

Sri Lanka
State of the Economy Report 2012

Chapter 5
Optimizing Natural Resources and Agriculture

by
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5. Optimizing Natural Resources and Agriculture

5.1 Introduction

In order for Sri Lanka to achieve its targeted GDP growth in excess of 8 per cent in the medium to longer term, various economic sectors will have to contribute significantly by raising their output – although the degree and nature of increased contribution may vary depending on the sector. The issue of sustainability comes into play, when the activities of the sectors have significant linkages to the natural environment, including 'natural capital.' Although the present classification of economic sectors does not include natural capital as a sector – whereby the actual contribution is largely unnoticed – it contributes significantly to the economy of Sri Lanka.

Natural resources are directly linked to the economy primarily via agriculture, fisheries, tourism and forestry. In addition, there is an array of indirect means through which natural resources contribute to economic activities. The contribution of natural resources to economic development is not well captured in the conventional system of national accounting. The inherent feature of some natural resource-based activities is that they are provided free and thus do not have market prices. This can lead to the neglect of the role of natural resources in policy formulation. In certain instances, the goods and services obtained through natural resources are counted under other economic sectors. Therefore, care has to be taken in making policies and strategies, since the issues related to natural resources are not well reflected in the current statistics.

The natural resource base in Sri Lanka will undoubtedly have to contribute its fair share to the country's medium and long term strategy to achieve the targeted high rate of growth. In turn, accelerated economic growth can have implications on the natural resource base, particularly on its sustainability. Agriculture has a major role to play in this as the

Resource-specific approaches would help to sustainably utilize the natural resource base in Sri Lanka and sustain its contribution to accelerated economic growth

largest sector dependent on natural resources at present. Unlike in many other uses of natural resources, in agriculture its values are determined in the market, albeit incompletely. Further, agriculture is at the core of some socio-economic parameters that go beyond growth, such as food security and poverty reduction. Hence the role of agriculture, in an attempt to achieve accelerated economic growth, stands out as a special concern.

In this context, it is imperative and timely to assess the real economic contribution of natural resources to attain and sustain a high growth rate and its repercussions on the sustainability issue, which might in turn determine growth in the long term. In this connection, it is a challenging task to increase the economic contribution of natural resource-based sectors in the short term in order to support high growth. Moreover, global environmental challenges such as climate change are also expected to decelerate the rate of growth if appropriate actions are not taken. Therefore, impacts of global climate change have also to be taken seriously in making policies for accelerated economic growth.

The nexus between the economy and environment consists of a complex web of relationships. Hence, it is a challenge to isolate the individual linkages to assess the specific contributions of the natural environment to the economic performance of a country. Therefore, the assessment which follows focuses on the most significant aspects of natural resources which are linked to economic growth. Accordingly, agriculture, fisheries, forests and tourism have been selected as the key sectors of high policy relevance in maintaining a high targeted growth rate in Sri Lanka. The discussion focuses on the current contribution of the sectors to GDP and the

ways and means in which the sectors can participate in the anticipated growth process in a sustainable manner.

5.2 Agriculture

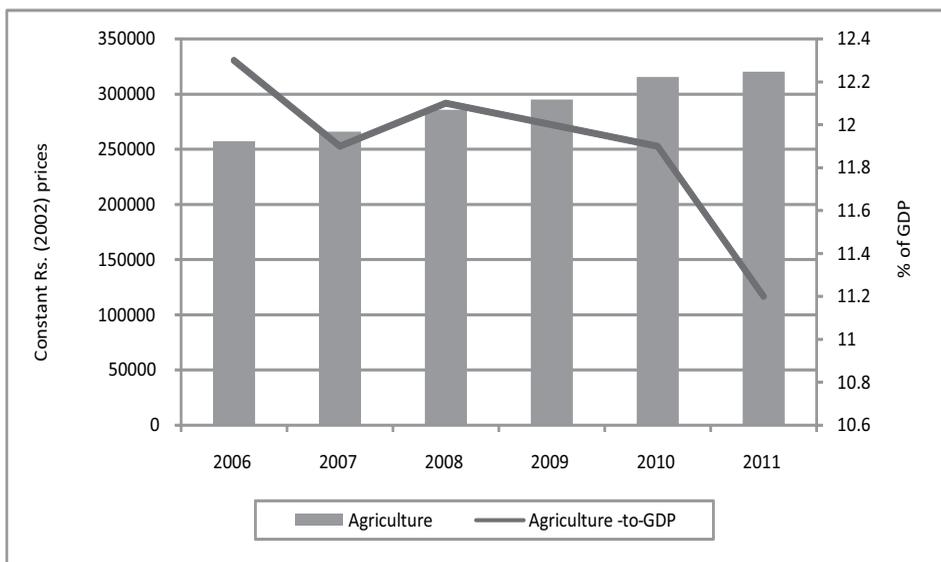
5.2.1 The Status-quo of the Agriculture Sector

Agriculture is one of the key sectors of the Sri Lankan economy with a significant contribution to GDP and employment, while being the main income source of the rural population. The relative contribution of agriculture to GDP was 11.2 per cent in 2011. The absolute contribution of the agriculture sector to the GDP has increased over time, but at a very slow pace. In absolute terms, agriculture's contribution to GDP has increased by 53.5 per cent from 2006-2010 (Figure 5.1). However, its relative contribution to GDP has declined from 14.3 per cent in 2002 to 11.2 per cent in 2011 due to faster growth rates recorded by industry and services sectors.

Owing to this gradual reduction of the contributions of agriculture to GDP and employment,¹ there was a growing concern that its contribution to the economy is no longer important. However, this mind set has changed significantly after the global food crisis of 2008. The merits of having a strong domestic food production sector in a low-middle income country like Sri Lanka, under conditions of growing volatility in world commodity markets, has received due attention. Indeed, domestic agriculture still provides 85 per cent of Sri Lanka's food requirement in value terms and provides employment to 33 per cent of the total labour force, while utilizing 30 per cent of the habitable land mass. It is the main stay of the rural economy which houses 38 per cent of the rural population. As such, it is highly un-

¹ Agriculture from here onwards refers to food production although some issues raised are common to both food production and plantation sectors.

Figure 5.1
Agriculture Contribution to GDP

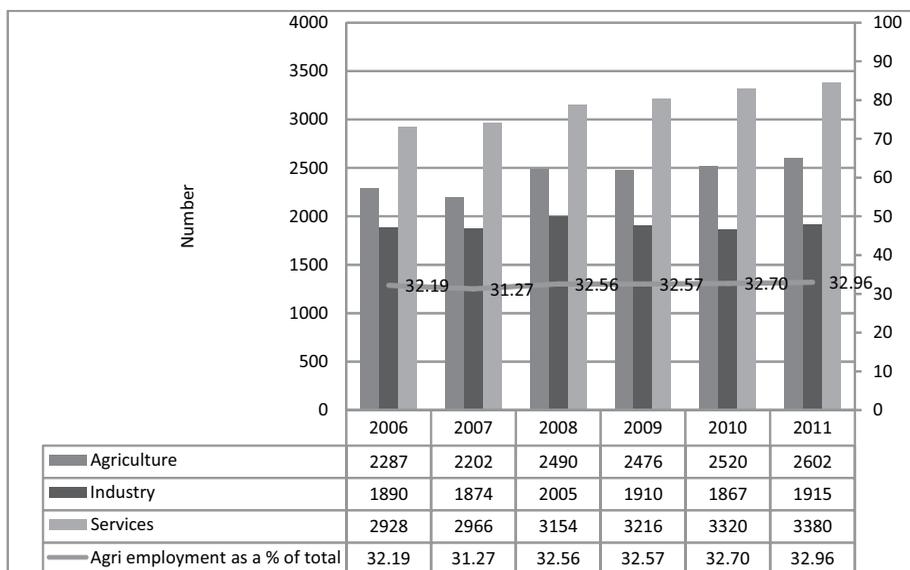


Source: CBSL, Annual Report, various years.

likely that Sri Lanka's domestic agriculture will lose its national importance in the near

future, even if world food prices fall and food imports become cheaper.

Figure 5.2
Employment by Economic Activities



Source: CBSL, Annual Report, various years.

Whilst this is the current status quo, the problem at hand is how this lacklustre agriculture sector could effectively contribute to higher growth – aspired to be achieved and maintained over an extended period of time. The ideal response of the agricultural sector to this could be multipronged.

- Increasing the growth rate of food production to match domestic demand
- Introducing and expanding non-traditional products mainly for exports
- Releasing resources for fast growth in industry and services
- Conserving the resource base in agriculture and protect it from degradation

Increasing the growth rate of food production

Currently, the agriculture sector produces nearly 85 per cent of the food requirement of the country and the balance is imported. Sri Lanka is now self sufficient with its staple food, rice. The country is producing nearly 94 per cent of its rice requirement in an average crop year and the entire requirement, or more, in a favourable crop year. Individual per capita food production in selected food items (rice, pulses and milk) have increased over the last decade (Table 5.1). However, Sri Lanka still strongly depends on imported sugar (local production accounts only for 9 per cent of the total requirement), pulses and nuts (local production amounting to 24 per cent of the total requirement), milk (local production fulfilling only 78.5 per cent of the requirement) and fish (local production accounting for only 83.6 per cent of the requirement).

Therefore, while Sri Lanka is generally self-sufficient in its staple food of rice, 15 per cent of the country's food requirement is still imported. The cost of food imports was 12.2 per cent of total import expenditure in 2010. This is a substantial burden on the country's

BOP and a hindrance to the achievement of accelerated economic growth. Also, this is directly related to the macro level food security of the country. The situation would be further aggravated when the country moves along the anticipated high growth path, as the resulting improvements in per capita income will lead to increased demand for food. This is especially true for Sri Lanka, where the low income strata dominate the country's population. If domestic food production is not increased to match the increased demand resulting from this income growth and continuing population growth, the need for food imports will be further exacerbated. The increased food imports will result in a further strain on the BOP and, if not, would result in higher rates of inflation. Both could strain or undermine the efforts of achieving, and maintaining, high economic growth in the country. Nevertheless, Sri Lanka as country with a tradition in agriculture with large proportions of resources already committed to it, has a rational option of increasing domestic food production in order to avoid this predicament.

Increasing non-traditional agricultural exports

The role of agriculture in supporting higher economic growth rates does not stop at meeting the growing food requirement. As a sector that employs a large portion of the national resource base, it should contribute to increasing the trade volume and income generation. The possibilities of expanding exports of traditional plantation crops any further, are limited. However, the current situation where substantial amounts of land and labour are being continuously committed to the production of traditional food crops under substandard technologies is something that needs to be reconsidered. At least part of these resources have to be diversified into agricultural products with an export poten-

tial to buttress current efforts to achieve a higher economic growth. The pros and cons of this proposition will be discussed in the sections to follow.

Releasing resources to non-agricultural sectors

Agriculture has an imperative role in the transformation of an agricultural economy to an industrial one as the main source of labour supplied to the growing 'capitalist sectors'.¹² Although the conditions assumed in this classical theory of Lewis are not entirely valid in contemporary Sri Lanka, the need for transferring labour and some land into other sectors emerges as a basic requirement for attaining higher growth. As such, a growth spurt can only be generated from industry and services, but not in agriculture.

However, this necessitates growth of output per unit of labor and land in agriculture too, as the amount being already produced or more will have to be produced with less land and labour after such a transformation. This is another dimension of the necessity of boosting agricultural production concomitant to the acceleration of GDP growth. Further, agriculture contributes to economic growth

by being the source of raw material to other sectors. Sri Lanka, being a developing country, possesses a higher potential for agro-based industries and in this case too, agriculture sector has a main role of supplying inputs to the industry sector. Thus, the need for the enhancement of agricultural production is strongly felt in a situation where a high economic growth rate is the expectation.

Conserving agricultural resource base

Resource degradation is a customary problem in agriculture, and it is particularly severe where attempts are made to accelerate production. Increasing agricultural production could be done either through expanding the extent operated, or intensification of operations in a given extent. Higher food demand from rapid growth will provide an incentive for the agriculture sector to apply both these strategies in order to increase output in both the short and long run. However, the experience in Sri Lanka as well as in other countries is that under these circumstances, small farmers tend to use resources, especially land and forests, exploitatively – resulting in their degradation. This, in the long run leads to a reduction of a country's natural capital, which in a more comprehen-

Table 5.1
Per-capita Food Production 2002-2010

Year	Rice (MT)	Pulses (MT) (Green Gram, Dhal, Cowpea, Soya Beans)	Potatoes (MT)	Milk (L)
2002	0.15	1.15	4.67	9.64
2003	0.16	1.37	3.73	9.70
2004	0.14	0.97	4.18	9.78
2005	0.17	1.28	4.04	9.80
2006	0.17	1.17	3.95	9.89
2007	0.16	1.20	3.89	10.10
2008	0.19	0.95	3.70	10.29
2009	0.18	1.03	3.02	11.41
2010	0.21	1.08	2.51	11.99

Source: Department of Census and Statistics, *Food Balance Sheet*.

¹² Arthur Lewis theory on 'dual sector model' in 1954 explains the transition of labour between two sectors, from the agriculture to the industrial sector.

sive framework of national accounting, would be a factor discounting a set GDP growth target. The same degradation, in future, will result in reduced productivity and reduced value added in the agricultural sector. As such, it is of utmost importance to respond to the enhanced demand for food, resulting from the pursuit of accelerated growth, with caution and with necessary legal and institutional backing to ensure sustainable resource use.

5.2.2 How to Increase Agricultural Production

Use unutilized land

At present, 1.2 million ha of high land and 0.7 million ha of low land are available for crop production, and nearly 80 per cent of the total arable extent is annually cultivated. As such, even under the most favourable conditions in economic and natural environments, only a 20 per cent increase in area cultivated can be expected.

Sri Lanka has introduced several development programmes such as 'Api Wawamu Rata Nagamu,' 'Rehabilitation of 1000 tanks,' and 'Divi Neguma' to cultivate unutilized agricultural lands. However, the sustainability of these programmes is doubtful as some of them have already faded out. In addition, most of these programmes are aimed at maintaining nutritional levels, rather than increasing agricultural production as a whole. For instance, the Divi Neguma programme is promoting the concept of home gardening. Yet, home gardens represent only 3.9 per cent of the total cultivable land,³ and even if fully cultivated at current productivity levels, it is hardly adequate to add significantly to present production levels.

Sri Lanka has encountered several adverse experiences in the past when expanding arable land areas. For example, during the 'Pro-

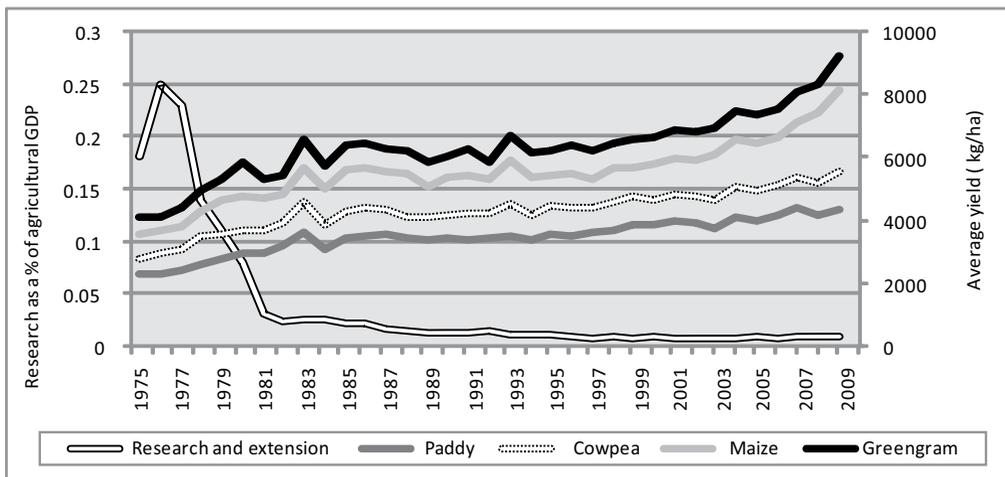
duction War' declared by the government in 1978 to accelerate agricultural production, Sri Lanka lost a considerable extent of virgin forest land due to clearing and inappropriate use, ultimately resulting in enhanced land degradation. Thus, as pointed out earlier, it is imperative to identify sustainable methods to increase agriculture production by increasing the cultivated extent without harming the resource base and the environment. This is an exceedingly difficult task as Sri Lanka is already using most of the cultivable land and the remaining forest cover is too limited for further exploitation.

Increase productivity of existing resources

In the face of growing scarcity of land and water, and emerging challenges due to climate change, productivity gains in agriculture will be the remaining option available for achieving increased agricultural output. Sri Lanka's historical experience of agricultural productivity growth casts doubts on whether it is possible to raise productivity in the near future. Productivity improvement has to be gained through the introduction of new technology, generated through sustained investment in agricultural research and extension (R&E). In countries like Sri Lanka where small farmers dominate the sector, investments in R&E have to be done by the public sector. As illustrated by Figure 5.3, the investment pattern in agricultural R&E over the past four decades clearly shows that it had an upward trend during the green revolution starting around the 1970s, declining from 1977 and continuing on a negative trend thereafter. This has been as low as 0.6 per cent of agricultural GDP after the 1980s, and was further reduced to 0.01 per cent after 1999. Most of these R&Es were allocated to rice, as it is the staple food, achieving national self sufficiency. However, productivity of other main crops increased at insig-

³ Area of home gardens (land below 40 perches or below 0.1 ha) are 188,994 acres, whereas total cultivated land area is 4,797,004 acres.

Figure 5.3
Investment in Agricultural R&E in Sri Lanka and Productivity Growth



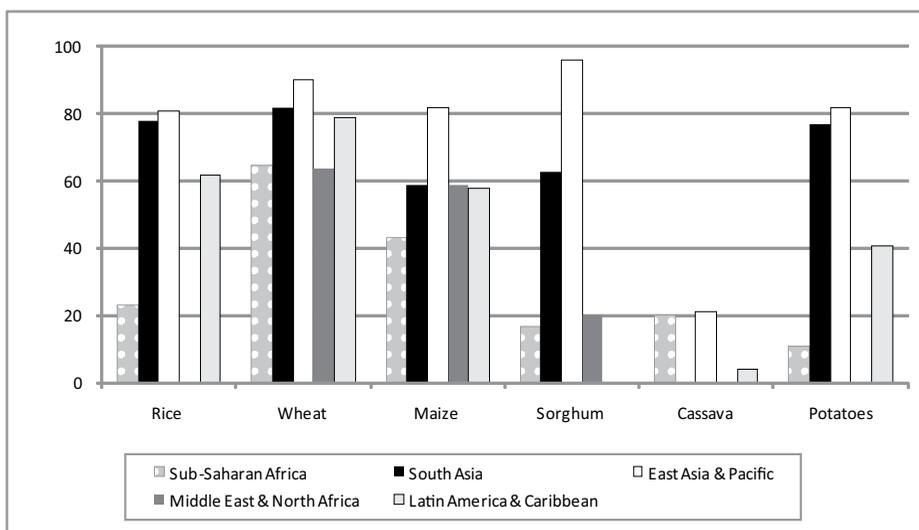
Source: IPS, Sri Lanka: State of the Economy 2011.

nificant rates. Under these circumstances, it is doubtful whether productivity can grow significantly within the next few years because Sri Lanka has not accumulated the technological capital necessary for this over the past three decades.

Find new technology and materials

Another possible option, to find new advanced technology and new genetic materials to achieve better productivity, is to import them. Most countries have adopted high yielding varieties to get high returns. Figure

Figure 5.4
Area Planted with Improved Varieties in Different Regions



Source: World Bank, World Development Report 2008.

5.4 shows the area planted with improved varieties in different regions as a percentage of total crop areas between 2000 and 2005. South Asia is only second to East Asia in using high yield varieties. Thus, there is a high potential to increase production in Sri Lanka by adopting imported new technology.

Nevertheless, importing technology and high yielding varieties will be very costly and they will directly and indirectly affect the trade balance. Further, even if Sri Lanka imports technology and high yield varieties, it will take several years to adapt it to domestic conditions. As such, it is highly unlikely that the country will be able to do it within a short period of time in order to achieve rapid growth in the near future.

In addition, agricultural bio-technology has the potential for generating a substantial impact on many facets of agriculture, especially in crop and animal productivity, yield stability and environmental sustainability. Agricultural bio-technology has been adopted by many developed countries. Developing countries are lagging behind in introducing this technology due to the large investment expenditure needed to experiment and implement bio-technology. However, as Sri Lanka achieves better growth outcomes, it may be possible to import new technology as it will take a long time to invent them domestically – and again, at large capital cost. It also takes several years to perform the necessary adaptive research before commercial utilization.

Agricultural diversification

Most of the options discussed earlier to ensure national (or macro) level food security entail large fiscal expenditure and sometimes, foreign exchange spending. Therefore, to minimize the impact on the trade balance, one option would be to adopt agricultural diversification, with more non-traditional agricultural products for export. Agricultural diversification can be regarded as a re-allo-

cation of some farms' productive resources, such as land, capital and labour into new activities. These can be new crops or livestock products, value-adding activities that have export potential, or provision of services to other farmers and non-farm activities such as operating restaurants and shops which enhance farm earnings.

There are a number of ways to diversify agriculture. At present, there are several crop diversification programmes in Sri Lanka to increase national production whilst giving adequate consideration to safeguarding the environment. Some of the crop diversification programmes are agricultural diversification of marginal tea lands, inter-cropping coconut lands, introduction of fruit crops in dry zone uplands, and homestead development. There have been numerous programmes to diversify fragmented lands with fruits, vegetables and coconuts. The newly introduced Divi Neguma programme also supports a diversification strategy by providing different types of fruits and vegetable seeds to recipients. Further, vertical diversification can be introduced to utilize surplus labour available in farm households through activities such as domestic food processing. There can also be horizontal diversification, where uneconomical or less productive traditional food crops are replaced with high value, labour intensive products with comparative advantage, such as horticultural products.

It should be noted that agricultural diversification is strongly influenced by price policy, infrastructure development (especially markets and roads), urbanization, and technological improvements (especially information systems). To accelerate agricultural diversification, Sri Lanka needs to take a series of measures to reform the R&E sector and the institutional arrangements responsible for integrating production and markets. The other immediate measures include develop-

ing roads, creating appropriate infrastructure and encouraging private sector participation for value addition and processing. There is hope in this respect because of the present drive to improve infrastructure, as rural roads record the second highest rate of return on investment (after R&E) among agricultural development interventions.⁴

5.2.3 Challenges in Expanding the Agriculture Sector

In light of the above facts, it is clear that the agriculture sector has a serious role in achieving and sustaining high growth, either by its contribution to GDP or by way of supporting to reduce rural poverty, ensure food security and to supply labour to other sectors, etc.

Agricultural intensification can pose several challenges. It can generate environmental problems, such as reducing biodiversity, mismanaging irrigation water, agrochemical pollution, land degradation, etc. In general, agriculture and environment agendas are inseparable. Degradation of natural resources undermines the basis for agricultural production and increases vulnerability to risk, imposing high economic losses from the unsustainable use of natural resources. The agriculture-for-development agenda will not succeed without more sustainable use of natural resources – i.e. water, forests, and soil conservation. Thus, it is imperative to have a strong and well-established institutional system and good governance for better implementation of agricultural policies, alongside efforts to raise investments in agriculture.

Adapting agricultural systems to climate change challenges is also becoming an important area, as the adverse impacts are al-

ready evident in some parts of the country by way of irregular rain fall patterns. In addition, some developmental programmes are decelerating the agricultural expansion programmes. For example, urbanization programmes and some infrastructural programmes have already acquired existing agricultural lands. Furthermore, with the increasing pattern of rising per capita income, the consumption pattern of the food basket is also changing. Therefore, meeting the new food requirements of the population is also another challenge.

5.3 Fisheries

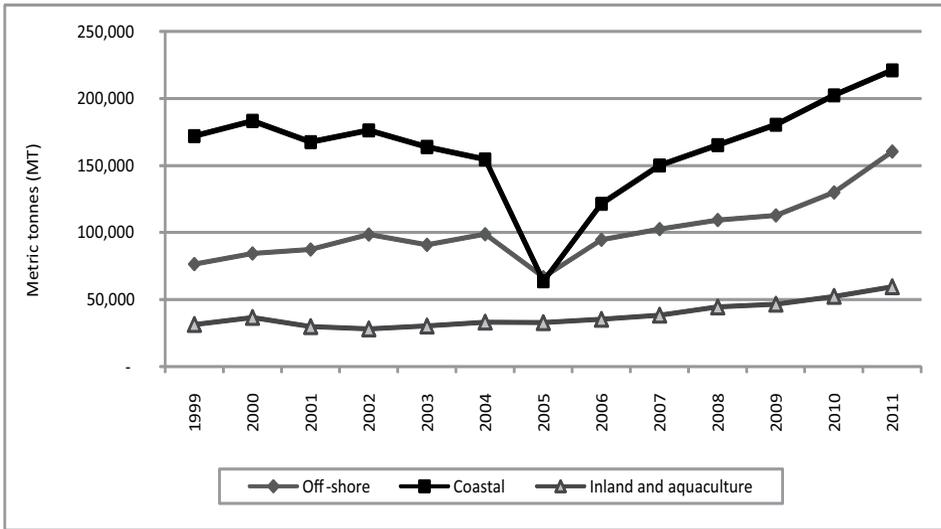
The fisheries sector has become an important economic sector with high potential for growth in Sri Lanka's post-conflict era. In 2011, the fisheries sector accounted for 1.3 per cent of GDP. In addition to its direct economic contribution, the sector has an important role to play in ensuring food security of the country as a main source of protein. It also provides both direct and indirect employment opportunities, particularly to low skilled workers.

The fisheries sector in Sri Lanka primarily consists of three sub-sectors, namely coastal, off-shore and fresh water fisheries. In terms of annual fish production of each sector, the coastal sub-sector takes the first place, followed by the off-shore sub-sector (Figure 5.5).⁵ Both coastal and off-shore sub-sectors recorded remarkable growth after the end of the separatist conflict in May 2009. The coastal line in the Northern and Eastern Provinces which comprises 60 per cent of the total length of the coastal line in Sri Lanka became available for resuming fishery and related livelihoods after 2009.

⁴ Fan, S., Jitsuchon, S. and N. Methakunnavut (2004), "The Importance of Public Investment for Reducing Rural Poverty in Middle-income Countries: The Case of Thailand", DSGD Discussion paper No.7, International Food Policy Research Institute (IFPRI).

⁵ Coastal and off-shore fish production saw a sharp drop in 2005 following the December 2004 Asian tsunami.

Figure 5.5
Annual Fish Production by Sub-sectors (1999 - 2011)



Source: Based on data from the National Aquaculture Development Authority of Sri Lanka.

However, fisheries resources are as yet highly under-utilized. Sri Lanka possesses a territorial sea of 21,500 km² and an Exclusive Economic Zone (EEZ) of 517,000 km². The EEZ is seven times larger than the geological extent of the country. Under the UN Law of the Sea, Sri Lanka is entitled to lodge a claim for an extended area of seabed where the thickness of the sediment layer is over 1 km. The claim is being submitted and, if accepted, Sri Lanka will gain an additional seabed area which would be 23 times the island's land area. In addition to the living resources, the extended area is found to be rich in non-living resources such as hydrocarbons and a variety of economically important minerals including manganese nodules.

Given the vast potential that the country possesses in terms of its fisheries resources, there is enough room for increasing the fisheries sector contribution to support Sri Lanka's accelerated growth strategy. Increasing the sectors contribution to national GDP has already been acknowledged in Sri Lanka's medium term policy frameworks. However, in

order to increase and sustain the fisheries sector contribution to economic growth, adequate attention has to be paid to issues which hamper increased utilization and sustainability of the fisheries resources. As of now, there is no comprehensive database on fisheries resources in Sri Lanka, which is vital for effective policy formulation. Although there are regulations in place, they are not properly enforced to handle unsustainable activities associated with fisheries. Better regulation also calls for an effective institutional set up where co-management is being foreseen as a successful tool. In addition, there are infrastructural constraints, inadequate technological facilities, and issues in the marketing of fish. Furthermore, there are large research gaps existing in an array of scientific and socio-economic aspects related to fisheries resource, such as the bio-economic aspects of sustainable fish harvesting and sustainable fishery management, etc. Hence, there is an essential need for addressing the said issues if the fisheries sector is to be geared towards supporting the country's efforts to raise GDP growth in a sustainable manner.

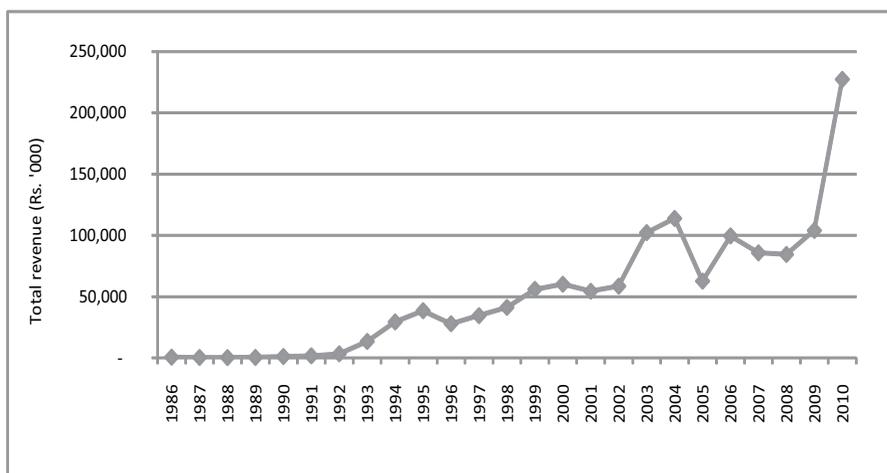
5.4 Forests

The depletion of forest resources and associated losses in biodiversity have been long discussed environmental issues in Sri Lanka. The extent of natural forests in 2010 was estimated to be 1,883,310 ha, which accounts for nearly 28.7 per cent of the total land area of the country.⁶ Increasing population pressure has created land fragmentation and farmers tend to cultivate crops by clearing surrounding natural forest areas. Forests have now become more vulnerable to depletion, in the face of an increasing demand for land for rapid development activities, in the post-conflict period. Whilst the reported contribution of the firewood and forestry sector to national GDP is only 0.6 per cent, it does not capture the actual contribution of the forestry sector to Sri Lanka's economy. Ecosystem services provided by the forests and community level benefits of forests are some of the aspects that are not included in the statistics.

At micro level, forests contribute significantly to rural economies. They primarily provide inputs needed for agricultural activities taking place around the forests by providing land, the primary means for chena cultivation, serve as a source of firewood and as a supplementary source of food. However, unlike in some other countries in the region, communities are not as dependent on forests for commercial purposes. Instead, forest lands are cleared and used for crop production, which remain the main source of livelihood for the peripheral communities. Increased demand for emerging commercial agricultural activities has threatened the sustainability of the forest resource to a significant extent.⁷

Forest-based tourism has been a source of forests' economic contribution over the years. The forest resources possess a significant potential for developing forest-based tourism,⁸ including ecotourism. Revenue from foreign tourists visiting wildlife national parks

Figure 5.6
Revenue from Foreign Tourists Visiting National Parks in Sri Lanka



Source: Sri Lanka Tourist Development Authority, *Annual Statistical Report 2010*.

⁶ Ministry of Environment, *Progress Report 2011 and Action Plan 2012*.

⁷ Senaratne, A. and K. Wickramasinghe (2011), "Commons vs. Commons: Managing Scarce Water Resources in Dry Zone Village Tank Systems in Sri Lanka", Economic and Environment Program for South East Asia (EEPSEA) Research Report.

⁸ Wickramasinghe, K., (2009), "Ecotourism for Sustainable Forest Management in Sri Lanka", Environmental Economic Policy Series No. 12, Institute of Policy Studies, Colombo.

in Sri Lanka marked a momentous growth in 2010 (Figure 5.6). This is due to the increased tourist arrivals after the end of the conflict in 2009. The opening up of national wildlife parks which were restricted during the conflict period for security reasons, also made a significant contribution.

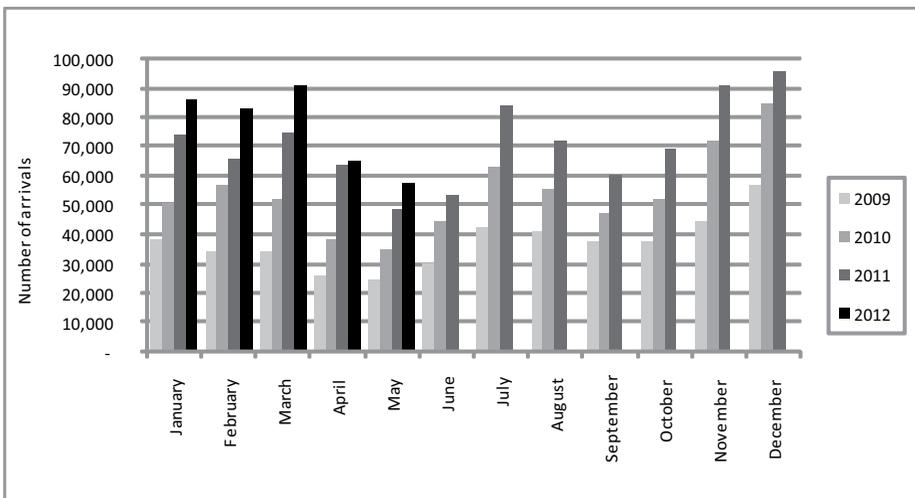
However, the forest sector is not well utilized in terms of exploiting its potential for providing recreational benefits. Given the vast diversity and richness in forest resources and associated cultural wealth in adjoining communities, promotion of forest-based tourism for high-end tourists can increase the earnings to the economy. Therefore, developments in the forest-based tourism sector can be considered an important and significant avenue to support Sri Lanka's current growth strategies.

However, the anticipated improvements in forest-based tourism will not be a medium and short term reality if insufficient attention is paid to the issues of the resultant environmental consequences. More specifically, negative implications to the natural environ-

ment due to increased visitations should not be taken lightly. Over the years, certain wildlife parks have been experiencing over-visitation which can damage the sustainability of the resource and consequently reduce the potential for earnings from tourism. Continued increases in tourist arrivals following the end of the conflict could further worsen the problem. Therefore, careful attention has to be paid to regulate tourist visits to wildlife parks, learning from the experiences of other countries which have been successful in effectively regulating tourism in the natural forest areas.

In addition, forests provide an array of environmental services which are not valued in the market, such as carbon sequestration, preservation of biodiversity and nutrient recycling. Since these services are not priced, the services are not reflected in the national accounts and thus are largely ignored in policy formulation. If the sustainability of the forest resources are not assured, it can have severe impacts on various aspects such as agricultural production, water scarcity, and energy security, etc.

Figure 5.7
Monthly Tourist Arrivals (2009 - 2012)



Source: Sri Lanka Tourism Development Authority.

While certain goods and services provided by the forests are not accounted for, the present system of national accounting also does not make any adjustment for the degradation and depletion of forests. This has been true for most other natural sectors also. In this connection, present estimates of national output can be considered an over-estimate, as natural resource degradation has not been taken into account. Although the degradation issues are currently ignored in national accounting, there remains a clear need for balancing conservation and utilization of natural forests, failing which, subsequent developments might impede growth prospects.

5.5 Tourism

The coastal resources and natural forest resources play an important role as a natural attraction for foreign tourists. Tourism was Sri Lanka's fifth largest source of foreign exchange earnings in 2011, increasing by more than 44 per cent, relative to earnings in 2010. The country recorded the highest ever tourist arrivals in 2011, rising by more than 30 per cent as compared to 2010, with the trend continuing into the first quarter of 2012 (Figure 5.7). Given the sector's potential, special policy attention should be paid towards the development of a sustainable tourism sector.

As per forecasts made by the Sri Lanka Tourism Development Authority (SLTDA), the tourism sector is expected to attract more than 2.5 million tourists, generate about

600,000 direct and indirect employment opportunities and earn about US\$ 2,500 million of foreign exchange by 2016. Substantial tourism development activities are in place, in order to develop tourism infrastructure and to cater to the demands of increased tourist arrivals in the coming years.

However, if the tourism sector is to be made a significant contributor to the growth process, volume-based tourism targets alone will not be sufficient. Necessary care has to be taken to ensure the environmental and social sustainability of the tourism business, because favourable natural and social environments are the mainstay of a viable tourism industry. Although Sri Lanka's post-conflict environment has opened new avenues for developing an array of tourism products, most of the time they are not effectively regulated. For instance, whale watching is being carried out without any regulations or good practice guidelines. Sustainability of the whale resources can be under great threat as a result. If the issues related to social and environmental sustainability of tourism are not taken into consideration, the potential environmental and social costs can lead to a retardation of the rate of economic growth.

5.6 Coastal Resources

The coastal zone plays a crucial role in the economy of Sri Lanka. The coastal zone consists of around 25 per cent of the total land area of Sri Lanka. Almost a third of the country's population, two-thirds of the total urban population, two-thirds of the indus-

Table 5.2
Contribution of Coastal Sector to National GDP (%)

Sector	1983	1989	2004	2005
Coastal GDP	35.1	40.2	44.0	43.0
Non coastal area	64.9	59.8	56.0	57.0

Source: Nayananda, O.K., (2007), "The Study of Economic Significance of Coastal Region of Sri Lanka in the Context of Environmental Changes of Pre and Post Tsunami", Coast Conservation Department and The Ministry of Environment and Natural Resources.

trial facilities and over 80 per cent of tourist infrastructure are accommodated within this zone. There has been an increasing trend in the contributions of the coastal area to the national GDP, rising from around 35 per cent in 1983 to 43 per cent in 2005 (Table 5.2). Agriculture, fisheries, trade and tourism sectors have been playing a major role in the coastal economy over the years. The contribution may have been increased further in the post-conflict period due to developments in the associated economic sectors. Accordingly, natural resources play an important role in the overall performance of the coastal districts of the country.

In addition to fisheries and tourism, other economic activities involving the use of coastal resources are coral mining for lime production, capturing of live ornamental fish mainly for export, and sand mining on the beaches and sand dunes. These activities have so far been environmentally damaging.

When the economic activities which are based on the coastal sector, such as tourism and fisheries are developed, there will be an increased threat to the sustainability of coastal resources. Whilst the sector holds the potential to further enhance its contribution to the country's overall growth, it is vital to minimize the environmentally damaging practices through policies and laws, and their effective implementation. The adoption of better fishery management approaches, effective law enforcement to minimize harmful harvesting methods and the promotion of sustainable fishing techniques are some of areas to be addressed.

5.7 Water Resources

According to the available estimates of water scarcity, there is no water scarcity in Sri Lanka as per 1991 data.⁹ However, by 2025,

with the projected increase in population, the demand for both irrigation and domestic and industrial water is expected to increase. Using the Falkenmark indicator, which uses annual per capita water availability to define water scarcity, it has been found that the country as a whole and the Dry Zone in particular, will reach a level of medium-water scarcity by 2025 (Table 5.3). As per 1991 scarcity levels, only five districts were in the medium to severe scarcity categories. Three more districts are expected to enter into this category by 2025.

Water scarcity in the rural areas of the Dry Zone will continue to impose severe impacts on agriculture-based livelihoods, food security and poverty. The consequences of water scarcity on Dry Zone agriculture would further intensify the problem of poverty and food security in the coming decades, if appropriate measures are not adopted. Additionally, water scarcity can have a number of other implications on human security, for instance the lack of water in major reservoirs leads to reduced hydro power generation in the country, which would have a serious implication on the energy security of the country.

In addition to population related impacts, global climate change is also expected to challenge the water security situation in Sri Lanka. Although precise scientific estimates are not available in this regard, it is predicted that there will be changes in the temporal and spatial distribution of rainfall in the coming years. Such changes have been seen in Sri Lanka during recent years. Changes in rainfall distribution will cause adverse impacts on cropping patterns and thereby on the agricultural performance of the country. In addition to the Dry Zone agriculture, plantation agriculture in the Wet Zone will also be adversely affected, since plantation crops are

⁹ Amarasinghe, U.A., and L. M. R. Sakthivadivel (1999), "Water Scarcity Variations within a Country: A Case Study of Sri Lanka", Research Report 32, International Water Management Institute, Colombo.

highly sensitive to water shortages. Accordingly, water scarcity, when aggravated by the process of climate change will impact the foreign exchange earnings of the country. However, exact magnitude of the impact of climate change on water scarcity is not yet known.

The issues related to water scarcity can pose constraints on targeted contributions of individual economic sectors, such as agriculture and energy, towards economic growth.

Also, there will be significant indirect implications on retarding the anticipated growth rate. Water scarcity problems have to be carefully dealt with and appropriate policy actions need to be taken to conserve and effectively utilize available water resources by different sectors. In this regard, it is important to encourage efficient water allocation through meaningful coordination between relevant government agencies and the promotion of water efficiency in agriculture, etc.

Table 5.3
Level of Water Scarcity, by District in 1991 and Projections for 2025

Area	1991	2025
Sri Lanka	N	M
Wet Zone	N	N
Dry Zone	N	M
Districts in the Wet Zone		
Colombo	MS	S
Galle	N	N
Gampaha	M	MS
Kalutara	N	N
Kandy	MS	MS
Kegalle	N	N
Matara	N	M
Nuwara Eliya	N	M
Ratnapura	N	N
Districts in the Dry Zone		
Ampara	N	N
Anuradhapura	N	M
Badulla	N	N
Batticaloa	N	M
Hambantota	N	M
Jaffna	S	S
Killinochchi	N	MS
Kurunegala	M	MS
Mannar	MS	MS
Matale	N	N
Moneragala	N	N
Mullaitivu	N	N
Polonnaruwa	N	N
Puttalam	MS	S
Trincomalee	N	N
Vavuniya	N	M

Notes: N – Little or no water scarcity, M – Moderate water scarcity, MS – Medium to severe water scarcity, S – Severe water scarcity.

Source: Amarasinghe et. al., (1999).

5.8 Global Environmental Threats: Climate Change

Climate change is a global environmental threat to which Sri Lanka has made a negligible contribution. Regardless, Sri Lanka is going to be a victim of various impacts of global climate change, which might affect the economy in numerous ways. Climate change can pose constraints on reaping benefits from the natural resource base, by way of its adverse effects on agriculture, fisheries, tourism, etc. In addition, climate change can have impacts on other economic sectors and the well-being of the population. As stated in the 'National Climate Change Adaptation Strategy (2011 - 2016)', the impacts of climate change will be primarily in terms of (i) increased frequency and intensity of natural disasters such as droughts, floods and landslides; (ii) variability and unpredictability of rainfall patterns; (iii) increase in temperature, and; (iv) sea level rise.

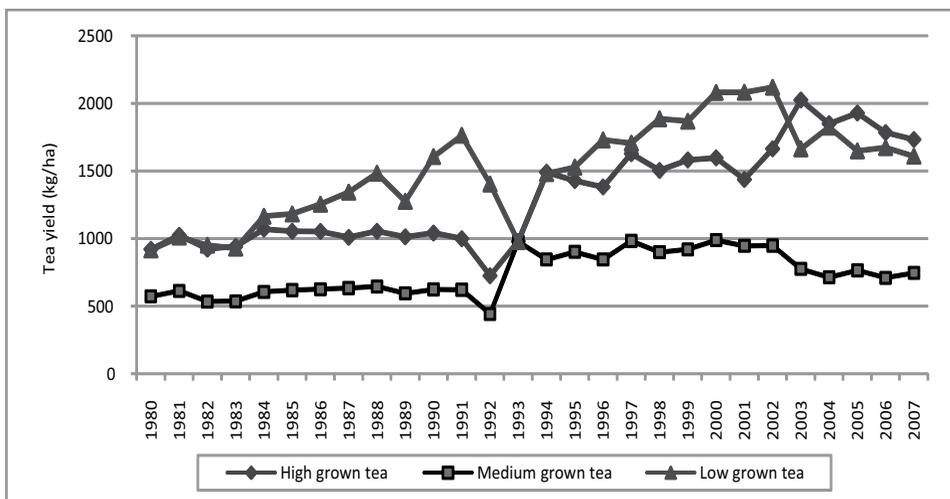
The agriculture sector will be adversely affected by the aforementioned impacts of climate change. It will have implications on national food security and also on export-

oriented plantation agriculture activities such as tea and rubber products. Time series data on tea yield shows that tea production has been greatly affected by climatic conditions. As shown in Figure 5.8, significant yield drops have been observed in years which have recorded droughts, such as 1982, 1989, 1992 and 2003. Also, the tea sector will be more vulnerable for yield drops, as with the impacts of climate change the frequency of natural disasters is expected to increase.

The coastal zone is also going to be affected through sea level rise, which will result in numerous impacts such as the inundation of low-lying areas, salt water intrusion into coastal water bodies and the consequent changes to the coastal ecosystems. Additionally, increased frequency of extreme events, such as cyclones, will affect infrastructure and coastal livelihoods.

In addition, climate change is expected to post significant constraints on the growth of other sectors such as energy, industry, human settlements, infrastructure, etc. It will also have direct impacts on human health

Figure 5.8
Tea Yield in Different Tea Growing Areas (1980 - 2007)



Source: Based on data from the Sri Lanka Tea Board.

Box 5.1

Accounting for the Role of Natural Resources in Economic Output

The role of the natural capital is not well captured in the present system of national accounting. Also the depreciation of natural resources is not included in the national accounts. Therefore, it is questionable whether the current national statistics can be used as a basis in formulating policies for sustainable development. Presently, there is an increasing recognition of incorporating the contribution of natural resources into the national income accounting system. The Ministry of Environment together with other relevant state and non-state agencies is in the process of developing a green accounting system for Sri Lanka. The process has been initiated by developing a mechanism for integrating the forestry sector into national accounting in the country.

due to increased health stress, spread of vector borne diseases and health implications due to extreme events.

Therefore, despite Sri Lanka's negligible contribution to global climate change, its implications can pose challenges to the sustainability of long term growth, particularly if appropriate adaptation measures are not taken at the correct time. Hence, there is a need to mainstream adaptations to climate change into the national development agenda.¹⁰ As Sri Lanka has a negligible contribution to global green house gas emissions, adaptation to climate change should be the main focus, over that of mitigation. Sri Lanka can obtain benefits via climate change mitigation activities such as clean development mechanisms and carbon trading. From a policy perspective, it is encouraging to note that Sri Lanka is in the process of developing a climate change policy which is required for the effective integration of climate change into the development agenda. A climate change adaptation strategy has already been prepared for the period of 2011-16 which provides a prioritized framework for action and investment aimed at systematically moving towards a climate-change resilient future.

5.9 Conclusion

Sri Lanka's natural resource base has the potential to contribute significantly to Sri Lanka's long term growth. For most of the natural-resource based sectors, such as tourism, fisheries and forests, the resource base remains under-utilized. Therefore, their contribution can be increased by adopting sustainable policies. On the other hand, certain natural resource sectors, such as coastal fisheries, lack effective regulatory and enforcement mechanisms which lead to over-exploitation.

Agriculture, being the sector that supports over one-third of the total population and using the largest share of natural resources, has a significant role to play in supporting higher growth. This involves increasing domestic production while conserving the resource base. Both import substitution and export promotion are possible avenues of making this contribution. However, the lack of land for agricultural expansion and the non-availability of an improved technological stock resulting from 30 years of neglect of agricultural R&E pose serious problems. Scarcity of land may be partially remedied through agricultural diversification but this,

¹⁰ Senaratne, A., N. Perera, and K. Wickramasinghe (2009), "Mainstreaming Climate Change for Sustainable Development in Sri Lanka: Towards a National Agenda for Action", Working Paper Series No. 14, Institute of Policy Studies of Sri Lanka, Colombo.

again, needs new technology. One solution available for the lack of technology could be importing it, but this is expensive and also somewhat time consuming. As a result, import substitution may become socially unprofitable and export promotion almost impossible, due to a marginal competitive advantage. Consequently, these avenues should be tried with caution, especially in the short run. Hasty decisions may lead to uneconomic exploitative use and therefore degradation of the agricultural resource base. However, world prices in agricultural commodities show no sign of declining in the near future and therefore, chances exist in the long run for both import substitution and export promotion to be gainfully undertaken. Sri Lanka should learn from past mistakes and invest adequately in agricultural R&E now, in order to exploit these long run opportunities for sustained growth.

A single approach would not help to sustainably utilize the natural resource base

in Sri Lanka and maintain its contribution to growth. Given the complexity of the natural environment and its multifarious links with the economy, actions essentially have to be resource-specific. In addition, comprehensive legal mechanisms and their effective enforcement emerge as a must, and multi-stakeholder collaboration becomes a key necessity in this regard. Long term economic growth can be unfavorably affected if the role of natural resources is not well reflected in a country's economic policies. Therefore, integration of sustainable practices is critical. Even as these issues are addressed, the overriding need to shift surplus agriculture labour to more productive sectors of economic activity, has to receive immediate policy attention. This requires an in-depth assessment of the human resource development needs of the country and appropriate policy measures to enhance education and labour market outcomes. These issues will be taken up in Chapter 6 of this report.