic impact of the Green Revolution technologies in the 1960s and 1970s, the increasing commercialisation of agriculture in the 1980s, experiments with different strategies of rural development, and institutional and policy reforms in agriculture, in order to evolve a conceptual framework to highlight the importance of the positive interaction between rural transformation and human development.

In post-independence South Asia in the 1950s, agriculture was the primary source of income and employment. Due to a decline in mortality, largely as a result of public health measures, the rate of population growth was rising. The agricultural sector employed traditional technology. Due to high population pressure, labour productivity in agriculture measured per unit of land and labour was low. Increase in agricultural productivity was also low due to low rate of investment in the sector. Absorbing labour and providing food through domestic production were difficult tasks in view of the low and stagnant productivity in agriculture. The distribution of land was extremely unequal. The situation with respect to human development was not very encouraging. Life expectancy was low. Educational attainment was meagre and rates of illiteracy extremely high. These attributes combined with low average income meant that, the value of Human Development Index must have been abysmally low at that time.

The first decade of the independent South Asia did not witness any major improvement in the agricultural sector. The balance between increasing food needs and food supply had remained precarious. Food aid was used to import food from the donor countries whenever there was a shortfall in domestic food production. Expectations in independent South Asia of achieving prosperity for the majority of its population were high. The task of rehabilitation and development of the economies was, however, a big challenge to the policy-makers. Colonial rule over a prolonged period for the countries had resulted in the persistence of extreme poverty in the region. Prospects of dashed expectations in independent South Asia were a source of potential social and political instability.

The second decade however saw the advent of the Green Revolution. As a result of the introduction of high yielding varieties of wheat and rice beginning in the mid-1960s, the Malthusian spectre of rapid population growth, famine and widespread deaths from starvation was averted in South Asia. The expansion in irrigation, the impressive technological advances and improvements in policies and institutions serving agriculture had led to a sustained overall increase in agricultural production.

The decade of the 1980s saw the successful diversification of agriculture, from cereal to cash crops like cotton and oilseeds and also to horticulture and livestock. While this diversification helped

The positive impact of human development on agricultural production has not yet been fully recognised in policy relations

Ecological and livelihood security is the foundation on which sustainable food security has to be built

to sustain the overall rate of agricultural growth in the 1980s and 1990s, the constraints arising from the patterns of land ownership and unequal access to irrigation water began to surface. The region is still mired in pervasive poverty, widespread chronic malnutrition, large income and wealth inequalities and low human development. At the turn of the century, the region seems to be in an unsustainable relationship with nature.

Today, South Asia is faced with major challenges. Negative social and environmental effects of the Green Revolution have erased some of the positive gains. The high rate of population growth has exceeded the population supporting capacity of the ecological-system in the Sub-continent. Life support systems of land, water, forests and bio-diversity are threatened by the nature of agricultural change experienced in the region. There is an increasing feminisation of poverty and gender inequity in rural South Asia. Employment growth in agriculture has been slow, relative to the increase in the rural labour force. The non-farm economy has not been able to pull out labour from agriculture significantly. Labour productivity has stagnated and income gains per capita have been small. It is no wonder that food and nutritional security at the level of the household has emerged as a major issue. Ecological and livelihood security is the foundation on which sustainable food security has to be built. At the beginning of the new millenium, South Asia is precariously placed to ensure a productive and healthy life for its people. The agricultural sector has yet to deliver on the potential it has in the region. The Green Revolution provided a respite. But it did not offer a permanent solution to the human poverty in rural areas. The pertinent issue is to identify the factors that explain the failure of the agricultural sector in achieving widespread social and economic benefits. A satisfactory explanation of the development experience in South Asian agriculture, however, faces major conceptual and empirical challenges. What is the appropriate role of agriculture and rural development in a poverty alleviation and growth strategy? Did the pattern of non-farm transformation in South Asian agriculture play such a role? If not, what policies and institutional features and structural issues in agriculture explain the role of agriculture and rural development? What was the extent and nature of commercialisation and diversification of agriculture? What was the impact of the structural changes in agriculture on growth, employment and poverty reduction? The broad-based pattern of rural non-farm transformation spreads the benefits of agricultural growth widely across different groups in rural areas. Did it happen in South Asia? The role of the government in this transformation is critical in realising its beneficial impact on poverty alleviation, job creation and quality of life in rural areas. The initial rise in agricultural productivity has been a pre-condition for successful economic transformation elsewhere. What explains the limited spread effects of the Green Revolution in South Asia? Was the Green Revolution strategy suited only to some areas with assured irrigation facilities? Lagging areas in South Asia were bypassed as a result of the nature of technology suited to irrigated areas only, or that the technology was not backed by appropriate credit policies and appropriate technologies for non-irrigated areas?

The importance of human capital for strong performance of the agricultural sector has been recognised in theoretical and empirical literature. For the agricultural sector, the impact of education works through the improved ability of farmers to adopt complex technologies. Education encourages adoption of improved business practices and provides access to information. Investments in health and nutrition supplement the impact of education in improving agricultural productivity. The investment in human capital in South Asian rural areas has been lower than the national average due to an urban bias in allocations

of the social sector expenditure mainly for the benefit of urban areas. The lower level of human capital formation in agriculture in turn explains the low rate of agricultural advance. This factor may be of crucial importance in efforts to maintain productivity gains in the post-Green Revolution era. The need to coordinate and carefully sequence investments in human capital, technology and institutional reforms is more urgent now than at the beginning of the Green Revolution. The premium on human capital is also higher in the competitive world of globalisation.

The issues of land reforms and agrarian structural were important to give small holders incentives to invest in land improvements and adopt new technologies requiring substantial investment. The high concentration of land in South Asia was, by itself, an important constraint in the efficiency of resource use in agriculture. The impact of large inequality in land distribution tilted the agricultural policies in favour of large holdings. The preemption of credit and extension services by large farmers had deprived the small farmers from these essential inputs and public services.

Assuming that policy and institutional lapses committed in agriculture and rural development in the past are corrected in South Asia, would this suffice to ensure a higher level of human development in rural areas. Agricultural growth is a means and not an end in itself. If agricultural growth is sufficiently high and is broad-based, it generates sufficient levels of incomes and employment which are a necessary condition to improve human resources in rural areas. By itself, higher levels of private incomes are not sufficient to ensure high levels of human development. There is abundant evidence showing that the quality of life in rural areas is lower than the level prevailing in urban areas. The evidence also suggests that a large number of rural people—artisans, women and landless workers are living in abject poverty in South Asia. A still larger proportion is without access to proper sanitation, safe water, health or education facilities. As these unfortunate groups of rural people are unable to establish their entitlements over the elements of better living conditions, they are condemned to lower levels of human development. The need to specifically focus on promising strategies to improve their human development status is urgent. These policies complement the strategies for the broad-based process of agricultural and rural development.

If agricultural growth is sufficiently high and is broad-based, it generates sufficient levels of incomes and employment

Changing roles of agricultural development

In the half century of independence from the colonial powers, the importance given to agricultural development in South Asia and other developing countries has varied over time and among countries. The changes in the roles assigned to agriculture have emerged mainly from the evolving perspectives of development economists on the contribution that agriculture could make to the development process.

Urban strategy—no role assigned to agriculture

The dominant view in the 1950s was that the agriculture sector was backward and had limited, if any, potential for stimulating the growth of the economy. The key to overall growth was to devote resources to urban centres to absorb the migrants from rural areas. The argument on which this view was based maintained that rural poverty was a direct outcome of traditional small holder agriculture and could only be mitigated from industrial growth and rural-urban migration. The emphasis on industrial growth, located generally in urban areas, attracted migrant workers from rural areas. However, in practice industry had created very few jobs for potential migrants from rural areas. Most of the massive population transfer to the cities was into construction and the informal sector with the majority of migrant workers becoming urban slums dwellers.

The bankruptcy of the development strategy adopted initially had forced a reconsideration of a development approach towards a strategy of development in which agriculture and industry both had complementary roles to play.

A dual economy model—Transferring surplus resources from stagnant agriculture

The Lewis Model had provided a framework to identify the contributions of the agricultural sector in economic transformation

The role of agriculture in development in this context was conceptualised into a formal model of development by W. Arthur Lewis in 1954.[1] Two sectors, a modern capitalist sector and a non-capitalist sector, were equated generally with modern industry and traditional agriculture, respectively. These interacted with each other by transferring labour from the non-capitalist sector to the modern sector which had a high marginal productivity as well as high savings capacity. The transfer of resources from agriculture would continue till the marginal productivity of labour in the two sectors became equal. Once this turning point was reached, growth was guided by the neo-classical growth model and the dual economy model lost its relevance. The level of living in traditional sector and the modern sector for wage earners remained at the subsistence level. Poverty was rampant. Capitalists who had earned profits were supposed to invest their profits and expand their business and not indulge in conspicuous consumption.

The Lewis Model had at least provided a framework to identify the contributions of the agricultural sector in economic transformation. The most obvious and significant contributions identified were the transfer of food, labour and capital from agriculture. It was argued that the rapid transfer of labour was needed for the structural transformation of the economy as the shares of agriculture in employment and output were to fall consistently during the economic development process. The role of agriculture originally was perceived as passive as it was assumed that it had a reservoir of resources, which could be tapped to fuel growth in the industrial sector.

The role of agriculture according to the Lewis Model has to be seen in two different ways. The passive role of agriculture would result in the relative neglect of agriculture in policy and strategic terms as the sector declined naturally. Labour would flow to industry, located in urban areas, for no other reasons than the bright lights of the cities. Food and capital would be transferred to industry from a mixture of policies that would turn the terms to trade against agriculture, would impose indirect and direct taxes on farmers and transfer savings from rural areas. The unfavorable incentives to agriculture were not expected to have adverse consequences on agricultural productivity due mainly to assumed low price responsiveness of the sector.

The empirical research on the supply elasticity in agriculture showed, however, that the adverse incentives had slowed the rate of agricultural growth in South Asia. This was especially so in the case of individual crops for which the price response was positive. Reformulation of the Lewis Model by Ranis and Fei showed that turning the terms of trade against agriculture could ultimately cut into the rate of growth of the industrial sector by reducing the profit of industrial entrepreneurs.[2] This happens when the agricultural output slows down as a result of adverse terms of trade for agriculture. The prices of wage goods increase as a result of reduced supply of food. When this happens, there is a need to transfer resources back to agriculture to keep the industrial expansion going.

Dynamic agriculture: An essential ingredient of rapid overall growth

Forced extraction of resources from a stagnating agricultural sector during the 1950s, in South Asia and elsewhere had resulted in frustrated industrial take-offs. It neither resulted in sustained high growth nor it had resulted in any

significant reduction in rural or urban poverty. The debate shifted to emphasising the role rather than the contribution of agriculture to development. Johnston and Mellor had identified five roles for agriculture in economic development.[3] Providing food for domestic consumption, releasing surplus labour for employment in industry and financing capital needs were common to the prior thinking on the subject. However, the fourth and the fifth role of enlarging the size of the market for industrial output and earning foreign exchange to finance imports, respectively were the two important additional roles assigned to the agricultural sector. With the emphasis on broad-based agricultural growth as a way of generating larger effective demand for industrial products, the favourable welfare impact on rural poverty reduction became an important implicit objective of agricultural development. Aziz has highlighted the importance of favourable macro-economic policies for improving terms of trade for the agriculture sector and thereby strengthening the incentives for higher productivity in agriculture.[4]

Objectives of agricultural development

Given the five roles to be played by agriculture, in all successful cases of agricultural transformation, it is not surprising that all countries in South Asia evolved a uniform set of objectives and goals for the sector and articulated similar strategies of rural and agricultural development.

Notwithstanding the nature of the agricultural transformation characterised by declining shares of agriculture in employment and incomes, it needs to be emphasised that agriculture moves through a number of stages with changing roles, political economy considerations and policy requirements.[5]

Agriculture as an engine of growth

Despite considerable structural change in the economies of South Asia, the region remains dominantly agrarian in nature. At the time of independence, the share of agriculture in the economy was high. Despite a decline in its relative importance, the sector is still the single largest sector. In view of the small size of the modern sector, unless the agricultural sector can grow at a respectable rate, the economy as a whole cannot experience a high rate of growth. The engine of growth perforce has to be the agricultural sector in view of its large initial share in the economy. Under the colonial regimes, industry was neglected. Furthermore, even if the food needs of the non-agricultural sector could be met by imports, the small industrial sector could not become the major source of growth for employment and national output. The priority given to agriculture by the policy-makers was low in the initial years, especially during the 1950s. The realisation that dynamic agriculture was necessary for the development of the rest of the economy had not dawned on the policy-makers. Consequently, the role of agriculture as an engine of growth for the economy was not realised in South Asia till the mid-1960s.

Despite considerable structural change in the economies of South Asia, the region remains dominantly agrarian in nature

Increasing the supply of food

The importance of food as a wage good had persuaded the policy-makers in South Asia to abandon the policy of neglecting agriculture. By the early 1960s, South Asian governments were forced to attach high priority to food self-sufficiency. Dependence on trade to finance imports of food was becoming risky, in view of the long-run tendency of decline in terms of trade for the primary exports and large yearly fluctuations in their prices. For countries having a comparative advantage in agriculture, the emphasis on the agricultural sector could be justified on the yardstick of an efficient allocation of resources. Foreign demand for

Labour and capital can be diverted easily from a dynamic agriculture, when it starts to grow at a rapid rate

agricultural goods could supplement the domestic demand to avoid the demand bottleneck for the rapid growth of the agricultural sector. In the case of large countries, the policy of food self-sufficiency in South Asia was justified to avoid rising prices for the wage good for rapid development of the industrial sector.[6] It is pertinent to note that in the initial stage of development, the emphasis in South Asia has been on increasing the supply of major food grains—mainly rice and wheat. A part of the increase in food grains production was due to the switching of area from other crops, including minor food items like pulses. With the introduction of the Green Revolution, the major source of growth for major grains was improved technology. It is crucial to understand that rising incomes are associated with a fall in the share of food grains in total expenditures on food. The diversified pattern of food consumption implies a need to diversify South Asian agriculture in line with the changing patterns of food demand and the trading opportunities. Unless the domestic food production increased, it was recognised that there would be no significant development of the non-agricultural sector in South Asia.

Releasing labour and transferring capital from agriculture

Labour and capital can be diverted easily from a dynamic agriculture, when it starts to grow at a rapid rate. Abundant supplies to the non-agricultural sector as a result of increased agricultural productivity can keep the rise in wage rates in check. Increase in labour productivity in agriculture prolongs the phase of surplus labour. Cheap labour remains an important source of growth for the non-farm sector in cities, small towns and rural areas. The cost of migration remains low as long as the pattern of non-agricultural growth is not dominated by large cities. The historical case of Taiwan illustrates the beneficial impact of rural-centered small scale industrialisation. This type of growth had also occurred in parts of Indian and Pakistani Punjab provinces respectively in the 1970s.

A rapidly growing agricultural sector is also an important source of capital for the industrial sector. Saving rates in rural areas even in traditional agriculture in South Asia were found to be quite high.[7] The savings potential rises sharply when agriculture starts modernising itself. Two issues are important in mobilising capital from the agriculture sector. First, the transformation of agriculture itself needs large amounts of capital. Building rural infrastructure, setting up research and extension systems and investing in machines and modern inputs requires capital. On a net basis, when the agriculture sector is provided its capital requirements, it generates surplus capital for use in the non-agricultural sector. Second, the methods of resource transfer need to be carefully selected in light of their impact on the resource use efficiency in agriculture. The choices of different methods of resource transfer are between taxation (direct and/or indirect taxes), mobilising rural savings and changing intersectoral terms of trade through macro policy and/or trade instruments. The successful cases of economic transformation have relied on a mix of direct taxes on agricultural income or land and/or mobilisation of rural savings through direct investment by farmers in urban areas. Cases in point are the historical experiences of Japan and Taiwan, when large amounts of rural resources were transferred for use in industry through taxation of land and investment by farmers in industry. In South Asia, direct taxation on agriculture has been insignificant in the post-independence period. The reliance on turning the terms of trade against agriculture was dominant as large amount of resources were transferred from agriculture with adverse impact on agricultural production.[8] In South Asia, the banking system was also used to mobilise rural savings. The lending by the financial institutions was mainly to the

urban sector. The financial repression experienced in South Asia was a source of inefficiency in the region. Low and subsidised deposit rates had reduced the amount of bank deposits. Low lending rates had encouraged capital intensity and was a powerful force for rent-seeking activities. Powerful groups received most of the loans. The irony was that most of it was also not paid back to the banks.

Domestic demand expansion for the non-agriculture sector

The release of food, labour and capital from agriculture helps in achieving a higher rate of industrial growth and increasing the supply of non-agricultural goods. The demand constraint for the non-agricultural sector was not given much attention in the beginning. Import-substitution strategy was based on the assumption that the already existing demand being met by imported goods would be sufficient to buy the domestic output of industry. The experience, however, showed that a vibrant agricultural sector that could unleash a large increase in domestic demand for the non-agricultural goods and services was needed to avoid the emergence of demand constraint. In this context, demand for consumer goods, agricultural inputs and investment goods were all important. The experience further showed that an equitable process of agricultural growth that generates effective demand from the entire mass of farming population is better suited to generate demand for the non-agricultural sector.[9]

Box 2.1 Rural-oriented strategy and poverty alleviation: India's experience

The bankruptcy of an urban-oriented development strategy and the beneficial impacts of broad-based agricultural and rural development strategy on poverty alleviation have been demonstrated in India. A World Bank study has shown that (1) urban growth based on import-substitution industrial strategy did not have any discernable impact on urban poverty and (2) rural to urban migration was too small to tighten the labour market in rural areas or to have any major impact on rural poverty. In contrast rural-oriented strategies based on investment in human capital had major impact on poverty alleviation in both rural and urban areas.

Changes in agricultural productivity have been found to have important implications for poverty reduction in both urban and rural areas. Consumption poverty declined significantly when mean household consumption registered an increase from rising rural incomes. Growth in agriculture and services in the rural sector has been more effective than rural non-farm growth in poverty reduction in the early stages of development. When the agricultural sector is at a greater stage of development, however, it creates demand for the non-farm sector thus making it, at that stage, an important tool for poverty reduction.

While increases in urban growth rates have had no discernible effect on rural poverty the rural sector growth, on the other hand, has had a positive effect on national poverty levels as both the urban and rural poor have gained from rural sector growth. One important channel of reduction in urban poverty has been lower food prices as a result of vigorous growth in food production. Data from 1958 to 1994 show that higher real wages and higher farm yields lead to a significant decline in absolute poverty because they improved average living standards without adversely affecting income distribution.

The experience of poverty reduction in rural areas has differed substantially across various states in India. The poor in states which had lower levels of farm productivity, rural living standards and poor rural infrastructure have mostly not been able to benefit from the growth. The most important factor which, determines whether the poor benefit from growth is attributed to initial literacy levels. The cases of Bihar (state with the lowest elasticity of poverty to non-farm output) and Kerala (state with the highest elasticity of poverty to non-farm output) illustrate the importance of favourable initial conditions for broad-based growth leading to poverty reduction. Within literacy levels, it has been found that women's literacy levels are a more accurate precursor of growth's effect on poverty compared with male literacy.

The clear policy implication is that agricultural growth, rural development and growth in the non-farm sector can significantly reduce urban and rural poverty. Human capital formation by removing the gender bias in access to education leads to overall growth and poverty reduction.

Source: Ravallion and Datt 1999, as quoted in World Bank 2002b.

Labour-intensive agricultural growth generates rapid growth in employment in rural areas

Generating foreign exchange earnings

The objective of dynamic agriculture in earning and savings of foreign exchange is a crucial determinant of development policy. The demand for food is high in a developing economy as a result of high population growth and some increase in per capita income. The income elasticity of demand for food is low but positive in South Asia. Population growth was high before the onset of demographic transition in South Asia. Despite a fall in the rate of population growth recently, it is still quite high for the region. As a result of relatively high population growth and a positive income elasticity of demand for food, the demand for food in South Asia has been high and rising. Domestic production of food saves foreign exchange, which can be used to import intermediate, capital or consumer goods. Countries that need to import food often face a bottleneck sooner than the countries who have abundant domestic production of food. The earning of foreign exchange through cash crops in South Asia was always an important policy goal. However, the policy tools used to transfer capital out of agriculture in South Asia after its independence from Great Britain have been detrimental to agricultural production, especially in the case of export goods. Export duties on cotton and other cash crops and the overvalued domestic currencies in South Asia were used to transfer resources out of agriculture. These policies had dampened agricultural incentives and resulted in lower earnings of foreign exchange from agricultural exports. The advent of the Green Revolution in the 1960s and the reform of macro incentives in South Asia since the 1980s have placed South Asian agriculture in an improved situation to save and earn foreign exchange for meeting the import requirements of the economies in the region.

Agriculture and poverty reduction

The five roles of agriculture, described above, provide a boost to the growth of the non-agricultural sector. Increased output and employment in agriculture and other sectors have favourable impact on poverty reduction. The indirect role of agriculture based-overall growth, when combined with a particular type of labour intensive rapid agricultural growth can have major impact on poverty reduction in rural and urban areas. A sharp increase in agricultural output reduces prices of food commodities. Labour-intensive agricultural growth generates rapid growth in employment in rural areas. The tightening of labour markets results in a rise in wages in both rural and urban areas-especially in the informal sector. Rising incomes coupled with reduced prices of food often proves to be a powerful force in poverty reduction. South Asia was late in joining the group of countries, which had spectacular success in generating agricultural growth and reducing poverty. Lack of effective land reforms initially coupled with heavily subsidised capital-intensive farm sector in South Asia probably explains the limited success of the region in developing and implementing an agricultural strategy that could have achieved both rapid agricultural growth and poverty reduction. The political economy constraints on the type of pro-poor agricultural change has shifted the attention of policy-makers to the transformation of the agricultural sector itself, rather than how, and under what conditions it can play a role in the broader context of development of the non-agricultural sector. The issues of rural development structural transformation of the agricultural sector and of the non-farm sector within rural areas as a source of productive employment for poverty eradication have emerged as core development issues since the early 1970s.

Growth, diversification and commercialisation of agriculture

The correlation between declining importance of agriculture and overall growth of the economy often results in a widespread misperception that agriculture is unimportant. The obvious implication is that the sector does not require investment resources and/or a favourable policy environment as its relative share in total output declines. On the contrary, the need for rapid agricultural growth is paramount for overall economic growth. A stagnating agricultural sector inevitably leads to economic stagnation. The importance of rapid agricultural growth requires an understanding of the factors and policies that generate growth in the sector.

The decline in the relative size of the agriculture is also accompanied by a complicated process of commercialisation and diversification of the sector. Production of subsistence food crops gives way to a market-oriented production structure. The marketed share of agricultural output increases. Purchased inputs replace non-traded inputs. Integrated farming systems give way to specialised enterprises in the sector itself.

The impact of the commercialisation of agriculture on the poor needs serious analysis. The pros and cons of the dynamic but rapidly transforming agricultural sector need to be evaluated with respect to both equity and growth considerations.

Approaches to agricultural development

Box 2.2 gives a brief historical account of the possible agricultural development strategies in South Asia. The five models of agricultural development described in the box are not mutually exclusive, however. In view of the intra country differences of resources, more than one model was adopted in a particular country at a particular time. There is also no unique sequence in which different models become relevant. Elements of different models may also be combined at a particular time in a country.

The diffusion model had provided a rationale for the establishment of extension systems in South Asia. It was argued that farmers were tradition-bound and were not allocating resources efficiently. Adopting technologies from developed agricultural systems (both new ways of doing things and introduction of new crops) and using resources more efficiently could increase the agricultural output. Drawing on this model of agricultural development, during the 1950s, aid programmes in South Asia placed heavy emphasis on establishment of agricultural extension systems. Farm management research and rural sociology were introduced as specialised subjects for training agricultural extension officials. However, no major impact of the extension work on agricultural output was noticed. Despite the diffusion model's failure to accelerate agricultural growth, the usefulness of effective agricultural extension systems has remained high on the policy agenda on the ground that such systems were required to make other models work more effectively. There is, however, renewed interest in the restructuring of the extension system during the 1990s. There is a pressure to downsize the public extension services, utilise modern systems of means of communication, and also to make the systems pluralistic and cost-effective. The privatisation of the public extension system is also on the policy agenda of most countries in South Asia to make the extension systems accountable to the farming community.

The failure of the diffusion model of agricultural development led to the emergence of a new perspective in the 1960s. Based on T.W. Schultz's ground-breaking work that farmers in developing countries were efficient resource allocators, the key to the transformation of traditional agricultural systems into productive agriculture was to make

The impact of the commercialisation on the poor needs serious analysis

The rapid adoption of high-yielding rice and wheat seeds in South Asia had increased the supplies of food grains

available to farmers new high-payoff inputs.[10] Three inter-related steps in this context were required. First, the research system had to generate new technologies with higher productivity. Second, the industrial sector was to be geared to produce and distribute new equipment, seeds and other inputs. Finally, farmers were to be provided finance and human capital to use the new knowledge and inputs. The high-payoff input model was to be the lead act in this connection. However, the importance of effective extension system was underscored as a necessary complement to the Green Revolution model.

The success of the Green Revolution has been somewhat denigrated as the crop yields on experimental stations had been declining. Also rice and wheat productivity has shown signs of slowing down since the mid-1980s. These trends underscore the importance of shifting the research focus from a fixation on increasing yields to increasing productivity through a more comprehensive approach to manage agricultural resources within the framework of a sustainable farming system suited for the new situation in the twenty-first century. Elements of the conservation model described in the box 2.2 need to be combined with the essence of the high pay-off input model.

The urban-industrial impact model and the induced innovation models described in the box have not been a major force relevant to the South Asian reality to-date. However, the insights from these two models need also be taken into account in view of the rapid urbanisation and large price distortions in South Asia. Rapid urbanisation takes away land from agricultural uses. Large price distortions result in wrong decisions with respect to choice of techniques.

Diversification and commercialisation of agriculture

The accelerated growth in agricultural incomes is always accompanied by diversification and commercialisation of agriculture. Engel's law implies that as incomes rise, demand for food rises but more slowly than incomes. The demand for livestock and other high value commodities is more income-elastic than cereals. The agricultural sector needs to diversify its production structure in line with the changing demand structure. Diversification is associated with commercialisation of agriculture as high opportunity cost of labour on large farms induces them to substitute machines and modern inputs in place of family labour.[11]

The transition to commercial agriculture in South Asia has not been smooth. The pattern of growth and diversification of the sector, especially using Green Revolution technologies, had an adverse impact on the poor in the short and medium term. Demand for labour did not expand due to premature mechanisation. In the long run, however, due to increase in crop intensities the demand for farm labour had increased sufficiently to generate a net increase in employment opportunities in rural areas. In retrospect, the process could have been better managed.

The rapid adoption of high-yielding rice and wheat seeds in South Asia, as elsewhere, undoubtedly had increased the supplies of food grains. The resultant reduction in the real price of food to the poor had improved the prospects for food security. It also had a favourable impact on the environment in the rain-fed areas as it had reduced the need to cultivate the marginal or fragile areas.

The beneficial impact of the Green Revolution has been contested by its critics on the ground that the increased profitability of agriculture had induced landlords to evict tenants. The premature tractorisation in South Asia had helped in the eviction of the tenants and the landless whose access to land was reduced. The tractors were subsidised by the government to facilitate timely tillage of land for sowing the new varieties.

Box 2.2 Approaches to agricultural development: A historical perspective

Sources of increase in agricultural output have been changing in South Asia as a result of changing emphasis on different models of agricultural development.

The frontier model stipulates an expansion of the cultivated area as the major source of increase in agricultural output. South Asia did not experience any dramatic opening up of its land frontier since 1950s. Despite a significant addition to cultivated area through increased irrigation, rapid population growth in rural areas has limited the relevance of this model in South Asia.

The conservation model is based on the integrated crop-livestock husbandry which recycles plant nutrients in the form of animal manure to maintain soil fertility. In South Asia, agricultural production increased at about one per cent per year for a long period using this model. This rate of growth was less than the growth in the demand for agricultural output. The need to discover other growth factors became obvious in the post-independence era.

The urban-industrial impact model that gives a prominent place to growth in the industrial sector has been of limited value in South Asia due largely to premature urbanisation. Employment opportunities in the urban sector were not sufficiently high to pull labour out of agriculture or induce rapid agricultural change to boost the agricultural sector.

The diffusion model was used during the 1950s to boost the agricultural sector. A network of extension agents was instituted to transfer technology from the developed countries to South Asia or from experimental stations located in South Asia to farmers. The limitations of the model became obvious as the agricultural sector did not experience rapid growth as a result of either inappropriate technology or at best, static technology.

Beginning in the early 1960s, South Asia experimented with high-payoff input model. The success in the development of high yielding varieties of wheat and rice, which were responsive to fertilisers, has increased food production manifold. The increase in food production has, however, involved some social costs, and the use of pesticides and other chemicals has increased the incidence of pesticide-related diseases.

The induced innovation model, which treats technical and institutional changes as an endogenous factor, explains the time path of technical and institutional changes. In South Asia, price distortions of inputs, outputs and factors of production have often resulted in inappropriate import of technology. As an example, the mechanical technology imported from abroad, which is more suited to large-scale agricultural organisations, has resulted in a 'bimodal' rather than a 'unimodal' strategy of agricultural development in South Asia. Emergence of income inequalities has been a serious adverse consequence of this bimodal strategy of agricultural development.

South Asia needs in the coming years a more broad-based model of agricultural development in which there is mutually reinforcing interaction between agricultural change, small scale employment generating rural industries, and a sustained process of human development.

Source: Rutton 1998.

The new seed supporters had argued that the fertiliser responsive grains were divisible and scale-neutral. Had the credit subsidy not been given to large farmers, the new seeds could have been introduced into the existing systems of small-scale agriculture. It would have produced larger output of food grains and would also have provided increased employment opportunities to the poor farmers. The Green Revolution would have been a win-win strategy of agricultural development even in its early years. More recent evaluations of the Green Revolution have shown that in the long run, the yield-enhancing technologies had a favourable impact on a variety of social groups in the farm and non-farm sectors through a combination of larger employment and lower food prices.[12]

Rural development and non-farm transformation

South Asia, home to the largest number of absolute poor, shows that its rural areas have a higher proportion of poor people than the urban areas. The rural poor are also discriminated against with respect to occupation, access to land and to self-employment. It is ironic that the poor in rural areas are more malnourished where food is produced. In view of the persistent nature of rural poverty and its differentiated structure, there is a need to have a comprehensive poverty-eradication strategy for the rural areas.

The essential elements of such a strategy should focus on the poverty features of the main groups of rural poor, i.e., non-farm households as well as small

farmers and landless households. In addition to pursuing a small-holder-friendly agricultural development strategy, the policy requirements for the non-farm poor households need to be addressed. In view of the importance of social services in reducing human poverty, access to these services and their effective delivery are important issues in the anti-poverty policy package.

Initial success of the Green Revolution in increasing food production was perceived to be a break-through in solving the poverty and food security problems

Rural development programmes

The overarching conceptual framework for each element, referred to above, in South Asia has been in a flux during the past fifty years. The paradigm of rural development has been changing continuously. The main issue in this context has been the redefinition of the roles of various tiers of government, private sector and civil society in rural development programmes. Other major issues pertain to the relative emphasis on agricultural development and the provision of social services and the role of foreign assistance in agricultural and rural development.

The community development programmes during the 1950s were based on the notion that the needs of rural people could be adequately filtered in self-help rural development programmes by the community development officers. The scope of these uplift programmes was too broad to have any significant impact on rural well-being. The serious food shortages that emerged during the 1950s had also indicated that the agricultural components had to be given a top priority in rural development programmes. The increase in food production as a result of the Green Revolution during the 1960s had, however, put the community development programmes on the backburner as all efforts were devoted in helping farmers to switch to the new technologies. The initial success of the Green Revolution in increasing food production was perceived to be a break-through in solving the poverty and food security problems. However, the impoverishment of small farmers and tenants attributed to indiscriminate mechanisation, and the emergence of income inequalities ultimately led to a strategy of rural development focussing on the basic needs of the target groups. The integrated rural development programmes and the basic need approach to development had operationalised the new trend of attacking poverty directly and not by waiting for increases in the average per capita incomes to solve the poverty problem.

The Integrated Rural Development Programmes, started in the early 1970s, focused on simultaneously increasing agricultural production and provision of social services.[13] The programmes were funded by donors and implemented by governments in South Asia. Special project management units were established to run the programmes. Despite many innovative methods pertaining to beneficiary consultation and participation, the Integrated Rural Development projects failed as a result of their complex design and the centralised control over the programmes by the government.[14] The donors withdrew their support from these programmes after a decade of active support.

The involvement of the non-government organisations in rural support programmes in the 1980s and the 1990s has filled the vacuum left by the Integrated Rural Development Programmes. The redefinition of the role of government in delivering support services to agriculture and rural development has given rise to a movement aimed at greater financial and administration autonomy to the lower levels of government, community organisations and the private sector.

Non-farm transformation

Rural non-farm sector in South Asia is large. It accounts for about one-third to

one-half of the rural population. It is also relatively poorer than its counterpart sector, i.e., the farming community. The pervasive poverty in this sector is due both to historical factors as well as public policies in both pre and post-independence periods. The role of the non-farm population was to provide services and locally produced non-agricultural goods for the prosperous farming population. The remuneration given to them was a fixed share of agricultural products. Rise of modern industry, mainly in urban areas, had drastically reduced employment for this segment of the population. Pauperisation was the natural result of the traditional institutional arrangement of remuneration evolved in pre-independence period and of the particular public policy choices made to encourage large scale urban industry since independence in South Asia.

The prospects of poverty reduction for the non-farm population must, however, be improved. There is a need to understand the growth dynamics of this sector and the required supporting policy and institutional arrangements. The sector's prospects are linked with the demand for its products. Agriculture, being the main source of demand for its products, needs to be promoted through a broad-basing of the agricultural development process. This is so because small and medium farmers have strong demand linkages to the non-farm sector in rural areas. Large farmers purchase goods produced by the large scale industry.

The policies for the non-farm sector in rural areas should cover trade, services and manufacturing sub-sectors of the rural non-farm economy. A well-developed infrastructure, efficient rural financial markets, education and extension programmes specifically designed to fulfil the needs of non-farm population are important on the supply side to enable the non-farm rural sector to play its role in rural transformation.

Policy and institutional reforms for accelerated agricultural growth

Pro-poor broad-based agricultural growth requires a variety of reforms with an appropriate sequence and scope and possessing design features having a reasonable chance of implementation. In South Asia, the reform efforts to-date have been adhoc and of limited scope. Identification of the missing elements in different reform areas is needed for appropriate policy and institutional reforms to generate high and pro-poor agricultural growth, under three broad heads: policy, institutions and governance.

Policy reforms

a. Agricultural price policies

Price policy in agriculture relating to both prices of agricultural outputs and inputs is often justified on the grounds of income parity, optimal resource allocation and minimising price uncertainty. Interventions by government are rationalised on the premise that markets do not perform these roles in a satisfactory fashion.

The instruments of minimum support prices, food subsidy and input subsidies in South Asia have played an important role in achieving the objectives of food security and accelerated growth of economy. The regime of low-input prices and high output prices for farmers had encouraged farmers to adopt new technology and increase food production. Low prices of grains had helped achieve food security for poor consumers.

The case for withdrawal of subsidies is built on the necessity to curtail fiscal deficits. It is further buttressed by the argument that farmers are now familiar with the modern inputs and need no incentives to adopt the new technologies. The agencies set up to procure agricultural commodities have proved to be inefficient and costly. The costs of handling produce had been higher than

Policies for the non-farm sector in rural areas should cover trade, services and manufacturing

Despite large land inequalities in South Asia the scope of land reform efforts has not been ambitious

the private sector. Generalised food subsidy does not discriminate between poor and rich consumers.

Despite these short-comings of past agricultural price policies, it needs to be stressed that the approach to withdrawal of input and output subsidies needs to be cautious and gradual. It is doubtful whether markets can be made poor-friendly. For the poor farmers who do not have the capacity to hold their produce for better prices, government support of the appropriate type is unavoidable. The same is also true for the abject poor whose caloric intake needs to be increased. The form of appropriate support price policy and/or food stamps needs to be carefully evolved to minimise levels of food subsidies and to extend help only to the needy. In general, it is now widely acknowledged that a price support policy is preferable to input subsidies as the latter often accrue mainly to richer farmers.

b. Macroeconomic reform and restructuring of agriculture

The policy reforms under the structural adjustment programmes in South Asia during the 1980s and the 1990s have powerful implications for agricultural policy as well as agricultural performance. The primary reliance on aligning domestic prices more closely with the world prices and on the private sector as a lead agent in production and distribution sub-sectors has induced major changes in South Asia's agricultural policies.

First, the increased alignment of domestic and world prices for the agricultural commodities erodes the power of domestic agricultural policy to affect rural incomes. The restrictions under WTO regime further erodes the importance of domestic agricultural policies. A concern is often raised whether South Asia would be in a position to provide safety nets for the poor and adopt appropriate national environmental policies without breaking its commitments under the WTO rules.

Second, the stipulations of reducing subsidies on food, credit, water and electricity and cutting expenditure on research and extension under the stipulated fiscal deficit reduction targets with donors has often constrained growth in the agricultural sector.

Third, the privatisation of public enterprises operating in agricultural sectors under the structural adjustment programs raises the issue of the private sector's ability to take on the job, without reducing the responsibility of the public sector.

Last but not least, the macro reforms have improved the terms of trade for agriculture in South Asia by removing the anti-agriculture bias implicit in high protection of the domestic industrial sector. Part of the benefit from this reform may not be realised if the stabilisation phase of the adjustment process cuts the level of support services to agriculture.

Institutional Reforms

1. Land reforms

The case for re-distributive land reforms rests on the widely observed inverse relationship between farm size and productivity. The reasons behind the observed relationship relate to higher incentives for family operators, absence of hiring costs for family labour, low supervision costs for family workers, and better land quality in the case of small holdings. The farm management research in South Asia during 1950s had demonstrated the empirical validity of the inverse relationship between productivity and farm size.

Despite large land inequalities in Pakistan, India and other countries of South Asia, the scope of land reform efforts, especially at the implementation stage, has not been ambitious. The ceilings fixed in the land reform laws were relatively high and exemptions from the redistribution of land were liberal. Implementation of land reforms was

entrusted to centralised government departments. Only a limited amount of land was redistributed to the small farmers. Tenancy reforms that gave security to tenants have fared somewhat better.

The land or agricultural income taxation has been low or virtually non-existent in South Asia. A progressive land tax system provides an incentive for breaking the large farms into small farms. In South Asia, agricultural land has often been used as a tax haven by the urban elites as well. Agribusiness and contract farming provides access to land in the case of small farmers. To-date reliance on such practices has been minimal in South Asia. Ineffective land reforms and the absence of other practices that could have increased access to land for the landless and the small farmers has been a major factor for the limited gains for the rural poor.

2. Credit

The credit constraint emerged as a serious constraint in the rapid spread of high yielding varieties in the 1960s. The policy response to the relaxation of this constraint had a positive impact on agricultural productivity and also a perverse effect on equity since the bulk of additional credit went to large farmers. The recovery of agricultural loans also became problematic affecting the sustainability of credit institutions in most countries of South Asia.

The nature of government intervention for the provision of finance to support agricultural transformation has been similar in all countries in South Asia. The governments created special financial institutions for agricultural credit, and the existing commercial banks were also directed to provide agricultural credit according to prescribed lending requirements. An interest rate subsidy was given to farmers in all cases. In some cases, credit was advanced at zero or nominal rate of interest.

The large flow of subsidised and directed agricultural credit had large unintended consequences in South Asia. Low interest rates induced premature capital-intensification in agriculture through mechanisation. Employment creation resultantly suffered. The subsidised credit was mostly pre-empted by large farmers leading to income inequalities in rural areas. The phenomena of non-performing loans in the portfolio of agricultural and commercial banks emerged as cheap loans encouraged investments with lower rates of return. The corruption in the banking sector was also a direct outcome of the wrong policies adopted for rural credit. The viability of credit institutions was undermined by huge defaults.

Of late, countries in South Asia have been reforming their rural financial system. Interest rate liberalisation has occurred in all countries since the early 1990s. There has been a move towards reduced reliance on the targeting of agricultural loans and the pricing of credit closer to market rates. The emphasis on sustainable finance seems to be replacing the old paradigm of subsidised credit. Establishment of micro-finance banks is another welcome development in South Asia as their outreach is mainly towards small farmers, women and other credit-starved groups.

3. Establishment of an agricultural knowledge system

The importance of a functioning research, extension and education system derives from high rates of return to investments in human capital, technology and institutional reforms for accelerated growth in the sector. In view of the diversification imperative, the scope of research needs to cover both activity specific and the system-level research and education issues.

In South Asia, there is a narrow research focus on major crops. There is a need to increase the scope of research, training and extension effort. Problems

Land or agricultural income taxation has been low or virtually non-existent in South Asia

of soil, water conservation, infrastructure, regulation and roles of government, private sector and civil society in strengthening the agricultural knowledge system needs to be better analysed and understood.

Governance reforms

Governance issues

There is a need to increase the scope of research, training and extension effort

There is a need to develop an improved understanding of the role of governance in rural and agricultural development in South Asia. Greater participation of different stakeholders in rural areas in decisions that affect their quality of life is needed. This participation can increase their voice effectively in the activities that matter to them most. There are many ways to ensure their participation.

First, the options to supply public goods have increased as a result of the increased role of the private sector and the civil society in providing some of these services. The private sector has already entered the fields of health and education. It is also active in some forms of agricultural research and extension. The government's role needs to be redefined to include regulation of private sector's activities in these new fields. The government would need to have a continuing presence in the supply of merit goods like high quality seeds.

Second, the decentralisation of some services to local government or community-based organisations can be important to improve the delivery of some services. However, one needs to guard against the possibility that local elite might capture the bulk of the services.

Third, the government needs to share some of the information that it has about the working of rural institutions with the people. This transparency can help in minimising corruption in some of the institutions.

Last but not least, there is a need to meet the demand for more open and democratic politics in rural areas of South Asia. Countries vary in the extent of democratic forms of governance. However, the need to nurture effective democratic institutions is common to all countries.

Priority challenges for agriculture

Despite manifold contributions made by agriculture in South Asia over the past fifty years, there are still enormous challenges facing the sector. The number of chronically poor and malnourished in South Asia remains large. Despite the enviable record of achieving national food self-sufficiency in major countries, a large proportion of the population in South Asia does not have the required purchasing power to access food and social services. As a proportion of total population, the proportion of the malnourished people has not declined. A serious concern about environmental degradation and scarcity of water resources has also been highlighted by recent climatic variations. To meet the emerging challenges, agriculture in South Asia is not as well placed as was the case two decades ago. International environment for agriculture in terms of access to world markets, capital and technology has, infact, deteriorated despite the commitments made by the developed countries in international negotiations to gradually reduce farm subsidies.

Food insecurity and poverty

The achievement of national food self-sufficiency in India and Pakistan has provided a conducive environment for ensuring food security at the household level in the region. The experience to-date, however, is that the nature of agricultural changes, access to resources and employment creation in rural areas has not adequately addressed the challenges of ensuring food security at the household level. There is a need also to make larger investments in the health and sanitation sectors to enable the absolute poor to utilise the food they consume.

Sustainable agriculture

Preservation of the natural resource base and avoidance of the negative externalities from pesticide runoff, excessive input use in intensive agriculture and livestock production and soil erosion have raised serious issues of sustainability for the agricultural sector. Policies and institutional limitations have continued to erode the natural resource base at a fast pace. There is a need to address the environmental and agricultural development agendas jointly. This is especially so in the case of areas with limited agricultural potential where excessive population pressure leads to a loss of forest cover and ultimately accelerates soil erosion.

Increasing public investment in agriculture

The main source of productivity growth in agriculture has been large public investment in agricultural research and extension, irrigation networks, rural infrastructure and human capital. The rates of return to public research have remained high in South Asia mainly because governments have been under investing in research.

Public investment normally crowds in private investment, as it raises the returns to private investment in agriculture keeping the empirical relationship in view. There is a strong case for increasing public investment in agriculture, along with rising private investment in agricultural research and services.

Declining foreign assistance for agriculture

Foreign assistance in support of agricultural development in South Asia has played an important role especially in financing the setting up of agricultural knowledge systems since the 1950s. The impact of aid given to the sector on food production was visible and substantial. The aid environment evaluated in terms of declining importance of aid as proportion of GDP of major donors, has deteriorated over time, especially after the end of Cold War. There is also a tendency to downgrade agriculture from the portfolios of major development agencies. The quality of advice by the donors on agricultural issues has also worsened since most donor agencies, have downgraded their special skills and expertise on agricultural development issues. The decline in the funding of the international agricultural research system has started to affect adversely the prospects of agricultural development in most developing countries, including South Asia.

Market access for agriculture

The Agreement on Agriculture (AOA) had proposed to liberalise trade in agriculture by reducing agricultural subsidies provided by developed countries to their farmers and by dismantling quantitative restrictions (QRs) and substituting tariff rate quotas to trade in agricultural commodities. It was expected that the South Asian countries would have had expanded access for some of its agricultural commodities. However, the actions taken to-date by industrialised countries have been disappointing. The agricultural subsidies by the OECD countries have in fact increased since the signing of the Agreement on Agriculture. Such subsidies have increased from US$ 235 billion a year on average during 1986-1988 to US$ 350 billion during 1999-2001.

Small farmer support

South Asian agriculture is predominantly small farmers' agriculture. About 125 million holdings are operating an area of 200 million hectares, which implies the average size of farm is only 1.6 hectares. Of these 80 per cent of holdings are extremely small, possessing land of less than 0.6 hectares. Such small farms operate about one-third of the total agricultural land. There is a need to develop a policy framework supportive

Policies and institutional limitations have continued to erode the natural resource base

of small farms in South Asia. In fact, only by doing so, sustainable agriculture can be achieved. If the prospects of small farmer deteriorate further, social and political stability would remain a distant dream in South Asia.

Putting poor people first

What is needed for a broad process of rural and agricultural development to succeed in its primary goal of achieving sustainable development is to put poor people first with a renewed focus on human development. All policies, institutional and governance reforms should adopt the goal of expanding the capabilities of people. The approach needs to emphasise the centrality of human initiative and participation in all activities—be it agricultural and rural development as a private economic actor or a public servant working in institutions serving the farm and non-farm sectors.

Chapter 3

Agriculture in South Asia—Historical Perspective

The history of South Asian agriculture makes for interesting reading. Most countries in the region attained independence from colonial rule in the late 1940s. Agriculture was the dominant source of income and employment in the newly independent states. These states were, however, facing a desperate situation due to growing food demand and food insecurity. Malthusian predictions of rising population and declining food production haunted the region. Amid this dismal scenario, the advent of Green Revolution, pioneered by Norman E. Borlaug[1], raised the hope for a brighter future in food security and agricultural development. Agricultural productivity grew remarkably in most countries of South Asia during the 1960s and 1970s. The productivity started declining, however, in post Green Revolution period. Through the 1980s and 1990s it became increasingly difficult to sustain the success achieved earlier due to increasing population, declining agricultural resource base, land degradation, deforestation, natural catastrophes, constraints in input management and lack of institutional reforms. The saga of agricultural development in South Asia is thus filled with stunning performances but at times dismal failures.

During the past two decades a number of other disturbing developments took place[2], for instance:

- The population of South Asia grew steadily, albeit at a decreasing rate. A Large population base meant provision of more and more food for the increasing number of people. It also meant increasing pressure on agricultural resource base.
- Commercialisation and diversification played an important role in motivating farmers to move away from major staple food crops and cereal production to high-value oil crops, vegetables, fruits and horticulture.
- The growth of cereal yield per hectare fluctuated erratically and at times demonstrated a declining trend.
- The per capita food production started declining in many South Asian countries.
- The per capita food availability increased but at a decreasing rate.

Historically, there has been a race between population growth and food supply in South Asia

Reassessing the Malthusian Cross in South Asia: Are we winning the race between population growth and food supply?

In the 1950s it was apprehended that a severe food shortage might occur in South Asia resulting in a Malthusian Cross whereby population growth would exceed the rate of increase in food production; and food supply in particular[3]. Historically, there has been a race between population growth and food supply in South Asia. At times food production outpaced the rate of population growth; at others population growth exceeded the rate of food production and food supply.

Between 1971 and 1998, the total population in South Asia increased by 79 per cent, the crop production grew by 69 per cent, whereas livestock production index showed a growth of 114.7 per cent. The growth in overall food production therefore, outpaced the population increase. By looking at these figures, one may argue that South Asia has been able to avoid the Malthusian[3] prediction. The overall figures, however, mask the fluctuating trends in per capita food

Table 3.1 Reinventing Malthusian Cross in South Asia

(Average annual growth rates, 1971-75 to 1996-00)

Bangladesh

Period	Population	Food Production	Per capita Food Production	Cereal yield (Kg/ha)	K-calories per capita Per day
1971-75	2.8	0.5	-2.3	1.1	-1.9
1976-80	2.5	2.6	-0.3	1.9	0.8
1981-85	2.4	1.5	-1.0	2.4	0.3
1986-90	2.5	2.4	0.4	2.2	0.4
1991-95	1.7	1.4	-0.3	1.5	-0.4
1996-00	1.7	4.1	2.4	1.8	1.8

Bhutan

Period	Population	Food Production	Per capita Food Production	Cereal yield (Kg/ha)	K-calories per capita Per day
1971-75	1.4	2.2	0.1	0.1	–
1976-80	2.0	2.6	0.4	-0.1	–
1981-85	2.0	3.8	1.4	-0.2	–
1986-90	2.1	0.6	-2.0	-5.8	–
1991-95	2.8	2.2	0.4	0.8	–
1996-00	2.9	1.1	-1.5	0.5	–

India

Period	Population	Food Production	Per capita Food Production	Cereal yield (Kg/ha)	K-calories per capita Per day
1971-75	2.3	2.1	-0.1	1.7	-0.5
1976-80	2.3	2.9	0.8	2.9	1.1
1981-85	2.2	4.4	2.2	4.0	1.1
1986-90	2.1	3.5	1.3	3.5	1.2
1991-95	1.9	3.0	1.0	2.5	0.6
1996-00	1.8	2.4	0.7	1.6	0.2

Nepal

Period	Population	Food Production	Per capita Food Production	Cereal yield (Kg/ha)	K-calories per capita Per day
1971-75	2.4	2.7	0.2	0.4	0.0
1976-80	2.5	1.0	-1.5	-2.0	0.4
1981-85	2.6	5.0	2.3	2.4	2.1
1986-90	2.6	4.3	1.6	2.2	3.2
1991-95	2.5	2.2	-0.3	0.0	-0.9
1996-00	2.1	2.5	0.1	1.9	-0.4

production and food supply vis-à-vis population growth. The fact is that food production has been erratic during the past forty years. In the Green Revolution era, food production increased at a faster pace due to the introduction of high yield varieties. In post-Green Revolution period, however, growth in food production slowed down in many countries. It must be noted that in South Asia, the absolute number of under-nourished people increased in the past two decades (table 6.3 in chapter 6).

The following conclusions could be drawn from table 3.1:

- In Bangladesh, population growth outpaced the growth in food production during the last three decades. The cereal yield (kg/h) growth rate that increased from 1.1 per cent in 1971-75 to 2.4 per cent in 1981-85 has decreased to 1.7 per cent in 1996-00. The per capita food production growth rate has been negative over the period 1971-96. Similarly, per capita food availability (food supply) did not improve much until 1996-2000. The devastating floods of 1998 exposed Bangladesh's vulnerability to natural catastrophes. It is only recently that the country has managed to increase its food production by 4.1 per cent (1996-2000) and per capita food availability (food supply) by 1.8 per cent in 1996-2000.
- The situation in Bhutan, Nepal, and Sri Lanka is not much different from Bangladesh. In Bhutan, population increased from 1.4 per cent in 1971-75 to 2.0 per cent in 1976-85, and further to 2.9 per cent in 1996-2000. For the last fifteen years, growth in food production has been lower than the population growth. Food production has decreased from 3.8 per cent in 1981-85 to 0.6 per cent (1986-90); rising briefly to 2.2 per cent (1991-95) and falling again to 1.1 per cent (1996-2000). Bhutan has consistently witnessed a declining trend in cereal yield per hectare and per capita food production.
- In Nepal, population is growing at an average rate of 2.5 per cent while food production is fluctuating from a high growth rate of 5.0 per cent in 1981-85 to 2.2 per cent in 1991-95 and 2.5 per cent in 1996-2000. The per capita food availability, which had been growing

strongly at 2.1 per cent in 1981-85 and 3.2 per cent in 1986-90, has shown a negative growth rate in recent decade.

- In Sri Lanka, although population growth is not as high as in other countries of the region, yet food production is fluctuating erratically. The population is increasing at a decreasing pace; growing at 1.6 per cent in 1971-75 it has slowed down to 1.3 per cent in 1996-2000. The food production growth rate at times matched the population growth. However, it decreased from a high of 4.7 per cent in 1976-80 to 3.1 per cent in 1981-85, and to 1.1 per cent in 1986-90, rising briefly to 2.5 per cent in 1991-95 and falling again to 0.7 per cent in 1996-2000. This led to a declining trend in per capita food production and food supply.
- In South Asia, only Pakistan and India seem to have done better than the other countries in terms of their performance in per capita food production and food supply. So far, Pakistan and India have effectively managed a food crisis even under unprecedented drought conditions in 2000-2001. In the past few years, although Pakistan has seen fluctuations in growth of agricultural value added yet food production has outpaced population growth rate. The population growth has consistently decreased from 3.1 per cent in 1971-75 to 2.6 per cent in 1986-90 and 2.4 per cent in 1996-2000. The food production is growing at a stable rate from around an average of 3.4 per cent in 1976-85 to well above 4 per cent in the last 15 years. Domestic food availability is, however, increasing at a decreasing rate due to increasing processed food exports. This holds true for India as well.
- In India, except for the damaging floods of 1998 that brought the growth rate in food production down to 2.4 per cent, it has been growing steadily above 3.0 per cent from 1976 to 1995. The per capita food production and food supply which was growing in periods spanning from 1976-80 to 1986-90 have shown a declining trend in the last ten years from 1991 to 2000.
- The situation in Maldives is satisfactory. The population growth has slowed down over the years while food production has increased. Per capita food production and cereal production growth rates have shown considerable improvement in the past few decades.

Pakistan

Period	Population	Food Production	Per capita Food Production	Cereal yield (Kg/ha)	K-calories per capita Per day
1971-75	3.1	2.8	0.1	2.6	0.7
1976-80	3.1	3.2	0.6	2.6	0.4
1981-85	2.8	3.6	0.2	1.1	-0.4
1986-90	2.6	4.6	1.2	2.1	1.0
1991-95	2.5	4.7	1.8	2.2	0.9
1996-00	2.4	4.0	1.2	2.2	0.4

Sri Lanka

Period	Population	Food Production	Per capita Food Production	Cereal yield (Kg/ha)	K-calories per capita Per day
1971-75	1.6	1.5	-0.3	-4.2	-0.9
1976-80	1.7	4.7	3.0	5.1	1.1
1981-85	1.5	3.1	1.4	4.7	0.2
1986-90	1.5	-1.1	-2.3	0.5	-1.2
1991-95	1.2	2.5	1.5	0.3	0.1
1996-00	1.3	0.7	-0.3	1.5	1.3

Maldives

Period	Population	Food Production	Per capita Food Production	Cereal yield (Kg/ha)	K-calories per capita Per day
1971-75	2.4	2.4	0.0	3.1	1.6
1976-80	2.8	1.9	-0.9	-2.5	3.8
1981-85	3.0	4.2	1.2	2.6	1.6
1986-90	3.0	1.0	-2.2	6.8	0.9
1991-95	2.7	2.7	-0.2	2.7	1.2
1996-00	2.6	3.0	0.1	–	-1.5

Note: Growth rates are based on 3-year central moving average.
Source: Extrapolated using data from FAO 2002d and World Bank 2001a.

The race between population growth and food production in South Asia has been far from won. If population grows at a rate of about 2.0 per cent, the food grain production and supply must also

continue to increase above 2.5 per cent annually to maintain the delicate balance between population growth and food production in this region[4]. In the 1990s, growth in food production has slowed down slightly. One may argue that the the the Malthusian predictions may start coming true if food production continues to decline in the next few years and the much-needed policy and institutional reforms are not undertaken.

Agriculture and rural poverty in South Asia: A historical nexus

Investment in human development is not possible without a sustained increase in per capita income. There is widespread poverty in rural South Asia where livelihood is dependent on agriculture. Countries that achieved rapid reduction in poverty had the most rapid agricultural growth[5]. In order to understand the vicious link between low agricultural incomes and rural poverty in South Asia, we need to understand the process of economic growth and transformation in this region. A few questions need to be answered here to provide a historical perspective: Is agriculture playing an important role in sustaining overall economic growth? Has agriculture effectively transformed the South Asian economies? Is there a widening gap between agricultural and non-agricultural sectors as a consequence of transformation? Is the quality of economic growth fair enough to alleviate poverty? Is the dominant agricultural economy in South Asia the primary cause of poverty?

Agriculture and Overall Economic Growth

Agriculture has always been the mainstay of South Asian economies. The key to attack poverty lies in rapid agricultural growth that fuels broader economic growth. A robust growth in agriculture can contribute to overall economic development in many ways. A stable and growing agriculture sector has strong forward and backward linkages (box 3.1). In East Asia and the Pacific for instance, a consistently high rate of agricultural growth of above 3.0 per cent (1971-80 to 1990-2000) has proved to be a precursor for overall economic development. In 1971-80, agricultural GDP in that region grew by 3.1 per cent while overall economic growth was above 7.0 per cent (table 3.2). In 1981-90, the agricultural sector grew by 4.3 per cent and overall GDP by 7.5 per cent.

South Asia stands way behind East Asia and the Pacific in this respect. In comparison to East Asia and the Pacific, the growth in agricultural sector has fueled a rather slower growth in overall

Table 3.2 Net real growth rates of selected countries and regions (1971-80 to 1990-2000)[a]

Countries	GDP growth			Growth in value added								
				Agriculture			Manufacturing			Services		
	1971-1980	1981-1990	1990-2000[a]	1971-1980	1981-1990	1990-2000[a]	1971-1980	1981-1990	1990-2000[a]	1971-1980	1981-1990	1990-2000[a]
Bangladesh	1.9	4.6	4.8	0.5	2.7	2.9	5.6	2.9	7.2	3.1	6.0	4.5
Bhutan*	–	7.8	6.1	–	4.9	3.2	–	21.1	12.6	–	7.1	7.0
India	3.4	5.5	6.0	2.1	3.7	3	4.7	6.7	7	4.7	6.3	8
Nepal	2.5	4.3	4.9	0.8	3.8	2.5	–	8.0	9.2	–	3.5	6.2
Pakistan	4.9	6.6	3.7	2.6	4.9	4.4	5.7	7.8	3.5	6.2	6.9	4.4
Sri Lanka	4.3	4.3	5.3	2.6	2.7	1.9	2.5	5.6	8.1	4.9	5.3	6
East Asia & Pacific	7.1	7.5	7.2	3.1	4.3	3.1	12.6	9.6	9.9	7.1	8.4	6.4
South Asia	3.4	5.5	5.6	1.9	3.7	3.1	4.4	6.4	6.6	4.6	6.3	7.1
Sub-Saharan Africa	3.9	2.1	2.5	2.2	2.2	2.8	5.3	2.8	1.6	4.5	2.6	2.6

Note: Growth rates are based on 3-year moving average.
a: Data for period (1990-2000) is taken from World Bank 2002a.
*: For Bhutan 1990-2000 data pertains to period 1991-98 calculated from World Bank 2001a.
Source: Extrapolated using data from World Bank 2001a & 2002a.

Box 3.1 Strong backward linkages from agriculture to other sectors

It has been estimated that in Asian countries where agriculture's share in the economy is significant, a 1 per cent increase in per capita agricultural growth leads to a 1.5 per cent increase in per capita nonagricultural growth. This is because agriculture has strong backward linkages (by purchasing farm inputs such as chemicals, fertilisers, and machinery) and forward linkages (by supplying raw materials to food and fiber processing to the non-agricultural sector). On the other hand, increase in agricultural incomes are usually spent on locally produced goods and services which have high-income elasticity of demand and employment content. Countries having higher growth in agricultural value added have relatively higher growth in overall GDP (See figure below).

Agriculture and economic growth of selected Asian countries (1960-92)

(annual percentage growth)

	Gross Domestic Product			Agriculture		
	1960-70	1970-80	1980-92	1960-70	1970-80	1980-92
China	5.2	5.8	9.1	1.6	3.2	5.4
India	3.4	3.4	5.2	1.9	1.8	3.2
Indonesia	3.9	7.2	5.7	2.7	4.1	3.1
Republic of Korea	8.6	9.6	9.4	4.4	2.7	1.9
Malaysia	6.5	7.9	5.9	–	5.0	3.6
Pakistan	6.7	4.9	6.1	4.9	2.3	4.5
Thailand	8.4	7.1	8.2	5.6	4.4	4.1

Source: Faruquee 1995.

Agriculture and Economic Growth Selected Countries, 1980-92
(annual percentage growth)

Source: Extrapolated by the author.

economy in this region. For instance, in 1971-80 agricultural value added increased by 1.9 per cent, therefore, overall economy grew by only 3.4 per cent. As agricultural sector growth rates increased above 3.0 per cent in the next two decades (1981-90 to 1990-2000), the overall economy grew by more than 5.0 per cent. The growth in overall economy is, however, slower than East Asia and the Pacific which experienced a growth in the overall economy of above 7.0 per cent for the same growth in agricultural sector. Nevertheless, the evidence of a positive relationship between agricultural growth and overall economic growth does exist in both the regions (figure 3.1).

Within South Asian countries, there are striking differences in growth performance. Some countries have grown faster than the others (table 3.2). In case of Pakistan, a strong growth in agriculture value added averaging well above 4.0 per cent and a corresponding overall growth averaging well above 5.0 per cent in the last two decades has ranked it among high growth rate countries. Consequently, there has been some decline in rural poverty from 49.1 per cent (1969-70) to 31.95 per cent (1998) over the last thirty years (table 3.4). In recent years (1990-2000) there has been a slight decline in agricultural growth rate (4.4 per cent) due to unprecedented drought conditions in 1998 and 2000. The overall GDP growth rate has, therefore, declined to 3.7 per cent.

Similarly in the case of India, agricultural growth fueled overall economic growth[6]. In 1971-80, the

agricultural sector grew by 2.1 per cent and subsequently, overall GDP increased by 3.4 per cent. In later periods (1981-90 and 1990-2000), agricultural production increased above 3.0 per cent and consequently, overall GDP increased by 5.5 per cent in (1981-90) and 6.0 per cent in 1990-2000.

Bangladesh, on the other hand, has seen strong but volatile growth in agriculture value added and other sectors of the economy. Floods and cyclones in 1970s and in the recent years as well caused significant crop losses in affected areas of Bangladesh. In 1971-80, the country was struggling with post independence problems. As there was no industrial base in the country prior to independence, therefore manufacturing and industry received priority in government policies. However, the agricultural policies were also strengthened which helped to improve agricultural performance in later years. In later periods, agricultural value added grew by 2.7 per cent in 1981-90 and 2.9 per cent in 1990-2000; overall economy grew by 4.6 per cent in 1981-90 and 4.8 per cent in 1990-2000.

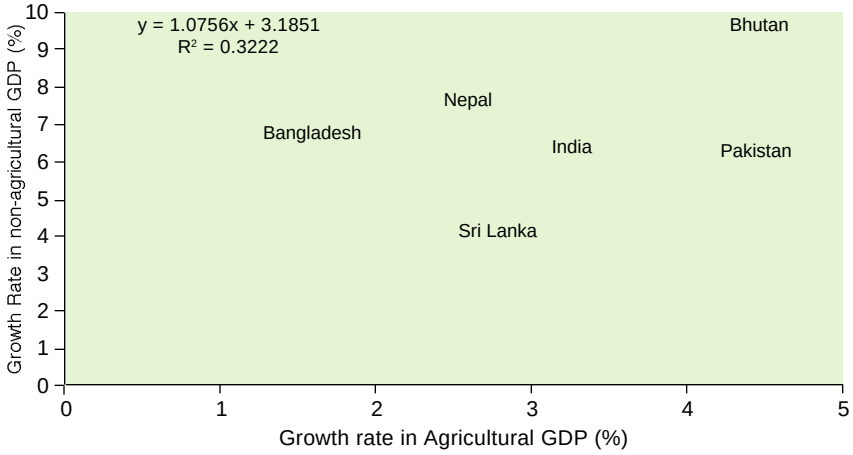
In Nepal, the agricultural value added growth fluctuated erratically. In 1971-80, agricultural value added grew by only 0.8 per cent; subsequently overall GDP grew at a stagnant rate of 2.5 per cent. In 1981-90, as agricultural value added increased rapidly at a rate of 3.8 per cent, overall GDP grew by 4.3 per cent. In the last decade (1990-2000), agricultural sector growth rate averaged around 2.5 per cent while the overall GDP growth was 4.9 per cent (table 3.2).

The above evidence from South Asian countries indicates that there is positive relationship between agricultural growth and overall economic growth. Periods of high agricultural growth are more or less associated with high levels of overall economic growth. The evidence also underlines the important point that rapid agricultural and economic growth has a significant impact on poverty reduction. In East and South East Asia for instance, rapid agricultural and overall economic growth reduced the incidence of poverty by two-thirds between 1975 and 1995[7]. South Asia, on the other hand, witnessed a reduction in poverty by only one third[8] during the same period. This is mainly because growth in the agricultural sector was slower and population growth was much higher. Also, widespread human deprivation prevailed in the region. Economic growth alone is not sufficient to reduce poverty. It must be accompanied by policies that raise the status of human development.

Agricultural transformation: The unfinished agenda

Rural nonfarm transformation is one of the most important steps in the process by which agricultural growth contributes to overall economic growth. It helps to transfer surplus resources to other sectors of the economy and creates demand for non-agricultural products. An estimated relationship between agricultural and non-agricultural value added growth rates for South Asian countries over the last 30 years suggests that a one per cent change in per capita agricultural incomes could lead to 1.08 per cent change in per capita growth in non-agricultural sector (figure 3.2 and box 3.2 for the income multiplier effect from agricultural to other sectors)[9].

Figure 3.2 Agricultural and nonagricultural GDP growth rates 1971-98



Source: Extrapolated using data from World Bank 2001a.

After the advent of the Green Revolution much of Asia transformed rapidly. In South Asia, however, agricultural transformation is still part of an unfinished agenda[10]. For instance, in East Asia and the Pacific, countries with relatively larger share of agriculture in GDP experienced high agricultural growth, which helped to boost non-agricultural sectors of the economy. In South Asia, although the overall performance of the agricultural sector has not been unimpressive (the region experienced agricultural growth rates of above 3.0 per cent for the last two decades), yet the growth in per capita agricultural GDP has been asymmetrical, mainly due to high population growth rate (table 3.3). For instance, growth in per capita agricultural GDP in South Asia was minus 0.47 per cent in 1971-80, 1.44 per cent in 1981-90, and 1.52 per cent in 1991-98. This low growth in per capita agricultural GDP resulted in low growth in per capita non-agricultural GDP.

Compared, to other South Asian economies, Pakistan and India have done very well in the 1980s. Both countries have seen above 2.0 per cent and 1.5 per cent increase in per capita agricultural GDP, respectively. This, in turn, transformed into growth in non-agricultural sector during the same period. The per capita non-agricultural GDP has increased by above 4.0 per cent in both countries in 1981-90. In the 1990s, however, uneven growth in agriculture did not help much to extend the agenda of transformation.

During the 1960s, Pakistan did very well and benefited from the Green Revolution. The per capita agricultural incomes increased by 2.55 per cent and nonagricultural incomes increased by 5.81 per cent. The gains in agricultural sector were lost in the period of nationalisation (the 1970s) that followed immediately. The agriculture sector witnessed a negative growth of -0.54 per cent in per capita incomes whereas the per capita non-agricultural incomes grew at a non-impressive rate of 2.89 per cent.

Table 3.3 Per capita income growth in South Asian economies and selected regions

	Per capita value added growth					
	Agricultural			Non-agricultural		
	1971-80	1981-90	1991-98	1971-80	1981-90	1991-98
Bangladesh	-2.14	0.17	1.03	0.22	5.83	4.98
Bhutan	–	2.75	0.27	–	9.54	3.42
India	-0.22	1.54	1.58	3.54	4.11	3.16
Nepal	-1.63	1.19	0.13	0.89	6.94	5.24
Pakistan	-0.54	2.07	2.22	2.89	4.17	2.45
Sri Lanka	0.88	1.13	0.65	1.86	2.39	3.69
East Asia & Pacific	1.01	2.68	2.16	5.50	5.85	7.08
South Asia	-0.47	1.44	1.52	2.90	4.12	3.13
Sub-Saharan Africa	-0.53	-0.74	-0.46	1.52	-0.78	0.62

Note: Growth rates are calculated on 3 year moving average basis.
Source: Extrapolated using data from World Bank 2001a.

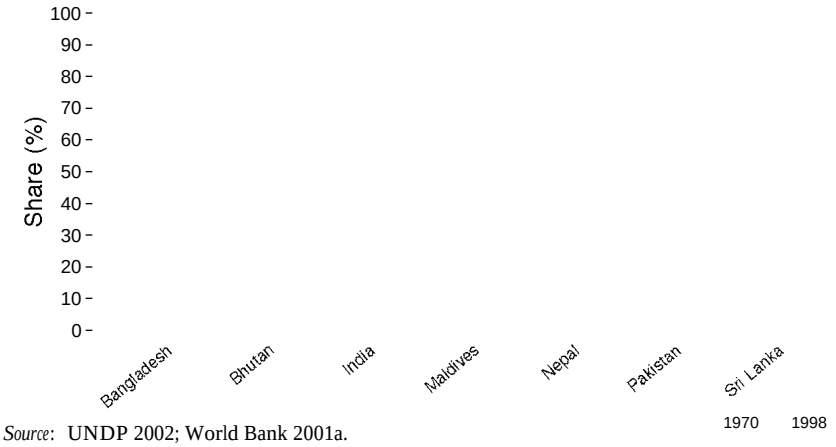
In the relatively stable period of the 1980s, characterised as a period of structural change, the per capita agricultural incomes increased at a rate of 2.07 per cent and non-agricultural incomes at a rate of 4.17 per cent. Later in the 1990s the country faced many problems ranging from political instability and corruption to slow macroeconomic reforms and rising economic sanctions. However, the overall economy progressed at an enviable rate of above 6.0 per cent during 1965-98 with per capita agricultural and non-agricultural incomes

Box 3.2 The income multiplier effect from agriculture to other sectors

Agricultural growth has strong linkages to non-farm economy. The linkages work in several directions. On one hand, a growing agricultural sector generates demand for various agricultural inputs provided by the non-farm sector. On the other hand, increased agricultural production provides raw materials that require processing and distribution by the non-farm sector. Agricultural growth also influences the supply side of the rural nonfarm economy through labour market. As nonfarm sector expands, the opportunity cost of labour becomes very high in farming sector and surplus labor moves out of agricultural sector. Increase in per capita income leads to a rise in demand. Increased demand induces diversification of consumption into nonfood goods and services, many of which are provided by local firms. Empirical studies have found that each dollar increase in agricultural value added leads to an additional $0.5 to $1.0 of value added in the rural nonfarm economy. The income multipliers from agricultural growth are found to be stronger in areas with better infrastructure, higher population density, and higher per capita agricultural incomes. For instance, studies conducted in India have found that the income multipliers were particularly large in Punjab and Haryana, which score better on these fronts whereas they were found to be lower in Madhya Pradesh and Bihar, which score poorly.

Source: Rosegrant and Hazell 2000.

Figure 3.3 Share of agricultural labour in total labor force



Source: UNDP 2002; World Bank 2001a.

rising at a rate of 1.42 per cent and 3.84 per cent, respectively.

On the other hand, it was primarily due to negative growth in per capita agricultural GDP that some South Asian economies, where agricultural sector was dominating non-agricultural sector, did not develop faster. For instance in Bangladesh, a huge percentage of its GDP is drawn from the agricultural sector, its per capita growth in agriculture was, however, negative in 1971-80. The per capita income in non-agricultural sector, therefore, grew by only 0.22 per cent. In the last two decades, agricultural sector progressed at a rate above 4.0 per cent and with a coincident decline in population growth, the per capita agricultural value grew by 0.17 per cent and 1.03 per cent in 1981-90 and 1990-2000, respectively (cross analysis of table 3.1, 3.2, and 3.3). In the 1990s, a stable growth in agriculture led to a high growth rate in the manufacturing and services sectors, thereby increasing per capita incomes in non-agricultural sector by more than 5.0 per cent (table 3.3).

In case of Nepal too, the linkages from agricultural to non-agricultural sector are very strong. During 1971-80, per capita agricultural value added declined at a rate of –1.63 per cent and did not generate enough surplus for the nonagricultural sector, which grew by only 0.89 per cent. During later years, agricultural sector grew at more than 5.0 per cent due to which non-agricultural incomes increased.

Labour absorption capacity of non-agricultural sector

As the share of agriculture in GDP declines in the process of transformation, demand for labour grows in other sectors of the economy. In South Asia, the absorption of labour in other sectors has been relatively slower. It is obvious from the trend of agricultural share in GDP that as agricultural share in GDP has declined slowly, the rate of labour absorption in other sectors is sluggish. In case of Bhutan and Nepal, the transformation of labour is almost non-existent during the period 1960-98: the share of labour employed in agriculture declined from 95 per cent to 94 per cent for both countries. In the case of India, the process is relatively slower in comparison to Bangladesh, Pakistan, and Sri Lanka. In India, the share of labour employed in agricultural sector decreased from 74.3 per cent to 60 per cent in the last 38 years. In Pakistan and Sir Lanka, the share of agricultural labour force decreased at a moderate pace (Figure 3.3).

Economic transformation and agricultural exports

A declining share of raw agricultural exports is an important aspect of transformation. For instance, Bangladesh was a major exporter of jute and jute

products during the 1970s. With progressive economic transformation, the jute production and exports declined in the past two decades and the share of agricultural exports in total exports declined rapidly from almost 40 per cent in 1971 to merely 2.7 per cent in 1999. In 1999, the agricultural exports contributed very little towards national income (figure 3.4).

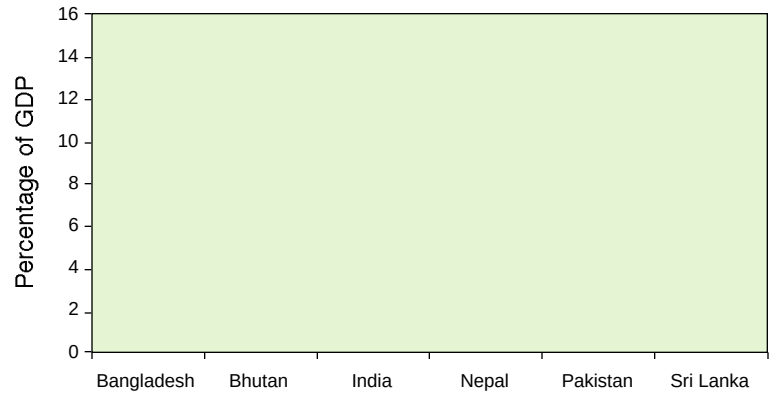
India has witnessed a relatively lower share of agricultural exports in its total exports, yet it did not decrease rapidly over the period 1966-1980. The last two decades have seen a more rapid decline. The decline in the share of agricultural exports is most dramatic in case of Nepal, Pakistan and Sri Lanka. It decreased from 93.8 per cent in 1970 to 10.1 per cent in 1999 for Nepal, 89.3 per cent in 1966 to 14.9 per cent in 1999 for Pakistan, and 95 per cent in 1970 to 20.7 per cent in 1999 for Sri Lanka.

As a percentage of GDP, the share of agricultural exports is declining in almost all the South Asian countries. In Pakistan, the agricultural exports as percentage of GDP fluctuated considerably; from 3.5 per cent in 1966 to 2 per cent in 1970 and rose again to above 4 per cent and then fell again to 1.8 per cent in 1988. In case of Nepal and Sri Lanka, share of agricultural exports in GDP declined rapidly from 8.8 per cent to 1.2 per cent in 1998 and 18.5 per cent to 6.8 per cent, respectively, over a period of 32 years.

Bhutan and India are the only exceptions. In India, agricultural exports as percentage of GDP did not decline significantly. It fluctuated around 1.3 per cent in 1966 to 1.2 per cent in 1998. In Bhutan it averaged around 4 per cent over a period of 28 years.

During the process of transformation, per capita incomes in non-agricultural sector grow faster than agricultural sector and income disparity increases. When resources such as labour move out of agriculture, per capita incomes in agricultural sector start rising. Though per capita incomes have risen in some South Asian countries yet rising absolute poverty suggests that a lot of effort is still required to distribute the fruits of growth evenly among its contributors.

Figure 3.5 Agricultural exports as percentage of GDP



Note: For Bhutan the latest year is 1980.
Source: FAO 2001c.

Intersectoral gap, income inequality and poverty

Poverty in South Asia is mostly a rural phenomenon and rural incomes are predominantly dependent on agriculture. Almost 72 per cent of South Asians still live in rural areas. Evidence from several South Asian countries, particularly Pakistan and Sri Lanka, suggests that there has been a considerable decrease in rural poverty in percentage terms, yet several studies indicate that the absolute number of people living below poverty line has increased. Rural poverty is still very high in Bangladesh, India and Pakistan (table 3.4).

Table 3.4 Poverty in selected South Asian countries 1970-1998

	Persons below $ 1/day (Based on incidence %)		Rural poverty %		Income consumption distribution		
					Lowest 20%	Highest 20%	
	1990	1995-98	1991-93[b]	1994-98	1970-75	1995-98	1995-98
Bangladesh	29.1	–	46.0	39.8	6.8	8.7	12.0
India	52.5	44.2	43.5	36.7	5.9	8.1	11.6
Nepal	37.7	–	44.0	…	…	7.5	11.5
Pakistan	11.6	31.0	49.11	31.95	8.0	9.5	12.9
Sri Lanka	4	6.6	20.0	25.0	7.3	8.0	11.8

Note: a: Refers to national level only.
b: Rural poverty data for Pakistan refers to 1969-70 from Economic Survey of Pakistan 2002/2003)
*: Note US$ 1/day is the international poverty line (Purchasing power parity, 1985 dollars).
…: Not available.
Source: World Bank 2001a, 2002a.

Another important feature of these economies is rising income disparity. There are many different measures of income disparity. In recent years, intersectoral GDP gap has turned out to be an important measure of unequal distribution of income among different sectors of the economy. Over the last three decades, the intersectoral income gap is increasing much faster in many countries of the region[11].

The widening intersectoral GDP gap is also a measure of a deepening transformation in the economy. In the beginning, non-agricultural sectors grow faster and the gap widens. As non-farm employment increases, the opportunity cost of working on farms increases. Once the transformation is complete, resources like labour move out of the agricultural sector, per capita agricultural income starts increasing and the gap between per capita agricultural and non-agricultural income narrows. In South Asia agricultural transformation has been slower than East Asia and the Pacific. Therefore, widening intersectoral gap is deepening the income inequality.

Poverty, inequality and per capita income growth are all interrelated. A rise in per capita income may alleviate poverty only if there is a corresponding improvement in its distribution. The distribution of wealth is skewed in this region and it has deteriorated further. The percentage of people with the lowest 20 per cent share in income consumption distribution has increased for almost all the countries of the region over the last 28 years. Income consumption inequality between the lowest 20 per cent and highest 20 per cent of population has increased in Pakistan from 8.0 per cent to 12.9 per cent, in Bangladesh from 6.8 per cent to 12.0 per cent, in India from 5.9 per cent to 11.6 per cent, and in Sri Lanka from 7.3 per cent to 11.8 per cent between 1970-75 and 1995-98.

The above discussion can be summed up as:

- Slow and sometimes negative growth rate in per capita agricultural GDP in South Asia has led to lower incomes in rural areas.
- Slow growth in per capita agricultural incomes has led to widening intersectoral GDP gap and deepening income disparity in urban and rural sectors of South Asia.
- As majority of people live in rural areas, therefore, they bear the major burden of intersectoral income inequality.
- Rising income inequality has led to higher number of people living below poverty.
- Absolute poverty in South Asia has increased.

Performance of agriculture through time

Structural change in South Asian agriculture

The widening gulf between the agricultural and non-agricultural incomes is reinforced because of structural transformation in a growing economy. The share of agriculture in GDP decreases rapidly, which is normal to the process of economic transformation. It should not be taken as a negative outcome of development as long as agriculture keeps growing at a reasonably good pace. The Engel's Law, which states that as income increases expenditure on food declines rapidly, provides sufficient reason for decreasing share of agriculture in overall production.

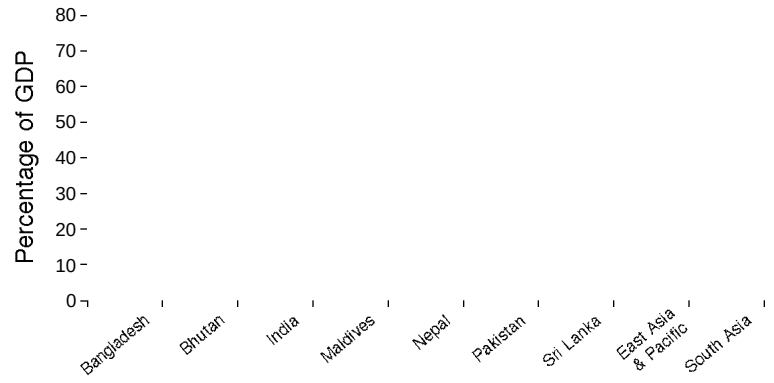
South Asia has witnessed a declining trend in its share of agriculture. From 44.9 per cent in 1960, it has declined to 25 per cent by 2000. The pace of reduction is relatively faster than East Asia and the Pacific: in East Asia the share of agriculture in GDP declined from 31.0 per cent in 1960 to 13.0 per cent in 2000, an 18 percentage point reduction (figure 3.6). South Asia witnessed a reduction of 20 percentage points, over the same period.

In Bangladesh, during the period 1971-2000, the share of agriculture in GDP declined at a moderate pace from about 39.2 per cent in 1971 to 25.0 per cent in 2000. It must be noted that transformation was slow in the early years of independence as its share of GDP declined to only 38.1 per cent by 1980. As a matter of fact there was no industrial base in Bangladesh before independence. However, the manufacturing and industrial base started expanding and share of agriculture in GDP decreased sharply by almost 10 per cent in 1990 (table 3.5).

In India, the share of agriculture in GDP declined at a slower pace from 45.2 per cent in 1960 to 25 per cent in 2000 (table 3.5). During the 1960s and 1970s, the share of agriculture in GDP did not decline at a fast pace. The most important reason was the sudden increase in agricultural value added due to the Green Revolution, which increased the share of agriculture in GDP.

In the case of Pakistan, though agricultural production increased dramatically during the 1960s yet the pro-industrialisation drive of 1960s led to a sharp reduction of agricultural share in GDP. The pace slowed in the 1970s as private sector investment declined sharply due to nationalisation drive. In the 1980s and 1990s the share of agriculture in GDP did not decline much as the decentralisation and privatisation policies increased more uncertainty because of increasing political instability.

Figure 3.6 Agriculture as percentage of GDP



Note: The Latest year available for Bangladesh is 1971; for Bhutan 1980; for Maldives 1990.
Source: World Bank 2001a.

In Sri Lanka, the pace of transformation was even slower. The share of agriculture in GDP declined from 31.7 per cent in 1960 to 20 per cent over the last 40 years (table 3.5).

In Nepal, the share of agriculture in GDP is highest among other South Asian economies. Although the transformation was slower in first 20 years of the period 1960-2000, it declined significantly in later years. Within the last 20 years, it declined rapidly from 61.8 per cent in 1980 to 40 per cent in 2000.

In case of Bhutan and Maldives, the data is only available for the 1980s and 1990s, respectively. For Bhutan, the share of agriculture in GDP declined rapidly in the last 16 years. On the other hand, it is

Table 3.5 The changing structure of the economy

(Value added as percentage of GDP)

	Agriculture					Manufacturing					Services				
	1960[a]	1970[d]	1980[b]	1990[c]	1997-2000[d]	1960[a]	1970[d]	1980[b]	1990[c]	1997-2000[d]	1960[a]	1970[d]	1980[b]	1990[c]	1997-2000[d]
Bangladesh		39.2	38.1	28.3	25.0		11.4	23.8	23.6	24.0		49.4	38.1	48.1	5.10
Bhutan			56.7	43.2	38.2			12.2	25.3	36.4			3.11	31.5	25.4
India	45.2	44.8	37.8	30.8	25.0	18.9	20.0	23.7	27.1	27.0	35.9	35.2	38.5	42.1	48.0
Maldives				21.9	16.4				6.0	6.5					
Nepal	65.5	67.3	61.8	51.6	40.0	11.0	11.5	11.9	16.3	23.0	23.5	21.2	26.3	32.1	37.0
Pakistan	46.2	36.8	29.5	26.0	26.0	15.6	22.4	24.9	25.2	23.0	38.2	40.8	45.6	48.8	51.0
Sri Lanka	31.7	28.3	27.6	26.3	20.0	20.4	23.8	29.6	26.0	27.0	47.9	47.9	42.8	47.7	53.0
East Asia & Pacific	31.0	32.6	24.3	20.0	13.0	30.5	32.4	42.4	40.4	46.4	38.5	35.0	33.3	39.6	40.6
South Asia	44.9	43.3	36.6	31.0	25.0	17.9	19.9	24.0	25.5	26.0	37.2	36.8	39.4	43.5	49.0

very hard to comment about Maldives because of unavailability of information and data. Maldives has the smallest agricultural base in South Asia. It relies more on tourism and fisheries.

Trends in sub-sectors

During the last few decades, many South Asian economies have seen strong growth in crop production (above 2 per cent). At times crop production growth rates closely matched or outpaced population growth rates. In particular, the growth rates were very impressive in Bangladesh, India, Nepal and Pakistan.

From 1970-71 to 2000, agricultural production increased in Pakistan by 199 per cent, in India by 128 per cent, Nepal by 124 per cent, Bangladesh by 107 per cent, and Sri Lanka by 47 per cent. There has also been tremendous growth in production of food, cash crops and livestock in all the countries (table 3.6)

During the 1960s, scientifically modified semi-dwarf varieties of wheat and rice were introduced in South Asian countries. The new varieties were highly responsive to input usage such as water and fertilisers. The small farmers benefited the most as high yield per hectare from their small tracts of land suddenly increased their incomes. An increase in income was used for nonfarm transformation. On the other hand increasing food supply ensured that there is enough food available for growing number of people in South Asia.

The Green Revolution was regarded as truly an Asian miracle. It increased cereal production dramatically in Bangladesh, Nepal, India, Pakistan and Sri Lanka. The introduction of high yielding semi dwarf varieties of rice and wheat led to a rapid increase in input usage. International Rice Research Institute (IRRI) played an important role in introducing new varieties of rice and wheat in Asia. With its help, Pakistan, India, and Bangladesh developed many high yielding varieties. Soon after the introduction of high yielding varieties of rice, new high yielding varieties for maize, wheat, soybean, and some major vegetables were introduced. The growth rates for wheat were high in Bangladesh, Pakistan, and India

The impact of Green Revolution was tremendous in alleviating hunger and poverty. It not only increased agricultural incomes but transformed rural livelihood throughout Asia. It changed the cropping patterns and strengthened food supply. As cereal production per hectare increased, more and more arable land became free for other types of crops. Area under wheat and rice relatively decreased and farmers diversified crop production. The diversification was narrowed as farmer focused on cash crops such as oil seed crops and soybean and abandoned other crops, which were not yielding good production and incomes. This was an indication of growing commercialisation as well.

In South Asia, the growth rate for total area under cereal production has shown a declining trend over the last three decades. For instance, in case of Bangladesh, India, and Pakistan area under cereal production has shown a consistent decline for the last thirty years,

Table 3.6 Performance of agriculture from 1970-71 to 2000

	Agricultural Production			Food Production		
	1970-71[a]	2000	Growth rate	1970-71[a]	2000	Growth rate
Bangladesh	64.6	133.6	106.8	63.8	131.6	106.3
Bhutan	64.1	114.4	78.5	64.3	114.4	77.9
India	55.7	126.9	127.8	55.5	127.4	129.5
Maldives	64.6	132.4	105.0	64.6	132.4	105.0
Nepal	55.8	124.9	123.8	55.2	125.3	127.0
Pakistan	46.9	140.2	198.9	49.0	146.6	199.2
Sri Lanka	79.0	116.4	47.3	71.8	115.7	61.1
	Crops			Livestock		
	1970-71 [a]	2000	Growth rate	1970-71 [a]	2000	Growth rate
Bangladesh	62.8	132.6	111.1	75.7	140.0	84.9
Bhutan	65.0	122.7	88.8	62.7	93.9	49.8
India	60.4	125.7	108.1	42.4	132.6	212.7
Maldives	64.8	132.9	105.1	61.0	124.5	104.1
Nepal	55.1	126.3	129.2	58.2	126.7	117.7
Pakistan	49.0	129.9	165.1	44.0	153.1	248.0
Sri Lanka	78.8	114.7	45.6	81.5	131.2	61.0

a: The data year for Bangladesh is 1971.
Source: FAO 2001c.

while cereal output per hectare continued to increase. During the same period there has been an unprecedented increase in total oil seed crops, nuts, soybean and cotton.

Many South Asian countries witnessed relatively high growth rates of crop production in the 1960s and 1970s, but since the 1980s they have been experiencing second generation problems of Green Revolution. These problems have arisen due to excessive fertiliser and pesticide use, intensive cropping, and over use of water, which have resulted in chemical toxicity, water logging, salinity, and soil degradation for example, the growth has slowed down in 1991-98 as compared to 1965-70 (figure 3.7a & 3.7b).

Even if the overall crop production growth rates were impressive, they failed to leave an imprint as per capita crop production growth rates did not increase fast enough. As a matter of fact, the growing population has been a major concern. In per capita terms, agricultural production, crop production and food production have not changed much due to high population growth in many South Asian countries. For instance, in Bangladesh the per capita crop production growth rates were negative for almost two decades, from 1971-80 to 1981-90 (table 3.8). The situation has improved recently as its population growth has slowed down and per capita agricultural production increased to 1.1 per cent in 1991-2000.

The per capita agricultural production indices show only a slight improvement in case of Bangladesh, India, Nepal and Pakistan over the last 30 years (figure 3.8). For other countries, the index has shown a relative decline. This holds true for per capita crop production indices as well. However, the per capita livestock indices have improved for almost all the countries of the region except for Maldives and Bhutan. The change in livestock production index is dramatic in case of Bangladesh. India and Pakistan have also shown dramatic changes in this regard. This fact reinforces the existence of strong linkages between farm and nonfarm sectors of the economy.

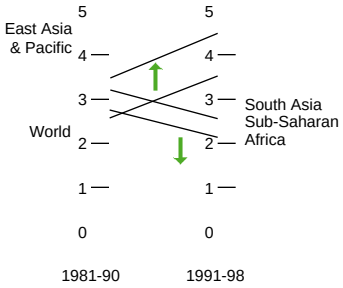
Non-crop transformation and commercialisation[12]

The confluence of the declining share of agriculture in GDP and increase in overall economic growth sets the broad foundations for the process of commercialisation and diversification of agriculture. Diverse sets of support policies prove very effective for fostering this process such as, enhanced agricultural research, supportive macro policies, access to credit; growth of rural financial markets, public investment in infrastructure, and establishment of secure property rights.

Though the post Green Revolution period is marred with second-generation problems, however, non-crop transformation has particularly picked up pace during this period. In post Green Revolution era, there was a clear shift in production towards meat, milk, butter, poultry and fruits. Rapid technological change in agricultural production and the changing pattern of food-demand resulting from higher personal disposable incomes triggered the process of diversification and commercialisation in South Asian agriculture.

The non-crop transformation is much more visible in India and Pakistan as compared to Bangladesh, Nepal and Sri Lanka. For instance, in India the growth rate of livestock production increased from only 1.2 per cent in 1971-80 to 2.7 per cent in 1981-90. Over the last

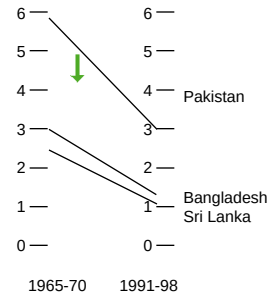
Figure 3.7a



Crop production annual average growth rate

Source: World Bank 2001a.

Figure 3.7b



Crop production annual average growth rate

Source: World Bank 2001a.

Table 3.8 Per capita agricultural and crop production growth rates (percentages)

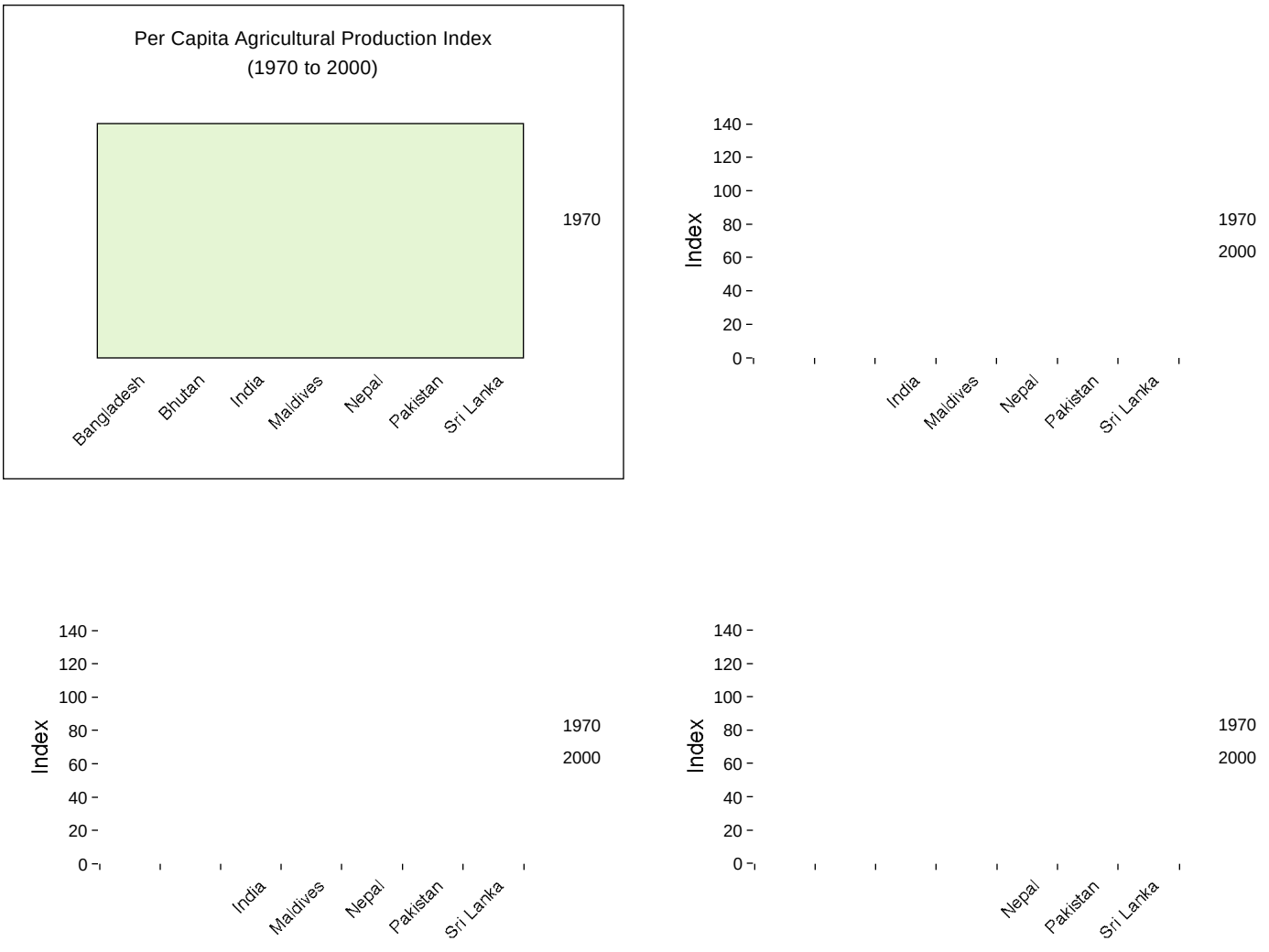
	1970	1971-80	1981-90	1991-2000	1970	1971-80	1981-90	1991-2000
Bangladesh	-1.8	-1.4	-0.5	1.1	-2.1	-1.4	-0.3	1.0
Bhutan	0.2	0.3	-0.3	-0.6	0.2	0.2	-0.4	0.3
India	2.5	0.3	1.6	0.8	3.3	0.1	1.3	0.6
Nepal	0.4	-0.5	-0.5	-0.1	0.4	-0.5	-0.5	0.0
Maldives	1.0	-0.6	1.8	-0.2	1.5	-1.0	2.8	-0.1
Pakistan	1.5	0.2	1.2	1.2	2.3	0.1	0.8	0.5
Sri Lanka	0.4	0.3	-0.7	0.7	0.4	0.5	-0.7	0.5

Source: FAO 2001c.

thirty years (1970-2000); livestock production has increased by 212.7 per cent; meat production by 141 per cent; milk production by 251.4 per cent and fruit production by 211.6 per cent (table 3.9). One may notice that per capita incomes in agricultural and non-agricultural sector increased relatively faster in the 1980s and 1990s.

Similarly, in Pakistan the growth of livestock production jumped from mere 0.4 per cent in 1971-80 to 1.7 per cent in 1981-90 and further to 2 per cent in 1991-2000. The agricultural value added increased by 2.07 per cent in 1981-90 and 2.22 per cent in 1991-98 and non-agricultural value added increased by 4.17 per cent in 1981-90 and 2.45 per cent in 1991-98. A faster increase in incomes fueled demand for livestock and fisheries products. Changing food demand has led to increase in milk and egg production (table 3.9).

Figure 3.8 Per capita production index



Note: For Bangladesh the latest year is 1971.
Source: FAO 2001c.

Table 3.9 Changing patterns in non-crop production

Country	Total meat production (1000 MT)					Total milk production (1000 MT)				
	1970	1980	1990	2000	Growth over 1970-2000	1970	1980	1990	2000	Growth over 1970-2000
Bangladesh	245	209	308	424	73.1	1065	1162	1594	2096	96.8
India	2003	2608	3900	4827	141.0	20800	31560	53678	73100	251.4
Nepal	81	127	187	237	192.6	625	747	922	1170	87.2
Pakistan	462	713	1325	1752	279.2	7445	9014	14723	25566	243.4
Sri Lanka	56	53	53	91	62.5	141	243	252	295	109.2

	Hen eggs (000 million)					Total fruit production (1000 MT)				
	1970	1980	1990	2000	Growth over 1970-2000	1970	1980	1990	2000	Growth over 1970-2000
Bangladesh	36	35	61	132	266.7	1407	1304	1332	1340	-4.8
India	290	583	1161	1782	514.5	15787	20357	27359	49199	211.6
Nepal	12	15	17	22	83.3	112	135	463	457	308.0
Pakistan	13	96	220	331	2446.2	1577	2533	3894	5409	243.0
Sri Lanka	19	31	46	51	168.4	520	2032	718	834	60.4

Source: FAO 2001c.

The growth in production of fruits is another indication of diversification and increasing commercialisation in South Asia (table 3.10). It is not only used for domestic consumption but for export as well to the Middle East and other countries of the world. In India, Nepal, and Pakistan, the fruit production has increased by 211.6 per cent, 308.0 per cent, and 243 per cent, respectively (table 3.9).

The growth in non-cereal and non-farm production is not the only indicator of diversification and commercialisation. The production of forest products also increased during the transformation period. In South Asia people rely on forests for their shelter and energy needs. The round wood is used for roofing and furniture manufacturing, while fuel wood is used for burning in stoves for cooking and heating in winters. Agro forestry is growing very fast in many South Asian countries. It not only provides wood for human needs but also protects farm embankments from degradation. It also provides protection from heavy storms and winds. Fast growing trees are very popular among farmers. In Pakistan, the production of round wood and fuel wood is growing at more than 3 per cent for the last 20 years.

Evolution of institutions and policies for agriculture

The evolution of institutions and policies is a historical process; it neither happens nor is implemented overnight. Although there is no guarantee that institutions that evolve over time will produce economic growth, yet they provide a framework that is necessary to understand the economic performance of economies in a historical perspective[13]. Institutional and organisational change is an important aspect of dynamically growing economies. In the past, many countries have tried to circumvent the need for policy reforms and institutional change by the introduction of new technologies. For instance, the Green Revolution technology has been effectively used to circumvent the need for policy and institutional reforms[14] without realising the fact that institutions and technology complement each other. The technology determines the process of production while institutions make rules and laws that govern this process. There is no doubt that South Asian governments provided required institutional support to agriculture during the Green Revolution period (1960 to 1985), yet in post-Green Revolution period it was realised that the policy and institutional framework

adopted earlier had not been well-conceived, keeping in view the holistic nature of agriculture in South Asia.

During the Green Revolution the new plant technology came with top to down government support for seed distribution, expanding irrigation operations, enhanced fertiliser usage, and credit disbursement with subsidies and price support policies. The irrigation, fertiliser and credit subsidies along with price support policies were highly desirable as the traditional farmers viewed new crop technology with suspicion and uncertainty. The government set up extension operations for demonstrating new technologies. In many cases, the farmers started adopting new technology by realising the potential of high-yielding varieties (HYVs) in demonstration plots. It was a relatively new technology and not much was known about its side effects. After two decades of its introduction, the second generation problems of the Green Revolution started appearing in South Asia. These and the changing patterns of social and economic institutions in rest of the world made it imperative for policy makers in South Asia to reassess the role of institutions and policies for agriculture.

Irrigation development received high priority by farmers as well as governments in South Asia

Historical trends in policy and institutional reforms

The process of institutional and policy reforms to promote agricultural growth can be divided into two periods: the period of the Green Revolution from 1960 to 1985, and the post-Green Revolution period from late 1980s to the present.

The Green Revolution period (1960 to 1985)

The 1960s and 1970s is considered as a period of technological change, infrastructure building and institutional development through investment in agricultural sector. The Ford Foundation helped to establish rice research institutions in Pakistan, Bangladesh and India. The new high yielding varieties (HYVs) of rice increased production dramatically. The success in rice production led to development of high yielding varieties of wheat, maize, and soybean crops as well. This created a dramatic increase in cereal production. The extraordinary performance of high yielding varieties of cereal crops was not possible without the support of government policies for various inputs that included seeds, irrigation, fertiliser and credit. During the 1960s and 1970s, fertiliser and water usage grew manifold.

IRRIGATION INFRASTRUCTURE DEVELOPMENT: Irrigation development, being one of the key inputs for enhancing agricultural production, received high priority by farmers as well as governments in South Asia. There were two main aspects of irrigation policies in most countries[15].

- First, the governments conducted comprehensive water resource assessment surveys and invested in short and long-term irrigation development projects. The short-term projects were expensive from small farmer cost effectiveness point of view, while long-term projects involved huge investments and had longer gestation periods. The small-scale irrigation projects were popularised by demonstrating government sponsored low lift pump and tubewell projects. The long-term projects were carried out in collaboration with international donors. The modern irrigation technology of shallow and deep tubewells and low lift irrigation pumps was first introduced in India in the 1950s. Later it spread across South Asia by the early 1960s.
- Secondly, the subsidy to cover the cost of tubewells and lift pumps was an important part of government policy to introduce the irrigation technology through public/private partnership.

In the case of Pakistan, Bangladesh, and India the low lift pump technology was very successful at the small scale. It relied

on human, animal and electric power and provided much needed water input for irrigating new HYV plants. At a larger scale, regional water treaties for settlement of water disputes and associated infrastructure development projects played an important role in irrigation infrastructure development. For instance, the Indus Water Treaty (IWT) was negotiated and signed between India and Pakistan, under the World Bank supervision, that evolved into Indus Basin Development Project (IBDP), and transformed agriculture especially in Indian and Pakistani Punjab provinces. The project dominated the irrigation development scene not only in South Asia but in the whole of Asia as well. The IBDP was meant to implement provisions of IWT in India and Pakistan[16]. Under this project several dams and a network of canals were to be built on the river Indus and its tributaries. In Pakistan, the construction of the world's largest earth filled dam at Tarbela, and another big dam at Mangla was carried out under this project. Bangladesh entered into water treaties with India soon after its independence. An Indo-Bangladesh Joint Rivers Commission was signed at Dacca on 24 November 1972. Irrigation infrastructure development was initiated in other countries of the region. Following the patterns of small-scale irrigation development in India, Pakistan and Bangladesh, the government of Nepal initiated capital subsidies for shallow tubewell schemes in the early 1980s[17]. Similarly in Sri Lanka, one of the largest infrastructure investments ever made was the development of the irrigation sector under the accelerated Mahaweli Development Programme in the early part of 1980s. Irrigation facilities were made available to farmers to expand their cultivation extents especially in the dry zones.

RURAL INFRASTRUCTURE: ELECTRICITY AND ROADS: The construction of dams and canals in Indus Basin and elsewhere not only helped to build power projects on these dams but also facilitated the construction of roads in the area. The main source of energy in Bangladesh, Bhutan, Nepal, India and Pakistan is hydroelectric power. In order to transport raw materials, machines and labour to dam and canal construction sites, a network of roads were built which later proved to be a precursor in linking farms to urban markets. For instance, the Gandak Irrigation and Power Project treaty signed between India and Nepal included articles on construction and maintenance of roads in the project area. Similarly, in Sri Lanka, under the Mahaweli Development Programme of 1980s road construction, rural electrification and other community services were also developed in line with irrigation development facilities.

FERTILISER DISTRIBUTION POLICY: The advent of the Green Revolution expanded fertiliser use in India, Bangladesh, Pakistan, Nepal and Sri Lanka. The improved varieties of crops required higher fertiliser dosages on irrigated lands. For instance, during 1964-70 fertiliser usage per hectare of arable land grew by 23.7 per cent in Bangladesh, 24.7 per cent in India, and 29.9 per cent in Pakistan. In order to provide relief to small farmers, the governments gave subsidies for chemical fertiliser use.

LAND REFORMS: The introduction of the Green Revolution in South Asia raised the controversial debate on land reforms. The debate revolved not only around the issues of efficiency and equity but the vested interests of the ruling elite. Those in favour of land reform used the equity and efficiency arguments in favour of small farmers. Land reform in India under Zamindari Abolition Act was very successful as the reform was based on simple transfer of land to the tenant who already knew the land and managed it well using family labour and draft animals[18]. The landlords are also known to divide their land into small parcels and assign to peasants under sharecropping or tenancy agreements[19]. The major opposition to

Those in favour of land reform used the equity and efficiency arguments in favour of small farmers

land reforms came from landlords who had managed to get vast tracts of lands from the British in return for political favours[20]. They argued that poor farmers, peasants, and landless poor did not have enough resources to buy all the inputs, therefore they needed support and assistance which was readily provided under sharecropping and tenancy agreements. Hence, they argued, land reforms would hurt the poor peasants as they lacked money to farm small parcels of land efficiently. But in many parts of South Asia the empirical evidence suggests inverse relationship between farm size and productivity (box 3.3).

AGRICULTURAL RESEARCH AND EXTENSION: Agricultural research and extension services are considered vital for agricultural development. The advent of new plant technology stipulated the establishment of support infrastructure and institutions. The success of the Green Revolution was not possible without institutionalising extension services. The Ford foundation helped to establish rice research institutions in South Asia and other parts of the world as well for the advancement of HYVs of rice. Subsequently, agricultural universities and crop research departments were set up to promote research on other cereal and cash crops as well. Such initiatives played an important role in developing agriculture in South Asia. In the early years of agricultural development, the extension departments, managed by the governments were run with a great deal of efficiency. They played an important role in introducing high yielding plant varieties, fertiliser use, and irrigation practices.

AGRICULTURAL CREDIT: The introduction of the Green Revolution rendered credit an indispensable input. Although irrigation, fertilisers and seeds were highly subsidised, yet small farmers did not have much financial resources to

Box 3.3 Land reforms in South Asia: An unfinished agenda

Pakistan

Pakistan has had a mixed experience with the three land reforms that have been carried out since independence in 1958, 1972 and 1977. These reforms were ceiling-based land reforms. However, these attempts have suffered from a number of flaws and have not impacted the agrarian structure in any meaningful manner. Concentration of land ownership has exacerbated the problem of rural poverty. The tenants on the other hand had low productivity due to lack of tenant proprietorship rights and the absence of cash remuneration in return for share-cropping.

Sri Lanka

Sri Lanka has also experimented with a limited degree of land reforms. The Land Development Ordinance that came into effect in 1935 did not permit lands to be leased out or to be sold by imposing a restricted land tenure system. In 1958 demand arose to enact the Paddy Lands Act with an objective to grant security of tenure to tenant cultivators who were engaged in the share cropping of paddy lands. The land policy in Sri Lanka hindered the achievement of optimal productivity of lands. Therefore it was amended in 1968. The absolute ownership, provisions to mortgage, and obtain optimum productivity were the main objectives of this amendment. In the absence of a clear legal position regarding the ownership of the land, the peasants were not interested in effecting permanent improvements and making investment. Therefore, land titling and registration became another important aspect in the latter period of 1990. However, these Ordinances still maintain their supremacy as the core legislation for the allocation, utilization and development of state lands.

Nepal

Although a number of interventions were initiated by the State to reform land tenure, the measures started by the Lands' Act of 1964 bore promise of genuine reform. But the ruling elite thwarted the promises of the Act almost immediately. Although intended to redistribute land to the landless and smallholder peasants, the Act was largely ineffective as most of the large landholders were able to take measures to conceal their actual land holdings. Government was able to redistribute only 1.5 per cent of agricultural land in the following thirty years. Provisions of the Lands Act of 1964 protected the tenant against eviction and authorised a registered tenant to claim one-fourth of the land area or equivalent value of land from the owner. This provision effectively resulted in 'dual ownership' and encouraged landowners to seek alternative non-formal tenancy arrangements.

Source: Land Reforms in Pakistan by Naqvi *et al.* and country papers on Nepal and Sri Lanka.

invest in new technologies. The agricultural banks and farmer cooperatives played an important role in credit advancement for agricultural purposes. The commercial banks in many countries were also directed to provide agricultural loans on subsidised interest rates. For instance, in India commercial banks played a complementary role to that of farmer cooperatives in providing a comprehensive institutional support to agriculture through various lending programs.

PRICE SUPPORT POLICIES: The agricultural pricing policies in South Asian countries were introduced to achieve the following objectives:

- Protection of farmers from losses that may be incurred due to declining prices resulting from an excess supply of agricultural products.
- The provision of a price floor during the harvest and post-harvest season. This can act both as a form of incentive and insurance. In many countries crops under the price support programme fared very well and ensured a stable source of income for producers.
- The protection of urban consumers against a sudden rise in prices of cereals.
- Maintaining balanced terms of trade between agriculture and other economic sectors.
- To encourage the use of new technologies.

The agricultural support prices are not determined on the basis of a pre-determined formula but rather on a variety of factors that include production costs, import/export parity prices, supply situation, local and world demand and government-imposed production targets. Thus despite limitations, support prices assisted in reducing uncertainty of prices and created an environment that helped investment prospects in agriculture sector. In many South Asian countries, the output and input price polices have encouraged the adoption of new technology and enhanced both production and productivity by promoting use of inputs, such as fertilisers and HYV seeds.

THE POST-GREEN REVOLUTION ERA (1985 TO 1990s): By the late 1980s, South Asia failed to sustain the gains achieved through Green Revolution due to second-generation problems resulting from inefficiencies induced by price distortions and agricultural subsidies. Lack of policy and institutional reforms had created many problems not only in agricultural sector but at the overall economy level as well. For instance,

- The irrigation practices are very old and wasteful. Increasing demand for water is pressing against water resource limits.
- Substantial loss of arable land to increasing environmental degradation, soil erosion, and escalating urban and industrial use has mounted pressure on remaining croplands.
- Agricultural investments in public and private sector are inadequate for accelerating growth.
- The broken link between research and extension system has become a major obstacle in agricultural development.
- Agricultural price, taxation, and subsidy policies in the past have led to inefficient resource allocations.
- Lack of legal framework to define property rights and delay in land reforms have negatively impacted on agricultural investment.
- The macroeconomic framework in many South Asian countries has not been conducive for agriculture and rural development.
- The small farmer and landless poor have always been at a disadvantage in agricultural pricing and credit policies.

In South Asia, lack of major reforms in these areas has threatened the foundation of sustainable agriculture. The

In South Asia, lack of major reforms has threatened the foundation of sustainable agriculture

policy distortions in the form of expensive irrigation and fertiliser subsidies, credit market inadequacies, absence of physical infrastructures, excessive government controls, heavy indirect taxes and almost no direct income tax on agriculture made the governments and the donors more aware of the imperatives to make policy and institutional reforms. There had been some success in this respect. There had been gradual correction of price and credit distortions. However, in some countries the reforms were oversimplified and haste was shown in implementing lessons learned in other parts of Asia. For instance, public suppliers of services were eliminated too quickly even before private enterprises could step in to fill the gap; government expenditures on agriculture were reduced abruptly before private sector had taken any steps to replace the void created. Some of the important features of institutional and policy reforms implemented across South Asia are discussed below.

IRRIGATION REFORMS AND MANAGEMENT OF WATER: The irrigation development projects of 1960s and 1970s focused on infrastructure development and overlooked the importance of institutionalising water and irrigation management. The irrigation infrastructure and operational mechanism was highly subsidised in Pakistan and Bangladesh. The water charges paid by farmers were so small that they did not help to cover the maintenance, operation and depreciation costs. In Pakistan, the surface water irrigation subsidies comprised 60 per cent of the costs of maintenance and operation, while the electricity charges were 50 per cent below the cost in 1989-90. Similarly, in 1989 the proportion of subsidies on the sale price of tubewell was 40 per cent in Bangladesh[21]. This exacerbated the maintenance and operation problems in later years. The waterways embankments were eroded and passages were filled with earth and weeds. According to some estimates only 50 per cent of the water supplied by an irrigation system reached the farmers' field due to seepage, erosion, and wastage. On the other hand, lack of knowledge base in the Green Revolution era caused excessive water use. In many areas the ground water table has dropped due to excess water pumping. The use of excess ground water has increased the salt content in land, thereby, causing salinity and water-logging.

As almost 70 to 80 per cent of fresh water is used for agricultural purposes, the efficient management of water resources is essential. The problems in water management and irrigation and drainage operations led policy makers to seriously re-examine the existing policies. There has been an ongoing debate about decreasing public sector involvement and increasing private sector role in irrigation management. On the other hand, subsidies are gradually being removed and farmers are encouraged to construct cemented waterways around their farms to minimise water losses.

MARKET REFORMS: Efficient markets are key to economic development. Although there are many instances of market failure in developed countries yet it is more prevalent in low-income countries[22]. A market is unable to function competitively without a supporting institutional and legal framework. Efforts are underway in South Asia not only to provide infrastructure facilities for markets to work efficiently but also to liberalise the markets from the constraints of government-controlled prices and financial institutions. The market reforms can be divided into three main areas:

- Provision of physical infrastructure
- Rethinking agricultural price and subsidy policies
- Instituting credit market reforms

A well-established network of roads and physical marketplaces are highly desirable for agricultural development.

Though in the past public sector has played an important role in providing inputs and marketing outputs, the inefficiencies and lack of infrastructure necessary for competitive markets created huge bottlenecks. Since the late 1980s and 1990s, doors have been opened for public/private partnership and establishment of basic infrastructure and deregulation of delivery mechanisms.

The prices of agricultural commodities in South Asia are well below the international markets. The agricultural price policy distortions and associated disincentives have resulted in inefficient resource allocations. In the case of irrigation, corruption and rent-seeking behaviour has resulted in the diversion of water to large farms. Such malpractices have increased the cost of irrigation subsidies, thus enhancing the costs for the governments and farmers. During 1991 structural adjustment, the international financial institutions required many countries to institute agricultural price policy and subsidy reforms. Pricing and subsidy policies have been modified in many South Asian countries. For instance in Pakistan, subsidies on fertilisers, seed and tube-wells have either been removed or gradually eliminated. Nevertheless, subsidies continue in sectors such as electricity, water and credit. In a changing economic environment, currently the major objectives of agricultural price policy in many South Asian countries are: to ensure that long-run domestic price trends conform with the world prices; to eliminate extreme fluctuations in prices in domestic markets, and increase the role of private sector in import, export and stocking of agricultural commodities.

During the 1990s, financial institutions around the world were restructured at an unprecedented pace with the main objective of becoming more cost effective and resilient to shocks. These developments made the subsidy-dependent agricultural development banks white elephants of development finance, and many donor agencies excluded them from their support. Reforming agricultural development banks became a favourite strategy in Asia. The flaws of directed credit led to the formulation of a new paradigm, which is a shift away from the administration of directed credit programmes that rely on continuous government subsidies. Major attention is now given to the performance of financial institutions and two performance indicators, outreach and financial sustainability, are considered important for any viable rural financial institution.

AGRICULTURAL INFORMATION SYSTEMS: Increasing problems in drought management in India and Pakistan; and Bangladesh's vulnerability to flood and cyclone related destruction, and post-Green Revolution second generation problems in particular have led to reexamination of the existing knowledge and agricultural information base in South Asia. Many agricultural information systems have been launched in the region. In this regard the establishment of South Asia Network on Plant Genetic Resources (SANPGR) is worth mentioning. Six countries of South Asia, namely, Bangladesh, Bhutan, India, Nepal, Maldives and Sri Lanka are members of this Network. The major objective of the SANPGR is to improve conservation and use of plant genetic resources through collaborative efforts among the member countries[23]. The SAARC Agricultural Information Center (SAIC) is also an important development in this respect[24].

Prices of agricultural commodities in South Asia are well below the international markets

Conclusions

The introduction of the Green Revolution led to a dramatic increase in agricultural production. Although the Green Revolution suffered from top to down approach, yet increasing government support for agriculture helped to increase not only agricultural incomes but also non-agricultural incomes, leading to commercialisation and diversification of agriculture and

economic transformation in general. The benefits of the Green Revolution, however, could not be sustained in the long run because of the absence of the required institutional and policy framework. Recently, many South Asian countries have started undertaking institutional and policy reforms with a hope that a healthy interaction between agricultural and rural development with industrial and service sectors will enhance and sustain long-term development of South Asian economy and South Asian people.

Chapter 4

Agricultural Productivity and its Determinants

Introduction

As we have seen previously, agriculture has historically played an important role in the economies of the South Asian region. The Green Revolution phenomenon of the late sixties and early seventies has brought about a significant transformation in productivity in the agriculture sector at a time when the region was facing a growing land constraint due to the pressure of a rising population.

This chapter presents a comparative analysis of agricultural performance in South Asia showing the relative contribution of land, labour productivity, irrigation, fertiliser and tractor use and of research and extension.

It will be seen from this analysis that in the past twenty years, all the countries of South Asia achieved sustained growth in the agricultural sector at a rate that was faster than the increase in their population. This rate ranged from about 2.5-3 per cent in Sri Lanka and Nepal to 4.7 per cent in Pakistan.

The resource endowment of each country determined relative priorities. In Bangladesh and as Sri Lanka, with little scope for expanding the area under cultivation, the application of fertiliser per unit of land is the highest, whereas in Pakistan total irrigated area as a percentage of total area under cultivation has gone up to a record 82 per cent. Public expenditure on research is the highest in India. Almost all countries now face the difficult challenge of maintaining their productivity growth in the face of declining land resources, ecological degradation, adverse climatic factors and unfavourable conditions in the international markets.

Growth in agricultural output

Agriculture has always been the backbone of South Asian economy and society, besides being one of the major contributors to GDP growth. During the last two decades, however, due to structural changes that have been taking place in most South Asian economies, the share of agriculture in GDP has started declining. This change has been most significant in Nepal and Bangladesh; in Nepal the share of agriculture in GDP declined from around 62 per cent in 1980 to 42 per cent by 1999—a decline of 20 percentage points, while in Bangladesh the value added by agriculture went down from 39.6 per cent to 25.25 per cent in the same period (table 4.1). However, the agricultural sector in Nepal still continues to be the biggest contributor to GDP and the largest employer of labour force—the percentage of population involved in agriculture saw little or no variation during 1980-99 (table 4.2). In India, the agriculture sector contributed 39 per cent in GDP in 1980 but by 1999-2000 had gone down to 27.7 per cent.

In case of Pakistan and Sri Lanka, the structural transformation has been more gradual with the share in GDP of agriculture declining from 29.5 per cent to 27.2 per cent between 1980-99 in Pakistan. In Sri Lanka, the value added

Table 4.1 Agricultural value added and its growth in South Asia

	Agriculture, value added (% of GDP)					Growth in value added in agriculture (Average annual %)	
	1980	1985	1990	1995	1999	1980-89	1990-99
India	38.70	33.56	31.45	28.40	27.71	4.48	3.14
Pakistan	29.52	28.54	25.98	25.89	27.18	5.11	4.23
Bangladesh	39.63	33.34	29.42	25.33	25.25	2.29	3.48
Nepal	61.77	51.71	51.63	41.76	41.73	3.59	2.58
Sri Lanka	27.55	27.69	26.32	23.01	20.67	2.37	2.63

Source : World Bank 2001a.

Table 4.2 Economically active population in agriculture

(% of total labour force)

	Labour force in agriculture (% of total)				
	1980	1985	1990	1995	1999
India	69.53	67.02	64.43	62.40	60.60
Pakistan	64.04	59.35	54.96	54.43	53.23
Bangladesh	72.47	68.16	62.69	58.44	55.55
Nepal	90.02	92.14	93.18	95.38	96.57
Sri Lanka	51.21	49.69	46.96	45.32	44.33

Source: FAO 2001c.

by agriculture had reached 21 per cent by 1999—down from 27.55 per cent in 1980; the decline in agricultural value added being more pronounced in the 1990s.

During the period 1980-99, Pakistan experienced the highest growth in agricultural GDP in the region—an average annual increase of 5.11 per cent during the eighties with growth being slightly lower in the nineties at 4.23 per cent (table 4.1). In India, the agricultural sector grew at an average annual rate of 4.48 per cent in the eighties with growth being comparatively lower during the nineties at 3.14 per cent. In Bangladesh, on the other hand, agricultural growth was higher in the 1990s where the value added in agriculture grew at an average rate of 3.5 per cent between 1990-99, while growth during 1980-89 was only 2.3 per cent. The lowest growth in agriculture value added was experienced by Sri Lanka, where the agricultural GDP grew at an average annual rate of only 2.6 per cent but even this growth rate was faster than the increase in its population.

The share of labour engaged in agriculture declined throughout South Asia in the eighties and nineties as the agriculture sector gave way to industry and services sectors. India, which had about 70 per cent of its labour force employed in agriculture in 1980 had around 61 per cent of it employed in agriculture by 1999. The proportion of agricultural labour in the total labour force declined throughout the region between 1980-99 with the exception of Nepal where by 1999, 96.6 per cent of total labour force was employed in agriculture, up from 1980 figure of 90 per cent. The highest decline in the percentage of labour force engaged in agriculture was seen in Bangladesh with the share of labour force employed in agriculture declining from 72.5 per cent in 1980 to 55.5 per cent in 1999.

Table 4.3 Agricultural land use in South Asia

	Agriculture, land use in South Asia					Growth in land use (Average annual %)	
	1980	1985	1990	1995	1999	1980-89	1990-99
India	168255	169015	169438	169750	159000	0.06	-0.61
Pakistan	20300	20610	20940	21550	21880	0.40	0.40
Bangladesh	9158	9135	9437	8148	8440	0.35	-1.11
Nepal	2320	2335	2350	2968	2968	0.12	2.42
Sri Lanka	1880	1876	1900	1886	1900	0.07	0.00

Source: FAO 2001c.

Growth in the use of agricultural inputs

Agricultural land use in South Asia

The expansion of agricultural land has contributed very little to output growth in South Asia although in the first two decades after independence there was considerable expansion in cultivated area due to increased irrigation. During 1990-99, the increase of agricultural land was negative in some countries such as India and Bangladesh (table 4.3). Rising population in the region exerted tremendous pressure on land. In Bangladesh, for instance, the pressure of rising population has shifted a large area from directly productive activities such as crop cultivation to other uses such as housing, roads and urban development. The population density in Bangladesh is now one of the highest in the world leading to a drastic reduction in cultivable land. In India, agricultural land expanded nominally between 1980-95, but in the later part of the nineties the growth declined sharply contributing to an overall negative growth of 0.61 per cent during 1990-99. Nepal has seen the highest growth in agricultural land use during the 1990s: the agricultural land grew at an average rate of 2.42 per cent between 1990-99, while growth in the eighties was only 0.12 per cent. Growth in land

accounted for 51 per cent of the growth of production in Nepal[1]. Pakistan saw very low rates of growth in land use averaging 0.4 per cent per year in both the eighties and the nineties, while growth in agricultural land was virtually non-existent in Sri Lanka during these twenty years.

As regards the productivity of land, all countries have witnessed an increase in their land productivity. The growth rate of land productivity however varies from country to country (table 4.4). In 1980, land productivity was highest in Sri Lanka where a hectare of land produced on average $780 worth of output. This was followed by Bangladesh at $561 per hectare. Nepal and Pakistan had the lowest levels of land productivity in the region, where a hectare of land produced just $242 and $290 worth of output respectively in 1980. But by 1994, land productivity had reached $1119 per hectare in Sri Lanka, while it increased to only $382 in Nepal. The highest growth in land productivity was witnessed by Pakistan where land productivity grew by 4.8 per cent during the eighties which then slowed down to 3.12 per cent during 1990-94. India too saw a high growth in land productivity during the eighties and the early nineties, with growth being relatively higher in the eighties. In case of Bangladesh, growth in land productivity was the highest during 1990-94 at 4.37 per cent, while it was the lowest during the eighties at just 1.97 per cent. The value added per hectare of agricultural land in Nepal grew by only 1.1 per cent in the early part of the nineties even though the agricultural land in Nepal grew by 2.42 per cent during the nineties.

Use of irrigation

Trends in irrigated area show that most of the South Asian countries have still less than half of their agricultural area covered by irrigation. Pakistan is the only exception to this pattern: by 1999 it had a remarkable 82 per cent of its agricultural area covered by irrigation which is the highest proportion in the entire region (table 4.5). Bangladesh experienced the highest growth in irrigated area during both the eighties and the nineties at 3.85 and 5.1 per cent, respectively. By 1999 it had more than 47 per cent of its agricultural land covered by irrigation while in 1980 only 17 per cent of the agricultural area was covered by irrigation. In Sri Lanka, on the other hand, growth in irrigated areas was actually negative in the eighties. The cost of new irrigation went up in many countries, including India and Sri Lanka, giving rise to negative growth in irrigated areas. In India for instance, the real costs of new irrigation have doubled since the late 1960s and early 1970s; in Sri Lanka too it has doubled which combined with falling cereal prices has resulted in negative rates of return to irrigation in these countries[2]. This is not an encouraging trend for food supply since irrigated area accounts for nearly two thirds of South Asia's rice and wheat production[3].

Use of Labour

The agricultural labour force increased more rapidly than agricultural land in the

Table 4.4 Land productivity in South Asia

	Value added per hectare of agricultural, land (constant 1995 US $)				Growth in land productivity (%)	
	1980	1985	1990	1994	1980-89	1990-94
India	324.04	375.63	454.68	515.28	4.49	3.37
Pakistan	290.25	365.58	446.63	500.62	4.80	3.12
Bangladesh	561.49	684.63	718.68	831.43	1.97	4.37
Nepal	241.79	302.91	383.70	381.58	3.70	1.08
Sri Lanka	780.36	977.00	1023.05	1118.72	232	3.54s

Source: World Bank 2001a.

Table 4.5 Growth of irrigated area in South Asia

	Irrigated area as % of agricultural area in South Asia					Growth in irrigated area (Average annual %)	
	1980	1985	1990	1995	1999	1980-89	1990-99
India	22.87	24.72	26.64	31.22	37.11	1.66	2.79
Pakistan	72.32	76.47	80.90	79.81	82.04	1.73	0.61
Bangladesh	17.13	22.69	31.11	42.08	47.22	6.30	3.85
Nepal	22.41	32.55	40.43	38.21	38.24	7.48	1.89
Sri Lanka	27.93	31.08	27.37	30.22	34.84	-0.21	3.00

Source: FAO 2001c.

Table 4.6 Land to labour ratios in South Asian agriculture

	Land to labour ratio					Growth in agricultural labour (Average annual %)	
	1980	1985	1990	1995	1999	1980-89	1990-99
India	0.81	0.77	0.73	0.68	0.61	1.10	1.38
Pakistan	1.06	1.00	0.95	0.88	0.81	1.65	2.14
Bangladesh	0.30	0.28	0.28	0.23	0.22	1.09	1.23
Nepal	0.35	0.32	0.29	0.32	0.29	2.15	2.54
Sri Lanka	0.66	0.61	0.57	0.53	0.51	1.64	1.27

Source: FAO 2001c.

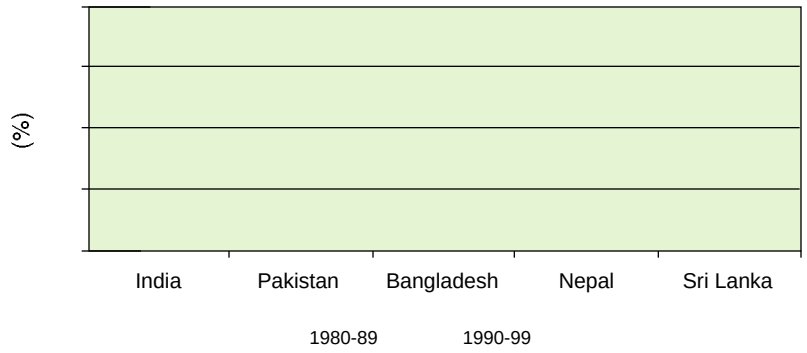
South Asia. As a result land to labour ratios declined in all countries during the past two decades. This ratio was as high as 1.06 hectares per worker in Pakistan in 1980, which came down to 0.81 hectare per worker by 1999. In the same period, labour use in agriculture in Pakistan grew by 1.9 per cent per year on average. The labour force employed in agriculture saw the highest growth in Nepal where it grew at an average annual rate of 2.15 per cent between 1980-89 and 2.54 per cent between 1990-99. The growth in agricultural labour was the lowest in Bangladesh during both the eighties and the nineties where labour employed in agricultural activities grew at an average annual rate of 1.1 per cent during 1980-89 with growth between 1990-99 being slightly higher at 1.23 per cent.

Table 4.7 Labour productivity in agriculture in South Asia

	Agricultural value added per worker (constant 1995 US $)				
	1980	1985	1990	1995	1999
India	276.47	304.15	350.67	363.09	402.31
Pakistan	386.71	455.18	529.25	578.79	629.06
Bangladesh	216.39	246.40	264.92	267.87	301.07
Nepal	154.31	177.29	194.72	184.08	188.18
Sri Lanka	630.16	719.55	708.31	746.49	752.49

Source: World Bank 2001a.

Figure 4.1 Growth in labour productivity



Source: World Bank 2001a.

Trends in labour productivity show that by 1999, the value of labour productivity measured as the agricultural value added per worker at constant 1995 US dollar was the highest in Sri Lanka at $752 per agricultural worker (table 4.7). Nepal had the lowest value of labour productivity in the region at $188 and its average growth during the nineties was also the lowest in the region—labour productivity in Nepal grew only at an average annual rate of 0.05 per cent between 1990-99, while during the eighties it was 1.4 per cent (figure 4.1). Pakistan saw the highest growth in labour productivity in the eighties where the value added per worker grew at an average annual rate of 3.4 per cent between 1980-89, which slowed down to 2 per cent in 1990-99. In India, the growth in labour productivity during the eighties was considerably higher than growth in the nineties. Labour productivity in Bangladesh saw the highest growth in the nineties, the overall growth between 1990-99 being 2.23 per cent per annum. In Sri Lanka, the growth in labour productivity was modest at around 1 per cent during 1980-99.

It is clear that in all countries of South Asia, growth in labour productivity lagged behind growth in land productivity in the 1980s and 1990s. The slower growth of labour productivity as compared to growth in land productivity indicates that the South Asian countries have generally adopted land saving agricultural technologies[4]. The decline in cultivable land led most countries in South Asia to increase their cropping intensity. In Bangladesh for instance the cropping intensity increased from 147 per cent during 75-80 to 180 per cent in recent years[5].

Fertiliser use

Data on fertiliser use in the South Asian countries is presented in table 4.8. The

highest level of fertiliser application per unit of land was recorded in Bangladesh in 1999, where a hectare of land received 154 kg of fertiliser on average. In Sri Lanka, 136 kg of fertiliser was applied on a hectare of land while in Pakistan the fertiliser application per unit of land stood at 129-kg per hectare. The fertiliser use in Nepal was much below the levels prevalent in the region—a hectare of land there received just 30 kg of fertiliser on average in 1999 while in 1980 only 10 kg of fertiliser was used on a hectare of land. Increased application rates of fertiliser led to high rates of growth in all countries of the region between 1980 and 1999. In Bangladesh, the fertiliser application per unit of land grew at an average annual rate of 8.8 per cent during the nineties—the highest in the region. In Nepal, the growth in fertiliser application was very high at 12.5 per cent during the eighties which slowed down to just 1.1 per cent during the nineties. Sri Lanka, on the other hand, saw relatively lower rates of growth in fertiliser application in both the eighties and the nineties.

Use of tractor

South Asia lags far behind other Asian countries as far as the use of tractors and other agricultural equipment is concerned. In 1980, there was fewer than one tractor available for every thousand agricultural workers in Bangladesh and Nepal—the lowest in the region. In Pakistan, there were 5 tractors for every thousand people employed in agriculture on average in 1980, which had increased to 12 tractors per thousand workers by 1990—an average annual growth of 9.1 per cent. During the nineties, however, there was virtually no growth in tractor use in Pakistan. There were 5 tractors per 1000 agricultural workers available in India in 1999; the growth in the use of tractors was highest in India between 1980-89 as well as 1990-99. The use of tractors per 1000 workers actually saw a decline in Sri Lanka during 1980-99; in 1980 around 4 tractors were available to every thousand agricultural workers but by 1999 this number had declined to only 2 tractors per 1000 workers. The slow growth of tractor use has occurred as a result of the realisation by policy makers that the speed of mechanisation through subsidised agricultural credit had not only reduced rural employment but also accelerated income inequalities in rural areas.

Table 4.8 Fertiliser application per unit of land in South Asia

	Fertiliser application per unit of land					Growth in fertiliser application (Average annual %)	
	1980	1985	1990	1995	1999	1980-89	1990-99
India	32.88	50.32	71.72	81.74	115.55	8.15	5.77
Pakistan	53.20	73.31	90.40	116.38	129.07	6.65	3.89
Bangladesh	45.53	59.22	74.18	146.66	154.03	5.76	8.76
Nepal	9.48	18.42	31.06	31.67	29.65	12.53	1.05
Sri Lanka	87.77	103.94	90.00	109.23	136.32	3.92	2.53

Source: World Bank 2001a.

Growth trends in some selected crops in South Asia during the nineties

Table 4.10 presents growth in the area, yield and output of four major crops in South Asia during the period 1990-2000. The major conclusions that emerge from analysis of data provided in the table are the following:

1. RICE: Rice is the most important food crop in the region. In Bangladesh, rice accounts for 70-72 per cent of the total value of gross output. During 1990-2000, Pakistan and Bangladesh saw the highest growth in production of rice at an average annual rate of 4.26 and 3.25 per cent respectively. However, the area cultivated grew by only 0.3 per cent in Bangladesh

Table 4.9 Tractor use in South Asian agriculture

	Tractors per thousand agricultural labour					Growth in use per 1000 workers (Average annual %)	
	1980	1985	1990	1995	1999	1980-89	1990-99
India	1.83	2.76	4.28	5.43	5.78	9.39	3.67
Pakistan	5.10	7.58	12.08	12.42	11.90	9.05	0.66
Bangladesh	0.14	0.15	0.15	0.15	0.14	1.88	-0.65
Nepal	0.38	0.38	0.54	0.49	0.45	5.25	-1.57
Sri Lanka	4.24	2.75	1.96	2.10	2.15	-6.95	0.49

Source: FAO 2001c.

Table 4.10 Growth in area, yield and production of major crops in South Asia (1990-2000)

a. Rice

	Area	Yield	Production
Bangladesh	0.30	2.90	3.25
India	0.29	0.98	1.56
Nepal	0.93	1.20	2.67
Pakistan	1.21	2.81	4.26
Sri Lanka	2.46	1.36	3.86

b. Wheat

	Area	Yield	Production
Bangladesh	3.86	2.07	5.97
India	1.22	2.02	3.29
Nepal	0.65	2.91	3.55
Pakistan	0.86	2.84	3.76

c. Sugarcane

	Area	Yield	Production
Bangladesh	-0.05	0.41	0.39
India	2.30	1.51	3.91
Nepal	6.45	1.63	8.06
Pakistan	1.50	0.96	2.66
Sri Lanka	-1.34	7.74	5.98

d. Cotton

	Area	Yield	Production
Bangladesh	7.19	-1.79	6.20
India	0.98	1.14	2.10
Nepal	1.28	1.51	1.67
Pakistan	1.22	2.33	3.71

Source: Extrapolated using data from FAO 2001c.

whereas it grew by 1.21 per cent in Pakistan during the nineties The yield per hectare of rice was the highest in Bangladesh followed by Pakistan. The lowest growth in production was recorded in India between 1990-2000, where rice production grew only at an average rate of 1.6 per cent.

2. WHEAT: Wheat is the second most important cereal in the region and is the staple diet of Pakistan and India. Growth in wheat production during 1980-99 was the highest in Bangladesh at nearly 8 per cent. However, this growth was mainly the result of land expansion; the land under wheat cultivation grew at an annual average rate of 6.9 per cent between 1980-99 while the yield per hectare grew only at 1.1 per cent per annum—the lowest in the region and was negative during the eighties.

3. COTTON: Bangladesh saw the highest growth in cotton production during the nineties averaging 6.2 per cent per year between 1990-2000. However, this growth was accompanied by falling yield levels and was mainly the result of expansion of the cultivated area which grew at an average rate of 7.2 per cent. During the nineties, cotton has been the major contributor to agricultural growth in South Asia.[6] Cotton yield in Pakistan experienced the highest growth at 2.33 per cent.

4. SUGARCANE: Trends for sugarcane show that the highest growth in production was experienced by Nepal, where sugarcane production grew at an average annual rate of 8.1 per cent between 1990-2000. This high growth was mainly the result of area expansion, which grew at nearly 6.5 per cent during this period although the yield per hectare grew only by 1.6 per cent per annum. Production of sugarcane grew at an average rate of 6 per cent in Sri Lanka during 1990-2000 resulting mainly from the high growth in yield per hectare while area under cultivation actually declined.

Trends in total factor productivity (TFP)

Total factor productivity has been one of the major sources of agricultural productivity in South Asia. In India for instance, growth in TFP accounted for nearly one half of agricultural production growth between 1956 and 1987.[7] The total factor productivity in South Asian countries has generally been low compared to other Asian economies. Several factors have contributed to low TFP in the region, the most prominent among them are low

investment in agricultural research and extension and underdeveloped rural infrastructure. In India for instance, research and extension accounted for 70 per cent of the growth in total factor productivity[8]. In Bangladesh, major factors contributing to low agricultural TFP were low investment in research, extension, rural infrastructure and irrigation, and dislocations arising from the civil war and independence of Bangladesh[9]. In Sri Lanka, civil unrest is cited as one of the major factors responsible for low TFP. In Nepal, difficult agroclimatic environment, limited funding available for research and its misallocation, have all contributed to low TFP. In Pakistan, research, rural literacy, modern seed varieties, and irrigation had the highest positive effects on productivity growth[10]. A study conducted by Murgai *et al*.[11] covering the Pakistani and Indian Punjab found that India experienced higher growth in yields of food crops than Pakistan.

In the early phase of the Green revolution (1967-75), the TFP growth in India was mainly due to the adoption of modern varieties of seed and sharp increases in irrigation investment, but somewhat low rates of growth in investment on extension and research. In Pakistan, during the same period, TFP growth accelerated due to sustained growth in irrigation development and high growth in the use of modern varieties, which was able to offset the decline in growth of investment in research[13].

The later phase of Green Revolution (1975-85) was characterised by relatively lower growth in the adoption of modern varieties in Pakistan and India leading to declining productivity growth. In India, investment in public research, extension and literacy increased in comparison to the previous decade, while investment in irrigation infrastructure dropped slightly but was able to sustain growth in proportion to irrigated area. In Pakistan, the growth in investment in research, irrigation and human capital declined sharply, and expansion in irrigated area virtually stopped during this period[14]. But as a result of past investments in irrigation and research combined with favourable macro economic policies, Pakistan was able to achieve an average agricultural growth of 4.7 per cent per annum in the 20 year period from 1980 to 2000.

Box 4.1 Resource degradation; Taking a heavy toll on agricultural productivity in South Asia

Resource degradation has severely hampered the growth of agricultural productivity in South Asia. Over the period of 1945-1990, the region has suffered an estimated loss of yield of approximately 16.5 per cent, which is well above the global figure of 5 per cent during the same period[12]. Data from Pakistan shows that resource degradation reduced overall productivity growth from technical change, education and infrastructure investment by almost one third. Several factors have led to the degradation of agricultural resource base in the region, the most prominent among them is the increase in the intensification of inputs. The intensification of inputs is often caused by inappropriate polices that provide incentives to use certain inputs in an excessive manner. In Pakistan, for instance, subsidies on some agricultural inputs have caused damage to the environment. In particular, the provision of irrigation water at prices below the cost of delivery has increased water logging, salinity and diminished bio-diversity. Subsidies for pesticides have encouraged its overuse. Water logging and salinity are causing serious environmental problems affecting agriculture. In India, studies have found that salinity problem affected nearly 4.5 million hectares and water logging 6 million hectares of land. In Nepal Tarai area, water logging reduced yields by half a ton per hectare.

Source: Rosegrant and Hazell 2000; Murgai *et al*. 2001; Faruqee 1997.

Investment in South Asian agriculture

Public expenditure on agriculture expressed as a percentage of agricultural GDP gives a good indication of the level of public commitment to agriculture. India spent the highest on agriculture, nearly 12 per cent of its agricultural GDP

Table 4.11 Government expenditure on agriculture as a percentage of agricultural GDP

(%)

	1975	1980	1985	1990	1993
Bangladesh	1.3	2.7	3.6	2.3	3.2
India	8.0	12.3	13	13.9	11.7
Pakistan	4.6	4.3	2.9	3.1	3.6
Nepal	2.4	4.3	7.8	2.7	3.7
Sri Lanka	7.1	7.7	26.9	8.1	8.1
China	7.9	9.1	6.0	6.5	6.3
Malaysia	6.1	13.5	14.7	10.7	8.1
South Korea	5.6	6.5	10.6	19.9	18.7

Source: Rosegrant & Hazell 2000.

in 1993 (table 4.11). Moreover, its expenditure has remained above 12 per cent of agricultural GDP since 1980, reaching the highest point in 1990 when nearly 14 per cent of the agricultural GDP was spent on agriculture. A comparison of India with China shows that while in 1975 both countries spent around 8 per cent of their agricultural GDP on agriculture sector, the pattern of spending diverged considerably for the two countries later on in the eighties and the nineties with public expenditure on agriculture rising in India while declining in China.

The levels of government expenditures on agriculture have been the lowest in Pakistan and Bangladesh throughout the eighties and the early nineties, with expenditures generally falling in Pakistan. In 1993, both Pakistan and Bangladesh spent only 3.6 and 3.2 per cent of their agricultural GDP on agriculture. In Nepal, public expenditure on agriculture has seen fluctuations with a high of 7.8 per cent in 1985 to a low of 2.7 per cent in 1990. Overall, it can be seen that the South Asian countries (with the exception of India and Sri Lanka) have spent a considerably smaller percentage of their agricultural GDP on their agricultural sectors as compared to other Asian countries like China, Malaysia and Thailand.

The agriculture sector has been given high priority in government spending in India and Nepal as can be seen from table 4.12, which shows government expenditure on agriculture as percentage of total government expenditures. Both these countries have consistently spent a relatively higher proportion on the agriculture sector than other countries in the region. In Pakistan, the proportion of government expenditure on agriculture has been the lowest in the region and has seen a declining trend during the eighties and the early nineties. In Bangladesh, the public sector expenditure on agriculture as a percentage of total public expenditure has varied throughout the eighties and the nineties—recording a high of 15.7 per cent in 1985 and a low of 5.4 per cent in 1990.

Table 4.12 Percentage of government expenditures in total govt. expenditures

	1975	1980	1985	1990
Bangladesh	12.3	15.7	5.4	6.9
India	14.6	12.6	11.5	9.6
Nepal	16.4	22	8.5	10.5
Pakistan	5.4	2.9	2.6	2.6
Sri Lanka	5.7	20	5.8	5.1

Note: Expenditures include those at both central and local government levels.
Source: Rosegrant & Hazell 2000.

Agricultural knowledge system

Research

Agricultural research and extension has been found to be the most important contributor to growth in total factor productivity (TFP) in South Asia. An investment of 100 billion rupees of investment in research and extension in India, for instance are estimated to increase growth in TFP by 6.98 per cent and reduce the incidence of rural poverty by 48 per cent[15]. Not only that, it has high economic rates of return particularly for India and Pakistan. Several studies have found economic rates of return to agricultural research that range from 40 to 100 per cent for India and 20 to 65 per cent in Pakistan.[16] Yet the South Asian governments continue to under invest in agricultural research and extension.

In 1993, India spent more than $ 1.6 billion on agricultural research, more than double the amount spent in 1980. The expenditure on agricultural research in India grew at an average annual rate of around 7 per cent during the 1980s, which slowed down to 1.8 per cent between 1990-93. In Pakistan, only $ 188 million were spent on agricultural research in 1993, the growth in agricultural expenditure being negative during the early part of the nineties. This compares unfavourably with Thailand—

a much smaller country which spent more than twice this amount on agricultural research in 1993. Agricultural research expenditures peaked in Bangladesh at $ 144 million in 1990, while in Sri Lanka only $ 35.5 million was spent on research.

India has one of the largest and institutionally well developed system of agricultural research in the world, where more than 10,000 scientists are engaged in different branches of agricultural sciences[17]. Agricultural research spending averaged about US $ 150 million (Rs. 5000 million) annually between 1989-92 at 1996 prices[18]. The Central Government provides 60 per cent of funds for agricultural research, the state governments about 20 per cent, private companies about 12 per cent and foreign donors the rest[19]. At the national level, the Indian Council of Agricultural Research (ICAR) is responsible for overlooking, coordinating and directing agricultural research and education in the country. The ICAR has 4 multi-disciplinary national institutes, 45 central research institutes, 30 national research centres, 4 bureaus, 10 project directorates, 84 All India Coordinated Research Projects/Networks and 16 other projects/programmes[20]. The ICAR is funded mainly through lump sum grants from the Central Government and proceeds of levy on certain export commodities. ICAR institutes conduct about 43 per cent of the research done in India; the state agricultural universities about 33 per cent; the private sector about 16 per cent and international centres about 8 per cent[21]. At the state level, the 28 state agricultural universities (SAUs) are also engaged in research spending about 45 per cent of their budgets on average on research[22], operating over 300 research stations across the country. In addition, general universities, scientific organisations, other government departments, private and voluntary organisations and scientific societies are involved in agricultural research in India.

In Pakistan, both the federal and provincial governments are involved in agricultural research. The Pakistan Agricultural Research Council (PARC) is the apex body for agricultural research in the country. It is an autonomous body working under the Ministry of Food, Agriculture and Livestock and has overall responsibility for coordinating agricultural research in the country. Besides the PARC, several other federal ministries and autonomous organisations are also engaged in agricultural research, while the share of private sector in agricultural research is still relatively small. At the provincial level, agricultural research is dispersed between many provincial departments including agriculture (crops), animal husbandry/livestock and fisheries[23].

The National Agricultural Research System (NARS) of Bangladesh is composed of 10 primary research organisations mandated to carry out research on crops, livestock, forests and fisheries. The Bangladesh Agricultural Research Institute (BARI) is the main planning and coordinating body of the agricultural research system. There are separate research institutes for conducting research on rice, jute, sugarcane, forests, livestock and fisheries. Besides the NARS institutes, the agricultural universities and some other universities are also involved in agricultural research.

In Nepal, the Nepal Agriculture Research Council (NARC) is the apex body for agricultural research in the country. NARC consists of 15 divisions with 14 commodity programmes, 41 regional agriculture stations and 18 agricultural stations[24]. In 1998 it had 350 researchers working on different projects across the country[25]. Other govt bodies/departments also conduct research in agriculture and related disciplines; the Forestry Survey and Research Department is responsible for research in forestry while the Jute Development Corporation and Tobacco Development Board focus their research on jute and tobacco, respectively.

In Sri Lanka, the Sri Lanka Council for Agricultural Research Policy (CARP) has been established to coordinate and direct agricultural research within the country. It formulates national agricultural research policy and priorities and reviews the performance of agricultural research projects and institutions from time to time. The Department of Agriculture is one of the major organisations conducting applied agricultural research in the country which consists of three divisions and has 3 institutes and 4 centers working under it[26]. In 1998 it had a total budget of Rs. 560 million of which around 54 per cent have been utilised for research and related activities[27].

Extension

Presently, in India the Training and Visit (T&V) system of extension as developed by the World Bank is in place at the state level. The T&V system emphasises single purpose professional extension workers, regular training of extension workers and transfer of technology through personal contact with farmers. This mode of extension has been formalised through the establishment of the National Agricultural Extension Project (NAEP). In 1987, more than 17,000 workers in 17 major states were involved in extension work throughout India[28]. The ICAR research institutes as well as the state agricultural universities are engaged in extension activities. The ICAR funds 48 national demonstrations, 152 operational research projects, 89 Krishi Vigyan Kendras (farm science centers) and 107 Lab to Land Projects[29]. The KVKs which now number around 260 'are aimed at providing need based, skill oriented vocational training for farmers, farm women and farm youth through different on campus and off campus training programs'[30].

Agricultural extension in Pakistan is a provincial subject with the provincial agricultural departments being responsible for carrying out extension work in their respective provinces. All provinces have separate directorates of agricultural extension working under the agriculture departments. Presently, two extension approaches are in use in Pakistan: the traditional approach to extension and the World Bank sponsored T&V system introduced in the 1980s. Initially, the T&V system was introduced to only five districts of the Punjab in 1978, but by 1988 it had expanded to the whole province[31].

In Bangladesh, the Department of Agricultural Extension is the main government agency responsible for providing extension services to farmers. The Department includes eight wings; four of which provide technical support to extension staff in issues related to water management and agricultural engineering, food crops, cash crops and plant protection[32]. The Training and Visit (T&V) approach to extension is currently in use in the country and the Department of Agricultural Extension has developed the Revised Extension Approach (REA) to increase the efficiency of the extension system. Linkage between research and extension is provided by the National Agricultural Technical Coordination Committee (NATCC) and the Agricultural Technical Committee; both these committees meet at least four times a year to ensure close working relationship between research and extension and to review the technical contents of extension plans[33]. The Department of Livestock Services (DLS) is responsible for carrying out extension services in the livestock sector while the Department of fisheries provides extension services on aquaculture.

In Nepal, the Department of Agriculture is responsible for undertaking extension activities related to agriculture. In the livestock sector which is an important component of the agricultural GDP of Nepal, the Dairy Development Corporation and Nepal Food Corporation are the two major public sector institutions involved in livestock development and extension services. New technologies in the livestock sector are

transferred through District Livestock Development and Services Office, which has 999 service centers working under it[34]. Besides these there are about 5000 NGOs working on different aspects of agricultural development which are also involved in extension work[35]. The T&V approach to extension had been adopted since 1975 to overcome the shortcomings of the traditional system, which however has not been very successful to date.

In Sri Lanka, the Department of Agriculture (DOA) under the national Ministry of Agriculture and Lands and the provincial DOAs are responsible for providing extension services in the food crop sector. The Agricultural Extension and Adaptive Research Project (AEARP) funded by the World Bank brought about a significant expansion in the extension services and introduced the Training and Visit (T&V) extension system[36]. The T&V system has been instrumental in establishing research and extension linkages with systematic scheduling of farm visits and proper monitoring of the extension staff and their activities. There are 6 In Service Training Institutes (ISTIs) which conduct a variety of training programmes for the extension workers while there are 22 District Agricultural Training Centers (DATCs) operated by both the Central and provincial DOAs that provide vocational training to farmers[37]. For the livestock sector, extension services are provided by the provincial Department of Animal Production and Health (DAPH).

Agricultural education

In India, at present, there is no provision for agricultural education at the secondary level of schooling although the Central and state governments have been contemplating the introduction of agriculture in the curriculum at the 10+2 level. In India, presently agricultural education is imparted through a network of 28 state agricultural universities (SAUs) and one Central Agricultural University. Besides these there are 4 ICAR (Indian Council of Agricultural Research) institutes with university status. Under these universities, there are 172 constituent colleges where each year 15,300 students are annually admitted for undergraduate, masters and doctoral programs[38]. The state agricultural universities offer education from undergraduate to doctoral level not only in agriculture but also in veterinary and animal sciences, dairy science and technology, fisheries, horticulture. On average, 9,500 students are admitted annually into India's agricultural universities[39].

In Pakistan, agricultural education is a provincial subject with education in agriculture being provided by 4 agricultural universities functioning at the provincial level. These include; the University of Agriculture at Faisalabad (UAF), the NWFP Agricultural University at Peshawar, the Sindh Agricultural University (SAU) at Tandojam and the University of Arid Agriculture at Rawalpindi, which has recently been upgraded to university status. However, all universities (including those for agriculture and related subjects) are provided financial support by the federal government. The four agricultural universities offer bachelors, masters and doctoral programmes in a variety of disciplines. Besides these four agricultural universities, there are several agricultural colleges, which are engaged in providing agricultural education[40]. In addition, there are five agricultural training institutes in Punjab, two in Sindh, two in the Frontier province and one in Balochistan responsible for training field and livestock assistants.

In Bangladesh, agricultural education is incorporated into general education from the primary level of schooling. At the secondary level, agricultural education had been a compulsory subject for male students although it has now been made an optional subject. Higher agricultural education is completely controlled by the Central Government in Bangladesh with local governments having no control over

A comparison of land and labour productivity shows that growth in labour productivity lagged behind growth in land productivity

any college or university. The Bangladesh Agricultural University is the main agricultural education institution in the country. In 1999, it had an enrolment of 4686 students and a teaching staff of 390[41]. Besides there are 2 other agricultural universities and 3 agricultural colleges.

In Sri Lanka, agricultural education is confined only to the senior secondary level as a technological subject. After senior secondary level, further opportunities in agricultural education are provided through one year certificate courses and two year national diploma courses in agriculture and animal husbandry offered by 13 agricultural colleges including 6 institutions. Higher education in agriculture in the country is provided by 7 faculties of agriculture and one faculty of veterinary science at 7 universities which have a combined enrolment of 1500 students[42]. There is also a Post Graduate Institute of Agriculture (PGIA) in addition to these faculties which offers programmes at the M.Sc, M.Phil and Ph.D levels.

Agricultural education in Nepal is the sole responsibility of the Institute of Agriculture and Animal Science (IAAS), which is the only institution of higher education in agriculture in the kingdom. The IAAS functions under the Tribhuvan University offering courses in various disciplines of agriculture at the Bachelors and Masters level. Forestry education is provided by the Institute of Forestry which is also a part of the Tribhuvan University.

Conclusion

This chapter provides an analysis the performance of the agricultural sector in South Asia in the eighties and the nineties. There has been a decline in the contribution of agriculture in all the economies of the region during this period. Overall, the growth in agricultural GDP has been comparatively higher in the eighties than the nineties for most countries of the region with the exception of Bangladesh and Sri Lanka. Agriculture continued to be one of the major sources of employment in South Asia although the percentage of labour employed in agriculture has seen a decline throughout the region. However, in Nepal the proportion of labour employed in agriculture actually increased during 1980-1999 where by the end of the nineties nearly 97 per cent of the total labour force was engaged in agriculture.

Trends in agricultural input growth reveal that agricultural labour grew at a much faster pace than agricultural land during this period. Consequently, the land to labour ratios declined in all countries of the region. A comparison of land and labour productivity shows that growth in labour productivity lagged behind growth in land productivity. The decline in cultivable land has led the South Asian countries to adopt land saving techniques and increased cropping intensity.

The growth of output in the region has been due to greater adoption of chemical fertilisers and mechanisation of agriculture although use of tractors in South Asia is still far behind other Asian countries. Fertiliser application rates on the other hand have seen higher rates of growth between 1980-1999. The growth in irrigation facilities has been modest during the eighties and the nineties. However, Pakistan had a phenomenal 82 per cent of its cultivated area under irrigation by the end of the nineties, while the other countries had only 30-50 per cent of their cultivated areas covered by irrigation.

The agricultural knowledge system consisting of agricultural research, extension and education has an important role to play in increasing agricultural productivity in South Asia in the coming years as agricultural land shrinks. India and Pakistan possess well developed National Agricultural Research Systems (NARS) which are essential for introducing new inputs and technologies which can result in increased yield levels.

The other countries of the region are also in the process of developing effective NARS but are facing financial constraints. Agricultural education systems in South Asia are also in need of reform to improve their performance and to provide an improved linkage with extension services to assist farmers in improving their farming methods and increasing their production efficiency.

Chapter 5

Rural Development in South Asia[1]

The multiplicity of the objectives which rural development was expected to achieve often deprived it of a central focus

Over half a century of independent existence, South Asian states have given varying degrees of attention and priority to rural development. The motivations and objectives of public policies have varied over time and among countries due to a complex combination of political, economic and social factors as well as opportunities for development provided by foreign assistance and global economic trends.[2] Nevertheless, there have been some common elements in the rural development policies of South Asian countries because of the similarities in their social and cultural milieu and a shared legacy of their colonial past which included institutions of governance and an agrarian structure suited to the needs of the empire.

Objectives of rural development

The objectives of rural development followed and implemented by various governments have also been influenced by the overall plans for development and the performance of the economy. In particular, they have been conditioned by the international economic environment, especially for foreign assistance. Although rural development has been a priority area for external donors, its importance has increased in the second half of the last 50 years as concerns about food security, population explosion, environment and climatic changes, as well as poverty, equality and social justice, came to be increasingly perceived as part of global, rather than national, policy agendas. Rural development stood at the crosscutting path of these concerns. However, the multiplicity of the objectives which rural development was expected to achieve often deprived it of a central focus and often contributed to its failure.

The South Asian countries have, in recent years, tried to achieve some combination of the following major objectives, whose importance has differed both over time and among countries.

Raising agricultural productivity

This has been—and to a large extent continues to be—the primary objective of and the principal motivation for most rural development programs, which were undertaken in the wake of rising population pressure on the land and the need for transferring resources for non-agricultural pursuits. Before the advent of the Green Revolution in the 1960s, most South Asian countries faced chronic problems of food shortage, in some cases famine, and had to import substantial amounts of food grains.

However, it needs to be recognised that while raising agricultural productivity is an essential goal, it is a means for achieving larger development goals, such as increased welfare and alleviation of poverty of the masses. While increased agricultural productivity may ensure abundance of food availability for a given population, it may well not provide adequate nutritional food intake for the majority of the population or, much more importantly, it may not provide sufficient access to those who need food, despite large surpluses of food grains. This paradox is evident in India, where as a result of the government's successful drive to raise food production, reserves of about 70 million tonnes of wheat and rice lie in government godowns while over 200 million children, women and men are chronically undernourished.[3]

Also, as pointed out by Rao in the context of India, food grain security, though essential, cannot be equated with

food security.[4] The share of consumer expenditure on cereals now accounts for a little less than 40 per cent of the total consumer expenditure on food in the country, the remaining 60 per cent being incurred on items such as edible oils, sugar, milk, eggs, meat, fish, vegetables and fruits. Even for the poor these non-food grain items account for as much as half the total expenditure on food but in order to bring the intake of these items to adequate levels their consumption by the poor has to increase at least three-fold. The demand for these items of food will, therefore, rise at a higher rate due to population growth as well as the rise in per capita income. The goal of food security, therefore (as discussed in chapter 6), goes far beyond attaining self-sufficiency in food grains, and should aim at attaining physical as well as economic access to a balanced food basket, especially for the poor. However, achieving economic access to non-food grain items would require a much stronger effort to raise the purchasing power of the poor than ensuring the necessary supplies.

There is an urgent need for diversification of South Asian agriculture from its current focus on food grain and cash crop production into the production of non-cereal products, which will also serve to raise employment and increase the purchasing power of the poor. This is because the potential for employment generation in dairy and horticulture, is much greater than in cereals. These activities also have the potential for greater human development which would, in turn, result in higher wage rates and provide the necessary purchasing power for both food grains and non food grain consumption of the poor.

The objective of raising agricultural productivity in the context of rural development programs is often discussed without any reference to the agrarian structure prevailing in a country. However, there seems to be a persistent bias in such programs in favour of the larger farmers. As pointed out by Banerjee, few historical phenomena share this remarkable tendency in the history of agrarian relations. 'The state, it appears, has intervened always and everywhere in the markets for land, agricultural labour and other inputs into and outputs from agriculture to make life easier for larger farmers'.[5]

Such a bias could be defended as a means of achieving food security, if it could be demonstrated that large farmers were in fact more efficient than small farmers. On the contrary, however, there exists a large body of evidence to show that small farms in developing countries, including South Asia, tend to be more productive than larger farms.[6] The logic of the argument about the higher productivity of smaller farms is quite simple, and is based on the higher costs of supervision of hired labour in larger farms, and the relative scarcity of land in relation to the availability of family labour virtually at zero opportunity cost.[7] The smaller farms are also able to grow additional crops and engage in subsidiary activities to supplement their incomes and for the survival of their family while the larger farms concentrate on only one major crop.[8]

There seems to be a persistent bias in rural development programmes in favour of larger farmers

Alleviating poverty and providing employment opportunities to landless labour

At the beginning of the 21st century, there is general agreement, at the global as well as national level, that poverty is unacceptable as part of the human condition. The global family has come to recognise that the coexistence of pervasive poverty, with the affluence of a much smaller segment of the population, is ethically unacceptable, economically inefficient and politically unsustainable. Most developing countries also put poverty alleviation as their primary development goal, at least on paper.[9]

The various global commitments to eradicate poverty have been endorsed, first at the Social Summit in Copenhagen in 1995 and then at the Millennium Summit, convened by the United Nations

There are very few programmes of rural development which live up to the motto of being of the poor, by the poor or for the poor

in New York in September 2000, where the international community committed itself to halve extreme poverty by 2015. Such commitments to alleviate poverty are not new and have been reiterated in various forms for at least a quarter of a century.

However, until recently, poverty alleviation was not part of a broader agenda for development and viewed as a by product of rapid growth. But now, poverty has been priortised as the primary objective of the global development agencies and many governments. The development agencies, in particular, appear quite categorical in defining poverty reduction as the immediate priority of their various aid programmes.

For South Asia, which is home to about 40 per cent of the worlds absolute poor, 515 million out of 1.2 billion,[10] this is undoubtedly an overarching objective for rural development programs, especially since the bulk of poverty is in the rural areas. However, until recently rural development programmes did not pay much direct attention to the task of poverty alleviation. Most of the programmes, which were run by the government adopted a top-down approach.

Promoting a suitable social environment—democratic, egalitarian and participatory—for the uplift of the rural community

Among the most fundamental changes in the evolution of rural development programmes is the continuing debate about the need for a change in their ethos and the way the protagonists of these programmes (who are often outsiders) relate to their beneficiaries. Most of the earlier programmes were either paternalistic in nature or were run by bureaucrats, and their fruits accrued largely to elite groups. There are still very few programmes of rural development which live up to the motto of being of the poor, by the poor or for the poor. The induction of the NGOs in poverty alleviation and rural development programmes has to some extent brought them closer to the ideal, but the empowerment of the poor is still much more a rhetoric than reality in the South Asian context.[11]

In order to empower rural communities, the rural development programmes along with the governments and institutions of civil society need to focus on a number of interrelated areas, particularly on human development.[12] Most South Asian countries have already committed to goals such as education or health for all, which should remain on every agenda. What is needed is not only the speeding up of the implementation of these goals, but also of moving beyond them in the direction of ensuring some affirmative action in favour of the poor. The priority should be to move towards substantially enhancing investment for the purpose of upgrading the quality and governance of rural schools and health care facilities to a level where the rural poor do not feel disadvantaged compared to the urban middle class.

Such a goal carries formidable implications as to costs and governance and may need some deployment of resources from non-priority projects. The resultant effect of such a process of quality enhancement efforts could enable the younger generation of poor households to compete on the basis of equality with the children of the elite for places in the university and in employment. This would transform the competition between the children from poor and elite households into a more level playing field and would have 'an empowering effect' on the poor to demand more rapid democratisation of opportunities.

Providing access to basic facilities, including credit, housing and sanitation and the management of the rural commons

A common critique of most rural development programs is that they fail to cater to the needs of the more vulnerable groups such as the women, landless, minority and other deprived groups of South Asia. To reach and include them

requires a deeper understanding of poverty and its underlying causes; an emphasis on building critical human, social, and physical assets; and more effective delivery of basic services. For example, despite improvements, access to education and health care remain, along with other social indicators, below desired levels especially in rural areas and among women and female children. Such poor delivery of basic services works to limit progress in human development.

These imbalances can be reduced by interventions through rural development programmes that focus on increasing the access of the poor and vulnerable groups to essential services that are presently available only to the privileged and elite groups. In order to respond effectively to the needs of these vulnerable sections of the population, rural development programmes must have the following features:

(i) the adoption of decentralised, participatory and beneficiary-driven approaches designed to improve the delivery of such rural services as drinking water and rural sanitation, irrigation, extension, micro-credit, education and health to the poorest sections of the population;

(ii) community management for the sustainable use of natural resources, such as joint forest management and watershed management programs;

(iii) fiscal and administrative decentralisation to local governments for enabling them to undertake the programs identified above;

(iv) measures to improve governance and social inclusiveness of public sector institutions across income, gender and ethnic groups.

(v) measures to reduce the vulnerability and risks faced by the rural poor and measures to help them recover from natural catastrophes such as floods, droughts and hurricanes (e.g. disaster and coastal management) and to improve the effectiveness of existing government safety nets (e.g. food and rural employment.)

These measures will require the combined efforts of the government (at the national, sub-national and local levels) as well as foreign and private donors and non governmental organisations.

Bridging the rural-urban gap in incomes and economic opportunities, including technology and access to human development

Rural-urban disparities have been an endemic problem of most developing countries and a major source of the continuing increase in their urban population. Although the main reason for the rural-urban population drift is the push of rural unemployment and underemployment, a contributing factor is also the lure of greater access to amenities of life which is in inverse proportion to the distance from urban metropolitan centers.

The disparity in the social indicators between rural and urban areas is widespread in South Asia. Literacy rates are lower in rural compared to urban areas and among women compared to men. In India, the adult literacy rate in rural areas (49.4 per cent) in 1997 is significantly below those in urban areas (80.4 per cent), with rural female literacy rates (34 per cent) only about half of rural male literary rates. Although infant and child mortality and malnutrition rates have improved considerably, the bias against rural areas means that other regions have made stronger progress in health. A major objective of the rural development programs should be to overcome the education, health and other services gap between urban and rural areas.

Enhancing the role of technology as a means of raising productivity

Facing increasing scarcity of land that can be cultivated, South Asia must apply technological innovations to improve efficiency and sustain productivity growth. If the region's population almost doubles, as projected, from 1.4 billion in 2000 to 2.2 billion in 2045, the challenge

South Asia must apply technological innovations to improve efficiency and sustain productivity growth

Box 5.1 The rural-urban divide

The rural-urban divide is not a discrete attribute but is a continuum, ranging from the urban suburb or periphery to the most isolated or distant rural communities. The rural development programs need to fine tune themselves to take account of the specificity of the problems that are faced by communities lying between the two ends of the rural-urban spectrum. At least four major divisions of this spread with their own distinctive rural strategies can be distinguished.[13]

i. Peri-urban areas: The main issues arising in the urban periphery are not dissimilar to those in urban squatter settlements: creation of jobs in industrial and service sectors in neighbouring urban center, provision of adequate transport facilities and housing. Many of these areas have been reduced to dormitories of adult residents who commute daily on bicycles or animal-driven vehicles to the urban center. To the extent there still exists some scope for farming in these areas, the rural development programs can help promote micro-scale, high-value-added farming, such as producing vegetables and dairy products which would provide fresh produce, create jobs and avoid pollution. There also exists considerable scope for rural industrialization in these areas which could take advantage of backward linkage with agriculture and forward linkage with urban industry. For this there will be need for credit and new credit institutions which could provide venture capital for the establishment of small-scale industries and services to enterprising individuals or groups.

ii. Accessible rural areas with good natural resources: These areas are good candidates for agricultural development with the help of market incentives and institutional development. They have potential for higher absorption of both labour and capital and of producing market surpluses. With investment in human development and technology, these areas could become highly productive and their products could compete in world markets. These areas could provide employment to people of other less well-endowed areas, especially during seasonal peaks.

iii. Accessible rural areas with poor natural resources: The possibilities of productive employment are likely to be low in these areas and migration may be the only alternative to most people. However, possibilities of livestock farming could be considerable and may provide opportunities for employment in the dairying and related activities, along with handicrafts for women. The main handicap is likely to be access to water and capital investment in tubewells and small irrigation projects are likely to yield beneficial results, as land itself is unlikely to be scarce. Since these areas are not remote it may not be difficult to access services from government and non-government organizations engaged in rural development activities. In particular, they could receive the services of teachers and health workers for training people and providing basic education.

iv. Remote or isolated rural areas: These are the most difficult areas to deal with as the costs of construction of infrastructure to reduce their remoteness is generally high. Nonetheless, measures to improve their productivity and incomes can be undertaken by subsidizing certain economic activities such as poultry farming and livestock. They could also be assisted in launching public works programs to help build the needed infrastructure. Some remote areas have the advantage of being yet unspoilt by excessive human habitation and still preserve their pristine beauty. They could become attractive destinations for eco-tourism. Inhabitants of the area could be encouraged to preserve and protect wildlife and biodiversity and to guard against poaching by illegal hunters and fortune seekers.

of keeping agricultural growth rates at par with population growth will require putting available technology to better use and, through energetic research, developing new and more efficient growing methods. The average rate of agricultural growth per annum during the period 1990-98 was 1.5 per cent in Sri Lanka, about 2 per cent in Nepal and Bangladesh, 3.8 per cent in India and 4.5 per cent in Pakistan. This pace is particularly worrying as there are indications that the rate of growth of total factor productivity is slowing down in many areas.

While the benefits of the Green Revolution are generally recognised to be scale-neutral and did benefit the poor in South Asia to a considerable extent, the gains from technological innovation remain unequally distributed between those with access to land, water and inputs, and those without. There is broad consensus that the main causes of rural poverty lie in low rates of agricultural growth and factor productivity and that the key to raising productivity in agriculture lies largely in measures to broaden access to land and complementary inputs, along with a more favourable policy environment towards agriculture.[14] More equitable distribution of operational land holdings would create more equitable patterns of demand, which in turn would enhance growth in the rural non-farm sector and remove some of the

biases in credit, marketing and research institutions that arise from the unequal distribution of assets and power.[15] This is supported by recent evidence which suggests that countries with more equal land distribution experience higher rates of economic growth.[16]

The knowledge and information revolution is now being brought within the reach of the remotest areas by advances in telecommunications and information technology, and this revolution needs to be harnessed also for the rural poor. Formidable opportunities are being opened up in the area of distance learning and medical facilities, for urban standards of education, medical diagnosis and prescription for delivery to the most remote villages. Here major investments to build the infrastructure to take the IT revolution to villages remains a major goal of public and global development policy. It also provides an opportunity for collaborative arrangements between public and private sector, as well as the NGOs. The example of Grameenphone in Bangladesh enabling poor rural women to be brought into the communications revolution, as both providers as well as users of IT services, needs to be emulated elsewhere in South Asia.

A survey of rural development programmes in South Asia

It is difficult to categorise the various rural development initiatives undertaken in the South Asian region over the last half century, as they have differed in terms of their approaches, objectives, motivating impulses, impacts, *modus operandi* and several other parameters. However, two broad periods in the evolution of two distinct paradigms of rural development can be identified: the first from 1950-75 and the second from 1985 to the present. While the first generation programmes had a definite focus on community development, the second generation programmes have a much diverse agenda, such as the empowerment of the poor, especially women and other vulnerable groups, the protection of the environment and natural resources, and enhancement of the capabilities of the poor through greater access to education, health and credit.

The intervening decade between the two broad periods can be considered to be a period of flux during which the new paradigm—though never unambiguously defined or discernible—was taking shape. The inadequacies and failures of the first generation rural development programmes helped not only formulate the ideas and the agendas for the new generation of programmes but also helped provide experienced cadres who became the leaders and activists of the next generation.

Inadequacies and failures of the first generation rural development programmes helped provide experienced cadres became the leaders and activists of the next generation

The evolution of rural development programmes: 1950-75

Concern for the poor and the neglected conditions of the countryside had often aroused benevolent and public-spirited civil servants, affluent individuals and social workers even in the pre-independence days to launch schemes which would bring about a rural renaissance. These consisted of attempts to improve not only the economic well-being, but also the socio-economic conditions, including agriculture, education, health and sanitation, as well as the enrichment of their culture. But these efforts, though well-intentioned and often beneficial, were generally sporadic and did not have a lasting impact, although they continue to be reincarnated. In the first quarter century after the independence, the focus of these programmes, which were generally administered by a centralised bureaucracy, with some degree of local participation, was focused on community development and its variants. Among these, the most prominent were:

1. Community Development Programmes (CDP)
2. Integrated Rural Development Programmes (IRDP)

3. Infrastructure Development Programmes (IDP)

1. Community development programmes

After achieving independence, the national governments in South Asia launched more systematic rural development programmes, for the benefit of their rural constituency, often with substantial foreign assistance. The success of the communist-led peasant revolution in China just over two years after the independence of India and Pakistan led the western Governments to see rural development programmes as an effective way of combating the danger of communism in South Asia. The peasants' struggle in South India and Bengal also was seen as posing a threat to both Indian and Pakistani governments. The United States government and some private foundations sponsored the idea of village level rural development which was embraced enthusiastically by both India and Pakistan.

All of the 'Social development' projects stayed at the bottom of the ranking in terms of coverage

The community development programmes were largely concentrated in the three major countries of the Indian subcontinent. Other countries, including Nepal and Sri Lanka were preoccupied with other nation-building activities and major infrastructure projects to pay much attention to rural development activities during the 1950s and 1960s. In Nepal, for instance, it was not until the Fifth Plan in 1975 that 'physical infrastructure was de-emphasised for the first time, with the agricultural and social sectors receiving the first and second priority'. Similarly, in Sri Lanka, the major funding in development plans was allocated to such capital-intensive projects as the Mahaveli river basin project, the Million Houses programme and the Free Trade Zone development programme. Rural development programmes served the role of 'consolation prizes' and were located in areas not served by these mega projects.[17]

India: India inherited a rich legacy of experimentation with rural development programmes, which drew inspiration not only from the Gandhian vision of a rural commune, but also from various philanthropic and missionary movements from the US and UK. However, it was Nehru's centralized planning policies which not only established the community as a 'site for the privileged agency of the rural poor', but also provided the full backing (including domestic and foreign funding) of the Community Development Programmes, which was launched in 1952 on the fourth anniversary of Gandhi's death.[18]

The CDPs aimed explicitly to increase access to education, health, housing and social welfare as a means of institutionalising the legitimacy and acceptance of the developmental state in the rural areas, but the most pressing objective of the programme was to increase agricultural production. To that end, project units were located near irrigation facilities or in areas of assured rainfall. The main focus was on "the adoption of improved agricultural practices, which had been undertaken in 95 per cent of the villages. Cottage industries, which were the main vehicle of employment and income generation for the poor were undertaken in only 17.5 per cent of the project villages. All of the 'social development' projects stayed at the bottom of the ranking in terms of coverage, as did co-operatives and primary education and adult literacy programs.[19]

The orientation of the CDPs gradually moved further away from a multi-faceted programme touching all aspects of rural life to one focused on increasing agricultural production. The CDPs had in effect become agencies for providing agricultural extension services and their main objective was redefined as 'achieving the targets of agricultural production, on the basis of the widest possible participation by local communities'.[20] This change in emphasis led to a reorganisation of the CDP in which the number of village level workers was halved and the number of villages under their charge

doubled. Funding of the programme was greatly reduced because of budgetary constraints. These measures further eroded the programme's ability to address the problems of poverty and social development and increased the leakage of its benefits to the rich farmers.

Bangladesh and Pakistan: The flagship of community development in Pakistan (which then included areas that are now in Bangladesh), Village-Aid Programme, lasted for a decade (1952-61). The programme reached its zenith during October 1955 to October 1958, becoming the showpiece of Pakistan's rural development efforts. The success of the programme, however, provoked jealousy and sometimes outright hostility from two major sections of the bureaucracy, viz. the local administration, traditionally the source of all power and prestige in rural areas and the line departments which were called upon to collaborate with the Programme.

After the take-over by the first military regime in 1958 and the establishment of Basic Democracies at the village level, the Programme lost favour with the government and lost its political utility for the new regime. As a result, the Village-Aid programme was wound up in 1961 and many of its functions were assigned to the Agricultural Development Corporation which itself was dissolved a decade later.[21]

The Village Aid Programme was by far the most extensive rural development programme undertaken in Pakistan. It cost approximately US$ 100 million, the bulk of which was spent on projects in East Pakistan (now Bangladesh) and the remainder was allocated to the central government and West Pakistan. Among the impressive achievements of the Village Aid Programme was its extensive coverage. The Programme covered 176 development areas covering a total of 24.64 million people. The Programme's physical achievements included the laying out of 150 thousand agricultural demonstration blocks, digging out of 1000 miles of canals, construction of 3000 miles of unmetalled roads and repair of 4000 miles of old roads. The Programme also assisted in the adaptation of improved farm practices in the development area. The village communities contributed Rs. 12 million, or about 6 per cent of total expenditure, for social sector development through self-help activities.[22]

2. Intergrated rural development programmes

A major critique of the community development programmes in South Asia was their inability to address the problems of those without land or those with small farms which were incapable of producing marketable surpluses. The community development programmes were designed mainly to improve the efficiency in agriculture and, therefore, focused on larger and middle farmers. The de facto exclusion of the landless and the marginal farmers from the ambit of benefits of the land-centred community development programmes gave rise to the need for programmes which would engage in a multiplicity of activities which affected the poor.

Community development programmes in South Asia were unable to address the problems of those without land or with small farms

The point of departure of the IRDPs was the recognition that with declining access to the land the rural poor derive a decreasing portion of their incomes from working on the farm which has to be made up from other activities. It was, therefore, essential to develop programmes which would result in the creation of non-farm activities and provide some opportunities for non-agricultural employment. Unlike, community development programmes, the IRDPs were not based on the assumed commonality of interest of the entire community, but were based on the pragmatic assessment of the needs of poor households in various situations.

While the detailed specifications of the IRDPs in different countries have differed a great deal, they have relied on three common elements:

i) some form of local participation in the identification of the needs of the

people and even in the planning of the projects to fulfill them;

ii) a multi-sectoral delivery system, including agricultural infrastructure and inputs, and access to credit, health, education and other social services; and

iii) an organisational mechanism ensuring the delivery of the services to the needy households.

Among the issues most prominent in the rural development programmes was the development of rural infrastructure

Almost all countries of the region experimented with the IRDP model with varying degree of success. In most countries the programmes have been run by the same centralised bureaucratic structure, such as the ministries of rural development and local self government, that supervised the community development programmes earlier. The required changes in style and attitudes, however, did not match the vocabulary and the jargon associated with the new programme. However, there were some successful models of IRDP, such as the Comilla model, established by its legendary pioneer, the late Akhtar Hameed Khan, in East Pakistan (now Bangladesh) in the 1960s which became a basis for a number of similar innovative experiments in South Asia, especially in Bangladesh and Pakistan.[23]

3. Infrastructure development programmes

Among the issues most prominent in the rural development programmes of the first quarter century of independence of most South Asian states was the development of rural infrastructure. It was considered as a pre-requisite for accelerated economic development of rural areas, especially of agriculture. In most South Asian countries, infrastructural facilities were generally weak and inadequate at the time of their independence. Since independence, although there has been considerable improvement in the availability of basic infrastructural services in the rural areas, such as roads, irrigation, electricity, transport and communications, many people, especially the rural poor, and those living in underdeveloped areas do not have access to even minimal infrastructure services.

India: In an attempt to fill critical infrastructural gaps and strengthen linkages and marketing facilities, the allocation under IRDP for the development of programme infrastructure was increased from 10 to 20 per cent in all States, and to 25 per cent in the north-eastern States.

Recognising the importance of rural roads to rural development, the Indian Fifth Five-year Plan included them as a part of the Minimum Needs Programme (MNP). The programme envisaged the connection, via all-weather roads, of those villages with a population of 1,500 and above. In hilly, tribal, desert and coastal areas, the objective was to connect a cluster of villages of matching populations. India has about 600,000 villages of various population sizes. The improvement of the economic conditions among the rural population, a high percentage of which is below the poverty line, hinges crucially on the provision of accessibility by means of such roads. In addition, the construction of rural roads is highly labour-intensive, generating gainful employment for millions of unemployed and underemployed rural people.

Pakistan and Bangladesh: (1962-72): After the disbandment of the Village Aid Programme, the Rural Works Programme was initiated in Pakistan with its primary focus on East Pakistan (now Bangladesh). It was initially started in Comilla as a small project but culminated as a major experiment in rural development under the charismatic leadership of the late Akhtar Hameed Khan. The choice of Comilla was particularly appropriate for undertaking self help projects of rural infrastructure such as the construction of protective walls, and tubewells, since Comilla was subject to flood in summer and water shortage in winter, allowing the growing of only one crop which was inadequate for subsistence. The close

association of the rural community with the staff of the Comilla Academy also provided the opportunity for mutually beneficial interaction between the staff of the Academy and the local farmers.

On the basis of the highly successful Comilla experiment, the Rural Works Programme was extended to West Pakistan during 1963-84. From 1963-68, the programme enjoyed the support of the President, but thereafter it suffered from the change in presidents and other adverse political developments. The Programme was organised under the auspices of the central ministry of Finance and Planning, with each provincial government being responsible for project organisation and execution. The programme was directed to undertake labour-intensive projects, create and improve rural infrastructure, and mobilise local resources, manpower and leadership.

Although the Rural Works Programme in West Pakistan was much less successful than in East Pakistan, it made an impressive contribution to the development of local infrastructure.

The Rural Works Programme was, however, largely motivated by the political considerations. It provided legitimacy to the military government by giving the impression of reducing inter-regional disparity between East and West Pakistan, through somewhat larger expenditures in East Pakistan. On the other hand, its programmes in West Pakistan were biased in favour of the elements providing political support to the regime. The strong emphasis on road construction through capital-intensive methods apparently benefited the large farmers producing marketable surplus and led to further increase in inequality of rural income.

Despite these limitations, the rural works programme did succeed in opening up vast areas of rural Pakistan to larger markets and linked the villages directly with the main stream of development activity. It also opened up opportunities for the rural poor to seek employment in neighbouring urban industrial centres. It also helped the raising of social consciousness and the spirit of self-help among rural community and in promoting a more egalitarian social structure through the formation of local level committees which encouraged popular participation and fostered confidence among the people in the successful completion of the project.

Pakistan: (1972-1983): With the separation of East Pakistan and the coming into power of Pakistan Peoples Party (PPP) in West Pakistan, the role of the Rural Works Programme had to be transformed to take into account the changed political situation. However, in terms of formal structure, there was very little change except that the programme was renamed as the Peoples Works Program and placed under the Federal Ministry of Finance and Planning.

The projects under the Peoples Works Programme covered road construction, school buildings, small irrigation dams, drinking water facilities, dispensaries, industrial schools for women, tree planting, adult education centres, and cottage industries, etc. The emphasis was on the provision of physical infrastructure without organising a machinery for their proper utilisation through active participation of the community. The hardware/software linkage was missing as in the case of Rural Works Programme and Village-Aid Programme.

As a result, the Programme was riddled with irregularities in the collection of projects, determination of priorities and locations by politically influential people with little regard over the needs of the community, overwhelming reliance on contractors rather than on project committees, and preference for large projects as well as widespread corruption and misuse of public funds. The impact of the Peoples Works Programme on the alleviation of poverty and in addressing the problems of the poor was minimum.

The impact of Peoples Works Programme on the alleviation of poverty and in addressing the problems of the poor was minimum

New generation of rural development programmes

In the wake of the disenchantment with the state-led rural development programmes, there was a quest for alternative paradigms of rural development in the 1980s. It was becoming obvious that in order to be really effective, these programs had to find out what the needs of the rural poor were in different localities. This could not be done by officials sitting in the federal or provincial capital and making an occasional tour of selected rural areas. It required a high degree of commitment to understand the problems and identify the needs of the people in a particular area, not to speak of mobilising them around a particular problem. Fortunately, in South Asia, there has been no dearth of people, mainly from the educated middle classes, to come forward and live with and learn from the rural poor and give them hope for improving their lot.

While most of the new generation rural development programmes have been launched by NGOs, there has also been a change in the focus of government-led programmes

Many of the new initiatives in rural development in the post-1980 period were undertaken by similar individuals or groups who perceived the opportunity of mobilising the poor and marginal households to engage in programmes largely through their own efforts, with the catalytic help of well-conceived and persistent efforts of outsiders, whether individual experts or social mobilisers, government agencies, universities, NGOs or donor agencies. Generally, these programmes were started at a relatively modest scale in a small locality or village, but were later expanded to cover larger geographical units, often to the entire country and in some cases were replicated in other countries, with help and assistance from the originating unit.

Prominent among these programmes are the Grameen Bank and BRAC in Bangladesh, AKRSP and NRSP in Pakistan, Amul Dairy, SEWA and the Paricipatory Watershed Movement in (Rajasthan) India, SANASA and Gal Oya Irrigation Project in Sri Lanka.[24] Nepal, Bhutan and Maldives have also several examples.

The distinguishing common features of these new generation programmes which set them apart from the earlier programmes are:

a) Their participatory approach;
b) Social mobilisation;
c) The unpromising initial project area in terms of location, economic opportunities and high incidence of poverty;
d) Minimal role of foreign assistance;
e) Galvanising role of the initiator/ charismatic leader, supplemented by a process of institution building;
f) Diversified activities, though initially sectoral.

An important reason for the success of these programmes is the identification and choice of their thematic content, which pertains to a specific household or social need, which was not adequately addressed in the previous RDPs. Thus, for example, Grameen Bank was based on the need for providing microcredit to the rural poor, especially women, as a means of emancipating rural women and liberating their households from poverty. BRAC's focus was on providing education and training in the rural areas. AKRSP focused on rural infrastructure in the remote hilly areas of Northern Pakistan. Amul was set up to solve the marketing problems of small livestock owners in Bombay. SEWA responded to the needs of self-employed women in Ahmedabad and neighbouring areas. The Rajasthan Watershed Movement in India and the Gal Oya irrigation project in Sri Lanka responded to the needs of small farmers in rain-fed areas.

While most of the new generation rural development programmes have been launched by NGOs, there has also been a change in the focus of government-led programmes. Realising the need for providing employment and credit to the vulnerable groups in rural areas, two new genres of government-led rural development programmes, viz., public works and microcredit programmes have been

launched in recent years. Both programmes are aimed at increasing income and employment of the poor—the first focused on wage employment and the second on providing avenues for self-employment.

(a) Rural public work programmes

In recent years, public works programmes have been used to provide wage employment opportunities for the poor. These programmes have been used to deal with situations (such as famine and drought) marked by widespread but transitory unemployment in rural areas. South Asian countries with large populations, high rates of unemployment and poverty, such as India, Bangladesh and Pakistan, have included employment creation through rural public works (RPWs) at the core of their anti-poverty strategy. RPWs also play a significant role in reducing the poverty of the landless who are forced to rely on agricultural employment with long seasonal spells of inactivity. In contrast to other anti-poverty interventions whose benefits are often captured by the non-poor, RPWs have the advantage of being self-targeting since they usually involve hard physical labour.[25] A more relevant rationale for RPWs can be found in the fact that they may be effective in equalising geographical disparity, by creating infrastructural assets in the particularly disadvantaged areas.

RPWs have become important in alleviating poverty in a number of South Asian countries, though none are as significant as the huge programmes in India, such as the Employment Guarantee Scheme in Maharashtra State, and its somewhat diluted version at the national level, the Employment Assurance Scheme.

(b) Micro-credit programmes

The access to credit by the poor in South Asia has been recognised as one of the main causes of rural poverty. Since formal credit institutions require tangible assets, such as land, as collateral for receiving loans, the only access to credit for the poor is the informal sector. To augment the supply of funds at affordable rates to the poor, group-based lending programmes have recently become popular in South Asia and have taken a quantum leap since the success of the Grameen Bank in Bangladesh. These programmes seek to provide credit and other services to poor people who lack access to formal credit institutions.

In the context of rural development, their role has been mainly to alleviate poverty at the household level, rather than development of community infrastructure or to improve the access to public services. Micro-credit programmes typically enable the poor to acquire income-generating assets by providing access to credit, marketing and other inputs. Many rural development programmes have tried to dovetail micro-credit programs with their other activities as an incentive to members of the village community to participate in collective programmes for rural development. Most micro-credit programmes also require the borrowers to deposit a small sum of money regularly in order to become eligible to a loan.[26]

Bangladesh, which inspired the micro-credit revolution in South Asia with the establishment of the Grameen Bank under the pioneering leadership of Mohammed Yunus, has two other micro-credit programmes: the Bangladesh Rural Advancement Committee (BRAC), and the Bangladesh Rural Development Board's Rural Development Programme, which engage in a variety of other developmental activities. A UN study (UNDP/UNOPS/APDC 1996) on the outreach of 39 microfinance institutions programmes in 12 countries of Asia found that they covered a total of 5.1 million households. Of this, about 4.5 million households were in Bangladesh, and only 0.6 million households in the rest of the region.

The access to credit by the poor in South Asia has been recognised as one of the main causes of rural poverty

A common feature of the inadequacy of the rural development efforts is the low level and inappropriate composition of public outlays for rural development

The area where micro-credit has made the greatest impact in rural Bangladesh is on the empowerment of women. Through the provision of credit and income generating programmes many poor women have improved their economic situation, and in several cases taken on work traditionally regarded as men's work.

In Pakistan, micro-finance offers considerable promise, yet at present, the existing programmes are unable to cover a vast majority of the poor. Less than 5 per cent of the credit needs of the rural poor are estimated to be met by micro-credit programs. The main impetus to micro-finance has so far come from the NGOs, primarily the rural support programmes. In view of the heightened demand for micro-credit in poor communities, the government and donors have realised the need for ensuring the supply of sufficient funds on a sustainable and institutionalised basis. Recently, two major on-lending institutions have been set up, distanced from the governmental bureaucracy through the involvement of the NGOs and the private sector. The first a Micro-finance Bank (MFB), called Khushali Bank, has already been established under joint ownership of three public sector, 11 private sector and 2 international banks and with the structural integration and partnership of the National Rural Support Programme (NRSP), the largest NGO in Pakistan with extensive experience in social mobilisation as well as micro-finance.

The second umbrella institution, created with the funding from the World Bank, the Pakistan Poverty Alleviation Fund (PPAF), has adopted the method of wholesaling credit through selected NGOs. Both the institutions will deliver services through NGOs using their core competency in social mobilisation.

In India, institutional credit has been the major source for providing access to small and marginal farmers and other weaker sections, to enable them to adopt modern technology and improved agricultural practices. Loans are disbursed through a multi-agency network comprising commercial banks, regional rural banks and cooperatives. Although there has been an overall increase in agricultural credit, there remains a grave problem concerning overdue payments which has inhibited credit expansion and the economic viability of the lending institutions, especially cooperatives and rural banks.

The National Bank for Agriculture and Rural Development (NABARD) in India pioneered the concept of Self-Help Group (SHG) bank linkage programme way back in 1992 with the active policy support from the Reserve Bank of India. Over 30,000 SHGs covering about 0.5 million rural households have been linked with the banking system in different parts of the country. The programme is doing well with almost 100 per cent repayment of loans by the SHGs to the banks.

Normally, a Self-help Group (SHG) gets established in response to a perceived need, besides being centered around specific productive activities. SHGs provide the peer pressure in order to ensure that credit is utilised for the purpose for which it has been taken and is repaid according to schedule. The repayment performance of members of such groups has been found to be overwhelmingly satisfactory, at around 95 per cent, compared with roughly 50 per cent in the case of normal bank lending. Apart from helping to improve levels of income and savings, SHGs have also been able to bring about positive improvement in a number of social indicators such as literacy and health.

Overview of RD in South Asia

A common feature of the inadequacy of the rural development efforts in South Asia is the low level and inappropriate composition of public outlays for rural development—often misdirected and diminishing—that need to be reoriented and, in many cases, raised to promote growth. A related problem, often inadequately researched, is the leakage of

a large part of the funds allocated for these programs to elite groups who manage to capture most of the benefits intended for the poor and the rural population at large.

Several decades of deteriorating levels and composition of public expenditure and a high degree of political intervention in the rural sector, often in favour of rural elites rather than the rural poor, have contributed to the erosion of the foundation for more rapid and sustained rural growth and poverty reduction. Public expenditures in the rural sector in Nepal are declining with real per capita spending in fiscal year 1997 and 1998 only 59 per cent and 77 per cent, respectively, of spending in 1995. In Bangladesh, total public sector agricultural spending is less than 1 per cent of GDP.

India's record in public spending on social sectors in the 1990s, despite stringent resource constraints in the 1990s, has been commendable. The allocation for rural development, which encompasses the major programmes for poverty alleviation, was increased from Rs 31 billion in 1992/93 to Rs 77 billion in 1995/96 and 86 billion in 1996/97, increasing the share of the social sectors and anti-poverty plan from 35 per cent in 1992/93 to 47 per cent in 1995/96. The government also accorded high priority to poverty alleviation programmes. The outlay for elementary education rose considerably, mainly because of the programme of nutritional support to primary school students. The allocations for health and rural development, which encompasses the major poverty alleviation programmes, increased by 21.6 and 12 per cent respectively in 1996/97, compared with the allocations in 1995/96.

Although India spent close to 23 per cent of agricultural GDP (or about 6 per cent of GDP) on agriculture and rural development, the impact of rural development programs is adversely affected by two key factors: unbalanced composition and low efficiency of public spending. Largely untargeted subsidies, accounting for nearly half of public spending, crowd out capital and the non-wage operations and maintenance that promote private investment, in the non-farm sector and productivity growth and poverty reduction.

However, the success of rural development programs in South Asia has depended not only on how much the state has spent on them, but also on the way they have been organised and the extent to which the intended beneficiaries have been involved in them, both in design and implementation. Participatory approaches to rural development, where they have been adopted, have generally shown promising results in targeting the poor and in providing sustainable livelihoods to them. Experiences in water (irrigation and drinking water), watershed and forestry management, micro-credit, rural infrastructure and income-generating activities in India, Nepal, Sri Lanka and Bangladesh are producing encouraging results in empowering communities and increasing household incomes. Where the government and non-governmental organisations play important roles in facilitating such initiatives, social mobilisation and capacity building of communities to take over and manage priority activities are essential.

There is considerable debate on a number of major issues of development which affect rural development

The unfinished agenda of rural development

Rural development programmes are conceived and implemented as a part of national development strategy. There is, however, considerable debate on a number of major issues of development strategy which affect rural development. Some of these issues are broader and structural in nature on which there has been a continuing debate in South Asian countries and in the development literature in general; others are institutional in nature.

Structural issues

i. The macro-micro mismatch

Neither the state-led nor the NGO programmes of rural development address the issue of poverty and regeneration of rural areas in a macro-economic framework. While most government programmes are formulated in sector-centric framework, the NGO programmes are project-oriented and address the issues only at the micro level. This often accounts for the gap in micro level successes and failures at the overall level of the economy or the rural population. Thus, although there are examples of remarkable successes at the level of individual projects of rural development, the overall rural picture remains bleak.

Neither the state-led nor the NGO programmes of rural development address the issue of poverty and regeneration of rural areas in a macro-economic framework

The project approach detracts from the task of mainstreaming rural poverty and development agendas into the overall design of development. Indeed, only by mainstreaming the poverty agenda at the macro level can one expect strong growth in the economy. It is only by reversing the roles of the elitist agenda, both at the economy-wide and in rural development, can the growth of the economy be strong as well as reduce poverty and inequality significantly.[27]

This can be achieved only by enhancing the capacities of the poor to contribute to the process of growth by enabling them to participate, on more equitable terms, in the dynamics of the market economy. To enhance the capacity of nearly half of the population to participate in a market economy, as a deliberate measure rather than as a wishful afterthought, is likely to radically transform the process of economic growth. The need for a macro-policy designed to eliminate poverty is premised on the argument that poverty originates in the structural features of society which can not be changed by tinkering at the project, micro or sectoral levels.

ii. Access to land and reforms

An issue which is of basic significance to rural development and yet has not become a part of the architecture of rural development programs is the access to land and the related issue of land reform. Empirical evidence has shown the incidence of poverty is highly correlated with lack of access to land, although it does not necessarily imply a causal relationship. Bina Agarwal's pioneering work on India, for instance, shows that households that depend on agricultural wage labour account for less than a third of all rural households but make up almost half of those living below the poverty line.[28] Many of these households also own some land, but in holdings that are so small or unproductive that their owners derive a greater share of their livelihoods from their own labour than from their own land.

Land plays a strategic role in rural South Asia: aside from its value as a productive factor, land ownership confers collateral in credit markets, security in the event of natural hazards or life contingencies, and social status and, in case of those with large landholdings, considerable political and economic leverage. Those who control land tend to exert a disproportionate influence over other rural institutions, including labour and credit markets, as well as access to education and other social programs.

The three areas of agrarian reform which could be considered politically feasible as well as economically sustainable are:

- Transforming tenancy rights into either ownership rights for the tenant or through right of permanent tenancy.
- Redistribution of ownership of uncultivated land
- Giving title to lands and watercourses owned by the State.

Transfer of tenancy rights into permanent leaseholds has been successfully implemented in the Indian state of West Bengal under Operation Barga, with the active participation of peasant organisations and a pro-poor administration. The operative issue here is to give those who actually cultivate the land a direct stake in the land. Without legal title to ownership or tenancy of land, the cultivators retains little incentive to invest in the land, nor are they able to use land as collateral to access the credit market.

A study based on empirical evidence of the Indian experience from 1955 to 1988 concludes: '… there is robust evidence of a link between poverty reduction and two kinds of land reform—tenancy reform and abolition of intermediaries. Another important finding is that land reform can benefit the landless by raising agricultural wages. Although the effects on poverty would probably have been greater if large-scale redistribution of land had been achieved, the results are nonetheless interesting as they suggest that partial, second-best reforms which mainly affect production relations in agriculture can also play a significant role in reducing rural poverty.' [29]

It is equally important to improve the system of property rights particularly in rural areas. The system inherited from the colonial era has hardly changed. The staff handling land records in South Asia are generally corrupt, and favour the rich at the cost of the poor and the weak. Whenever a land owner dies, male heirs pre-empt most of the inheritance and generally deprive the female or minor members of the family of their rights. An improved system of property rights with computerised records could greatly improve the livelihood of rural women by making them more credit worthy.

Considerations of both equity and efficiency would therefore suggest that some form of agrarian reform remains part of an unfinished agenda of economic reforms and as a prerequisite for rural development.

iii. Rural industrialisation

The virtuous cycle between agriculture and non-agricultural enterprises plays a strategic role in providing employment opportunities in rural areas.[30] The countries that made substantial progress in poverty reduction, created off-farm employment opportunities. There has been a spurt in the growth of non-farm enterprises in the Chinese countryside after liberalisation around the late 1970s where off-farm employment grew at a rapid rate of 12 per cent per annum, currently employing 31 per cent of the rural labour force.[31] As such, rural enterprises can become both an engine of growth as well as major contributor to the reduction of rural poverty. In most South Asian countries the potential for labour absorption is high in agro-based industries, small and medium industries and the rural services sector. Most of these activities are highly labour- intensive and provide employment opportunities for the semi- and unskilled rural labour and semi-skilled urban labour force.

Non-farm sources of income for the rural poor are important for two reasons:

- The direct agricultural income of the poor is not enough to sustain their livelihood, either because of landlessness or because of insufficient owned or tenanted land.
- Wage employment in agriculture is highly seasonal and requires supplementation of income during lean periods. As most rural non-farm activities require little capital and generate more employment per unit of capital, they provide a good source of raising employment and income opportunities for the poor.

The non-farm sector also has considerable scope to complement farming because of the strong linkages

Considerations of both equity and efficiency suggest that some form of agrarian reform remains part of an unfinished agenda of economic reforms

between the two sectors, and because the non-farm sector forges linkages between rural and urban areas. Service activities dominate the non-farm economy in rural areas in South Asia. The non-farm sector is also an important source of income for women, small farmers, landless workers, and the poor living in rural towns. Manufacturing, service, and trade activities are the most important sources of employment for both male and female workers in rural areas, though women are relatively more concentrated in these activities than men in most countries.

Industrial estates for rural areas are widely viewed as expensive failures

The slow growth of rural industrialisation in South Asia is the lack of public policies to promote the non-farm sector, both direct and indirect, such as macroeconomic and trade policies. Among the support policies, directed at non-farm sector enterprises, financial assistance and credit facilities to the non-farm sector and technical services of various kinds are the most important. These policies help reduce the discrimination and disincentives suffered by small-scale rural enterprises through lack of access to credit, technology and markets. Given the urban bias in policies, these enterprises also suffer from underdevelopment of social, human and physical infrastructure in rural areas.

The establishment of industrial estates fully endowed with infrastructure, roads, communications, electricity, and financial services, in small towns or semi-rural areas for providing services to small micro-enterprises has had mixed and generally disappointing results.[32] Industrial estates for rural areas are widely viewed as expensive failures. A rather different approach, relying on social networks in rural and semi-urban areas, to exploit the synergy between social and economic factors, argues for the establishment of industrial clusters which can also harness the benefits of globalisation for the poor.[33]

Another source of stimulus to the growth of the rural non-farm sector is through the local government institutions which can help facilitate the development of physical, social, and human infrastructure at the local level. Decentralisation tends to shift the focus of expenditure toward small-scale infrastructure projects, encouraging the growth of small-scale private sector projects.

Rural governance

Five decades of rural development efforts by the state and civil society, with considerable assistance from donor agencies, have transformed the nature of governance structures in the rural areas in South Asian countries. The writ of the central government through its bureaucratic apparatus from the Deputy Commissioner to the *patwari* has considerably been diluted by the revival of local government institutions and the growing outreach of non-governmental organisations in the countryside.

The growing economic differentiation of rural society, partly a result of the gainers and losers created by rural development programs, the rapid diversification of activity and its commercialisation have loosened traditional social structures. The process will, if anything, intensify and lead to a significant realignment of the power structure in substantial parts of rural South Asia. Such realignments will not of course occur in all cases spontaneously and in a manner which gives effective voice to the poor and promote their interests. The process unleashed and the potential for change created by them must therefore focus on creating conditions which will facilitate a favourable outcome. In this context three aspects deserve special attention.

First, the state will have to continue to play a supportive role in rural development. A great deal of knowledge and expertise is needed to assess local resources and their potential, different ways of exploiting the potential, the costs involved and raising resources. This knowledge, much of it technical in nature, is often not available locally. Strong support from state agencies and/or non-

government organisations (including educational institutions) is necessary to make it accessible to the communities and their leaders. Along with this support, the role of government agencies also needs to change. Instead of planning, deciding and implementing schemes on their own, as they now do, the agencies will have to play a less intrusive role by facilitating coordination between related schemes of different communities and providing a broader perspective.

Second, the creation of democratic institutions of local government and assured representation for disadvantaged groups are necessary, but not sufficient conditions to ensure that the latters' interests are safeguarded. The determination of priorities, in the context of limited resources, inevitably involves a process of bargaining between different groups. In order for this to work in favour of the poor and vulnerable, the latter have to articulate their needs and actively persuade and/or pressure the relevant forums to take necessary action to meet their needs. None of these occur easily or automatically. Conscious measures to encourage and strengthen institutions of civil society at the local level are essential. Moreover, the elected local institutions can not merely generate demands for larger devolution of resources from the state and central governments; they should be required to mobilise their own resources to meet a significant part of the costs of their programmes.

Third, non-governmental and voluntary organisations have a particularly key role in obtaining and disseminating information on the working of government (including local government), making people aware of their entitlements and obligations, and enabling them to vent their grievances and seek redress. Besides interceding with the concerned authorities to secure benefits for the eligible and minimise leakages, they have a role in motivating and organising local communities to take active interest in the working of specific programmes and persuading the bureaucracy to work with the community for improving the effectiveness of programmes. Over time they can help promote a process of more broad-based changes in institutional mechanisms for funding and managing local development activities to meet the specific local conditions.

Chapter 6

Poverty and Food Security

'Providing food security for all the people living on the planet is perhaps one of the most important unfinished tasks of the twentieth century. The basic cause of hunger is poverty and poverty is a very complex phenomenon.'

– Sartaj Aziz[*]

The world is producing enough food to meet the basic requirements of each and every person on the planet

What is food security?

The Food and Agriculture Organization has defined food security as 'physical, social and economic access to food by all people at all times to sufficient, safe and nutritious food to meet their dietary needs according to their food preferences for an active and healthy life'.[1] Thus, a distinction has been made between food availability and food security. Often, the former does not guarantee the latter. Food availability is a necessary but not a sufficient condition for achieving food security. At present, there are enough resources in the world to produce the required amount of food and, in fact, the world is producing enough food to meet the basic requirements of each and every person on the planet; but since the available food is distributed unevenly and people lack the resources to buy an adequate amount of food, many households, as well as countries, experience 'food insecurity'. South Asia is an agricultural region endowed with an abundance of natural resources. It has some of the world's greatest river systems, fertile soils and forests. Around 70 per cent of the population is dependent, directly or indirectly, on agriculture. Agriculture accounts for a little over 28 per cent of the sectoral share of GDP in the region. South Asia is endowed with one of the richest areas in terms of bio-diversity.[2] And it is the region that is quoted as one of the most successful regions in terms of raising agricultural productivity under the Green Revolution.

The food grain production has more than doubled in the region since the 1960s and at present there is enough food available to provide everyone with 2,416 calories per day to meet minimum requirements if the food were distributed equitably.[3] Yet, the wide prevalence of hunger and malnutrition in the midst of rising supply of food grain in the region is indicative of the fact that food insecurity in South Asia is mostly due to a lack of purchasing power of the poor. People simply do not have enough resources to purchase adequate food. This is not to say that South Asia does not need to increase its food supply. Of course, there will be a need to increase the production of food to meet the demand of ever growing population in the region, but as far as the question of food insecurity is concerned, it is mostly low access, not low availability that is the root cause of the problem.

The concept of food security operates at all levels: individual, household, regional, national and global. Food security at any one level does not guarantee food security at any other level. For instance, food security at the national level does not guarantee household food security and household food security does not mean that all individuals in the household have adequate access to food. Intra-household inequality has often been observed with women getting less share of the total food available at the household level.

Food security is not only a basic human right and a fundamental need but also a foundation on which the development of entire nations rests. Malnutrition reduces the productivity of nations and undermines their economic growth.

Poverty/food insecurity nexus

Poverty is a multidimensional concept comprising economic, political, and social as well as income deprivation. Hunger and food insecurity are outcomes of poverty. Food insecurity occurs mainly because people are poor and hence they lack the purchasing power to buy adequate food. The fact that South Asia is one of the poorest regions in the world points to the widespread prevalence of hunger and food insecurity in the region. Of the world's 6 billion people, 2.8 billion live on less than $ 2 a day and 1.2 billion on less than $ 1 a day.[4] Using the poverty line of less than $ 1 a day, South Asia with 22 per cent of the global population accounts for 44 per cent of the world's poor. However, if the population below $ 2 a day is taken as a yardstick then around 85 per cent of the regional population can be categorised as poor. Within South Asia, India has the highest absolute number of people in poverty, even though it has managed to reduce the percentage of incidence from 52.5 per cent in 1990 to the current figure of 44.2 per cent (table 6.1).

Since food is the most basic human need, poor people subsisting on less than $1 a day spend a larger proportion of their meagre incomes on food. As a result the overall level of undernourishment is lower than the overall incidence of poverty. However, regions with extreme level of undernourishment are also regions with extreme level of poverty (see table 6.2). Any policy to reduce hunger and food insecurity, therefore, must consist of a concrete plan to reduce poverty in the first place.

Status of food security in South Asia

At present, over 500 million South Asians live in absolute poverty while over 300 million are chronically malnourished. This is about 40 per cent of all food insecure people in the developing world (800 million).[5] The crisis of food insecurity in the region is mostly related to low access rather than low availability of food. Average per capita availability of food, as represented by per capita dietary energy supply, has been rising in South Asia. For instance, per capita dietary energy supply rose from 2330 kcal per day to 2400 kcal per day from 1990 to 1999.[6] However, severe inequality in land and income distribution prevents the poor from reaping the benefits of increased food availability. The total number of

Table 6.1 Profile of poverty in South Asia

	No. of Poor (Million)	Incidence (%)	No. of Poor (Million)	Incidence (%)
Bangladesh	–	–	38[a]	29[a]
India	438	53	443[b]	44[b]
Nepal	–	–	9[c]	38[c]
Pakistan	13	12	43[a]	31[a]
Sri Lanka	0.7	4	1[c]	7[c]

Note: Survey year: a: 1996; b: 1997; c: 1995.
Source: ADB 2001b, World Bank 2002a.

Table 6.2 Prevalence of undernourishment compared with extreme poverty in selected regions as percentage of total population

Region	Prevalence of undernourishment (1997-99)	Prevalence of extreme poverty (1998)
Sub-Saharan Africa	28	46
South Asia	24	40
Latin America and Caribbean	11	16
East Asia	10	15
Eastern Europe and Central Asia	4	5
Near East and North Africa	8	2
Total Developing World	15	24

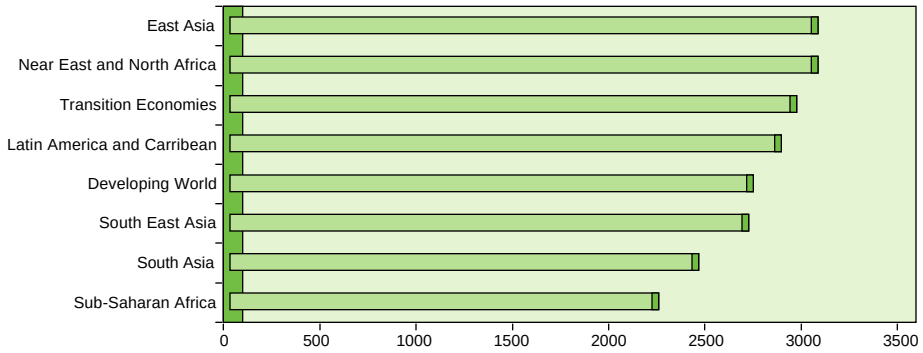
Source: FAO 2001b.

Table 6.3 Trends in per capita availability of dietary energy supply and the number of undernourished people

	Number of People Undernourished (millions)		Per Capita Dietary Energy Supply (Kcal/person/day)	
	1990-92	1997-99	1990-92	1997-99
Bangladesh	39	44	2070	2120
India	215	225	2370	2430
Nepal	4	5	2380	2290
Pakistan	27	24	2330	2480
Sri Lanka	5	4	2210	2350
South Asia	289	303	2330	2400
Developing World	816	777	2540	2680

Source: FAO 2001a.

Figure 6.1 Per capita dietary energy supply (DES) (Kcal/person/day) 1997-99



Source: FAO 2001b.

undernourished increased from 289 million to 303 million in the region (see table 6.3). In Pakistan, one third of the population does not have access to food needed to maintain adequate nutrition. In 1998, around 8 million children in Pakistan were malnourished[7]. In Sri Lanka, more than 50 per cent of the urban, 46 per cent of the estate and 30 per cent of the rural population consume less than the recommended level of caloric intake.[8] In Nepal, 45 out of 75 states are classified as food deficit[9].

Although the overall per capita dietary energy supply in South Asia increased, compared with the rest of the developing world this is still low (see figure 6.1). However, despite this rising trend in per capita dietary energy supply, the absolute number of undernourished people went up in South Asia whereas it went down in rest of the developing world.

There are three key elements to assure food security: availability, access and distribution. The physical availability of food does not guarantee access of everyone to food. Equitable access to food is dependent upon the equitable distribution of food to all parts of the country as well as the ability of all people to produce or buy the food they need. These elements of food security in South Asia are discussed below.

Availability

During the 1970s and 1980s, most countries in South Asia were food self-sufficient. However, the growing population exerted increasing pressure on domestic food supplies thus turning many countries in South Asia from net exporters to net importers of food. Pakistan, for instance, had achieved near self-sufficiency in wheat, and was considered a leading rice-exporting country during early eighties. This was the period when many developing countries had to struggle for self-sufficiency in food grain production due to wide fluctuations in world prices of food grains, especially in wheat and rice. With the passage of time, however, the demand for food grains increased in the country due to continuously high population growth. The growth of food grain production, on the other hand, did not keep pace with demand due to continuing decline in the world prices of food grains and lack of adequate investment in infrastructure and technology to improve agricultural productivity. As a result, in Pakistan the domestic demand for food grains exceeded the domestic supply and imports increased to 2.5 million tons in the second half of the 1990s. To respond to this situation, new incentives for wheat production were announced in 1997 and in 1999. Production of wheat went up to a record 22 million tons in 1999-2000 and Pakistan, once again, emerged as a wheat exporter. Nepal also used to be food surplus country until the 1970s. However, owing to the high population growth and low productivity, Nepal started experiencing a deficit of food production and has now turned into a net importer of food: 45 out of 75 districts in the country are classified as food deficit.[10] It imported 46 thousand metric tons of cereals during 1999.

Other important factors affecting the availability of food for domestic consumption include food losses that occur during handling and storage of food. In Nepal for instance, around 10-15 per cent of cereals, 15-20 per cent of fruits and 25-30 per cent of vegetables

are lost during the handling and storage process.[11]

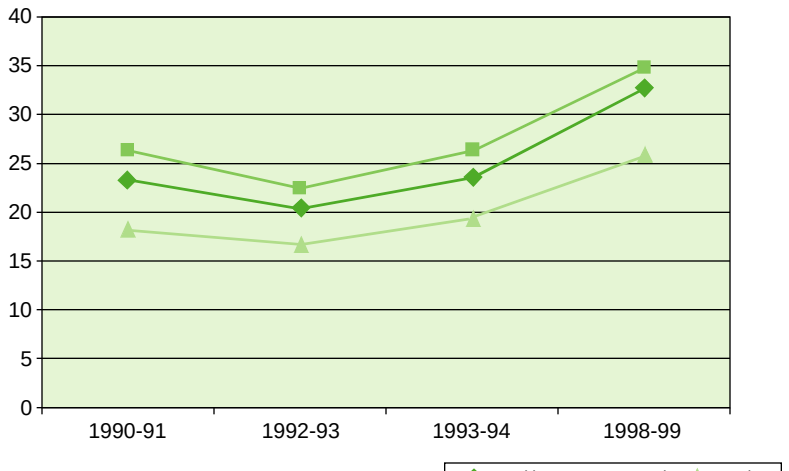
Access

Access to adequate food depends upon household income and food prices. As mentioned previously, the poor usually lack adequate means to access food. In Pakistan, for instance, despite an increase in the total food availability from 1980 to 1999, the incidence of food poverty had gone up[12], and during recent years it has reached alarming levels (see figure 6.2). At present, about one-third of the households in Pakistan are living below the income poverty line and are thus unable to meet their minimum daily nutritional requirements.

Over 50 per cent of household consumption expenditure in South Asia is directed towards food items (see table 6.4).

The access to adequate food for all segments of the population also depends on the pattern of landholdings, income distribution and employment opportunities.[13] The distribution of assets is highly skewed in most countries of South Asia. In Pakistan for instance, 40 per cent of the total farm area is owned by 7 per cent large farmers with an average landholding of 10 hectares or more. The remaining 81 per cent of the farmers have small land holding with an average size of 5 hectares or less.[14] In Bangladesh, 96 per cent of the farms have an average size of 0.3 hectares. In Sri Lanka, more than 70 per cent of the population is engaged in farming, of whom more than two thirds are small holders with less than 1 hectare of cultivable land, which is either owned or leased for their livelihood. In Nepal, more than two-thirds of the total holdings have less than one hectare of land, and they account for 30 per cent of the total farm area.[15] In South Asia as a whole, 80 per cent of the farms have an average size of 0.6 hectares.[16] Small farmers have limited access to water, credit, fertiliser and other resources as compared to large farmers and landowners. And lower access to these resources leads to low incomes and, consequently, food insecurity in the rural areas. Equity in the distribution of resources is, therefore, an important factor influencing food security. The divide between the rich and poor is widening in all South Asian countries following the adoption of liberalisation policies (table 6.5).

Figure 6.2 Trend in the incidence of food poverty in Pakistan (1990-99)



Source: FAO 2000b.

Table 6.4 Food share in household budget in South Asia

Country	%
Bangladesh	63.4
India	65.4
Nepal	59.4
Pakistan	44.5
Sri Lanka	61.4

Source: Hoda (nd).

Food distribution

An efficient distribution of food is as important as its production. At the national level, the distribution system must be efficient in delivering food items to poor and to far-flung areas. Even in the presence of excess supply, inefficient distribution among different segments of the society may lead to inadequate consumption and undernourishment. The public food distribution system in South Asia is believed to be highly inefficient

Table 6.5 Gini co-efficient trends in South Asia

Countries	Gini Co-efficient	Countries	Gini Co-efficient	Countries	Gini Co-efficient
India		**Bangladesh**		**Sri Lanka**	
1992	0.338	1992	0.283	1990	0.301
1997	0.378	1995-96	0.336	1995	0.344
Pakistan		**Nepal**			
1991	0.31	1984-85	0.301		
1998-99	0.41	1995-96	0.367		

Source: World Bank 1996; World Bank 2002a.

and corrupt. In India for instance, the inefficiency of the Food Corporation which is responsible for procurement, stocking and supplying for the Public Distribution System (PDS) is often cited as one of the major factors behind malnutrition and lack of access to adequate food. In Nepal, The Nepal Food Corporation (NFC) which is responsible for supplying food grains to the food deficit districts is also believed to be inefficient. The corporation is reputed to meet the requirements of army and civil servants before supplying food to the needy people. Also it is argued that it procures food grains from traders rather than farmers at high prices.[17]

In 1987 Pakistan gave up the old system of issuing subsidised food to low income people against ration cards because the bulk of the subsidy involved never reached the poor. It was distributed among the food department officials, the ration depots and the flour mills. Under the new system of food marketing, the government issued wheat in bulk to the authorised flour mills at a fixed price throughout the year, throughout the country. This has assured price stability and free availability of grain in all parts

Box 6.1 Balance sheet of selected food distribution programmes in South Asia

Country	Programme	Coverage and Targetting	Benefits	Drawbacks
India	Fair Price shops (70s through present)	State-wise	Food and agriculture prices became more stable than world market prices.	The programme was neither successful in terms of its spread nor in terms of achieving its basic objectives.
	Subsidy & Ration (70s) Ration books were used and food was distributed through ration shops.	Extensive: urban and rural areas in the state of Kerala.	The programme provided price support and improved equity among Kerala producers. Rationing was positively co-related with child nutritional status.	The programme was largely untargetted.
Pakistan	Subsidy & Ration (1943-87). Food was distributed through ration shops with quotas being imposed according to supply availability and location.	Narrow coverage; about one-third of the population mostly urban, one shop per 2,000 people.	Initially poor people benefited by obtaining food at subsidized prices.	Bogus ration cards were issued which were diverted to the free market at considerable profit. Most of the subsidy was utilized by corrupt officials and mill owners. The floor quality declined due to which many people did not obtain ration: Hardly 16 percent of the targeted population availed this subsidy.
Sri Lanka	Coupon System (after 1979). Coupon issued on basis of income and family size.	Covered an estimated half of lower income population, urban and rural.	The programme was well targeted.	The contribution of food stamps to the household budget was insignificant: contributed to only 11 percent of the total household budget in the poorest quintile and 7-2 percent in the highest quintile.

Source: World Bank 1982; Kelegama 2000; India country paper 2002; Aziz 2000.

of the country, but it does not provide food at cheaper rates to very low income families. Various food stamp or food distribution schemes, introduced for this purpose, have not been very successful.

In order to enable the low-income groups to secure adequate food, the governments in South Asia and international agencies have been formulating various food distribution programs that included food aid, food subsidies and low cost rations. These programs had some benefits as well as drawbacks (see box 6.1). Most of these programs were expensive and poorly targeted. The price supports and regulations mostly favoured consumers and harmed producers' incentives, thus depressing the domestic production of food.

Intra-household food security

In South Asia, the distribution of food within households is often dictated by tradition with women eating last and the least amount of food that is available to a household. The role of women in food security can not be ignored since this impacts on women's ability to engage in farm and non-farm activity as well as the health of their born and unborn children. Women are involved in various stages of agricultural activities either on their own farm or on others farms. They fetch water; collect fodder, firewood and crop residue; graze animals and perform a multitude of other similar tasks. At home they are responsible for raising children and cooking and other household chores (see chapter 7 for a detailed discussion on the role of women in agriculture). Because of women's productive and reproductive duties, nutritional requirements of women are higher than those for men (see annex table 6.2).

The gender disparity in access to good food is evident from the fact that around 50 per cent of the world's anemic women live in South Asia.[18] Often, women with anemia give birth to low birth-weight babies and carry 23 per cent higher risk of maternal mortality. Infant mortality rate and maternal mortality ratio in South Asian countries are shown in table 6.6. A very high percentage—84 per cent—of the pregnant women (aged 15 to 49) are anemic in South Asia which is probably one of the reasons of high infant and maternal mortality rates, as well as of high prevalence of low birth weight newborns in the region. In South Asia, 21 per cent of the children are born with low birth-weight that accounts for around 64 per cent of the world's low birth-weight infants. The gender bias in access to food is mostly due to the perceived differences in social and economic benefits that families supposedly derive from boys and girls.

Table 6.6 Infant mortality and maternal mortality rates

	Infant mortality rate (per 1000 live births) 2000	Maternal mortality ratio (per 100,000 live births) (1985-99
India	69	540
Pakistan	85	340[a]
Bangladesh	54	350
Nepal	72	540
Sri Lanka	17	60
Bhutan	77	380
Maldives	59	350

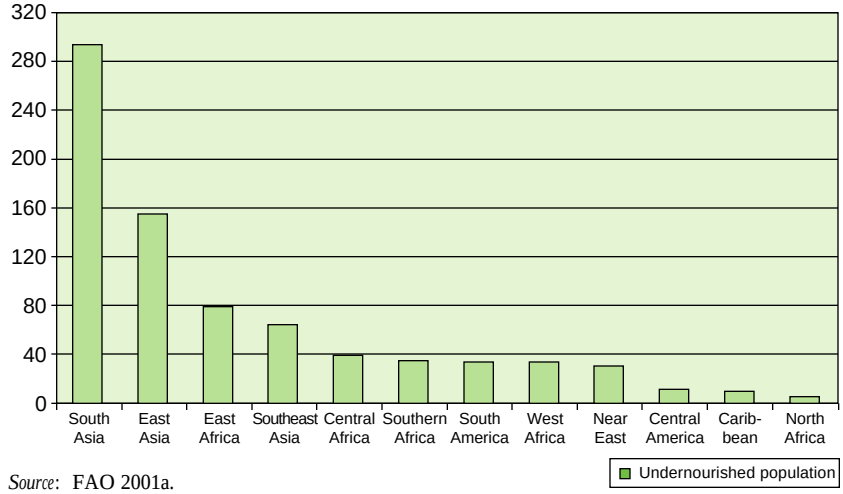
a: year 1990-98.
Source: UNDP 2002, MHHDC 2001.

State of malnutrition in South Asia

Of the world's 815 million undernourished people, 294 million are in South Asia: the highest proportion in all developing regions.[19] In addition, there are tens of thousands of people with low incomes who constantly live with the risk of food insecurity: any sudden fluctuations in their incomes, production shortfalls or loss of employment can take them to the brink of food insecurity. Considering these vulnerable groups, the situation of malnutrition in South Asia is simply mind-boggling.

The FAO Committee on Food Security has approved a list of seven indicators to monitor the food security outcomes in the area of food consumption, health and nutrition status.

Figure 6.3 Prevalence of undernourishment in developing countries (in millions) 1996-98



Source: FAO 2001a.

These include: the percentage of population undernourished; number of people undernourished, average per person dietary energy supply; share of cereals, roots and tubers in total DES; life expectancy at birth; under five mortality; and proportion of children under five that are underweight. These indicators depict an alarming picture for South Asia (see table 6.7 for a complete profile of the above mentioned indicators for South Asian countries for the year 1996-98): Bangladesh has the highest proportion (38 per cent) of malnourished people in the region. Also in terms of the share of cereals and roots/tubers in total Dietary Energy Supply (DES),[20] Bangladesh tops the list of not only the South Asian countries but the entire world. Nepal has the highest number of malnourished children in the world (57 per cent), where one in every two children under the age of five is stunted and one in every five children is severely stunted. Overall, nearly half of the children under the age of five are chronically malnourished in South Asia[21].

Despite encouraging progress in per capita availability of food in the last decade, Pakistan's situation regarding malnutrition has improved only marginally in the past 20 years, from 26 per cent of the population to 24 per cent. Malnutrition is still an over-whelming problem throughout the nation especially amongst the vulnerable groups: infants, pre-school children, pregnant and lactating mothers. During 1999-2000 there were 8 million malnourished children in Pakistan with iron and anemia deficiency being most common. Nearly half of the children under 5 years of age in Pakistan are underweight and there is an increasing trend in the number of children wasted in Pakistan. In Bangladesh, 9 out of 10 children are malnourished, every other child is stunted and some 600 children die daily from causes related to malnutrition. In Nepal, according to a recent survey conducted by the Ministry of Health, nearly half the children are found underweight and some 13 per cent children are found to be severely underweight.[22] Food availability

Table 6.7 Food, nutrition and health indicators for South Asia (1996-98)

Countries	Number of people under-nourished 1997-99 (million)	Proportion of undernourished in total population 1997-99 (%)	Average per capita dietary energy supply (DES) 1997-99 (kcal/day)	Share of cereals and roots/tubers in total DES (%)	Life expectancy at birth (years) 1999	Under five mortality rate (per 1000 live births) 1999	Prevalence of child malnutrition (%<5 years) 1990-98
Bangladesh	44	33	2120	84	59	89	56
India	225	23	2430	64	63	98	53
Nepal	5	23	2290	80	58	104	57
Sri Lanka	4	23	2350	56	74	19	34
Bhutan	–	–	–	–	62	107	38
Maldives	–	–	–	–	65	83	43
South Asia	303	24	2400	–	62.9	97.6	51.1

Source: FAO 2001a; World Bank 2000 and MHHDC 2001.

Table 6.8 Food availability and depth of undernourishment in South Asian countries (1996-98)

Countries	Food availability Dietary energy supply (kcal/person/day)	Dietary energy supply of the undernourished (kcal/person/day)	Minimum energy requirement (kcal/person/day)	Food deficit of the undernourished (kcal/person/day)
Bangladesh	2060	1460	1790	340
India	2470	1520	1810	290
Nepal	2190	1530	1800	260
Pakistan	2430	1490	1760	270
Sri Lanka	2300	1570	1830	260

Source: FAO 2000c.

and depth of undernourishment in South Asian countries is shown in table 6.8.

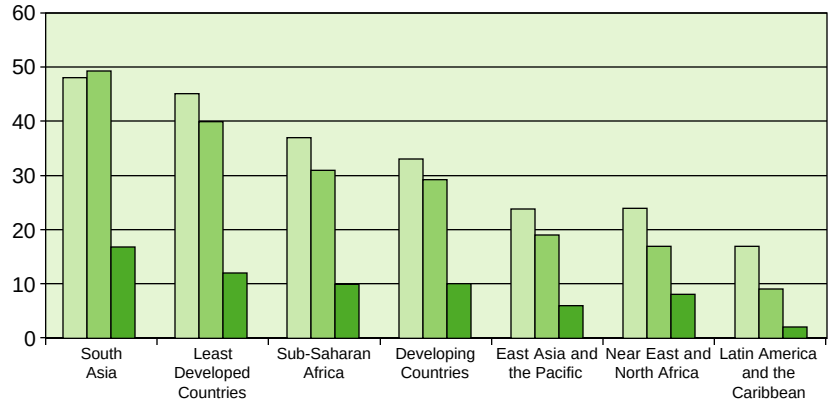
Various other deprivations, combined with malnutrition, have led to low health status of the South Asians, especially the children of South Asia. These include lack of access to safe drinking water and sanitation facilities, improper systems for disposal of wastes, lack of awareness about health, nutrition and hygiene, and lack of adequate health facilities. In Pakistan for instance, 45 per cent of the population does not have access to health services, 40 per cent is deprived of safe drinking water and 53 per cent is living without any sanitation facilities.[23] All these factors, combined with a high incidence of food insecurity, has resulted in South Asia having the highest proportion of underweight, stunted and wasted children in the world (See figure 6.4).

Future food requirements in South Asia: Achievements and challenges

The food requirement in South Asia is likely to double in the next 25 years whereas, in the face of a burgeoning population, its natural resource base is already shrinking[24]. Increase in urbanisation and industrialisation, is likely to put further pressure on natural resources of this region. The increase in demand for food, therefore, will have to be met from increase in agricultural yields. There is not much scope of increasing the cultivated land.

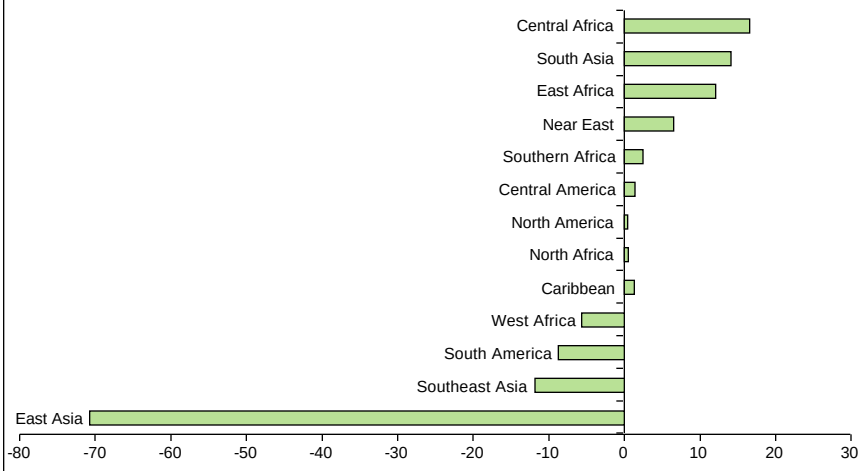
Rosegrant and Hazell 2000 projected the demand and supply of food as well as the food security situation in Asia for the year 2010. According to the study, the demand and supply outlook for food is positive in Asia provided the governments and international community maintain their commitment to agricultural growth. In fact, the per capita availability of food is projected to increase in Asia. However, despite this positive trend, the future of food security as manifested by the number of malnourished children is not very bright. South Asia will continue to be home to the highest proportion of malnourished children in Asia: out of the estimated 113 million malnourished children in Asia in year 2010, 83 million will be in South Asia. IFPRI projections indicate that by the year 2020, over 63 million pre-school children in South Asia will remain malnourished accounting for nearly half of the developing world's children under five suffering from malnutrition. India alone will be home to

Figure 6.4 Estimated prevalence of underweight, stunted and wasted children in developing countries (1995-2000)



Source: FAO 2001b.

Figure 6.5 Changes in number of undernourished by region, 1990-92 to 1997-99



Source: FAO 2001a.

Table 6.9 Trends in the number of undernourished people in South Asia

Countries	Number of people undernourished (millions)	
	1990-92	1997-99
Bangladesh	39	44
India	215	225
Nepal	4	5
Pakistan	27	24
Sri Lanka	5	4
South Asia	289	303

Source: FAO 2001a.

44 million malnourished preschoolers, accounting for 34 per cent of the developing world's total.[25]

The UN Millennium Summit (2000) set the goal of reducing the proportion of people in poverty by half by 2015. The World Food Summit (1996) secured international commitment to reduce the number of undernourished people by half by 2015. FAO estimates indicate that progress to date has been quite slow. In South Asia for instance, the total number of undernourished people went up from 289 million in 1990-92 to 303 million in 1997-99 (see table 6.9).

According to the Report by FAO on Food Insecurity (2001), South Asia has reported the highest increase in the number of undernourished people after Central Africa in the entire developing world (see figure 6.5).

Policies to eliminate food insecurity

Food security for all cannot be achieved in South Asia unless conventional policies are modified, and a concerted effort is made to abolish hunger and malnutrition from the region. The first step in this direction should be to address the structural issues associated with the problem of food insecurity that is chronic poverty and low purchasing power of the poor. As mentioned earlier, food insecurity is a consequence of extreme poverty and both food insecurity and poverty are correlated. Hence combating hunger and food insecurity is directly related to the objective of reducing poverty.

Poverty in South Asia is mostly a rural phenomenon. For instance, in India, three out of every four poor persons live in rural areas. Most of the rural poor derive their incomes from the agricultural sector. Agriculture is the main source of livelihood for the majority of the population in Nepal; about 80 per cent of the rural population is engaged in agriculture and 86 per cent of the total population lives in rural areas. Moreover, according to the National Living Standard Survey 1996, about 40 per cent of agricultural population in Nepal has less than 0.5 hectare of land, implying that a considerable part of the agriculture population in Nepal has serious problem in obtaining sustainable livelihood from agriculture.[26] In Sri Lanka, more than 70 per cent of the rural population still relies on agriculture and related industries for their livelihood. Around 35 per cent people from total labour force were employed in agriculture in 2000.[27] Of Bangladesh's total population, 77 per cent lives in the rural area.[28] One way to ensure food security would, therefore, be to increase agricultural production and productivity. This would not only increase food supply thus lowering its price to an affordable level and improving the overall access to food, but it would also increase incomes of those who are most vulnerable to fluctuations relating to availability and price of food.

As emphasised in the previous chapter, another way to address rural poverty in South Asia is to invest and promote the rural non-farm economy which is an important part of rural South Asia. Rural non-farm economy in South Asia accounts for about 20—40 per cent of total rural employment and for about 25 to 50 per cent of total rural income[29]. Also governments in South Asia must reallocate expenditures in favour of less-

developed areas. More than two-thirds of South Asians live in less-favoured regions that depend primarily on rain-fed agriculture[30]. Instead of relying on the 'trickle down' benefits from high to low potential areas, direct investments must be made in basic infrastructure, technology and human development in these areas.

So far, most governments in South Asia have been addressing the problem of food insecurity through various welfare programmes, including food stamps. These programmes are useful provided they are targeted properly. But, they are not a long-term solution to this crucial problem. Also, most of these programmes have suffered from bad design, implementation and corruption problems, thus reducing their effectiveness. In Sri Lanka for instance, the two main income transfer programmes, Janasaviya and Samurdhi, are rated as poorly targeted reaching only two-thirds of the poorest 10 per cent of the households[31]. Improving the targeting of social safety nets and other welfare programmes is a critical issue for ensuring food security for vulnerable groups.

A reduction in food insecurity and hunger in South Asia also requires a substantial reduction in population growth as well as an increase in the per capita availability of food. FAO 2001a compared two groups of countries: one in which the number of undernourished people increased significantly and the other in which it declined from 1990-92 to 1997-99. The first group, as expected, had a much higher population growth rate and a much lower growth rate of per capita availability of food than the second group. Agricultural growth must also be facilitated by an increase in the domestic resources allocated to agriculture and the efficient utilisation of these resources. The same study conduced by FAO found that in countries where the number of undernourished people declined were also the group of countries where net capital stock in agriculture per worker had increased.

Providing good quality public education particularly for women is another stepping stone towards achieving food security in the region. IFPRI 1993 indicates that a household with the same level of income but with adult women with some education consumes about 150 calories per person per day more than a similar household where women do not have education. In Pakistan, the incidence of food poverty is almost three times higher in households with no education compared to those with 10 years of education or higher.[32]

Countries in South Asia are also vulnerable to extreme natural shocks such as droughts and floods (see box 6.2). These shocks create food emergencies and increase food insecurity. There is a strong inverse relationship between the occurrence of shocks and progress in reducing the number of undernourished.[33] Any plan to reduce food insecurity must, therefore, contain a comprehensive strategy to deal with these food emergencies.

Box 6.2 How is food security affected by natural disasters?

Bangladesh's experience in 1998; a combination of increased rainfall, abnormal melting of ice and a rise in sea level caused Bangladesh to experience in worst flooding ever. At its peak, water deluged 66% of the land and covered fifty two out of sixty four of the country's administrative districts. Twenty million people were rendered homeless.

The floods had devastating effects on certain crop yields significantly lowering production for the 1998-99 year. Production declined from 8.850 million metric tonnes in 1997/98 to 7.730 million metric tonnes in 1998/99, a decline of 12.7%. Aus production also suffered a decline of 14.5%. FAO estimated that the national shortfall of rice was about 3.6 million tons. In the fall of 1998, there was a 225 deficit between production and national consumption. An impressive increase in food grain imports made up for more than 25% of domestic production in 1998-99 as opposed to 9.3% in 1997/98. In total, the government imported one million tons of food, assisted the private import of 1.5 million tons, and received a promise of food-aid about 1.2 million tons.

In response to the flood, the government enlisted international agencies, NGO's and local governments in its food relief and rehabilition programmes. In the beginning the damage overwhelmed government authorities. However, with a concerted effort by all the concerned parties, famine was averted through increased food imports. The Vulnerable Group Feeding programme dealt with urgent consumption needs by issuing four million VGF cards which guaranteed free monthly rations of 8 kilograms of wheat and rice to card-holders.

Source: RESAL 1999.

Annex Table 6.1: Per capita availability of cereals for South Asia (1970-1999)

	Domestic Supply					Domestic Utilisation	Per Caput Supply			
							Per Day			
	Production	Imports	Stock Changes	Exports	Total	Food	Kilograms per year	Calories	Protein (grams)	Fat (grams)
	1000 metric tons									
India										
1970	92818	4262	-2424	49	94606	83894	151.2	1377	32.7	7.3
1980	113747	417	-3806	706	109652	96507	140.1	1277	30.8	6.4
1999	188432	1779	-14035	2619	173557	154471	155.6	1428	33.7	6.3
Pakistan										
1970	10999	233	336	346	11223	10082	163.0	1433	35.4	7.2
1980	15514	613	-1216	1164	13747	11747	144.6	1261	31.4	6.3
1999	24880	3249	-603	1796	25730	21829	158.7	1300	33.0	6.6
Bangladesh										
1970	11339	1569	292	0	13201	12080	181.7	1788	35.0	4.3
1980	14765	2194	-1225	0	15734	14317	167.6	1629	33.1	4.2
1999	25015	4765	-2354	0	27425	25454	189.1	1856	36.7	4.6
Nepal										
1970	2789	1	-127	253	2408	1980	166.7	1508	34.8	8.4
1980	2971	54	-151	10	2865	2386	163.9	1508	34.8	7.5
1999	5230	46	-68	30	5178	4192	186.3	1733	40.8	8.7
Sri Lanka										
1970	1106	1159	-418	0	1847	1741	141.5	1229	27.7	2.2
1980	1460	883	-259	1	2083	1947	133.3	1184	25.8	2.0
1999	1942	1232	-50	3	3121	2815	150.2	1323	29.4	2.4
Maldives										
1970	240	10850	0	–	11090	10928	90.3	666	15.7	1.9
1980	17	24839	0	–	24856	23770	150.4	1184	26.8	3.2
1999	25	27816	6300	–	34141	32814	116.4	1055	21.7	5.5

Source: FAO 2002c.

Annex Table 6.2 Nutrient requirement for women and men

Nutrient	Adult female Per 1000 kcal	Adult male Per 1000 kcal
Calcium (mg)	500	350
Iron (mg)	12	4
Vitamin A (ug RE)	250	210
Vitamin C (mg)	23	16
Vitamin E (mg)	3.6	3.6
Niacin (mg)	7	6
Protein (g)	25	22.5

Source: FAO 2000c.

Chapter 7

Women in Agriculture

Women are the invisible and unrecognised backbone of South Asian agriculture. The significance of their role can be gauged not only by high female participation rates in farm and non-farm activities in rural areas, but also by their intimate connection to rural customs, traditions and values. Women in South Asia keep the rural way of life alive, and they also suffer for it. Cases of discrimination and violence against women in South Asia's rural areas, dominated by a feudal mindset, continue despite the work of thousands of committed women's groups throughout the region. To provide a gender perspective on the interaction between agriculture and human development, this chapter focuses on both the contribution and the deprivation of women in South Asia's agriculture.

Overall role of women in agriculture

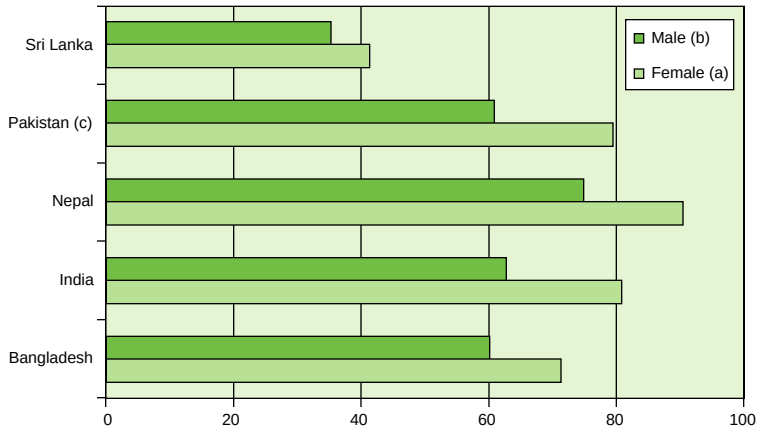
In most South Asian countries women agricultural workers as a percentage of total employed women exceeds that of male agricultural workers as a percentage of total men employed (see figure 1).[1] In their varied roles as agricultural labourers, *de jure* landowners, *de facto* household heads, or as managers of their home-steads, women are active participants in the agricultural sector. They participate in all operations pertaining to livestock management, crop production such as sowing, transplanting, weeding, harvesting as well as post-harvest operations such as threshing, winnowing, drying, grinding, husking and storage. Unlike their male counterparts, their tasks are not only limited to agricultural activities; they are also responsible for fetching and managing water and fuel, cooking, cleaning, maintaining the house and taking care of the young and old. It has been estimated that a working class village woman in South Asia works from 12 to 16 hours a day. In Nepal, for example on an average, women work for 12.07 hours, 47 per cent higher than men who work on average 8.21 hours.[2]

Women as agricultural labourers

The involvement of women in agriculture is spread over a large number of activities. In fact in most regions they perform more tasks than men. The participation of women in South Asian agriculture depends on a number of factors such as the type of activity, the crop in question, the particular geographical area, socio-economic status of the family and whether the agricultural production is of subsistence or cash crops.

Traditionally, agricultural activities were more gender-segregated but in recent years women have started to

Figure 7.1 Percentage of male/female employment in agriculture and its allied industries



(a) Female employment in agriculture is as a percentage of total female employment
(b) Male employment in agriculture is as a percentage of total male employment
(c) Pakistan's data refers to rural women and men involved in agriculture as a percentage of total rural women and men. This data is therefore not comparable to the data of other four countries presented here.

Source: FAO 2002a.

The socio-economic status of women also determines their participation in the agricultural labour force

participate in a greater number of activities as labour shortages increase. In Sri Lanka, it has been estimated that women perform over 70 per cent of all agricultural activities.[3] On agricultural farms where men and women work together, women participate in almost all activities related to crop production, but there are certain tasks that demonstrate greater female participation than others. For instance, the earlier phases of the production cycle involving field preparation are more male intensive whereas the latter phases of crop production including field work of harvesting cotton, weeding, transplanting rice and post-harvest tasks such as drying, storage, threshing and winnowing are mainly the responsibility of women.[4] Specific activities, which are more traditionally female responsibilities, include parboiling of paddy and cinnamon peeling in Sri Lanka, manual weeding in rice fields and bidi manufacturing in India and cotton picking in Pakistan.

Female participation may also be higher for a few specific crops harvested in South Asia. In India, women constitute one half of the labour in rice cultivation. They are also involved significantly in the plantation sector. In Sri Lanka also, a major percentage of women work as rubber and tea estate workers mainly because of the employment opportunities offered by activities such as tea plucking.[5] In Pakistan, women play a critical role in the production of cotton[6], but there exists a clear division of labour based on gender: picking and weeding cotton is done entirely by women; while land preparation is handled by men.

Particular geographical locations across South Asia also lend their support to higher female activity rates in agriculture. In Pakistan for instance, agricultural activity rates may vary from one region to another as in the North West Frontier Province (NWFP) and Balochistan socio-cultural norms are more binding and less female participation is observed.[7] In Nepal, a similar distinction is observed where women from Tibeto-Burman groups are less socially bound and more occupationally active than their Indo-Aryan counterparts, especially those belonging to the Terai communities.[8] In Sri Lanka, due to seasonal paucity of labour, women's involvement in family farm work is greater in the dry zone—characterised by paddy production and production of other field crops on rain-fed uplands and homesteads.[9]

The socio-economic status of women also determines their participation in the agricultural labour force. Women from poor land-less families work in fields in an attempt to raise their household income. In Bangladesh, studies have found that the highest involvement of women in agriculture comes from households with small landholdings (0.05-0.4 acres) followed by women from medium-sized farm households (0.5-0.99 acres). Women from larger size farms (2.5 acres) were not found to be involved in agricultural production.[10] Similar studies in Punjab, Pakistan found that female productive contribution decreases as socio-economic status indicated by the size of land holdings increases.[11]

Women and livestock management

Women are often responsible in part or in whole for livestock activities, an integral part of farming systems in South Asia. Women are usually afforded greater recognition in this sector than their role in crop production. Livestock not only generates income but it also provides fertilisers for plants, draft power for farms, food for humans and bio-mass fuel for energy. Across South Asia, women perform varying aspects of this sector. In Pakistan for instance, it is women who make the feed, collect fodder, clean animals and their sheds, make dung cakes, collect manure for organic fertilisers, pump milk, process animal products and market them. They also play a crucial role in rural poultry farming where they apply their own methods of rearing and breeding. In Bangladesh, women feed

livestock, clean sheds, secure them properly for the night, take care of their health and collect farmyard manure. In Nepal, both men and women perform fodder collection, grazing and milking but some activities, especially detecting illnesses of animals are women's responsibilities. In India, women's responsibilities related to livestock vary across regions. In 90 per cent of the families, indoor jobs related to livestock management such as milking, feeding, cleaning of animal sheds are done by women while management of male animals and fodder production are tasks performed by men.[12] In Bhutan, both men and women perform most tasks together but women tend to look after smaller stock especially poultry.

Women also play an important role in dairy production. In Pakistan for instance, all fresh milk consumed in the country with the exception of a few large cities is based on small domestic production, run and managed by women. In Sri Lanka, women's groups are now looking towards cow rearing for milk production as a self-employment activity that not only results in additional income but also in improved household nutrition.

Within livestock management, women in general have greater control over decision- making and also their own sources of income. In Nepal, women have the right to own livestock and men market livestock in consultation with them. In Bangladesh, because of their intense involvement with livestock rearing women are consulted before buying and selling cattle. In Pakistan, income from poultry, sheep and goats is often the only source of income completely within their control. It is estimated that 89 to 90 per cent of the women who earn income from livestock products control the expenditure of this income.[13] In India, however, women have less control over the income generated from livestock activities. For instance, only 14 per cent of the dairy cooperative members are women whereas the rest is controlled by men.[14]

Women as invisible workers in agriculture

Despite the critical involvement and contribution of women in agriculture, their presence is officially largely invisible, with few statistics reflecting their actual contribution to agricultural output and rural employment, and thereby, to the Gross Domestic Product. The data surveys are male focussed with very little acceptance and understanding of the role women play. In rural households, there is no clear boundary between tasks that fall under agricultural production and those that are defined as household duties. In addition, many women work on small landholdings in subsistence agriculture where very little output is sold in the market. Most women work as unpaid agricultural workers or as 'family helpers' with their male heads of household on feudal or large landholdings where only males are paid. With such blurred distinctions, the task of measuring women's economic contribution to agriculture and national accounts becomes difficult.

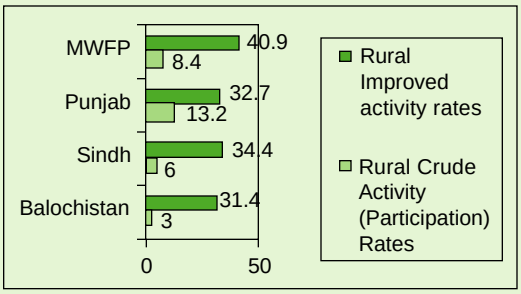
The process of measurement itself has numerous flaws. Both surveyors and survey respondents are generally males who are either unaware of the amount of work women put in, or are reluctant to disclose this information. Men are traditionally responsible as breadwinners for their families according to the existing socio-cultural patterns in the region. When women do remunerated work, it reflects poorly on the male head of the household. This problem is exacerbated when the enumerators are also male.[15] When female enumerators interview women only, much higher labour participation rates are recorded. In Pakistan for instance, some female-specific surveys include questions which elicit answers reflecting higher female participation rates (see box 7.1).

The design of questions and definitions itself is often flawed. In the Census and Labour Force Survey reports of Sri Lanka the concept of 'gainful

Despite the critical involvement and contribution of women in agriculture, their presence is officially largely invisible

Box 7.1 Invisibility of female workers: A question of definition

Statistics collected in South Asia on female activity rates do not reflect the actual contribution made by women. Female employment rates, recorded by official sources are usually low because of arbitrary definitions. If definitions are revised and all activities for which women are traditionally responsible incorporated, a huge difference in activity rates is noted. In Pakistan, for instance, the Labour Force Survey (LFS) initially excluded women who reported housekeeping and other related activities. In recent years, the LFS sought to include women who worked on one of fourteen specified agricultural and non-agricultural activities under the classification of improved female participation rates. This resulted in a huge discrepancy between female crude activity rates (earlier definition) and improved female participation rates in all the provinces of Pakistan as indicated in the figure.



Source: Pakistan Labour Force Survey 1999-2000.

In Sri Lanka similar measures to correct the definitional errors in data were taken by the Department of Census and Statistics. In its third quarterly report in 1998, the Department began to include previously excluded housewives involved in income generating activities as 'unpaid female family workers'. Between the first quarter report of 1995 and the 1998 third quarter report female participation in the unpaid family worker category rose from 16.2 per cent to 27.9 per cent.

In Bangladesh too there are two types of definitions of employment that are currently in use. The 'conventional' or usual definition does not include home-based activities such as collection of firewood or threshing of rice etc; which are included in the extended definition. A huge difference in female labour force participation is found on the basis of these definitions. The 'extended' definition reports female rural activity rate to be 57.3 per cent as against 17.4 per cent based on the conventional definition.

Source: Labour Force Survey of Pakistan 1999-2000; Bangladesh: M. Asaduzzaman 2002; Sri Lanka: Goonesekere 2000.

employment' excludes a high percentage of women in the informal sector engaged in economic activities within and outside the home. In the Agricultural Census of Pakistan for example, the definition of full-time agricultural workers includes only those who perform agricultural work exclusively.[16] It is ironic that women are not considered full-time workers according to this definition, not because they do too little but because they do too much of both household and agricultural work. Often, these definitions classify women as 'supplementing' the work carried out by men, which is defined as 'actual' work. In weaving of textiles, for example, women do not operate the loom but usually perform the preliminary tasks of spinning the yarn, washing, dyeing and setting up the loom. These women are very rarely listed as 'workers'.[17] In Nepal, tasks performed exclusively by women, such as weeding and harvesting, home gardening, livestock and poultry rearing and fuel and water collection, are not considered as 'economic activities', and are therefore excluded from the labour force surveys.[18] The situation is exacerbated when women are not remunerated in cash which is often the only measure of visible economic accounting. Thus women, being considered and treated as the subordinate half of the family within the household, are officially perceived and recorded as only 'family helpers', and not as economic contributors to agricultural products and productivity.

Expanding role of women in agriculture

The failure of statistics to accurately reflect women's participation in agricultural production is all the more grave now that their role is consistently expanding all over South Asia. All countries in the region have experienced an increase in their female labour force participation rates (LFPR) in agriculture (see table 7.2 and figure 7.2), the rate of increase being much greater than that of male LFPR. There are three main reasons for this: Firstly, rising poverty has led to an increasing number of male migration from rural to urban areas, and abroad, in

search of better opportunities. An indication of rural urban migration may be gauged by the increase in urban populations in recent decades in South Asia. The largest increases in urban population as percentage of total population, between 1980 and 2000 have been registered in Bangladesh (from 14 to 25 per cent) and Pakistan (from 28 to 37 per cent).[19] In India, for instance, the percentage of women working in agriculture, especially those involved in the cultivation of high yielding varieties increased drastically, as men moved onto non-farm employment. Within rural areas, many men have left agriculture and moved into non-farm rural activities. In Pakistan, the construction and transport industries grew rapidly during the 1980s,[20] drawing a substantial number of men into these sectors.

Secondly, some countries in South Asia have seen an increase in smaller land holdings. When land holdings are small, hiring additional workers becomes inefficient and female family members are involved to fulfil labour requirements. In Pakistan for instance, labour absorption patterns depicted a change after the Green Revolution. In the provinces of Punjab and Sindh, land holdings of less than 5 hectares increased. This farm size may be cultivated adequately by only three adults. The owners of the farms, therefore choose to cultivate the land themselves utilising female labourers from home.[21]

A third reason in certain South Asian countries, such as Sri Lanka, includes technological trends. In Sri Lanka the introduction of high yielding crops, which require more labour inputs such as transplanting, led to increased female employment.[22] In India also, although the effects of the Green Revolution have been mixed on female employment, in certain cases where labour intensive activities have grown, female employment has also risen.

Despite their expanding role in agricultural production, women continue to face conventional constraints. Women have a lack of access to input supplies, extension advice, credit and the most important agricultural resource-land. This continues despite their increased participation rates. Women now have heavier responsibilities and perhaps a stronger presence but their voice is still largely unheard.

Table 7.1 Economically active population in agriculture (000s)

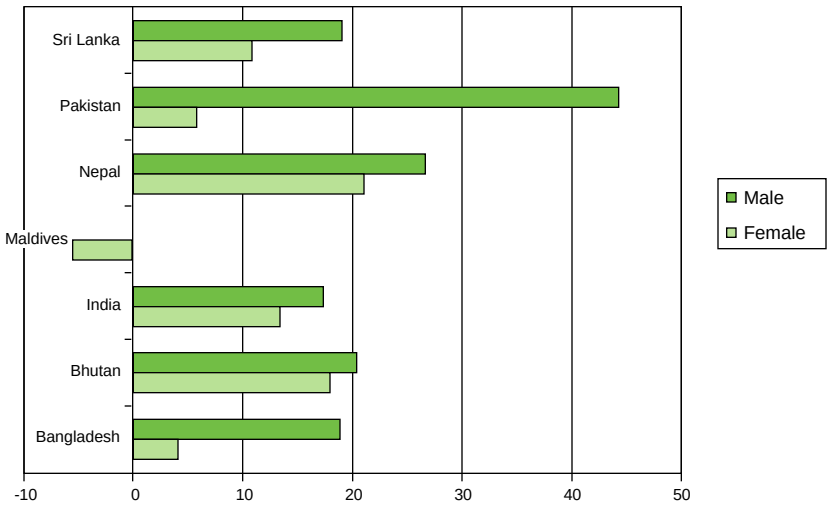
	1980		1990		2000	
	Male	Female	Male	Female	Male	Female
Bangladesh	16,298	13,886	18,729	16,198	19,478	19,254
Bhutan	376	261	468	325	552	391
India	125,097	83,668	146,363	83,243	165,961	97,730
Maldives	26	11	18	10	17	10
Nepal	4,152	2,708	4,891	3,307	5,920	4,18
Pakistan	12,888	5,932	13,861	6,829	14,681	9,839
Sri Lanka	2,067	790	2,291	1,134	2,537	1,349

Source: FAO 2002d.

Women and access to land

In South Asia, land is not only an economic factor of production but its ownership also reflects the economic power structure within the society that guarantees access to important agricultural inputs. It is also a guarantor of political power. Women are mostly denied their right to own land. The infringement of rights may take on

Figure 7.2 Percentage increase in economically active population in agriculture (1990-2000)



Source: Extrapolated using data from FAO 2002d.

Box 7.2 Law vs customs: What prevents women from owning land?

Inheritance laws and local customs throughout South Asia prevent women from gaining equal rights to own land. Inheritance legislation varies across regions from the most gender-neutral General Law in Sri Lanka to the comparatively gender-biased laws in Nepal—the *Maluki Ain*. Even where laws permit women to own land, for example in Pakistan custom dominates practice and women all over the region, either as daughters, widows or sisters do not receive their due share of inheritance.

Laws preventing inheritance:

- Under specific religious laws women are entitled to smaller shares than men. Islamic law in South Asia (and some Christian sects) provides for a half share for daughters.
- Even when women inherit land, certain additional conditionalities may be attached. In Nepal for instance, only unmarried daughters above the age of thirty-five can inherit land.
- In some cases, women are prohibited from selling their inheritance. For instance, under the Maluki Ain in Nepal, women need the prior consent of male family members before selling their inherited, geographically immobile property.
- In specific South Asian communities customary tribal laws supercede other laws and women's rights to land ownership are severely curtailed.
- There may be certain gender biases in the devolution of agricultural land where land enactments may supercede earlier laws. In India, for instance, numerous land enactments give preference to male agnatic heirs.

Customs preventing inheritance:

- Women in South Asia under pressure renounce their legal inheritance claims rather than risk the relationship that they have with male family members, especially brothers.
- Women may give up their claims to ensure access to their natal homes where their brothers provide them with a certain amount of economic or physical security.
- In South Asia, women often need male mediation to deal with the outside world. They are dependent on male family members in dealing with familial, financial, social and legal matters.
- Women do not want to risk incurring hostility from their male family members that may result in violent acts committed against them. Land motivated 'witch-killings' are common in the tribal communities of Bihar, India.
- Land disputes are usually resolved by extra- judicial village councils e.g. panchayats that are dominated by male authority and male-centric rules. Due to the inherent biases of male members, land disputes are never settled in favour of women.

Source: Agarwal 1996.

various dimensions: legal, social or monetary, which essentially leave women land-less. Even where women may hold legal titles to land they effectively lack control over it or the revenues it generates. In Punjab, Pakistan for instance a 1996 survey of 1000 households in rural areas, found that only 36 women owned land in their own name while only 9 had the power to sell or trade their land without obtaining prior permission from their male relatives.[23] In Nepal also, within all communities, the control of land rests with men.

Table 7.2 Distribution of the labour force by status in employment

% of distribution of the labour force, each sex, 1990-1997

	Wage & Salaried workers		Self-employed workers		Contributing family workers	
	Women	Men	Women	Men	Women	Men
Bangladesh	9	15	8	43	77	17
Pakistan	25	35	14	47	62	17
Sri Lanka	68	60	16	34	16	6

Source: UNSD 2000.

The recent liberalisation drives in South Asian countries have meant that governments have focussed on increasing production of cash crops at the expense of food crops. This means that when women, who mainly work in subsistence production, are fortunate enough to be awarded land it is often land of poor quality. In Bangladesh for instance, many female-headed households either do not own land, or if they do, they are awarded small marginal holdings. Due to the small and low quality of land holdings, women encounter numerous problems. Extension workers are reluctant to work with their small land properties since they are geographically dispersed and their yields are bound to be low.[24] Women's productivity is also fragmented and diverted from actual agricultural production to the transportation of input supplies and tools from one plot to another. Additional livestock management

and domestic responsibilities, such as caring for children and the elderly, further limit their efforts to increase the productivity of their land.

The problem of land ownership has become more important in South Asia because of the degradation of communal lands. Forests as well as common areas of villages—those that are uncultivated—belong to the entire village including the women in that village. These shared grounds are especially important for poor rural households because they provide fuel, fodder, fibre and food. The quantity of these lands is declining under population pressure and under different government programmes which transfer these village commons to private ownership through privatisation.[25]

Women's lack of land ownership is an indication of the extent to which they are relegated to an inferior position in society. On the economic front, the lack of owning land effectively precludes women from access to a number of agricultural support services. Women are denied access to credit as well as benefits of agricultural extension services, because land is most often used as collateral by many banks and development organisations to disburse loans and other agricultural input supplies. Even though women may have user rights to work on land without actual land ownership, they are simply perceived as being supplementary workers and are not granted recognition as farmers in their own right. However, governments are now beginning to recognise women's rights to ownership and control of productive assets. In the implementation process of the Beijing Platform for Action, many governments are now taking steps to recognise women's needs and rights to own the land they depend on for their subsistence.

Rural remuneration: Are women compensated for their efforts?

Agricultural workers are the lowest paid employment segment in South Asia, and women receive the lowest remuneration within this sector, if they are paid at all. In many instances, when small holdings exhibit declining returns, farmers substitute hired male labour with female household members who work as unpaid helpers.[26] In Sri Lanka, 89 per cent of female unpaid family workers work in agriculture, forestry and fishing.[27] In other instances, when land-less women seek employment on other farms they are met with low demand. In general, they perform the very specific tasks which are low paid. In India's rural areas, female-intensive activities, such as weeding, are paid less than male-intensive activities. A study found that in the more developed district of Karnal, Haryana women received 12 rupees a day for weeding while men received 28 rupees. In threshing season women receive 20-25 rupees in contrast to men who receive 40-60 rupees.[28] In Sri Lanka, the female-male gaps in wages are closing. However, certain discriminatory practices continue to exist: Government-administered minimum wage rates for tea estate workers, mostly women, are lower. In Pakistan, women in rural areas are paid 59 per cent of what men receive. Their counterparts in Bangladesh fare better in the agricultural sector where they are paid 71 per cent of what men are paid.[29] This is in violation to ILO Convention 100 ratified by Sri Lanka, India, Bangladesh, Nepal and Pakistan, advocating 'equal remuneration for men and women workers for work of equal value'. The problem lies in the subjectivity of the perception of 'value'.

The low wages paid to women cannot be linked with any perceived inefficiency on their part. In fact, tests conducted in India by the Punjab Agricultural University at the Indian government potato seed farm found that women were four times as efficient as men. In the tests the picking rate per labourer per minute was 1.6 for men and 5.2 for women.[30]

Wage rates based on social systems of payment in rural areas are so deeply entrenched that any attempt to increase

Women's lack of land ownership is an indication of the extent to which they are relegated to an inferior position in society

incomes of women in one farm is met by a combined resistance by other landowners. In some cases women are not paid cash but are paid a portion of the crop they harvest. Often it is not potential employers but representatives sent in place of women who undersell their labour. Being occupied by their domestic obligations and constrained by mobility and segregation norms in some South Asian countries, women send male representatives in their place, who end up agreeing to lower rates.[31]

For the same reasons, apart from receiving low wages, women have little or no access to markets outside their villages, especially to export markets except through men. In Nepal, for example, the destination of most agricultural produce sold by 60 per cent of women is at hat bazaars which are weekly markets held within the confines of the village itself.[32] Women who do not market their produce themselves usually do not have control of the income generated from those sales. In Sindh, Pakistan a study found that women who did their own marketing retained 86 per cent control of the income and their mean income was also higher compared to when the produce was marketed by their husbands or middlemen.[33]

In addition to the issues of equity and rights, women's access to income is crucial because it not only improves their own lives but the lives of the entire household. In low income groups, women are often the primary income earners responsible for the survival and maintenance of their families. Research has shown that income in the hands of women contributes more to household food security than when income is in the hands of men. They are more likely to invest in their children's nutrition, health and schooling and on their own basic and reproductive health (see box 7.3 on food security).

Women in rural areas may divert their energies towards non-farm income generating activities to supplement their incomes. The cottage industry has established itself firmly in rural areas and is a primary source of income-generation. Non-farm rural activities of women include spinning and weaving, dress making, coir rope making, handicrafts, tobacco production, etc. In Sri Lanka, women use the local materials collected in the forests for their enterprises. Rural women in Sindh, Pakistan are proficient at creating hand-made bed covers or rilees. The market for these products, however, is extremely limited in rural areas. In urban areas, women cannot market their products themselves and are often dependent on agents who sell their product at exorbitant prices while sharing very little of the profits with rural women. It is therefore imperative to formulate marketing strategies before embarking on income generating projects for women.

Several steps can be taken in order to empower women and increase their access to income. For instance, measures can be taken to increase women's productivity in both the paid sector and domestic production in order to increase their income without sacrificing their children's welfare or the status of their own health. But these measures would have to be within an overall human-centred approach to agricultural and rural development in South Asia which would include, among other things, improved rural infrastructure such as rural electrification, and access to improved sources of water, sewerage and sanitation. (see box 7.3)

Credit as a constraint

With women receiving low incomes in rural areas, the need for credit becomes clear. Women in South Asia, however, face multiple barriers in obtaining loans from any source, be it formal financial institutions, cooperatives, farmer's banks or farmer's organisations. Women seldom own land, which is the usual form of collateral required for taking agricultural loans. Other than women in absolute poverty, they hold wealth in the form of jewellery or livestock, which are

Box 7.3 Food security and women

Women in South Asia face an ironic situation regarding food security: On the one hand, they play a pivotal role in maintaining and strengthening the three key pillars of food security: food production, food access and food utilisation. On the other hand, they are often the worst victims of food insecurity within the household.

The first pillar of food security, namely food production, is largely participated in by women all over the region. The second pillar, accessibility of food, is dependent on the income generation capacity of the household. A number of studies around the world have found that it is not only the level of household income but also who earns that income that influences food security. Women usually spend a greater proportion of their income on food, education and healthcare for their children as compared to men. This is also supported by studies conducted in the South Asian region. In Bangladesh, recent research using samples of urban women shows that resources in the hands of women result in higher average nutrition per capita for all in the family. The third pillar of food security—food utilisation—implies that the food consumed is utilised efficiently so that it contributes to the physical health of the household. This is facilitated by looking after the physical, mental and social needs of growing children and other members of the household, something that is the exclusive domain of women. If women are educated properly and made aware of the benefits of breast-feeding, preparing nutritious food for the family and practising hygiene, they can deliver a lot more benefit to the overall health of their family by utilising the same amount of food. During times of economic shock and a state of food insecurity, women use a number of coping strategies often to their own disadvantage. They work harder by expanding their already tight schedule and sacrifice their own portions of food for the sake of their male children and men.

Despite their pivotal role in ensuring household food security and managing economic shocks, women in South Asia are the most severe victims of food discrimination in the entire world, girls and women consume half as many calories as consumed by their male counterparts resulting in severe malnutrition. In India breast-feeding for boys is carried out twice the time than for girls, and in rural Bangladesh, the chances of dying from extreme malnutrition for girls are double than those for boys. Anaemia is widespread among women: 84 per cent of pregnant women (aged 15 to 49) in the region are anaemic, which is one of the reasons for high infant and maternal mortality rates, as well as of high prevalence of low birth weight new-borns in the region.

Governments need to encourage women to be involved in food production for a number of reasons. A female-oriented supply of food crops should improve the nutritional status of women especially under-nourished young girls and pregnant and lactating women. Improving food supply will also help countries achieve self-sufficiency in food production and a more equitable distribution of food over regions and within households.

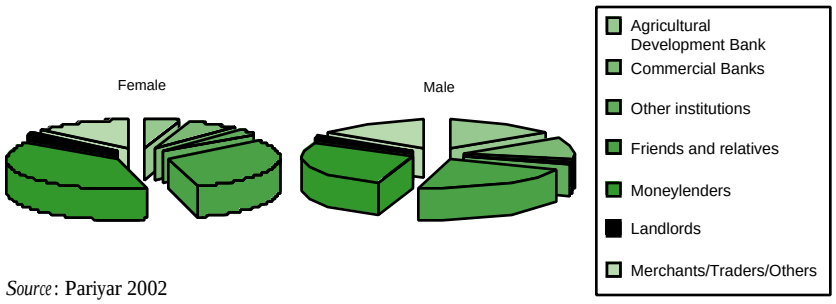
Source: IFPRI 1995, Asaduzzaman 2002.

unacceptable to banks as forms of collateral. The type, scale and nature of women's activities also exclude women from accessing credit. Their agricultural production is concentrated on subsistence crops, which are rarely the focus of formal lending programmes. Women in South Asia have substantially lower literacy levels than their male counterparts, especially in rural areas, which impairs their comprehension of loan procedures often leading to their exploitation by middlemen.

The bureaucratic and centralised structure of lending programmes also discourages the poor, particularly women, from borrowing from these institutions. The beneficiaries of such programmes are feudal landowners or large industrialists. In Bangladesh, in 1994 out of 879,000 people who took out loans from commercial banks only 64 were women.[34] However, Bangladesh also has very successful micro-credit programmes for women, such as the Grameen Bank.

Due to the inflexible policies and bureaucratic procedures of these formal institutions, women prefer to borrow from informal institutions: rotating savings and credit associations, merchants, friends and relatives. Such moneylenders are situated near potential borrowers and are attractive in their proximity, lack of paperwork and collateral. These moneylenders however, charge very high rates of interest which often means that the borrowers remain in perpetual debt.[35] In Nepal, the Nepal Rural Credit Review study disclosed that 84 per cent of the credit borrowed by women was from non-institutional sources, of which 40 per cent was from money lenders.[36]

Figure 7.3 Borrowing from formal and informal sources in Nepal (1999)



Source: Pariyar 2002

Various initiatives have been taken, by governments and non-governmental organisations all over South Asia to overcome some of the deficiencies of both formal and informal institutions of rural credit. The prominent among those include the Grameen Bank in Bangladesh, SEWA Bank in India, Small Farmers Development Programme and Production Credit for Rural Women (PCRW) in Nepal. Rashtriya Mahila Kosh, established in 1993 in India, and the newly-established Khushali Bank in Pakistan, are providing micro-credit to women in rural areas. In Nepal, five Regional Rural Development Banks were set up in the early 1990s to concentrate on providing credit to those individuals who, in general, do not benefit from ongoing credit programmes. In Sri Lanka, the Central Bank has initiated the Small Farmers and Landless Credit Project, which emphasises female participation in income generation.[37] (see box 7.4)

Women as beneficiaries of extension services

Extension services in South Asia have benefited men more than women farmers due to several reasons. Although women

Box 7.4 Giving credit where credit is due: Micro-credit initiatives in Bangladesh

The micro-credit movement in Bangladesh began in the early nineteen eighties with exemplary initiatives, such as the Grameen Bank and Bangladesh Rural Advancement Committee. Initially, institutional credit providers sprouted after non-profit NGOs realised that successful poverty alleviation depended on selected savings and credit programmes which could generate sustainable self-employment. The Grameen Bank revolutionised micro-credit concepts by focussing on the poor and marginalised, removing the collateral requirement and basing the banking system on participation, accountability and trust. It has now grown to be the largest rural credit institution in Bangladesh and is being replicated all over the world. Two other major micro-credit programmes in Bangladesh include BRAC (Bangladesh Rural Advancement Committee) which is the largest NGO in Bangladesh providing financial services to the poor; and a government-managed programme, Rural Development Project 12 headed by the Bangladesh Rural Development Board. NGO-supervised micro-credit programmes in Bangladesh lend to over 10 million people of whom 90 per cent are women (MHHDC 2000).

One such programme began in 1994 with the support of a donor agency. UNDP South Asia Poverty Alleviation Programme (SAPAP) selected a town in Bangladesh, Kishoreganj Thana, to be part of a UNDP selected pilot project. Kishoreganj. suffered from weak infrastructure, lack of electricity, a literacy rate of only 16 per cent; and landholdings of 0.5 acres or less for half of its 46,000 households.

The SAPAP project began its implementation in 1996 resting its foundations, like other successful credit initiatives, on the key concepts of social mobilisation through micro-credit, a focus on the poor and community building. The project aimed to narrow the gap between people and government by mobilising the poorest people into village organisations which could take advantage of the existing system and local resources. The project offers credit to the participants without need of collateral and asking only in return that the members save from their earnings and participate in weekly meetings. The participants are also offered technical and administrative support from UNDP, including training in book-keeping, credit management etc.

The beneficiaries of the programme have mostly been women. In fact, female organisations seem to be the real means for transforming the society. The Bhatrish-Basurdia female organisation, which began in 1995, has a membership of 129 and a total savings of 250,000 takas. The organisation has given 1.9 million takas of credit targeted towards micro-industries like cloth weaving and rice-husking, conventionally handled by women. A few of the women have also diverted their interests towards activities such as fisheries, poultry or shop-keeping. The Bhatrish-Basurdia female organisation is proud to be functioning from a location with a large tin-roof hall, a dirt floor and no electricity—its very own premises. The credit programme has also had benefits beyond its objectives. A large part of the investment generated by the credit programme is in improving agricultural production resulting in an abundance of nutritious food.

Source: UNDP August 1999, Choices, Human Development Magazine, MHHDC staff.

have an increasingly prominent role in agriculture they do not receive adequate agricultural advice nor the benefits which accompany it, such as seeds and credit. Most extension staff professionals are male. For instance in India, only one-half per cent of the total extension staff professionals were women in 1989 whereas in Bangladesh this percentage was 3.6.[38] Restrictions imposed on women due to the custom of segregation make it is unacceptable for male extension agents to communicate directly with women agricultural farmers and labourers. Domestic responsibilities and lack of mobility also limit women's movements making it more difficult for them to participate in meetings and courses outside their homes. Extension programmes also have in-built gender bias by ignoring the real contribution of women and directing the main thrust of their training towards export crops, and not food crops and small livestock which usually involve women.

One way of overcoming social restrictions that prevent male agents to meet with women farmers and workers would be for the agents to meet women in groups. This would not only overcome cultural constraints but would also enable women to speak more confidently and without any restraint. Male agents themselves also need to be gender-sensitised towards the needs of women farmers. Gender sensitivity may be attained by training the agents in gender awareness and communication methods and concentrating on activities where women dominate.[39] However, a culturally more acceptable option would be to recruit more female extension agents. Although many South Asian countries have been using female extension agents for quite a few years now, neither their number nor their expertise are adequate enough to cater to the needs of women farmers and workers in South Asia.

Family responsibilities may make it difficult to transfer urban women to work in rural areas. One way to solve this is to use local female para-extension agents. Relatively uneducated women could be given short intensive training in courses in agriculture and could be located within their home villages. Since most of women's agricultural work is seasonal they may be trained when there is less demand for their labour. This strategy may only work with selective recruitment, adequate training and integration into the existing system. In India, women from the farm are carefully selected and are given broad-based training; they then share the responsibility for forming and training groups and in turn strengthen the delivery of extension. Women's groups in South Asia may also be a means of providing extension advice.

Another recent trend to solve existing problems in extension systems is for farmers to hire their own extension agents. In Bangladesh, a few community groups under the auspices of NGOs have started selecting and supporting their own extension agents. In India, groups of farmers growing 1-3 hectare of grapes employ private extension agents. These agents are motivated to respond to farmers' needs since their salary and continued employment depend upon the farmers' satisfaction. But this kind of private services is beyond the ability of poor women smallholders who depend on their land for livelihoods. Governments must cater to the needs of such group of women.

Extension programmes have in-built gender bias by ignoring the real contribution of women

Technological innovations and women

The distribution of costs and benefits of technology adoption and mechanisation depends on the specific cultural and social characteristics of a particular location. In general, technological innovations imply diversion of time from laborious tasks to more productive ones resulting in greater income for both men and women. In Nepal, the advent of tractors and pump sets has caused an increase in cropping intensity. This has created demand for female labour-intensive activities such as weeding, transplanting, harvesting and

threshing.[40] More often than not, however, technological innovations to aid agricultural production imply greater efficiency at the cost of rural employment. Manual laborious tasks are transformed into new efficient time-saving jobs: tractor drivers, threshers and combine operators. Women as marginal workers, employed when the season demands it, are the first to lose their jobs in both absolute and relative terms.[41] In Indian Punjab, one analyst felt that the decline in female labour was approximately 90 per cent following the Green Revolution.[42]

When new technology requires training, women are left out and this perpetuates cycles of ignorance

When a particular stage of agricultural process that involves women becomes more productive due to technological innovation, male workers take over. In Bangladesh, indigent and land-less women earned income by using conventional threshing tools to supply hand-pounding services. When this was replaced by a mechanical rice mill, women lost their incomes. The situation was exacerbated because alternative employment could not be found due to social constraints on the movement of women outside their homes.[43] In Southern India, when irrigation techniques were introduced in tea plantations, technology was geared towards men only, ignoring the fact that it is women who perform this type of activity. As a result, men replaced the women, and women were deprived of their main source of employment. Other examples of women dominated tasks that have been transformed into paid male activities are hand grinding of flour by home-based women workers which was transformed into animal or power driven grinders run by paid male workers; the domestic spinning of yarn at home being substituted by commercially produced yarn or cloth, and terra cotta containers made by women being swapped by plastic storage bins, etc.[44] In Sri Lanka, the weeding of paddy producing areas is now done by chemical spraying whereas earlier 50-75 per cent was done manually by women.[45]

As rural women are largely considered illiterate it is assumed that they will be unable to alter their behaviour and customs in order to adapt to new technology. When new technology requires training, women are left out and this perpetuates cycles of ignorance, leaving them permanently excluded from the mechanised sector. In Gujarat, India, dairy production was carried out mainly by women. With the introduction of a modern dairy complex, not a single woman was enlisted for training. In Sri Lanka, when the Farm Mechanisation and Training Centre was set up in 1971 to conduct training programmes on operation and maintenance of machines the number of women trained was very low, despite the heavy presence of women in the agricultural sector.[46]

For women who farm their own plots, new agricultural technologies may reduce drudgery and increase productivity as opposed to the loss of income and employment that female hired labourers face. However, new technological innovations are seldom directed to women. For instance, while the use of tractors has allowed a greater number of acres of land to be ploughed, little progress has been made to improve equipment to facilitate women's duties such as; extracting oil from seeds, cleaning cotton, drying mango, drying and husking corn, grinding corn, wheat pulses or rice into flour and peeling the tops of sugarcane for animal fodder. Mechanisation and investment in high yielding cotton varieties has also increased male productivity while female productivity has remained unaffected, resulting in women expending more time in the back-breaking task of cotton picking and weeding. The most tiresome chore unaffected by technological innovations is grinding maize, millet, sorghum, rice or other crops, which usually has to be done at the end of a long day.[47]

Development of technologies for agricultural production have primarily concentrated on research on increasing

productivity of cash crops while subsistence agriculture, a predominantly female domain, has been pushed onto marginal, less productive lands. Technology, which may be used in the production of vegetables, fruits and pulses (women-intensive activities) has been ignored. Technological innovations should focus on facilitating women's agricultural tasks and easing their domestic pressures so that they may divert their energies towards more productive activities. If women are to be free to engage themselves in more productive labour outside the home, then one of the first priorities of any technological innovation or policy planning is to target domestic chores. Women's burden may be alleviated to a large degree by locating drinking water at closer locations and promoting the use of eco-friendly sources of domestic fuel so that the time-consuming task of collecting fuel-wood is eliminated.

The Green Gender: Rural women and the environment

Rural women and the environment share a special symbiotic relationship in South Asia. Being responsible for providing water, food, fuel firewood and fodder, women in South Asia interact intensively with their natural surroundings. Any unsustainable exploitation of natural resources, therefore, has direct implications for women.

In nearly all South Asian countries, fuel-wood collection is the responsibility of women. Any environmental change that affects the production of fuel wood, therefore, has direct repercussions on women. For instance, the destruction of forests in Bangladesh and reduction of mangroves in Pakistan have resulted in women walking longer distances for firewood at the expense of other more productive activities. Women of Baba and Bhit islands in Pakistan have to walk half a day to collect fuel wood. In Gujarat, India, women walk for four or five hours a day gathering fuel-wood.[48]

Environmental degradation not only requires women to expend more energy it may also damage their home-based enterprises. In India, many women walk miles to collect forest products such as fuel-wood, fodder, honey, gum, fruits, medicinal herbs, etc. Although they receive little for their efforts, the decreasing forests deprive them of this source of income as well.[49] In Bangladesh, the destruction of mangroves has meant salinisation of the coastline which has affected women's traditional tasks of kitchen gardening, livestock and poultry rearing. It has also diminished their incomes since they are no longer able to sell firewood.[50]

Women are also affected directly by the ubiquitous use of pesticides and other chemicals. Pesticides leave residues on crops, particularly on cotton, which are picked only by women causing blisters on their hands and necks. The Agricultural Commission Report of Pakistan (1988) estimated that 70 per cent of total pesticide use is accounted for by cotton. In fact, the increase in cotton productivity in Pakistan is thought to be mainly because of increased use of pesticides. Animal waste used as fuel-wood generates harmful bio-gases affecting women, especially since they are responsible for cooking.[51] Women in some areas also perform the hazardous task of placing mixtures of mercury and oil in the grains to kill insects. The increased exposure to toxic chemicals and pesticides, combined with water pollution, creates a number of health risks for women and their infants.[52]

Women in South Asia are not only the victims of environmental degradation, they are also in the vanguard of environmental movements. In India there are movements such as Chipko headed by women for forest preservation.[53] Women often have specialised knowledge of genetic resources. In Nepal, women conduct farmyard manure collection and application, which has great relevance for soil fertility management. In specific regions of the country, women have

Women in South Asia are not only the victims of environmental degradation, they are also in the vanguard of environmental movements

Box 7.5 Women and water

Even though the world's population continues to increase beyond the 6 billion mark in 1990, the world's supply of fresh water is limited to 2.5 per cent, of which only about 0.5 per cent is accessible ground water. The world grows by 77 million people a year, while water consumption has increased six-fold over the last 70 years due to increased industrial development and irrigation. The situation is worse in Asia, which is believed to have the lowest per capita availability of freshwater resources in the world. In South Asia, although 80 per cent of the rural population has access to drinking water*, yet the safety of accessible water is not guaranteed. In Bangladesh, high-arsenic concentrations have been discovered in numerous wells in rural areas. Of 20,000 tube-wells tested, 19 per cent were found to be contaminated by more than 0.05 mg per litre and 2,200 cases of arsenicosis were identified (UNEP 2000).

Not only is the water unhygienic, the supply of water itself is depleting in some parts of the region. According to UNFPA (2002b), water tables under some cities are declining at over one meter per year. In Pakistan, water withdrawal as a percentage of the total available is more than 40 per cent leading the country towards the state of high water stress. In Gujarat, India, excessive use of ground water in some cases, has caused water levels in acquifers to fall by 40 meters (UNEP 2000).

The lack of water affects women in several ways: For instance, being responsible for the domestic procurement of water, they have to walk several more miles to procure water carrying heavy containers. In Thar district, Pakistan, women in the dry season have to trek for up to 10 miles in 45c heat, to get to the closest source of water. (UNICEF 1990). The contamination of water also affects women directly since women are responsible for household provision of water. Women have a greater contact with water because of their washing and cleaning chores and therefore, become more susceptible to several water-related diseases. As agricultural labourers and farmers, women have their productivity limited by the unavailability of one of the most important inputs to agricultural production.

Even though women in rural South Asia are so critically affected by the supply of adequate and safe water, they are often excluded from water resource policies and programmes which usually focus on cash crop production. Irrigation strategies rarely address women's concerns, their rights and uses, reflecting the entrenched biases in agricultural systems. In rural areas where piped water is a rarity, women need to be trained in operating maintaining and repairing private hand pumps, and community tanks so that they become self-reliant in accessing water supplies (INWID 1991).

* According to the World Development Indicators 2001, in 2000 the percentage of rural population with access to an improved water source in South Asian countries was: Bangladesh 97%, India 88%, Nepal 81%, Pakistan 88% and Sri Lanka 83%.

Source: UNFPA 2002a; FAO 2002b; UNEP 2002; World Bank 1989; UNICEF 1990; INWID 1991.

found new methods of managing and conserving wastelands assigned to them. In Sri Lanka, women discovered Gotkola which is domesticated in home gardens and is used for nutritional and medicinal purposes. In Pakistan, women possess knowledge of herbal medicines for both general and reproductive health. All these examples show that women all over South Asia are carrying out environmentally sustainable and preservation activities. However, they need to be able to pursue these activities. Where there is insecurity of tenure, activities such as tree planting may become economically unfeasible.[54]

Conclusion

Women form the vast majority of the 70 per cent of South Asia's population that live in rural areas. The number of rural women living in absolute poverty has risen during the 1990s. The preceding analysis shows that although it is understood that women are responsible for producing food, they have the least access to means of production, receive the lowest wages and know least about how to improve the productivity of land with modern inputs and technology. Migration by rural men to urban areas, or overseas, to escape poverty traps has increased the number of women who have to carry the full burden of earning income and managing households for their families; and there have been very few strategies and facilities to enable women to do so.

The numerous issues that affect rural women in South Asia are extremely complex as these are intertwined with the issue of women's status in South Asian society. The solution to these issues require affirmative action on the part of policy makers within governments; international agencies and non-

governmental organisations. Women should be included not only in the planning and designing of gender-sensitive development programmes but their input should be integrated in all agricultural projects pertaining to credit, fertiliser, pesticides, water, land reform, fuel-energy, marketing, institutional development and research. Recognising women's worth as economic producers is not only imperative for gender-equality but also to achieve larger South Asian objectives of higher economic growth, poverty alleviation and human development.

Chapter 8

Agricultural Marketing and International Trade[1]

Absence of a good marketing system may slow down the growth of agriculture

While technological improvements and use of higher inputs result in a higher level of output, in the absence of a good quality marketing system it may not improve the incomes of the farmers and may eventually slow down the growth of the agricultural sector. Inefficient marketing system siphons off private and public resources because of low farm-level prices and high retail-level prices. The significance of marketing has increased even further because of the advent of globalisation as it is expected to change the production patterns. Not only specialisation in accordance with the comparative advantages but also the rapid commercialisation calls for improvements in the marketing systems. Since most of the South Asian countries still rely heavily on the agricultural sector they must strengthen their domestic marketing system.

The structure of agricultural marketing in South Asia

Marketing efficiency of agricultural products depends on a number of factors including production, environment, seasonality in production, perishability of the product, and the farming system. The complexity of the agricultural marketing system increases when a large number of small farmers, dispersed all over the country have diverse production patterns. The distinctive characteristics of the region also constrain the agricultural marketing system resulting in impoverishment of the farmers.

As we have seen in previous chapters, the South Asian economies are dominated by the agricultural sector; share of agriculture in GDP ranges from 21 per cent in Sri Lanka to 41 per cent in Nepal. The high dependence on the agriculture sector is one of the factors for South Asia's low per capita GDP of US$ 2238 (PPP$), which, though it has shown a rising trend during the 1990s, is still far below other developing regions except Sub-Saharan Africa. More than 75 per cent of the regions' population lives in rural areas, and 57 per cent of the economically active population is directly involved in agriculture—ranging from 32 per cent in Sri Lanka to 87 per cent in Nepal (table 8.1).

Despite the dominant share of the agriculture sector in overall production, consumers are at risk of high price instability of food items[2]. Since the share of food in the household budget ranges from about 45 per cent in Pakistan to 65 per cent in India, the issue of food insecurity assumes great significance in the South Asia region (see chapter 6). A well-organised agricultural marketing system that helps them to specialize in high value added crops would go a long way in improving their wellbeing. It needs to be underscored that the South Asian region has a great potential of producing and exporting high value horticultural crops but most of the marginal and small farmers produce traditional food grain crops because they do not have access to proper marketing facilities. The need of a proper marketing system and post-harvest technologies is, therefore, obvious.

Table 8.1 Value added in agriculture and labour force (%)

Country	Rural population- % of total	Share in value 1990	Share in value 2000	Share in labour force [1995-97]	Food share in household budget
Bangladesh	76	28	24	62	63.4
India	72	31	24	57	65.4
Nepal	88	52	39	87	59.4
Pakistan	64	26	26	45	44.5
Sri Lanka	77	26	21	32	61.4

Source: Hoda nd; Shindo 2001; World Bank 2001.

Table 8.2 Marketing costs and margins in some of the agricultural commodities

Country	Commodity	Channel	Farmer's Price (Rs/qt)	Farmer Share (%)	Marketing costs and margins (%)		
					Cost	Margins	Total
India	Rice	Private	201.47	64.96	17.76	17.28	35.04
		Institutional	162.65	66.02	26.96	7.02	33.98
	Wheat	Private	144.70	65.77	20.00	14.23	34.28
		Institutional	140.85	66.83	27.48	5.69	33.17
	Apple	Private	230.44	41.90	34.97	23.13	58.10
		Institutional	339.30	51.21	26.21	21.58	47.79
Nepal	Onion	Private	89.40	40.64	35.70	23.66	59.36
	Rice	Private	–	69.04	18.96	12.00	30.96
	Wheat	Private	–	57.00	32.10	11.90	43.00
	Apple	Private	–	40.12	39.18	20.70	59.88
Pakistan	Wheat	Private	–	62 to 74	–	–	26 to 58
	Fruits	Private	–	28 to 41	–	–	72 to 59
	Onion	Private	–	44.00	–	–	56.00
Republic of Korea	Rice	Private	–	–	–	–	14.60

Source: FAO Four Decades of Agricultural Marketing Development in China, India, Republic of Korea, Nepal, Pakistan, Philippines and Sri Lanka, Bangkok, 1992. (cited in Sidhu 1997).

What is an efficient marketing system and how does it help the farming communities in raising their income level? The marketing efficiency can be evaluated by (i) quality and quantity of the goods brought to the market; and (ii) differential in the prices paid by the consumers and received by the producers. Inefficiency in the market comprises relatively high marketing margins due to either higher marketing costs or unusually higher profits or a combination of these two. Poor roads, lack of storage, high post harvest losses, poor handling are the main causes of higher marketing costs. Marketing profits are usually high in trading of those commodities that involve greater risks of losses and require greater capital investment in trade, in addition to the opportunities of exploitation.

Marketing costs in South Asia are very high. The farmers receive less than two-thirds of the cereal prices while in fruits and vegetables, their share is less than 50 per cent. In contrast, the farmers in Korea receive more than 85 per cent of the price of rice paid by the consumers (see table 8.2). Another important point that needs to be underscored is that the high marketing cost is both due to the marketing cost as well as margins, but the cost is almost two-third of the total marketing cost.

There are high post-harvest losses and severe quality damage in fruits and vegetables in South Asian countries (see table 8.3). The post-harvest marketing losses are as high as of 70 per cent in case of vegetables in Bangladesh and 46 per cent of fruits in Sri Lanka, which are quite high when compared with some other countries in Asia and the Middle East. In order to survive in the era of globalisation the post harvest losses will have to be reduced to improve their competitiveness.

There are various reasons for marketing inefficiency in Asia, the most important of these include the following[3]:

Table 8.3 Post-harvest losses in fruits and vegetables

Country	Fruits (%)	Vegetables (%)
Bangladesh	20-50 (All horticultural crops)	50-70 (deterioration)
India	20-30	16-62
Nepal	20-30	15-35
Pakistan	17-40 (Sindh)	
Sri Lanka	18-46	20-46
Republic of Korea	12-26	17-32
Malaysia	20	20
Indonesia	25	25
Thailand	23-28	23-28
Philippines	28-42	
Jordan	10	10

Source: Compiled from APO 2000.

Small farmers in South Asia are under a lot of pressure to sell their output immediately after harvest

- *Small scale production*: Small uneconomical and fragmented farm holdings have little or no marketable surplus, providing little inducement to farmers in direct marketing. Thus, the village dealers and traders exploit the farming communities. For example, in Bangladesh about 63 per cent of the marketed surplus is handled by the village dealers.
- *Seasonality in production and demand*: Crops are sown and harvested in a particular season creating supply glut and lowering prices. There is seasonal supply and demand even for animal and animal products.
- *Immediate need for cash*: The small farmers in South Asia are under a lot of pressure to sell their output immediately after harvest at very low prices. And towards the end of the year most of them buyback food grains at abnormally higher prices.
- *Lack of poor infrastructure and post-harvest facilities/technologies*: Many of the agricultural products are highly perishable and require an efficient marketing system including quick transportation, proper packaging and refrigeration. Improper packaging seriously damage fruits and vegetables reducing the shelf life of these products.
- Poor marketing knowledge, lack of accurate and timely market information, poor institutional support services are other bottlenecks.

State trading and its distortionary effects[4]

State Trading Enterprises[5] (STE) may have power or authority to influence the market decisions or to make a decision themselves regarding prices and/or quantities of traded commodities. However, the intensity of intervention in order to influence the direction of trade and prices depends on whether the institution is under direct government control or it works as an autonomous body.

There are various objectives of government intervention in the agricultural sector including food security, price stability, income support, industrial development, and protection of domestic markets[6]. Governments regulate agricultural marketing activities by selling or purchasing domestic produce, exporting or importing commodities. Regulatory activities in marketing and trade also include administering domestic prices, import and export restrictions like tariffs, quotas or outright bans.

STEs control a large number of the world-traded commodities and handle a significant share of the volume of trade. For example, 40 per cent of the world wheat, 50 per cent of rice, 38 per cent of barley (Australian and Canadian STEs), and 30 per cent export of dairy products (by New Zealand Dairy Board) are handled by STEs. Although Europe and USA do not use STEs to export dairy and dairy products, they provide heavy export subsidies. The operation of STEs and their potential role in avoiding commitments to reduce export subsidies are important issues because they use various ways and means to control production, imports and exports. Their operation involves assessment of levies on production and imports, export and import license requirements, export subsidies, provision of government guarantees on borrowed funds and minimum production prices. Though the importance and role of STEs vary from country to country, they accounted for about 13 per cent of the GDP in the world during the late 1980s and in a group of 10 developed countries, they accounted for 6 per cent[7].

Ingco and Ng[8] ranked 45 developing countries based on the role of STEs and their possible distortionary effects on trade. According to this ranking, seven countries—the list include Bangladesh and India—were considered to have STEs with 'strong' control on trade and distortionary effects. The sixteen developing countries where the role of STEs was considered to have 'medium'

control included Pakistan and Sri Lanka[9]. It also showed that about 30 per cent of the imports of food grains, edible oils, and meat were under the direct control of the STEs in Bangladesh, and 28 per cent of total imports of cereals, edible oil and fertiliser were under the control of the STEs in India. Pakistan used to have pervasive trade interventions through government agencies like Rice Export Corporation, Trading Corporation of Pakistan, PASSCO, Provincial Food Departments, and National Fertilizer Corporation. However, under the structural adjustment programmes' commitments Pakistan government has significantly reduced these market interventions. State trading in Sri Lanka is heavily involved in tea.

Marketing, globalisation and food security[10]

In the past 35 years, the achievement of higher agricultural growth rate to accomplish the objective of food self-sufficiency and higher return to farmers remained the major target of the South Asian countries. The main focus, however, has been the eradication of rural poverty. The Green Revolution encouraged the Asian countries to undertake massive investment in the agriculture sector and pursue national policies to accelerate the growth process. Consequently, South Asian countries were able to avoid famines and reduce the severity of poverty in the world's most densely populated region. The Green Revolution also helped to improve the general living standards of a large proportion of the people in Asian countries. This performance came about within the controlled market structures and with significant government interventions. Nonetheless, about one third of the population of the region is still below the poverty line.

The major concern in South Asia like any other developing country is food security and state trading is normally used to attain it. The policy to provide cheap food by subsidising the consumers, taxes the producers with adverse impact on the production and levels of incomes of the farmers. The instruments used by the state have been to institute price support programs, subsidising the transport and distribution and the provision of subsidy on inputs. With the advent of globalisation, some of these policies are being abandoned. But the South Asian countries must not abandon these programs in a hurry. They must ensure that their comparative advantage is not distorted by the inefficient policies of the developed world.

With the advent of globalisation, trade liberalisation and structural adjustment, South Asian countries have taken various measures to achieve competitiveness, efficiency in resource allocation and cost-effectiveness. Under these circumstances the scenario of food security, a major concern of developing countries needs to be seriously examined. This issue is being highlighted as a major challenge for the developing countries when the WTO rules are fully implemented. There is also a fear that most of the rapidly growing populated developing countries will not have enough purchasing power at the disposal of their consumers to enable them buy the imported food. Moreover, most of the South Asian countries have very low level of reserves and are facing further external debt problem leaving no room to ensure food security through reliance on imports[11]. The emerging multilateral trading system under the WTO, therefore, will have far reaching implications for food security in the South Asian region.

Better access to food depends on well-functioning markets and distribution networks, better infrastructure, adequate income and good governance. To provide better access to nutritional food, it is necessary to increase the income of the people. If agricultural markets are liberalised, the ability of countries to obtain affordable food supplies will vary depending on whether individual countries have traditionally been net food

Better access to food depends on well-functioning markets and distribution networks

importers and their overall ability to purchase or produce food supplies. In fact, this ability will depend on their competitiveness in world markets for non-agricultural products as well as agricultural products.

The Uruguay Round Agreement on Agriculture

In accordance with the spirit of the Agreement, subsidies should have been reduced, they in fact have gone up in the developed countries

The fundamental objective of the WTO Agreement on Agriculture (AoA) is to establish a fair and market-oriented agricultural trading system with a view to reducing existing and future distortions. It is expected that the agreement would stimulate investment and production by making conditions of agricultural market access transparent, predictable and competitive; strengthening the link between national and international markets; and the allocation of scarce resources into most productive use. Specifically, it focuses on the three main issues, viz., market access; domestic support programme; and export subsidies.

The Agreement on Agriculture (AoA) calls for removal of all non-tariff barriers and convert them into tariffs. Moreover, over a period of six years, customs duties on all products were to be reduced from an average of 36 per cent and by 15 per cent on each of the tariff lines.[12] However, because of a high degree of reliance on specific tariffs, and the use of compound tariffs with ad valorem and specific components, agricultural tariffs have become very complex and non-transparent. Instead of a decline, protection levels may have increased due to a number of factors. Firstly, the choice of the base period of 1986-1988 has been quite unfortunate because the protection was rather high during this period. Second, many countries used the flexibility in the modalities for the conversion of non-tariff measures in a manner that overstated the tariff equivalent. Third, the requirement of an average (weighted) 36 per cent reduction in tariffs resulted in a shallower reduction in tariffs for sensitive products. Fourth, tariff peaks continue to be a characteristic feature of the agricultural sector; tariffs remain prohibitively high on many products and tariff escalation still remains prominent. Fifth, implementation of Tariff Rate Quotas (TRQs), established for maintaining current access and granting minimum access, has also been problematic.

While in accordance with the spirit of the Agreement, subsidies should have been reduced, they in fact have gone up in the developed countries. The developing countries, however, are constrained because of the lack of financial resources to subsidise their agriculture sector. Therefore, they suffer from an inherent disadvantage as compared with the developed countries. As a mater of fact, AoA institutionalises the disparity by allowing developed countries to maintain 80 per cent of their base-level high average measurement of support (AMS), while prohibiting the developing countries from going beyond the de minimis level of 10 per cent set for them.

As regards export subsidies, developing countries are allowed two types of export marketing and transportation subsidies. They are also allowed investment subsidies for agriculture, input subsidies for low-income resource poor farmers and subsidies for diversification from narcotic crops. In addition, the so called 'green box' subsidies are also permitted, which may include government expenditure on agricultural research, pest control, and improved marketing; relief for natural disaster, regional assistance, and environmental programmes, and structural adjustment assistance. (box 8.1)

There is a consensus among the WTO members to continue negotiations over domestic price support programme, export competition rules and the issues related to Sanitary and Phytosanitary standards. (see box 8.2) The member governments at Doha, Qatar agreed that agriculture is now part of the single undertaking in which all the related

negotiations are supposed to be completed by 1 January 2005. The Doha Declaration explains special and differential treatment for developing countries including the SAARC member countries. The Declaration stresses that the outcome of the negotiations should be effective and should enable the developing countries to meet their needs, especially of the rural development and food security. The WTO agreement consists of certain provisions which give developing countries longer time period (10 years for developing countries as against 6 years for developed countries) for implementing the agreements to increase the trading opportunities.

Concern of developing countries over AoA

Three major concerns are:

- Market access: Despite some progress in securing a reduction of tariffs, the protection rates to agriculture in the developed economies continue to be rather high. The import duties must be reduced and eventually eliminated on developing-country agricultural products, including in their processed forms. There is a need for greater transparency to ensure that the *ad valorem* incidence of specific tariffs does not increase. Tariff rate quotas should be removed, as they distort comparative advantage.
- Domestic support: If the developing countries are to provide market access, Blue Box needs to be merged with the Amber Box category and subjected to reduction commitments.
- Exports Subsidies: All forms of subsidies must be eliminated. An agreement on export credit must be finalised well before the end of the negotiations. An agreement also needs to be reached for imposing disciplines on food aid so that its quantum does not increase when prices are low and decrease when prices are high.
- TRIPS Agreement: The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) supplements the basic World Intellectual Property Organization (WIPO) conventions with substantive obligations within WTO disciplines. It offers both benefits and costs, presents a major task of implementation for which developing countries may well need help. While TRIPs largely resulted from industrial concern, this has been used increasingly in the agriculture sector against the interests of

Box 8.1 Categorisation of subsidies to agriculture

The measures that have no, or at most minimal, trade or production distorting effects, were exempted from reduction requirements and are known as the Green Box measures. Also exempted from reduction commitments are the direct payments made conditional on limitation of production, as these are considered less distorting than open-ended price support known as the Blue Box. Investment subsidies that are generally available to agriculture, agricultural inputs subsidies generally available to low-income and resource-poor farmers and domestic support to encourage diversification from growing illicit narcotic crops, are also exempted from reduction commitments to be undertaken by the developing countries.

All others are lumped into Amber Box which are subject to reduction commitments. Each government is required to compute the aggregate measurement of support (AMS), the annual level of non-exempted measures provided to agriculture, expressed in monetary terms. Calculations for product-specific and non-product-specific support had to be shown separately. Where it came to less than the *de minimis* level of 5 per cent (10 per cent for developing countries), there was no requirement to undertake reduction commitments. In other cases, WTO members were required to reduce their total AMS by 20 per cent over a period of 6 years (13.3 per cent over 10 years for developing countries).

Source: Subramanian 2002.

Box 8.2 Sanitary and phyto-sanitary standard agreement

The agreement allows restriction of imports if on the basis of scientific knowledge, it can be demonstrated that without imposition of a particular standard on imports of specific products, there is a risk of disease and contamination. While in case of disputes, the affected country can approach a WTO panel for examination of the standards, the developing countries have limited resources and technical abilities to challenge such rulings. The developing countries, therefore, feel that the developed countries are using SPS measures to protect their local markets by denying market access. It needs to be underscored that in most of the cases conditions imposed by the developed countries cannot be met because production technologies are simply not available in the developing countries. The levels at which health, food subsidy and crop and animal diseases control standards are set in these countries indicate the potential risk to the exports of developing countries. Under the SPS agreement each country has the right to determine the level of sanitary and phytosanitory protection, and as such they can misuse and deny the access to developing countries.

Source: Subramanian 2002.

Box 8.3 Protection of traditional knowledge

While the developing countries are home to about 90 per cent of the world's genetic resources and traditional knowledge, more than 90 per cent of the world's research and development activity takes place in the industrial countries. Whereas gene-rich, technology-poor South and a technology-rich, gene-deficient North shows the potential for mutually beneficial bargains between the two groups, a number of prominent companies of the North are using plants or resources found in developing countries without remuneration. Even worse, the bio-piracy has led to the development of patented product by western firms of the southern origin which developing country may have to buy at a rather high price.

Developing countries are seeking to protect two related but distinct resources, viz:, traditional or indigenous knowledge, and genetic resources, which include seeds, endoplasm, rare animal and plant species. They do so because firstly, plants and other organisms are natural biochemical factories and yield many products that enhance human welfare. Secondly, bio-diversity has important eco-logical functions that sustain plant and human life, i.e. protecting watersheds, regulating local climates, maintaining atmospheric quality, absorbing pollutants, and generating and maintaining soils, among others. The developing countries that have genetic resources must institute a regime of property right protection and their proprietary rights should be internationally recognised.

Source: Subramanian 2002.

Table 8.4 Growth in food and fertiliser subsidy: India

Year	Food subsidies	Fertiliser subsidies
1971-80	32.26	–
1980-90	18.67	29.66
1990-00	16.91	12.85
1991-95	23.74	4.28
1995-00	10.78	15.31

Source: Srivastava and Rao 2002.

developing economies. The majority of developing countries do not confer legal protection on plant or animal varieties and rely heavily on informal innovation, traditional knowledge and the presence of bio-diversity in developing and conserving varieties. Further moves towards higher, internationally standardised levels of IPR protection could affect them significantly. (see box 8.3)

Table 8.5 Aggregate measurement of support in selected economies

	Years	Aggregate measurement of support (US $ million)	Share of agricultural products %
South Asian countries			
India	1995-96	-23847	-31.1
Pakistan	1996-97	-56.9	-0.03
Sri Lanka	1996	0.0	0.0
Developed economies			
Australia	1997-98	89.4	0.5
European Union	1995-96	61309.1	22.9
Japan	1996	30547.7	32.5
United States	1997	6238.4	3.1

Source: Freeman *et al.* 2000.

Subsidies in South Asia

While South Asian economies have historically subsidised agricultural inputs, the level of subsidies has generally exhibited a declining trend. For example, food subsidy in India fell from 32.26 per cent in 1971-80 to 16.91 per cent in 1999-2000. Similarly, fertiliser subsidy sharply declined from 29.7 per cent in 1980-90 to 12.9 per cent in 1999-2000 (see table 8.4).

In South Asia, agricultural producers receive administered prices that are below world market prices (see table 8.5). In general, the aggregate measurement of support (AMS) levels for South Asian economies are far lower than for most of the developed countries and in case of India and Pakistan AMS levels have been negative.

Agricultural trade in South Asia: Policies and trends

It is generally believed that trade liberalisation can bring gains to both importing and exporting countries and can lead to economic growth. In spite of the establishment of the South Asian Association for Regional Cooperation (SAARC), the intra-regional trade among the South Asian countries is very low, at about 2 per cent of their total trade. In recent years, almost all the South Asian economies have reoriented their trade strategies from import substitution to export promotion. The export promotion policies in these countries broadly consist of a host of fiscal incentives in the form of tax exemptions, duty drawbacks, and bank credit at concessional rates.

Growth performance of the agriculture sector

Only when agricultural output is significantly higher than the rate of population growth, surpluses become available for export. In South Asia, even in the recent past, most countries have maintained a reasonable increase in per capita agricultural production.

In Pakistan, the growth rate in agriculture increased from 1.9 per cent in 1999 to 7.2 per cent in 2000. In Bangladesh, the GDP growth increased from 4.9 per cent in 1999 to 5.5 per cent in 2000. In India, the average agricultural output grew by 2.5 per cent during 1995-2000. In Sri Lanka, the agricultural sector slowed due to the unfavourable weather conditions and the fall of paddy price in 1999. The average growth rate was 1.9 per cent during 1995-2000. In Nepal, a favourable weather and extensive use of fertiliser led to strong agricultural recovery in 2000 to 5 per cent, the average growth rate during the period remained at 2.8 per cent. In Maldives, the growth rate increased to 5 per cent in 1999 and than declined to 1 per cent. In Bhutan, the growth in the agricultural sector is 2.4 per cent in 2000 as compared to 3 per cent in 1999 (table 8.6).

Table 8.6 Growth rate of value added in agriculture %

(per year)

Country	1995	1996	1997	1998	1999	2000	Average growth rate
Bangladesh	-0.3	3.1	6	3.2	4.8	6.4	3.87
Bhutan	4	6.4	3.1	1.3	3	2.4	3.37
India	-0.9	9.6	-1.9	6.5	0.7	0.9	2.48
Maldives	1.6	1.9	1.3	7.3	4.	1	2.85
Nepal	-0.3	4.4	4.1	1	2.7	5	2.82
Pakistan	6.6	11.7	0.1	3.8	1.9	7.2	5.22
Sri Lanka	3.3	-4.6	3	2.5	4.5	2.5	1.87

Source: ADB 2001a.

Mechanisation of agriculture

A comparison across roughly twenty years from 1979-81 to 1997-99 indicates that the number of tractors increased 2.5 times for all the South Asian countries except Sri Lanka (table 8.7). The tractorisation along with oil engines and electric motors resulted in partial mechanisation of major operations such as water pumping, threshing, ploughing and sowing, etc. Besides, the increase in numbers, the quality of tractors, tubewells, threshers and other hand tools and implements has greatly helped in improving agricultural productivity in the region. The extensive use of the irrigation system in developing the network of tubewells has resulted in a large-scale adoption of high yielding varieties especially in India, Pakistan and Bangladesh.

Trade orientation

The process of trade liberalisation in most of the South Asian economies has begun only recently. After independence India pursued inward oriented policies. Pakistan, in the beginning, followed outward-oriented policies based on private sector development but later changed this policy. By the 1970s, almost all the countries in the region were pursuing inward oriented policies giving more authority to the state in determining their development priorities. By the late 1980s, most of the South Asian countries had started pursuing outward-oriented policies, and by the early 1990s, most of the countries in South Asia were more liberalised than ever before. The South Asian economies have also witnessed sharp structural changes over the years. As shown in previous chapters, the share of agriculture in GDP declined but the agriculture sector still plays a dominant role.

Share of agricultural commodities in trade

In most of the South Asian countries the population growth rate is still very high and poverty is prevailing in most of the region. In such circumstances, the most

Table 8.7 Agricultural machinery

Country	Tractors per 1000 agricultural workers		Tractors per 1000 sq. km. of arable land	
	1979-81	1997-99	1979-81	1997-99
Bangladesh	0	10	5	7
India	2	6	24	92
Nepal	0	0	10	16
Pakistan	5	12	50	150
Sri Lanka	4	2	141	84
South Asia	2	5	25	91
East Asia and Pacific	2	2	55	74
Latin America and Carib	25	36	95	118
Sub-Sahara Africa	3	1	23	16
World	19	20	172	188

Source: World Bank 2002a.

Table 8.8 Structure of merchandise exports

	Merchandise exports		Food		Agricultural raw materials	
	$ millions		% of Total		% of Total	
	1990	2000	1990	2000	1990	2000
South Asia	27790	64252	16	15	5	1
Bangladesh	1671	6500	14	7	7	2
Bhutan	–	–	–	–	–	–
India	17975	42295	16	14	4	1
Maldives	–	–	–	–	–	–
Nepal	210	804	13	21	3	0
Pakistan	5589	9173	9	11	10	3
Sri Lanka	1983	5134	34	21	6	2
East Asia and Pacific	220936	711644	12	6	5	2
Latin America and Caribbean	143146	356115	26	21	4	3
Sub-Saharan Africa	66402	92560	13	17	3	4
World	3432703t	6355992t	10	7	3	2

Source : World Bank 2002a.

important consideration is the availability of food to the poor segments of society. Expansion of agricultural trade has a direct relationship to poverty reduction and high economic growth. Amongst the SAARC member states, India is the biggest market in the region both in terms of population and volume of trade. Its major agricultural exports include cotton and cotton products, textile, rice, leather, computer software and information technology products. Pakistan has an exportable surplus of wheat, cotton, and cotton products, rice, textile, leather and leather products. Bangladesh exports jute and jute products and garments and has the potential to export rice. The rest of the member states have even fewer items to trade amongst the region.

Table 8.9 Structure of merchandise imports

	Merchandise imports		Food		Agricultural raw materials	
	$ millions		% of Total		% of Total	
	1990	2000	1990	2000	1990	2000
South Asia	39329	79318	9	10	4	4
Bangladesh	3618	8360	19	15	5	5
Bhutan	–	–	–	–	–	–
India	23642	50455	3	7	4	3
Maldives	–	–	–	–	–	–
Nepal	686	1573	15	17	7	5
Pakistan	7546	11048	17	14	4	3
Sri Lanka	2685	6823	19	15	2	1
East Asia and Pacific	230644	620409	7	5	5	3
Latin America and Caribbean	120526	381064	11	8	3	2
Sub-Saharan Africa	56179	85932	–	10	–	2
World	3516422	6565299	9	7	3	2

Source : World Bank 2002a.

Over the past two decades, composition of exports of the South Asian countries has gradually shifted from primary commodities towards manufactured goods (table 8.8). In 1990, the share of food in the total merchandise exports of South Asia was 16 per cent that came down to 15 per cent in 2000. The decline in the exports of agricultural raw material is significant as compared to food, the share of agricultural raw material (unprocessed) in the total merchandise exports declined from 5 per cent in 1990 to 1 per cent in the year 2000. A comparison of South Asia with the other regions in the world, East Asia & the Pacific and Latin America & the Caribbean had also declining shares of agricultural commodities in their total merchandise exports, while Sub-Saharan Africa and low-income countries show an increasing trend.

The share of food in the merchandise imports of South Asia increased from 9 per cent in 1990 to 10 per cent in 2000, while the share of agricultural raw material remained at the same 4 per cent level (table 8.9). In India, the increase in food imports has been two fold, increasing from 3 per cent in 1990 to 7 per cent in 2000 while the share of raw material imports declined from 4 per cent to 3 per cent. A declining trend in both food and raw material imports was observed in the case of Pakistan. Share of the low income countries has almost doubled from 7 per cent to 14 per cent for food and from 3 per cent to 5 per cent for agricultural raw materials. The share of the world as a whole has declined over time for agricultural commodities.

Conclusions

The conclusion of the Uruguay Round of trade negotiations heralded a new era of liberal trade. Trade liberalisation is based on the general assumption that it would

help improve the income levels of the developing countries in various ways. The main driving force behind that would be the comparative advantage in production of various agricultural commodities enjoyed by the developing countries, since most of them are low cost producers. Consequently, there would be greater demand for exports resulting in expansion in output of tradable commodities leading to higher income and thus will have a positive impact on food security. Moreover, trade would also result in higher foreign investments in developing countries and transfer of better technologies. However, there are reservations about whether the developing countries would be able to benefit from free trade in the face of large subsidies by developed countries, and even if there are potential benefits then which group within these countries would share those benefits. It is being argued that the major beneficiary would be the commercially oriented farms, while the South Asian agricultural system is dominated by the small subsistence farmers who often lack necessary resources to produce exportable surplus.

The South Asian economies have witnessed sharp structural changes over the years. Although the share of agriculture in GDP has declined in all the countries of the region, the agriculture sector continues to play a dominant role in the economy in view of the huge number of people that are dependent on this sector for income and employment, and the importance of agricultural produce both for food security as well as providing raw materials for industries and exports. However, the composition of exports has gradually shifted from primary commodities towards manufactured goods.

To benefit from the new era of globalisation it is essential on the part of the developing countries to improve management capacity of the farming community, invest in physical infrastructure and communication, improve agricultural marketing which is a major bottleneck for improving agricultural productivity, and providing support to traditional subsistence farmers to ensure food security of the poor, which has always been a stated objective of agricultural policies in the region.

In the era of globalisation under WTO, dominated by a large number of regional organisations, it would be difficult for any one country to face the severe rules of international trading regime. Therefore, regional associations like SAARC can play a significant role in developing a collective position in the WTO negotiating forums.

Regional associations like SAARC can play a significant role in developing a collective position

Chapter 9

National Agricultural Experience

The past decade as a whole has been disappointing in terms of aggregate growth performance in agriculture

India[1]

Agriculture remains the lifeblood of economic activity in India. The process of development (and industrialisation) entails the progressive transfer of labour and resources from agriculture to other sectors, and this is typically associated with a reduction in its share of national income and an even sharper decrease in agriculture's share of aggregate employment. In India, however, over the past five decades, while the first process has been evident to some extent, the second process has been negligible in its extent. This points to two features: the failure to generate dynamic sources of additional employment in non-agricultural sector which would encourage the movement of workers out of agriculture, and the lack of success in raising the aggregate social productivity of labour in the country, which is crucial to sustained growth and development.

This basic assessment must be combined with a more nuanced view of recent trends in agriculture. The most crucial fact relating to the last decade has been the growing integration of the Indian economy with the global economy, through both trade and capital markets. This has had major effects on agriculture as well as on other sectors. But there are several ways in which the impact on agriculture has been both significant and quite different from what was anticipated at the start of the most recent 'globalisation' phase.

Some aspects of the agrarian question which remain crucial to understanding both short-run macroeconomic processes and longer run growth patterns include:

- the extent to which agricultural output growth constrains or encourages non-agricultural growth through the usual mechanisms of raw material supply, food and wage goods supply, foreign exchange earned by agriculture and demand for manufacturing and other activities;
- the influence of non-agricultural activities on agricultural growth, through mechanisms such as infra-structure and machinery inputs, foreign exchange requirements, demand for agricultural goods, etc.;
- the nature of employment generation in the countryside, in both agricultural and non-agricultural activities; and
- the pattern of technological change and sustainability of farming practices.

Trends in crop production

The past decade as a whole has been disappointing in terms of aggregate growth performance in agriculture. For several decades before the 1990s, the Indian economy experienced a secular growth rate of foodgrain production of around 2.5 per cent per annum, which was a little higher than the population growth rate. Over the 1980s, there was an acceleration of the growth in output, with all foodgrains except coarse cereals showing relatively high rates of growth, led by yield increases rather than acreage expansion[2]. The output of oilseeds also increased very rapidly, and even cotton production showed a healthy expansion.

However, the subsequent period has shown a decline in rate of output growth for every single one of the major crop categories. Over the 1990s, the growth rate of foodgrain production dropped to 1.66 per cent per annum which was lower than the population growth rate of 1.9 per cent in the same period. This was not only the lowest average rate since the

mid-1950s, but also amounted to a dramatic drop when compared with the earlier decades[3] (table 9.1).

The fall in production cannot be blamed on lack of area expansion, because the 1990s actually experienced a more rapid rate of area expansion than the 1980s, for most crops. Rather, it was the collapse in yield growth that explained the deceleration in output growth. To some extent this reflected the easing down of the process of the spread of the Green Revolution techniques to other regions (particularly the eastern region) which had marked the 1980s.

One important reason for concern is the continuing slackness in agricultural investment. To a large extent this is due to the collapse in public investment in agriculture, which has fallen by 6 per cent in real terms between 1994-95 and 1999-2000. While private investment has picked up to some extent, it has not been enough to reduce the slide in the already low share of agricultural investment in GDP, from 1.6 per cent to 1.4 per cent over this period. Clearly, the expectation that reforms which liberalised external trade, and consequent relative price incentives, would act as positive stimuli for agricultural investment has been belied by the experience.

Indeed, despite the freeing of export restrictions, total agricultural exports actually declined from $6.83 billion in 1996-97 to only $5.75 billion in 1999-2000. Over the same period, agricultural imports rose steadily, nearly doubling from $1.4 billion in 1996-97 to $2.6 billion in 1999-2000. While vegetable oils were the largest source of growth of imports, cereal and pulses imports were also prominent over this period. One important characteristic of the 1990s was the shift, on balance, from net imports to net exports for foodgrain. Obviously, while net foodgrain exports can be a sign of domestic self-sufficiency and market saturation, they need not be so : India was a net exporter of foodgrain even in the late 19th century, when much of its population was denied access to adequate food.

Table 9.1 Area, production and yield of major crops (% increase)

	1980-81 to 1989-90		1990-91 to 2000-01			
	1990	2000	1990	2000	1990	2000
Rice	0.41	3.62	3.19	0.63	1.70	1.16
Wheat	0.47	3.57	3.1	1.21	3.04	1.81
Coarse Cereals	-1.34	0.4	1.62	-1.84	0.06	1.65
Pulses	-0.09	1.52	1.61	-1.02	-0.58	0.27
Total foodgrains	-0.23	2.85	2.74	-0.2	1.66	1.34
Oilseeds	-1.51	5.2	2.43	0.44	0.66	0.61
Sugarcane	1.44	2.7	1.24	1.72	2.62	0.89
Cotton	-1.25	2.8	4.1	2.21	0.92.	-1.26
Total non-foodgrains	1.12	3.77	2.31	0.84	1.86	0.59

Source : GOI, Agricultural Statistics in India, various issues.

Table 9.2 gives the state-wise breakdown of the growth in domestic product (SDP) from agriculture and of the Cost of Production Surveys (COPS) gross value of output (GVO), both at 1993-94 constant prices. It is clear that the deceleration from the beginning of the 1990s was widespread, with only the southern states of Karnataka, Kerala and Tamil Nadu possibly bucking the trend. In five states, Andhra Pradesh, Bihar, Gujarat, Orissa and Uttar Pradesh, collectively accounting for more than half the population, the rate of output growth fell below the rate of growth of rural population. The most dynamic state during both the 1980s and 1990s was

Table 9.2 Agricultural growth rates by state

	SDP 80-81	COPS GVO	SDP 80-81	SDP 93-94	COPS GVO
Andhra Pradesh	1.97	3.29	0.56	1.14	0.98
Assam	2.20	1.51	2.09	2.04	1.60
Bihar	3.13	2.29	-0.14	-1.93	0.03
Gujarat	0.80	-0.51	-0.41	1.26	0.97
Haryana	5.46	5.68	0.64	2.37	2.18
Karnataka	2.34	-0.25	3.23	3.37	0.97
Kerala	3.72	NA	3.99	3.95	NA
Madhya Pradesh	3.34	2.72	3.57	3.25	5.09
Maharashtra	4.67	4.14	0.96	4.31	0.85
Orissa	1.86	5.54	-1.98	0.38	-1.15
Punjab	5.19	4.67	2.40	2.96	1.15
Rajasthan	4.60	3.85	3.40	2.92	3.20
Tamilnadu	3.36	2.56	4.19	4.69	1.91
Uttar Pradesh	3.00	2.20	1.81	2.39	1.60
West Bengal	6.14	4.96	5.15	5.65	3.69
Total of major states	3.38	2.96	1.98	2.69	2.01

Note: TE: Triennium ending, SDP: State Domestic Product, COPS: Cost of Production Surveys, GVO: Gross value of output.

Source : GOI, Estimates of State Domestic Product, various issues; GOI, Cost of Production Surveys, various issues.

clearly West Bengal, while the only other states which recorded consistently high agricultural growth (over 3 per cent per annum) were Kerala and, possibly, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu.

Trends in agricultural incomes

The National Account Statistics provide estimates of the rural-urban breakdown of national income whenever a series with new base is prepared. These show that the importance of agriculture in total rural incomes has been declining over the decades. Nonetheless, the latest such estimate, for 1993-94 when the base year was last changed, implies that the National Domestic Product (NDP) from agriculture is about 55 per cent of rural NDP. The performance of agriculture thus continues to be the most important determinant of the well-being of the rural population.

Estimates of the growth performance of the agricultural sector are available from the Index Numbers of Agricultural Production (IAP) computed by the Directorate of Economics and Statistics, the Ministry of Agriculture and from estimates of National and State Domestic Products compiled by the Central Statistical Organisation (CSO). Growth rates computed from these sources are given in table 9.3, which also gives growth rates computed from the Comprehensive Scheme for the Collection of Cost of Production of Major Crops in India (COPS)[4]. With the exception of the IAP, which is purely a quantum index, the growth rates are presented for both the constant price series and for the series at current prices deflated by the state-specific Consumer Price Index for Agricultural Labourers (CPIAL). The former measures agricultural production, whereas the latter measures real incomes from agriculture taking into account movements in relative prices.

Two basic conclusions emerge from the data summarised in table 9.3. First, that terms of trade tended to move in favour of agriculture during both the 1980s and 1990s, causing real incomes in agriculture to grow more rapidly than physical production. Second, these data

Table 9.3 Rates of growth in agriculture

	At constant prices		At CPIAL deflated current prices	
	TE 83-84 to TE 90-91	TE 90-91 to TE 99-00	TE 83-84 to TE 90-91	TE 90-91 to TE 99-00
Index of Agricultural	3.79	2.10	NA	NA
Production	3.79	2.10	NA	NA
From National Account Statistics, 1993-94 base				
GDP from agriculture	3.47	3.06	5.02	3.82
GVO from agriculture	3.35	3.01	4.45	3.37
GVO from crops	2.97	2.73	3.72	3.22
GVO from forecast crops	3.67	2.03	3.82	2.39
GVO from cereals	3.59	2.04	2.44	3.19
GVO from pulses	1.55	0.45	6.00	-0.96
GVO from oilseeds	6.79	2.16	7.81	-0.61
GVO from fibres	3.96	2.20	4.79	1.91
GVO from sugarcane	2.44	2.82	4.61	4.38
State Domestic Product from Agriculture of 15 major states				
1993-94 base	3.38	2.69	4.53	3.46
1980-81 base	3.38	1.98	4.53	2.38

Note: GDP: gross domestic product, GVO: gross value of output, TE: triennium ending.
Source: GOI, Estimates of State Domestic Product, various issues; GOI, National Accounts Statistics, various issues; GOI, Cost of Production Surveys.

Table 9.4 Changes in distribution of agricultural incomes

	Rates of growth				Hired Labour Payments as % of the total of FBI and HLP		
	Farm Business Incomes (FBI)		Hired Labour Payments (HLP)				
	TE 1983-84 to TE 1990-91	TE 1990-91 to TE 1999-00	TE 1983-84 to TE 1990-91	TE 1990-91 to TE 1999-00	TE 1983-84	TE 1990-91	TE 1999-00
Andhra Pradesh	4.74	1.11	6.00	1.10	29.16	31.18	31.28
Assam	0.90	3.15	5.36	-0.44	11.03	14.40	10.81
Bihar	1.16	-1.79	7.14	0.15	11.43	16.23	19.33
Gujarat	4.71	-1.42	-3.75	5.78	18.44	11.23	30.47
Haryana	8.24	2.29	1.72	6.45	10.37	6.88	9.62
Karnataka	1.17	-0.77	1.89	2.56	16.66	16.92	21.75
Madhya Pradesh	2.85	3.15	6.68	5.01	10.44	13.17	15.07
Maharashtra	8.10	-2.67	6.14	3.71	19.92	18.04	27.89
Orissa	8.64	-2.99	8.10	1.82	17.41	17.07	23.72
Punjab	4.31	3.25	2.83	2.13	16.35	15.07	13.98
Rajasthan	5.61	2.71	0.13	8.07	5.41	3.87	5.89
Tamilnado	5.79	1.55	2.92	5.06	32.18	27.64	34.47
Uttar Pradesh	0.79	2.75	3.17	3.11	8.93	10.34	10.62
West Bengal	2.71	4.80	7.07	2.61	24.64	29.78	25.74
All 14 states	3.61	1.47	4.40	3.1	15.0	15.71	17.7

Source: GOI, Cost of Production Surveys.

confirm, as we saw from the estimates of crop production provided earlier, that agricultural growth (whether in terms of production or income) decelerated during the 1990s.

However, the magnitudes of change differ considerably across series. The present official GDP series (with 1993-94 as base) shows growth of agricultural production decelerating only from 3.5 to 3 per cent and of incomes only from 5 to about 4 per cent, implying fairly robust growth even during the 1990s. Against this, the IAP decelerated from almost 4 to 2 per cent. This implies insignificant per capita growth during the 1990s.

The rates of growth of output and prices are very different across crop groups, as is evident from table 9.3. According to the official GDP series with 1993-94 as base, cereal production was static during the 1990s in terms of per capita of rural population, but there was a sharp terms of trade improvement. For pulses, oilseeds and fibres, per capita output peaked in 1996-97 and there was significant terms of trade loss from 1994-95 onwards. Output per capita of other crops and livestock continued to increase till 1998-99, but again there was some terms of trade loss during the 1990s.

The plausible assessment on the basis of all available data is that overall agricultural production probably grew at around 3.5 and 2.2 per cent per annum during the 1980s and 1990s, respectively and, adjusted for terms of trade, farm real income growth was around 4.5 and 2.5 per cent per annum during these two periods. This implies that in terms of per capita of rural population, annual growth of income and output during the 1990s were around 1 and 0.5 per cent respectively. In addition, there has been virtually no growth in per capita agricultural output and incomes after 1996-97, according to any series. Therefore, it is likely that per capita agricultural real incomes have actually declined after 1996-97 due both to very low yield growth for most crops and substantial terms of trade loss for non-cereal crops. This implies a significant shift in income distribution in the economy away from agriculture.

An important question relates to how the income growth which has occurred in agriculture been divided between cultivators and wage workers. The only consistent time series available for this is from the COPS data. Table 9.4 gives the rates of growth of Farm Business Incomes and Payments to Hired Labour

Table 9.5 Rate of growth of real agricultural wage rates

	Agricultural wages in India		COPS	
	TE 1981-82 to TE 1990-91	TE 1990-91 to TE 1999-00	TE 1981-82 to TE 1990-91	TE 1990-91 to TE 1999-00
Andhra Pradesh	4.91	1.02	4.64	2.20
Assam	4.73	-0.61	4.86	1.05
Bihar	5.53	-0.55	6.59	-1.09
Gujarat	1.05	3.86	2.80	2.83
Karnatka	4.74	1.75	3.08	2.93
Madhiya Pradesh	3.10	2.42	4.56	1.76
Maharashtra	6.91	1.85	4.31	2.32
Orissa	5.32	1.62	6.62	2.18
Punjab	4.27	0.41	0.81	1.93
Rajasthan	0.51	2.08	2.30	4.33
Tamilnadu	2.75	6.69	2.95	6.03
Uttar Pradesh	3.10	1.83	4.25	0.49
West Bengal	9.50	1.03	6.67	0.96
All 14 States	4.66	2.14	4.13	2.24

Source: 1. GOI, Cost of Production Surveys.
2. GOI, Agricultural wages in India.

(both deflated by CPIAL) and also the ratio of Hired Labour Payments to the sum of this and Farm Business Incomes.

The data on distribution between Farm Business Incomes (FBI) and Hired Labour Payments (HLP) show that at the All-India level, the rate of growth of both of these have decelerated in real terms over the two decades, with the deceleration more marked in the case of Farm Business Income. Nonetheless, despite this implicit increase in wage share, there has been a very marked deceleration in the growth rate of real agricultural wage rates (table 9.5), accompanied by some increase in the growth rate of hired labour use.

For the 14 major states considered in table 9.5, both the series show a significant deceleration in the rate of growth of real wages over the 1990s as compared to the previous decade. At the level of individual states, there are three broad groups:

- In Andhra Pradesh, Bihar, Maharashtra, Orissa and Punjab, the growth of both FBI and HLP has decelerated. In all these states there has also been a marked deceleration in the growth of labour use. The growth of real agricultural wage rates in all these states has been less than the national average during the 1990s, and, with the possible exception of Punjab, these are all states where growth of the implicit real wage rates are low and have also decelerated. Thus, the increase in wage share has occurred along with slower growth in incomes of wage workers.

- In Gujarat, Haryana, Karnataka, Rajasthan and Tamilnadu, FBI growth has decelerated but HLP growth has accelerated. In these states, too, HLP growth now exceeds FBI growth, but here the growth of overall labour use has accelerated and is significantly larger than in all-India. In none of these states is there evidence of a deceleration in real wage rates and in fact rising wage rates appear to have eaten into farm incomes.

- In Assam, Madhya Pradesh, Uttar Pradesh and West Bengal, FBI growth accelerated while HLP growth has decelerated. Interestingly, except for Assam, growth of hired labour use has accelerated in these states, implying significant deceleration in the growth rate of the implicit real wage rates. The most interesting case is that of West Bengal where real wage rate growth was amongst the highest in the 1980s but fell below the all-India average

Box 9.1 Demystifying employment statistics

The National Sample Survey (NSS) in India collects employment data by three reference periods: (i) one year (Usual Status), (ii) one week and (iii) every day of the reference week. Within Usual Status, Principal Status (PS) refers to main employment over the year. Those who report themselves as not usually working throughout the year, are included in the Usual Status category as Subsidiary Workers (SS) if they were gainfully occupied for some part of the year. Thus Usual (PS+SS) is always higher than Usual (PS), the difference mainly involving female workers. The number of workers by weekly status is the subset of Usual (PS+SS) who worked during the reference week, but for a particular industry the number of weekly status workers could be larger than Usual (PS+SS) if the industry of work during the week is different from the usual industry. The daily status is a flow measure of the number of full days put in by weekly status workers, so that the ratio of the two is a measure of the frequency of employment.

Thus the NSS classifies activities according to the major time spent. The activity on which a relatively longer time is spent is defined as the 'Principal Status' activity, those in which a relatively shorter time is spent is defined as a 'Subsidiary' activity. Subsidiary activities include a whole range of economic activities which may be extremely minor in terms of the actual time employed in them—for example, if a single cow is regularly milked every morning or if a chicken is fed daily by a member of the rural household, that could be included as a subsidiary activity under livestock rearing.

In a significant break from past Survey Rounds, the 55th Round enlarged the coverage of Subsidiary Status activities. In the questionnaire schedule, the past practice was to record the details for only one subsidiary usual economic activity of all the members of the household. However, in the 55th Round, two subsidiary usual economic activities pursued by members of the household for relatively more time were recorded. While this would certainly add more valuable information about the nature of rural economic activity, it would also mean that more such activities would be covered than were covered earlier. This could lead to an impression of employment expansion and diversification which would appear to be more than in previous Rounds even if it simply reflected the greater recording of such activities. This could make the data from the 55th Round less comparable to that extent.

According to the weekly status definition, the NSS reports a person as working if he or she had worked (i.e. pursued any economic activity) for at least one hour on at least one day during the 7 days preceding the date of survey. Even by this very restrictive definition, the 55th Round results suggest that the proportion of male population who had not found any work for even an hour in the previous week had increased dramatically. For women too, the unemployment rate by weekly status definition shows an increase.

during the 1990s despite fairly rapid growth of farm incomes.

Trends in agricultural employment

When the first results of the 55th Round of the National Sample Survey (conducted in 1999-2000) were released, it was already apparent that there had been some major shifts in patterns of employment, especially in the rural areas. The 55th Round indicated a substantial decline in the share of agriculture and a rise in the share of non-agriculture in employment. In itself this could be a positive sign of progress and diversification, but it was associated with a fairly large drop in work participation rates of both men and women, which indicated a deceleration in aggregate employment growth.

Such a deceleration has now been confirmed by data emerging from the 2001 Census. When the estimated population is used to estimate the total number of those in some form of employment in 1999-2000, it yields results which show an even sharper drop in the rate of growth of rural employment generation than was previously supposed (table 9.6), although the fall in urban employment growth is less severe. Thus, the combined estimates suggest an average annual rate of growth of aggregate rural employment growth of only 0.58 per cent over the period between 1993-94 and 1999-2000. This makes it not only as low as around one-fourth of the previous period's rate, but also the lowest such rate of increase observed since the NSS first began recording employment data in the 1950s.

Table 9.7 gives growth rates of All India rural employment by these different concepts (see box 9.1). Interestingly, the growth rate by daily status is generally lower than by the usual weekly status after 1987-88, having been higher earlier. This fits in with the fact that daily status unemployment increased between

Table 9.6 Annual growth rates of rural employment according to census

(per cent per annum)

	Male	Female
Main	0.31	0.49
Marginal	23.3	7.82
Total	1.73	3.18

Source: GOI 2001.

Table 9.7 Rural employment growth by reference periods

(Usual Status)

	1977-1978 to 1983	1983 to 1987-88	1987-1988 to 1993-1994	1993-1994 to 1999-2000
Total employment, PS	1.6	1.45	2.01	1.23
Total employment, PS + SS	1.89	1.23	2.14	0.66
Agricultural employment, PS	1.11	0.43	2.08	0.8
Agricultural employment, PS + SS	1.45	0.33	2.17	0.18
Non-agricultural employment PS	3.73	5.27	1.76	2.6
Non-agricultural employment PS + SS	3.97	4.86	2.02	2.34

Source: Sarvekshana, various issues.

1987-88 and 1993-94 and increased further in 1999-2000, after declining during 1977-78 to 1987-88. Also, post-1987-88, the weekly status growth rate is higher than usual status for agriculture but lower for non-agriculture, having been the opposite earlier. This suggests fewer usual status agricultural workers finding non-agricultural work (or more usual status non-agricultural workers having to resort to agriculture) so that the situation as regards rural non-agricultural employment is probably even worse than indicated by the sharp reduction in growth rates by usual status.

The data in table 9.7, providing rates of growth of employment from the large samples of the NSS, show very significant deceleration in rural job creation in both agriculture and non-agriculture over the latest period 1993-94 to 1999-2000, although the slowdown is sharpest for agricultural employment. Indeed, all agricultural employment (that is, Principal Status plus Subsidiary Status) shows the sharpest slowdown of all. The increase in non-agricultural employment evident from table 9.7, was not sufficient to prevent the rate of total rural employment growth from falling well below the rate of rural population growth over this period.[5] In general, therefore, there is a substantial decline in the rate of employment growth in agriculture.

However, despite what appears to be a very disturbing picture in terms of employment growth, there are those who have argued that the 55th Round data actually reflects many positive features and that the slowdown in employment growth is not really cause for concern. This argument is based on two points: the rise in the number of those attaining education, and the increase in non-agricultural employment. The shift of workers out of agriculture can be seen as a sign of accelerated development. Thus, it is argued that the fall in work participation for both males and females actually reflects a large increase in the number of those who would earlier have been in the work force and are now in full time education, especially in the age group 15 to 19 years. The increase in education is in any case a very welcome sign, and if it explained all of the decline in work force participation, then it would clearly be even more cause for celebration. Similarly, non-agricultural work has increased not only relative to those in employment, but also as a proportion of population compared to the last large sample of the NSS in 1993-94. There has been an argument that such an increase generally reflects a process of diversification of employment which is a necessary and desirable feature of development, rather than a distress sign of inadequate employment generation within agriculture. There are others who have seen it as the result of public expenditure patterns which

generate non-agricultural employment in particular periods.

But in actual fact interpreting this movement requires more analysis of the context in which it is occurring. Neither the increase in those who are in full time education nor the shift to non-agriculture in the rural areas is sufficient to explain the drop in agricultural employment, which is why it is reflected in the dramatic drop in rural work participation rates for both men and women (see table 9.8).

While the 55th Round does show a fairly sharp drop in primary employment, this is in marked contrast to all the previous small sample rounds of the 1990s. At first glance, the data suggest that for rural male workers, diversification away from primary employment had occurred, albeit slowly, in the period until 1990, that this process had been halted and even reversed over the 1990s, and that the change in 1999-2000 would indicate a recovery to the levels of one decade earlier. However, there is scope for more detailed analysis into this process. For rural women workers, the primary sector has continued to dominate in employment.

As far as male employment in agriculture and non-agriculture is concerned, the pattern suggests that much of the subsidiary economic activity for rural males tends to be some form of agricultural activity rather than non-agricultural work.[6] For rural women, the fall in primary sector employment does not appear to have been compensated for by a commensurate increase in non-agricultural employment for rural females, but more by their removal from the work force. For both males and females, the overall decline in work participation needs to be explained by either education or unemployment, or a combination of the two. The proportion of males in education has indeed increased, but this increase is not as substantial as the fall in aggregate employment rates would lead us to expect. In fact the 55th Round shows very little difference from the earlier rounds in this respect, merely conforming to the generally upward trend but with no sharp additional increase. Similarly for rural females, there is a continuation of the earlier upward trend in terms of participation in education, but the increase is not large enough to explain away the fall in aggregate employment rate (as per cent of population)[7].

As for trends in unemployment, it should be noted that they tend to be very low in rural areas because of the complete absence of any form of social security. The strong divergence between usual status and current weekly status definitions of unemployment points to the actual lack of availability of jobs or productive occupations in the country-side.

Since the decline in work participation rates cannot be fully explained by either

Table 9.8 Rural employment by type and sector

(as per cent of Usual Status workers)

	Males			Females		
	Self-employed	Regular	Casual	Self-employed	Regular	Casual
1983-88	60.5	10.3	29.2	61.9	2.8	35.3
1987-88	58.6	10	31.4	60.8	3.7	35.5
1993-94	57.9	8.3	33.8	58.5	2.8	38.7
1999-2000	55	8.8	36.2	57.3	3.1	39.6
	Males			Females		
	Self-employed	Regular	Casual	Self-employed	Regular	Casual
1983	77.5	10	12.2	87.5	7.4	4.8
1987-88	74.5	12.1	13.4	84.7	10	5.3
1993-94	74.1	11.2	14.7	86.2	8.3	5.6
1999-2000	71.4	12.6	16	85.4	8.9	5.7

Source: Sarvekshana, various issues.

Table 9.9 Rural unemployment rates

(per cent of labour force)

	Usual status		Weekly status		Daily status	
Year	Males	Females	Males	Females	Males	Females
1983	2.1	1.4	–	–	7.5	9
1987-88	2.8	3.5	13	5	4.6	6.7
1993-94	2	1.3	17	8	5.6	5.6
1999-2000	2.1	1.5	21	10	7.2	7

Source: Sarvekshana, various issues.

education or unemployment, it seems that there must be other factors which are affecting the rates. In developed countries, much is made of the 'discouraged worker effect', which means that those who find it difficult to get jobs often withdraw from the labour force. This is likely to have much less relevance in the Indian rural economy context where informal and self-employment figure much more prominently, where social security systems are lacking and where the luxury of open unemployment is simply not available to most of the poor population. Nevertheless, the data do suggest that even in an economy like that of rural India, where no social security systems exists, many people simply describe themselves as 'not in the labour force' when the possibilities of finding gainful employment appear to be too remote.

This points to a very serious crisis of employment generation in rural India. The aggregate picture, therefore, is one that must lead to pressure for reorienting the macroeconomic strategy towards the basic goal of increasing productive employment opportunities in the rural areas as well.

The crisis in the food economy

There is little question that the food and agriculture situation in India is in a state of crisis. This is now a crisis of fairly long duration, whereby for nearly two years now, some of the more disturbing aspects have continued without any abatement. Thus, cultivators have been in distress because of rising costs and inadequate financial returns on sales. Foodgrain stocks held by the public sector, which mounted to several multiples of the desired level of stockholding, have continued to remain high and even increased. Meanwhile, there is continued incidence of chronic absolute poverty and malnutrition among a significant section of the population, and areas of distinct food shortage also remain.

The original objectives of India's public food management system were threefold: to maintain a reasonable degree of price stability; to provide some producer incentives to cultivators by ensuring that prices remained above estimated costs; and to provide a degree of food security to consumers. The system rested on the twin pillars of public procurement with minimum support prices provided at farmgate for a range of major crops, and public distribution organised at the state level through a network of Fair Price Shops providing some food items at subsidised prices. Of course, it could be argued that the system was never completely successful, either in terms of its spread, or in terms of fully achieving its basic objectives. Nevertheless, over the 1970s and 1980s, the network did certainly expand in physical terms and Indian food and agricultural prices were certainly more stable than world market prices for such commodities.

However, in the 1990s the system came under increasing pressure, and even under attack, as various measures, aimed at first targeting access to the Public Distribution System (PDS) to only those officially defined as 'poor' and then at reducing the subsidy offered to other

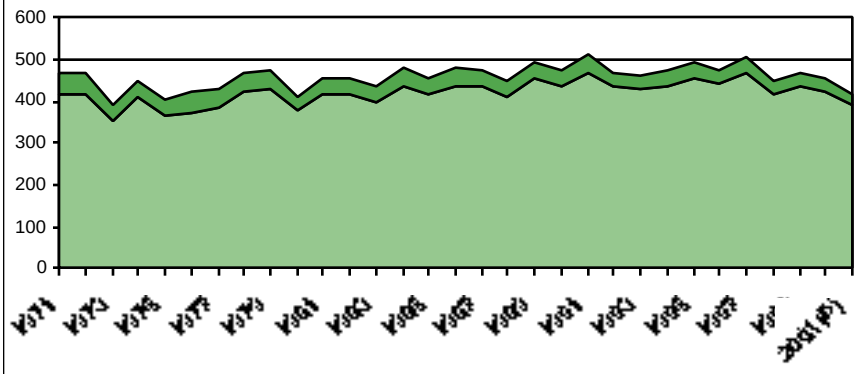
consumers, undermined the consumer network. These measures, which were supposed to reduce the food subsidy, had precisely the opposite effect of increasing it, because they led to declining offtake (sales) from the Fair Price Shops. Because procurement levels did not decline but rather increased, this led to the growth of stocks held by the Food Corporation of India, and therefore to higher carrying costs of holding all this excess foodgrain. The current level of publicly held food stocks is estimated to be in excess of 64 million tonnes, compared to the buffer norms of 16-24 million tonnes.

In consequence, the revised estimate of food subsidy for 2001-02 is a record Rs. 17,612 crore on disbursals basis, and total expenditure is likely to be at least 20 per cent larger when amounts outstanding against stocks held by state governments are cleared. Of this, the dominant part is the carrying cost of foodgrain stocks, which exceeds Rs. 12,000 crore. This happens to be larger than the Central Government's combined plan and non-plan expenditure on agriculture, rural development and irrigation & flood control.

To address this situation, most progressive economists in the country have called for a comprehensive programme of public works, especially in the rural areas, which would allow some of the excess food stocks to be used productively and, therefore, bring the public stocks down to reasonable levels within a few years. This would also have the important effects of building/ maintaining rural infrastructure and providing much needed rural employment. However, instead of this, the government has chosen to try and export food at very low prices, rather than use the grain within the country.

These policy moves are taking place in a context of overall deterioration of per capita availability of foodgrain, as is evident from figure 9.1, which shows longer term trends in net per capita availability of foodgrains, in terms of grams per day. This is where the failure of the food strategy really becomes apparent. It is clear that the 1990s have witnessed no trend increase in per capita availability of foodgrain, and in recent years the situation has deteriorated even relative to the levels achieved thirty years earlier. The last five years, in particular, exhibit declines in per capita availability of both cereals and pulses. In fact, per capita cereal availability in 2001, at 417 grams per day, was the lowest it had been since 1975, which was itself a very bad year.

Figure 9.1 Per capita net availability of foodgrain



Source: GOI 2002.

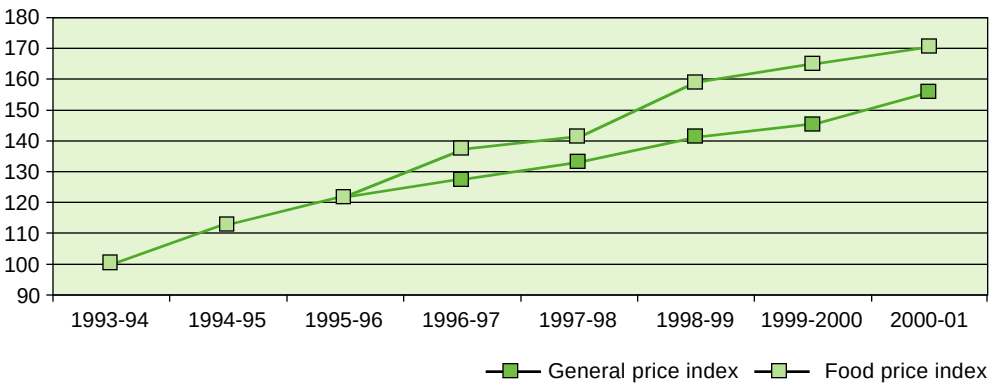
It has been argued by some economists and policy makers that this does not reflect more adverse food consumption patterns, but rather a positive shift in demand and diversification towards non-grain foods. While there is some evidence of a diversification of consumption pattern away from cereals towards other food, data from different sources differ substantially on the precise extent. It should also be borne in mind that even food consumption is price sensitive, and relative prices of foodgrain have moved faster. In fact it has been convincingly argued[8] that the increase in the relative price of food, particularly of cereals, is a major factor explaining why the incidence of poverty did not decline during the 1990s, despite an increase in the mean real per capita consumption as measured by the NAS. Rural poverty did not decline during the nineties both because there was somewhat higher inequality within the rural sector and because the rural real mean consumption lagged considerably

Table 9.10 Average per capita availability foodgrains

	Grammes per day
1971-1975	443
1976-1980	442
1981-1985	456
1986-1990	474
1991-1995	482
1996-2001	463

Source: GOI 2002.

Figure 9.2 Food and general inflation



Source: GOI 2002.

behind its urban counterpart, causing negligible or even negative growth in the real consumption of the bottom 40 per cent of the rural population. A very significant role in this has been played by the higher relative price of food, as evident from figure 9.2.

The build-up in public stockholding of foodgrains has occurred largely because of the growing disparity between public procurement (which forms an essential part of the Minimum Support Price operations designed to guarantee cultivators a floor price that covers costs) and distribution across the country, which is supposed to ensure food security of consumers. The gap is of fairly recent origin: in fact, as recently as 1997, public foodstocks were below the buffer norm at 15 million tonnes. However, they have increased continuously thereafter, with the largest increases occurring in the past two years, to reach the present high levels.

Annual procurement had averaged 21.9 million tonnes during 1991-97. Since then this has increased in every successive year to reach more than 42 million tonnes last year. Meanwhile, annual PDS offtake, which averaged 17.3 million tonnes during 1991-97, declined steadily from 18.6 million tonnes in 1998 to 12.7 million tonnes in 2001. This imbalance between procurement and offtake essentially reflects unrealistic administered prices at both points of the system. Minimum Support Prices have increased (often due to political pressure) in ways that have caused more output to be sold to the Food Corporation of India, regardless of public requirements. This is why the share of public procurement as a share of domestic production has gone up so much. In the period 1996-2001 this amounted to 17.2 per cent of production, substantially more than in previous periods, and more than double the level in the 1970s.

Procurement prices for rice and wheat, the largest items in public foodgrain stocks, increased much faster than the general price level from the mid-1990s. That was also contrary to the international trend: from 1996 world prices of rice and wheat were falling. The process of reduced offtake over time can be explained by the rising issue prices of foodgrain at Fair Price Shops over the 1990s. The situation was aggravated in 1996-97 by the introduction of the targeted PDS, which made PDS less attractive to those above the poverty line (APL) and increased the unit subsidy for those below the poverty line (BPL) but on a reduced initial quota of only 10 kilograms per household per month. This immediately resulted in a reduced offtake from 19.7 million tonnes in 1996-97 to an average of 17.5 million tonnes for the next three years.

Subsequently, in April 2000, an attempt was made to reduce the food subsidy by increasing all issue prices for APL households to the full economic cost, charging BPL households half the

economic cost but doubling the monthly quota to 20 kilograms per household. While this led to a small increase in offtake by BPL households (from 7 to 9 million tonnes), the overall impact was hugely negative because of a collapse in offtake by APL households (from 10 to only 2 million tonnes). This not only contributed to the damage to the PDS system in general, it was also counterproductive in fiscal terms since it increased the carrying costs (and therefore the losses) of the Food Corporation of India, and the overall food subsidy therefore actually increased.

In the aggregate, price inflation has been more marked for food items than for all commodities, as indicated in figure 9.2. Even the food index for the consumer price index for industrial workers has been growing faster than the overall CPI-IW. And this has been accompanied by other features of food price behaviour which are disturbing, such as higher volatility. India's past record in food price stabilisation was good, but instability has increased very markedly in recent years.

Agriculture and trade openness

The expectation of enhanced benefits from agricultural trade, was one of the main reasons why a range of developing countries were persuaded to sign the Uruguay Round GATT Agreement, which otherwise had several elements which were prejudicial to their interests. The Agreement on Agriculture (AoA) apparently promised reduction of subsidies on agriculture by the major OECD countries, which had kept world prices of many primary agricultrual commodities much lower than they would otherwise have been. It also promised greater market access for the crop products of export interest to developing countries. So widespread was the expectation that these promises would be largely fulfilled, that the concern of countries like India was dominantly on the effects of increased exports and higher international prices of agricultural goods than on domestic food security.

In the event, of course, these expectations have been almost completely belied. The small print in the Agreement on Agriculture made it possible for the major OECD countries to continue with high levels of subsidy, by transferring the payments to different official categories. A recent OECD study found that subsidy levels in the OECD member countries, after falling slightly in 1995-96,were back to their pre-Uruguay Round levels by 1999-2000. The recent anouncement of a new US Farm Bill, which substantially increases the extent of farm subsidy, is nothing more than the continuation of the now established recent trend. This has been associated with low and falling prices of many primary products in international markets as the combination of continued subsidy and low international demand, because of low aggregate growth, made itself felt. Most agricultural commodity prices have been falling in dollar terms, especially since 1996. In India, as domestic prices have come closer to international relative prices because of increased openness, some food prices have been rising, as we have seen, but this has not really meant a large increase in agricultural exports as a result. Meanwhile, food security concerns have become, if anything, more acute.

By the turn of the decade there were at least two major sources of concern in Indian agriculture, and both of these concerns have intensified in the more recent period. The first was the mess in the food sector, reflected in the unprecedented holding of foodgrain stocks by the public sector combined with lower prices faced by cultivators. The second was the combination of low prices and output volatility for cash crops. While output volatility increased especially with new seeds and other inputs, the prices of most non-foodgrain crops weakened, and some prices, such as those of oilseeds, plummeted. This reflected not only domestic demand conditions but also the growing role played by international

Food security concerns have become, if anything, more acute

prices consequent upon greater integration with world markets in this sector. These features in turn were associated with growing material distress among cultivators.

In a closed economy, lower output is normally accompanied by some price increase. Therefore, coincidence of lower production with lower terms of trade was very rare until recently. The emerging pattern of lower prices accompanying relatively lower output reflects the effect of the growing integration of Indian agriculture with world markets resulting from trade liberalisation. As both exports and imports of agricultural products were progressively freed, international price movements were more closely reflected in domestic trends. The stagnation or decline in the international prices of many agricultural commodities from 1996 onwards meant that their prices in India also plummeted, despite local declines in production. This was not always because of actual imports into the country: the point about openness is that the possibility of imports or exports can be enough to affect domestic prices at the margin.

The stagnation or decline in the international prices of many agricultural commodities from 1996 onwards meant that their prices in India also plummeted

This was graphically illustrated in the case of various cash crops. Thus, for example, the fall in the prices of oilseeds, raw cotton and pulses during the 1999-2000 peak marketing season occurred despite lower production of these crops. So farmers faced the double disadvantage of prices being low at a time of reduced output. As it happens, world market prices of almost all important agricultural commodities have slumped since 1996, as developed countries have continued with high levels of direct and indirect subsidies despite the stated claims of the GATT's Agreement on Agriculture. Along with this, the slowdown in world economic growth has contributed to a further weakening of primary product prices in recent years.

The shift away from quantitative restrictions on imports for a range of agricultural commodities at the end of the decade obviously accentuated this tendency, creating a much greater linkage between world and Indian prices. The international competitiveness of Indian agriculture became more critically dependent on world price movements which were still more volatile than domestic prices. This made it unlikely that more open trade would automatically stabilise domestic prices or ensure that farmers get adequate incentives or even the correct price signals for the future. Indian farmers, therefore, faced much greater volatility in a more unprotected environment.

An additional issue for farmers was that, even as the uncertainties related to international price movements became more directly significant for them, progressive trade liberalisation and tariff reduction in these commodities made their market relations more problematic. Government policy did not adjust in ways that would make the transition easier or less volatile even in price terms. Thus, there was no evidence of any co-ordination between domestic price policy and the policies regarding external trade and tariffs. For example, an automatic and transparent policy of variable tariffs on both agricultural imports and exports linked to the deviation of spot international prices from their long-run desired domestic trends, would have been extremely useful at least in protecting farmers from sudden surges of low-priced imports, and consumers from export price surges. Such a policy would prevent delayed reactions to international price changes which allow unncessarily large private imports (as occurred in 1999 for edible oils, sugar, wheat, cotton, and even broken rice). It would, therefore, allow for some degree of price stability for both producers and consumers, which is important especially in dominantly rural economies like that of India. In the absence of such minimal protection, Indian farmers had to operate in a highly uncertain and volatile international environment, effectively competing against highly subsidised large producers in the developed countries, whose average level of subsidy amounted

to many times the total domestic cost of production for many crops.

It is in this highly uncertain environment that the government has been attempting to reduce explicit and implicit subsidies provided to farmers, whether in the form of fertiliser subsidy or reduced rates of user charges for water and electricity. This has meant increased monetary costs even as the Minimum Support Price mechanism is no longer adequate to ensure that market prices will remain above costs for most direct sellers.

In effect, the government is no longer able to meet the basic objectives of agricultural price policy, which were to stabilise prices and ensure producer incentives, while simultaneously protecting the poor against undue food price increases. In consequence, agricultural investment and output, as well as food security, have been adversely affected. Even production has not increased according to the expectations of the reformers, because some important aspects of the reform process, such as the reduction of public investment in rural areas and the attempts to cut subsidies leading to higher input costs, actually worsened the conditions of cultivation.

Another adverse effect has come from the financial liberalisation policies which have involved the reduction of 'priority sector' lending norms for banks. Since the most important prioirty sector was agriculture (along with small scale industries) this has meant a significant decline in rural credit from formal channels, which has had major effects in terms of costs and feasibility of cultivation. The irony is that the rural sector continues to contribute its savings in the form of deposits to the banking system, which has made rural credit-deposit ratios alarmingly low. The reduced access and higher cost of agricultural credit obviously mean not just an increase in costs of cultivation, which has not been given adequate policy notice, but also adversely affect private investment in agriculture.

The recently announced medium-term (2002-07) Export-Import Policy of the government has given special attention to agriculture. It puts the focus of trade policy on a range of measures that will further liberalise the export trade, especially with respect to agricultural exports, and provide some fiscal incentives including duty neutralisation and other tax incentives to exporters.

The Policy contains a number of measures specifically for agriculture. Quantitative restrictions have been lifted on exports of all commodities except onion and jute. There is provision for a transport subsidy for exports of fresh and processed fruits, vegetables, floriculture, poultry, dairy products and products of wheat and rice. Registration requirements, which were earlier necessary for farm exports, have been removed. The minimum export price condition has been lifted. While these will obviously reduce bureaucratic delays and assist more exports, there are questions about how small cultivators facing large and often monopsonistic distributors would be able to manage.

The policy reflects the government's perceived need to somehow get rid of the large public stocks of foodgrains through more (effectively subsidised) exports. Because this attempt may come up against WTO regulations, the Exim Policy proposes an internal transport subsidy on movement of foodgrain from Food Corporation of India (FCI) godowns to the nearest port, which it believes will bypass the WTO restrictions. In addition to all this, twenty agri-export zones (AEZs) have been sanctioned, covering mainly horticultural products. The 13 existing Special Economic Zones (SEZs) are also to be allowed to open overseas banking units, which are effectively offshore banks free from domestic restrictions such as those on Cash-Reserve Ratio and Statutory Liquidity Ratio. These zones have been promised further tax concessions as well.

However, this over-emphasis on agricultural exports can have very

The government is no longer able to meet the basic objectives of agricultural price policy

deleterious consequences for domestic consumption patterns. Already in the past decade, the rate of growth of foodgrain production has fallen below the rate of growth of population, for the first time since Independence. It is not clear that diversion of cropped area to cash crops will either benefit the poor or ensure the long-term food security of the country. In fact, the experience of export-oriented agriculture in Sub-Saharan Africa and its consequences is anything but inspiring, as the current near-famine conditions in parts of that region suggest.

A basic question, of course, if whether the new GMO technology is safe

Biotechnology and plant varieties protection

Modern biotechnology, especially the creation of Genetically Modified Organisms (GMOs), is often presented as a magic solution, or universal panacea for the problems of poverty, inadequate food access and nutrition, and even environmental degradation in the world. Conversely, there are others who present the picture of Frankensteinian monsters and major human health hazards being created by science which interferes too rapidly and too intensively with long-term natural processes of transgenic evolution. The reality, as always, is far more complex than either of these two extremes. Even today, total food production is adequate to feed the hungry of the world; the problem is rather of unequal distribution, which deprives a large part of the population of even their minimal nutritional requirements. Similarly, farmers, especially in developing countries, face many problems which biotechnology does not address, much less solve: lack of infrastructure, poor or unstable market access, volatile input and output prices, and so on.

Recent problems with the effects of new methods of livestock rearing in European agriculture in particular—such as BSE (or Mad Cow disease) and foot and mouth disease—have underlined the problems that many of the technological changes currently in the process of being utilised in agriculture can have unforeseen consequences, and their safety and future viability are far from secure.

It is true that transgenic plants can offer a range of benefits which are above and beyond those which emerged from more traditional innovations in cultivation. It is suggested that such new technology offers more effective pest resistance of seeds and crops through genetic control mechanisms, which also reduces the need for pesticide use; leads to improved yield; improves tolerance to biotic and abiotic stress; and also offers nutritional benefits in areas where traditional breeding methods have been unsuccessful. All this also means that such technology can reduce the adverse environmental impact, by producing crops that tolerate cultivation in stressful conditions, introducing GM traits that control disease (especially root disease) and allow farmers to cultivate where reduced tillage is essential.

But a basic question, of course, is whether the new GMO technology is safe, and this is clearly absolutely crucial, since the effects may only be known much later. The jury is still very much out on this matter, and the controversy does not appear to be resolved quickly. The controversy over BT-cotton seeds, which have recently been approved by the India government for general use by cultivators, but are still considered by many experts as problematic because of the potential problems of super-pests and superweeds, is a case in point.

On the pro-GMO side, it is argued that this is a valuable technology for all the reasons outlined above, and is essentially an extension of traditional breeding methods, which encouraged the combination of desirable traits within species. It is further argued that all GMOs have been tested and demonstrated safe prior to reaching markets and final consumption, and that they have been consumed for some years now in the United States without any evidence to indicate that they are harmful. The opponents, on the other hand, argue that

in any new technology, it is always possible that harmful side effects may occur much later, and therefore there need to be long term tests on health and environment before its implementation. Similarly, unlike traditional plant breeding methods, the new technology uses artificial laboratory techniques to combine genes that would never occur in nature, which really means altering genetic patterns that have developed over millions of years. Similarly, the pre-testing of GMOs has generally been on laboratory animals rather than human beings, and the effects may be quite different, especially over time. It is pointed out that the effects of BSE on beef consumption and its implications for human health also appeared after a very long time lag and was not something that would have been evident through short term laboratory tests.

The trouble is that many governments in developing countries have relatively low food and beverage regulatory standards, and public systems for monitoring and surveillance of such items are poor or non-existent. This is also true of India, despite official efforts to introduce some degree of system and regulation in the cultivation and consumption of food. This leaves them open for entry and even dumping of a range of agricultural products of the new technology which may not pass regulatory standards in the more developed countries. Currently the international systems for ensuring some degree of uniformity in this do not exist, and therefore citizens of poor developing countries will be relatively disadvantaged in this matter.

There are also problems of sustainability for farmers in developing and tropical/sub-tropical countries like India, which may arise from the newer lab-based technologies. There is greater need to tailor agricultural technologies to variable but unique circumstances, in terms of local climate, topography, soils, biodiversity, cropping systems, market insertion, resources, and so on. For this reason, farmers have over millennia evolved complex farming and livelihood systems which balance risks—of drought, of market failure, of pests, etc.—with factors such as labour needs versus availability, investment needed, nutritional needs, seasonal variability, and so on. Typically their cropping systems involve multiple annual and perennial crops, animals, fodder, even fish, and a variety of foraged wild products. When transgenic varieties are introduced into such cropping systems, the risks are much greater than in the farming systems of western countries.

It is now recognised that loss of biodiversity, especially because of new cultivation practices, can have very negative implications for the future sustainability of agriculture. There is also recognition that the rate of decline of diverse biological species has accelerated in recent times. There are several reasons for this. One significant factor has been the rapid expansion of industrial and Green Revolution agriculture, intensive livestock production, industrial fisheries and aquaculture that cultivate relatively few crop varieties in monocultures, rear a limited number of domestic animal breeds, or fish for, or cultivate, few aquatic species. Production systems using GMOs only accelerate this trend. Also, the process of globalisation of the food system and marketing, and the extension of industrial patenting and other intellectual property systems to living organisms have led to the widespread cultivation and rearing of fewer varieties and breeds for a more uniform, less diverse but more competitive global market.

This has had a number of consequences which also affect the conditions of biodiversity. These include the marginalisation of small-scale, diverse food production systems that conserve farmers' varieties of crops and breeds of domestic animals, which form the genetic pool for food and agriculture in the future. Similarly, reduced integration of livestock in arable production reduces the

Loss of biodiversity, especially because of new cultivation practices, can have very negative implications for the future sustainability of agriculture

Box 9.2 Terminator seeds

An aspect of new seed technology which is of some potential concern relates to so-called 'terminator' seeds. Currently, while there is an attempt to ensure patent-style protection for commercial seed companies, the TRIPS regime is vague on this and the only treaty (the UPOV Convention) is signed by relatively few countries. In this context, the seed industry has sought to develop technologies in which protection is actually concocted biologically, through the development of seeds in which a certain quality collapses or cannot be transmitted through natural reproduction.

The most widespread example of biological protection is hybridization. The yield factor of F1 hybrids deteriorates in subsequent generations, forcing farmers to buy fresh seed from the company every year or two. Earlier, not many crops could be hybridized in an economically feasible way, but this is changing with the new biotechnology. It is estimated that to date, over 60 patents have been awarded worldwide related to hybrid seed production using genetically engineered cytoplasmic male sterility. Another related development in biological protection is Genetic Use Restriction Technology, more popularly known as 'terminator' seeds. These prevent farmers from saving seeds since the genetically engineered plants will not germinate in subsequent generations or will not express a particular trait (such as herbicide resistance) unless sprayed with specific chemicals that activate the right gene.

After widespread public outcry when such seeds were introduced in several developing countries, several major companies have insisted in public that they will not pursue the technology. Nevertheless, already 60 patents on such terminator technology have been identified—25 of them held by a single seed company, Syngenta of Switzerland laboratory—and field tests of plants transformed with this technology have already taken place in the US and UK. Some of these seeds are being attempted to in introduced in India by certain major multinational seed companies.

diversity of uses for which livestock are needed. As a result, locally diverse food production systems are under threat and, with them, the accompanying local knowledge, culture and skills of the food producers. All this has caused agricultural biodiversity to diminish. This is exacerbated by the loss of forest cover, coastal wetlands and other 'wild' uncultivated areas, and the destruction of the aquatic environment. This also leads to losses of 'wild' relatives, important for the development of biodiversity, and losses of 'wild' foods essential for food provision, particularly in times of crisis.

Recent changes in agricultural biotechnology have both good and bad implications for cultivators and consumers, but they are still not adequately understood (see box 9.2). This is why it is so crucial to ensure that proper systems of regulation, monitoring, surveillance and discipline are set up to regulate new technologies for cultivation and food production which may have health and nutrition implications, and also may have unforeseen implications in the specific and more complex conditions of our agriculture.

The recent decision by the Indian government to join UPOV is cause for some concern (see box 9.2). The Indian Plant Varieties Protection and Farmers Rights Act was formulated for registration of new as well as extant varieties of seeds. In a more farmer friendly stance, it provides for the farmer many rights denied under UPOV. It also includes a provision for passing on a share of benefits to local communities whose knowledge contributes to the evolution of a plant variety. While UPOV provides for registration of only new varieties of plants that are uniform, distinct and stable, India presently allows registration of both new as well as existing varieties that have the same attributes. In an international system like the UPOV, there needs to be systemic interaction between systems of registration of extant variety and new variety. This is crucial for India since it has a rich variety of plants being traditionally produced, and these could be exploited by new registrations that are recorded in countries that do not record extant varieties or acknowledge them. Being a member, India will be obliged to recognise those rights, sometimes at the cost of its own traditional cultivators. On the other hand, UPOV by its very nature will not recognise the registered extant varieties and cannot secure for India any special benefits.

Policy issues

The analysis of the previous sections makes it clear that the longer-term goals of agricultural growth and rural development, as well as the currently pressing requirements of employment generation and poverty reduction, cannot be tackled adequately through a macroeconomic strategy that relies on liberalisation and deregulation to deliver growth. Instead, there should be attempts on the part of the government to address these problems directly, in the context of a broader macroeconomic policy framework that reinstates the crucial role of public investment in infrastructure development and aggregate capital formation.

Macroeconomic strategies

There is absolutely no doubt that the current economic situation in India urgently requires a significantly enhanced role of the government, and agriculture is no exception to this. Since the Indian economy is now in the midst of recession, with excess food stocks as well as a large build-up of foreign exchange reserves, there is the obvious Keynesian case for a counter-cyclical fiscal stance with increased expenditure to stimulate recovery in the economy. But there is more to it than that. The decline in public investment, and in public expenditure in the rural areas, must be reversed. This will have positive effects in both short term and long term. The immediate multiplier effects of spending will increase employment and economic activity. And increased public spending, especially in much-needed rural infrastructure, will enhance future growth prospects by easing supply bottlenecks and increasing productivity. In addition, there is need for more provision of public resources to address the problem of inadequate rural credit, by setting up and providing resources to more rural banks, cooperative societies and other formal financial institutions, which should also be encouraged in other ways to direct credit towards agriculture.

The standard counter-argument of proponents of neo-liberal reform is that these policy options are infeasible since they would result in an increase in the fiscal deficit and contribute to the already unsustainable level of public debt. There are three reasons why that argument is fallacious. First, insofar as food stocks carried by the government in 2001, which added to its expenditure, would constitute a significant chunk of the 'expenditure' incurred on a food-for-work programme, it would make no difference to the fiscal and debt situation. Second, even to the extent that such a programme involved a non-food financial component, that additional expenditure would in large part be financed by the increases in tax and non-tax revenues of the government that an increase in output and demand would entail. And, finally, given the already low

Box 9.3 TRIPS and agriculture

The TRIPS agreement, to which India is a party, requires among other things, all signatory countries to generate either a patent or a *sui generis* system for protection of plant varieties. This would imply that any future use of such varieties would have to be made against a royalty payment. Currently the multinational seed industry is promoting the Union for the Protection of New Varieties of Plants (UPOV) as the appropriate system of *sui generis* protection. UPOV is a small intergovernmental organisation (with mainly industrialised country members) that administers common rules for the recognition and protection of PVP internationally.

Through successive revisions of the 1991 UPOV Convention, the rights granted to breeders have become more and more similar to those granted under the patent system. While breeders get exclusive commercial control over the reproductive material of their varieties and the right to enforce licenses, farmers planting PVP-protected varieties are prohibited from saving seeds for replanting except under highly restricted conditions. An extreme example of the kind of control over cultivators that could result from such an orientation is when the major company Monsanto hired the detective agency Pinkertons to report on farmers' seed use and cultivation practices in the United States, and farmers were forced to allow these detectives access to their fields.

There is currently tremendous pressure on developing countries to sign this Convention or to introduce PVP broadly in consonance with the fairly stringent requirements of UPOV. Since PVP is not explicitly covered by a WTO trade agreement, and the application of TRIPS is not possible since the wording of the TRIPS agreement is ambiguous in this area, multinational seed companies and their political lobbies have been exerting pressure on developing countries to sign this Convention or to introduce PVP broadly in consonance with the fairly stringent requirements of UPOV.

levels of the tax-GDP ratio in India, the government was definitely in a position to increase tax rates and widen the tax base to raise the tax-GDP ratio. This would go a long way in financing the expenditures that would be incurred.

The last of these reasons points to a second area in which initiatives are required to halt and reverse trends associated with the neo-liberal reform process, namely, the long-term decline in the tax-GDP ratio. It is no doubt true that intensifying the tax effort and allowing, if necessary, the deficit on the government's budget to rise, while making economic sense in the current context, would be received with alarm by foreign capital, in particular foreign financial capital. This has provided advocates of reform with the argument that such moves, when not favoured by international finance, can lead to a decline in capital flows and even capital flight that would precipitate a financial crisis.

The terms on which foreign financial capital flows into and operates in the country need to be regulated

This, however, does not mean that the effort at adopting appropriate economic policies aimed at restoring domestic economic balance should be abandoned, but rather that the terms on which foreign financial capital flows into and operates in the country need to be regulated. Policies such as minimum lock-in periods, differential rates of capital gains taxation for gains registered through short and medium-to-long-term investments and even a transactions tax of the Tobin-tax kind need to be imposed, to reduce the volatility of, as well as the country's dependence on, cross-border financial flows. This would allow for greater autonomy of domestic policy making, designed to revive economic growth and generate more employment.

Trade policies

It has been seen that the increased trade openness of the Indian economy has rendered cultivators more vulnerable to price volatility and to import competition. There are also possible adverse effects on food security. It should be noted that world agricultural trade continues to be highly distorted in various ways, because of features such as the persisting and even growing subsidies provided to agriculture in the industrial countries, the increasing control by major multinational companies over various aspects of input and output distribution and marketing, and so on. Liberal trade policies in such a context not only expose domestic cultivators to competition from highly subsidised production from elsewhere, they can prove to be highly unstable for consumers because of fluctuations in price. Certainly, food and livelihood security requirements in an economy like that of India require a degree of control and regulation over trade.

This means that policies such as variable import tariffs, which would ensure domestic price stability for major crops, and controls over export in periods of domestic stress, must be seriously considered. In addition, India, along with other developing countries especially in South Asia, must argue in the ongoing WTO negotiations on the AoA, that as long as developed countries continue to protect and subsidise their own agriculture, other countries must be allowed to protect the livelihood of their own cultivators through various forms of trade regulation.

Institutional reforms

For the past decade or more, land reforms and other interventions for institutional change have been almost forgotten in the Indian policy debate. Even the Plan documents, which earlier at least paid lip-service to the idea of land reform, have recently abandoned even the pretence of concern over such reform. Indeed, insofar as such changes are talked of at all, they are usually along the lines of furthering the corporatisation of agriculture, increasing plantation-type organisational structures, and so on. However, land reforms—or institutional changes of various sorts—remain crucial to sustainable expansion of agricultural

growth and productivity in the various regions of India. These need not necessarily be land reforms in the classic sense of land redistribution, but can encompass a range of measures which would vary according to the specific requirements of different regions and states. In many parts of India at present, small-holder agriculture dominates in both ownership and occupancy of land, but tenurial patterns are still such as to deny security of tenure or viability of holdings. Similarly, credit and marketing arrangements are often monopolistic/ monopsonistic in character, and are skewed against the interests of small and marginal cultivators. Fragmentation of holdings, even very small ones, makes cultivation more difficult, less viable, and discourages certain types of investment such as in sustainable irrigation practices. In some areas, control over water has become possibly even more important than control over land, and this also remains highly unequal. Therefore, new patterns of institutional change must be thought of which will incorporate these changing conditions and different regional contexts. The notion of 'land reform', far from being forgotten, must and could insist on better service. In any case, the very existence of dual prices for the same commodity from the same shop is an invitation for corruption. For a universal system, it is essential that the public food delivery system be revived and strengthened, and the network of ration shops and fair prices shops should be extended, especially to drought-prone, backward and remote areas.

There is need for more active intervention in the field of agricultural technology as well, especially in biotechnology, where the risks and possibilities are both extensive. This is especially important given the greater bargaining power and marketing skills of multinational companies which are now entering India in a big way and are extending their markets to poor and often uneducated farmers. Agricultural extension services run by the government must be increased and widened in scope and also geared up towards dealing with these new features.

There is need for more active intervention in the field of agricultural technology especially in biotechnology

Box 9.4 Towards a sustainable food system

The 20th century ended with spectacular achievements in every field of human endeavour—culture, sports, science, technology and the spread of democratic systems of governance. At the same time, it ended with nearly a billion people going to bed hungry and with the universal goals of 'food, health, literacy and work for all' still remaining distant dreams. The uneven progress in taking the benefits of modern science and technology to the poor, particularly in the areas of medicine, agriculture, informatics and biotechnology, has led to increasing rich-poor divides in economic, technological and digital fields.

Since 1991, M. S. Swaminathan Research Foundation of India has been implementing the vision of a biovillage which is a pro-nature, pro-women, pro-poor and job-led economic growth strategy in rural areas. The Union Territory of Pondicherry was chosen for initiating this programme of technological, skill and information empowerment of women and men living in poverty. The programme is based on the conviction that the poor are poor only because they have no assets in the form of land, livestock or houses, and often no education. Their only assets are their time and labour. The challenge therefore lies in enhancing the economic value of the time and labour of the poor. This can be achieved only by building the assets of the poor through a transition from unskilled to skilled work. Asset building and community development have to be the pathways for poverty eradication. This calls for a paradigm shift in developmental mindset, a shift from a patronage approach to one of genuine partnership with the poor.

The term 'biovillage' is derived from the Greek word 'bios' which means living. This is another term for human-centred development. Poverty persists under conditions where the human resource is undervalued and land and material resources are overvalued. Therefore, the biovillage model of rural and agricultural development is based on the foundation of sustainable human development. It pays equal attention to: natural resources conservation and enhancement; poverty eradication; and women's empowerment

The principal components of the programme are:

a) Eco-farming leading to the substitution of chemical and capital with knowledge and biological inputs like vermiculture, bio-fertilisers and bio-pesticides. This in turn creates jobs which are ecologically sound.

b) Increased avenues for rural non-farm employment based on opportunities for remunerative marketing.

Thus, integrated attention is paid to on-farm and non-farm employment. The new livelihood opportunities are based on an analysis of the resources available to the family. Thus, landless labour families take to household mushroom cultivation, ornamental fish rearing, coir rope making, rearing small ruminants under stall-fed conditions and other enterprises which are within their resource capability. Those with a small plot of land take to hybrid seed production, floriculture, dairying, poultry and other high value enterprises. Groups of women without assets take up aquaculture in community ponds. The asset-building exercise is based on micro-level planning and micro-enterprises supported by micro-credit.

Multiple livelihood opportunities help to enhance total income and minimise risks. The key inputs are education and training, social mobilisation and producer oriented marketing. The self-help groups operate a Community Banking system, which makes credit available to its members on terms

decided by themselves. The system involves low transaction costs and a high percentage of loan recovery. Over a period of time, the training is done by local women and men. The pedagogic methodology is learning by doing, and hence formal literacy is not a pre-requisite for admission to the training courses. A fundamental principle guiding the biovillage movement is inclusion and not exclusion. The women and men who become trainers are inducted into a biovillage corps of rural professionals. Most of the nearly 100 biovillage corps members inducted so far are either semi-literate or even illiterate. They are the prime-movers and doers of the biovillage movement. They have demonstrated that the rural poor can take to new technologies like fish to water, provided they are enabled to learn through practical work experience and not through class room lectures.

How can such a biovillage movement become self-replicating? With the help of the Pondicherry administration, it is proposed to convert all the 270 villages in the Territory into biovillages by 15 August 2007, which marks the 60th anniversary of India's independence. Accelerating the pace of spread of the movement has been facilitated by the following institutional structures.

- A Biovillage Council comprising two members from each village (one female and one male) provides the overall policy oversight and undertakes the strategic planning.
- A Biocentre serves as a single stop resource centre, providing the needed inputs, information and training. The Biocentre is the hub of the biovillage movement.
- A computer aided and internet connected Rural Knowledge Centre provides the information needed by the rural families in the areas of health, education, entitlements, ecologically-sound technologies and marketing. At the Knowledge Centre, owned and operated by the local village community, trained women help to convert generic into location specific information.

The knowledge centres also provide information on the population supporting capacity of the village ecosystem and on culturally and socially compatible family planning methods.

Thus, the biovillage model of sustainable human development helps to bridge at the same time the demographic, digital, economic and technological divides. It promotes harmony with nature and with each other. It is based on ecologically-sound technologies which are environmentally benign, economically viable and socially equitable. It shows the path to an ever-green revolution in agriculture, where productivity advances can take place in perpetuity without associated ecological or social harm. The choice of technologies is flexible depending on local desires, capabilities and opportunities. While the concept has certain ground rules like 'a pro-nature, pro-poor and pro-women' orientation to technology dissemination, and a partnership and not a patronage approach to poverty eradication, the precise action plan is developed by the people of the village through dialogue with professionals. The virtual colleges linking scientists and rural families help to hasten the spread of such symbiotic partnerships. Under UNESCO's Asian Ecotechnology Network, the biovillage paradigm of sustainable human development is now being spread to other parts of India and to other nations. The biovillage programme has led to the emergence of many new voices and leaders in the villages. They take over the leadership and ensure the replicability and sustainability of the programme.

Contributed by: M. S. Swaminathan.

Bangladesh[1]

Area, population and natural resources of Bangladesh: The basic parameters

Bangladesh's large population has meant that over time the density per square km has increased and that the area available for cultivation has fallen drastically

The population of Bangladesh according to the preliminary estimates of the last census in 2001, was 129.2 million.[2] This represented an average annual growth of 1.47 per cent since 1991, which was substantially lower than the 2.32 per cent growth rate recorded between the1970s to early 1980s.[3] Yet, Bangladesh's large population has meant that over time the density per square km has increased and that the area available for cultivation has fallen drastically. At present, the population density is 834 per sq km, one of the highest in the world. Of the total population, 77 per cent is situated in rural areas, which indicates the importance of rural development for generation of employment and income and slowing down the process of rural-urban migration.

The pressure of rising population over the last few decades has substantially shifted large areas of land from being directly used in productive activities, such as crop cultivation, to other uses such as housing, roads and urban development. The net cultivated area over the period 1983-84 to 1995-96 has fallen by an average annual rate of just over one per cent. This trend of land loss for homestead and other purposes is expected to continue in the future with severe consequence in terms of land availability. Thus, if population is rising now at around 1.5 per cent and the land available for cultivation is falling at 1 per cent every year, the per capita cultivable land is falling at the rate of nearly 2.5 per cent. This clearly explains the tremendous pressure on land in the country.

The large sized population also exerts pressure on other natural resources. Bangladesh enjoys one of the highest rainfalls in the world while three rivers and their tributaries account for the availability of vast quantity of surface water.[4] The ground water reserve is also high particularly as high rainfall recharges the aquifers every year. Yet, proper and efficient management of competing use of water has not been easy. In fact, all major interventions in the water sector, till recently, have generally had only one purpose—to increase crop production without any reference to other uses of water.

There are two kinds of unevenness in the distribution of water. Much of the rainfall is concentrated during a few months of monsoon. Also, the spatial distribution of available water, both surface and ground, is rather uneven. Regions also vary greatly in their susceptibility to flood due to a combination of factors such as relief, the quantum and timing of surface water flow and rainfall. Completely flood-free land varies from 57 per cent of the total cultivable area in the north-west to only 23 per cent in the south-central districts[5]. This uneven regional distribution of available water also leads to different regions experiencing different rates of land productivity.

There is also a pronounced regional variation in cattle density and, therefore, livestock development across the country. For the country as a whole, 47 per cent of households in rural areas own cattle, but there are districts where nearly 80 per cent of households own cattle. Similarly, the number of cattle per unit of land also varies across the country. This applies also to other kinds of livestock such as goats, sheep and poultry.

Agriculture and the economy

Historically agriculture has had the major share in the economy.[6] Over time, however, the importance of agriculture has fallen and that of the services sector has risen (table 9.11). Yet, if the indirect influence of agriculture is taken into account, the importance of the agricultural sector remains high. Much of the services are related to transportation and trading of agricultural commodities. Except readymade garments, a large part

of the manufacturing sector also relies on the processing of agricultural commodities (e.g., jute, tea, sugarcane, tobacco, hides and leather, shrimps, rice and wheat). Therefore agriculture has a substantial influence on employment generation.

Crops account for the largest share of agricultural production. The ratio of crop GDP to the agricultural GDP has remained largely constant at around 75 per cent over the years. However, agriculture's direct share in GDP has fallen over time with consequent fall in crop's share in GDP. At present, the crop sector is just about 25 per cent. But crop production still remains the single largest economic activity.

The constancy of sectoral shares in GDP cannot be directly co-related with a lack of growth although the over-all growth in agriculture has never been high, except until very recently. Thus, over the whole period from 1975-76 to 2000-2001, agricultural GDP grew at a rate of 2.78 per cent while crops, the main sub-sector under it, managed to grow at just 2 per cent per year.

Table 9.11 Shares of broad sectors in GDP (1975-2001)

(crore Taka)

Period	Agriculture	Manufacturing	Service	GDP
1975/76-1979/80	147.69 (46)	34.71 (10)	137.26 (42)	319.66
1980/81-1984/85	162.82 (43)	38.63 (10)	175.88 (46)	377.35
1985/86-1989/90	178.02 (38)	45.09 (9)	234.12 (51)	457.24
1990/91-1994/95	198.81 (35)	59.28 (10)	302.70 (53)	560.90
1995/96-2000/01	237.59 (31)	83.71 (11)	422.40 (56)	744.01

Note: Figures in parentheses are percentages of GDP. They may not add up to 100 due to the exclusion of mining and rounding error. One crore equals ten million.
Source: Estimated by the author.

Organisation of production[7]

Farm and non-farm households

The cultivation of land in Bangladesh is the business of millions of peasants, each on an average owning and/or operating only small pieces of land. In 1996 when the last agricultural census was taken, the number of farms was 11.8 million compared to 10.0 million listed in the agriculture census of 1983/84. Over a span of 12 years, there had been a growth of only 1.8 million households at an exponential rate of 1.4 per cent per year. This may be contrasted with the number of all rural households, which were 13.82 and 17.83 million during the two consecutive censuses indicating a rate of growth of nearly 2.1 per cent per year. The balancing has been due to the growth of non-farm households, which grew from 27.3 per cent of the total number of rural households in 1983/84 to 33.8 per cent in 1996. Large sections of households among both farm and non-farm households are reported to be agricultural labour households. While the definitions are not clear at this stage[8], the proportion of households selling labour to farms remained roughly at 37-38 per cent of all rural households. All these indicate a diversification away from farming to non-farm activities.

Access to land

In Bangladesh, a full 50 per cent of households had been functionally landless in 1983/84, which increased to 58 per cent by 1996. Farms in 1983/84 and 1996 owned on an average just around 2.16 and 1.61 acres of land, respectively. The corresponding land area under operation had been 2.26 and 1.69 acres (table 9.13). Thus there had been a fall in the size of land owned and operated. But the fall has not been uniform across all categories of farms. While the ranks of the marginal

Table 9.12 Distribution of annual rates of growth

Rate of Growth (%)	Crop GDP			Agricultural GDP		
	1975/76-1979/80	1980/81-1989/90	1990/91-2000/01	1975/76-1979/80	1980/81-1989/90	1990/91-2000/01
< 0	1	4	2	2	2	1
0.01-1.0	1	1	1	–	3	1
1.01-2.0	1	5	3	1	–	2
2.0+	2	–	5	2	5	7
All	5	10	11	5	10	11

Source: Estimated by the author.

Table 9.13 Temporal changes in average land holdings

Farm size (acres)	Average land owned (acres)		Average land operated (acres)	
	1983/84	1996	1983/84	1996
Up to 0.49	0.45	0.39	0.26	0.27
0.50-1.49	0.96	0.88	0.92	0.90
1.50-2.49	1.76	1.71	1.93	1.91
2.50-7.49	3.73	3.61	4.12	3.99
7.50+	11.23	11.61	11.85	11.60
All	2.16	1.61	2.16	1.69

Source: Asaduzzaman 2002.

and the small farmers swelled, they actually had been the most to lose in terms of average area owned while the larger farms had held on to their land more tenaciously.

In 1983/84, 16.8 per cent of operated land was under some kind of tenurial arrangement; by 1996, the proportion of land under tenancy has risen to 21.6 per cent as a whole. But, again, the trend has not been uniform across farms. The proportion of land under tenancy has increased for the lowest three farm size categories, remained stagnant for the fourth and again rose for the highest group (table 9.14).

Table 9.14 Changes in extent of land under tenancy
(% of operated land under tenancy)

Farm size (acres)	1983/84	1996
0.05-0.49	14.5	19.8
0.50-0.99	22.4	28.5
1.00-2.50	22.0	25.5
2.51-4.99	21.3	22.6
5.00 +	11.2	15.5
All	16.8	21.6

Source: Adapted from Saha 2001.

Each acre of land in 1983/84 was divided into roughly three plots. In 1996, the number of fragments per acre of operated land had gone up to 3.6. Thus, the average area per fragment has fallen from 0.33 to 0.28 acres. While such a fall in average area of plots is expected, this appears to be somewhat less than what could be expected given that there have been very large increases in population during the same period.

Access to technology

How do farmers, particularly marginal and small farmers fare compared to others in their access to inputs? A comparison of the information in the 1983/84 and 1996 agricultural censuses show that for every group of farm, the proportion of area under irrigation has increased over the years. Furthermore, in both the years, the smaller farms had a higher percentage of land under irrigation compared to the largest farms (table 9.15).

Table 9.15 Access to irrigation in 1983/84 and 1996
(% of cultivated area)

Farm size (acres)	1983/84	1996
0.05-0.49	20.3	47.2
0.50-0.99	24.5	55.8
1.00-1.49	24.1	54.6
1.50-2.49	22.0	50.5
2.5-7.5	19.0	46.5
7.5+	17.2	43.8

Source: GOB, Agricultural Census Reports.

By the mid-1990s, the use of power tillers had become much more common than before. In 1996, 29 per cent of area was tilled with power tillers or tractors, the rest with bullocks or even cows. Although comparatively fewer households own tillage machines, many more can hire their services for a short period[9] specially since small farms are less economically capable to keep bullocks the year round. The Agriculture Census of 1996 reflects this clearly. Small farmers (operating land up to 2.5 acres) in 1996 accounted for 40 per cent of the area under (temporary) crops. At the same time they accounted for around 45 per cent of the area tilled mechanically whereas for all farms, the proportion is just 29 per cent.

All these changes indicate that while the small farmers owned and operated only tiny farms, in terms of access to inputs they may not have been in a very unfavourable situation. This, of course, does not imply that access to inputs had been adequate or that during crises small farmers were able to cope as easily as farmers with large land holdings.

Cropping intensity

The intensity of land use varies both by the type of farm and the area. The 1996 Agricultural Census reported variation in cropping intensity from 98.5 per cent (just about 1 crop a year) to 199.6 per cent (i.e., just about 2 crops) a year. Small farm holdings, as has been demonstrated in other parts of the developing world, have much higher cropping intensity than large farmers.

Intensity of cropping may be influenced by several factors including the terrain, whether the area is flood free or not, and technology. Both irrigation and power tiller also play a major role in increasing cropping intensity. Although, mechanised tillage is perceived to have a greater impact on cropping intensity than irrigation, historically, irrigation has almost always preceded the adoption of large-scale power tillers.

Rice cultivation

Rice is the main crop in Bangladesh. Of the total area under cultivation, about 77-78 per cent of the gross cropped land is devoted to production of rice in three seasons. Other major crops by area are wheat, pulses, oilseeds and jute. Of the total value of gross output, 70-72 per cent is accounted for by rice. Thus, whatever happens to rice sets the tone for what happens to the crop sub-sector in general and by implication to agriculture.

The output of rice in 1999/00 was 23.1 million metric tons compared with an output of 24.9 metric tons of food-grains, including wheat. Over two decades the production level has gone up by about 66 per cent. It is by now well known that the growth in output has been mainly due to the increase in yield rather than area. In fact, there has been very little rise in area under rice production. For the decade of the 1990s as a whole, area remained stagnant while yield increased at the rate of 1.79 per cent per annum and production rose at the annual rate of 1.96 per cent. The over-all rise in yield of rice has been due to the switching of area from cultivation of local to high-yielding varieties (HYVs).

Much of the growth in rice production has taken place during the comparatively drier boro season with irrigation thus making water management easier. During other rice growing seasons, there has been a switch to HYVs, but on the whole, there has been a switch from the basically wet period rice to the dry period rice.

Factors behind productivity growth

The high-yielding varieties of rice have played an important role in the enhanced production of rice over time. The HYVs are high-yielding only if there are matched with an adequate and balanced application of fertiliser along with proper water management and application of pesticides and insecticides if necessary.

Over the period under consideration, there had been a major growth in both fertiliser application and expansion of acreage under irrigation. In 1975/76, the fertiliser use per ha was just about 53 kg; by 1980/81 it rose to just about 98 kgs, and by 1994/95 it rose to 326 kgs.

In the late 1970s, crop cultivation in Bangladesh was largely rain-fed. Mechanically irrigated land constituted only about 12-14 per cent of net cultivated area. The use of mechanised irrigation rose rather slowly and, during the first half of the 1980s, the proportion remained static at about 17-18 per cent of net cultivable area. By the late 1980s, however, the situation changed and irrigation coverage began to increase. By 1994/95, it stood at just over 36 per cent of net cultivable land. Thus, over the mid-1970s to the mid-1990s, the proportion of irrigated land rose at an annual exponential rate of 6.7 per cent. Between 1996/97 and 1999/00, there had been further growth as the net land under irrigation rose by about 20 per cent.

The high-yielding varieties of rice have played an important role in the enhanced production of rice over time

Policies to support crop agriculture

Till almost the mid-1980s fertiliser sales were heavily subsidised. Their import and sales were the monopoly of state organisations such as the Bangladesh Agricultural Development Corporation (BADC). The prices of fertiliser were regulated. In case of irrigation, equipment was standardised. All these policies began to change in the mid-1980s. Subsidies were gradually withdrawn, bars on prices and selling points were dismantled and standardisation policy for irrigation equipment was abolished. Farmers were allowed to own shallow tubewells. All these had a positive effect on the expansion of irrigation coverage and increased use of fertiliser. Much of the growth in the late 1980s to early 1990s in the crop and agricultural sectors may be traced to these policies.[10] However, part of the gain was washed away by the successive floods of 1987 and 1988 and gave rise to concerns regarding the proper integrated management of flood, drainage problems as well as irrigation.[11]

Table 9.16 Refined activity rates by location and sex

(percent of population age 10 years & above)

Locality	Usual definition			Extended definition		
	Both sex	Male	Female	Both sex	Male	Female
National	48.3	77.0	18.1	64.8	78.3	50.6
Urban	46.4	71.1	20.5	50.6	71.6	28.6
Rural	48.9	78.8	17.4	69.1	80.4	57.3

Source: GOB 1996.

Employment, income and poverty

Employment

Currently two types of definition of employment are used in Bangladesh, the 'usual' category which means employment in an explicitly income-earning activity, and the extended category which includes home-based income-saving and income-earning activities such as collection of firewood or threshing of rice which were not previously considered as employment. The new extended definition affects mainly the labour force participation rates of women in the rural areas (table 9.16). The extended category, nationally and within rural areas, records participation rates, which are three times higher than rates recorded under usual definitions. It also affects mainly agriculture.

Agriculture is the main employer for both men and women as shown in Tables 9.17 and 9.18. However, non-farm activities also have a major role in employment generation in rural areas.

The predominance of rice in area allocation and high labour inputs mean that rice cultivation generates the bulk of employment. Of the total crop employment, rice accounts for nearly three-fourths[12]. Other crops also generate indirect employment through linkage effects and generate cash incomes for the farmers.

If rural non-crop and rural non-farm activities are considered, their significance in terms of the contribution to GDP and the rural employment may outweigh the contribution of crops.[13] Many of such activities are related to processing of crops or servicing agriculture in general and the crop sub-sector in particular. This implies that there is a well-diversified but integrated rural economy than has so far been conventionally thought of.

There is a debate regarding whether non-farm activities sector can act as sponge to absorb labour that is not employable elsewhere in the economy or whether it constitutes an engine of rural economic growth.[14] Research findings show that rural non-farm employment contributed nearly 36 per cent to GDP compared to 31 per cent for crop agriculture, during the first half of the 1990s. Around 45-46 per cent of total rural employment may be due to the non-farm sector especially in trade and transport.

Table 9.17 Employment in all Bangladesh

(Under pro definitions)

Major industry	Extended definition		Usual definition	
	Men (mn)	Women (mn)	Men (mn)	Women (mn)
Agriculture	18.4	16.1	17.9	2.8
	(54.4)	(75.2)	(53.6)	(38.9)
Manufacturing	2.6	1.5	2.6	1.4
	(7.6)	(7.0)	(7.8)	(19.4)
Construction	0.9	0.8	0.9	0.1
	(2.7)	(3.7)	(2.7)	(1.4)
Trade	5.6	0.5	5.5	0.4
	(16.6)	(2.3)	(16.6)	(5.6)
Transport	2.3	0	2.3	–
	(6.8)	(0)	(6.9)	
Finance	0.2	0	0.2	–
	(0.6)	(0)	(0.6)	
Community services	3.3	1.7	3.3	1.7
	(9.7)	(7.9)	(9.9)	(23.6)
Household & others	0.4	0.8	0.4	0.7
	(1.1)	(3.7)	(1.2)	(9.7)
All	33.8	21.4	33.2	7.2

Note: Figures in parentheses are percentage of column totals.
Source: GOB 1996.

Table 9.18 Employment in rural Bangladesh

Major industry	Extended definition		Usual definition	
	Men (mn)	Women (mn)	Men (mn)	Women (mn)
Agriculture	17.5	15.2	17.0	2.6
	(65.5)	(83.5)	(64.9)	(50.0)
Manufacturing	1.5	1.0	1.5	0.9
	(5.6)	(5.49)	(5.7)	(17.0)
All others	7.7	2.0	7.7	1.8
	(28.8)	(11.0)	(29.4)	(33.0)
All	26.7	18.1	26.2	5.3

Note: Figures in parentheses are percentage of column totals.
Source: GOB 1996.

Also, nearly 68 per cent of all rural non-farm employment is due to wage or salaried employment. Most women are engaged as wage labourers in non-farm activities, while men are usually self-employed. One-half of all households in rural areas are involved in both farming and non-farm activities; thus, nearly 75 per cent of the households in the rural areas have some kind of involvement in non-farm activities. The sectors/activities that have been identified to have high output, value addition and employment multipliers are rice milling, fish and sea-food processing, gur making, livestock products, poultry, shrimp and forestry products. The linkage between farm and non-farm economies is clearly demonstrated here.

Research has shown[15] that livestock rearing and production may generate just about 1900 million person days of employment per year. Of this, cattle accounts for just about one-half and poultry slightly more than a quarter. These figures indicate the importance of livestock in relation to crops in general and rice production in particular. As much of the non-farm activities, particularly livestock activities, take place within the farm households, this opens up an avenue of opportunity for generation of income and employment in marginal and small farms in a spatially diversified manner.

One reason for the diversification has been the introduction of micro credit schemes. Loans under micro credit have been a major route for creation of non-farm self-employment and consequent source of income. Another reason for the diversification has been the creation of various physical infrastructure which support the production of non-farm products and services[16].

Income

Since the mid 1980s, the Bangladesh Household Expenditure Surveys (HES) have indicated a rising level of nominal income nationally, and also for rural and urban areas.[17] Particularly over the 1990s the officially reported growth in nominal income per household had been around 7.5 per cent per annum. When deflated by the GDP deflator (with 1984/85=100) to convert them into real income, however, the picture becomes less rosy. Particularly for rural areas, it remained essentially flat with a slight fall up to the early 1990s and then a rise at the rate of only 2.9 per cent per year. One reason could be economic shocks due to heavy flooding of 1987 and 1988, which were hard to overcome economically and the severe cyclone in early 1992. For the urban areas, in contrast, while the pattern is the same, both the fall and the rise of income are sharper. These figures indicate a growing disparity in average income between the towns and the countryside. The average rural real income in 2000 was less than one half of the average real urban income. In 1995/96 the difference was of similar magnitude (table 9.19).

Table 9.19 Monthly household Income in selected years

(Taka)

Income type	Year	National	Rural	Urban
Nominal	2000	5842 (34)	4816 (35)	9878 (24)
	1995/96	4366 (31)	3658 (18)	7973 (65)
	1991/92	3341 (17)	3109 (16)	4832 (14)
	1988/89	2865 (11)	2670 (11)	4223 (12)
	1985/86	2578	2413	3766
Real	2000	2507 (16)	2067 (14)	4239 (7)
	1995/96	2161 (9)	1810 (-2)	3947 (38)
	1991/92	1977 (-3)	1840 (-3)	2859 (-5)
	1988/89	2032 (-17)	1894 (-14)	2995 (-13)
	1985/86	2344	2194	3424

Note: Figures in parentheses indicate the percentage change over the income in the preceding period.
Source: Author's estimates.

Agricultural labourers in rural areas are particularly vulnerable to wage changes. If agricultural wages increase, their economic situation is likely to be better. The real agricultural wages shows a slight upward trend, but not much. However, micro level investigations have indicated the positive roles of irrigation and HYV cultivation on wages of agricultural labourers.

Poverty

Absolute poverty (consumption of less than 2122 Kcal) in rural areas has

In Bangladesh, some of the interventions in the social sectors have improved the quality of life

apparently fallen substantially from 54.7 per cent in 1985/86 to 42.3 per cent in 2000. Much of the fall was concentrated in the beginning and the end of the period. The proportion of the hard core poor (with consumption below 1805 Kcal) appears to have centered around 28 per cent in most years before falling to 24.6 per cent by 1995/96 and then further to 18.7 per cent. The situation may seem somewhat different if one uses the basic needs method and various alternative poverty lines.

While there had been substantial reduction in poverty in the urban areas over the first half of the 1990s, the situation was reversed during the second half. This is consistent with the experience of growth in real urban income over the two sub periods. The situation was different in the rural areas. Despite an apparent lack of growth in real rural income during the first half of the 1990s, poverty fell somewhat, but the subsequent fall during the second half was substantially lower despite an apparent surge in agricultural growth. The proportion of poor is the highest in 2000 among the households where agriculture is the main occupation.[18]

Income poverty provides only a partial picture. In Bangladesh, some of the interventions in the social sectors have improved the quality of life. The Human Poverty Indices for the two decades since 1980 show a continuous improvement in the poverty situation.

Food security

The food balance till recently constantly showed a national food deficit in the aggregate. Only recently has this gap been apparently bridged. Going by the figures of BBS culled from the HES over the 1990s, there has been little change in rice consumption per capita in rural areas, which hovered around 480 grams per day. For urban areas, it has consistently fallen by around 10 per cent over the period. If calorie measure is used, the intakes have hardly changed in both rural and urban areas.

There has been extensive research on intra-household resource allocation including income, food, nutrition, and investment on human development. In all of these, the thrust has been towards understanding the factors related to intra-household resource allocation. But there is a lack of such literature on Bangladesh. Recent research, using samples of urban working and non-working women, show that resources in the hands of women do result in higher average nutrition per capita for all members of the family.[19]

What role has agriculture played in all these changes?

Growth in income is a necessary condition for long-term eradication of poverty. It may not be sufficient and has to be supplemented with improvement in other aspects of the quality of life. But the growth in agriculture has certainly helped. Had there been no expansion of irrigation, HYV rice cultivation, rise in cropping intensity, expansion of non-farm activities, public investment in agriculture and in social sectors, the situation could have been far worse. But this is no reason for complacency. The number and proportion of the poor, however defined and measured, is unacceptably high. The growth that has taken place has not been enough to pull a large number of people out of the economic and nutritional deprivations. A far more pro-active role of the society in general, and the public authorities in particular, is needed. Rather it means a more pragmatic and concerted effort with a farsightedness, which is sadly lacking among policy makers in South-Asia. This vision is all the more necessary because of the two new challenges that are now facing South Asia: environmental degradation and the new trade regime.

Environmental challenge

There are many causes of environmental degradation.[20] Some of these are due to

natural factors (river erosion and sand deposition, soil erosion in hilly areas)[21], but most are due to the nature of human interaction with land. Among these one may include inadequate and unbalanced dosage of fertiliser, mono-cropping practices (mainly rice) although land may be more suitable intrinsically for other crops and subsequent fall in the organic matter content in the soil possibly due to inadequate application of organic manure, and other cultural practices.[22] In some parts of coastal areas, the same land is sometimes used for shrimp cultivation and later converted into paddy land. If not flushed well, residual salinity may accumulate and soil quality degrades. In coastal areas, water logging and drainage are major problems due to improper attention to engineering details. The impact of such degradation is reflected in lower land productivity. Despite a lack of exact estimates, earlier analyses indicate annual production losses as high as up to 1 per cent of the crop GDP up to the early 1990s with consequent losses elsewhere in the economy through linkage effects.

The quality of land and soil is likely to fall further eroding the intrinsic productive capacity of land. Two factors militate against the possibility of arresting the present trend. These are a lack of awareness of the gravity of the problem at the policy level and its immediate and ultimate causes (both scientific and societal); and a lack of any integrated and general programme for soil quality improvement.[23] This is in a sense ironic because, much of the scientific ground-work for such a programme has already been completed over a number of years and are also being updated, and the results are available as digitalised data base.[24]

There are now question marks over the further expansion of irrigation because of problems of economic profitability. Despite the overall potential of further expansion, the spread of irrigation has been slowing down over successive periods since the mid-1980s.[25] The main reason appears to be economic, in some cases exacerbated by technical factors. Thus, deep tubewells are the only good technical means of irrigation in many of the upazilas[26]. Yet, in the absence of subsidy, these are much more costly to operate than say, shallow tubewells and low lift pumps, thus curtailing the efficiency and spread of irrigation. In any case, the profitability of the use of irrigation water appears to be falling over time, thus slowing down its spread.

The uneven spatial availability of water has so far determined the suitability of land for one crop or another during various seasons of the year. Flood protection projects, however, in many cases, changed the effective water regime within the protected areas and also outside and thus changed the normal cropping patterns. The impact of flood protection projects has also been uneven. In many cases these have been neither in the desired direction nor magnitude, in terms of crop production and other output. These also created a considerable social discord as evident from the various reports of the Flood Plan Coordination Organisation (now replaced by the Water Resource Planning Organisation, WARPO).[27]

One other problem that has attracted the least attention so far from the agricultural point of view is what might happen to Bangladesh if the climate change and global warming predictions become a reality. Studies show that a substantial part of Bangladesh (11-25 per cent by 2070) might be permanently under water if the sea level rises. The subsequent economic and social dislocation is unimaginable. But studies indicate that we might be able to adapt to the situation if work begins now. But there is little awareness of the problem among high-level policy makers.

A major health hazard, which appears to have been thought of simply as an environmental problem is that of arsenic toxicity in ground water. Apart from the problem of supply of safe drinking water, there is the issue of contaminated water

Quality of land and soil is likely to fall further eroding the intrinsic productive capacity of land

entering the food chain through crops or their by-products fed to livestock. This raises a different kind of problem of source of water for irrigation. The spread of irrigation has been a major factor in the technological change in crop production in general and food production in particular. This depends mainly on ground water. Now that the emphasis on surface water is re-emerging as a response to the arsenic contamination in ground water, this may raise cost of irrigation because of adjustments that people have to make. Also, the use of surface water will curtail the scope of irrigation as its availability is more location-specific than ground water. In either case, the cost of food production may rise thus threatening the livelihood of the poorer sections of the people.[28] This may also raise the dependence of the country on food imports, which may become costlier in future years than at present.

Global trade regime and agriculture

Finally, much of what may happen to Bangladesh agriculture or to rural development may be conditioned not by what farmers do in Bangladesh but by external factors such as the new rules of trading. Bangladesh agriculture is at a stage where much of what it produces, such as rice, is not externally competitive, i.e., the domestic resource cost is higher than export parity price. But there are other crops for which the domestic resource cost is higher than even import parity price. For example, sugarcane is externally competitive, but because of inefficiencies in sugar manufacturing, the whole activity becomes uncompetitive. Yet, there are areas where support in various ways may help the farmers and allow them to capture a portion of the world trade[29]. Unfortunately, there is little awareness at the policy level of the type of support to be provided, its nature and costs.

The basic problem is that Bangladesh has already pared down to the minimum support it provides to agriculture as part of the structural reform programme over the mid-1980s to mid-1990s. There are no longer any substantial fertiliser subsidies in place. Irrigation subsidies are non-existent and price support for output is no longer a policy option for the government. The irony lies in WTO rules which allow Bangladesh to provide support to agriculture of up to 10 per cent of the value of agricultural products, at least till now. The current level of support constitutes only about 3 per cent. Due to budgetary and other constraints, including the dictates of some of the multilateral organisations, Bangladesh cannot raise them again, at least not substantially to enable Bangladeshi farmers to gain a foothold in the world market. Bangladesh now has to take an active part in WTO deliberations on the types and manner of support to agriculture.

Nepal[1]

Agriculture is the backbone of the Nepalese economy. Although its contribution to Gross Domestic Product (GDP) has been declining over time, it is still the largest sector of the economy (table 9.20). The share of agricultural GDP has fallen steadily from 70 per cent in 1974/75 to its lowest level of 39 per cent in 1999/2000. Agriculture is the main source of livelihood for a majority of the population in Nepal. About 80 per cent of the rural population aged 15 and above is engaged in agriculture (NPC 1999), with 86 per cent of the population living in rural areas.

A close look at the growth trend during the last decade as a whole indicates that agricultural GDP grew annually at a rate of 2.5 per cent, only 0.23-percentage point higher than population growth rate, which was estimated at 2.27 per cent over the period 1999-2001. The per capita growth of GDP in agriculture of 0.23 per cent is still far from the goal of 3 per cent proposed in the APP.

The low productivity of labour in agriculture contrasts with productivity per unit of land. In Nepal, agricultural GDP per ha of agricultural land is $649. However, given the small land holding size (average holding size in 1990/91 was 0.94 ha), it is not surprising that a majority of the agricultural population earn low incomes. Moreover, according to the National Living Standard Survey 1996, about 40 per cent of agricultural population in Nepal has less than 0.5 ha, implying that a considerable part of the agricultural population in Nepal encounters serious problems in sustaining its livelihood from agriculture (NPC 1997). The combination of low productivity and small land size are part of the explanation of wide poverty in rural areas.

Components of agricultural GDP

The government's Central Bureau of Statistics has classified agricultural GDP into 6 components, namely, food grains, cash crops and other crops, livestock, fishery and forestry. An analysis of the growth pattern of all these components shows that over the period of one and half decades, the food grains and livestock sectors remained the major two components of AGDP with shares of 34.8 and 28.8 per cent, respectively (table 9.20).

In 1999/2000, all crops taken together provided 61.4 per cent of AGDP. Because of different growth performance, the shares of various sub-sectors have changed over time. In the case of food grains, cash crops, livestock, and fishery the shares have gone up during 1995/96 to 1999/2000 compared to the previous 5-year period, while in the case of other crops and forestry, the shares have gone down.

Trends in crop production

It is obvious that during 1970/71 to 1999/2000, there has been a steady increase in the area planted under the food crops with an average annual growth rate of 1.80 per cent. Likewise, the overall production of food grains has grown by

Table 9.20 Growth and share of agricultural GDP components, 1985-1986 to 1999-2000

	Growth rate per annum over periods (%)					Share per annum over period (%)				
AGDP Component	1985/86-1980/90	1990/91-1994/95	1995/96-1999/2000	1990/91-1999/2000	1985/86-1999/2000	1985/86-1980/90	1990/90-1994/95	1995/96-1999/2000	1990/91-1999/2000	1985/86 1999/2000
Foodgrains	4.26	-0.78	5.49	2.36	2.99	35.85	33.78	34.71	34.24	34.78
Cash Crops	4.59	3.95	6.11	5.03	4.88	6.03	6.71	7.54	7.13	6.76
Other Crops	6.36	4.75	-0.06	2.34	3.68	18.39	20.94	18.73	19.83	19.35
Livestock	3.18	1.58	3.58	2.58	2.78	29.24	28.26	28.96	28.61	28.82
Fishery	22.68	6.05	13.80	9.93	14.18	0.80	0.95	1.34	1.14	1.03
Forestry	2.54	2.25	0.45	1.35	1.75	9.69	9.36	8.72	9.04	9.26

Source: HMGN, Economic Survey.

2.93 per cent per year over the past three decades.

The total production of food grain in Nepal increased considerably in the past, mainly due to an increase in the area under food crop cultivation rather than due to increase in their yield levels. Not only have yield levels remained low due to poor growth rates, their annual fluctuations have been large and persistent. A recent review of agricultural sector performance[2] has indicated that in the past decade (the 1990s), area expansion explains 51 per cent of the growth of production, while yield increases explains the remaining 49 per cent.

The production growth of cereals has only slightly outperformed the growth in population

While looking at cereals as a whole, some general facts emerge. First, the cultivated area devoted to cereals has increased in the past. Second, the production growth of cereals has only slightly outperformed the growth in population. Third, increases in food grain production can largely be explained by increases in cropped area. Fourth, hardly any crop diversification within cereals has occurred, an example being the constant share of paddy and maize in total area. Fifth, variability in growth of production, area, and yield, even though high, has declined considerably in the 1990s. Sixth, the acceleration of growth of food grain production contributed to the improvement of the agricultural sector performance.

Cash crops account for about 8 per cent of total agricultural GDP. The major cash crops: oilseeds, potato, tobacco, sugarcane and jute represented about 9.1 per cent of the total cultivated area in 1999/2000, most of it in the Terai. Oilseed is the major cash crop occupying almost 49 per cent of the cash crop area, followed by potato (32 per cent) and sugarcane (15 per cent). Tobacco and jute together occupy only 4 per cent of the cropped area under cash crops. During 1970/71 to 1999/2000, there has been a steady increase in the area planted under the cash crops with an average annual growth rate of 1.96 per cent. Likewise, the overall production of cash crops has grown by 6.33 per cent per year over the past three decades.

While looking at the cash crops as a whole, some general facts emerge. First, the area under cash crops has increased in the past. Second, the production growth of cash crops has remarkably outstripped the population growth. Third, increases in crop yields have substantially contributed to production increases. Fourth, some crop diversification within cash crops has occurred, for example, the share of potato and sugarcane in total area has changed.

Food crops, such as pulses, on the other hand occupied about 7 per cent of the cropped area in 1999/2000. In Nepal, pulses are one of the main sources of protein in the diet of the population. Together with rice, pulses are also a particularly important staple food. With about 3.5 per cent of the total cropped area, vegetables are the most important crop after cereals, pulses and oilseeds. The performance of production over the 1990s has been satisfactory with a growth of 3.7 per cent. The pattern of growth of vegetables is characterised by high yield performance. Although different vegetables are grown in the country, there is a lack of crop specific information. Hence, it is difficult to draw additional conclusions about the growth performance of vegetables.

Agricultural investment

Public investments

The agriculture sector comprises four subsectors, viz., agriculture, irrigation, forestry and land reforms. Total expenditure on agriculture, and the irrigation subsector have remained high, while the expenditures on land reforms and the forestry subsector have remained at about one per cent over the period 1974/75 to 1999/2000. Statistics on private investments in agriculture are not available. Most of the investments are in the form of loans from banks. According to a Nepal Rastra Banks study, only

30 per cent of the rural credit need is fulfilled by formal sector.

Status of agricultural research

Nepal's agricultural research system has been traditionally dominated by the public sector. Unlike in other countries, agricultural research within the university system is, at best, minimal. In recent years, the private and the non-governmental sectors have initiated some applied research, which is even negligible compared to the extent and scope of research conducted within the public sector. Hence, the government has a leading role in setting the stage for, as well as in determining the pace of, agricultural research in the country. This also means that the shape and the size of the Nepal's agricultural research system, as it exists now, is an outcome of policy and other interventions introduced by the government from the beginning of organised agricultural research in the country.

As in the past, the main emphasis of agricultural research still continues to be largely on enhancing crop yields through the selection and development of high-yielding crop varieties. In 1985, the National Agricultural Research and Services Center (NARSC) was created within the Ministry of Agriculture to take over the research functions of the DOA.

In view of their share of cropped area and importance in terms of meeting food demand, the greater emphasis on cereal crops and the allocation of research resources for developing improved varieties of these crops—especially rice, maize and wheat—may be justifiable. However, the level of acceptance of these varieties by the farmers, measured by their adoption rates, raises doubt about the effectiveness of disproportionately large emphasis on variety development, and hence, about the efficiency of allocation of the scarce research resources to this field.

Significant efforts, at least in cumulative terms, have also gone into disciplinary research; for example, to identify improved agronomic and crop management practices, and to control pests. The ultimate purpose has been to increase crop yields both through exploitation of potential yield and reduction of yield losses for the given variety and production environment. Moreover, the major cereal crops have received a very large share of all such research experiments on crops. There is no doubt that past agricultural research has achieved positive results in several respects.

Main emphasis of agricultural research still continues to be largely on enhancing crop yields

Rural development and non-farm activities

Rural infrastructure

As rural development is the basis for overall development of the nation, balanced development is only possible when equal opportunity of electricity consumption is provided to the rural and urban populations. Considering inadequate government funding for electricity development, in the Eighth Plan, plans were initiated to bring the private sector in this field. The Ninth Plan also continued the policy so that government investment can be increased in other social as well as rural development sectors.

Irrigation development, being one of the key inputs for enhancing agricultural production, has received high priority by farmers as well as government agencies in Nepal. Farmer managed irrigation systems (FMISs), which are the result of communal efforts to exploit water resources, account for nearly 70 per cent of the irrigation development in the country; and support the irrigation needs of over 21 per cent of cultivated land.[3] Over 89 per cent of the irrigated area in the hills and mountains are covered by FMISs. It is also estimated that approximately 40 per cent of the national cereal production is produced out of 17,700 units of FMISs existing in the country. The FMISs are not restricted to

Table 9.21 Irrigation infrastructure development in Nepal

Period of irrigation development		Area covered by irrigation infrastructure, ha		
		Surface water	Ground water	Total
A.	End of Eighth Plan (1996/97)	853,111	187,510	1,040,621
	Agency managed	260,801	31,745	292,546
	Farmer manaed	592,310	155,765	748,075
B.	Irrigation Development during the Ninth Plan (until mid-2000)	21268	33231	54499
C.	Total irrigation facilities until mid 2000	874,379	220,750	1,095,129

Source: Shah and Singh 2001.

smaller units only. While there are systems of less than one hectare in size, supporting irrigation needs of individual farmers, there are also FMISs as large as 15,000 ha. The FMISs mainly comprise (i) surface irrigation schemes—traditional run of river type with temporary structures, and run of river type with permanent/semi-permanent structures constructed mostly with external assistance, and (ii) groundwater irrigation systems—shallow tubewells (STWs).

The groundwater irrigation facilities developed upto mid-2000 have the potential for irrigating 220,750 ha (DTW = 38,814 ha and STWs = 181,936 ha), of which 139,363 ha is estimated to be irrigated in winter, 131,329 ha in the wet season and 48,606 ha in spring. But, the actual command area of groundwater irrigation infrastructures in the country would be around 70,000 ha against the officially reported 220,750 ha.

Rural markets

Rural markets in Nepal are highly fragmented due to inadequate transport and communication networks and absence of effective market information systems. There are basically three tiers of marketing systems: primary markets at the village and farm-gate levels where collecting agents and small traders operate; secondary markets, haat bazar, organised on fixed day(s) of the week at various locations where wholesalers, agents and processors operate, and the final market which is controlled mainly by processors, traders/exporters. Small traders at the primary markets manage marketing of agricultural products and a small number of large traders control the secondary markets of traditional products. Retail market of the agricultural products is operated by a large number of small traders/retailers.

The major constraints to rural markets in Nepal are weak marketing infrastructure; lack of marketing information, and lack of quality improvement. Nepali farmers experience low levels of commercialisation not only in the case of food grains, but a little more surprisingly, in the case of cash crops like pulses and high value products like fruits, vegetables and livestock products. Low productivity is part of the explanation of the low level of commercialisation: small holding farmers often produce barely enough to satisfy their needs. However, another important part of the explanation is lack of access to market outlets. Even when the demand is available, the scarcity of marketing infrastructure such as collection centers, storage facilities, and organised rural urban market places limits the opportunities of farmers to commercialise their products. Moreover the absence of organised and adequate market place constraints the exchange of information, limits quality improvement and quality control, and makes more difficult the application of sanitary and environmental standards. The weakness of marketing infrastructure is particularly felt in the high-value products such as fruits and vegetables, seeds, dairy and other livestock products, where post-harvest requirements are more stringent.

Lack of information on markets and marketing opportunities, both domestically and internationally, as well as insufficient

information on final consumer prices for their processed and reprocessed products, is a key problem in marketing of agricultural products. As urban income increases and opportunities offered by more open international markets expand, the requirements for higher quality and other characteristics of agricultural products become more stringent. If Nepalese farmers are to benefit from more open markets, then improvement in quality will become a key to success. This is particularly important in case of high value products where Nepal will perhaps focus its efforts and has a comparative advantage. The introduction of standards for agricultural products requires institutional mechanisms, which are not yet available. Making consumers, farmers and enterprises aware of these standards is a service that will ultimately benefit the overall agricultural system.

Development of agro-industries

In Nepal, the position of agro-industries remains atop in the total contribution of the industrial sector. In an economy of agricultural predominance, it is but natural that, industries are agro-based at the initial stage. The number of agro-industries is gradually growing in the country. More than two decades ago primary processing industries like rice mills, flour and oil mills were the predominant industries and a few units of jute, sugar and beverages existed. But, in recent years more diverse agro-industries have emerged. In 1997/98, 147 medium and large agro-industries were in operation and 28 under construction.[4] The analysis of the background of industries established to date reveals that almost all of them fall in import-substituting categories. The quantity of agro-based products is high whereas the same of pure industrial products is very low in the list of exportable Nepalese goods. Most of agro-based industries are cold storage and agricultural tools besides the processing of goods produced by the agricultural sector. Modern technology and new innovations have diversified the nature of agro-based industries.

The policy constraints in the growth of agro-industry sector of Nepal were more related to deviation of policy and its practices, frequent changes with major departures, and attitudinal bureaucratic behaviour. These factors result in psychological impacts of totally disappointing investors and extra cost involvement often leading to non-viability of the project.

Poverty, food insecurity and malnutrition

Nepal is among the least developed and poorest countries of the world by all major indicators of economic, social and human development. Despite continued efforts to alleviate poverty, poverty is rampant and the overall living standards of the majority of population, especially in rural areas, are far below the acceptable levels. Poverty appears to be mostly a rural phenomenon, with poorer people living in more fragile and vulnerable ecosystems of rural Nepal.

The situation of food security in Nepal is viewed from the perspectives of (i) aggregate food availability, (ii) food supplies, and (iii) food access. The following sections deal with detailed analysis of these aspects

Aggregate food availability

The country's food availability scenario is greatly influenced by the growth rates in food production. Food grain production increased by 2.48 per cent per year in the last decade only marginally outstripping a population growth rate of 2.27 per cent. Paddy, wheat and maize are the principal staples in Nepal, which experienced a growth rate of 1.31, 3.55, and 1.93 per cent respectively over the last ten years. Ecologically, the production growth scenario is extremely poor in the hills and the mountains.

At the national level, Nepal had surplus food grain production and was a

Introduction of standards for agricultural products requires international mechanisms, which are not yet available

net exporter of food grains until the early 1980s. The export of agricultural products was a major source of foreign exchange. In the mid-seventies, the export of food grain alone was nearly half the total merchandise export from Nepal. But since the early 1980s exports started to decline. The country has gradually turned into a net importer of food grains, periodically in the initial few years and almost regularly in the latter years. The value of food imported in Nepal increased from US$69 million in 1986 to US$95 million in 1996 and declined to US$74 million in 1998. The export and import data on food items is believed to be seriously underestimated as most movement of food items between Nepal and India goes unrecorded mainly due to their shared porous border.

There seems to be a distinct correlation between the level of food-insecurity and the agricultural conditions of farmers in food-deficit districts

Food losses occur at several stages, such as, production, storage, transportation, cooking and digestion. The estimates of such losses are between 10 to 15 per cent for cereals; 15 to 20 per cent for fruits and 25 to 30 per cent for vegetables. These losses directly reduce the total food availability in the country.

Food availability situation is assessed against food requirements, which are estimated on the basis of daily per capita calorie requirements. The National Planning Commission of Nepal (NPC) assumes the per capita consumption requirements of 2,140 kcal/person/day in the Terai and 2,340 kcal in the hills and mountains based on WHO guidelines adjusted for climate and household composition. Staple foods (cereals, potatoes and other starchy foods) are considered to be the chief sources of calorie supply. In 1999/2000, the per capita production of major cereals was 353 kg in the Terai, 278 kg in the hills and 201 kg in the mountains. At the national level, a surplus production of 61,000 tons has been estimated for this year. The food availability situation at the national level masks the actual extent of food insecurity prevalent in Nepal, as the situation varies greatly across regions and across districts within a region. The World Food Program, based on the vulnerability analysis mapping (VAM), has identified 44 of the 75 districts as food-deficit districts. These 44 districts have been further classified according to the severity of food shortage, based on food availability in a certain number of months in the district. Out of the 44 districts, 3 districts have been classified as severely food-deficit, 8 districts high food-deficit, 16 as medium food deficit and 17 as low food-deficit. Of the remaining 31 districts, 10 districts have been classified as food self-sufficient and 21 as food-surplus districts.

Food supply

The Nepal Food Corporation (NFC) under the Ministry of Supplies is the sole government agency responsible for the supply of food grains to the food-deficit districts. Private sector involvement in food supply is limited to urban areas. The main function of NFC is to procure food grains from the surplus districts and supply these food grains to the food-deficit districts, which number 38 in its list. Transport costs are huge and are subsidised by the government from its limited resources amounting to NRs 225 million in 1999-2000.

The WFP under the Rural Community Infrastructure Works (RCIW) program jointly implemented by the Ministry of Local Development, local elected bodies, WFP and GTZ has been supplying food grains to the poor, food-deficient people. The objective of the food-for-work program has been to provide employment to the poor during the slack seasons and to create development-oriented infrastructure. The projects selected are labour-intensive, and provide considerable employment to the poor during slack seasons.

Food access

There seems to be a distinct correlation between the level of food-insecurity and the agricultural conditions of farmers in

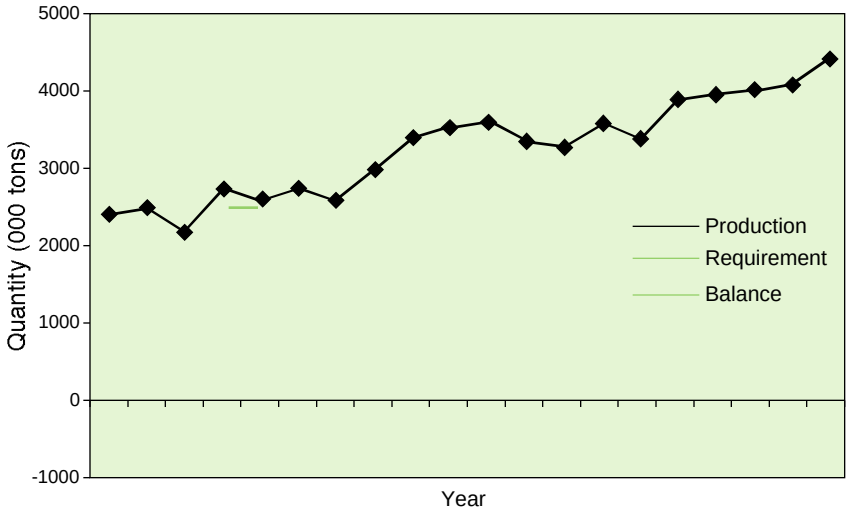
food-deficit districts. The problem is most severe in more remote and mountainous areas where the cropping intensities and crop yields are the lowest, population of livestock per household is the highest, and the opportunities for high-value agricultural production and access to off-farm employment are most limited. The livestock on which these food-insecure people depend most heavily are low yielding and are in poor health, resulting in their low productivity. Despite great potential, production of high-value agricultural commodities even in accessible areas has not progressed to the desired level due to a number of constraints. Production pockets are mostly small, scattered and exhibit low economies of scale in production, processing and marketing. Transportation of agricultural products to the nearest markets is often costly, reducing their competitiveness in both the local and international markets. The linkage between agricultural production and processing sectors has remained, at best, weak. While, on the one hand, most of the major agro-industries are forced to rely on imported raw materials, the same materials produced domestically are deprived of access to market.

Women in agriculture

It is a well-documented fact that women play a crucial role in many areas of agriculture. However, the issues relating to their involvement have not been satisfactorily addressed by national agricultural plans, development projects, extension services or researchers. Women farmers are not recognised as individuals farmers but are referred to as farmers' wives, sisters, daughter etc. Cultural traditions also exist which inhibit direct communication with female farmers. Various agricultural related issues are summarised below.

- 'Feminisation' of agriculture: Agriculture is becoming progressively feminised. According to census figures, the proportion of female labour force increased from 30.4 per cent in 1971 to 36.4 per cent in 1984, and to 45 per cent in 1991.
- High presence of women as unpaid family workers in subsistence agriculture.
- Low level of technology and primitive farming practices.
- Long work hours; carrying the double burden of work in the family and farm; their contribution to income and economic well-being of the family is not recognised.
- The most important constraints in implementing strategies to improve the role of women in agricultural development have been at the conceptual, structural, organisational and the implementation level.

Figure 9.3 Trends in domestic foodgrain production, requirement and balance, 1980/81-1999/2000.



Institutional and policy issues

Land reforms

Land and land-based resources are inextricably linked with the livelihood of the Nepalese people. Nearly 90 per cent of them still pursue agriculture and related land-based activities and reside in rural areas. Thus, ownership and access to these resources have an overwhelming influence on the well-being of the vast majority of the population. Historically,

Table 9.22 Land distribution by farm size in Nepal, 1991

Size of Holdings	Holdings		Total Area	
	Number	%	Hectares	%
No land	32,109	1.2	1,571	0.1
Holdings with land	2,703,941	98.8	2,597,400	99.9
Less than 1.0 ha	1,877,702	68.6	791,883	30.5
1.0-2.0 ha	529,467	19.4	716,533	27.6
2.0-3.0 ha	168,499	6.2	400,227	15.4
3.0-5.0 ha	88,165	3.2	328,089	12.6
5.0 ha and above	40,158	1.5	360,669	13.9
Total	2,736,050	100.0	2,598,971	100.0

Source: HMGN 1995.

they also determine the economic and social status of the people.

Ownership and distribution

Land distribution in Nepal is highly skewed. More than two-thirds of the total holdings have less than one hectare of land, and they account for 30 per cent of the total farm area. On the other hand, 1.5 per cent of the holdings in the more than five-hectare holding class cover 14 per cent of the total farm area (table 9.21). Data from the same source indicates that farm size is larger on the Terai (1.29 ha) than in the hills (0.77 ha) or mountains (0.66 ha).

Tenancy

Table 9.22 presents information about the land tenancy situation in Nepal. Details are provided for three holding categories: (a) holdings of cultivated, rented land only, (b) holdings engaged in more than one tenure arrangements (mixed tenure, and (c) rented area as a percentage of the total area of holding. About 2 per cent of the total farm holdings are those of pure tenants who do not have their own land.

Table 9.23 Structure of tenancy, 1991

Region	Pure tenants as % of total holdings	Mixed tenants as % of total holdings	Area rented as % of total land
Mountains	1.1	12.0	5.8
Hills	1.2	11.8	4.6
Terai	2.7	18.8	12.9
Nepal	1.9	14.9	9.3

Source: HMGN 1995.

The proportion of such holdings varies across the ecological belts. It is 1.1 and 1.2 per cent, respectively, in the mountains and hills, while 2.7 per cent of the holdings in the Terai are of this type.

Fragmentation

Land fragmentation is considered to be one of the structural problems inhibiting agricultural modernisation. Because of the scattered nature of farm parcels and, in many instances, as a result of their economically non-viable size, farmers are hindered from adopting productivity enhancing technologies that are otherwise readily available to them. The land fragmentation has its roots in the traditional Hindu law of succession whereby all male offspring are entitled to parental property, including land.

Information on the extent of fragmentation by ecological region is presented in table 6.5. It is interesting to note that the average number of parcels into which a hectare of land is divided is the highest in the mountains, it is more than twice (6.8) and significantly higher (5.1) in the hills than in the Terai (3.1). The combination of the existing legal provisions for inheritance and the present land ceilings imply increasing fragmentation and subdivision of land holdings as the society moves from one generation to the other.

Main Issues

Government policy with regard to land reform has been lukewarm, if not outright inimical. For instance, the Eighth Plan (1992-97) argued a land reform program could not be self-contained in itself, and that experience across the globe made it doubtful whether imposition of a land ceiling through land reform and the automatic guarantee of tenancy rights to the tillers would support the deprived sections.[5] The current Ninth Plan (1997-2002) essentially reiterates this view,[6] while emphasising the elimination of dual ownership of land, introducing progressive

land tax to encourage effective use of land, preventing excessive land fragmentation, developing an appropriate land-use system and encouraging land consolidation, initially by involving consumer's groups in tubewell irrigation area. All periodic plans since the Seventh Plan (1985-90) have emphasised increased production and productivity through discouraging the tendency towards absentee landholding and diverting investment to the non-agricultural sectors.

It has been demonstrated by the experiences of other countries that land reforms, with the objective of providing access to land, the most important productive resource, for the majority of poor households (landless, near landless, and smallholders), and improvement in tenure relationships can act as engines of growth in the initial stages of economic transformation.[7] Because of the pre-dominant feudal influence on governance, Nepal has been unable to introduce genuine steps in this direction for a long time, even after it did away with the autocratic regime of the Ranas in 1951, and until now, after nearly a decade of multi-party democracy. The democratic governments that came to power after the people's movement of 990 have also tended to embrace the status quo and avoid any serious action on this front until the recent declaration of land reform measures. Indications are that redistribution of land could help increase agricultural productivity, although the issue needs to be investigated more thoroughly. Issues of tenure are very important, and these need to be analysed and implications of various options clearly understood. The tendency has been to avoid these issues all together. This has only contributed to perpetuating the uncertainty, discouraging investment in land, and hampering adoption of wide-scale measures to raise productivity. The main issues related to land ownership and tenure are ceilings on land holdings, dual ownership of land, fragmentation of holdings, and landlessness among rural households.

Considering the importance of equitable land distribution for poverty reduction and for a more peaceful and harmonious society, the government has recently amended the Land Reform Act 1964, significantly revising downwards the ceilings on landholding in all the three ecological regions and in the Kathmandu Valley. The intention is to generate surplus land for distribution to the landless families.

Agricultural credit and finance

Changes in the rural finance landscape

Previously there were only two commercial banks in the country, namely, Nepal Bank Limited (NBL) and Rastriya Banijya Bank (RBB). Beginning in 1984, additional commercial banks were established and were soon joined by finance companies, Rural Regional Development Banks (RRDBs) operating the Grameen systems, multipurpose cooperatives and NGOs with limited banking operations. These institutions are expected to lend to agriculture, extend micro-credit or serve the deprived sector. In particular, the focus of RRDBs and NGOs is on providing collateral free short-term loans not exceeding NRs. 15 thousand per borrower which are payable weekly and could be used for any agriculture related purpose. Interest rate varies from 20 per cent to 25 per cent compared to 14 to 17 per cent per annum charged by cooperatives.

Over the period 1990-2000 the number of rural borrowers has increased from 340,000 (10 per cent of households) to reach 970,000 (22 per cent of households). MFIs have been responsible for 70 per cent of this growth with commercial banks and ADBN the remainder. Most of the MFI growth has been through formal MFIs emphasising the importance of an institutional rather than project or informal focus. Credit outreach among the poor is now three times that of 1990;

115,000 borrowers increasing to 427,000, while women as borrowers increased from 28,000 to reach 285,000 in 2000. SCBs have been responsible for 90 per cent of the increase in amount of lending indicating the continuing importance of banks, and especially ADBN, in rural finance.

In 1990 there were no formal MFIs. Especially since 1993, there has been the emergence of 11 development banks (with more in the process of formation), more than 1,700 financial service cooperatives, and 75 financial service NGOs. A number of coalescences MFIs are evolving.

None of the institutional systems providing rural financial services are self-sustainable

Major Concerns

None of the institutional systems providing rural financial services are self-sustainable and capable of the outreach required to provide widespread and attractive financial services and a substantial shift in rural GDP. In general, financial institutions serving rural areas exhibit characteristics of: a dependency on borrowing for expansion, very little deposit mobilisation, low level of profitability, insignificant profit retention, average to poor recovery of loans and interest income, and weak financial structures. Rural lawlessness is hampering efforts to expand the outreach and sustainability of rural financial services.

The four institutions (ADBN, NBL, RBB, and RRDBs)[8] expected to finance increases in agricultural lending are all in a bad financial shape. They have been unable to earn adequate profits on their loan portfolios and are in desperate need of structural refinance. The RRDBs are either insolvent or approaching insolvency on their date of startup and location. They share similar adverse features of: government dominance in their ownership and management, a lack of Grameen-type culture. Although they do follow Grameen operating principles, insufficient attention is paid to obtaining full cost recovery through pricing of products.[9]

Agricultural pricing policy

Major food policy in Nepal includes food production to meet domestic and export demand, equity in regional distribution of food, improvement in nutritional status of the poor, and food security through a reduction in the variability in food production. A variety of producer and consumer price policies have been adopted to achieve these goals. Three price policy instruments used with respect to food grains are: (i) food subsidies to consumers, (ii) price supports for rice and wheat, and (iii) input price subsidies, particularly for fertilisers. Since the input price subsidies are discussed in later sub-section, a brief review of the first two policies is presented below.

Food subsidies to consumers

The government provides food subsidies to consumers primarily through the procurement of food grains in areas of food surplus for resale at below market prices in areas of deficit. Until the 1970s the government's intervention in the food grain market was limited to the procurement of paddy through a levy in the Terai for distribution among the army, government employees, and urban residents of the Kathmandu valley. The Nepal Food Corporation (NFC) was established in 1974 with the aim of expanding food grain procurement and distribution. The official stated objective of the NFC was to implement official price policies. More specifically the objectives were to: (i) provide a floor price for farmers in less accessible areas, (ii) provide food for consumers at fair prices, (iii) intervene in the food grain market to stabilise prices, (iv) hold food stock to improve food security, and (v) manage emergency and regular food aid received from foreign donors.

At the time NFC was established, most of the surplus food grains production in the Terai was exported to India and a few large-scale millers who were believed to be in collusion to maintain high profit

margins dominated the market in Nepal. In recent years there have been significant development in the food grains market and its management in Nepal. Almost all the market centers in the accessible areas are well organised and have become competitive. This is largely due to the expansion of road network along the Terai and into formerly inaccessible hill regions that has greatly improved the access for private traders.

In order to rationalise NFC's activities and eliminate unnecessary market distortions in the changing context, the government has over time implemented the phasing out of the NFC's subsidised distribution of food grains. The government has adopted the policy that there would be (i) no intervention in the food grain market for price stabilisation purposes, and (ii) no declaration of minimum support prices for food grains. NFC continues to subsidise the delivery of foodgrains to remote areas up to the amount of subsidy available. The policy is that the final price of food grains delivered under this program should be 20 per cent below the prevailing market price in these areas to avoid extensive impact on local market prices. NFC is responsible for maintaining a reserve of 40,000 million tons, half of which is subsidised by the government.

Role of input subsidies

Fertiliser subsidies

Historically, fertiliser sales in Nepal have been quite heavily subsidised. The subsidies have been of two types. A direct subsidy which kept retail prices below world market levels, and a transport subsidy, aimed at maintaining retail prices at the same level throughout the country, thereby enabling farmers in remote, hilly or mountainous parts to obtain supplies. Fertilisers provided to the country on concessionary terms have sometimes taken the form of soft loans from multilateral donors for purchases on the international market. At other times bilateral donors have provided fertilisers as grant-in-aid.

Until 1991/92 the publicly-owned Agricultural Input Corporation (AIC) was the only organisation in Nepal that could legally import fertilisers. In that year many subsidies were removed, and shortly afterwards private sector firms were given permission to import. However, continued government subsidies on urea effectively precluded that sector from bringing urea into the country. Since 1997/98, the HMGN has progressively reduced direct subsidies and deregulated the sector, allowing private sector to compete with AIC. More recently in 1999/2000, there has been a complete elimination of direct subsidies on all kinds of fertiliser. The monopoly of fertiliser distribution by AIC was broken and the private sector started to get involved both in import and distribution of fertilisers in Nepal. Official figures on fertiliser imports show that the privates sector share of total imports grew from 20 per cent in 1997/98 (the first year of the reforms) to 60 per cent in 2000/01. Total official availability of fertiliser also grew from 108,728 tons in 1997/98 to 138,747 in 2000/01.

Fertiliser subsidies represented a heavy burden on the treasury. Between 1990/91 and 1994/95 the average yearly subsidy to fertiliser was US $11.2 million; even in the second period of the 1990s when subsidies started to decline the average amount was considerable at US $6 million. In spite of such a heavy burden on the treasury, fertiliser subsidies in the past in Nepal were not necessarily leading to higher use nor to higher growth of productivity. Since the overall budget for subsidies was fixed at the beginning of the year, in the past, that implied a ceiling on the amount of use imported by AIC in the country. As such, the policy created a situation of scarcity and rationing. Moreover, on equity ground the fertiliser subsidy is equally questionable. First the rich farmers consume more fertiliser than the poor. Second, it is likely that richer households by virtue of their

Rich farmers consume more fertiliser than the poor

better connections might be able to obtain preferential treatment than poorer households.

With the elimination of subsidies of fertiliser, there has been a widely raised concern that farmers might not get the desired quantity of fertiliser in time. Official figures on imports and availability seem to confirm the general concern of a scarcity of fertilisers or the hypothesis that too expensive fertilisers (that is not subsidised) are hurting farmers and that inadequate quantities of fertilisers would be available to farmers. The official figures, however, show only imports and distribution from AIC and registered private sector. The unofficial inflow of fertilizers from India, even though thought to be of a considerable amount, are not taken into account. A recent survey[10] has revealed that the fertiliser use per cultivated hectare is much higher, nutrient use per hectare has increased substantially, timely availability of fertiliser has improved, but the fertiliser quality has declined.

The elimination of subsidies has had two useful effects. First, it eliminated or considerably reduced a burden on the treasury. Second, it led to the involvement of the private sector in the distribution system. On the negative side, the quality of fertiliser is increasingly deteriorating even though better enforcement of existing regulation together with self-correcting marketing mechanism are likely to reduce the problem in the future. The private sector in fertiliser distribution system is still fragile and requires institutional support in order to grow.

Irrigation subsidy

Two different forms of subsidies are associated with the irrigation development in Nepal: capital subsidies and operation and maintenance (O&M) subsidies. Subsidy policy on irrigation has followed two different patterns for surface and groundwater irrigation schemes. The surface irrigation schemes and deep tubewells constructed with government initiatives are almost fully financed by the government. Recently, however, as a step towards participatory management of AMIS, a small proportion of capital expenditure has been stipulated for beneficiary participation[11]. The government also provides annual budgets for operation, maintenance and management of the systems. Although there is a provision for charging irrigation service fees (ISF), the ISF collection efficiency is extremely low, and the government virtually bears all the O&M costs.[12] In order to reduce the O&M burden, the government has initiated turn over and joint management programs, but there has not been much progress in this accord. As such, the government has been providing both the capital and the O&M subsidies to the government managed surface and deep tubewell irrigation schemes.

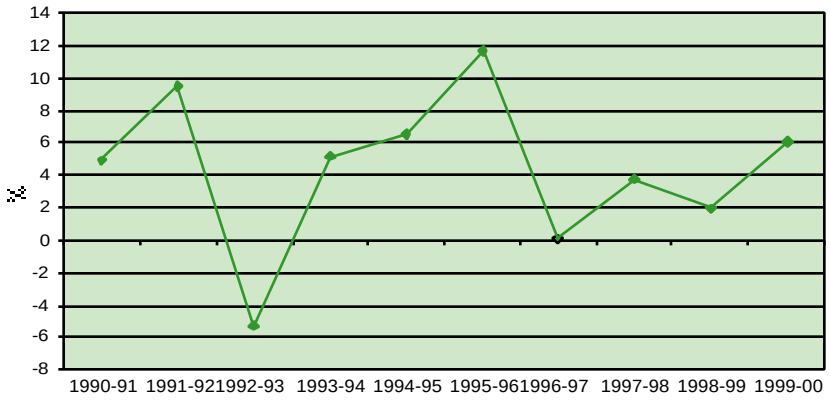
In the recent past, significant policy revisions have been made affecting the irrigation sector. An important aspect of the new policy orientation is towards reducing the cost of subsidy to the irrigation sector. Complying with the above policy initiatives, in October 1999, subsidy for individual STWs was eliminated altogether as part of the SAPL. In July 2000, the subsidy even for group STWs was completely removed.[13]

The current debate is about: whether or not to re-introduce the subsidy and if a subsidy is required, how to reintroduce the subsidy; whether the APP Terai irrigation strategy will have to be modified; or how to introduce some sort of motivating package to ensure the pace of STW installations be kept at the desired level. In most of the discussion, the APP and Ninth Plan targets are regarded as sacrosanct, as if the failure to achieve them is a sure recipe for disaster.

The STW subsidy issue highlights the contrast with surface irrigation. It is often noted that about 90 per cent of the government subsidy on irrigation is given to surface irrigation along with technical support. Only 5 per cent of the total cost is effectively borne by the users. Water

tax collection at the WUA level is below 50 per cent of the total estimated target, which also makes it an implicit subsidy. Moreover, the annual DOI budget is estimated at around NRs 4.9 billion (regular and development expenditure) of which groundwater expenses may be below NRs. 500 million for shallow tubewell and deep tubewell. This amount comes to only around 12 per cent of the total budget.

Figure 9.4 Agricultural growth in the 1990s



Source: GOP, Economic Survey of Pakistan, various issues.

Pakistan

Agricultural Status

In Pakistan, the agricultural sector plays an important role in providing food, employment, exports and Pakistan's gross domestic product. Agricultural activities have direct economic effects by contributing 24.5 per cent to GDP 44.1 per cent to employment, 50 per cent to total value of industrial production and 65 per cent to total export earnings. Apart from the sector's immediate economic contribution it also has indirect linkages with various parts of the economy. Any changes in agricultural productivity, therefore, sends a ripple effect throughout the rural population of Pakistan, 67.5 per cent of whom derive their sustenance from agriculture in some way or the other. Hence, any policies developed by governments for accelerating economic growth, poverty alleviation, or development have to be inextricably linked to the agricultural performance of Pakistan.

All over South Asia the importance of agriculture's contribution to GDP has declined considerably, as it is being replaced with industrial or service sector products. In Pakistan's case, this structural transformation has been taking place slowly and gradually with the share in GDP of agriculture declining from 29.5 per cent to 27.18 per cent between 1980-99, although during 1990-95 value added by the agricultural sector GDP declined to as low as 26 per cent. This structural change is also reflected in the employment in the sector where in 1999 the labour force employed by agriculture was 53.23 per cent in comparison with 64.04 per cent employed in this sector in 1980.[1]

Pakistan has experienced high growth rates in agricultural GDP even though they have been fairly unstable. The 4.9 per cent growth recorded in 1969-70 was indicative of the Green Revolution, characterised by the high use of external inputs and of highly yielding varieties. During 1980-99, Pakistan enjoyed the highest growth in agricultural GDP in South Asia, an average annual increase of 4.67 per cent. Growth during the 1990s was, however, much lower than the previous decade. In between 1990 and 1999 agricultural growth rates experienced distinct highs and lows with the growth rates climbing to nearly 12 per cent one year and falling to 0.12 per cent the next.

Crop situation

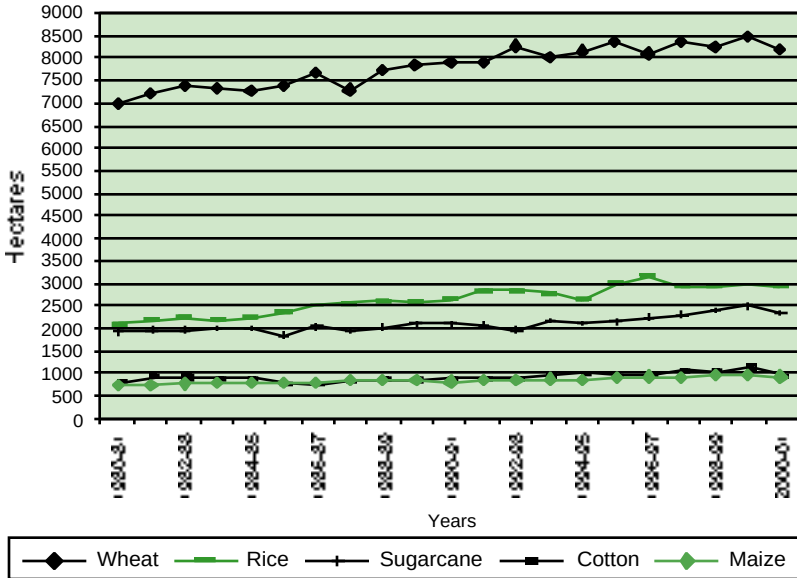
The agriculture framework in Pakistan is supported to a great extent by the crop sector, with its percentage contribution to agricultural GDP exceeding that of other sectors. In 2000-01, the crop sector contributed 40 per cent to agricultural GDP as opposed to a 38 per cent contribution from livestock and 5 per cent from the fisheries and forestry sectors.

Table 9.24 GDP growth rates of agriculture

Year	Rate
1980-81	3.66
1985-86	5.95
1990-91	4.96
1991-92	9.5
1992-93	-5.28
1993-94	5.23
1994-95	6.57
1995-96	11.72
1996-97	0.12
1997-98	3.82
1998-99	1.95
1999-2000	6.1
2000-2001	-2.49

Source: GOP, Economic Survey of Pakistan, various issues.

Figure 9.5 Area under major crops



Source: GOP, Economic Survey of Pakistan, various issues.

There are two main crop seasons in Pakistan: Kharif and Rabi. Kharif crops, including wheat, gram, tobacco, rapeseed, barley and mustard, are sown between April and June and harvested during October and December. In contrast the sowing season for Rabi crops-rice, sugarcane, cotton, maize, bajra and jowar—starts in October-December and ends in between April and May. Wheat, rice, cotton and sugarcane constitute the major crops of Pakistan representing 36.5 per cent of value added to agriculture. Minor crops including pulses, potatoes, onions and chilies make up 10 per cent of value added.

The performance of a number of both major and minor crops in Pakistan during the current year has been mixed. Estimated yields of cotton, rice, wheat and barley, onions and chilies for 2001-02 are lower, while the estimated production of sugarcane, maize, bajra, jowar, gram, rapeseed, mustard, and all three major pulses has increased. Lower yields for most of the major crops have been registered due to a number of reasons. The production of cotton, which contributes nearly 2.7 per cent to GDP will, it is estimated, experience a 1.1 per cent decline during the coming year due to shortage of irrigation water, and pest attacks in some of the cotton growing areas. Rice production, which uses a large amount of water, during 2001-02 has decreased by an estimated 19.2 per cent due to shortage of water as well as a shift in plantation from irri to basmati rice. The 2.9 per cent contribution of wheat to GDP has also gone down by 2.4 per cent because of the drought affecting both barani (rain-fed) and irrigated areas. The reduction in chili production by nearly 46.6 per cent exemplifies agricultural pricing problems inherent in Pakistan's agricultural systems. A bumper crop during 2000-01 resulted in a 50 per cent decrease in chili prices lowering profitability to such an extent, that farmers reduced chili plantation by 42.2 per cent the next year.

A number of strategies have been planned by the government to improve the performance of the crop sector in order to amplify and improve agricultural productivity. Some strategies that have been planned include: educating farmers about various agronomic practices, balancing fertiliser-use and encouraging certain efficient practices to improve productivity. To increase output of the

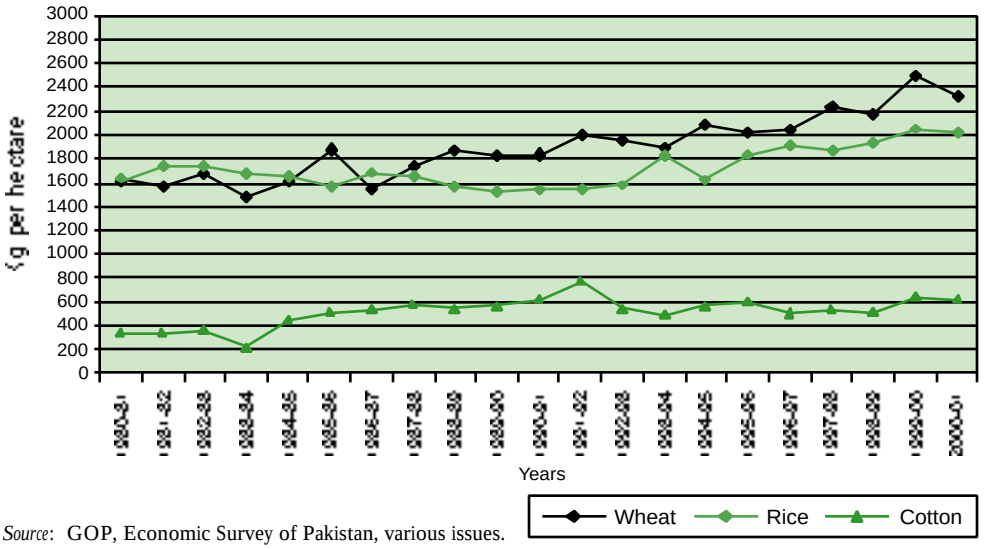
Table 9.25 Production of major crops

	Cotton		Sugar cane		Rice		Maize		Wheat	
Year	(000) bales	Growth rate	(000) tonnes	Growth rate	(000) tonnes	Growth rate	(000) tonnes	Growth rate	(000) tonnes	Growth rate
1997-98	9184	-2.0	53104	26.4	4333	0.7	1517	1.7	18694	12.3
1998-99	8790	-4.3	55191	3.9	4674	7.9	1665	9.8	17856	-4.5
1999-00	11240	27.9	46333	-16.0	5156	10.3	1652	-0.8	21079	18.0
2000-01	10732	-4.5	43606	-5.9	4803	-6.8	1643	-0.5	19024	-9.7
2001-02	10613	-1.1	48042	10.2	3882	-19.2	1665	1.3	18475	-2.9

Source: GOP, Economic Survey of Pakistan, various issues.

crop sector, farming area expansion has been planned especially for certain important crops, such as rice, wheat, and cotton. In view of the recent drought as well as usual water scarcity issues, water management will be encouraged. Farmers will be trained in utilising water efficiently, which will not only save water but divert it to crops and areas which will increase productivity. The Government also aims to improve and enhance the use of technology in the crop sector.

Figure 9.6 Yields per hectare of major crops



Source: GOP, Economic Survey of Pakistan, various issues.

Livestock performance

Both the livestock and poultry sector of Pakistan play an important role in agricultural performance. The livestock sector contributes 37.5 per cent to agricultural value added; approximately 9.4 per cent to GDP and 12.34 per cent to Pakistan's export earnings. Within rural households, livestock activities generate additional income for households, which is why nearly 30-35 million people in rural areas are involved in this sector. Production of poultry has also accelerated in recent years with almost every rural family, and one in every five urban families being involved in poultry production activities. A number of policies have been planned to increase the performance of this sector. The measures have been developed to increase productivity per unit of animal, improve feed and fodder availability, strengthen extension services, improve livestock marketing and to improve animal health coverage. A number of steps have also been taken to meet the Sanitary and Phyto-sanitary standards under the World Trade Organization requirements for quality assurance and to increase livestock exports.

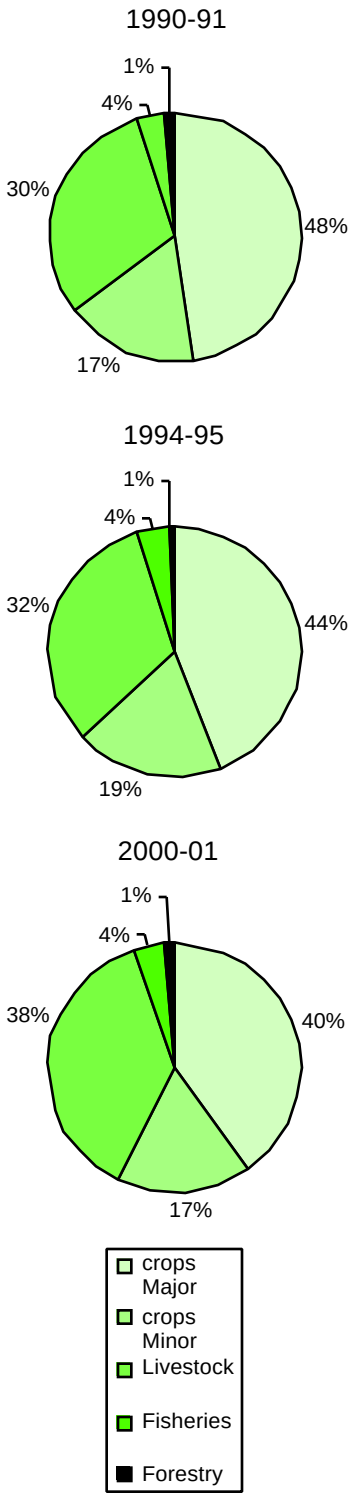
Fisheries

The fishery sector contributes a small percentage to GDP but a large percentage to the export sector through its export of shrimp and fish. During July 2001 to March 2002 fish and fishery products worth nearly 5.9 billion rupees were exported, generating substantial amount of foreign exchange. A number of measures have been taken to increase the output of both marine and inland fisheries by the Federal and Provincial Fisheries Departments. The Government of Pakistan aims to increase the output of marine fisheries by upgrading fishing boats, equipping them with fishing gadgets and harvesting from deep seas. Enhanced production of inland fisheries has also been planned by using waterlogged areas for aqua-culture, intensive fish farming, proper stocking in major lakes and reservoirs and improved management practices.

Forestry

Pakistan does not possess adequate forest resources since forest area constitutes a meager 4.8 per cent of total land area. The forest sector despite its small size makes its presence felt by employing half a million people, supporting 30 million herds of livestock, conserving soil, regulating water flow for irrigation and power generation, reducing sedimentation, maintaining ecological balance,

Figure 9.7 Contribution to agricultural GDP by sector



Source: GOP, Economic Survey of Pakistan, various issues.

providing 3.5 million cubic meters of wood and one third of the nation's energy requirements. The government has taken some steps to augment forest cover. The Forestry Sector Master Plan in 1992-93 has planned strategies for the next 25 years. The Plan aims to conserve renewable natural resources and manage eco-systems by actively engaged local population at all levels of planning and implementation.

Horticulture/Floriculture:

Pakistan experiences different climatic conditions in its different regions, which provides it with a unique opportunity of growing fruits and vegetables all year round. Each region of Pakistan is adept at growing particular kinds of fruits. The horticultural sector has the potential of contributing significantly to the incomes of farmers, and export incomes of Pakistan. Steps which the government hopes to take within this sector include: improving the marketing system for fruits and vegetables by providing marketing credit and improving infrastructure, financing horticulture through the State Bank of Pakistan, training people working in sea/air ports to handle horticultural products and encouraging farmers around main cities to grow flowers by establishing wholesale markets for these products.

Farm inputs

Fertiliser

A main input to agricultural production—fertiliser—experienced a decline in its domestic production by 0.7 per cent and its import by 13.6 per cent reducing total availability for the year 2001-02. Improving crop productivity in future years in Pakistan will rely on an integrated and balanced plant nutrition management approach including the use of organic bio sources with mineral fertilisers. Fertiliser consumption in low use areas and crops needs to be increased through an effective delivery system and proper extension services. The mismanagement of fertiliser consumption should be checked through soil testing advisory services and education of the farming community.

Improved seeds

A crucial input to agricultural production is the quality of the seed used. In Pakistan, the Federal Seed Certificate and Registration Department regulates the quality of seed by registering various crop varieties and inspecting standing crops. Currently a total of 143 seed processing plants are working in Pakistan which have enhanced seed processing capacity from 12.2 to 35.4 per cent.

Mechanisation

Agricultural mechanisation is imperative to improve agricultural performance in Pakistan. At the end of 1998, the command area per tractor was 92.3 hectares, which is deemed inadequate to meet Pakistan's mechanisation needs. The Agricultural Development Bank of Pakistan has increased its efforts to increase mechanisation. A majority of development loans are provided by the ADBP for the purchase of tractors/attachments and installation of tube wells, laser leveling, drip/sprinkler irrigation, fodder cutters and bed sowing.

Plant Protection

Even though plant protection does not increase crop yields directly, it is an important input for it reduces their deterioration. The public sector provides pest scouting, aerial spray and advisory services to farmers whereas the private sector is responsible for carrying out plant protection measures. The government aims to make Integrated Pest Management (IPM) its main strategy with regard to plant protection, which is simultaneously eco-friendly and maximises crop production. The Pesticide Act will also be strictly enforced in order to reduce adulteration of agro-chemicals.

Box 9.5 Corporate farming in Pakistan

In an attempt to revitalise Pakistan's agriculture sector, a new policy has been announced to open up the economy to corporate farming. A number of measures are being taken to make this happen: the existing ceilings on land holdings (100 acres of irrigated and 200 acres of non-irrigated land) are to be eliminated; compulsory floors of foreign investment (US $300,000) for agriculture-related industry are to be removed; tax holiday of five years for irrigated agriculture, seven years for Barani and ten years for cultivable waste have been established. Apart from these measures, the government also aims to sell or lease state-owned land for 50 years to corporate farming corporations. Furthermore, the government will give preference to corporate firms in credit schemes, and they will also not be subjected to local labour laws.

The objectives of this corporate farming initiative are to: i) encourage foreign investment; ii) increase domestic private sector investment; iii) improve international quality standards established by WTO regulations; iv) enhance agricultural productivity; and to v) increase exports of fruits, vegetables and fisheries, especially to the Middle East, Iran, Afghanistan, and the Central Asian.

This initiative has generated a lot of criticism. Corporate farming, it is feared, will have negative impact on small farmers and aggravate rural poverty. Already rural credits from institutions such as the Agricultural Development Bank have mostly been usurped by landlords. Now the preferential treatment of corporate farmers will make the situation worse for small farmers. The effects of land reforms will be reversed and large land holdings will be consolidated in the hands of a few. This will also affect bio-diversity as well as encourage a regime of mono-cropping and cash crops. Scarce resources such as water will also be diverted to large corporate farms. It is also not clear whether despite all these effects, corporate farming can indeed be more productive than small farms.

Irrigation

Pakistan is the only South Asian country, which, by 1999, had 82 per cent of its agricultural area, covered by irrigation—the highest proportion in the entire region. However, despite its adequate irrigation canal network, Pakistan experiences a large amount of wastage in its irrigation process. The continued drought has also worsened the availability of irrigation water. The current fiscal year has experienced overall water shortage to the extent of 51 per cent from normal availability as against 40 per cent shortage of last year.

Natural resource issues

Water shortage

Water shortage is a major factor impeding growth of the agricultural sector. Fluctuations in weather conditions, deficiencies in storage capacity and poor use of available water, culminate in water acting as a major constraint to agricultural growth. The recent drought in Pakistan has meant that during 2000-01 production of cotton bales was down by 2.1 millions while wheat, sugar cane and rice crops were lower by 4.1, 7.6 and 1.2 million tons, respectively.[2] A substantial amount of water is also lost annually due to water management inefficiency. Water losses are estimated to be approximately 25 per cent from the canal head to the outlet and another 15 per cent from the outlet to the farm gate mainly due to poorly linked canals and water courses. To deal with water as an agricultural input, conservation and proper utilisation of water must be underlined especially in view of the fact that the Tarbela Dam, built in the 1970s, was the last significant development in water storage management. The government has devised a number of measures to overcome the constraints set by water; participatory water management at distributory level in the Indus basin and at the school level outside the basin, integrated land use, development of water and energy efficient technologies, dissemination of water-related information, development of agricultural advisory services and the re-orientation of the role of on-farm water management.

Land degradation

There are several factors affecting land productivity in Pakistan. There has been an overall deterioration in the fertility of

arable land due to mismanagement and unbalanced fertilisation resulting in the depletion of soil organic matter and soil erosion. In addition, water—logging and salinity has negatively affected agricultural performance. To conserve land a number of strategies need to be adopted.

Institutional improvement issues

Despite its high agricultural growth rates Pakistan continues to experience a growing discrepancy between food supply and demand. Items such as edible oil, wheat, sugar, tea, pulses and other food items are a permanent fixture of our import list, all food items constituting 16 per cent of the total value of imports. It has been calculated by the Ministry of Food, Agriculture, and Livestock that by the year 2010 an estimated agricultural growth rate of 5 per cent will be needed in order to satisfy a future population with the basic diet requirements of 2860 calories consumed daily. This will require a number of institutional improvements including the following:

Investment in agriculture

Public investment in agriculture, has been declining consistently. Agriculture's share in the Public Sector Development Programme (PSDP) has been reduced from 12.8 per cent in 1980-81 to 1 per cent in 1998-99. This lack of financial resources has meant low public investment in agricultural infrastructure and support services such as drainage reclamation, flood management, irrigation works and water management. Private investment, on the other hand has been increasing since 1996-97 due to a combined effect of increased wheat support prices and increased agricultural credit. To achieve high agricultural growth rates, the National Commission on Agriculture in 1988, recommended that public and private investment need to be increased substantially. Now, the government intends to follow that advice. The allocation of agriculture in the PSDP will be gradually increased by 0.25 per cent to 5 per cent in 2009-10, which it is hoped will be adequate to ensure high agricultural growth rates.

Pricing policies

Pricing disequilibrium can occur because of shocks such as droughts and therefore, there is a need for macro-economic management of issues which are compatible with the aim of developing a strong agricultural sector. Major crops in Pakistan are covered by a minimum support price. A number of mechanisms have been used as price support systems that include input subsidies, minimum support prices, as well as instruments of macro policy such as fiscal and trade and exchange rate policies. There are a number of objectives any agricultural pricing policy hopes to achieve:

1. The first major aim of agricultural pricing policy is the requirement of protecting farmers from losses that may be incurred due to declining prices resulting from an excess supply of agricultural products and for a floor to be provided to market prices during the harvest and post-harvest season. Experience from 1980-81 to 1999-2000 shows that crops under the price support programme experienced an increase in production, productivity and growth.[3] Current subsidies have ensured a good record of food security, though with a cost, in that prices of commodities such as wheat, have remained low acting as disincentives to both farmers and traders.

2. Second, to incubate urban consumers against the rise in prices of agricultural commodities, maintain balanced terms of trade between agriculture and other economic sectors, stabilise market prices and supplies of commodities and ensure a reasonable level of income for farmers.

3. Third, to encourage the use of new technologies and reduce average costs by easing the pressures on farmers and

growers that arise due to uncertain market conditions.

In response to a number of problems with price support systems in the past, the government proposes to set up an Agricultural Price Stabilisation Fund, whereby credits and debits will represent system surpluses and deficits, respectively.

Agricultural research

The present agricultural research system does not make any significant contribution towards accelerating agricultural growth. The National Commission on Agriculture had demanded in 1988 that research funding should be increased to 1.5 per cent of agricultural GDP, an increase which is desperately needed should Pakistan hope to reform its research systems. An increased level of funding should occur concomitantly with strengthening of research institutions and their management systems. Research should also be directed towards bio-technical and genetic engineering.

Extension Services

The role of extension services should be changed to promote self-reliance in rural communities through developing community based organisations and NGOs. The effectiveness of extension programmes will depend on restructuring field staff into smaller mobile extension units and encouraging a problem oriented approach.

Agricultural education and training

The main aim of agricultural education and training should be to improve the motivation and productivity of rural populations. The government hopes to: promote adult education programmes, strengthen farmer's training programmes by organising short training courses in various aspects of agricultural management and farm management and train extension workers especially at the field level.

Agricultural marketing

Agricultural marketing is a section in the economy, which needs to be revamped urgently. The marketing system needs to be over-hauled with special attention required by the areas of procurement, pricing, transport, storage, processing, grading, packaging and management.[4]

Agricultural credit

Agricultural credit is imperative in guaranteeing access to other inputs necessary in agricultural production. The National Credit Consultative Council is responsible for the annual allocation of credit to various institutions to promote investment in the agricultural sector. The Agricultural Development Bank of Pakistan is one government controlled financial institution through which agricultural credit is disbursed. Agricultural loans extended between July and March 2001-02 include production and development loans, loans to small farmers, loans for newly identified priority items (for example water management, land development, soil improvement, storage, farm mechanisation, import substitution and export based commodities) and one window operations which specially focus on subsistence and small farmers. Agricultural credit has increased substantially over the last twenty years. In 1998-99 different financial institutions disbursed agricultural

Table 9.26 Supply of agricultural credit by institutions

Year	ADBP	Commercial banks	Cooperatives	Total	
				Rs. million	% change
1996-97	11687	4411	4920	21018	–
1997-98	22363	5653	4723	32739	–
1998-99	30176	7236	5440	42852	30.9
1999-00	24423	9814	5951	40189	-6.2
2000-01	27610	13002	4369	44981	11.9

Source: GOP 2002.

credit totalling 43.7 billion as opposed to 4 billion in 1980-81.

Pakistan's agricultural sector has languished under inappropriate agricultural policies over the last few decades causing the vast potential of our agricultural sector to go unrealised. The answer to Pakistan's agricultural performance lies in consistent, coherent agricultural planning, which balances scarce natural resources with regional demands. By conducting institutional reforms as well as identifying and eliminating inherent problems within the agricultural framework Pakistan hopes to recover the high agricultural growth rates it enjoyed in the 1980s. It is hoped that with planning and implementation of its agricultural plans Pakistan will achieve the aims it has set itself: an agricultural growth rate which outstrips population growth rate; food security and self-reliance in food crops; enhanced productivity of wheat, rice, oilseeds, cotton, sugar cane, land and water development, improved marketing of agricultural commodities, increased agricultural research to generate innovative technology-including bio-technology, improved productivity of small farmers and increased utilisation by large farmers of modern technology.

Sri Lanka[1]

Agriculture is the main source of wealth for Sri Lanka and its economy. The sector alone consists of about 18 per cent of GDP, employs 35 per cent of the total labour force and contributes about 20 per cent to gross exports. Agriculture is one of the largest sectors for growth and development in the economy. More than 70 per cent of the rural population still rely on agriculture and related industries for their livelihood. Therefore, sustainable development of agriculture is an essential requisite for the development of the rural sector.

Over the last two decades, the agricultural sector in Sri Lanka has performed below its full capacity average. However, in the last decade the sector grew at a rate of only 2 per cent, due to the lack of dynamism of the sector and this led to an overall reduction of the national agriculture output of the major crops. The production and output levels have slightly increased since, but the cost of production of cultivated crops has demonstrated an upward trend. Farmer's incomes have not kept pace with the increasing cost of living and factor costs instead the rural credit burden has consequently increased. Rapid erosion of farm income is a major problem that exacerbates rural poverty. This situation has further pushed more than a quarter of the population to live below the poverty line, which clearly indicates that growth in subsistence agriculture is insufficient, due to physical and policy constraints, in particular in the non-plantation sector agriculture.

Agriculture production trends

The plantation sector is based on export-oriented production while other field crops are mainly produced for domestic consumption (table 9.27). Paddy is the main non-plantation crop cultivated to the highest extent in the country while cash crop's production is limited to seasonal demand. Minor crops are also promoted for export in a limited way to earn foreign exchange.

The Plantation Sector reform programme was launched in 1994, with a set of objectives to boost the plantation sector development in the country. The state-owned regional plantations were privatised. hence tea production increased considerably, but rubber production dropped and recorded negative growth during the last decade. The rubber sector encountered a series of constraints such as poor yield and the collapse of natural rubber markets in the world. The coconut industry has not shown much progress during the same period of time, but in 1999-2000 recorded bumper harvest due to good weather conditions experienced in the region.

Since rice is the staple food of the nation, paddy became a main crop, with 70 per cent of farmers in the country being paddy cultivators. Paddy production has shown positive growth and met more than 90 per cent of the domestic requirement in 2000. However, profitability of paddy has been falling as factor prices increased.

Since, Sri Lanka has extensive marine resources, 80 per cent of total fish requirements was met by local production in 2000. Total fish production was estimated at 323,000 mt in 2000. Almost all shrimp production of 6,038 mt was exported in 1998.[2]

Table 9.27 Agricultural production (1990-2000)

Commodity	1990	1995	1996	1997	1998	1999	2000
Tea (Mn Kg)	233.1	248	258	277	280	284	306
Rubber (Mn Kg)	113.1	106	112	118	95.7	97	87
Coconut (Mn nut)	2532	2755	2546	2631	2547	2828	3055
Paddy (Th MT)	2528	2810	2061	2339	2692	2868	2860
Potato (MT)	84347	81657	100755	65800	25900	2700	48000
B'onion (MT)	18777	29719	19367	29100	17400	6300	3600
Dry Chillies (MT)	39100	21300	18400	17900	15600	15000	14000
Vegetable (MT)	558840	498235	427380	419000	352000	554641	58000
Sugar (MT)	57165	7100	7000	63897	6100	6600	6400
Milk (mnl)	249	333	328	331	341	342	346
Fish (MT)	177063	23800	228000	240000	260000	307000	323000

Source: Annual Report, Central Bank of Sri Lanka, various issues.

Use of land and technology

The intensity of agriculture land use has decreased considerably during the last decade. It has declined by 18 per cent during the period 1990 to 1997. The cultivation of subsidiary food crops was reduced by 40 per cent during the respective period and it has made a significant impact on reducing the total agriculture land extent in the country. During the same period, cultivation extents of the plantation sector and the paddy sector declined by 16 and 15 per cent, respectively. The cultivation of minor export crops has marginally increased by 15 per cent since 1990.

Land is a binding factor of production in Sri Lankan agriculture, leading to a number of constraints in land development. Under various property development schemes, a large number of coconut lands have been fragmented into blocks and sold for other activities. A large number of rubber lands have also been abandoned mainly due to rapid depletion of profits in the rubber plantation. Eventually different private management companies were made responsible for the management of marginal tea lands. Seedling tea plantations were gradually replaced with vegetative cultivation, while highly unproductive lands have been abandoned.

In the rural areas, most of the paddy farmers have fragmented and bequeathed their land to their children. The transfer of land from generation to generation has resulted in the land size decrement. In addition, there are a number of other problems for paddy land development. Absence of marketable title to paddy land, tight legal barriers to land transfers, cultural attachment to ancestral landholding, pattern of bilateral inheritance, most of lands being public lands and the complicated tenancy problem are some of the main constraints associated with paddy land development. Other constraints associated with land development include improper land management, which results in the erosion of fertile top soil layers reducing land fertility.

Sri Lanka still relies on non-commercial agriculture and the mechanisation process also is in the stage of infancy. Intensive agriculture needs highly sophisticated production mechanisms to get the optimum production. As far as the Sri Lankan agricultural sector is concerned, mainly the tractor is the only farm machine commonly used.

Sri Lanka is a labour surplus economy and this is a factor that determined the process of mechanisation in agriculture. In addition, the access to mechanisation is relatively difficult because of high cost of mechanisation. Land fragmentation is another constraint in the mechanisation of Sri Lankan agriculture. Thus Sri Lanka still has subsistence peasant agriculture with manual labour present in most agricultural activities.

Rural credit, agricultural research and infrastructure

A higher portion of loans disbursed in the agriculture sector is by the state owned banks. Despite the fact that farmers' real incomes are substantially low due to low returns of most crops cultivated and sudden crop failures, they refrained from getting loans from the organized lending institutions as well as private lending sources. The government wrote off cultivation loans in several instances in order to protect those farmers who had to bear a heavy debt burden. This had a negative impact on the rural credit market, as most of the private lending institutions became reluctant to provide loans to the farming community.

Agricultural research and extension was one of the crucial factors that have not developed well to improve the productivity of the agriculture sector. Public sector expenditure in research and development is less than 1 per cent of total GDP. And, most research institutes pay attention only to applied research

rather than adaptive research, mainly because farmers need remedial measures to their urgent problems through applied research. It is necessary to conduct not only agricultural research but also socio-economic research to find out practicable solutions for farmers' problems.

Agriculture is the main economic activity in rural areas where there is a lack of resources to develop other sectors in the rural economy. Income generated from agriculture is recorded as the lowest occupational income category in the country[3]. Therefore, off farm occupational categories are extensively popular. Despite this poor resource mobilisation to the rural sector, and low farm incomes of the peasantry have not encouraged rural infrastructure development. Further, there has been slow development, in the rural sector of parallel industries such as agro processing industry, storage facilities, transport services, trading and communication services, and insurance and banking services.

One of the largest infrastructure investments ever made was the development of the irrigation sector under the accelerated Mahaweli Development Program in the early part of 1980. Irrigation facilities were made available to farmers to expand their cultivation especially in the dry zones. In line with irrigation sector investment, road construction, rural electrification and other community services were also developed. There were other investments made for identified target areas such as agricultural market place development in Dambulla district, construction of large-scale paddy mills to provide milling facilities to the main paddy producing areas in the Hambantota and Polonnaruwa districts, among others. Under the 'Tea Shakthi Program,' the Ministry of Plantations has established several tea factories in the rural areas to ensure minimum guaranteed prices for tea smallholders. Further, the State sponsored poverty alleviation program called 'Samurdhi' has established several garment factories in the remote areas in order to reduce rural youth unemployment. However, rural sector investments for infrastructure development have been restricted due to budgetary constraints of the government. And the private sector investment flows to the rural areas have also been limited.

The government takes various measures to stabilise the prices of major agricultural crops in order to secure a reasonable market price for farmers. However, such measures do not work efficiently due to various reasons including the inability of procurement agencies to purchase sufficient quantities of agricultural commodities at harvest time. Farmers also do not have correct market information and adequate capital for new investments. Due to the low prices that the farmers receive for their products, they are not able to invest and improve their productivity. Moreover, since there is no consistency of supply and price stability of agricultural commodities, the profitability of agro-processing operations suffers as well.

Development of agro-based industries

Since the liberalisation of the economy in 1977, agricultural markets have been opened and exposed to international competition, tariff rates have been reduced and simplified, while import restrictions on agriculture and agro industrial goods have been reduced. A few agriculture-based industries have survived and grown in this competitive environment while others perished.

However, the agro-industrial sector is primarily catering to domestic market demands. Lack of specialised production with quality, appearance and storability in agricultural commodities has been a constraint in expanding export possibilities. In addition, export market avenues have been restricted by developed countries by imposing various non-tariff measures such as Sanitary and Phyto-Sanitary standards, origin of products for the export processing industries, etc.

The agro-industrial sector is governed by the agricultural sector policies as well as the policies for the manufacturing sector. There are several government ministries responsible for various aspects of agriculture and rural development, and in addition, several ministries are responsible for promoting industrialisation and commerce. A large amount of agro-industrial raw materials are produced by the small holder agriculture. However, the processing takes place only if there is a surplus of domestic agricultural output that is not consumed in raw form. Therefore, agro-industrial development is not considered as a development priority per se, but is influenced by policies to provide a supporting service for the small holder agricultural development.

Sri Lanka's economy has shown considerable progress in terms of per capita income that has grown steadily from US$473 in 1990 to US$856 in 2000. The Government's priority has always been to address the issues of social equity. There is a strong commitment to promote health, education, and poverty alleviation, and currently Sri Lanka is well ahead among the South Asian countries. This is clearly reflected by the high level of social indicators such as literacy rate 91.4 per cent, infant mortality 17 per 1000 live births, and life expectancy 72 years in 1999. In addition, there are various welfare and income support programmes implemented by the government in order to empower the rural poor and achieve social goals.

The problem of poverty still remains high due to the lack of good-quality social services in the rural areas, estate and metropolitan slum areas where health, education, housing, access to safe water and sanitation, and electricity are far below the national average (table 9.28). Malnutrition and under-nourishment is a major problem of the low-income poor, reflected by the high number of cases of low birth weights, stunting, and anaemia. The educational facilities are inadequate in the rural communities, in terms of poor school maintenance, shortage of experienced teachers, low quality of educational inputs, and low turnout of children in schools. In absolute terms, a considerable proportion of the country's population is still living in poor conditions and their socioeconomic situation is characterised by malnutrition, underemployment, vulnerability to most situations and lack of access to the economic opportunities and assets that would allow them to a secure a better lifestyle.

Table 9.28 Incidence of poverty by sectors based on poverty line

%

Sectors	1985/86	1990/91	1995/96
Urban	18.4	15.0	14.7
Rural	35.6	22.0	27.0
Estate	20.5	12.4	24.9

Note: North and East is not included.
Source: GOS 2000b.

Food security and poverty

More than 90 per cent of the rice requirement of the country is met by local production. Since rice is the staple food of the country special provisions have been declared in order to control the rice and paddy market. Monopoly provisions were given to the wheat flour market by the government in order to control price fluctuations of wheat flour. There are some food commodities such as potato, palm oil which are imported under high surcharges while most of the other food materials are imported free of restrictions.

The Cooperative Wholesale Establishment (CWE) is the principal state trading enterprise for food procurement, distribution and storage. It has over 40 wholesale depots and 120 retail outlets, through which they distribute and market imported and local produce. The CWE purchases bulk quantities of agricultural commodities from local producers, and also imports, based on the recommendations of the Ministries of Agriculture and Trade. This food procurement agency has the potential to

ensure adequate stocks of essential commodities in the event of civil unrest, floods, and shortages in the festive seasons. However, the CWE's market share has been diminishing over the period and currently, the private sector has the largest market share in almost all commodities traded in the market. The Multi-Purpose Cooperative Societies (MPCS) are also another state trading enterprise, which engage in the marketing of consumer commodities in the country. The overall availability of food in Sri Lanka is adequate to meet the local requirements. But a considerable proportion of the rural population, particularly those who are susceptible to food deficits such as women, infants and children, do not have access to food because of lack of purchasing power. During the last decade income disparity has widened and the share of national income of the lowest quintile has declined. Accelerated growth of the economy created new employment opportunities, but the poor have been adversely affected due to high rates of inflation, malnutrition and reduction in subsidies. The food security problem could be solved only with overall economic development, a more equitable distribution of income and active intervention of the government.

All governments have implemented various poverty alleviation programs. These programs are targeted to reach the poorest segments of society. Since the late 1980s, the wheat subsidy has remained in place. The targeted food stamps programme replaced the costly rice subsidy in 1989.[4] The Government distributed food stamps for those whose household income falls below Rs. 700 per month. Under this programme, 7.8 million or 46 per cent of the population got free food stamps to purchase essential food items from government sales outlets. With the inception of the Janasaviya poverty alleviation program (1989-1994), monthly cash grants were given to 265,000 families for food purchase and they were recognized as the beneficiary group of this program. In addition, a mid-day meal program was launched in schools in which a meal coupon worth Rs. 3.00 per day was given to all school children with no difference. In 1995, the Samurdhi program was launched by replacing Janasaviya programme.[5] It has an income transfer component to provide consumption support to beneficiary groups that cover 2 million households in 18 districts.

Employment in rural areas

In rural areas, agriculture is the predominant source of employment for men and women. With 70 per cent of the labour force rural based, the agriculture sector accounted for 32 per cent of the total labour force in 2000 compared to 46.8 per cent in 1990. Due to inadequate inflows of capital for investment in agriculture, generation of employment opportunities did not proceed rapidly enough to eliminate surplus labour conditions in the rural society. A large number of female rural labour force of around 150,000 migrated to the Gulf countries and the rest were locally absorbed by the garment industry.[6]

The recorded rural unemployment rate is 10 per cent, although labour shortages are reported in certain agricultural activities in the rural sector. Shortages are common in most skilled types of labour such as rubber tapping, coconut plucking and paddy growing activities, etc, and this is being reflected in rising wages for such job categories.

Real wages for unskilled and skilled labour categories in the rural areas have been rising sharply since about 1990. The real wages have risen between 2.5 per cent for paddy and 6 per cent for off farm employment per year. It showed that there was a strong demand for some sectors and changing labour supply conditions. However, some other sectors (especially non-plantation agriculture sector) have not shown the same level of growth of wages because of declining profitability. By the year 2000, the wage

differential between the different sectors in rural areas has narrowed, compared with early 1990 sectoral wages.[7]

After the economy was liberalised in 1977, major sectors grew in varying degrees and accelerated the process of employment creation. Large number of employment opportunities were created in the construction, manufacturing and service sectors while the number employed in the agricultural sector declined remarkably. This declining of the labour force in the agriculture sector caused problems in agriculture sector growth and productivity and largely affected the income generation capacity of the farming community.

In recent history, women have been treated as an important productive counterpart for earning an income. There was a severe pressure on women from low-income family to seek employment. Therefore, in the rural areas, women entered into the labour market and the rates of unemployment among women rose. Women unemployment is estimated to be 60 per cent of the total unemployment at the national level.[8] However, the majority of women still work in the agriculture sector, and most women workers are in the informal category as self employed workers and unpaid family labour.[9]

Institutional and policy issues

Out of the total land area of 16 million acres, 80 per cent still remains under state ownership and control. However, more than 70 per cent of the population of the country are farmers, of whom more than two thirds are small holders with less than 1 hectare of cultivable land, whether owned or leased. The population pressure has forced the land to labour ratio to be reduced to 0.89 acres per person. Out of the total agricultural land, 42 per cent of holdings are below 0.4 hectares, while 63 per cent of the holdings are below 0.8 hectares.[10]

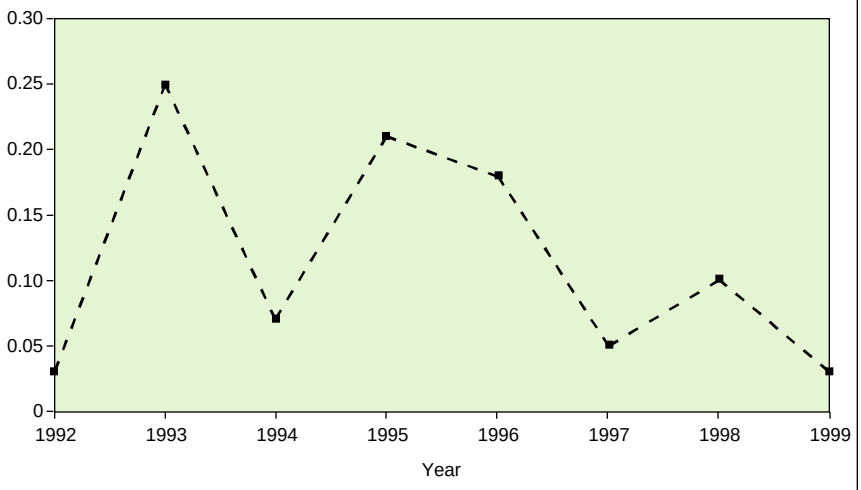
The Land Development Ordinance of 1935 tried to provide security to the peasants by distributing state owned lands for agricultural development and housing construction, and to avoid multiple-ownership of the lands already distributed. The Land Development Ordinance did not permit lands to be leased out or to be sold by imposing a restricted land tenurial system. This land policy did not attempt to achieve maximum productivity of lands. Therefore, it was amended in 1968. The main objectives of this amendment were absolute ownership, provisions to mortgage, and to obtain optimum productivity. In the absence of a clear legal position regarding the ownership of the land, the peasants were not interested in effecting permanent improvements and making investment. Therefore, land titling and registration became another important aspect in the latter period of 1990. However, these Ordinances still maintain their supremacy as the core legislation for the allocation, utilization and development of state lands.[11]

The rural credit schemes are primarily based on agricultural sector loans for the rural sector development. In 1996, the government introduced the New Comprehensive Rural Credit Scheme (NCRCS) under which interest subsidies are granted by the two state banks on short-term and long-term cultivation loans. Approximately 70 per cent of the total allocated credit is granted to paddy producers while the balance is given to the other field crops producers. The interest subsidy on cultivation loans as a percentage of government expenditure has declined over the past few years. A main reason for the decline is a significant drop in loan disbursement to the agriculture sector. The poor performance of the non-plantation sector is considered as a disincentive for the state banks to provide new cultivation loans. High default rates too have significantly contributed to this situation. The government wrote off cultivation loans given to the farmers by the state banks on several occasions in the past.

Tax collection from agricultural land is a highly politically sensitive issue in Sri Lanka. Therefore, land tax was abolished in 1963. High tax collection costs compared to the revenue collected, valuation problems in taxing agricultural produce and assets, and fluctuating agricultural incomes are cited as major difficulties in taxing the agricultural sector.

Figure 9.8 shows that the government investment in agriculture as a percentage of GDP declined over the 1993-1999 period. Due to structural problems in the general investment environment, the war, poor infrastructure and excessive bureaucratic administration, the investment in the agriculture sector in general and the non-plantation sector, in particular, was low during this period.

Figure 9.8 Total investments in agriculture as a percentage of GDP[4]



Note: Investments made for agriculture sector under Board of Investment in Sri Lanka.
Source: GOS 2001b.

Support to agriculture is provided through various subsidy programmes. Replanting and new planting subsidies are the most significant forms of support extended to tea, rubber, coconut and other field crops. The fertiliser subsidy was applied to four major fertiliser ingredients. In 1997, the fertiliser subsidy scheme was revised making it applicable only to urea. This was done in order to target the subsidy towards more needy farmers. The irrigation subsidy is another important indirect subsidy granted primarily to the paddy sector in the form of free irrigation water. In Sri Lanka, irrigation water is provided to the farmer free of charge. In addition, interest subsidy is also available for cultivation loans.

Several state food procurement agencies such as Paddy Marketing Board, State Trading Corporation (STC), Cooperative Wholesale Establishment (CWE) and the Multi-Purpose Cooperative Societies (MPCS) were set up in the early 1970s to address the problem of agricultural marketing. In order to avoid excessive price fluctuations and to reduce negative impact on farmers' income during the season, government introduced various measures such as establishing purchasing agencies and offering guaranteed prices. These measures, however, did not produce the expected results. Even when prices were guaranteed, the limited capacity of the procurement agencies did not allow them to absorb a significant percentage of the season's total production. This often created a panic situation in the farming community.

As an alternative to government interventions in agricultural commodity marketing, the Central Bank of Sri Lanka introduced the forward sales contract scheme in 1999. According to this contract, the seller is guaranteed of a remunerative price for his produce while the buyer is assured of the supply of a quality product. Many crops are covered under the scheme such as paddy, maize, and big onion. These crops are mainly grown in the rural areas of the country.

Chapter 10

Accelerating Agricultural Growth with Human Development

'The Green Revolution was triggered by the genetic manipulation of yield in crops like rice, wheat, and maize. The ever-green revolution will be triggered by farming systems that can help to produce more from the available land, water, and labour resources without either ecological or social harm'.

– M. S. Swaminathan *

The challenge is to build a system of agriculture and rural development that is both growth-oriented and human centred

South Asia has achieved much progress in agricultural development and in raising the levels of human development over the last four decades. But, as this Report documents, this progress has neither been adequate nor equitable to reduce the region's huge backlog of poverty. What could have gone wrong? Part of the answer lies in the patterns of economic and agricultural growth and distribution that was followed in South Asia. South Asia suffers from a chronic gap between its promise and performance. The Report started with a quote from Mahbub ul Haq who asserted that developing countries did not lack resources for human development, and that market forces alone could not deliver balanced patterns of economic growth and human development. 'There must be a judicious mix of market efficiency and social consciousness,' he said.

Through analysis and review of the processes of agricultural and rural development in South Asia, the Report has recorded both successes as well as failures of governments to raise the level of human wellbeing significantly. The process of agricultural development has been analysed in terms of raising productivity, increasing employment, and reducing poverty and income inequality. A review of policies and institutions, particularly those related to pricing of agricultural inputs and output, subsidies and institutional support, has been made including the impact of macro-economic policies on agricultural growth and rural poverty.

This chapter tries to explore some of the answers to questions that have been posed throughout the Report in order to make agriculture once again an engine of economic and social development, and an enriched way of life for the South Asians. The challenge is to build a system of agriculture and rural development that is both growth-oriented and human centred. There is no apparent contradiction between increasing economic growth and improving human lives. But these two are not automatically linked, and that is why it is essential to develop policies and institutions that will connect economic growth with enrichment of human lives.

What will it take for South Asia to develop policies for agriculture that increase the productivity of the poor, improve the quality of life in the rural areas, reduce South Asia's poverty, and enhance human well being? The Report shows that the long-term goals of agricultural growth and rural development, with employment generation and poverty reduction, cannot be achieved only through a macro-economic framework that relies on liberalisation and deregulation to deliver growth. The human development agenda is a progressive agenda. It calls for effective government interventions to address the issues of growth, poverty reduction and employment generation. Thus there is an urgent need for a broader macro-economic policy framework that reinstates the crucial role of governments in promoting pro-poor economic growth and job-creating infrastructure development.

In this chapter, the Report suggests policies and action in four areas in order

to enhance human development through accelerated agricultural and rural development. These are: (a) Focusing on enhancing agricultural productivity through increasing investments in agricultural research and extension and improving irrigation management. (b) Ensuring food security through non-farm employment creation. (c) Revitalising rural development. (d) Designing and implementing equitable macro-economic and trade policies.

Improve productivity through investments in research, extension, and irrigation

It is no longer possible for South Asia to increase agricultural yields through the Green Revolution technology of using more fertiliser, water and pesticide, or bringing more land under cultivation. Cultivable land is diminishing and environmental degradation due to excessive use of chemical inputs have limited these options. South Asia has to increase productivity growth through enhancing agricultural research and extension, and partly through improved water management.

The pace of technological progress in generating new varieties has slowed down in South Asia. Future progress requires the spread of technology to a wider range of crops, both food and cash crops, as well as to less favourable areas. This poses a challenge to research and extension efforts. It is critically important to increase investments for this purpose, as all South Asian countries are under-investing in agricultural knowledge systems, except India. It is also essential that available resources are used more efficiently. The importance of extension may be even greater in view of the need to focus on serving the small farmers, women farmers, and to increase the efficiency of input use.

Increased investments in small-scale irrigation, such as tubewells, focusing on small farmers and women, will be essential to improve their capability to increase productivity. On the other hand, large irrigation systems should be better managed and maintained, and free or highly subsidised provision of water to landlords and large farmers should be stopped. Input subsidies that were benefiting the rural elite should now be diverted to small farmers.

At the same time, it is important to provide price incentives to improve agricultural productivity. Pricing policy can be an effective instrument for guiding resource allocations in accordance with socio-economic development agenda of the country. It can also facilitate technology adoption and increase resource productivity. Minimum guaranteed prices could help increase the production of food grains and other crops of national priority thus promoting the cause of food security and higher degree of self reliance which, left to the market forces may not be well served. Effective implementation of price policy would not only lessen the dependence of small and marginal farmers on higher-cost non-institutional credit but also provide a conducive environment for increasing investment on farms and thus increase agricultural production.

Thus the Report recommends raising food grain productivity through more and better research, better access of small farmers to water and other inputs, and more extension services to help small farmers with knowledge to adopt new technologies.

Ensure food security through employment creation

Food security for all cannot be achieved in South Asia unless conventional policies are modified, and a concerted effort is made to abolish hunger and malnutrition from the region. The first step in this direction should be to address the structural issues associated with the problem of food insecurity that is chronic poverty and low purchasing power of the poor. Food insecurity is a result of extreme poverty. Hence combating

Increased investments in small-scale irrigation, focusing on small farmers and women, will be essential to improve productivity

Sustainable food security can be achieved mainly by increasing non-farm employment opportunities

hunger and food insecurity is directly related to the objective of reducing poverty.

So far, most governments in South Asia have been addressing the problem of food insecurity through various welfare programmes, including food stamps. These programmes are useful provided they are targeted properly. But, they are not a long-term solution to this crucial problem. Also, most of these programmes have suffered from bad design, implementation and corruption problems, thus reducing their effectiveness. Improving the targeting of social safety nets and other welfare programmes is a critical issue for ensuring food security for vulnerable groups. But a sustainable answer is to create income-earning opportunities—the empowerment approach.

The linkage of the rural development policies to ensure food security and provide employment opportunities is implicit in the very definition of food security which means both access to food and availability of food. The access concept implies the income-earning capacity and the opportunity of the poor to earn income, and the availability concept implies the adequacy and efficiency of food production and distribution systems in a country. Thus sustainable food security can be achieved mainly by increasing non-farm employment opportunities, as possibilities of creating on-farm job opportunities will continue to diminish.

To increase rural non-farm employment, infrastructure development including roads, transport, communication, improving existing irrigation system, rural electrification—all should be given an added importance in public and private sector development programmes. Small scale agro-processing and service industries should be promoted through credit and other promotional activities. In countries with large food grain stocks, the Report recommends a large and ambitious 'food for work' programme to create jobs and provide a growth impetus to the rural economy. It is suggested in chapter 9, that such a programme would directly address the most critical problems of slump in rural employment generation, create positive multiplier effects to generate more growth in rural areas and help to build rural infrastructure.

Revitalise rural development

South Asia's track record of rural development, focusing on poverty alleviation and women, attracted world-wide attention during the 1970s and 1980s. But these micro level successes failed to translate into economy-wide success so that at the beginning of this millennium South Asia's rural areas host the largest number of deprived people in the world. The analysis in the Report clearly shows that poverty alleviation through accelerated rural development must be the main strategy for sustainable economic development. But it must be seen as part of the overall economic development plan. A sectoral or project approach to rural development cannot address the deprivation of such a huge number of people.

Rural development and elimination of rural poverty has to be mainstreamed in development agendas. All national plans and budgets have to be judged on the basis of how they are going to increase rural infrastructure, rural productivity, rural employment, rural enterprises, and rural social services, particularly schools, health clinics, and facilities for drinking water and sanitation. Instead of being an add-on to national development plans, rural development plans should be the main focus, if the policy makers are serious about poverty alleviation and the revival of economic growth.

There has to be a tripartite partnerships, between government, community organisations and private sector to rebuild South Asia's rural areas in order to reduce poverty and empower women, who are the majority of rural population, illiterate population and

population in poverty. A forward-looking policy for rural development is in essence a policy of women's empowerment. Various institutional reforms are needed to make this happen, most important of these are land reforms, an improved system of property rights and an equitable and efficient system of agricultural credit.

Land reforms remain crucial to sustainable agricultural growth in South Asia, particularly in Pakistan and some parts of India. In many parts of South Asia, small-holder agriculture dominates in both ownership and occupancy of land, but tenurial patterns still deny security of tenure or viability of holdings. Similarly, credit and marketing arrangements are often monopolistic in character and work against the interests of small farmers. Fragmentation of holdings makes cultivation difficult, less viable and discourages investment by farmers. In some areas control over water has become more important than control over land. And these deprivations of small farmers are tied to the whole question of land ownership or permanent land tenure rights. Thus, the issue of land reform must be revisited and re-framed to cover a wider range of measures for institutional change in agriculture that will lead to viable small holder cultivation.

The Report recommends agrarian reform in four areas which are believed to be politically feasible and economically sustainable. First, tenancy rights must be transformed into either ownership rights for the tenant or to right of permanent tenancy. This has been successfully implemented into permanent rights in the Indian state of West Bengal. The principle here is to give rights to those who actually cultivate the land. Without the legal title to the land, the cultivators have little incentive to improve productivity. Second, the system of property rights must be improved through a better legal framework and computerised record to make small farmers, and specially women, more credit worthy. Third, landless small farmers should be given ownership of uncultivated land. And fourthly, state land should be redistributed to small or landless farmers. These four steps, as emphasized in chapter 5, will lead to productive and equitable use of an important asset which remains either unused or not efficiently and effectively used.

There must also be more and better provision of rural credit from formal banking system as well as from specialised rural micro-credit facilities. In the past, agricultural credit was channelled through government-sponsored or owned financial institutions and commercial banks, private or public, that were required by governments to allocate a certain proportion of their total lending to agriculture at subsidised rates of interest. Most of these formal rural financial institutions were burdened with heavy losses and large defaults, due to ineffective system of loan recovery and a weak legal system. In fact, most of the formal loans and the benefits of subsidy went to large farmers with political connections, and they were also the defaulters. There was also an inadequate appreciation of the farmers' need for credit for multiple purposes, such as crop failure or personal losses.

Various innovations in agricultural credit have been introduced over the years to overcome problems of supervision, monitoring and loan recovery. The innovations in micro-finance in South Asia, like the Grameen Bank in Bangladesh, have been quite successful in catering to the needs of low income families in rural areas. Yet a huge gap remains. The rural elite has been able to capture most of the subsidised credit. There is now a need to target the micro-credit to small farmers and, particularly, women. The inefficiency of previous efforts should not be used as an excuse to reduce public sector support of farmers' credit needs. The banking system providing rural credit must be made to effectively deliver timely credit to targeted farmers, instead of giving subsidised credit to larger farmers.

The issue of land reform must be revisited and re-framed a cover a wider range of measures for institutional change in agriculture

The imperative of poverty reduction and the revival of rural economy require increased public and private investments in rural areas

It is possible to develop and implement programmes that are pro-poor, pro-women and ecologically sound. South Asia's history is full of committed individuals who have made a tremendous difference in the lives of the poor. The names such as A.T. Ariyaratne in Sri Lanka, Akhtar Hameed Khan in Pakistan, Mohammad Yunus and Fazal Abed in Bangladesh, and Ella Bhat in India are now known worldwide. M.S. Swaminathan has developed and is currently implementing a programme called 'bio village' in India. The concept and implementation strategy of this programme, elaborated by M.S. Swaminathan, is summarised at the end of chapter 9.

Implement equitable macro-economic and agricultural trade policies

Many macro-economic policies, such as overvalued exchange rates, depressed domestic returns from export crops, and high-cost, import-substituting industrialisation raise the cost of inputs used by agriculture. In addition, high profits generated by protectionism of the manufacturing sector discouraged investment in agriculture. These policies amount to indirect taxation on agriculture and acted as disincentives to investment and production. It is now increasingly recognised that these policies need to be reviewed. There is now a movement away from state interventions in marketing and pricing of outputs and inputs with a view to bringing them into a greater conformity with their scarcity prices.

But the current economic situation in South Asia also requires a significantly enhanced role of the state in agriculture. The imperative of poverty reduction and the revival of rural economy require increased public and private investments in rural areas. The trend of declining public investment in agriculture and rural development must be reversed. This calls for increased public spending in rural infrastructure which will lead to increased employment and generate economic activity. This will also enhance future growth prospects by removing physical bottlenecks.

As mentioned before, in recent years South Asia has initiated a number of steps under liberalisation programmes aimed at increasing the role of the markets to guide allocation of resources. Exports of agricultural commodities have been taken over by private traders. But the commodity markets in many countries are dominated by powerful processors and their cartels. Millions of small and unorganised farmers cannot match and counteract their influence.

Increased trade openness has made farmers more vulnerable to volatile prices and import competition. This has also led to more food insecurity. International competitiveness of South Asian agriculture has become more critically dependent on world price movements which are more volatile than domestic prices and are distorted by large subsidies provided by rich countries to their agriculture sector. Unless and until these subsidies are reduced, as agreed at the WTO Ministerial Conference in Doha in November 2001, governments in developing countries will have to adopt trade policies that protect their farmers from the effects of these subsidies.

Moreover, progressive trade liberalisation and tariff reduction of internally-traded commodities has created more problems for farmers. As there is no coordination between domestic price policy and policies for external trade and tariffs, volatility has increased and as a result production has suffered. South Asian farmers are operating in an uncertain international climate, competing against highly subsidised large producers from developed countries.

It is in this highly uncertain trading environment that the South Asian governments have been trying to reduce explicit and implicit subsidies provided to farmers. Governments are no longer able to meet the basic objective of agricultural policy: to stabilise prices, ensure producer incentives, and provide food security to the poor. Reduction of

public investment in rural areas and cutting back subsidies have increased costs of production for farmers and worsened the food security problem.The developed countries have not abolished their systems of market interventions and are providing huge subsidies to their farmers in one form or other. South Asia's poor cannot afford the luxury of free market economy, when their livelihoods are endangered. The price support system should not be dismantled without adequate institutional arrangements and logistical support for implementation, otherwise this policy will adversely affect investments and growth in agriculture with serious implications for the economy.

Instead of forcing unfair rules on developing countries, WTO should become their ally for ensuring food and ecological security, and for spreading the benefits of new technologies like biological and information technologies among the poor countries. In order for this to happen, several proposals, suggested in the international forums, need to be seriously considered:[1]

i) WTO must ensure that trade helps to create and not destroy jobs. South Asian countries must be free to impose non-tariff barriers in cases where imports destroy the livelihoods of the poor.

ii) Trade must be rooted in the principles of ensuring equity in terms of social and gender relations, ecological sustainability and employment.

iii) Intellectual Property Rights should not exclude the poor people and poor countries from deriving benefit from inventions of significance to human food and health security.

iv) TRIPS agreement should incorporate the equity principles that are enshrined in the Convention on Biological Diversity with reference to access to genetic resources and benefit sharing.

v) A level playing field must be provided between the production structures of developed and developing countries. Developing countries must invest heavily in improving their infra-structure such as roads, storage, processing and marketing facilities. For this increased investment requirement of developing countries, there is a need to create a global facility for equitable trade on the model of Global Environmental Facility to support developing-country financing needs to compete in the global market place.

There is an urgent need for coherent and equitable national and international agricultural policies to help South Asia's farmers achieve their potential, and move towards the goal of food security for all.

There is an urgent need for coherent and equitable national and international agricultural policies to help South Asia's farmers

Notes

Chapter 1

* Haq 1995.
1 It needs to be stressed here that the HDI is a relative measure of a country's or region's progress in human development compared to the rest of the world. It is not an absolute measure so care needs to be taken in evaluating the HDI values and ranks for a particular country.
2 UNICEF 2001b.
3 World Bank 2001a.
4 UNICEF 2001b.
5 Anderson-Per 2002.
6 MHHDC 1998.
7 GOP 2001b.
8 UNESCO 2000.
9 Ibid.
10 MHHDC 2001.
11 MHHDC 2000.
12 Ibid.
13 MHHDC 2001.
14 Ibid.

Chapter 2

1 Lewis 1954.
2 Ranis & Fei 1961.
3 Mellor 1961.
4 Aziz 2000.
5 Timmer 1998.
6 Lewis 1954 & Mellor 1961.
7 Mellor 1976.
8 Timmer 1998.
9 Mellor 1998.
10 Ruttan 1998.
11 Rosegrant & Hazell 2000.
12 Anderson-Per 2002.
13 Staaz & Eicher 1998.
14 Aziz 2000.

Chapter 3

1 Norman E. Borlaug is the winner of 1970 Nobel Peace Prize and a distinguished Professor of International Agriculture, Texas A&M University. He is an agricultural scientist but his work in food production and hunger alleviation was recognised through the Nobel Peace Prize because there is no Nobel Prize for food and agriculture.

He says: 'I have often speculated that if Alfred Nobel had written his will to establish the various prizes and endowed them fifty years earlier, the first prize established would have been for food and agriculture.' Borlaug, Norman E. (2000). 'The Green Revolution Revisited and The Road Ahead.' Special 30th Anniversary Lecture, The Norwegian Nobel Institute, Oslo, 8 September 2000, available at http://www.normanborlaug.org.
2 See ADB 2000.
3 Originally, Malthus has placed emphasis on food production instead of per capita food availability (measured as availability of per capita kilocalories per day). Although food production is an important dimension of food supply yet we need to per capita food availability is an important measure of food poverty. A Malthusian crisis may not be kept at bay for long if population growth exceeds the rate of growth of food availability.
4 Siamwalla 2000.
5 Rosegrant & Hazell 2000.
6 Ibid.
7 Ibid.
8 Ibid.
9 This finding is similar to Rosegrant & Hazell 2000, p. 22.
10 See Rosegrant & Hazell 2000.
11 The intersectoral income or GDP gap is measured by subtracting per capita non-agricultural GDP from agricultural GDP. A negative number indicates the extent by which the agricultural sector lags behind. For instance, in case of Nepal an intersectoral gap measure of US$45 in 1970 indicates that agricultural incomes were higher in that year. However, a negative number US$-39 indicates that intersectoral gap is widening and agricultural incomes are 39 US$ less than the nonagricultural incomes.
12 This section draws on ideas presented in Rosegrant & Hazell 2000.
13 North 1994.
14 Kaosa-ard *et al*. 2000.
15 Islam 2002, p. 184.
16 The IWT and IBDP was the final outcome of the treaty signed earlier in 1948 between India and Pakistan.
17 The AMISs include (i) surface irrigation systems—run off river type, (ii) lift irrigation systems, and (iii) deep tubewell systems (DTWs). The government has been allocating

operation and management (O&M) budgets each year to all AMISs, and charges irrigation service fee (ISF) from the beneficiaries to cover the O&M costs.

18 Ibid.
19 Binswanger and Elgin 1988.
20 Particularly, in Pakistan the landlords and jagir owners have remained in power. Their vested interest in land holdings did not let the governments push the land reform agendas any further.
21 Islam 2002.
22 Stiglitz 1989.
23 See http://www.ipgri.cgiar.org/regions/apo/sanpgr.html
24 See http://www.saic-dhaka.org/saic/introduction.htm#obj

Chapter 4

1 Pariyar 2002.
2 Rosegrant & Hazell 2000.
3 Ibid.
4 Ibid.
5 Assaduzzaman 2002.
6 APO 1999c.
7 Evenson *et al*. 1999.
8 Rosegrant & Hazell 2000.
9 Ibid.
10 Ibid.
11 Murgai *et al*. 2001.
13 Rosegrant & Hazell 2000.
14 Ibid.
15 Ibid.
16 Ibid.
17 APO 1999a.
18 SAIC 2001.
19 Ibid.
20 Ibid.
21 IFPRI 1999.
22 APO 1999a.
23 SAIC 2001.
24 Ibid.
25 CGIAR 2002.
26 SAIC 2001.
27 Ibid.
28 IFPRI 1999.
29 Ibid.
30 APO 1999a.
31 APO 1999b.
32 SAIC 2001.
33 Ibid.
34 Ibid.
35 Ibid.
36 Ibid.
37 Ibid.
38 APO 1999a.
39 Ibid.
40 Ibid.
41 Ibid.
42 Ibid.

Chapter 5

1 This chapter, contributed by S.M. Naseem is based on a larger study undertaken by him as a Visiting Fellow at the Yale Centre for International and Area Studies and the Economic Growth Centre of Yale University, whose generous assistance is gratefully acknowledge.
2 For a recent extensive survey of the changing themes of rural development and their interaction with the parallel debates on development strategies (albeit mainly from the donors' perspective) see the special issue of ODI's *Development Policy Review*, December 2001, 19(4), especially the articles by Caroline Ashley and Simon Maxwell (*Rethinking Rural Development*) and by Frank Ellis and Stephen Biggs (*Evolving Themes in Rural Development 1950s-2000*).
3 M.S. Swaminathan, Food for peace and development, *The Hindu,* 10 Jan. 2002.
4 C.H. Hanumantha Rao, Food Security, *The Hindu,* 23 March 2002.
5 Abhijit Banerjee, Land Reforms: Prospects and Strategies, MIT, Cambridge, 2001, based on evidence contained in Binswanger, H., Deininger, K. and Feder, G. 'Power, Distortions, Revolt and Reform in Agricultural Land Relations' in Behrman, J. and T. Srinivasan, (eds.), *Handbook of Development Economics*. Volume III, Amsterdam; New York and Oxford: Elsevier Science, North Holland, 1995, pp. 2659-2772.
6 For India, this has been found by a series of farm management studies going back to the 1950s. A summary of more recent evidence from a range of countries, both in Asia and Latin America, is given in Berry, R.A. and Cline, W.R. *Agrarian Structure and Productivity in Developing Countries*, Baltimore: Johns Hopkins University Press, 1979, showing much the same pattern. Similar studies are cited in Binswanger, Deininger and Squire 1995, op. cit. In Rosenzweig, M.R. and Binswanger, H.P. 1993, 'Wealth, Weather Risk and the Composition and Profitability of Agricultural Investments', Economic Journal, Vol. 103, pp. 56-78, the authors using data from the semi-arid ICRISAT region of India, report that profit/wealth ratios are always at least twice as high for the farmers in the smallest category as they are for those in the largest.
7 Bhaduri, Amit, Productivity, production relations and class efficiency: illustrations from Indian agriculture in Bhaduri, Amit and Rune Skarstein (eds.), *Economic Development and Agricultural Productivity*, Edward Elgar, UK, 1997.
8 For an interesting link of the inverse relationship between farm size and productivity and Chayanov's theory of the

peasant economy, see Theodore Shanin's Introduction to A.V. Chayanaov, The Theory of the Peasant Economy, The University of Wisconsin Press, 1986.

9 The recent UNDP *Poverty Report 2000* on *Overcoming Human Poverty*, records that 69 per cent of all developing countries have prepared explicit poverty plans or have incorporated poverty alleviation into their national plans. However, preparing plans on alleviation of poverty is not always reflected in national policies or allocative priorities.

10 Based on a poverty line of $1 a day. Asian Development Bank, *Fighting Poverty in Asia and the Pacific*, ADB, Manila, 2001.

11 For a discussion of empowerment in the Indian context—with wide applicability in other parts of South Asia—see, Andre Beteille, 'Empowerment' in *Economic and Political Weekly*, Perspectives, 6-12 and 13-19 March 1999.

12 The other important areas which are dealt with in the paper elsewhere are: access to land, increased participation and inclusion of women and lower caste communities and decentralisation to local government, communities, and organisations.

13 For a more detailed discussion of the issues, see Wiggins, Steve and Sharon Proctor, How Special Are Rural Areas? Implications of Location for Rural Development, in *Development Policy Review*, December 2001, 19(4). Overseas Development Institute, London.

14 Fan, Shenggen, Peter Hazel and Sukhadeo Thorat, Government Spending, Growth and Poverty: An analysis of interlinkages in rural India. Mimeo. IFPRI, Washington, DC, 1998.

15 Singh, Inderjit, *The Great Ascent: the rural poor in South Asia*. Baltimore: Johns Hopkins University for the World Bank, 1998.

16 Deninger, Klaus and Lynn Squire. Economic Growth and Inequality: Re-examining the Links, *World Bank Economic Review*.

17 Ramchandaran, H. and J.P. de Campso Gummaraes (eds.), *Integrated Rural Development in Asia*. Concept Publishing Company, New Delhi, 1991.

18 Based on Sinha, Subir, 'Configuration of Community in the Agenda of the Nehruvian Socialism and its "Opponents"', Mimeo, April 2002, which gives a detailed discussion of the genesis of the community development program in India.

19 Government of India, Evaluation Report on Working of Community Projects and N.E.S. Blocks, vol. 1, New Delhi: Planning Commission, 1957.

20 Government of India, The Third Five Year Plan, New Delhi: Planning Commission, 1960.

21 See Naseem, S.M., Government and NGO Programmes in the Alleviation of Poverty in Pakistan: A Political Economy Survey. (Mimeo), 2001.

22 For a critique of the V-AID program in East Pakistan, see Sobhan, Rehman, *Basic Democracies, Works Program and Rural Development in East Pakistan*, Bureau of Economic Research, University of Dacca, 1968.

23 For detailed discussion of IRDP and the narratives of its projects in Bangladesh, India, Nepal and Sri Lanka, see the volume edited by Ramachandaran, H. and J.P. de Campos Gumaraes, *Integrated Rural Development in Asia, Learning from Recent Experience*, Concept Publishing Company, New Delhi, 1991. For Pakistan's experience in IRDP, see Khan, Dilawar Ali Khan, The Integrated Rural Development Programme in Punjab, Pakistan in Cheema, G. Shabbir (ed.), *Rural Development in Asia*, Sterling Publishers, New Delhi, 1985.

24 For an informative discussion of many of these programs, see Krishna, Anirudh, Norman Uphoff and Milton J. Esman, *Reasons for Hope, Instructive Experiences in Rural Development*, Kumarian Press, West Hartford, CT, 1997.

25 The UN's World Food Program (WFP) which actively supports rural works programmes in many countries uses the principle of 'food for work' to prioritize poorer households, allowing non-poor households to participate only after all poor households willing to participate have been covered.

26 Grameen Bank lays down the most stringent conditions on its members/borrowers, 90% of whom are illiterate, landless women. They are required to memorize 17 principles concerning their behaviour not only as borrowers but as responsible citizens, including those relating to sanitation, dowry and family planning.

27 Robert Chambers has argued the need for reversal of these roles forcefully in his two celebrated books on rural development: Chambers, R., *Rural Development: Putting the Last First*, Longman, 1983 and Chambers, R., *Whose Reality Counts: Putting the first last*, Intermediate Technology Publications, London, 1997.

28 Agarwal, B., *A Field of Her Own*, Cambridge University Press, 1996.

29 Besley, T. and Burgess, R. *Land reform, poverty reduction and growth: evidence from India*. London School of Economics, Suntory and Toyota Centres for Economics and Related Disciplines DP No. 13. London School of Economics: London, 1998.

30 Mellor, John W. (1978): 'Food Policy and Income Distribution in Low Income Countries', *Economic Development and Cultural Change*, Vol. 27, No. 1.

31 Stern, Nicholas H. (2001): 'Building A climate for Investment, Growth and Poverty Reduction in India', 16th Exim Bank Commencement Day Annual Lecture, Mumbai.

32 Haggblade and Mead (1998): 'An overview of Policies and Programs for Promoting Growth

of the Rural Nonfarm Economy', paper presented at an IFPRI/WB Conference on Strategies for Strategies for Stimulating the Growth of the Rural Nonfarm Economies Countries, Airlie House, Virginia, 17-21 May 1998.

33 Nadvi, K. 'Cutting Edge: Collective efficiency and international competitiveness in Pakistan', IDS Discussion Paper No. 360. Brighton: Institute of Development Studies, 1997.

Chapter 6

* Aziz 1990.
1 FAO 2000b.
2 Adhikari 2000.
3 Anderson-Per 2002.
4 World Bank 2001b.
5 Anderson-Per 2002.
6 FAO 2001a.
7 FAO 2000b.
8 Kelegama 2002.
9 Sharma and Babu 2002.
10 Ibid.
11 Pariyar 2002.
12 For measuring the incidence of food poverty, the poverty line has been estimated by using the food-energy-intake method, which locates food expenditure at which a person attains the caloric requirement. The incidence of food poverty is simply the proportion of poor (below poverty line) in a population who could not meet their caloric requirements.
13 Aziz 2000.
14 However land reforms were made in the country in 1959, 1972 and 1977.
15 Pariyar 2002.
16 Anderson-Per 2002.
17 Pariyar 2002.
18 Anderson-Per 2002.
19 FAO 2001a.
20 High values of DES indicate low diet diversification and vice versa.
21 Anderson-Per 2002.
22 Pariyar 2002.
23 Qureshi *et al*. 1999.
24 Adhikari 2000.
25 Anderson-Per 2002.
26 Pariyar 2002.
27 Kelegama 2002.
28 Asaduzzaman 2002.
29 Hazell 2002.
30 Ibid.
31 Kelegama 2000.
32 GOP 2000.
33 FAO 2001a.

Chapter 7

1 FAO 2002a.
2 Pariyar 2002.
3 Goonesekere 2000.
4 World Bank 1989.
5 Goonesekere 2000.
6 GOP 1995.
7 UNICEF 1990.
8 Pariyar 2002.
9 Goonesekere 2000.
10 World Bank 1990.
11 UNICEF 1990.
12 FAO 2002a.
13 World Bank 1989.
14 FAO 2002a.
15 UNICEF 1990.
16 World Bank 1989.
17 UNICEF 1990.
18 FAO 2002a.
19 World Bank 2002a.
20 GOP 1995.
21 UNICEF 1990.
22 World Bank 1992.
23 GOP 1995.
24 World Bank 1992.
25 Agarwal 1996.
26 Kelegama 2002.
27 Goonesekere 2000.
28 Mehta 2000.
29 MHHDC 2000.
30 Mehta 2000.
31 Stephens 1995.
32 Pariyar 2002.
33 World Bank 1989.
34 MHHDC 2000.
35 Heyzer & Sen. 1994.
36 Pariyar 2002.
37 MHHDC 2000.
38 Bhattacharya and Rani 1995.
39 World Bank 1992.
40 Pariyar 2002.
41 UNDP 1992.
42 MHHDC 2000.
43 IFPRI 1995.
44 UNICEF 1990.
45 MHHDC 2000.
46 Goonesekere 2000.
47 World Bank 1989.
48 UNFPA 2002a.
49 Mehta 2000.
50 FAO 2002a.
51 INWID 1991.
52 UNFPA 2002a.
53 FAO 2002a.
54 IFPRI 1995.

Chapter 8

1 Edited and abridged from a larger paper prepared for this Report by A.R. Kemal, with the assistance of Munir Ahmed and Ejaz Ghani.
2 The food security problem is severe for a very large proportion of the urban population and the rural population that has either no land or very small amount of land and have to buy some of the food.
3 For details please see Deomampo 1997.
4 This section heavily draws on the work done by Ingco and Ng 1998.
5 STEs may be an institution, an agency or an organisation.
6 Miner 1999.
7 See World Bank 1995.
8 Ingco and Ng 1998.
9 Nepal was not included in the study.
10 This section heavily draws on the work on Jha 2000.
11 Valde's and McCalla 1999 have shown that South Asia has higher food importing capacity than the East Asian and Pacific region has, but it has much less food importing potential than that of the Central Asian states.
12 The required reduction for developing countries is only 24 per cent, subject to minimum of 10 per cent for each tariff line over a period of 10 years.

Chapter 9

India Section

1 Abridged and edited version of a larger paper prepared by Jayati Ghosh for this Report. The views are the author's own.
2 Bhalla and Singh 2001.
3 Acharya and Chaudhri (eds.) 2001.
4 The COPS data provides per hectare estimates only, and these are blown up using official estimates of state-wise, crop-wise area. Also there are many gaps in the COPS series by crops and state, which have been filled using suitable proxies.
5 If the NSS thin samples are used for assessing the trends, a very different picture emerges. Sen 2002 shows how the evidence using the thin samples, and using 1990-91 as break year (after which the liberalising reforms were started) both for rural areas or the country as a whole, agricultural employment growth appears to have increased while growth of non-agricultural employment has decelerated, despite the known fact that GDP growth has followed the opposite pattern.
6 It is also worth noting that the current weekly status, which gives a flow measure of labour rather than a stock measure, provides much lower estimates of activity for agriculture in particular.
7 It is also worth noting that for both males and females, the current weekly status shows a lower degree of participation in education than the usual status definitions, indicating that even when there may be formal registration in education, actual attendance is probably less. (The current daily status shows an even lower rate.)
8 Sen 2002.

Bangladesh Section

1 This is abridged from a larger paper prepared by M. Asaduzzaman. The views expressed are author's own.
2 BBS 2001.
3 BBS 1997.
4 The Ganges-Brahmaputra-Meghna river basin system constitutes one of the largest in the world ranking after the Amazon and the Congo river systems.
5 Shahabuddin 2000.
6 For an overview of growth since the British period, see Asaduzzaman 1993.
7 This section partly draws upon Saha 2001.
8 Very possibly agricultural labour households among the farmers earn their income both from cultivation in their own farm and selling labour to other farmers. Agricultural labour households among the non-farm households are presumably those who sell labour in farms and have other non-farm occupations including non-farm labour.
9 In 1996, the country had nearly 90,000 power tillers and more than 60,000 tractors (BBS 1999). Of the total land tilled using tractors, practically the whole land was ploughed with hired ones. Of the 4.2 mn acres of land tilled using power tillers, 3.7 mn acres (i.e., 88 per cent) belonged to non-owners of power tiller.
10 Ahmed 1995 attributes 20-30 percent of the gain in rice production to these reform measures and subsequent input use changes. The increased use of fertiliser and irrigation were due to, among other factors, their lower real (Hossain 1996).
11 This also gave rise to the Flood Action Plan (FAP) studies, which resulted in amassing of voluminous data and their analysis for policy action. One of these, FAP-12 dubbed the Agricultural Study examined the issues of agricultural and rural development problems in the context of such water management interventions.
12 Asaduzzaman 2001.
13 Mondal and Asaduzzaman 2002.
14 By non-farm we actually include both non-crop agricultural and non-agricultural activities. Mandal and Asaduzzaman opted for a similar

broader definition and termed it as rural non-farm economy (RNFE).

15 Asaduzzaman 2001.
16 Asaduzzaman 2002.
17 BBS 2001.
18 This is according to the basic needs method. What happens if the calorie method is used, is not reported. It is likely that it would be lower than in most other cases, as farmers produce much of their own food and thus probably consume comparatively more calories than others.
19 Zaman 2002.
20 Asaduzzaman and Toufik 1997.
21 Roy and Quasem 2000, p. 22 quotes data from a report which shows that in such lands cultivated with rice, the top soil erosion is 97 metric tons per hectare per year. For pineapple cultivation, yjr erosion is much higher, 238 mt per ha per year.
22 Roy and Quasem 2000, p. 15, for example, reports on the basis of soil information on Bangladesh that depending on area, the soil organic matter has depleted from 9% in the old Himalayan plain 46% in the Meghna estuary flood plain between 19869/70 to 1989/90.
23 This does not mean that there are no such programmes, nor that such a programme would be easy to implement effectively. Roy and Quasem 2000, p. 4 for example cites the soil testing programme of the Soil Research Development Institute (SRDI) whose testing results are released rather late and often remains unknown to the peasants. Apart from such general problems of bureaucratic management of development projects in the country, any intervention which tries to halt or improve non-point degradation of resources such as that of land under the ownership and management of millions of peasants, is intrinsically more difficult to supervise and monitor compared to location-specific degradation (such as industrial pollution).
24 The FAO and the Bangladesh Agricultural Research Council have together worked and put agro-ecological information both in print and digitalised form.
25 As reported by Shahabuddin 2000; p. 85, the rate of growth of area under irrigation for 1984/85-1989/90 had been 8.4% per annum declining to 4.1% and 2.0% respectively over 1990/91-1994/95 and 1995/96-1999/2000.
26 An *upazila* is sub-district. There are now 64 districts or *zilas* and nearly 400 *upazilas* in the country.
27 See particularly the following reports: FAP 12, FAP 13 and FAP 15.
28 There is another problem of the switch from ground water to surface water. The supply of safe drinking water so far in the rural areas depended on the spread of hand tube wells because of the problem of harmful pathogens in surface water. A switch from ground water to arsenic-free surface water will be either costlier in terms of investment or will be less safe with the associated social cost of more babies dying of diarrhoea.
29 Asaduzzaman 2001.

Nepal Section

1 Summary of a paper prepared by Madan P. Pariyar (see Pariyar 2002).
2 HMGN 2002.
3 Pradhan 2001.
4 Shkya 1998.
5 HMGN 1992.
6 HMGN 1998a.
7 Chapagain 2000.
8 These institutions were responsible for 94 per cent of the increase in agriculture credit during 1990-2000.
9 Lucock 2002.
10 HMGN 2002.
11 The Irrigation Policy 1992 (Amendment 1997) gives the details on the cost sharing arrangement for different sections of the irrigation system.
12 HMGN 2001g.
13 HMGN 2000b.

Pakistan Section

1 FAO 2001c.
2 GOI 2001a
3 GOP 2000a.
4 FAO 2000b.

Sri Lanka Section

1 Summary of a paper prepared by Saman Kelegama (see Kelegama 2002).
2 GOS 2000.
3 GOS, Quarterly Labour Force Survey.
4 Gunatilake & Williams 1999.
5 Gunatilake & Salih 1999.
6 *Economist*, 8-14 August 1998.
7 Author's research assistance for the World Bank study on Sri Lanka's Labour Market.
8 ILO 2000.
9 Gunatilake 1999.
10 Tennakoon 2000.
11 Wijayadasa 2001.

Chapter 10

* M.S. Swaminathan, *A Century of Hope*, 1999. EastWest Books (Madras) Pvt., Ltd.

1 Discussion in this section is based on M. S. Swaminathan, 'The Persistence of Poverty in South Asia despite Green Revolution' in Khadija Haq (ed.), *The South Asian Challenge*. 2002, Oxford University Press, Karachi.

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_____. 1999b. *Agricultural Research and Extension Interface in Asia.* Tokyo.

_____. 1999c. *Structural Adjustments in Agriculture in Asia.* Tokyo.

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Note on Statistical Sources for Agriculture Tables

The special agricultural data for this Report have been collected from various international sources. Principle international sources include the UN system, specifically the Food and Agricultural Organization (FAO) and the World Bank. For instance, data on food security and most of the indicators for agricultural production has been collected from the FAO. Indicators for agricultural inputs, natural resources, rural and urban development and other agricultural data have been compiled mainly from the World Development Indicators of the World Bank.

Since regional international comparability is limited for data obtained from national sources, serious effort has been made to use international data wherever available. Even though data in international sources is not as current as the one available in national sources, preference was given to the former due to the nature of the data required. There is however, a scarcity of international and national data for both Bhutan and the Maldives.

Extra care has been taken to ensure that the information provided in the tables is both reliable and consistent.

1. Summary of Key Agriculture Data

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)
Agriculture (average annual % growth)								
– 1980-90	3.1	4.3	2.7	4	2.2	…	…	3.2
– 1990-2000	3	4.4	2.9	2.5	1.9	…	…	3.1
Agriculture value added (% of GDP)								
– 1990	31	26	29	52	26	43	…	30.5
– 2000	25	26	25	40	20	…	…	25.3
Agricultural productivity (agriculture value added per worker 1995 $)								
– 1979-81	272	394	217	162	648	…	…	281.6
– 1998-2000	397	630	296	188	453	…	…	407.3
Employment in agriculture (% of total labour force)								
– 1980	69.5	64	72.5	90	51.2	…	…	69.2
– 1999	60.6	53.2	55.6	96.6	44.3	…	…	59.7
Land to labour ratio								
– 1980	0.8	1.1	0.3	0.4	0.7	…	…	0.8
– 1990	0.7	1	0.3	0.3	0.6	…	…	0.7
– 1999	0.6	0.8	0.2	0.3	0.5	…	…	0.6
Food trade (% of merchandise export)								
– 1990	16	9	14	13	34	…	…	15.2
– 2000	14	11	7	21	21	…	…	13.2
(% of merchandise import)								
– 1990	3	17	19	15	19	…	…	6.5
– 2000	7	14	15	17	15	…	…	8.8
Cereal yield kilograms (per hectare)								
– 1980	1350	1613	2005.8	1687.1	2501	1425	850	11431.9T
– 1998-2000	2299	2261	2927	2007	3180	1456[a]	2500[a]	16630.0T
Fertiliser consumption (1000 metric tons)								
– 1990	12152	1893	700	73	171	…	…	14989.0T
– 1999	18372	2824	1300	88	259	…	…	22843.0T
Fertiliser application per unit of land (kilogram per hectare)								
– 1990	71.7	90.4	74.2	31.1	90	…	…	357.4T
– 1999	115.6	129.1	154	29.7	136.3	…	…	564.7T
Cropped area (1000 hectares)								
– 1990	169438	20940	9437	2350	1990	132	3	204065T
– 1999	159000	21880	8440	2968	1900	160	3	194188T

Note:
a: year 1999

Source: Rows 1, 5: World Bank 2002a; Row 2: World Bank 2002a, 2001a; Row 3: World Bank 2002a; Row 4: World Bank 2001a, FAO 2001c, MHHDC 2001; Row 6: World Bank 2002a, World Bank 2001a, 2000; Row 7: FAO 2001c; Row 8: FAO 2001c.

2. Agriculture and the Economy

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)
Agriculture value added (annual growth %)								
– 1990	3.7	3	10	5.7	8.5	3.1	9.2	4.3
– 1999	1.3	1.9	4.7	2.7	4.4	3.5	…	1.8
Agriculture raw materials								
(% of merchandise exports)								
– 1990	4	10	7	3	6	6.8[a]	…	5.0
– 2000	1	3	2	0	2	7.5[b]	0.11[c]	1.3
(% of merchandise imports)								
– 1990	4	4	5	7	2	0.7[a]	…	4.1
– 2000	3	3	5	5	1	1.4[b]	2.6[c]	3.2
Food (% of merchandise exports)								
– 1990	16	9	14	13	34	…	…	15.2
– 2000	14	11	7	21	21	23[b]	79[c]	13.3
Food (% of merchandise imports)								
– 1990	3	17	19	15	19	…	…	6.5
– 2000	7	14	15	17	15	21.5[b]	22.8[c]	8.8
Cereal imports (1000 metric tons)								
– 1980	417	613	2194	54	883	…	24839	29000T
– 1999	1779	3249	4765	46	1232	…	27816	38887T
Population employed in agriculture (1000)								
Male								
– 1990	146363	13861	18729	4891	2291	468	18	114746.4
– 2000	165961	14681	19478	5920	2537	552	17	130478.5
Female								
– 1990	83243	6829	16198	3307	1134	325	10	65688.0
– 2000	97730	9839	19254	4189	1349	391	10	77727.6

Notes:
a: year 1991; b: 1994; c: 1997.

Source: Row 1: World Bank 2001a; Row 2: World Bank 2002, World Bank 2001a; Row 3: World Bank 2002a; Rows 4, 5: FAO 2002d.

3. Profile of Agricultural Production

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)
Food production per capita								
(1989-91=100)								
– 1990	99.6	99.5	99.6	101.9	104.6	101.2	104.3	99.7
– 2000	106.9	111.6	111.5	98.3	104.7	91.3	99.9	107.7
Food production index								
(1989-91=100)								
– 1990	99.6	99.5	99.6	102	104.6	101.2	104.4	99.7
– 2000	127.4	146.6	131.6	125.3	115.7	114.2	132.4	129.6
Crop production index								
(1989-91=100)								
– 1990	99	97.4	99.2	102.3	104.6	100.8	104.8	99.0
– 2000	125.7	129.9	132.2	126.3	114.7	122.7	132.9	126.7
Livestock production index								
(1989-91=100)								
– 1990	101	119	101	101	101	102	100	102.9
– 2000	133	153	140	127	131	94	125	135.6
Fish production (1000 metric ton)								
– 1999	5353	675	1545	26	279	…	133	8011T
Forest production (1000 cu.m) 1999								
– Roundwood	302794	33075	33629	21962	10344	1751	…	403555T
– Fuelwood	278756	30670	33006	21342	9708	1706	…	375188T

Source: FAO 2001c.

4. Agricultural Inputs

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)
Fertiliser consumption (100 grams per hectare of arable land)								
– 1997-99	1040.1	1148.8	1465.2	418.6	2628.7	7.1	…	1103.5
Agricultural machinery total tractors in use (number)								
– 1990	988070	265728	5200	4400	6500	…	…	1269898T
– 1999	1520000	320500	5450	4600	8000	…	…	1858550T
Agricultural machinery tractors (per 100 sq.km of arable land)								
– 1979-81	24	50	5	10	141	…	…	26.2
– 1997-1999	92	150	7	16	84	…	…	88.1
Tractors per thousand agricultural worker								
– 1997-99	6	12	0	0	2	…	…	5.9
Total area irrigated (1000 hectares)								
– 1990	45144	16940	2936	950	520	39	…	66529T
– 1999	59000	17950	3985	1135	662	40	…	82772T

Source: Row 1: World Bank 2001a; Rows 2, 5: FAO 2001c; Rows 3, 4: World Bank 2002a.

5. Profile of Rural/Urban Development

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)
Rural population (millions)								
– 2000	725.5	86.9	96.9	21.3	14.6	…	…	945.2T
% of total population								
– 1980	76.9	71.9	85.6	93.5	78.4	96.1	77.7	77.6
– 2000	72	63	75	88	76	92.9	72.4	71.78
Urban population (millions)								
– 2000	288.5	51.1	32.1	2.7	4.6	…	…	379T
% of total population								
– 1980	23	28	14	7	22	…	…	22.3
– 2000	28	37	25	12	24	7.1	27.6	28
Rural population growth (%)								
– 1980-2000	1.6	1.9	1.5	2	1.2	…	…	1.6
Access to improved sanitation facilities								
Urban (% of population)								
– 1990	58	78	78	68	93	…	…	62.7
– 2000	73	94	82	75	91	…	…	76.2
Rural (% of population)								
– 1990	8	13	27	16	79	…	…	11.6
– 2000	14	42	44	20	83	…	…	20.9
Access to safe drinking water								
Urban (% of population with access)								
– 1990	92	96	98	96	90	…	…	92.9
– 2000	92	96	99	85	91	…	…	92.8
Rural (% of population with access)								
– 1990	73	79	89	63	59	…	…	74.7
– 2000	86	84	97	80	80	…	…	86.5

Source: Row 1: World Bank 2001a, World Bank 2002a; Row 2: World Bank 2002a, UNDP 2002; Rows 3, 4, 5: World Bank 2002a.

6. Profile of Natural Resources

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)
Land area (thousand square km)								
– 1999	2973	771	1209	143	65	…	…	5161T
Land productivity (value added per hectare of land) constant 1995 US $								
– 1980	324.04	290.25	561.49	241.79	780.36	…	…	349.2
– 1994	515.28	500.62	831.43	381.58	1118.72	…	…	550.54
Land use								
Arable land (% of land area)								
– 1980	54.8	25.9	68.3	16.9	13.2	…	…	52.1
– 1999	54.4	27.5	62.2	20.3	13.6	…	…	51.1
hectares per capita								
– 1979-81	0.2	0.2	0.1	0.2	0.1	…	…	0.2
– 1997-99	0.2	0.2	0.1	0.1	0.1	…	…	0.2
Irrigated land (hectares)								
% of cropland								
– 1979-81	22.8	72.7	17.1	22.5	28.3	…	…	26.9
– 1997-99	33.6	81.7	44.8	38.2	33.7	…	…	39.6
Forest area								
% of total land area								
– 2000	21.6	3.2	10.2	27.3	30	…	…	18.8
Average annual deforestation (square km)								
– 1990-2000	-381	304	-165	783	348	…	…	92.3T
Fresh water resources (total resources per capita cu.m) 1999	1913	1892	9482	8989	2634	…	…	2781.9
Fresh water withdrawals billion (cu.m) (annual)*								
– 1980-99	500	155.6	14.6	29	9.8	…	…	709T
Annual freshwater withdrawals (% for agriculture)								
– 1987	92	97	86	99	96	…	…	92

Note:
*data refer to any year from 1980 to 1999.

Source: Row 1: World Bank 2002a, World Bank 2001a; Rows 2, 3, 4, 5, 7: World Bank 2002a; Row 6: World Bank 2001a.

7. Profile of Food Security (Cereals only)

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)
Cereals production (1000 metric tons)								
– 1980	113747	15514	14765	2971	1460	…	17	148474T
– 1999	188432	24880	25015	5230	1942	…	25	245524T
Cereals imports (1000 metric tons)								
– 1980	417	613	2194	54	883	…	24839	29000T
– 1999	1779	3249	4765	46	1232	…	27816	38887T
Cereals exports (1000 metric tons)								
– 1980	706	1164	…	10	1	…	…	1881T
– 1999	2619	1796	…	30	3	…	…	4448T
Total availability of cereals (1000 metric tons)								
– 1980	109652	13747	15734	2865	2083	…	24856	168937T
– 1999	173557	25730	27425	5178	3121	…	34141	269152T
Domestic utilisation of cereals (1000 metric tons)								
– 1980	96507	11747	14317	2386	1947	…	23770	150674T
– 1999	154471	21829	25454	4192	2815	…	32814	241575T
Per capita supply of cereals kilograms per year								
– 1980	140.1	144.6	167.6	163.9	133.3	…	150.4	899.9T
– 1999	155.6	158.7	189.1	186.3	150.2	…	116.4	956.3T
calories supply (per day)*								
– 1980	1277	1261	1629	1508	1184	…	1184	8043T
– 1999	1428	1300	1856	1733	1323	…	1055	8695T

Note:
*data refer to only cereals.

Source: FAO 2002d.

8. Profile of Investment and Expenditure on Agriculture

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)
Government expenditure on agriculture (1985 million US $ PPP)								
– 1993	35918	1669	1773	359	596	…	…	40315T
Govt. expenditure on agriculture as % of agricultural GDP								
– 1980	12.3	4.3	2.7	4.3	7.7	…	…	10.4
– 1993	11.7	3.6	3.2	3.2	8.1	…	…	9.8
Percentage of govt. expenditure on agricultural in total govt. expenditure								
– 1980	14.6	5.4	12.3	16.4	5.7	…	…	13.4
– 1993	9.6	2.6	6.9	10.5	5.1	…	…	8.5
Public investment on agri research (1985 million US $ PPP)								
– 1980	775.7	121.8	104.7	17.6	35.5	…	…	1055.3T
– 1993	1649.7	187.6	136.7	19	35.5	…	…	2028.5T

Source: Rosegrant and Hazell 2000.

Human Development Indicators for South Asia

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Note on Statistical Sources for Human Development Indicators

The human development data presented in these annex tables have been collected with considerable effort from various international and national sources. For the most part, standardised international sources have been used, particularly the UN system and the World Bank data bank. The UNDP and World Bank offices made their resources available to us for this Report.

Countries in the indicator tables are arranged in descending order according to population size. While most data have been taken from international sources, national sources have been used where international data have been sparse. Such data have to be used with some caution as their international comparability is still to be tested.

Several limitations remain regarding coverage, consistency, and comparability of data across time and countries. The data series presented here will be refined over time, as more accurate and comparable data become available. In particular, policy-makers are invited to note the following deficiencies in the currently available statistical series and to invest sufficient resources to remedy these shortfalls:

(a) Generally the latest data are not available for several indicators. Some statistical indicators date back ten years or more. Analysis of the current economic and social situation is greatly handicapped in the absence of up-to-date data.
(b) Time series are often missing for even the most basic data as population growth, adult literacy, or enrolment ratios. An effort must be made to build consistent time series for some of the important indicators.
(c) In certain critical areas, reliable data are extremely scarce: for instance, for employment, income distribution, public expenditure on social services, military debt, foreign assistance for human priority areas, etc.
(d) Information regarding the activities of NGOs in social sectors remains fairly sparse.

It is time for policy-makers to make a significant investment in the collection and analysis of up-to-date, reliable, and consistent indicators for social and human development. If development is to be targeted at the people, a great deal of effort must be invested in determining the true condition of these people.

It is hoped that the various gaps visible in this annex will persuade national and international agencies to invest more resources and energy in investigating human development profiles.

1. Basic Human Development Indicators

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
Total estimated population (millions) 2000[a]	1014	138	129	24	19	2.10	0.30	1326T	4867T
Annual population growth rate (%) 1995-2000	1.7	2.6	1.6	2.7	1.1	3.1	3.7	1.8	1.8
Life expectancy at birth (years) 2000	63.3	60	59	59	72	62	67	62.6	65
Adult literacy rate (% age 15 and above) 2000	57.2	43.2	41.3	41.8	91.6	47.0	96.7	54.4	73.7
Female literacy rate (% age 15 and above) 2000	45.4	27.9	29.9	24.0	89	30[b]	96.8	42.3	66.0
Combined 1st, 2nd and 3rd level gross enrolment ratio (%) 1999	55	40	37	60	70	33	77	52.0	61
Infant mortality rate (per 1000 live births) 2000	69	85	54	72	17	77	59	68.5	61
GNP per capita (US$) 2000	450	440	370	240	850	590	1960	444	1230
GDP (%) growth 1999-2000	3.9	4.4	5.9	6.5	6.0	7.0	4.8	4.2	5.4
GDP per capita (%) growth 1999-2000	2.0	1.9	4.1	3.9	4.3	3.9	2.3	2.3	3.9
Real GDP per capita (PPP$) – 2000	2358	1928	1602	1327	3530	1412	4485	2237.5	3783
Human Development Index (HDI) 2000[e]	0.577	0.499	0.478	0.490	0.741	0.494	0.743	0.560	0.654
Gender Development Index (GDI) 2000[f]	0.560	0.468	0.468	0.470	0.737	0.444[c]	0.739	0.542	0.634[d]

Notes:

a: Population figures for 2000 are taken from UN: World Population Prospects: The 1998 Revision. (Medium variant). Population figures for Pakistan have been calculated using 1998 Population Census, GoP. The population growth rate has been calculated by using the formula {[(new value/old value)^1/n]-1}*100; b, c, d: year 1998;

e: The Human Development Index (HDI) has three components: life expectancy at birth; educational attainment, comprising adult literacy, with two-thirds weight, and a combined primary, secondary and tertiary enrolment ratio, with one-third weight; and income. Any significant difference in the HDI for the South Asian countries is due to the change in methodology for calculating the index. Please refer to UNDP's Human Development Report 2000; f: The Gender-related Development Index (GDI) adjusts the HDI for gender equality in life expectancy, educational attainment and income.

Source: Rows 1, 2: UN 1999, GOP 1998; Rows 3, 4, 6, 7: UNDP 2002; Row 5: UNDP 2002, MHHDC 2001; Rows 8, 9, 10: World Bank 2002a; Rows 11, 12: UNDP 2002; Row 13: UNDP 2002, 1999, MHHDC 2001.

2. Trends in Human Development

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
GNP per capita (US $)									
– 1973	130	130	80	90	230	…	…	126	880[a]
– 2000	450	440	370	240	850	590	1960	444	1230
Real GDP per capita (PPP, US $)									
– 1960	617	820	621	584	1,389	…	…	648	790
– 2000	2358	1928	1602	1327	3530	1412	4485	2238	3783
Human Development Index (HDI)									
– 1960	0.206	0.183	0.166	0.128	0.475	…	…	0.204	…
– 2000	0.577	0.499	0.478	0.490	0.741	0.494	0.743	0.560	0.654
Life expectancy at birth									
– 1960	44	43	40	38	62	37	44	44	46
– 2000	63	63	61	59	73	62	68	63	64
Gross enrolment ratio for all levels									
– 1980*	40	19	30	28	58	7	…	37	46
– 1999	56	40	37	60	70	33	77	53	61
Adult literacy rate (% age 15 and above)									
– 1970	34	21	24	13	77	…	91	32	43
– 2000	57	43	41	42	92	47	97	54	74
Infant mortality rate (per 1000 live births)									
– 1960	144	139	151	212	90	175	158	144	137
– 2000	69	83	60	74	15	80	60	69	58
Fertility rate									
– 1960	6.0	7.0	6.7	6.0	5.4	6.0	7.0	6.1	6.0
– 2000	3.1	4.7	3.1	4.3	2.1	5.3[b]	5.2[b]	3.3	2.8
Underweight children (% under 5)									
– 1975	71	47	84	63	58	…	…	69	40
– 1995-2000	47	38	48	19	33	19	43	45	29

Notes:
a: year 1979; b: year 1999.
*: % age 6-23.

Source: Row 1: World Bank 2002a, World Bank 1995b; Rows 2, 3, 5, 6: UNDP 2002, UNDP 1994; Row 4: World Bank 2002a, UN 1996; Row 7: World Bank 2002a, UNICEF 1998; Row 8: World Bank 2002a, UNICEF 1998, MHHDC 2001; Row 9: UNDP 2002, UNDP 1994, MHHDC 2001.

3. Education Profile

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
Adult literacy rate (%)									
– 1970	34	21	24	13	77	…	91[a]	32	43
– 2000	57	43	41	42	92	47	97	54	74
Male literacy rate (% age 15 and above)									
– 1970	47	40	47	22	86	…	…	47	55
– 2000	68.4	57.5	52.3	59.6	94.4	58[b]	96.6	66.0	80.3
Female literacy rate (% age 15 and above)									
– 1970	19	5	9	3	68	…	…	17	32
– 2000	45.4	27.9	29.9	24.0	88.6	30[d]	96.8	42.3	64.5[c]
Primary enrolment (%) gross									
– 1970	73	40	54	26	99	…	…	68	76
– 1998	100	86	122	114	111	73[f]	131	101	104
Secondary enrolment (%) gross									
– 1970	26	13	…	10	47	2	…	25	…
– 1998	49	37	47	48	71	5[g]	49[b]	48	56
Combined enrolment for all levels (%)									
– 1980	40	19	30	28	58	7	…	37	46
– 1999	55	40	37	60	70	33[l]	77	52	61
Percentage of children dropping out before grade 5 (1995-99)	48	50	30	56	3	14	2	46	27
Tertiary natural and applied sciences enrolment (as % of total tertiary) 1995-97	25	…	25	14	29	…	…	22	…
Public expenditure on education as % of GNP									
– 1960	2.3	1.1	0.6	0.4	3.8	…	…	2.0	2.5
– 1995-97	3.2	2.7	2.2	3.2	3.4	4.1	6.4	3.2	1.8
Children not in primary schools (in millions) 1997	27	7	5	0.60	0	0.22	0	39T	…

Notes:
a: year 1985; b, c, e: year 1998; d, i: year 1997; f, g, h: year 1993.

Source: Row 1: UNDP 2002, 1994; Row 2: UNDP 2002, 1999, UNICEF 1997, MHHDC 2001; Row 3: UNDP 2002, 1999, UNICEF 1997; Rows 4, 5: World Bank 2002a, 1997, MHHDC 2001; Row 6: UNDP 2002, 1999, 1994; Row 7: UNICEF 2001; Row 8: UNDP 2000a; Row 9: UNDP 2002, 1994, MHHDC 2001; Row 10: UNDP 1999.

4. Health Profile

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
Population with access to safe water (%)									
– 1990-96	81	60	84	44	46	58	96	82	71
– 2000	88	88	97	81	83	…	…	89	79
Population with access to sanitation (%)									
– 1990-96	16	30	35	6	52	70	66	22	29
– 2000	31	61	53	27	83	…	…	37	52
Population per doctor									
– 1984	2520	2910	6730	32710	5520	23310	20300	3720	4590
– 1992-95	2083	1923	5555	20000	4348	5000	5263	2273	1282
Physicians (per 100,000 people)									
– 1990-99*	48	57	20	4	2	16	40	45	…
Maternal mortality ratio (per 100,000 live births)									
– 1985-99	540	340[a]	350	540	60	380	350	492	…
Contraceptive prevalence rate (% of women aged 15-49)									
– 1990-2000*	52	28	54	29	66	19	17	50	…
Public expenditure on health (as % of GDP)									
– 1960	0.5	0.3	…	0.2	2.0	…	2.4	0.5	0.9
– 1995-99*	0.8	0.7	1.7	1.3	1.7	3.2	3.7	0.9	2.5
Prevalence of anemia in pregnant women (%)									
– 1985-99*	88	37	53	65	39	30	…	78	55

Note:
a: year 1990-98;
*: data from most recent year available.

Source: Row 1: World Bank 2002a, UNDP 1998; Row 2: World Bank 2002a; Row 3: UNDP 2000, 1992; Rows 4, 5: UNDP 2002; Row 6: World Bank 2002a, UNDP 2000, MHHDC 1998; Row 7: UNDP 2002, World Bank 2000a; Row 8: World Bank 2002a, UNDP 1999, MHHDC 2002.

5. Human Deprivation Profile

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
Population below income poverty line (%)									
– $1 a day (1993 PPP US$) 1983-2000*	44.2	31.0	29.1	37.7	6.6	…	…	41	…
– national poverty line 1987-2000*	35	34	35.6	42	25	…	…	35	…
Population without access to health services 1995									
– number (millions)	143	63	68	…	1.3[a]	0.6	0.1[b]	276T	910T
– as a % of total population	15	45	55	…	7[c]	35	25[d]	22	20
Population without access to safe water 2000									
– number (millions)	122	17	4	5	3	0.80	…	151T	…
– as a % of total population	12	12	3	19	17	38	…	11	22
Population without access to sanitation 2000									
– number (millions)	700	54	61	18	3.2	0.7	0.13	835T	2439T
– as a % of total population	69	39	47	73	17	31	44	63	48
Illiterate adults 2000									
– number (millions)	434	78	76	14	1.6	…	0.01	604T	…
– as a % of total adult population	42.8	56.8	58.7	58.2	8.4	…	3.3	45.5	26.3
Illiterate female adults 2000									
– number (millions)	270	48	44	9	1.0	…	…	372T	…
– as a % of total adult female population	55	72	70	76	11	…	…	58	31
Children malnutrition (weight for age) 2000									
– % of children under 5	47	38	61	47	33	…	…	47	…
Under 5 mortality rate (per 1000 live births) 2000	96	110	82	100	19	100	80	95	59
People living with HIV/AIDS Adults (% age 15-49) 2001**	0.79	0.11	<0.1	0.49	<0.1	<0.1	0.06	…	1.32

Notes:
a, c: year 1985-95; b, d: year 1991;
*: data refer to the most recent year available during the period specified.
**: data refer to the end of 2001.

Source: Row 1: UNDP 2002; Row 2: UNDP 1998; Rows 3, 5, 8, 9: UNDP 2002; Row 4, 5: UNDP 2002, MHHDC 2001; Rows 6, 7: World Bank 2002a.

6. Gender Disparities Profile

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
Female population (2000)									
– number (millions)	491	66	63	12	9.5	1.05	0.14	643T	2395T
– as a % of male	94	92	95	100	102	98	93	94	97
Adult female literacy (as % of male)									
– 1970	41	35	35	12	80	…	…	40	…
– 2000	66	48	57	40	94	52[d]	100	63	81
Female primary school gross enrolment (as % of male)									
– 1970	64	37	48	20	92	6	107	60	79
– 1995-99*	83	70	97	74	98	76	98	…	90
Female 1st, 2nd and 3rd level gross enrolment ratio (as % of male) 1997	75	50	75	71	103	71	101	74	87
Female life expectancy (as % of male)									
– 1970	97	99	97	97	103	104	95	97	103
– 2000	102	99	100	99	108	104	98	102	105[d]
Economic activity rate (age 15+) (female as % of male)									
– 1970	43	11	6	52	37	52	35	37	53
– 2000	50	42	76	66	55	65	80	52	67
Female professional and technical workers (as % of total) 1991-2000*	…	26	35	…	49	…	40	3	…
Seats in parliament held by women (as % of total) 2002**	8.9	…	2.0	7.9	4.4	9.3	6.0	7.2	…
Gender Development Index (GDI)									
– 2000	0.560	0.468	0.468	0.470	0.737	0.444[b]	0.739	0.542	0.634[d]
Gender Empowerment Measure (GEM) 2000	0.24[d]	0.176[d]	0.223	…	0.274	…	0.361	0.228	…

Notes:
a: year 1999; b, c: year 1998; d: year 1997.
*: latest available year.
**: as of March 2002.

Source: Row 1: UN 1999; Row 2: UNDP 2002, UNDP 2000, MHHDC 2001; Rows 3, 4: UNICEF 2001, UNICEF 1984; Row 5: UNDP 2002, UNICEF 1984; Rows 6, 7, 8, 9: UNDP 2002; Row 10: UNDP 2002, MHHDC 2001.

7. Child Survival and Development Profile

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
Population 0-14 (2000)									
– number (millions)	345	58	50	10	4.9	0.90	0.13	469T	…
– as a % of total population	34	42	39	41	26	43	44	35	…
Population 0-4 (2000)									
– number (millions)	116.6	21.7	17.5	3.7	1.6	0.3	0.05	161T	…
– as a % of total population	11.5	15.7	13.6	15.5	8.2	15.7	16.3	12	…
Infant mortality rate (per 1000 live births)									
– 1960	144	139	151	199	83	175	180	144	138
– 2000	69	85	54	72	17	77	59	69	61
Under 5 mortality rate (per 1000 live births)									
– 1960	236	226	247	297	133	300	300	235	216
– 2000	96	110	82	100	19	100	80	95	89
One-year-olds immunised against tuberculosis (%)									
– 1980	14	9	1	43	63	9	8	13	…
– 1999	68	78	91	86	97	90	98	72	80
One-year-olds fully immunised against measles (%)									
– 1980	1	3	2	2	0	18	30	1	…
– 1999	50	54	71	73	95	76	86	54	69
Births attended by trained health personnel (%)									
– 1995-2000	42	20	12	12	94	15	90	37	52
Low birth weight infants (%)									
– 1995-2000*	26	21	30	21	17	15	12	26	18
Children (aged 10-14) in the labour force (% age group 10-14)									
– 2000	12	15	28	42	2	55	6	14	12

Note:
*: latest available year.

Source: Rows 1, 2: UN 2001; Rows 3, 4, 5, 6: UNDP 2002, UNICEF 1984; Row 7: UNDP 2002, MHHDC 2001, UNICEF 1984; Row 8: UNDP 2002, MHHDC 2001; Row 9: World Bank 2002a, MHHDC 2001.

8. Profile of Military Spending

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
Defence expenditure (US $ millions, 1993 prices)									
– 1985	7207	2088	308	22	214	…	…	9839T	189727T
– 1999	9520	2820	500	50	570	…	…	13460T	166300T
Defence expenditure annual % increase (1985-99)	2.0	2.2	3.5	6.0	7.2	…	…	2.2	-0.9
Defence expenditure (as a % of GNP) 1985	2.5	5.1	1.3	0.7	2.6	…	…	3.0	7.2
(as a % of GDP) 1999	2.1	4.8	1.1	1.0	3.6	…	…	2	2.1
Defence expenditure (as a % of central government expenditure)									
– 1980	19.8	30.6	9.4	6.7	1.7	…	…	21	…
– 1999	9.5	21.0	3.9	2.1	30.3	…	…	10	33
Defence expenditure per capita (US $, 1993 prices)									
– 1985	9.4	22	3.1	1.3	14	…	…	10	52
– 1999	9.5	21.0	3.9	2.1	30.3	…	…	10	33
Armed forces personnel (no. in thousands)									
– 1985	1260	484	91	25	22	…	…	1882T	16022T
– 1999	1173	587	137	46	113	…	…	2056T	14220T
– % increase (1985-99)	-7	18	34	46	81	…	…	8	-13
Employment in arms production (1000's) 1999	250	50	…	…	…	…	…	300	3600
Aggregate number of heavy weapons 1999	10530	5490	530	10	240	…	…	16800	210600

Source: Rows 1, 2: BICC 2001, 1997; Row 3: BICC 2001, 1997, UNDP 2001; Row 4: BICC 2000, 1997, UNDP 1999, World Bank 1995; Row 5: BICC 2001, UN 2001; Row 6: BICC 2001, 1997; Row 7: BICC 2001; Row 8: BICC 2001.

9. Profile of Wealth and Poverty

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
Total GDP (US $ billions) – 2000	457	61.6	47.1	5.5	16.3	0.5	0.6	589T	6059T
Real GDP per capita (PPP US$) – 2000	2358	1928	1602	1327	3530	1412	4485	2238	3783
GNP per capita (US$) – 2000	450	440	370	240	850	590	1960	444	1240
Income share: ratio of highest 20% to lowest 20% (1995-97*)	5.7	4.3	4.9	5.9	5.3	…	…	5.5	…
Population below income poverty line (%)									
– $1 a day (1993 PPP US$) 1983-2000*	44.2	31	29.1	37.7	6.6	…	…	41	…
– national poverty line 1987-2000*	35	34	35.6	42	25	…	…	35	…
Population below the poverty line (% 1990-96*)									
– rural	36.7	36.9	39.8	44.0	27.0	…	…	36.9	…
– urban	30.5	28.0	14.3	23.0	15.0	…	…	28.2	…
Public expenditure on education (as % of GNP) 1995-97	3.2	2.7	2.2[a]	3.2	3.4	4.1	6.4	3.1	…
Public expenditure on health (as % of GDP) 1998	…	0.7[b]	1.7	1.3	1.7[b]	3.2	3.7	0.3	…
Gross domestic investment (as % of GDP) 1999	23	15	22	20	27	47.3[c]	…	22	23
Gross domestic savings (as % of GDP) 2000	21	12	18	16	17	…	…	20	25
Industry value added (as % of GDP) 2000	27	23	24	22	27	37	…	26	35
Tax revenue (as % of GDP) 2000	10	12	7	9	15	8	21	10	…
Exports (as % of GDP) 1999	14	16	14	24	40	31	…	15	28
Total debt service (as % of exports of goods and services) 2000	13	27	9	6.5	9.6	4.2	4.3	14	19
Total net official development assistance received (US$ million) 2000									
– quantity	1487	703	1172	390	276	53	19	4100T	31652.5T
– as % of GDP	0.3	1.1	2.5	7.1	1.7	10.9	3.5	0.8	0.5
Total external debt (US$ billions) 2000	100.4	32.1	15.6	2.8	9.1	…	…	160T	2492T

Notes:
a: data refers to annual average rate between 1994-2000; b: data refers to average annual rate between 1993-200; c: year 1998.
*: data refer to most recent year available.

Source: Rows 1, 2, 4, 5, 7, 8, 4, 15: UNDP 2002; Rows 3, 6, 10, 13, 16: World Bank 2002a; Row 9: World Bank 2000a; Rows 11, 12, World Bank 2002a, MHHDC 2001.

10. Demographic Profile

	India	Pakistan	Bangladesh	Nepal	Sri Lanka	Bhutan	Maldives	South Asia (weighted average)	Developing Countries
Population (in millions)									
– 1960	442	50	51	9	10	1.0	0.1	563 T	2070 T
– 2000	1014	138	129	24	19	2.1	0.3	1326 T	4867 T
Population growth rate (annual %)									
– 1960-70	2.3	2.8	2.6	2.0	2.4	1.8	2.0	2.4	2.5
– 1970-80	2.2	2.6	2.8	2.6	1.7	2.0	2.7	2.3	2.2
– 1980-90	2.1	3.6	2.1	2.6	1.6	2.2	3.2	2.3	2.1
– 1990-95	1.9	2.7	2.0	2.0	1.1	3.7	2.6	1.9	1.8
– 1995-00	1.7	2.6	1.6	2.7	1.1	3.1	3.7	1.8	1.6
Population doubling date (at current growth rate) 2002	2045	2030	2047	2029	2068	2026	2022	2039	2047
Crude birth rate (per 1000 live births)									
– 1960	43	49	47	44	36	42	41	44	42
– 2000	25	34	28	33	18	37[a]	35[a]	26	23
– % decline (1960-2000)		42	31	40	25	50	12	15	41
Crude death rate (per 1000 live births)									
– 1960	21	23	22	26	9	26	21	21	20
– 2000	9	8	9	10	6	9[a]	7[a]	9	…
– % decline (1960-2000)	57	65	59	62	33	65	67	58	55
Total fertility rate									
– 1960	6.0	7.0	6.7	6.0	5.4	6.0	7.0	6.1	6.0
– 2000	3.1	4.7	3.1	4.3	2.1	5.3[a]	5.2[a]	3.3	…
– % decline (1960-2000)	48	33	54	28	61	12	26	47	52
Total labour force (in millions)									
– 1980	300	29	40	7	5	…	…	382T	1678T
– 2000	451	52	69	11	9	…	…	591T	2504T
Female labour force 2000 (% of labour force)	32	29	42	41	7	…	…	33	40
Percentage average annual growth in labour force									
– 1980-2000	2.0	2.8	2.7	2.1	2.2	…	…	2	2.0
– 2000-2010	1.9	3.2	2.3	2.4	1.7	…	…	2	1.6
Total unemployment (% of total labour force)									
– 1998-2000	…	5.9	…	1.1	7.7	…	…	0.74	…
Employment by economic activity rate (%) 1995-2001*									
Agriculture									
– female	…	66	78	…	49	…	…	15	…
– male	…	41	54	…	38	…	…	10	…
Industry									
– female	…	10	8	…	22	…	…	2	…
– male	…	20	11	…	23	…	…	3	…
Services									
– female	…	23	11	…	27	…	…	4	…
– male	…	39	34	…	37	…	…	8	…

Note:
*: Date refer to the most recent year available.
a: year 1999.

Sources: Rows 1, 2: UN 2001, 1998, 1994; Row 3: UN 2000; Rows 4, 5, 6: World Bank 2002, MHHDC 2001, UNICEF 1997; Rows 7, 8, 9, 10: World Bank 2002a; Row 11: UNDP 2002.

Selected definitions

Agricultural raw materials are started as a percentage of merchandise exports and imports. Merchandise exports express the f.o.b. (free on board) value of the goods provided in US dollars to the rest of the world. Merchandise imports on the other hand express the c.i.f. (cost plus insurance and freight) value of goods purchased from the rest of the world in US dollars.

Agricultural value added is the net output of the agricultural sector after adding up outputs and subtracting inputs.

Agricultural productivity refers to the ratio of agricultural value added to the total number of workers in the agricultural sector. Agricultural value added is measured in constant 1995 US dollars.

Cereal yield is calculated on the basis of a detailed area and production data expressed in terms of hectares and metric tons.

Fertiliser consumption measures the quantity of plant nutrients used per unit of arable land. Fertiliser products cover nitrogenous, potash, and phosphate fertilisers (including ground rock phosphate).

Cropped area refers to harvested areas or in the case of permanent crops it may refer to total planted area.

Population employed in agriculture is based on information for economically active population collated from national sources such as population censuses and/or labour force surveys. In addition, some countries base information on economic activity for persons of all ages, while others base it for persons of specific ages. However, the International Labour Organization (ILO) systematically makes this data consistent with international computational standards.

Food production index covers food crops that are considered edible and that contain nutrients. Coffee and tea have been excluded because although edible, they have no nutritive value.

Average annual deforestation refers to the conversion of the natural forest area for a variety of purposes and uses. These encompass shifting cultivation, settlements, permanent agriculture, ranching and using forest area for infrastructure development. However, deforested forests do not include areas that have been degraded by natural disasters such as forest fires or acid precipitation and human interventions such as fuelwood gathering.

Fresh water resources refers to total renewable resources. This is broken down between flows of internal flows of rivers and groundwater resources replenished from rainfall with the boundaries of a country, and flows of rivers from other countries.

Fresh water withdrawals refers to the total water withdrawal, excluding natural evaporation from storage reservoirs. However, withdrawals encompass water used in desalination plants in those countries where they are a significant source of drinking water. Withdrawals of water for agriculture and industry include total withdrawals for irrigation and production of livestock as well as for direct industrial use. On the other hand, withdrawals for domestic purposes include drinking water, commercial setups, use for public services and municipal use or supply.

Purchasing power parity is a rate of exchange that takes into account price differences between countries. This allows for international comparisons of real output and incomes. Usually, PPP US$1 has the same purchasing power in the domestic economy as has US$1 in the US economy.

KEY TO INDICATORS

Indicator	Indicator tables	Original source
A, B, C		
Agriculture		
average annual % growth	1a	WB
Agriculture value added		
as a % of GDP	1a	WB
Agriculture productivity		
agri. value added per worker	1a	WB
Agriculture value added		
annual growth %	2a	WB
Agricultural raw materials		
as % of merchandise exports	2a	WB
as % of merchandise exports	2a	WB
Agriculture machinery		
number of total tractors in use	4a	FAO
Agriculture machinery		
number of tractors per 100 square		
kilometers of arable land	4a	WB
Agriculture employment	1a	WB, FAO, MHHDC
as % of total labour force	1a	FAO
Armed forces personnel (thousands)	8	BICC
% increase	8	BICC
Agriculture research		
public investment, PPP US $	8a	Rosegrant & Hazell
Birth attended by trained health personnel	7	UNDP
Crop production index	3a	FAO
Cereal production		
1000 metric tons	7a	FAO
Cereal imports (1000 metric tons)	7a, 2a	FAO
Cereal exports	7a	FAO
Cereals domestic utilization		
(1000 metric tons)	7a	FAO
total availability (1000 metric tons)	7a	FAO
Cereal yield kilograms (per hectare)	1a	WB
Cereals per capita supply	7a	FAO
kilogram per year	7a	FAO
calories supply (per day)	7a	FAO
Cropped area (1000 hectares)	1a	FAO
Contraceptive prevalence rate		
% of women ages 15-49	4	WB
Crude birth rate per 1000 people		
% decline	10	WB
Crude death rate		
per 1000 live births		
% decline	10	WB
Child labour force	7	WB
Children not in primary school	3	UNDP
Children dropped		
before grade five	3	UNICEF
Children under weight	2	UNDP
D		
Debt, total external	9	WB
Debt servicing		
% of exports of goods & services	9	UNDP
Defence expenditure, total	8	BICC
annual % increase	8	BICC
as % of central govt. exp.	8	BICC
per capita	8	BICC
as of GNP	8	BICC
as of GNP	8	BICC
Deforestation		
(square kilometers)	6a	WB
E		
Economic activity rate		
(female as % of male)	6	UNDP
Employment in arms Production	8	BICC
Enrolment, primary level, gross	3	WB
Enrolment, secondary level gross	3	WB
Enrolment, combined		
1st, 2nd & 3rd level, gross	1, 3	UNDP
Enrolment, primary level, female	6	UNICEF
Enrolment, 1st, 2nd & 3rd level,		
gross (female as % male)	6	UNICEF
Enrolment ratio for all levels	2	UNDP
Exports (as % of GDP)	9	UNDP
Employment by economic activity rate	10	WB
agriculture	10	WB
industry	10	WB
services	10	WB
Employed in agriculture		
male	2a	FAO
female	2a	FAO
Education exp, as % of GNP	3, 9	UNDP
Enrolment tertiary, natural &		
applied science	3	UNDP
F, G		
Fertility rate, total	2, 10	WB
% decline	10	WB
Female population	6	UN
Female professional & technical workers	6	UNDP
Food trade		
as a % of merchandise exports	1a	WB
as % of merchandise imports	1a	WB
Fertiliser consumption		
(1000 metric tons)	1a	FAO
Fertiliser application per unit of land		
(kilogram per hectare)	1a	FAO
Food		
as % of merchandise exports	2a	WB
as % of merchandise imports	2a	WB
Food production per capita	3a	FAO
Food production index	3a	FAO
Fish production		
(1000 metric tons)	3a	FAO
Forest production (1000 cu.m)		
round wood	3a	FAO
fuel wood	3a	FAO
Forest area		
as % of total land area	6a	WB
Fresh water resources		
total resources per capita cu.m	6a	WB
Fresh water withdrawals		
(billion cubic meter)	6a	WB
Fresh water withdrawals		
(as % of agriculture)	6a	WB

Indicator	Indicator tables	Original source
Gender empowerment measure	6	UNDP
Gender development Index	1, 6	UNDP
GDP, total (US $)	9	UNDP
GDP, per capita growth	1	WB
GDP, growth rate	1	WB
GNP per capita (US $)	1, 2, 9	WB
GDP, real per capita (PPP US $)	1	UNDP
Gross domestic investment		
as % of GDP	9	WB
Gross domestic savings		
as % of GDP	9	WB
Government exp on agriculture		
US$ PPP	8a	Rosegrant & Hazell
as % of agriculture GDP	8a	Rosegrant & Hazell
as % of total govt. exp	8a	Rosegrant & Hazell
H, I, J		
HIV/AIDS, people	5	UNDP
Health expenditure, public		
(as % of GDP)	4, 9	UNDP
Human development index	1, 2	UNDP
Health service, without	5	UNDP
million	5	UNDP
as % of total population	5	UNDP
Illiterate adults, total, female	5	UNDP
as % of total adult population	5	UNDP
Income poverty, 1 $ a day	9, 5	UNDP
national poverty line	9, 5	UNDP
Income share: ratio of top		
20% to bottom 20%	9	UNDP
Industry value added (as % of GDP)	9	WB
Infant mortality rate	1, 2, 7	UNDP
Infants (low birth weight) %	7	UNDP
K, L		
Labour force, total	10	WB
female	10	WB
average annual growth rate	10	WB
Land to labour ratio	1a	FAO
Livestock production index	3a	FAO
Land area (1000 sq kms)	6a	WB
Land productivity		
value added per hectare of land	6a	WB
Land use		
arable (as % of land area)	6a	WB
hectare per capita	6a	WB
Land irrigated,		
1000 hectare	4a	FAO
as % of cropland	6a	WB
Life expectancy at birth	1, 2	UNDP
female (as % of male)	6	UNDP
Literacy rate,		
female	1, 3	UNDP
male	3	UNDP
adults	1, 2, 3	UNDP
Literacy rate adult female as		
% of male	6	UNDP

Indicator	Indicator tables	Original source
M, N, O		
Malnourished children under five	5	WB
Mortality rate under five	5, 7	UNDP
Maternal mortality ratio	4	UNDP
Measles, one year old fully immunised	7	UNICEF
ODA received, total	9	UNDP
as % of GDP	9	UNDP
P, Q, R		
Population estimated	1, 10	UN
growth rate, annual	1, 10	UN
Population per doctor	4	UNDP
Physicians (per 100,000 people)	4	UNDP
Population		
under fourteen	7	UN
under five	7	UN
as % of total population	7	UN
People in poverty		
rural	9	WB
urban	9	WB
Population doubling rate	10	UN
Population rural, million	5a	WB
as % of total population	5a	WB
urban, million	5a	WB
as % of total population	5a	WB
Rural population, growth %	5a	WB
S		
Safe drinking water		
urban	5a	WB
rural	5a	WB
Sanitation		
% with access	4	WB
% without access	5	UNDP
Sanitation, facilities improved		
urban	5a	WB
rural	5a	WB
Safe water		
% with access	4	WB
% without access	5	UNDP
T, U, V		
Tuberculosis, one year		
old immunised	7	UNICEF
Tax revenue, as % of GDP	9	WB
Tractors per 1000 agri. worker	4a	WB
Unemployment, % of total	10	WB
W, X, Y, Z		
Women, prevalence of anemia		
in pregnancy	4	UNDP
Women, seats held in		
parliaments	6	UNDP
Weapons, number of heavy		
weapons	8	BICC

Note: 'a' is added to table numbers that appear in Profile of Agriculture in South Asia.

Key to source abbreviations

BICC	Bonn International Centre for Conversion
FAO	Food and Agriculture Organization
MHHDC	Mahbub ul Haq Human Development Centre
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
WB	World Bank