Report No. 48968-LK

Sri Lanka
Agricultural Commercialization

Improving Farmers' Incomes in the Poorest Regions

May 12, 2009

Poverty Reduction and Economic Management Sector Unit
South Asia Region

Document of the World Bank

CURRENCY AND EQUIVALENTS

Sri Lanka Rupee (SLR)

US$1= LKR 120.1 (May 5, 2009)

GOVERNMENT OF SRI LANKA'S FISCAL YEAR

January 1 - December 31

LIST OF ABBREVIATIONS

CBO	Community Based Organization
DCS	Department of Census and Statistics
DOA	Department of Agriculture
FOB	Freight on Board
HIES	Household Income and Expenditure
HCI	Poverty Headcount Index
ICA	Investment Climate Assessment
GDP	Gross Domestic Product
GoSL	Government of Sri Lanka
LDO	Land Development Ordinance
NGOs	Non Governmental Organizations
PPPs	Public Private Partnerships
WDR	World Development Report

Vice President:	Isabel Guerrero
Country Director:	Naoko Ishii
Sector Director:	Ernesto May
Sector Manager:	Miria Pigato
Team Leaders:	Paul Wade and Claus Astrup

TABLE OF CONTENTS

Boxes

Figures

Tables

Foreword

The fundamental rationale for focusing policy research on agriculture is that the majority of poor people in Sri Lanka live in rural areas where agriculture is the mainstay of economic activity. Also, globally, as the World Development Report 2008 documents, GDP growth originating in agriculture can be at least twice as effective in reducing poverty as GDP growth originating outside of agriculture.

By focusing on a few selected products—maize, milk and vegetables—and carefully analyzing the value chain in these sub-sectors, from farmers to wholesalers, this report attempts to draw out some general lessons about the key constraints to increased commercialization of Sri Lankan agriculture. The report is part of a broader research program on spatial differences in economic development in Sri Lanka, and it will be followed by another report that will more deeply explore issues related to spatial economic integration. This report also provides an analytical foundation and a basis for dialogue for a possible World Bank agricultural lending operation to strengthen the market orientation of the agricultural sector in Sri Lanka.

The work on this report drew on a practical, bottom up approach to best take into account the local conditions. This involved extensive consultations with national and local government representatives, farmer representatives, members of the local agribusiness sector, and representatives from the regional chambers of commerce. The consultations focused on determining the main constraints to and opportunities for increasing farmers' incomes, as perceived by local stakeholders.

The following people contributed to the report: Grahame Dixie (SASDA), Terrence Abeysekera (SASDA), Chai Happugale (consultant), Kirthisri Wijeweera (SASEP), and Nobou Yoshida (SASEP). Preparation of the report was initially led by Rocio Castro (SASEP). Paul Wade (SASEP) and Claus Astrup (SASEP) led the completion of the report.

SRI LANKA: AGRICULTURAL COMMERCIALIZATION--IMPROVING FARMERS' INCOMES IN THE POOREST REGIONS

EXECUTIVE SUMMARY

1. **The issue of regional differences has moved to the center of the development debate in Sri Lanka**. For the past many years, there have been significant and increasing differences between the Western Province on one side and all other provinces on the other side in terms of per capita income levels, growth rates of per capita income, poverty rates, and the structure of provincial economies. This issue is important for Sri Lanka's inclusive-growth agenda because a large majority (about 71 percent) of the country's population lives outside the Western Province. There are concerns that failing to bring the lower-income provinces along in the country's economic development could result in further income disparities that might add to social tensions and create obstacles to Sri Lanka's future growth. Reflecting that these socio-economic differences have become increasingly clear in recent years, the Government emphasizes in its 10-year Development Framework, the *Mahinda Chintana* (2006), the need to reduce regional disparities through the implementation of pro-poor growth strategies. The *Mahinda Chintana* also emphasizes the need to accelerate economic growth from the historical average of 5 percent to around 8 percent a year. This will require the attainment of substantially higher growth rates outside the Western Province.

2. **The Western Province has been the fastest growing region in Sri Lanka during the last decade,** with an average annual real GDP growth of 6.2 percent from 1997–2006. The rest of the country, in comparison, grew by just 2.3 percent annually during the same period. Consequently, there are significant differences in GDP per capita between the Western Province and the rest of the country. In 2006, GDP per capita in the Western Province exceeded US$ 2000 and was more than double that of any other province. In parallel, the Western Province's share in national GDP also increased steadily and has, in recent years, hovered around 50 percent of Sri Lanka's entire production of goods and services. The other eight provinces—which together have two-and-a-half times the population of the Western Province—share the remaining 50 percent of economic activity amongst themselves.

3. **These uneven growth outcomes are associated with uneven poverty outcomes**. In 2006/07, the poverty incidence (head count index) in the Western Province was 8 percent. With the exception of the Eastern Province[1], the incidence of poverty in all other provinces was substantially higher (ranging between 14 and 27 percent). Furthermore, the incidence of poverty in rural areas is nearly double that in urban areas. In 2006/07, the urban poor accounted for 7 percent of the nation's poor, the rural poor for 82 percent and the estate poor for 11 percent.

4. **The majority of the poor lives in rural areas and depends on agriculture for their food and livelihoods**. Uva and Sabaragamuwa are the provinces with the highest incidence of poverty. In these provinces, more than 80 percent of both the population and the poor live in rural areas, with the vast majority of households depending on income from agriculture.

[1] The 2006/07 Household and Income Expenditure Survey (HIES) was the first to include information on the Eastern Province (EP). The EP was generally believed to be one of the poorer provinces in Sri Lanka in view of the negative impact of the armed conflict which spiked there in 2006/07. The province was also very hard hit by the 2004 tsunami. Further analysis of the 2006/07 HIES would be needed to better understand the reasons behind the low poverty recorded in the Eastern Province (the unit record data of the HIES was not available for this analysis).

5. **In order to address regional development issues in Sri Lanka it is necessary to address the development of agriculture, given the substantial role the agricultural sector plays in the poorest provinces.** Agriculture stands for a significant share of value-added, employment and the share of households dependent on income from the sector. Poverty among households dependent on agriculture is especially high, particularly in provinces with the highest incidence of poverty. Also, as argued in the World Development Report 2008, increased agriculture income is often more effective in eliminating poverty than increased income from other sources. More broadly, the usual transformation of an economy in a dynamic growth process--shifting from a rural-based, agricultural economy to an urban-based economy--has so far happened only slowly outside the Western Province. Achieving higher growth in agricultural productivity is a necessary part of economic transformation; it is the only way for the agricultural sector to release labor to other, higher-value-added sectors, while maintaining at least modest growth in rural/agricultural household incomes.

6. **The focus of this report on raising farmers' incomes in the poorest provinces is consistent with the *Mahinda Chintana* National Ten-Year Development Plan.** To diminish regional disparities, the *Mahinda Chintana* advocates that Government policies stimulate economic growth by especially enhancing and expanding livelihood options in the regions where most of Sri Lanka's poor inhabitants live. The agricultural section of the *Mahinda Chintana* explicitly recognizes the need for greater private sector involvement in agriculture research and development and extension services. It also seeks the full participation of community-based organizations in helping to transform subsistence agriculture into highly productive systems with linkages to agro-based industries. However, the Plan is less specific as to how these partnerships with the private sector are going to be translated into policy and action.[2] Thus, there is a gap in the policy portfolio, related to how private sector investment in production and market infrastructure and sourcing raw materials from poor regions can be facilitated.

7. **This report has three main objectives**:

- The first objective is to improve the understanding of the poverty and agriculture nexus in Sri Lanka's poorest regions (in particular Uva and Sabaragamuwa which show the highest recorded poverty levels in all surveys carried out in the past decade)[3]. It should be emphasized, though, that the report does not attempt to analyze why poverty in Sri Lanka, including in Uva and Sabaragamuwa, declined significantly between 2001/02 and 2006/07. Answering this question would, among other things, require detailed analysis of the two rounds of Household Income and Expenditure Surveys (HEIS) and, thus, require waiting for the Department of Statistics to make the latest surveys available.

- The second objective is to analyze the constraints for improving commercialization and profitability in the agriculture sector, based on the study of a few select agricultural products. By focusing explicitly on agriculture commercialization and profitability, the report complements other World Bank studies—both previous and on-going—on the cross-cutting issues that are holding back growth in agriculture. These include *inter alia* the 2003 World Bank report on *Promoting Agricultural and Rural Non-farm Sector Growth,* from which a number of conclusions remain valid today.

- Finally, the third objective is to provide a set of practical policy options to address the constraints facing agricultural producers in terms of commercialization and profitability.

[2] It should be noted that the Government does provide a number of tax-based incentives to agri-businesses, targeting export oriented production.

[3] The Northern and Eastern provinces are considered economically disadvantaged as they have borne the brunt of the past three decades of conflict. However, data availability for the Northern and Eastern Provinces is generally poor, precluding detailed analysis.

As such, the report is intended to provide an analytical foundation and a basis for dialogue for possible donor support to strengthen the market orientation of the agricultural sector in Sri Lanka.

8. **It should be noted that this report is part of a programmatic research program on spatial differences in economic development and social welfare in Sri Lanka.** As such, this report will be followed by another report focusing on spatial economic integration in Sri Lanka. The latter will explore, in greater depth, more broader issues related to spatial economic integration, including the challenge of managing the tension between the forces of economic concentration and maintaining relative spatial uniformity in standards of living.

9. **The key analytical tool employed in the report is a value chain analysis of three specific agriculture products, namely maize, milk and vegetables.** The value chain analysis includes an assessment of market prospects, competitiveness and potential enterprise profitability, as a basis for recommending interventions that will likely create sustainable and profitable opportunities for poor farmers. A key question that the analysis attempts to address is: What are the factors inhibiting the enhanced commercialization of the three chosen products? The starting point for the value chain analysis was an agricultural 'resource audit' of small-scale farmers in the poorest regions to analyze production, poverty and market data[4]. This was followed by an assessment of income opportunities from the selected agricultural products, and identification of product-specific constraints and gaps in the current policy portfolio that may be preventing this potential from materializing.[5]

10. **The value chain analysis was complemented by extensive consultations with stakeholders.** The overall purpose of these consultations, besides seeking validation of the initial findings, was to elicit informed local opinions on the key constraints restricting farmer incomes, interventions that could help alleviate rural poverty, and the local resources (enterprises, skills, production capacities, etc.) that would best help enhance rural livelihoods. This approach would enable policy options to focus primarily on enhancing the profitability of agricultural activities that are, or could be, significant sources of income for poorer farmers. Stakeholder consultations were held in four provinces—Uva, Sabaragamuwa, and the Northern and Eastern provinces. A number of meetings were held with farmer groups, farmer representatives, and the private sector (including local chambers of commerce), besides local Government officials and managers of projects that target the rural sector in the regions. The draft findings of the report were also discussed at a workshop held in Colombo in June 2008, with broad stakeholder participation[6].

11. **Although the study may ignore some general issues due to its focus on a limited number of agricultural products, the approach used has the advantage of being based on data that reflects the actual situation in the sub-sectors discussed in the report.** Moreover, experiences from elsewhere suggest that a narrow focus enables the analysis to better crystallize critical constraints and policy options. It should also be emphasized that although maize, milk and vegetables were chosen for focused study, their selection does not imply that these products are the only ones with potential or necessarily have the best prospects. What are more important are the processes and techniques used to evaluate the value chains of the individual products, assess the scale of their prospects and identify the alternative entry points for interventions. Finally, while paddy and plantations crops (tea, rubber and coconuts) are, in

[4] The initial identification of broader constraints also relied on the World Bank's 2005 Rural and Urban Investment Climate Assessment (ICA) for provincial data and useful insights into the constraints urban and rural firms face in doing business in Sri Lanka.

[5] Value chain analysis has been widely applied to several sectors, including in the Sri Lankan context. A recent example is a value chain analysis of the Sri Lankan fisheries sector by the Institute of Policy Studies (Arunatilake et.al. March 2008).

[6] This included representatives from the Ministries of Finance and Planning, Nation Building, Agriculture, Livestock, Central Bank, Finance Commission CARP and the Private Agribusiness Sector.

many ways, the mainstay of Sri Lankan agriculture, these crops were not included in the present study for a couple of reasons--these crops have already been the topic of several studies and diversification is a key challenge for Sri Lankan agriculture. Therefore, from this perspective, an analysis of somewhat untraditional products is more valuable.

12. **There are two main reasons for choosing maize, milk and vegetables as the products for the value chain analysis:**

- First, they are particularly important in the poorest regions of Sri Lanka and if their profitability is increased the products can be expected to have a particularly strong impact on poverty reduction. Maize is primarily cropped by dry land farmers in Uva and the Eastern Province (together these two provinces account for 60 percent of the national maize production). With respect to milk, around 40 percent of the national cattle herd is concentrated in Uva, the North and the East. Finally, vegetables (specifically, lowland tropical vegetables) were chosen because they are typically associated with poorer producers and are a popular crop diversification option.

- Second, the projected market demand for two of the products (milk and maize) is positive, and for the third, vegetables, profitability could be significantly improved by pro-market policies. For instance, in the case of maize the market prospects have been significantly stimulated through the increases in prices (that is, around 50 percent above typical international prices, in the mid-2000s); the crop offers the potential of an increase in net returns for domestic maize farmers to the tune of about SLRs 1 billion annually and the prospects of an annual increase in demand of about 5 percent per annum over time. This reflects the increase in demand for maize as feed for the expanding Sri Lankan poultry industry—a demand that was hitherto mostly met by imports. For milk, the market prospect was stimulated by price surges for imported milk powder of 60 percent above the typical prices in the first half of the decade, and has been bolstered by the long-term trend, brought on by higher incomes, towards a higher share of dairy products in people's diets. The strong market prospects of milk have generated interest from the private sector, suggesting that domestic milk production can become competitive vis-à-vis imported milk powder and capture a substantial market share from milk imports that now amount to about SLRs 13 billion per annum. Finally, while market prospects for lowland vegetables are not as strong as for maize and milk, there is still good potential for improvement and increased incomes for domestic farmers, primarily through better prices that can be achieved by improved market access. Vegetables also continue to remain the single largest contributor to agricultural GDP in Sri Lanka, making up 20.7 percent of real agricultural GDP in 2007.

13. **The value chain analysis and stakeholder consultations identified four issues as being the main constraints to enhanced commercialization and profitability in Sri Lankan agriculture**:

- **First, the value chain analysis revealed inefficient production technologies**. Poor producers receive little in the way of technical support. This is partly due to the weak agricultural extension services and research system. Crop yields and production efficiency could be much higher if farmers had better access to inputs and improved production technologies--for instance, in the case of maize, new seed varieties can more than double maize crop yields. On-farm drying techniques reduce maize moisture content to acceptable levels but the seed mills need to be developed and disseminated. In the case of milk, production per cow would increase substantially with improved 'milking herd germplasm' through sustainable artificial insemination systems delivering elite semen. Finally, for vegetables, extension services to facilitate the extension of the growing season and limit the current strong seasonal pattern in production and prices would help increase farm profitability significantly.

- **Second, farmers in the poorer provinces in particular have weak linkages to markets.** Weak market linkages are the result of a confluence of factors. They include poor public infrastructure, in particular roads[7]. The lack of 'last-mile connectivity' to farms—i.e. road connection all the way to the farms—was identified as a particular acute issue. Moreover, poor supply chain infrastructure is a key barrier to accessing markets—the number of storage facilities is extremely limited (a particular problem for highly perishable products like milk) and there is an absence of central collection points that would enable farmers to better benefit from the economies of scale in distribution. Also, there is a lack of adequate rural wholesale markets where produce can be aggregated into larger volumes, contributing to low farm gate prices. Lack of aggregation does not allow economy of scales for wholesale purchase of produce and trucking to urban centers. This leaves the farmers with no option but to sell separately to middlemen (or collectors) whose margins amount to a high share of the farm gate price (for example, 45 percent in the case of lowland vegetables). A proportion of this margin could become available to producers (and improve farm profitability substantially) if rural primary wholesale markets can be developed to attract larger-scale buyers and agribusiness by virtue of the quality and quantity of products available. Finally, market linkages are also weak because farmers have incomplete information about the supply and demand (and, consequently, inefficient market clearing prices) of agricultural products. For the most part, farmers are ignored by agribusinesses[8]; this means there is a significant need and potential for developing 'marketing extension' services to help them link up with the markets, tap into market information and make their production more consumer-oriented.

- **Third, access to finance is a serious constraint for farmers and prevents them from making productivity-enhancing investments.** Farmers largely depend on microfinance institutions, rural cooperatives, and regional development banks. The two State commercial banks and a few private banks also extend financing to small farmers but mainly through Government-sponsored programs. Small farmers also borrow from input suppliers and traders, and go to money-lenders to manage unforeseen liquidity constraints. The practice of leasing agricultural machinery is also underutilized. From the farmers' perspective, the main problems in terms of access to finance include inadequate access to term finance, limited suppliers' credit, cumbersome paperwork, and strict collateral requirements. The constraints on the part of commercial finance institutions include high transaction costs (in part because remote clients are difficult to service), lack of tangible security, and high repayment risk due to poor supply chains and marketing linkages.

- **Fourth, a trend towards decreased sizes in agricultural land plots is a cross-cutting issue that limits the commercialization of agriculture in Sri Lanka.** In 2002, 62 percent of all agricultural land plots were less than one acre in size. Two decades earlier, in 1982, this share was only 42 percent, suggesting a rapid fragmentation of agricultural lands. Moreover, since the Government owns the vast majority of all land, it cannot be used as collateral to access credit. The combined effect of these issues is that the farmers' incentives and capacity to make productivity-enhancing investments are greatly reduced. In the medium-term, policy and regulatory restrictions on buying and leasing land need to be removed and new policies to give farmers full and transferable ownership rights to land should be introduced. The Land Development Ordinance (LDO), which regulates the allocation of agricultural land, is currently in the process of being amended to resolve some of these issues.

---

[7] The lack of irrigation and electricity supply infrastructure is also an important bottleneck for some farmers.

[8] For a case study of successful integration between small-scale farmers and agribusiness, see "Innovative Practices in Integrating Small-Scale Farmers into Modern Supply Chains, the Case of Ma's Tropical Fruit Company" by P. Samaratunge, Institute for Policy Studies, 2006.

14. **The results of the analysis in this report point to two sets of policy options**, namely general policy options that are of relevance to the broader agriculture sector and policy options for the three specific products that have been studied in the value chain analysis. The former set of policy options is summarized in Table 1 and the latter in Box 1:

Challenge	Issues	Public Investments	Policy Environment
Improve Production Technology			
Improving the extension system	High degree of fragmentation among Government entities; poor focus on concrete, useful outputs; low institutional capacity	Create a limited number of mission-oriented innovation programs; build capacity building in selected institutions with proven potential	Strengthening, or alternatively replacing, the existing Council for Agricultural Research Policy (CARP); creating Provincial Agricultural Innovation Councils
Strengthening awareness of and demand for improved technology	Research and extension in Sri Lanka remains largely supply-driven and is defined in a top-down manner		Research and extension to improve links to their ultimate clients by more strongly involving them in setting agricultural priorities; possible introduction of user fees.
Bringing in the private sector	Lack of consistent quality; quality is necessary for commercialization	Support farmer training on good practices for quality enhancements and safety	Establish grades and standards
engthen Market Linkages			
Improving rural roads infrastructure		Selected rural roads upgrading	Strengthen system for maintenance
Aggregation of production volumes and improved integration with agribusinesses	Small production volumes increase marketing costs and undermine producers' abilities to integrate with agribusinesses	Matching grant support for selected supply chain infrastructure	Supporting establishment of producer groups—for example, around compact collection routes for milk producers
Strengthening market information systems	Farmers not well informed about changes in demand, availability of inputs at the best prices, and other information that is critical for well-functioning markets	Investments in market places to increase transparency and efficiency of wholesale markets; support enhanced use of communication technology	Strengthening of commodity exchanges
Promote innovative modes of financing	Absence of contract financing and warehouse receipt financing for example	Train purchasers in contract design and management; train farmers on rights and obligations	Strengthen institutions for dispute resolutions
Strengthen land tenure	Limited private land ownership	Reorganization of existing land administration agencies; investments in computerized land tenure recording systems	Implementation of a communication and awareness campaign and establishment of procedures necessary to formalize the change; create a comprehensive regulatory (legal and procedural) framework for effective land titling
Improve flexibility of land use	Designated paddy land cannot be used for alternative crops		Remove the existing provision that requires paddy farmers to obtain permission from the Commissioner of Agrarian Services to shift to other crops in designated paddy lands

Box 1: Product Specific Recommendations

The product-specific recommendations fall into two sub-categories: 'within' farm improvements of technology and production processes, and 'between' farm improvements to improve coordination and facilitate economies of scale.

The key 'within' farm recommendations for the maize sector include development of on-farm drying techniques to reduce moisture content to below 14 percent (without smoke contamination) and enhanced farmer training in maize agronomy, with a particular emphasis on expanding the use of F1 seeds. For the milk sector, the recommendations to increase productivity include genetically improving the milk herds, for example through artificial insemination, and improving feed, fodder and pasture practices. Finally, for vegetables, the 'within' farm recommendations are to improve production techniques and help extend the growing season, and to improve long-terms storing techniques to minimize the vast seasonal fluctuations in prices.

'Between' farm recommendations for the maize sector include the creation of organized producer groups (for example, a maize industry association) to better integrate the value chain, in particular improving the business linkages with major feed mills. There is also a need to rationalize maize collection points and perhaps develop shared drying facilities. For the milk sector, it is critical to form village societies around compact milk routes to reduce collection costs, and—in view of the relatively high capital costs—improve the provision of shared market structures like bulk chillers, collection centers and automatic quality testing equipment. For vegetables, it is necessary to improve marketing extension so that producers better understand the market and consider alternative marketing options. There is also a need to improve rural market infrastructure as has happened, for example, in Dambulla, where the vegetable market has greatly facilitated the integration of the value chain.

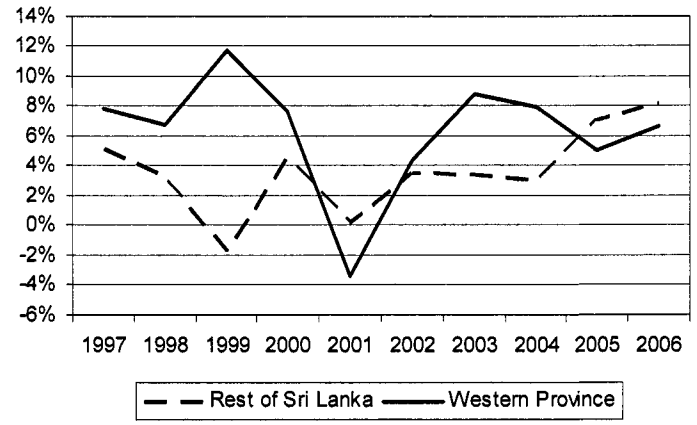
Finally, across all the three products, ways of creating incentives for agribusinesses to operate in poorer regions and make targeted investments that enable farmer groups to participate in modern agricultural supply chains should be considered.

1. INTRODUCTION

1. **The issue of regional differences in development has moved to the center of the development debate in Sri Lanka**, partly after the release of regional poverty data.[9] For the past many years, there have been significant and increasing differences between the Western Province and the rest of the country[10] in terms of per capita income levels, growth rates of per capita income, poverty rates, and the structure of provincial economies. This issue is important in Sri Lanka's inclusive-growth agenda because a large majority (about 71 percent) of Sri Lanka's population lives outside the Western Province. There are concerns that failing to bring the lower-income provinces along in the country's economic development could result in further income disparities that might add to social tensions. There are also concerns that these inequalities could create obstacles to Sri Lanka's future growth. Reflecting that the socio-economic differences have become increasingly significant in recent years, the Government emphasizes in its 10-year Development Framework, the *Mahinda Chintana* (Department of National Planning, 2006), the need to reduce regional disparities through the implementation of pro-poor growth strategies. The *Mahinda Chintana* also emphasizes the need to accelerate economic growth from the historical average of 5 percent to around 8 percent a year, which will require the attainment of substantially higher growth rates outside of the Western Province.

2. **The Western Province has been, by far, the fastest growing region in Sri Lanka during the last decade**, with an average real GDP growth of 6.2 percent per annum between 1997 and 2006. The rest of the country, in comparison, grew by just 2.3 percent per annum during the same period (figure 1)[11]. Average growth rates in Uva (3.2 percent) and Sabaragamuwa (0.7 percent) during this period were significantly below that of the Western Province, and also below the national average (4.6 percent). However, the North and the East fared better—growing at 7.4 and 4.6 percent respectively--in large part because of the substantial economic rebound between 2003 and 2005 following the ceasefire agreement signed in early 2002. However, growth slowed again in this part of the country following the re-intensification of the conflict in 2006/07. The Government's capture of the East is likely to increase growth there, at least in the short run.

Figure 1: Real GDP Growth—Western Province vs. Rest of the Country

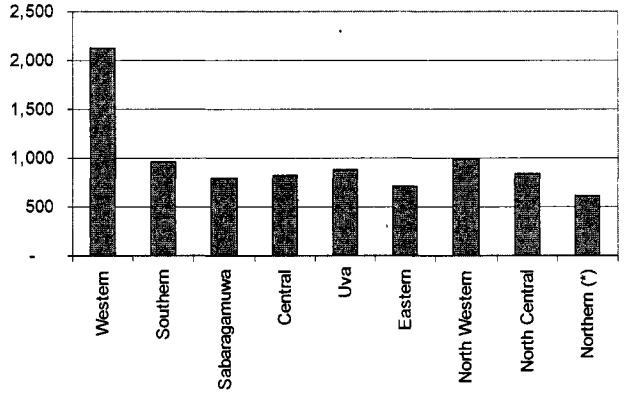


Source: Central Bank Department of Census and Statistics (Sri Lanka), and World Bank Staff Estimates
(*): North excludes Mulaitivu and Kilinochchi districts

[9] The Department of Census and Statistics (DCS) released detailed spatial poverty data in 2004, based on household surveys 2001/02 and Census data.
[10] The 'rest of the country' will at times be referred to as the 'lagging provinces'.
[11] Since regional price deflators are not available, real GDP figures by province have been derived using the aggregate GDP deflator. Therefore, this series should be interpreted with caution.

3. **Consequently, there are significant differences in GDP per capita between the Western Province and the rest of the country**. Rapid growth in the Western Province, compared to more lackluster growth in the rest of the country, has led to widening income differences. In 2006, GDP per capita in the Western Province exceeded US$ 2000—more than double that of any other province (Figure 2). The income differences among other provinces are comparatively small. The Northwestern and Southern provinces both have average incomes of around US$ 1,000 per capita, while the Eastern and Northern provinces have the lowest GDP per capita at US$ 714 and US$ 610, respectively.

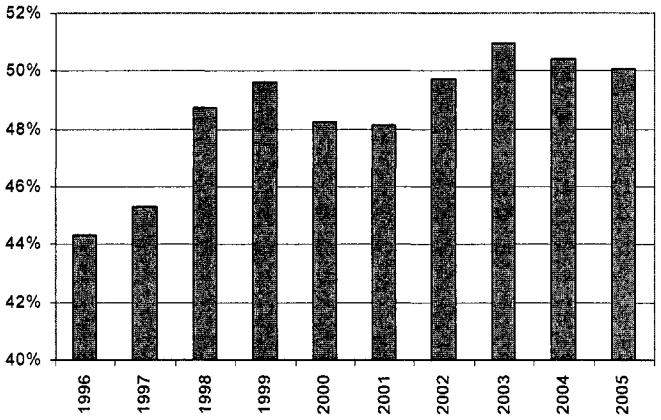
Figure 2: GDP Per Capita by Province, 2006



Source: Central Bank and Department of Census and Statistics
(*): North excludes Mulaitivu and Kilinochchi districts

4. **Similarly, the Western Province's share in the national GDP has increased** and, in recent years, has hovered at around 50 percent of the entire country's production of goods and services (figure 3). The other eight provinces—with two-and-a-half times the population of the Western Province—share the remaining 50 percent of economic activity among them. Among these provinces, the Northwestern and the Southern provinces are the largest in terms of GDP, with each accounting for 9.3 percent of the GDP in 2007. The Eastern and the Northern provinces contribute 4.7 percent and 2.9 percent, respectively, to the total GDP, on account of relatively low average incomes and small populations.

Figure 3: The Western Province's Share of Total National GDP



Source: Central Bank and Department of Census and Statistics
(*): North excludes Mulaitivu and Kilinochchi districts

5. **The uneven growth outcomes are associated with uneven trends in poverty incidence**. According to the HIES 2006/07 data[12], the Western Province has the lowest incidence of poverty (8 percent) (Table 2) as measured by the poverty headcount index. However, during the past decade (1995/06-2006/07), the Southern province experienced the largest reduction in poverty incidence--from 32 percent to 14 percent--while in the Western Province the poverty incidence dropped from 16 percent to 8 percent. In the most recent period (from 2002 to 2006/07), however, the Southern Province continued to

[12] The Department of Census and Statistics (DCS) released summary data from its 2006/07 surveys in August 2008. Poverty data generally do not cover the North and East because of incomplete coverage, although the 2006/07 survey did sample a number of Divisional Secretariat (DS) divisions in the East.

show a rapid drop in poverty incidence (14 percentage points) while the Western Province showed a reduction of only three percentage points.[13]

Table 2: Poverty Head Count Index (1995/96-2006/07)

Province	1995/96	2002	2006/07	Percentage change (1995/96-2006/07)	Percentage change (2002-2006/07)	Percentage points change (2002-2006/07)
Western	16	11	8	-50	-27	-3
Central	36	25	22	-39	-12	-3
Southern	32	28	14	-56	-50	-14
Eastern	n.a.	n.a.	11	n.a.	n.a.	n.a.
Northwestern	27	27	15	-44	-44	-12
North Central	25	22	14	-44	-36	-8
Uva	47	37	27	-43	-27	-10
Sabaragamuwa	41	37	24	-42	-35	-13
Northern	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Sri Lanka	29	23	15	-47	-33	-8
Coefficient of Variation	0.33	0.34	0.40			

Source: Department of Census and Statistics

6. **Uva and Sabaragamuwa have the highest incidence of poverty**. A comparison of poverty statistics shows that in 2006/07 Uva had the highest incidence of poverty (27 percent), followed by Sabaragamuwa (24 percent) (Table 2). From 2002 to 2007, the overall rate of poverty reduction in Sri Lanka was eight percentage points. However, Sabaragamuwa achieved a higher poverty reduction rate (13 percentage points) than the national average. The overall rate of poverty reduction in Uva was 10 percent.

7. **The sharp differences in growth and poverty outcomes between the Western province and the rest of the country do not seem to be mirrored by commensurable differences in human capital**. The dispersion—as measured by the coefficient of variation of provincial literacy rates—is only 0.03, confirming that public education policies in Sri Lanka have been, by and large, quite equitable[14] (Table 3). Despite the relative uniformity of literacy rates there is still, as expected, a negative correlation between the provincial poverty rate and the average literacy rate. The dispersion in indicators for educational attainment is higher in particular at the extreme ends of the achievement scale. The population shares of those who have not completed any schooling vs. those who have completed tertiary education show much more regional variation than the share of population with intermediate levels of educational attainment. Also, as expected, provinces with a high share of people with no schooling have higher poverty than provinces with a low share of people with no schooling, as indicated by the positive correlation coefficient of 0.45. Conversely, provinces with high shares of populations of individuals who have completed tertiary education have lower provincial poverty rates (correlation coefficient of -0.67).

[13] Further analysis is needed to determine the causes of poverty reduction and whether the changes are structural or not.
[14] Educational attainment indicators do not capture differences in the quality of education.

Table 3: Human Capital Indicators by Province 2003

	Literacy Rate	Share of Population that has Completed...			
		No Schooling	Primary	Secondary	Tertiary
Central	89	11	32	40	18
Eastern	87	14	38	31	17
North Central	93	8	31	44	17
Northwestern	94	7	30	42	21
Northern	93	8	32	32	29
Sabaragamuwa	92	9	31	43	17
Southern	93	8	32	38	22
Uva	88	12	36	39	14
Western	96	4	24	46	27
Sri Lanka	93	8	29	41	21
Coefficient of variation	0.03	0.33	0.12	0.13	0.25
Correl. with prov. poverty rate	-0.49	0.45	0.39	0.11	-0.67

Source: Central Bank (Sri Lanka) Annual Report and World Bank Staff Calculations

8. **Regional gaps, in terms of access to economic infrastructure, may help explain the differences in growth and poverty outcomes** (see Table 4). For example, in terms of access to markets, the accessibility index[15] for the Western province is 25 percent higher than that of Uva, which has the worst accessibility index in the country. The data suggest a negative correlation between accessibility and poverty--the better the accessibility the lower the poverty. Similarly, while over 90 percent of households in the Western province have access to electricity the coverage in other regions is around 60-80 percent, Uva being the least endowed province with only 57 percent having access to electricity. The correlation between electricity coverage and poverty is also strongly negative (correlation coefficient of -0.82). Firm-specific infrastructure seems, however, not to be strongly associated with regional differences in poverty. For example, there is only a low correlation between the share of firms connected to the electricity grid and the provincial poverty rate (correlation coefficient of only -0.05). The dispersion of firms' access to electricity is somewhat lower than access by households, probably due to the fact that firms are more concentrated in urban areas which, generally, have better access to electricity. The relationship between regional resources, returns on assets, and regional differences in income levels will be further explored in a follow-up report.

[15] The accessibility index measures at each point the sum of the population totals of surrounding cities and towns, inversely weighted by the road network travel time to each town.

Table 4: Provincial Access to Economic Infrastructure

Provinces	Average Accessibility Index	Percentage of Households with Electricity	Percentage Share of Firms with Electricity	Percentage of Firms Located in a Community with a Bank
Central	3.1	73	80	47
Eastern	n.a.	n.a.	n.a.	n.a.
Northern	n.a.	n.a.	n.a.	n.a.
North Central	2.9	66	61	75
Northwestern	3.1	69	61	70
Sabaragamuwa	3.3	62	76	70
Southern	3.1	78	68	62
Uva	2.8	57	62	78
Western	3.8	92	79	70
Coefficient of Variation	0.10	0.16	0.12	0.15
Correlation with Provincial Poverty	-0.57	-0.82	-0.05	-0.03

Source: "*Sri Lanka: Poverty Assessment*". World Bank (2006),

9. **Agriculture is a dominant economic sector in all provinces of Sri Lanka except the Western province.** The usual transformation of the economy from a rural-based, agricultural economy to an urban-based economy is happening only slowly outside the Western province. The share of agriculture in national GDP was 16.5 percent in 2006, a decline from 22.4 percent in 1996. In the Western province, the share of agriculture in provincial GDP was less than 3 percent in 2005 (Table 5). Agriculture's share is highest in Uva (44 percent in 2006), which also has the highest poverty rate. Accordingly, in the Western province the vast majority of the labor force is employed in industry and services (92 percent in 2004), whereas the rural-urban transformation in the rest of the country is at a much less pronounced stage and agriculture still accounts for close to half of regional employment. According to the Central Bank of Sri Lanka statistics, in Uva, over 63 percent of the population is directly employed in agriculture, while in Sabaragamuwa the share is close to 37 percent. In Uva and Sabaragamuwa, the estate population is 14 and 9 percent, respectively, of the province populations.

Table 5: Agriculture's Share in Provincial GDP

	1996	2000	2005
Central	34%	32%	34%
Eastern	34%	30%	28%
North Central	47%	45%	44%
Northwestern	34%	28%	23%
Northern	20%	19%	24%
Sabaragamuwa	26%	34%	29%
Southern	36%	38%	31%
Uva	53%	47%	49%
Western	6%	5%	3%
Sri Lanka	22%	19%	17%

Note: Data based on GDP at factor costs in current Prices

Source: Central Bank of Sri Lanka

10. **In summary, the picture that emerges is one of significant disparities in economic growth and poverty reduction among different provinces during the past couple of decades.** Areas outside the Western province have significantly lower per capita incomes and higher poverty rates than the Western province. This is consistent with the slower transformation of these provincial economies compared to the Western province--in terms of migration of people from rural to urban areas, more rapid economic growth in urban areas, and an increasing shift from primary industries (agriculture, fishery, etc.) to secondary and tertiary industries.

11. **Addressing regional development issues in Sri Lanka also requires addressing the development of agriculture, given the substantial role of the sector in the poorest provinces.** Agriculture stands for a significant share of value-added and employment, and the number of households dependent on income from this sector in the poorest regions of the country is very large. At the same time, poverty is particularly pervasive among households dependent on agriculture. For this reason, as research presented in the World Development Report on Agriculture (WDR 2008) shows, increased agricultural income, in general, has a stronger effect on eliminating poverty than growth in other sources of income. More broadly, agricultural productivity growth is a necessary part of economic transformation because it allows the agricultural sector to release labor to other, higher-value-added sectors, while maintaining at least modest growth in rural/agricultural household incomes.

12. **This report has three main objectives.** In keeping with the Government's objective of increasing competitiveness in the agriculture sector and raising farmers' incomes, the first objective of this report is to strengthen the understanding of the growth, poverty and agriculture nexus in the poorest regions (in particular North, East, Uva and Sabaragamuwa)[16] in Sri Lanka. The second objective is to identify, through empirical analysis and local stakeholder consultations, a few agricultural products with high potential for income growth and study the key constraints to improving the profitability of these commodities. The third objective is to provide practical recommendations for interventions to address the constraints facing the value chains of these products, as well as recommendations to alleviate cross-cutting constraints to broader agriculture sector growth. The ultimate objective is that these interventions and improvements in broader policies would mitigate poverty over the medium-term by spurring growth in the poorest regions. The report is also intended to provide an analytical foundation for a possible World Bank agricultural lending operation to strengthen the market orientation of this sector—something the Government has expressed interest in. It should be noted that although productivity improvements in agriculture would play an important role in any strategy to increase growth in poorer regions and facilitate economic transformation towards higher value-added production, there are many other issues related to the question of spatial economic integration and managing the tension between the forces of economic concentration on one side and maintaining relatively spatial uniformity in standards of living on the other side. These broader issues will be analyzed in a follow-up report.

13. **The report relies on extensive consultations with a broad spectrum of stakeholders in Sri Lanka.** Consultative meetings were held in Sri Lanka with numerous stakeholders, including the Government, the private sector, NGOs, and farmers. Most recently, the draft findings of this report were discussed at a workshop held in Colombo in June 2008, with broad stakeholder participation[17], coupled with a series of individual stakeholder meetings. The main objective of these consultations was to identify key resources, constraints and market opportunities in the agricultural sector, using an explicit value-chain approach. International experience suggests that this approach works best if the focus is kept on a limited number of value chains, and if the focus is on products with a strong market potential and on clusters of enterprises or farmers rather than on individual firms. Attention is then paid to resolving a

[16] Given the limited availability of data for the North and East, the discussion, to a large extent, focuses on Uva and Sabaragamuwa

[17] This included representatives from the Ministries of Finance and Planning, Nation Building, Agriculture, Livestock, Central Bank, Finance Commission, Council for Agricultural research Policy, and the private agribusiness sector.

limited number of major constraints. The long-term aim is to turn the identified potential strengths into a competitive advantage for the producers in high-poverty areas. The consultative process in Sri Lanka, supported by quantitative analysis of the product value chain, helped in assessing the competitiveness and profitability of the products studied in this report. It also helped identify gaps in the policy framework which currently limit the Government's scope for supporting the planned range of interventions. Finally, the most recent consultations also, to a large extent, validated the findings and recommendations of this analysis.

14. **The focus on three specific products (maize, milk and vegetables) does not mean that they are the only products with the potential for growth in Sri Lankan agriculture.** The report argues that the domestic growth potential for maize and milk is substantial. For maize the potential is linked to the rapid growth in the domestic poultry industry which relies heavily on maize for feed, while in the case of milk, domestic production of fresh milk has the potential to compete with imported dried milk which currently dominates the domestic market. Vegetable production has arguably a lower growth potential, but is included because of its importance for the poorest farmers in particular. Nevertheless, other products—for example tropical fruits, where Sri Lanka might have an unexploited export potential—could also reasonably have been included in the analysis. As such, the focus on the three selected products is also intended to serve as an example of how a value-chain based analysis can be carried out and replicated for other sectors as well.

15. **The structure of the report is as follows**. Chapter 2 looks at the poverty/growth/agriculture nexus in the poorest regions of Sri Lanka. It presents data on poverty and growth in the poorest provinces, especially Uva and Sabaragamuwa, and provides an analysis of factors associated with the rural poor. Chapter 3 provides an overview and brief discussion of the Government's agricultural policies and programs. Chapter 4 identifies constraints that restrict farmers' incomes in the four poorest provinces. It presents results from extensive stakeholder consultations carried out in these provinces. These results are complemented with findings from the 2005 Rural Investment Climate Assessment to identify some of the general constraints in the agriculture sector in Sri Lanka. Chapter 5 presents the findings of an agricultural resource audit of small-scale farmers in the poorest regions that analyzed production, poverty and market data. The chapter identifies income opportunities, in particular for a few agricultural products with high income potential for poor farmers, whose production could take off with appropriate interventions. This chapter also provides a value chain analysis of these products and identifies product-specific constraints and gaps in the current policy portfolio that could potentially limit the Government's capacity to support the whole range of needed interventions. Drawing on the findings in previous chapters, Chapter 6 presents recommendations. One set of recommendations is specific to the three products with high income potential and focuses on effective interventions for their production. Another set consists of cross-cutting recommendations that would further improve performance in the targeted areas but also benefit agricultural production more broadly. Chapter 7 sums up and concludes.

2. THE POVERTY, GROWTH AND AGRICULTURE NEXUS

16. **Given the importance of agriculture in many of the poorest provinces in Sri Lanka, this chapter looks at the poverty/growth/agriculture nexus.** It reviews the overall growth performance of the agricultural sector and the composition of its sub-sectors, and analyses the relationship between households' reliance on agriculture and their poverty status. It should be emphasized, however, that this section only provides a static perspective of the link between agriculture, growth and poverty in the poorest regions. This means that the section focuses on the correlation between poverty and agricultural characteristics, but does not seek to explain the possible link between trends in agriculture and the sharp decline in poverty that the most recent HIES reports. Such analysis has to wait until the unit-record HIES is made available for detailed analysis.

17. **Agricultural growth has lagged behind growth in other sectors in all parts of the country.** From 1996 to 2005, overall real GDP increased at an average annual rate of 4.6 percent. The services sector expanded the fastest, by 5.6 percent on average, while industry grew by 4.8 percent. By contrast, agriculture production increased by only 1.5 percent. The differences in sectoral growth rates have been even larger in the Western province compared to the rest of the country. The rapid sectoral transformation in the Western province is mainly explained by the fact that agricultural real GDP shrank by close to 2 percent per year over the last decade while industrial and services production grew between 6 and 7 percent annually in real terms (Table 6) over the same period. However, in the rest of the country as well, there was a measurable growth differential between agriculture and other sectors--agriculture growth averaged a low 1.9 percent annually between 1996 and 2005, while industry and services grew by 3.1 percent and 4.0 percent, respectively.

Table 6: Average Annual Real GDP Growth, 1996-2005

	Western Province	Rest of the Country	Sri Lanka
Agriculture	-1.8%	1.9%	1.5%
Industry	6.1%	3.1%	4.8%
Services	6.8%	4.0%	5.6%
GDP	6.2%	2.7%	4.6%

Source: Central Bank of Sri Lanka

18. **Although agricultural growth has been sluggish and productivity low, there are signs that farmers are diversifying their crop production.** The traditional mainstays of agricultural production in Sri Lanka—the plantation crops (tea, rubber and coconut) and paddy—continue to play an important role. In 2007 (the last year for which full-year data is available), these crops made up 44.8 percent of total agricultural GDP, of which paddy contributed the largest single share with 14.6 percent (Table 7). Over time, however, the share of these traditional mainstays has declined. In 2002, their share was 46.8 percent, down from almost 55 percent in 1995. Vegetables, fruits, spices, and other commodities are now more important within the agricultural sector than the traditional mainstays. Vegetables are the largest agricultural commodity group, contributing 22.9 percent of agricultural GDP in 2007. In 2005, the share of non-traditional crops in Uva and Sabaragamuwa amounted to 71 and 53 percent, respectively. The distribution of types of crops grown in different provinces varies significantly, mainly reflecting differences in agro-ecological characteristics (Box 2).

Table 7: Composition of Agricultural GDP, 2002-2008

	2002	2003	2004	2005	2006	2007	2008
Plantation Crops	31.3%	31.1%	31.7%	30.5%	30.1%	30.2%	27.4%
Tea	12.9%	12.3%	12.5%	12.1%	11.4%	11.0%	10.5%
Rubber	2.0%	2.0%	2.0%	2.1%	2.1%	2.2%	1.8%
Coconut	12.5%	12.7%	13.1%	11.9%	12.3%	12.6%	11.3%
Minor export crops	4.0%	4.1%	4.0%	4.4%	4.3%	4.4%	3.7%
Paddy	15.5%	16.2%	13.9%	16.0%	15.9%	14.6%	18.5%
Livestock	7.7%	7.6%	7.6%	7.3%	7.6%	8.1%	7.3%
Other food crops	34.9%	34.2%	35.4%	34.9%	34.7%	35.4%	36.0%
Highland crops	12.2%	11.5%	11.2%	11.3%	11.5%	11.8%	12.9%
Vegetables	21.9%	22.0%	23.4%	22.8%	22.5%	22.9%	22.4%
Fruits	0.7%	0.8%	0.8%	0.8%	0.7%	0.8%	0.7%
Other crops	10.6%	10.9%	11.4%	11.3%	11.6%	11.8%	10.8%

Source: Department of Census and Statistics, Sri Lanka
Notes. Percent of real agricultural GDP (2002 prices), excluding fisheries.

Box 2: Agro-Ecological Zones in Sri Lanka

The agro-ecological zones extending across Sri Lanka's 66,000 square kilometers are diverse. Elevations rise from sea level throughout the coastal lowlands to more than 1,500 meters in the central highlands. The climate is tropical, with little seasonal variation in temperature. Rainfall patterns are dictated by the southwest monsoon which blows from May to September, and the northeast monsoon which rings rains from November to February. The intensity of rainfall is influenced by the central highlands which lie in the path of the rain-bearing winds.

The island is divided into two broad agro-climatic zones: the wet zone and the dry zone. The wet zone covers the southwest quadrant of the island, including the central highlands. Rainfall is well distributed throughout the year, ranging from 2,000 to 5,000 millimeters per annum. Though accounting for only 25 percent of the land area, the wet zone supports about 60 percent of the island's 20 million strong population All of Sri Lanka's export crops, which are primarily perennial, are found in this zone.

The dry zone is characterized by low and highly seasonal rainfall which is heavily concentrated during the northeast monsoon. The zone thus experiences a long dry period from about February to August when agriculture is impossible without irrigation. In ancient times, the dry zone was the base of a hydraulic civilization and much of the current development in this zone has been associated with renovating and rehabilitating the ancient tank systems and resettling or colonizing the zone. The zone remains sparsely populated, except for these settlements in rehabilitated areas. Even so, rice and other annual crops produced in this zone help the island to meet its food requirements.

Twenty-five percent of the land in Sri Lanka is used for agriculture. Rice, coconut, tea, and rubber are the major crops; they are grown on more than 80 percent of the agricultural land area and account for about 60 percent of the value added from agriculture. It is common to distinguish between food crops and export crops (also referred to as non-plantation and plantation crops). Non-plantation crops include, besides rice, other cereal grains such as maize, finger millet, and sorghum; pulses such as green gram and black gram; condiments such as chilies and onions; tubers such as manioc (cassava), potato, and sweet potato; oilseeds such as gingelly (sesame) and soybean; and fruits and vegetables. Apart from tea, rubber, and coconut, plantation crops include coffee, cocoa, cinnamon, and other spices such as pepper, cardamom and nutmeg.

19. **The incidence of poverty in rural areas is nearly double that of urban areas**. According to the 2006/07 HIES[18], the poverty headcount index (HCI)[19] for Sri Lanka as a whole is 15.2 percent (nearly 2.8 million people), with the urban poor accounting for 7 percent of the poor, the rural poor for 82 percent, and the estate poor for 11 percent. The HCI also indicates that the regions with the highest poverty in Sri Lanka are Uva and Sabaragamuwa,[20] both of which are predominantly rural. According to the HIES 2001/02, in Uva and Sabaragamuwa 81 and 87 percent of the population, respectively, live in rural areas, as do and 81 and 90 percent of the poor.

20. **Poverty among households dependent on agriculture is particularly high**. Agriculture is an important source of income in rural Sri Lanka. According to the HIES 2001/02, agricultural households (that is, those deriving their income from crop production, livestock raising or agricultural wage labor) comprise over 60 percent of rural households in all provinces with the exception of the Western province (Table 8). In Uva, nearly 90 percent of rural households derive some income from agriculture, and more than 60 percent of rural households cultivate crops. In rural Sabaragamuwa, agriculture is somewhat less important, with about 60 percent of households deriving some income from agriculture and around 41 percent cultivating crops. In most provinces, poverty among households that are dependent on agriculture is higher than among households not dependent on agriculture. The difference is largest in Uva, where poverty among those depending on agriculture is 34 percent as opposed to 17 percent for non-agricultural households. The differences are also significant in the Western and Central provinces but are more moderate in the remaining provinces.

Table 8: Rural Household Distribution and Poverty Rates by Sector and Province, 2002

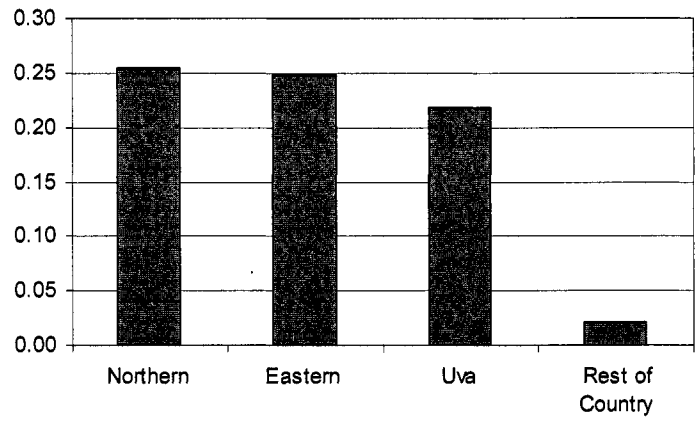
Region	Poverty Rates (%) by Sector			Sources of Income Among Rural Households (%)	
	Agriculture	Non-agriculture	All	Agriculture	Non-agriculture
Central	24.5	17.2	20.8	65.3	34.7
North-Central	19.0	17.6	18.1	80.3	19.7
Northwestern	22.0	23.9	22.3	64.6	35.4
Sabaragamuwa	30.5	28.4	28.9	62.0	38.0
Southern	24.3	24.6	23.6	69.0	31.0
Uva	34.3	16.9	31.8	89.6	10.4
Western	15.0	9.0	9.2	32.9	67.1
All Rural	24.1	16.4	20.8	58.0	42.0

Note: In agriculture-dependent households, the primary occupations include crop production, livestock raising and agricultural wage labor.
Source: Staff Calculations from HIES (2001/02).

[18] It should be noted that the unit record data from the HIES of 2006/07 have not been released as yet, and only broad trends are known. The detailed information presented here is based on the HIES of 2001/02.
[19] The basic measure of poverty is the size of the population that falls beneath the Poverty Line; the poverty head count index (HCI or PO) reports this as a percentage of the population.
[20] Reliable data for the North does not exist. The new HIES includes some data for the East, but the entire province was not surveyed due to on-going armed confrontations at the time of the survey.

21. **Agricultural production techniques in the poorest regions are undeveloped.** In particular, Uva, the Eastern province and the Northern province are heavily dependent on draft animals compared to the rest of the country (figure 4). This is evidence of a much lower prevalence of mechanization in agricultural production in these regions.

Figure 4: Number of Draft Animals Per Agricultural Household



Source: Agricultural Census 2002

22. **The types of crops cultivated seem to be related to the incidence of poverty.** Table 9 shows the poverty incidence by crop cultivation in rural areas of Uva, Sabaragamuwa and the Western province. Poverty rates among crop farmers (except tea and rubber producers) in Uva and Sabaragamuwa are much higher than among farmers in the Western province. In rural Uva, tea and rubber producers are better off than other crop producers, while in Sabaragamuwa, farmers who plant tea, rubber, coconut, and rice are better off than those who plant vegetables.

Table 9: Poverty Rates, by Cultivation of Major Crops in Uva, Sabaragamuwa and Western Provinces

Provinces	Tea/Rubber	Coconut	Paddy	Vegetables/Fruit*	All
Uva	16.5	38.9	40.1	36.0	41.1
Sabaragamuwa	27.0	25.0	26.2	36.6	30.1
Western	23.1	6.8	15.5	8.4**	12.0

Source: Staff estimates based on HIES 2002.
* Does not include onion and chili.
** Due to the small sample (only 22 households), this number should be treated with caution.

23. **Larger plot sizes are associated with higher incomes from agriculture.** The average plot size is small in Uva and Sabaragamuwa, with 63 percent of households cultivating plots of one acre or less. Small plot sizes may have an impact on agricultural productivity and the income generation potential of small farmers in Uva and Sabaragamuwa, for as the size of farm plots increases, so does agricultural income. In Uva and Sabaragamuwa, farmers who cultivate larger plots of land (more than two acres) earn nearly three times as much income, or more, as farmers with smaller plots (Table 10), which suggests that cultivating a larger plot ensures a higher income.

Table 10: Real Per Capita Agricultural Income, by Size of Cultivated Land

(in SL Rupees at 2002 Prices)

Provinces	Less than 2 acres	More than 2 acres	All
Uva	311	876	362
Sabaragamuwa	280	1003	327
Others	258	1014	375

Source: World Bank Staff Estimates based on HIES 2002.

Note: All per capita income is controlled for spatial price differences. The table shows median values for each group. Agricultural income does not include income from agricultural labor. Only rural areas are included in this analysis.

24. **Larger plot sizes appear to be associated with lower levels of poverty in Sabaragamuwa and, to a lesser extent, in Uva** (Table 11). While larger plot sizes increase agricultural income, they also reduce the probability that household members will seek off-farm employment opportunities, thereby keeping them from working in other sectors. This may partly explain why poverty has not declined commensurably with increased plot sizes in Uva.

Table 11: Poverty Rates (%), by Size of Cultivated Land

	Less than 2 acres	More than 2 acres	All
Uva	42	38	41
Sabaragamuwa	32	16	30
Others	25	14	22

Source: World Bank Staff Estimates based on HIES 2002.

3. GOVERNMENT POLICIES AND PROGRAMS

After having reviewed the link between agriculture, stagnant growth and high poverty, this chapter provides an overview and brief discussion of agricultural policies and programs.

3.1. Agricultural Policies

25. **The Government rightly emphasizes the role of agriculture in accelerating rural growth.** The Government's overall strategy for agriculture, as laid out in the Ten-Year Development Plan, aims at achieving food security and raising the incomes of small farmers. The key components of the strategy are to increase competitiveness through modern technology, shift to commercial agriculture, and promote diversification into higher value products (fruits, vegetables, livestock, and fisheries). The strategy also emphasizes diversification to higher value products for the domestic and export markets. The generally labor intensive nature of production will aid employment generation in rural areas. The Plan contains several programs and initiatives aimed at supporting rural development: (i) the flagship *Gama Neguma* (village 'up-liftment') program aimed at making the village the center of national development; (ii) agricultural sector programs aimed at raising farmers' incomes; (iii) greater private sector involvement in agricultural research and dissemination of research results; and (iv) incentives for agribusinesses to function as a market for agricultural output.

26. **Market and income facilitation policies advocated by the Ten-Year Plan** also seek to convert subsistence farming to more productive agriculture (emphasizing linkages to agribusiness, productivity enhancement, technology dissemination, and agricultural research enhancement, especially through private sector involvement), promote livestock raising (with a special focus on dairy farming and linkages with the private sector) and change Sri Lanka's current status as a net importer of agricultural products to become a net exporter.

27. **The Plan envisages a strong role for the public sector and also for the private sector where the latter can potentially be more efficient**. Examples for of areas where the private sector can play a role include: (i) production of certified seeds, where the role of the public sector could be limited to creating an appropriate certification system and reforming the seeds policy that currently serves as a barrier to the entry of improved varieties; (ii) achieving optimal land use by crops through market forces, rather than having the Government set targets for areas to be planted with specific crops by the year 2016; and (iii) reducing the dominant role of the public sector in determining land use. Given the reintroduction of significant public sector interventions in the paddy sector and the role envisaged for the Sri Lanka Agricultural Products Marketing Authority, careful attention should be paid to ensuring that these do not result in significant price and market distortions and fiscal costs.

28. **To induce sustainable increases in productivity and incomes, the Plan suggests measures to improve farmers' links to markets**. Such supply-focused policies are critical and could include the creation of effective farmers' organizations that can generate the required scale to reduce transaction costs and facilitate access to markets and interaction with private players. The strategy also emphasizes irrigation as a key contributor to agricultural growth and focuses on supporting modern irrigation techniques and improving water resource management. Special emphasis is placed on joint public sector and farmer management of major irrigation schemes and funding of operations and maintenance, but it would also be important to strengthen integration with the National Water Policy that is intended to provide the framework for sustainable water resource management.

29. **Farmers' access to productivity-enhancing technologies has been constrained by restrictive seed policies and the weakening of agricultural research systems and extension services.** Crop yields in Sri Lanka have considerable room for improvement and excessive seed regulation may be serving as more of a barrier to keep improved seeds from entering the country than as an environmental filter. Costly permits and inspection procedures are required under many regulations that are outdated and inadequate for keeping up with the rapid advances in research and technology worldwide. Moreover, the issuing of revised seed regulations has been delayed, increasing the uncertainty about the requirements for planting and marketing imported materials.

30. **Agriculture research is performed by a large number of Government institutes**[21] that have been relatively successful in raising rice productivity, but less so in raising the productivity of other crops. According to past reviews (Charles, 2002), the public agricultural research system was almost exclusively focused on rice, made little use of socioeconomic or financial analysis and was highly fragmented. Although the Government established a number of priority setting, planning and competitive funding schemes, the complicated procedures for accessing the grants deterred potential applicants. Moreover, private sector investments in agricultural research in Sri Lanka have been hampered by the absence of intellectual property rights protection, restrictive seed import regulations, and subsidized sale of planting materials. Improving the effectiveness of the agricultural research system in the future, as articulated in Sri Lanka's National Agricultural Research Policy (2003), will require fostering a pluralistic national agricultural research system that includes the Government, the private sector, NGOs, and other agencies. Existing public agricultural research institutions need to become more demand-oriented and improve the quality of their products and services.

31. **Agricultural extension services have been severely weakened since they were devolved to Provincial Councils in the early 1990s.** Most field-level extension workers were reassigned as village facilitators, which effectively eliminated their role as disseminators of agricultural information (Tabor et al., 2000). Analysis of SLIS data (1999/2000) found that only about 13 percent of agricultural households report receiving technical assistance from a Government extension agent (15 percent received assistance from all sources). In 1999, the Department of Agriculture (DOA) began piloting 'fee-based' extension services as part of the Second Perennial Crops project focused on export crops. By design, however, this approach concentrates only on larger commercial farmers and enterprises. Its applicability to smallholders may be more limited, as many farmers expressed reluctance to pay for extension services.

32. **The effectiveness of the agricultural extension system could be improved** by: (i) expanding the supply of extension services through Government sub-contracting to private firms, NGOs and producer organizations; (ii) strengthening client orientation through the adoption of participatory approaches in planning and implementation; (iii) linking providers to multiple sources of innovation (research and others); and (iv) expanding the use of new information and communication technologies to deliver a wider array of information to farmers[22]. Other recommendations include bringing together research, extension and market development under a central body, the National Innovation Council, which would develop an understanding of the issues and opportunities and act as a platform for innovation. A body such as this could help develop a limited number of action-oriented innovation programs focusing on achieving concrete economic gains, for example, reducing post-harvest losses in fruit and vegetables. Finally, it is also necessary to strengthen local-level research and extension services to be able to provide responses finely tuned to local-level needs.

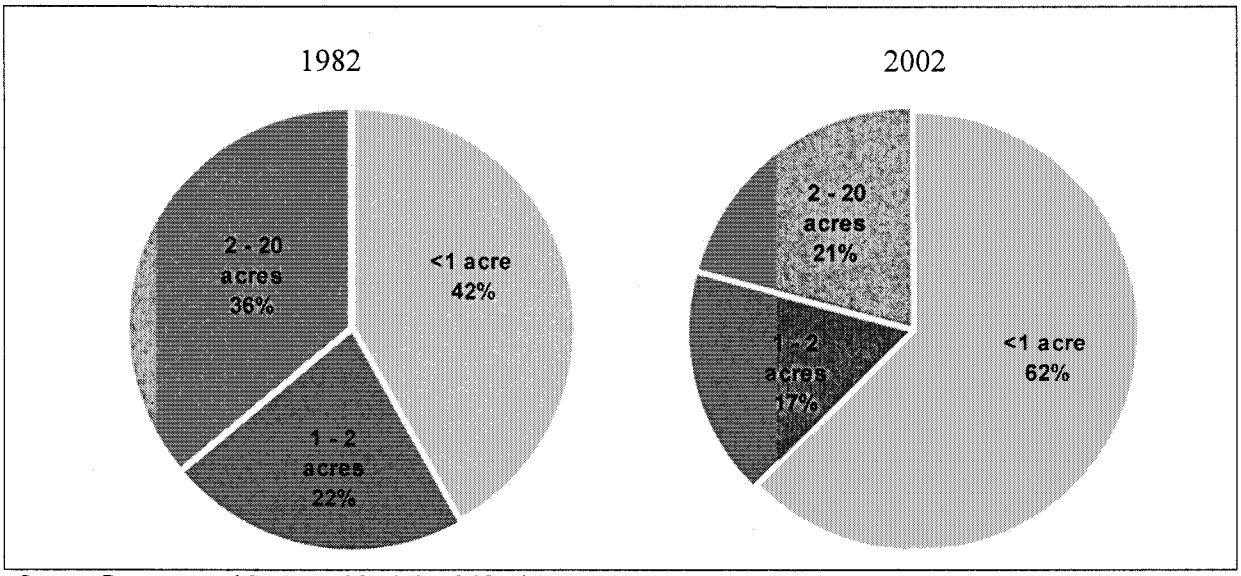
[21] These include the Department of Agriculture, plantation research institutes (tea, coconut, rubber), and several national institutes reporting to the Council for Agricultural Research Policy and universities.

[22] For a more detailed discussion of Sri Lanka's research and extension system see World Bank (2007c)

3.2. Land Tenure Policy

33. **Another constraint to raising agricultural incomes is the increasing number of farmers with small landholdings.** Analysis of land tenure structures in the 1982 and 2002 Agriculture Census highlights the significant jump in the number of farmers with landholdings of less than one acre (0.4 hectares). By 2002, 62 percent of owned agricultural holdings were less than one acre, while another 17 percent covered less than two acres (0.8 hectares) (Figure 5). Such small farm sizes limit income, especially if farmers are confined to growing only low-value crops (such as paddy), because they prevent farmers from exploiting economies of scale through processes such as increased mechanization, etc.

Figure 5: Distribution of Plot Sizes



Source: Department of Census and Statistics, Sri Lanka

34. **A critical feature of Sri Lanka's land tenure system is Government ownership of a large portion of the land.** Agricultural land in Sri Lanka totals about 2.79 million ha (1.72 million ha or 62 percent owned by the State and 1.07 million ha privately owned) (1996 data). Land may be transferred to farmers through various settlement programs.

35. **Existing land legislation limits the efficient functioning of land markets.** The Land Development Ordinance (LDO) of 1935, the most important piece of land legislation implemented, is now in the process of being amended to resolve some of the land tenure issues surrounding it[23]. The process is also addressing the inefficiencies that may arise from the procedures laid out in the LDO. The approval of LDO amendments would be critical for enhancing agriculture productivity. Other key land legislations include the Sale of State Lands (Special Provision) Law of 1973, Land Development (Amendment Act) of 1981, Agrarian Services Act of 1979, Land Reform Law of 1972 and 1975, Land Reform (Special Provisions) Act of 1981, and Agrarian Services Development Act No. 46 of 2000.

[23] Among the changes being considered are (i) eliminate the interim step of land-holders to receive a permit before being eligible for a land Grant (ii) remove the "male preference" to attain gender equity under succession of LDO permits; (iii) eliminate the protection that land held under LDO Grants cannot be seized in enforcement of a mortgage; the aim of this would be to increase land market flexibility; (iv) allowing unrestricted leasing and mortgaging of land held under Grants. Source: "*Land Rights*" Ranjit Wanigaratne (2008), Sanvada publication #4.

36. **While these laws succeeded in promoting greater equity in land ownership, their restrictive nature has hurt farmers in several ways.** Land obtained through an LDO carries restrictions on mortgaging that preclude its use as collateral to access credit which households could use to finance income-enhancing farm and non-farm investments. Lifting these restrictions would reduce transactions costs, increase access to credit sources. It would also reduce dependency on money-lenders, as—despite the LDO regulations—LDO land has been widely mortgaged and or leased out by the most vulnerable households through informal (and illegal) transactions, and mostly to money-lenders for consumption and emergency needs[24]. For those wanting to remain in agriculture, the small size of landholdings, the lack of secure property rights, and the legal restrictions on buying or leasing LDO land reduce the incentive to make productivity-enhancing investments. Those interested in shifting out of agriculture into non-farm activities or merely moving to another location would have to leave their land without receiving compensation for it. In addition to fostering a large cadre of part-time farmers, these legislative provisions limit the capacity of the land market to allocate land to its best use (World Bank, 2003).

3.3. Agricultural Tariffs

37. **Agricultural tariffs in Sri Lanka are high and subject to frequent changes.** The Government intermittently lowers the tariffs on major agricultural imports through duty waivers and also controls import volumes through licensing during months when domestic prices rise. These frequent changes create uncertainty, heightening price risks for farmers, consumers and local entrepreneurs, and dampen incentives for private sector investment in storage facilities. The high tariffs on agricultural commodities have also raised the cost of these products for consumers, with associated impacts on consumer expenditures and poverty levels (World Bank, 2006).

38. **Lowering tariff protection for various agricultural commodities over the medium-term would reduce the bias in favor of particular crops** (for example--rice, potatoes, chilies, and onions), thereby improving domestic resource allocation. It would also reduce the taxes on consumers who pay above-world-market prices. The phased reduction in tariff protection would need to be accompanied with parallel policy changes, especially measures to lift the constraints on domestic commodity and factor (land, seeds, technology, and water) markets and to improve rural infrastructure. These complementary actions will help ensure that farmers have the freedom and the capacity to alter their resource-use decisions to meet the changing needs of the market.

39. **Strong commitment by the Government to removing policy and regulatory restrictions is necessary so that those who choose to remain in agriculture can raise their productivity and incomes.** In the short- to medium-term, policies are needed to give farmers access to improved technologies, create a more transparent and stable trade policy regime, and allow full and transferable ownership rights to land. Adopting policies to speed up lagging private sector participation and investments would also be critical to promoting growth in both the farm and non-farm sectors. These policies include developing rural infrastructure and services with increased emphasis on operation and maintenance of physical assets to ensure their long-term performance.

3.4. Other Policy Issues

40. **Fertilizer subsidies have increased in recent years.** Fertilizer subsidies have greatly increased in step with higher international fertilizer prices; the total fertilizer subsidy will exceed SLRs 20 billion in 2008, against SLRs 11 billion in 2007. This increase in world market prices of fertilizer, coupled with the price increases for food, are all issues that have arisen after the field research and analysis took place. These trends have potentially large implications for policy and would likely require both short-term

[24] "*Land Reforms in Sri Lanka: A Poverty and Social Impact Analysis (PSIA)*", World Bank 2008.

actions to ameliorate their impact on the poorer sections of society and strategies to encourage a supply response. These are issues that would justify a separate study and they have, therefore, not been tackled in detail in this work. However, in the final section of this report, a set of recommendations is provided for facilitating a flexible, demand led approach to stimulate a medium-term supply response through investment in productive infrastructure, market linkages, and technology development and dissemination.

41. **The Sri Lankan Government has at least ten on-going schemes to incentivize agro-industry[25]. These mainly provide tax incentives**. Seven of the schemes are primarily targeted at export crops while the rest focus on technology (processing, greenhouses and refrigeration). Recently, the Sri Lankan Government expanded its range of interventions to support agribusiness and farmer investments through a series of schemes run through the Central bank. Under the Agro Livestock Development Loan Scheme, concessionary rates of interest are provided for dairy farmers at 12 percent for loans of between US$500 and US$4,000. Financing is also provided at 14 percent interest for loans of over five years for investments in milk processing, for projects of up to about US$3 million, provided the agribusiness commits to purchasing milk from 2,000 to 10,000 dairy farmers under forward contracts. Similar schemes are available for other agro industries and for companies willing to operate forward contracts with farmers for other agricultural products such as maize. There are a large number of product-specific policies and incentives schemes. As noted, this report focuses on three specific products (maize, milk and vegetables) that have high potential for farm income growth. As background information, Annex 2 provides a stylized overview of key Government policies, implementing agencies, incentives, credit schemes and conditions, and credit providers for the maize, milk and vegetable sub-sectors.

3.5. Funding for Agriculture in the *Mahinda Chintana*

42. The *Mahinda Chintana* envisages that going forward Government funding for the agricultural sector will increase significantly (figure 6). About half of the required financing is assumed to come from a 65 percent increase in money provided by donors, expansion in investments by NGOs and through public private partnerships (PPPs), and direct investment from the private sector (figure 7)

Figure 6: Agricultural Investment. Requirements

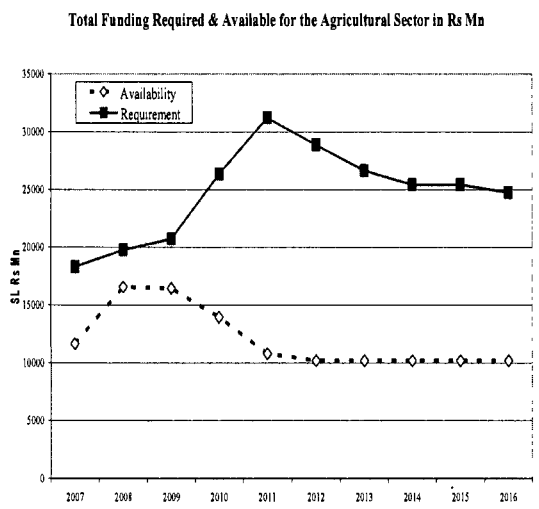
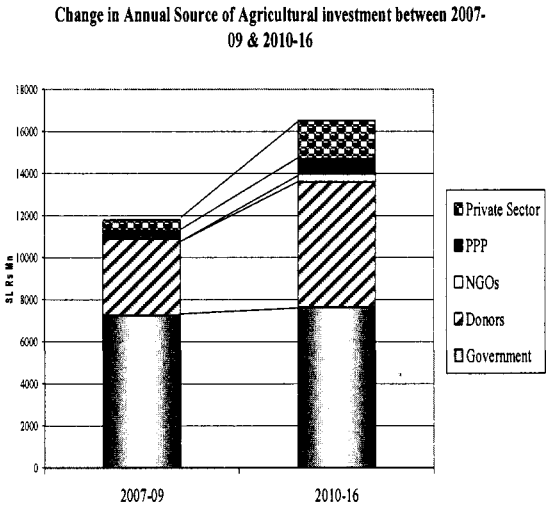


Figure 7: Expected Sources of Future Funding



Source: Government of Sri Lanka's Ten-year Development Framework

[25] See the chapter on Agro Diversification in Sri Lanka, by Jeevika Weerahewa, Agricultural Diversification & smallholders in South Asia, PJ Joshi, Ashok Gulati et al, 2007

43. **The Government's Ten-year Plan anticipates that the fund allocation for market facilitation will increase at the fastest rate to become the third most important budget line, after fertilizer subsidies and rural credit.** The *Mahinda Chintana* suggests that the investment allocation for agriculture (including livestock) is largely related to the size of the agricultural sectors in the different states, and that the poorer states with weaker agricultural sectors therefore received a lower proportion of funding. The Plan acknowledges that the high poverty rates, coupled with the development of new farming activities, will trigger higher funding allocations. Our own analysis of GoSL investments against agricultural GDP by province suggest that the story is more complex, with the level of GoSL agricultural investment in Sabaragamuwa being below par, but proportionately higher in the Eastern and Northern provinces. In essence, the *Mahinda Chintana's* long-term position on agricultural policy is that there is a need for greater donor and private sector contributions to agriculture in the future, and that these investments will need to be poverty focused and take a pro-market approach.

44. **One of the difficulties of implementing an agricultural strategy in Sri Lanka is that there are a large number of ministries and agencies involved.** There are nine ministries that deal with agriculture and rural development. Eight provincial councils run agricultural extension services. Additionally, the Central Bank has increasingly been taking on a role in the agricultural sector, providing interest subsidies for farmers and agribusinesses in a scheme operated through 12 financial institutions.

45. **The *Mahinda Chintana* emphasizes the need for enhanced agricultural research, productivity enhancement and technology dissemination (particularly with private sector participation).** The Plan encourages the development of community-based organizations (CBOs), market facilitation and investment in market infrastructure, and private sector participation in livestock and marketing particularly. It is particularly noteworthy that the Plan emphasizes an overall approach of relying on bottom up demand from communities to shape Government policies.

4. MARKET TRENDS AND SUPPLY CONSTRAINTS

46. The previous chapters explored the interplay between poverty and agriculture and reviewed the Government's agriculture policies. This chapter summarizes the key market trends for agricultural products and the main constraints to agricultural income growth, as expressed by stakeholders in the agriculture sector. Specifically, this chapter summarizes the findings from extensive in-country stakeholder consultations, complemented with the findings of the 2005 Rural Investment Climate Assessment (Rural ICA), with a view to identifying some of the general constraints to raising farmers' incomes. Interviews and focus-group discussions were held with farmer groups, farmer representatives, the private sector (including local chambers of commerce), local government officials, and managers of projects that target the rural sector in the poorest regions. The interviews and focus group discussions were used to gather informed local opinions on the key constraints restricting farmer incomes, interventions that could help alleviate rural poverty, and the enterprises which would offer the best scope for enhancing rural livelihoods. The Rural ICA contains provincial data and provides useful insights into the constraints faced by urban and rural firms in doing business in Sri Lanka.

4.1. Market Trends

47. **A theme emerging across South Asia is that agricultural production is moving beyond just supplying basic food needs.** Food production in South Asia today has to match the demands of consumers, especially the increasing number of urban consumers with their higher incomes and changing dietary habits. Common trends across the sub-continent include a static, or even declining, consumption of cereals. Significant increases are generally occurring in the consumption of animal proteins (milk, eggs, chicken, fish, etc), fruits, vegetables, condiments, vegetable oils, and sugar. Processed foods are becoming more prevalent, resulting in agribusinesses becoming bigger buyers of raw materials from farmers. Sales through formal retail stores and fast food outlets are all projected to increase rapidly.

48. **Sri Lanka is no different; analysis of food consumption and expenditure on food in Sri Lankan households shows a clear pattern of movement away from basic cereals to animal proteins, fruit and processed products.** The consumption of and expenditure on rice by households has been declining for some time[26] (table 12). Expenditure on other, mainly imported, cereals has increased and although consumption of pulses too has increased, household expenditure on pulses has fallen, reflecting the lower prices of the imported pulses that account for the bulk of supply. Vegetable consumption is broadly static, but growing in the poor sections of the population[27]. Consumption of roots and tubers has increased, mainly as a result of expansion in potato imports. There has been growth in fruit consumption, both of local products (bananas, papayas and mangoes) and imported products like apples. In the animal protein sector there has been a marked shift away from fresh milk to the use of milk powder and the consumption of processed milk products. Consumption of fish, meat and chicken is much higher in the urban areas, although rural consumption has grown faster. Albeit from a low initial base, the fastest growing food sector is prepared and packaged foods and confectionary. The growing demand for food products with high-income elasticity has been met largely by increased imports of milk powder, pulses, potatoes, onions, maize, etc. National production of these higher value foods has often either stagnated or declined. In parallel, supermarket retail chains have also developed, mainly to serve the urban consumers, especially in Colombo.

[26] The latest statistics suggest that rice consumption has increased at the expense of wheat consumption.

[27] More detailed analysis shows that consumer preferences have shifted toward upland, temperate vegetables and away from tropical, lowland vegetables.

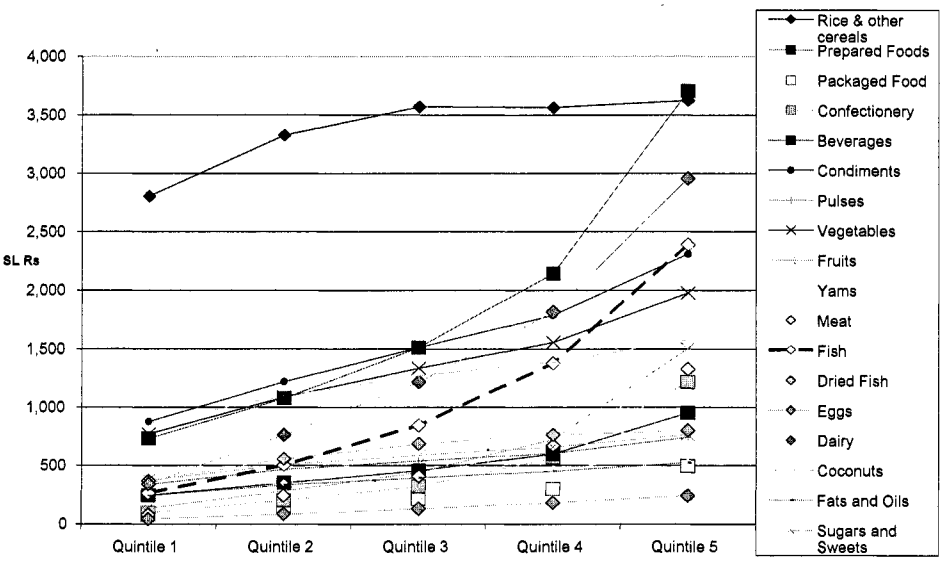
Table 12: Composition of Household Food Expenditure

Commodity	Percentage Change 1980-2002	2002	1990/91	1980/81
Rice	-39%	19.3%	22.4%	31.5%
Wheat products	-23%	5.5%	5.6%	7.1%
Pulses	213%	7.5%	4.4%	2.4%
Vegetables & Fruits	48%	12.9%	10.2%	8.7%
Meat & Fish	69%	16.7%	12.2%	9.9%
Milk & Milk products	139%	7.9%	4.7%	3.3%
Eggs	0%	0.8%	1.1%	0.8%
Sugar	-58%	3.3%	6.2%	7.8%
Others	63%	20.1%	15.4 %	12.3 %

Source: Department of Census & Statistics, Household Income & Expenditure Surveys.

49. **The differences in dietary patterns are also apparent across the population.** Data from HIES show that cereal consumption levels have declined with increased incomes, while expenditure on prepared foods, packaged foods, sweets, and products like dairy produce, fruits, fresh fish, and meat has increased (figure 8) With increased economic growth and development these trends are expected to continue. It is also expected that the three areas with faster than average increase in sales will likely be: animal proteins, high value crops, and the supply of raw materials to agro processors and the catering sector.

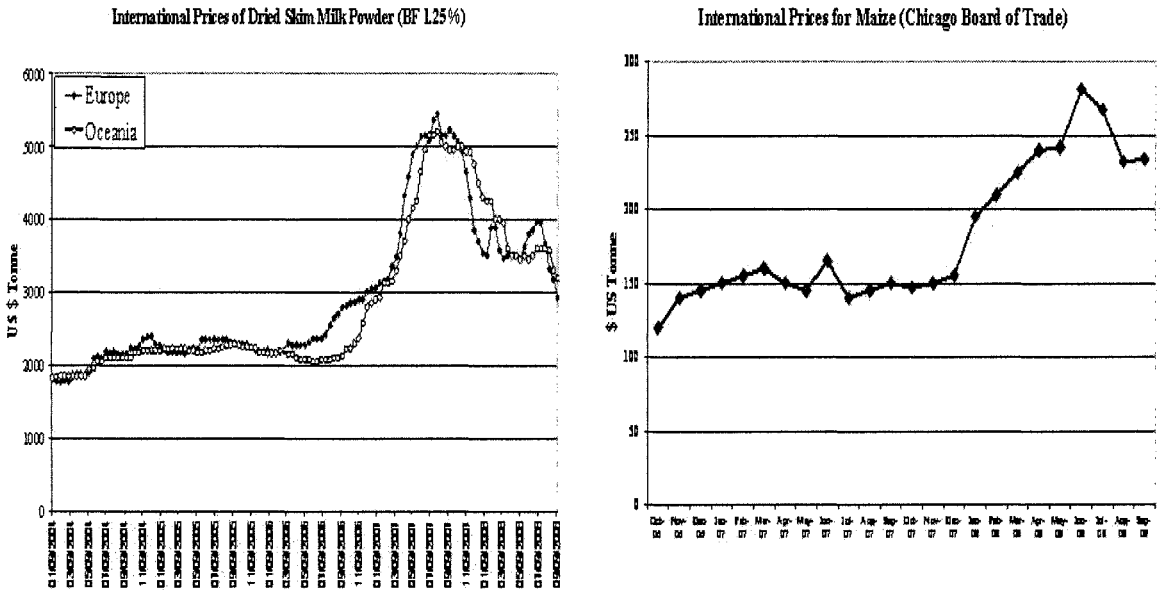
Figure 8: Food Expenditure by Income Quintile and Product Group



Source: Calculated from the Consumption Summary of HIES 2001/02

50. **International prices of food commodities have been going through a period on unprecedented increases, although prices are now moderating again**. International maize prices rose from around a US$ 100 per ton in 2005 to some US$ 240 per ton (FOB) in 2008 (figure 9). Similarly, farmer prices in Sri Lanka more than doubled from around SLRs 16 per kg in 2006 to around SLRs 32 in mid-2008. The FOB of dried milk powder rose from about US$ 2,000 per ton in 2006, peaking at over US$ 5,000 per ton in late-2007/early-2008; prices have since fallen again to around US$ 3,000 per ton. Farmer prices in Sri Lanka followed a similar pattern, rising from SLRs 23 per liter of milk in early 2007 to reach SLRs 32 per liter in mid-2008. These price rises have acted as an incentive to increase the interest of the private sector in sourcing raw materials locally. For the producers of the commodities, the price increases possibly create one-off opportunities for profitable diversification.

Figure 9: International Prices for Maize & Milk Powder



Sources: Milk Powder Wisconsin Center for Dairy Research, http://future.aae.wisc.edu/data/weekly_values/by_area/1707?tab=prices, Maize GIEWS http://www.fao.org/giews/english/ewi/cerealprice/2.htm,

4.2. Supply Constraints: Messages from Stakeholder Consultations

51. **Stakeholder consultations pointed to weaknesses in infrastructure as a key supply constraint**. During the preparation of this report, farmer representatives from Uva, Sabaragamuwa, the North, and the East regions were called together for a number of workshops. Typically, groups of farmers from specific areas were asked to give short verbal presentations, through their selected spokespersons, on their perceptions of key constraints, opportunities, and interventions most likely to lift agricultural incomes. A key constraint identified by the farmers was weak infrastructure—for example, wholesale markets, irrigation infrastructure, storage facilities, poor extension and research support, and difficulties in accessing markets, inputs and sufficient labor. At the same time, farmers saw opportunities around enterprises such as milk, maize, vegetables, fruits, and attracting agribusinesses to their areas. The farmers also said that there was a large potential for farmer organizations to facilitate market

opportunities but that they were frustrated by the regulatory systems in place (for example, some participants claimed that the approval of two government officials is often needed for a farmer organization to access its own bank account). Nonetheless, the farmers believed that their organizations have an active role to play in aggregating products, interfacing with agribusinesses, and organizing input delivery.

52. **Stakeholders believed that a mechanism was lacking to make investments in rural areas that would complement the planned private sector investments in processing plants and other value-adding facilities.**[28] Apart from weak investment-promoting mechanisms, there is also an absence of incentives for agribusinesses to operate in the regions of greatest poverty and those most affected by the conflict. Nonetheless, it is encouraging to note that the private sector is showing considerable dynamism and a willingness to develop new production systems and market opportunities in, for example, tropical fruit production, fish farming, maize production, etc. Agribusinesses are willing to invest in their own enterprises (that is, processing plants and retail chains), but are reluctant to invest in other activities such as creating rural infrastructure and forming farmers' groups.

53. **The findings of the stakeholder consultations are broadly in line with those indicated by the rural ICA**, that is, the top five constraints to doing business for firms located in rural areas in the four poorest provinces include transportation (quality and access to roads), high credit costs, poor credit access, low market demand, and unreliable electric power supply. However, the biggest barriers identified by farmers were weak demand, poor market access, and their inability to diversify into more profitable production systems. A common problem identified by stakeholders in all four provinces was the lack of adequate marketing infrastructure. Most farmers are disconnected from the markets, unaware of the changing market opportunities, and largely ignored by agribusinesses as sources of raw material. The analysis shows that farmers in the poorer areas receive inadequate support from agricultural extension services. Farmers themselves cited poor extension support, inappropriate technical advice, labor shortages, infrastructural problems, and lack of investment by agribusiness as major constraints.

54. **The ongoing civil conflict in Sri Lanka has no doubt exacerbated production problems, particularly in the North and East**. These regions have good economic potential, as evidenced by the growth in the agricultural sector (around 32 percent in the Northern region and 19 percent in the Eastern region) that occurred during the ceasefire (2002-2004). .To improve farm incomes in Uva and Sabaragamuwa, a more proactive approach will be needed to provide technical and marketing support, develop production, set up post-harvest and market linkages to increase the range of profitable enterprises, and encourage investment in and purchasing of raw materials by local agribusinesses.

[28] An agribusiness, when making an investment in milk processing for example, is wary of investing in rural infrastructure such as chiller plants, farm group formation, technical support, etc. Independent financed investments have the advantage of enabling farmers' groups to have the flexibility to switch to other buyers. These investments are often beyond the key competences and financial resources of the agribusinesses.

5. VALUE CHAIN ANALYSIS OF MAIZE, MILK, AND VEGETABLES

55. **This chapter provides an analysis of specific 'actionable' constraints to value-addition in three selected agricultural products, namely maize, milk and vegetables.** International experience suggests that most successful interventions aimed at raising agricultural incomes typically focus on improving production efficiency in areas where there is already some local production; launching a new product line is much more risky and likely to fail. This study, therefore, concentrates on agricultural commodities already being produced in the poorest areas of Sri Lanka and on identifying some that have the greatest potential for improving the income of poor farmers.

56. **The process of identifying a small set of such products began with a resource audit of small-scale farmers in the poorest regions; it included analyzing production, poverty and market data.** The results of the audit were combined with the outcomes of in-country consultations with numerous stakeholders as described in the previous chapter. In particular, discussions with the private sector were directed at understanding their perceptions of existing opportunities and the market. (See Annex 1 for further details on the results of the stakeholder consultations to identify agricultural products with high-income growth potential.)

57. **Taking these combined results as a basis for identifying a few products—maize, milk and vegetables were identified** (Box 3). Maize and milk were found to have a high potential for income growth. By contrast, the income potential might be lower for vegetables. However, due to the importance of vegetable cultivation in the poorer regions where appropriate interventions and better growing practices could substantially reduce rural poverty, it was nevertheless considered important and appropriate to include this crop. The case studies used in this report relied on statistical analysis to understand the market prospects, constraints, competitiveness, and potential profitability of each product. Subsequently, a value-chain approach was taken to review the combined findings of the case studies, the stakeholder consultations and the resource audit, and identify the key constraints that limit the development of maize, milk and vegetable production. Although these three products were chosen, their selection does not imply that these necessarily have the best prospects. Clearly, they are all important products for many of the agricultural producers in the poorer areas of Sri Lanka. However, what are more important are the processes used to evaluate the value chains of the individual products, assessing the scale of the prospects, and identifying the alternative entry points for interventions.

Box 3: Key Reasons for the Selection of the Three Specific Products		
Maize	Milk	Vegetables
➢ It is mainly a dry land crop and, therefore, a typically poorer farmer crop. Production is concentrated in the poorest provinces--in particular Uva and the Eastern region--which together account for the bulk (60 percent) of Sri Lanka maize production. ➢ Dry land farmers in the Eastern and Uva regions expressed an interest in commercializing their maize production ➢ New maize seeds have resulted in doubling yields which, combined with improved international prices, offer the prospect of a highly profitable rain-fed crop. ➢ Major and expanding demand, particularly as an ingredient in poultry feed, with imports worth over US$ 25 million per annum annually and increasing at some 5 percent per annum. ➢ Strong private sector interest in mobilizing internal production. ➢ World market prices have increased by 140 percent from late 2005 to late 2008 and are unlikely, in the short-term, to fall back to pervious levels. ➢ Farmer prices have increased 100 percent from 2007 to 2008.	➢ Three of the poorest regions--the North, East and Uva--account for about 40 percent of the national cattle herd. ➢ The value of milk imports stands at some US$ 120 million per annum, with an average annual growth rate of 3.7 percent per annum in recent years (1999-2004). ➢ Milk production is primarily a small farmer enterprise; 72 percent of the milking herd is found on holdings of less than one hectare and another 20 percent on holdings that are in the 1-2 hectare range. ➢ Producers were enthusiastic about being able to sell milk, especially to organized milk processors. They saw it as an enterprise that with limited physical effort would generate a regular cash income that was not directly linked to the size of the holdings. ➢ International prices of dried milk have increased by 42 percent from 2005 to mid-2008 ➢ Strong interest from the Sri Lankan private sector in increasing milk purchases. ➢ Typically increasing consumer demand for milk and milk products ➢ Farmer prices for milk have increased 40 percent from early-2007 to late-2008	➢ Lowland vegetables are typically associated with poorer producers[29] ➢ Poverty is mainly found in lower altitude areas, where only tropical vegetables are grown ➢ Although vegetable crops are normally expected to generate greater profits than other crops, the analysis shows that in the poorest regions, lowland vegetable growers were generally no better off than other producers. ➢ Under projects like *Gemi Dirya,* diversification into vegetables was a high priority amongst communities, implying that producers believed that vegetable production could result in higher incomes.

5.1. Importance of Maize, Milk and Vegetables for the Poorest Population Segments of Rural Sri Lanka

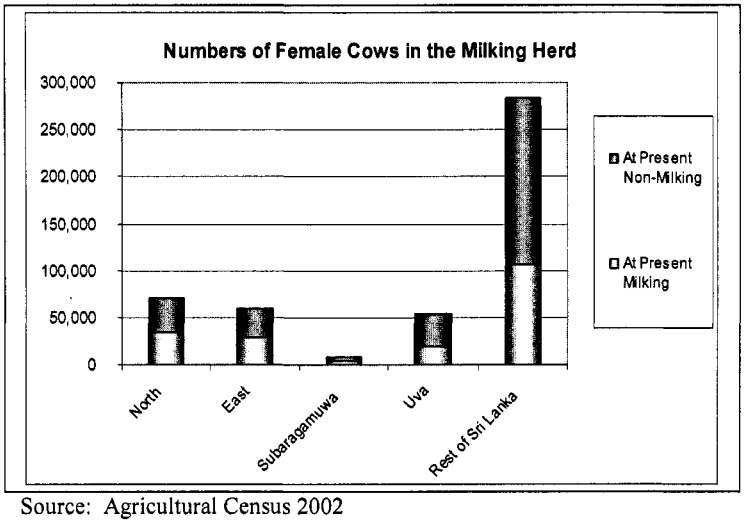
58. **Maize is primarily cropped by dry land farmers in Uva and the East region** (together these two provinces account for 60 percent of the national maize production). Farmers in these regions expressed a keen desire to commercialize their maize production. Poor producers could double their

[29] Although temperate vegetables and potatoes are grown in the higher areas of Uva, i.e. Badulla, these areas are not associated with poverty.

maize yields by using new improved seeds. This fact and the prospect of obtaining higher prices as a consequence of improved international prices, render maize a potentially highly profitable crop for poor farmers. (See Annex 3 for further details on the rationale for selecting maize and the other two products, as well as the market description and summary of findings for each product.)

59. **A key reason for choosing milk was that around 40 percent of the national cattle herd is concentrated in Uva, the North and the East** (see Figure 10).

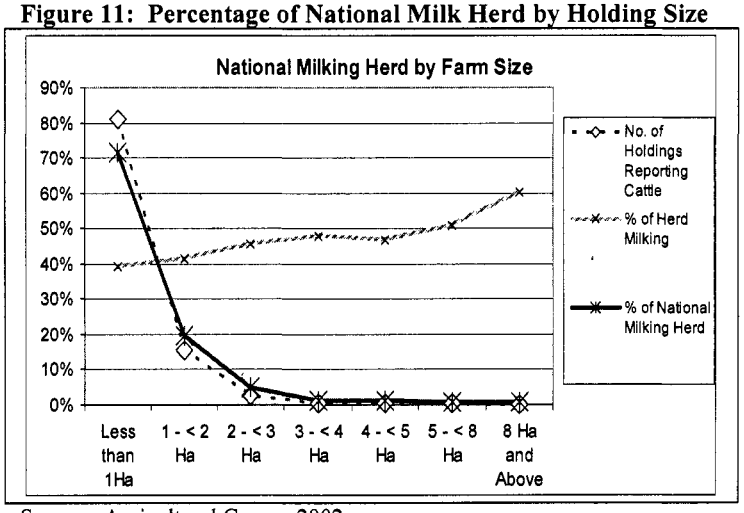
Figure 10: Geographical Distribution of National Milk Herd



Source: Agricultural Census 2002

60. **Moreover, milk production in Sri Lanka is mainly a small-farmer enterprise**, with 72 percent of all dairy cattle raised on farms less than 1 hectare in size and 20 percent on holdings of 1-2 hectares (see Figure 11). Producers considered milk production an attractive enterprise that can generate a regular cash income not directly linked to holding size. They were also enthusiastic at the prospect of selling milk to organized processors.

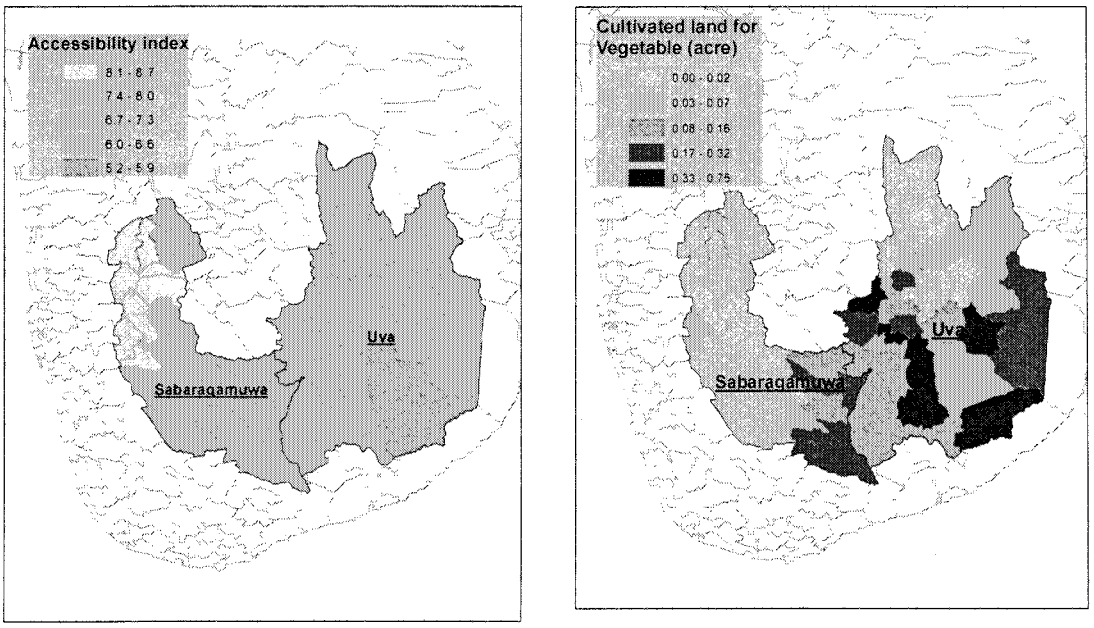
Figure 11: Percentage of National Milk Herd by Holding Size



Source: Agricultural Census 2002

61. **Vegetables (specifically lowland, tropical vegetables) were chosen because they are typically associated with poorer producers.** Although vegetable crops normally generate greater profits than other crops, in the case of Uva and Sabaragamuwa vegetable producers appear to not be much better off than average. They are, however, typically concentrated in remote areas with relatively poor accessibility to consumer markets, as shown in Figures 12a and 12b. The high transport costs, lack of mechanisms to aggregate individual farmers' produce into larger quantities for wholesale purchasers, and limited knowledge of market demand often render them with low farm gate prices.

Figures 12a and 12b: Districts in Uva and Sabaragamuwa, by Accessibility and Vegetable Cultivation.

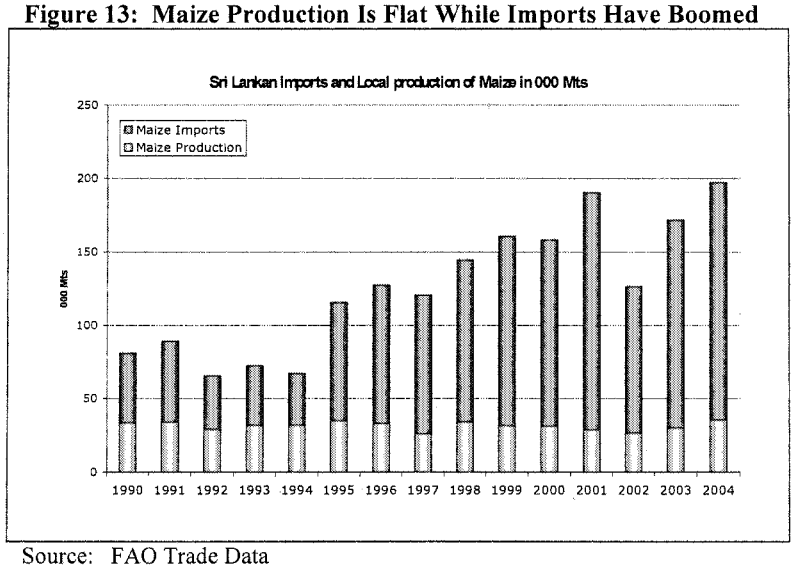


Source: World Bank staff calculations.

5.2. Market Prospects for Maize, Milk and Vegetables

62. **Market prospects for maize are good**. Demand for maize has grown at 6 percent per annum over the last decade but has, up to now, been met with imported grain. The potential farm gate income for domestic farmers, if they were internationally competitive, would be about US$ 15-20 million annually. Driven by the demand for maize for feed and for ethanol production, international maize prices increased by 65 percent between 2005 and2007. Because of its high import price major users of maize, mainly poultry farmers, are keen to purchase locally grown grain.

Figure 13: Maize Production Is Flat While Imports Have Boomed



Source: FAO Trade Data

63. **Growth in the poultry industry has fueled the demand for maize**. Maize is the major ingredient in chicken feed and the current national demand in this segment is about 160,000 tons per annum. However, Sri Lanka produces only around 30,000 tons per annum (see Figure 13) and, in recent

years, has been able to meet less than 20 percent of the demand. During the stakeholder consultations, representatives of the poultry industry predicted continued growth in the demand for chicken products, of between 5 and 10 percent per annum over the next decade. Five percent annual growth in the poultry industry would translate into a demand for an extra 45,000 tons of maize by 2011 and about 100,000 tons (worth over US$37 million) by 2016. Given an average yield of 2.25 megatons per acre, 45,000 acres of land would be needed to grow the equivalent of 100,000 tons of imported maize; the crop could provide an additional US$9 million in profits per year to Sri Lankan farmers. The latest Ministry of Agriculture statistics suggest that a supply response has already started, with production estimated to have reached around 60,000 tons in the 2007/08 season.

64. **These projections indicate that the potential for growth in the maize sub-sector is significant**. However, several key issues need to be resolved in order for poor farmers to begin producing and selling maize on a large scale. Farmers in a given location must have the potential to produce enough maize to ensure that a sufficient quantity can be accumulated for marketing, and to guarantee bulk buyers a secure supply for their needs. In addition, the price of locally produced maize would have to be low enough to encourage buyers to switch from imported maize. Producers will need technical assistance to consistently deliver grain that satisfies the buyers' quality requirements (for example, maize with less than 14 percent moisture content). Finally, maize farmers need to work in partnerships with the end-users to facilitate communications, market linkages and buying programs.

65. **This positive projection is supported by the strong response from the private sector in the past couple of years.** In the first year when the import of the F1 hybrid seed was attempted, half the imports (60 megatons) were lost due to bureaucratic mishandling brought on by lack of clarity about phyto-sanitary regulations. In subsequent years the difficulties have been overcome and the volumes imported amount to over 350 megatons (Table 13). Private sector enterprises are leveraging the social infrastructure mobilized by NGOs as their entry point for extension and buying. They have introduced cost-effective extension techniques using farmer groups, lead framers and, when possible, Government extension services to disseminate messages about improved agronomy

Table 13: Market Response to Maize Opportunities

Issue	Action	Comments
Supply of F1 Seeds	Volumes of F1 seed imports have increased from 60 megatons in 2005/06 to 260 megatons in 2006/07, 350 megatons in 2007/08 and are expected to reach 450 megatons in 2008/9	Seed imports were held up in 2005/06 by bureaucracy. The 2006/07 imports of 350 megatons of seeds should result in improved production on about 70,000 acres of land.
Specialized Extension Services and Techniques	Mainly led by the private sector, with small teams of about four people each. The approach is to work through lead farmers who are members of NGO-formed organizations. In the Eastern region, the teams often partner with the Government's extension services.	Indicates the cost-effectiveness possible through using focused extension, master farmers and operating through farmer groups.
On-farm Drying of Maize	Intermediaries and major buyers are investing in large scale dryers and silos.	These solutions result in the added value possibilities of quality and off-season sales being captured by agribusinesses instead of producers
National Production Volumes	Government statistics show that Sri Lanka maize production has doubled to about 60,000 megatons in 2007/08. Trade estimates are higher--about 100,000 megatons, or about 40 percent of total utilization.	A strong supply response has taken place, largely drive by international high prices. Much of this growth in production is occurring away from the poorest regions.
Formation of Farmers' Groups to Facilitate Direct Sales and Extension.	Leading private sector companies prefer to work through groups formed by NGOs and projects	Highlights the benefits of farmer group mobilization to facilitate agribusiness linkages in the poorer regions of Sri Lanka.
Formation of a Maize Federation Representing the Major Players in the Supply Chain to Facilitate Better Communication and Price Transparency.	Farmers are reluctant to commit to contract production; they believe prices are rising and spot prices will serve them better. Prices have doubled and now, at around SLRs 32 per kg, are broadly in line with international prices	The market, within the last year, has become sufficiently transparent to fully reflect international prices in farmer purchase prices. In the longer term, an effective value chain body would enhance the likelihood of the sector becoming sufficiently competitive to hold its market share in the event of international prices falling back.
Support for the Creation of Agribusiness-Farmers' Groups Linkages	The private sector, often through farmers' groups, has linked up with about 3,000 farmers directly and 4,000 indirectly	The private sector has taken advantage of higher prices, but has focused on working with pre-formed groups, larger scale farmers and in more accessible areas.

66. **Dairy products are increasingly becoming an important component of the Sri Lankan diet** The average consumption of milk and milk products has grown steadily, rising over time and across income deciles. However, about 80 percent of the increased demand has been met by imported dairy products, of which dried milk powder is the most significant, accounting for nearly 95 percent of total

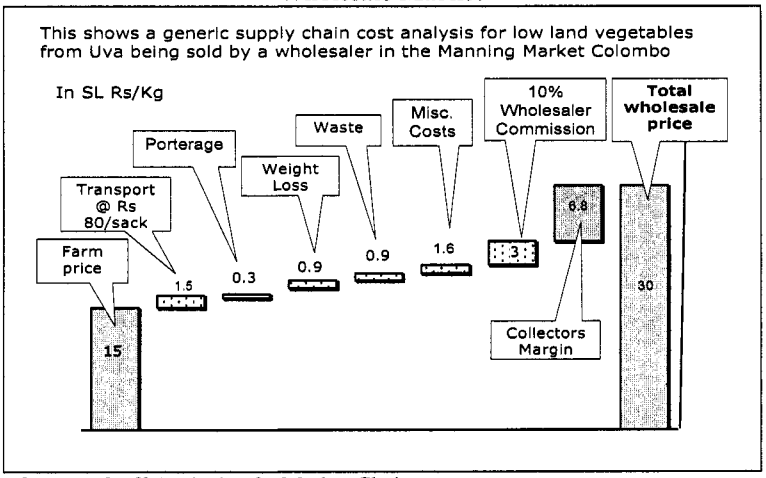
dairy imports. Sales of locally produced fresh milk currently constitute a small percentage of what consumers spend on milk products.[30]

67. **The market prospects for milk are quite encouraging.** On the positive side, consumer spending on and demand for milk products have risen substantially (8 percent per year over the last decade), even though sales of locally produced fresh milk have shown a long-term decline. However, prices of imported dried milk powder rose by 55 percent between 2005 and 2008, and this has made locally produced fresh milk more attractive to dairy processors. Their main interest is shifting towards producing value-added products where fresh milk has a qualitative as well as a cost advantage compared to powdered milk. At least two companies have expressed interest in setting up milk processing plants and procuring locally produced milk. However, for dairy processors to be able to operate, they would need support from the Government and/or an intervention to set up rural infrastructure (such as bulk chillers and electronic milk testing equipment), organize village dairy societies, set up milk routes, train producers, and implement and sustain long-term measures for increasing productivity. A key driver for developing the milk sector will be that there is a strong, profitable and consistent demand for milk, which can spur farmers' interest in investing in productivity-enhancing technology. Central elements in this will be improving the genetic make-up of the milking herd, primarily through artificial insemination and through improved nutrition.

68. **Compared to maize and milk, market prospects for lowland vegetables are relatively poor** but there is good potential for improvement. The export market and supermarket demand for lowland vegetables is weak (lowland vegetables account for only 30 percent of supermarket sales of locally grown produce). There has been a rise in vegetable consumption, but mainly of temperate vegetables, not lowland tropical vegetables, which are less popular with the affluent urban consumers. An additional obstacle to the profitable production of lowland vegetables is that they are normally harvested during the peak season or later, when prices are especially low.

69. **Historically, lowland vegetable producers have been disconnected from the market,** which means they have limited understanding of changing consumer demand or market-oriented production. Due to poor market access, they typically sell their produce through a network of middlemen or to poorly functioning local markets--for example, in Uva, poor farmers sell their produce to visiting 'collectors' who may be working on behalf of larger-scale distributors; the produce is delivered to primary wholesale markets such as Manning Market in Colombo and sold on a commission of about 10 percent. Eventually, the farm gate prices generally amount to about half of the wholesale selling prices (see Figure 14). Around 40 percent of the costs shared between the producers and the wholesalers are those of the collectors. A proportion of this margin could become available to producers if they

Figure 14. Vegetables: Typical Costs and Returns in Colombo Wholesale Market



Source: Staff Analysis of a Market Chain

[30] "Livelihood Improvement through Dairying in the Gemidirya Project," NDDB 2005, estimates that only 1.7 percent of the expenditure on milk and milk products is on fresh cow milk, while milk powder accounts for over 83 percent of consumer milk spending.

become sufficiently organized to consolidate and transport their produce to the urban wholesale markets, or if rural primary wholesale markets can be developed to attract larger scale buyers and agribusinesses by virtue of the quality and quantity of products available.

70. **However, large markets such as Manning Market are declining in importance**, as less overcrowded markets outside Colombo are gaining an increasing share of the wholesale market. Large-scale farmers and even farmers' groups are delivering their produce directly to wholesale markets and saving on the commissions they would have otherwise given to collectors. In the process, they are developing direct relationships with the trade and building an understanding of the market, which will enable them to make their production more market-oriented. Effective interventions include helping farmers' groups deliver their produce directly to wholesale markets and facilitating investments in setting up market places in strategic locations.

5.3. Competitiveness and Profitability

71. **The analysis of the maize sector suggests that locally produced maize can compete with imported maize even without tariff protection, if F1 hybrid seeds are used.** In 2007 international maize prices were exceptionally high (US$ 233 per ton CIF). A competitiveness analysis was performed using a more typical range of prices of US$ 125 to 200 per ton CIF. Table 14 shows how this would translate into SLRs/kg delivered to feed mills in Sri Lanka, with and without government tariffs and taxes. Table 14 also includes an estimate of what this would mean in terms of farm gate prices, assuming a delivery cost of SLRs 1.5 per kg and when feed millers buy locally produced maize at a 10 percent discount relative to imported maize.

Table 14: Maize: Import and Farm Gate Prices

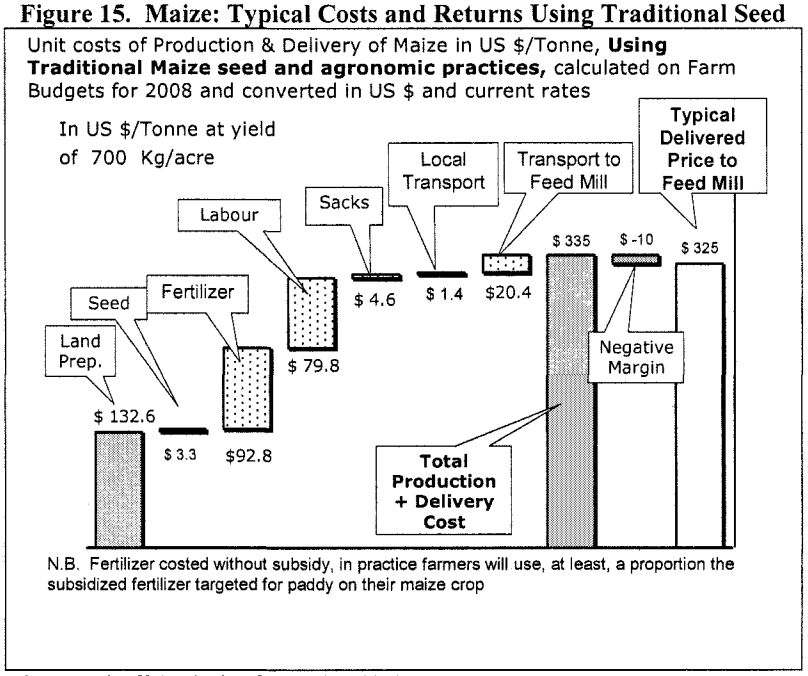
CIF price	Unloading and transport	+ Tariffs @ 26.75 percent	+ VAT	Estimated price of maize at feed mill gate	Estimated farm gate price
US $/MT	SLRs/kg	SLRs/kg	SLRs/kg	Minus 10 percent margin[31]	Minus transport[32]
$125.0	14.5	18.2	19.6	17.61	16.11
$150.0	17.2	21.7	23.3	20.98	19.48
$175.0	19.9	25.1	27.1	24.35	22.85
$200.0	22.6	28.6	30.8	27.72	26.22
$ 225.0	25.3	32.06	34.46	31.0	29.5
$ 250.0	28.0	35.49	38.2	34.4	32.9
$ 275.0	30.7	38.9	41.9	37.7	36.21

Source: Based on customs data and importers' actual figures.

[31] Imported maize has several advantages, including consistent quality, bulk availability, and the possibility of hedging prices internationally. A 10 percent discount has been used as an incentive for feed millers to move away form imported maize.
[32] Transport costs from production to the factories are estimated at SL Rs 1.5/kg.

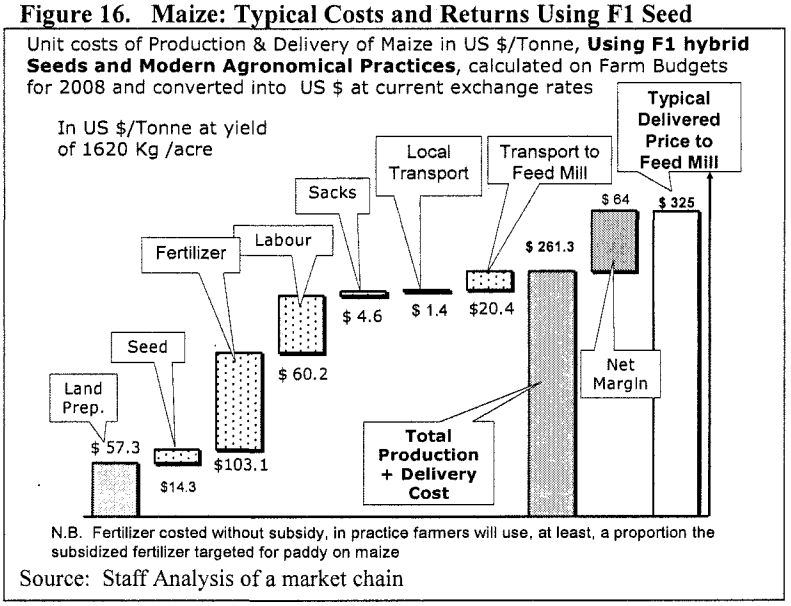
72. The use of F1 hybrid seeds is boosting yields. Between 2004 and 2005, average maize yields in Anuradhapura and Monaragala (in Uva) rose from around 400 kg per acre to 1,500 kg per acre.[33] Improved seeds are also being sown on a greater proportion of the maize area, with imports of F1 seeds reaching some 350 tons in 2007/08. Figures 15 and 16 compare the unit costs of production between traditional and modern maize production systems, using 2008 costs and prices[34]. The figures show that it is only with the lower costs per ton, made possible by modern maize production techniques, that Sri Lankan growers can be competitive with imported maize. Moreover, net return comparisons show that maize production is much more profitable than other dry land crops (groundnut, green gram, gingelly (sesame), cowpea, etc.). Maize offers a significant opportunity to save on foreign exchange of about US$ 20 million, enhance farmers' incomes by SLRs 2 billion per annum, and generate farm profits of about SLRs 1 billion

Figure 15. Maize: Typical Costs and Returns Using Traditional Seed



Source: Staff Analysis of a Market Chain

Figure 16. Maize: Typical Costs and Returns Using F1 Seed



Source: Staff Analysis of a market chain

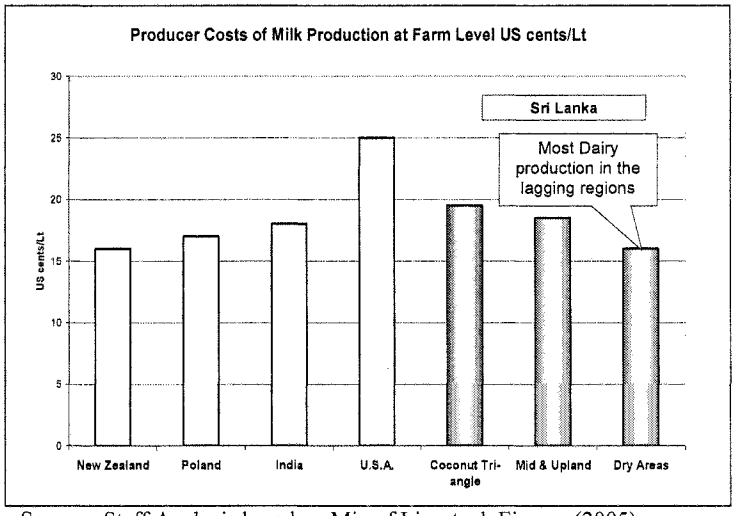
Figure 17. Producers' Costs for Milk, 2005

[33]Agriculture census data indicates that typical yields for the traditional systems, mostly before 2005, were about 400 kg per acre The increase in yields reflects the crop promotion program, mainly by the feed millers.

[34] These figures are based on using non-subsidized fertilizer. In practice, maize growers are using the subsidized fertilizer meant for paddy on their maize crops.

73. Sri Lanka milk production costs can be competitive with the major international producers (figure 17). The lowest cost producers are in the dry areas, which typify many of the poorer areas of Sri Lanka. The key elements of these costs are labor (56 percent) and feed (18.6 percent). The suggestions that Sri Lanka can be competitive at the farm gate in terms of cost of production, without an improved national milk herd and with little research and extension focusing on feed and animal nutrition bodes well for the scope for further improvement.

US cents/liter.

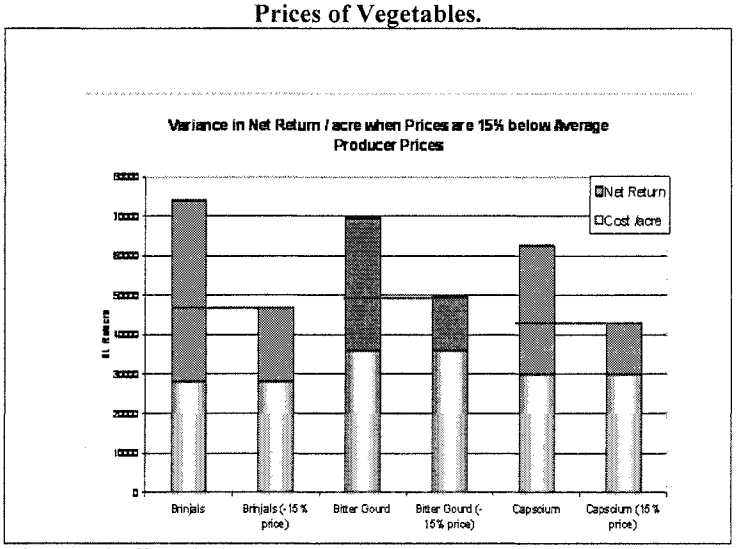


Source: Staff Analysis based on Min of Livestock Figures (2005)

74. **World price increases in dry milk powder are stimulating private sector interest in investing in local sourcing and processing of milk**. One company has already made investments worth US10 million in milk processing; at least three other companies are planning such investments as well. Typically, the constraints on private sector investments in milk include the low productivity of Sri Lankan cattle, the need for farmer training, improved animal nutrition, difficulties in organizing sensible milk routes, and sufficient critical mass of milk collected to justify investments in and operation of field bulk milk chillers.

75. Analysis of lowland vegetable production shows that producers, especially those in inaccessible locations, receive low prices for their crops. Small changes in farm gate prices have a disproportionately large effect on profitability. When these low prices (14-18 percent lower than the national average) are introduced into crop budgets, the net returns are reduced by about 60 percent compared to that of national average farm gate prices, that is, to the same level as the gross profit generated by irrigated rice (figure 18) This would explain why lowland vegetable farmers with poor market access are not better off than they are.

Figure 18. Impact on Net Return of Change in Producer Prices of Vegetables.



Source: Staff Analysis

5.4 Strengthening Product Specific Value Chains

76. The preceding analysis suggests that, in each of the three sub-sectors, there is a considerable potential for growth; this section uses the value chain analysis to try to determine why the potential has not been fully realized. There are two common characteristics for all three sub-sectors: (a) significant gaps in terms of knowledge and production technology, and (b) poor market linkages, from farmers to intermediate producers and/or final consumers.

Maize

77. In order to develop maize production in the poorer regions and incentivize the private sector to work in these areas, it is necessary to create a maize industry that can deliver continuous income streams to the poorest regions by building on their competitive advantages. This requires improvements in extension services, linkages to farmers' groups through projects operating in these areas, and the facilitation of on-farm trials and practical research (See Table 15 for a summary description of proposed interventions, areas of reform, responsible players and institutional roles, and how they all match the goals of the *Mahinda Chintana*). For improving knowledge and technology, it is necessary to focus on developing on-farm drying techniques to reduce the moisture content of maize to below 14 percent (without smoke contamination) and enhancing farmer training in maize agronomy, with a particular emphasis on expanding the use of F1 seeds. In terms of market linkages, the maize sector would need to create organized producers' groups (for example, a maize industry association) to better integrate the value chain, in particular improve the business linkages with major feed mills. There is also a need to rationalize maize collection points, and perhaps develop shared drying facilities.

Table 15: Policy Options to Develop the Maize Sub-Sector

Key Areas of Change	Institutional Requirements	Compatibility with *Mahinda Chintana* Goals
Development of on-farm drying techniques to reduce moisture content below 14 percent (without smoke contamination)	Mission-mode[35] research open to Government institutions, the private sector and/or NGOs	Promotes agricultural research with greater private sector involvement
Farmer training in maize agronomy, with a particular emphasis on expanding the use of F1 seeds.	Focused extension can be conducted, carried out by existing Government institutions or on a contract basis	Technology dissemination/farmer participation
Group formation and creation of business linkages with major feed mills	Mobilizing maize producer groups is often best done by NGOs	Participation of CBOs
Federation of maize groups and creation of a maize industry association to facilitate better integration of value chain	Can be facilitated by the agribusiness cluster under the National Council for Economic Development, possibly in partnership with chambers of commerce	Participation of CBOs
Incentivize agribusinesses to operate in poorer regions and make targeted investments to enable farmer groups to participate in modern agricultural supply chains	Expanding existing GoSL incentive program or developing a competitive matching grants scheme	Though not articulated in *Mahinda Chintana*, this type of grant is implicit in policies that promote farmer-trader contracts and agribusiness linkages
Improve maize collection points and shared drying facilities	Locally demanded productive infrastructure investments	Facilitates farmers' market access and builds relevant infrastructure

[35] 'Mission Mode Research' can be defined as targeted research programs that tackle specific constraints and productivity issues.

Milk

78. Developing the milk sub-sector will depend essentially on the private sector investing in processing plants and deciding to source the raw material (fresh milk) locally. The current high prices of imported milk powder have acted as a powerful incentive for processors to seek other sources of raw material. Their primary interest is in using local fresh milk to make dairy products that are increasingly in demand, especially in Sri Lanka's urban areas. Further analysis will be needed to establish the potential financial and economic viability of converting fresh milk to powder in Sri Lanka, but prospects have significantly improved with the increase in international prices. In the milk sector, knowledge and technology improvements should come from improving the milk herds by, for example, artificial insemination, and by improving feed, fodder and pasture practices. Market linkages should be strengthened by facilitating the formation of village societies around compact milk routes to reduce collection costs, and (in view of the relatively high capital costs) improving the provision of shared market structures like bulk chillers, collection centers and automatic quality testing equipment.

79. **A summary of the key changes required to strengthen the milk value chain is provided in Table 16.**

Table 16: Recommended Interventions to Develop the Milk Sub-Sector

Key Areas of Change	Institutional Set-up	Compatibility with *Mahinda Chintana* Goals
Improved productivity through better feed, fodder and the development of improved pasture practices	Mission mode research open to Government institutions (for example, Livestock Board), the private sector and/or NGOs	Enhanced agricultural research
Train farmers in improved animal husbandry practices	Provide training courses conducted by the private sector, NGOs or the public sector	Productivity enhancement
Increase milk production by genetically improving the national milk herd by, for example, artificial insemination	These services can be provided on a contract basis, possibly by local service providers	Fostering private sector involvement in providing technical support to milk producers
Formation of village milk societies around compact milk routes	Formation of milk farmer groups, possibly by NGOs in partnership with agribusinesses partners	Participation of CBOs
Partner with the private sector to develop milk routes in poor regions and use grants to build up production and market infrastructure in rural areas	Expanding existing GoSL incentive programs or developing a competitive matching grants scheme	Private sector participation in the livestock sector; market facilitation
Provision of shared market infrastructure like bulk chillers, collection centers and automatic quality testing equipment	Making locally-demanded productive infrastructure investments	Facilitating marketing and creating relevant infrastructure

Vegetables

80. The value chain analysis shows that generating more profits from lowland vegetable production will require greater marketing efficiencies. For example, direct marketing will lead to more market-oriented production. This, in turn, will depend on producers becoming more directly engaged in the market and will involve 'marketing extension' activities to provide them with some explicit knowledge. Particularly, however, there is a need to build implicit knowledge of the market (through learning by doing) in the farm community. However, the Government has little experience with

marketing extension activity, and there is limited capacity to carry out this work in Sri Lanka at present. There are high costs associated with moving produce through a traditional supply chain, a process which often involves at least three intermediaries between the grower and the retailer. Experience elsewhere has shown that larger-scale buyers will buy at primary rural wholesale markets when there are acceptable rural roads and cellular communication. This eliminates much of the collectors' costs and offers the potential for more efficient distribution, improved farm gate prices and lower post-harvest losses. The key is to create markets with sufficient critical mass, variety of products and fast turn-around times. There is also a need for vegetable farmers to improve production techniques to extend the growing season, and to improve long-terms storing techniques to minimize the vast seasonal fluctuations in prices (table 17)

Table 17: Recommended Interventions to Develop the Lowland Vegetable Sub-Sector

Key Areas of Reform or Requirement	Institutional Role	Compatibility with *Mahinda Chintana* Goals
Develop production techniques that extend seasonality. Develop long-term storage techniques	Mission mode research open to Government organizations, the private sector and/or NGOs	Enhanced agricultural research
Marketing extension provided so that producers will better understand the market and consider new marketing options	Development & delivery marketing extension and farmer group mobilization by the Government departments or NGOs	Marketing facilitation and participation of CBOs
Build or improve rural market infrastructure, for example, economic centers such as Dambulla Market; local stakeholder involvement in design and market operations	Community demanded infrastructure programs such as *Gemi Neguma* or by local authorities	Building rural market infrastructure

6. POLICY OPTIONS FOR STRENGTHENING COMMERCIALIZATION OF AGRICULTURE

81. Based on the analysis in the previous chapters, this chapter draws out the main policy options to strengthen commercialization of agriculture in Sri Lanka. While the value chain analysis was based on three specific products (maize, milk and vegetables), the analysis and stakeholder consultations nevertheless point to several common constraints for commercialization. The key impediments to agricultural growth in Sri Lanka appear to be: (i) poor production technology; (ii) poor market linkages, and (iii) limited access to finance. These factors also reinforce each other, suggesting that while alleviating one of the constraints might improve agricultural growth prospects, a comprehensive approach would be the most effective. Key policy challenges to mitigate these constraints are summarized in this chapter.

6.1. Improving Production Technology

82. The value chain analysis unequivocally points to severe deficiencies in production technologies across the three analyzed products. For maize, the main deficiencies include the slow adoption of modified F1 seeds (although their use has been expanding in recent years), partly due to low levels of awareness and generally limited knowledge among farmers about maize agronomy. Another production technology deficiency for maize is poor on-farm drying techniques that prevent farmers from reducing the moisture content of the harvested maize to acceptable levels (below 14 percent) without smoke contamination. For milk too there is significant scope to improve production technology. General key issues are poor feed and fodder, and inefficient pasture practices. In addition, milk productivity is low because of the genetic characteristics of the national milk heard, in part because of the poor provision of artificial insemination services for the animals. Finally, in the case of vegetables, a critical challenge is to develop production techniques that extend the growing season and smooth the strong seasonality in prices. This constraint could also be alleviated by developing cost-effective long-term storage techniques.

83. Improving production technology would require action on several fronts, including, in particular: (i) measures to improve the extension system, (ii) strengthen demand and awareness of improved technology, and (iii) efforts to more strongly involve the private sector in technology diffusion.

- ***Improving the extension system.*** The research and extension system in Sri Lanka suffers from a number of deficiencies, including a high degree of fragmentation among Government entities, poor focus on concrete and useful outputs, and low institutional capacity[36]. Moreover, the poorest regions are particularly lacking in extension services. For example, each extension officer in Uva has to cover 2.8 times the number of holdings and cropped area as his/her counterpart in the rest of Sri Lanka. In Sabaragamuwa, the ratio is 1.8. In the Northeast, the number of holdings each extension officer is expected to cover is on par with the Sri Lanka average but the land area he/she is expected to give advice on is about 28 percent more than in the rest of the country. Improving the existing extension system will require efforts along several dimensions. First, coordination of research and extension efforts will have to be improved by strengthening, or alternatively replacing, the existing Council for Agricultural Research Policy (CARP) by giving CARP a wider mandate, authority and responsibilities. In addition, provincial-level extension

[36] See "*Reviving Sri Lanka's Agricultural Research and Extension System,*" draft report, World Bank, May 2007

efforts should be strengthened by creating Provincial Agricultural Innovation Councils, modeled on, for instance, the successful Indian district-based Agricultural Technology Management Agencies which can ensure adequate bottom-up planning and involvement of local stakeholders, including farmers, input suppliers, traders, processors, and exporters. Second, the output orientation of research and extension efforts in Sri Lanka has to be strengthened by creating a limited number of mission-oriented innovation programs. Implementation of each innovation program would be assigned, based on specific topics/issues, to a consortium of the major stakeholders that includes the private sector, universities and farmer organizations. Finally, it is necessary to improve the institutional capacity of selected existing research and extension organizations

- ***Strengthening awareness and demand for improved technology.*** Agricultural research and extension in Sri Lanka remains largely supply-driven and is defined in a top-down manner. Consultations with farmers, input suppliers, processors, traders, exporters, and consumers in the selection of research and extension priorities are very limited. Except in the case of plantation crops, no financial contributions are requested from the users of extension services, so there is little feedback to indicate if the research and extension provided are offering what clients want. Clients/users are often not critical about services that they get for free. Although financial contributions from the users could improve this linkage and highlight priorities more effectively, the consultations with various parties revealed considerable reservations about having farmers contribute to agricultural research and extension costs as it was feared that the low income of farmers would make them unwilling to contribute. Going forward, there is a need for agricultural research and extension to improve links to the ultimate clients by involving them more strongly in setting agricultural research and extension priorities. Various instruments can be used—for example, consultations with users and giving farmers some influence over budget allocations. Mobilizing farmers into groups is an important prerequisite for facilitating their greater involvement, and the good work on building farmers' groups should continue. It would be useful to experiment in the more developed, export-oriented segments of the agricultural sector to determine whether and how farmers and other actors along the value chain could contribute to the costs of research and extension. In addition to tapping an additional source of income, the advantage of asking for contributions is that it could change the farmers from being passive receivers of services to becoming critical clients.

- ***Bringing in the private sector.*** There is a significant 'private goods' element to extension services--for example, technical advice provided by wholesalers (or supermarket chains) to farmers on producing higher value crops and consistent quality livestock for commercialization. At the same time, if extension services are initially directed towards subsistence farmers for the most part, then public funding (with the involvement of NGOs and the private sector) may be the most appropriate way to bring in the private sector. In general, there is a need for establishing flexible and mixed private/public systems that involve farmer organizations, civil society organizations and public agencies in contracting out extension services. However, there is no single 'best practice' for balancing the mix of providers of extension services.

6.2. Strengthening Market Linkages

84. Poor market linkages are a critical stumbling block for commercialization of agricultural products across the analyzed value chains. For maize, the business linkages between farmers and major feed mills are fractured, and there are no maize producer groups or industry associations that could

facilitate better integration of the value chain. In the milk sector, a major hindrance is the absence of local milk societies around compact milk routes, and the dearth of shared market infrastructure like bulk chillers, collection centers, automatic quality testing equipment, etc. Finally, in the case of vegetables, there is a lack of information among producers about supply and demand, in part because of limited rural market infrastructure and lack of innovation in terms of product differentiation and marketing.

85. Three factors are important for strengthening market linkages: improving the rural roads infrastructure; improving farmer coordination in aggregating volumes to exploit economies of scale and facilitating integration with agribusinesses; and strengthening market information systems (including establishment of commodity exchanges).

- ***Improving rural roads infrastructure.*** As in many other developing countries, inadequate transport infrastructure and services in Sri Lanka's rural areas push up marketing costs and undermine the farmers' income potential. Adequate transport infrastructure can help ensure higher farm gate prices for agricultural products, especially perishable products, so that large-scale buyers can access production areas directly by using trucks/lorries. Poor last-mile connectivity, in particular, is considered a significant problem by Sri Lankan small-scale farmers. A simple assessment of road density in Sri Lanka shows that in terms of overall road infrastructure, the country is not underprovided with roads in comparison with other South Asian countries; in fact, Sri Lanka has about twice the road density as the South Asia average. However, despite this relatively generous road density level, rural roads, culverts and bridges are among the most frequently requested infrastructure investment in community-driven development projects, suggesting that last-mile connectivity is a key priority. It should be noted at the same time that international experience suggests the benefits from rural roads investments often depend critically on other infrastructure and geographical, community and household characteristics[37]. For this reason, policy-makers need to consider more than the absence or the dire conditions of a road before deciding that a new road is critical.

- ***Aggregation of production volumes and improved integration with agribusinesses.*** Across value chains, there is a need to aggregate production volumes to enable farmers to establish stronger links with agribusinesses. As elsewhere in the South Asia region, increased demand for processed foods and the expansion in supermarket chains—which has been particularly rapid in Sri Lanka—has opened up new market channels with agribusinesses and large-scale traders that seek to purchase directly in the production areas (assuming adequate quantity and quality)[38]. During the stakeholder consultations, the farmers repeatedly emphasized their desire to attract agribusinesses into their areas to bring in jobs, market opportunities and the potential to create local value addition. The small-scale of milk production provides a good illustration of the importance for producers to be able to aggregate production. In order for small-scale milk farmers to meet dairy processors' demand, aggregation is needed to facilitate delivery to processing plants. Policy interventions should support milk producer groups in organizing sensible milk routes with collection centers, as well as enhancing the productivity and skills of producers. Similar issues are faced by vegetable producers: small production volumes

[37] See World Development Report 2008, World Bank.

[38] Meetings with a number of private sector businesses confirmed their increasing interest in sourcing raw material directly from producers. In view of the relatively high international prices of many commodities, the agribusiness sector currently sees the prospects of profitable production and processing at the local level as especially good. Discussions with agribusinesses revealed that tropical fruit, fish farming and honey were some potential areas of interest to the private sector (aside from maize, milk and vegetables).

greatly increase marketing costs and undermine the producers' abilities to integrate with agribusinesses.[39] A practical implementation issues that arises when attempting to aggregate production volumes is the formation and operation of farmers' groups. Sri Lanka already has a large number of farmers' groups. During the stakeholder consultations, members of these groups repeatedly expressed frustration about the bureaucratic ways in which their groups operate. These operational issues severely undermine the usefulness of partnerships between farmer groups and agribusinesses; the Government will have to examine alternative and more flexible modes of operation for the existing farmers' groups to create more effective working partnerships between them and agribusinesses.

- ***Strengthening market information systems***. Farmers repeatedly emphasized the need for investments in market places so that buyers have better access to the goods produced. These views were echoed by local businessmen, traders and national agribusinesses. Dambulla was typically cited as a successful example of a market developed in the right location. Stakeholders also cited examples of failed investments when markets were set up in the wrong places and without discussions with or participation from the farming and trading communities. Failed investments in market places are quite common in Sri Lanka; investment decisions are all too often badly influenced by the availability of Government land rather than the suitability of the location as identified by stakeholders. Political considerations are too often given greater priority than commercial realities and decisions are imposed on the trading and farming communities rather than agreed upon mutually. However, as evidenced by the success of Dambulla and some other regions, if the locations are chosen wisely and other benefits like improved rural access and cellular phones are available, large-scale rural wholesale markets can now attract big buyers, provided there is sufficient volume and variety of products available and the turn-around times are short. It is necessary, therefore, that a rigorous selection process be used for making investments in markets that have a high chance of success (Box 4). Experience from other countries suggests that enhanced use of communication technology can also help keep farmers informed about the changes in demand for their goods, availability of inputs at the best prices, and other information that is critical for well-functioning markets. In Sri Lanka, a study of 300 farmers in the Dambulla area showed that transaction costs account for 15 percent of total production costs, indicating that there is significant scope for cost reduction through enhanced use of information and communication technology[40].

[39] Arguably, there is a need to incentivize agribusinesses to make investments specifically in the more difficult regions and in products where the benefits are skewed towards smaller and more marginal producers. Such incentive schemes are operated elsewhere and typically they provide competitively bid matching grants to encourage businesses to operate in areas of need and/or to work with more disadvantaged farmers. Often, this involves involve agribusinesses forming partnerships with farmer organizations and then submitting, for competitive bidding, joint business plans covering investments in processing and logistics arrangements, farmer training, the provision of initial specialist inputs, investments in community based market infrastructure and equipment, and investments in practical research and development). Winning bids receive partial grants to cover a proportion of their costs that are targeted at farming communities and which can be defined as development investments. Examples of 'productive partnership' projects can be found in countries as diverse as Colombia, China and Georgia. In Colombia, for example, 117 productive partnerships have been formed with grant investments amounting to US$17.6 million that were further able to leverage private sector investment of US$ 70.4 million (a ratio of 4:1). An impact study of a sample of 17 partnerships shows that both farmer incomes and on-farm employment have increased by 20 percent each..

[40] "*Transaction Costs in Agriculture: From Planting Decision to Selling at the Wholesale Market—A Case-Study on the Feeder Area of the Dambulla Dedicated Economic Centre in Sri Lanka*", Harsha de Silva and Dimuthu Ratnadiwakara (2008), Mimeo

Box 4. Considerations for Investments in Agricultural Market Infrastructure.

International experience shows that rural market investments show best results when investments are made in those markets that are already thriving and expanding but need funds to create improved infrastructure, build management and enable the existing market to reach a higher level of throughput and operation. Typically, prospective investments can be identified and planned using: (i) a quantitative survey to draw up a priority list of markets; (ii) participative planning with the stakeholders to identify the key investments needed; and (iii) a feasibility study of the planned scheme.

After objectively screening a shortlist of markets, the preferred site for development is chosen. Agreements are reached with the local authorities on: (i) their contribution to costs, (ii) the use of elected market committees, and (iii) how a proportion of the fees raised would be spent on cleaning, maintenance and future market development.

Ensuring successful outcomes from investing in rural market places often depends on other additional factors. Market investment programs usually include investments in upgrading link roads to handle the additional traffic. A key element in the success of new and upgraded markets is the active involvement of a market committee of stakeholders who have a personal stake in the success of the market and take an active role in market management, organization and promotion. Other key issues to be considered are the location and design of the new markets. The following need to be considered: (i) participative design, (ii) acceptable location, (iii) adequate road access, (iv) market frequency and function, (v) creating sufficient critical mass of products to attract a number of large-scale buyers, (vi) actively promoting the market, (vii) creating ancillary support services to develop a multifaceted market (that is, banks, input shops, stores, packaging material, extension services), and (viii) an active market committee representing the stakeholders and with the remit to promote and develop the market.

6.3. Improving Access to Finance

86. Despite the fact that a variety of institution are involved in agricultural finance in Sri Lanka, lack of access to finance remains a key constraint for agricultural growth. Financing institutions include commercial banks, cooperatives, microfinance organizations, traders, processors, and informal money lenders. The availability and cost of finance from these institutions varies widely. Only enterprises at the end of the supply chains appear to attract long-term and more tailor-made credit. Small farmers largely depend on microfinance, rural cooperatives and regional development banks. The two state commercial banks and a few private banks extend financing to small farmers but mainly through Government-sponsored programs. Small farmers also borrow from input suppliers and traders, and resort to money lenders to manage unforeseen liquidity constraints. Leasing for agricultural machinery is also underutilized. From the farmers' perspective, the main problems in terms of access to finance include inadequate term finance, limited suppliers' credit, cumbersome paperwork, and strict collateral requirements. The constraints for commercial finance institutions, on the other hand, are high transaction costs (in part because remote clients are difficult to service), lack of tangible security, and high repayment risks due to poor supply chains and marketing linkages. Regional development banks have traditionally financed medium and small farmers; they have also been involved in the intermediation of various publicly backed agricultural credit schemes, but not at a scale to make a significant impact on the supply of finance.

87. Two types of innovative financing may complement the push towards improved agricultural value-chains particularly well, namely (i) contract financing, and (ii) warehouse receipt financing.[41]

- ***Contract Financing.*** Contract financing in the agricultural sector is insufficiently developed in Sri Lanka, in part because of the lack of commercial discipline. There is a clear role for the Government in educating farmers and other stakeholders about the benefits of commercial discipline. At the same time, support should be provided to ensure that the contract structures promote a fair sharing of revenues and risks among farmers and off-takers (such as supermarket chains), which would make contracts more likely to be honored. Once the relationships between the farmers and the off-takers become sustainable, new bank lending can develop by using the off-take contract as collateral. Under well-established contract farming, medium-term financing (for example, to support investments in new technology or machinery) can also become available.

- ***Warehouse Receipt Financing.*** Warehouse receipt financing is a secured lending mechanism widely used in developed and emerging economies; it could be promoted in Sri Lanka as well. In warehouse receipt financing, the farmers deposit their commodities in warehouses operated by designated warehouse keepers. The stored commodities are certified for quality and graded by Government-approved valuers. Certificates are also issued by agencies that inspect the commodities and certify the quantity deposited. The warehouses issue warehousing receipts that specify the quantity (as certified by the warehouse) and the quality (as certified by the accompanying quality certificates) of the commodities. The farmers can then request financing from banks, which take possession of the warehouse receipts as collateral. Warehouse receipt financing can be used as a price-risk management instrument by farmers; low-cost finance allows farmers to hold commodities after the harvest and sell them when market prices peak[42].

6.4 Improving Land Markets

88. Numerous studies have argued that Sri Lanka's inflexible land markets are a hindrance for more rapid rural income growth[43]**.** Experiences from around the world suggest that more secure property rights benefit farmers and help improve productivity by: (i) strengthening the incentive to make productivity-enhancing investments; (ii) improving access to credit; and (iii) lowering transactions costs associated with land transfers. Restrictive land use regulations are a further impediment to agricultural product diversification and productivity growth in Sri Lanka.

---

[41] These and other sources of financing for agriculture are further discussed in "Improving Access to Financial Services—Selected Issues," World Bank 2005.

[42] In the mid-1990s, the Sri Lankan Government tried to adopt a warehouse receipt system for paddy farming with poor results. An experimental system was implemented in a major paddy growing area in the dry zone. The government, with the close involvement of a commercial bank, arranged to store farmers' surplus paddy in a centrally located storage facility. Receipts were issued by the storage facility for farmers to use as collaterals to obtain short-term bank loans. The Government was trying to solve the chronic problem of low post-harvest prices and also increase farmers' access to finance independent of their creditworthiness. However, the system failed for a variety of reasons, including cumbersome implementation procedures, excessive State intervention, and the insufficient credibility of participating commercial banks.

[43] "*Sri Lanka: Promoting Agricultural and Rural Non-farm Sector Growth*", World Bank 2003; "*Sri Lanka Poverty Assessment*", World Bank 2007.

- **Land tenure**. Changing the LDO system to move to a system of ownership is a monumental task that is fraught with risks but has, at the same time, very significant potential benefits. It would require a well-planned and executed communication and awareness campaign, in addition to a strong and transparent set of procedures necessary to formalize the change. In all circumstances, any change would be best done in an incremental fashion in which restrictions on mortgaging and leasing would be removed first. In the medium-term, it would require establishing a comprehensive regulatory (legal and procedural) framework for effective land titling to facilitate a transition to a situation where outright sale of land would be allowed. The regulatory framework would have to be supported by a reorganization of existing land administration agencies and significant investments in computerized land tenure recording systems.

- **Land Use**. To engender a shift from low-value to high-value agriculture, it would be critical to remove the existing provision that requires paddy farmers to obtain permission from the Commissioner of Agrarian Services to shift to other crops in designated paddy lands[44].

[44] This would involve appropriately revising the Agrarian Services Development Act No. 46, of 2000.

7. CONCLUSIONS AND SUMMING UP

89. Measures to reduce poverty in the poorest regions of Sri Lanka should focus on enhancing the productivity of agricultural activities that are, or could be, significant sources of income for poor farmers. Experience indicates that to be effective, efforts must focus on just a few activities with good income generating potential. In order to prioritize just a few activities and determine the best ways of achieving the needed productivity increases in each, decision-makers need information on the particular circumstances and constraints affecting potential partners in the new supply chains (for example, poor farmers and agribusinesses).

90. Drawing on the value chain analysis, this report identified a series of interventions to effectively address constraints and opportunities in three important agricultural sub-sectors: maize, milk and vegetables. Maize, milk and vegetable production have considerable potential for raising farm incomes, as long as measures are taken to address key constraints such as poor market access and lack of critical infrastructure and services. It must be emphasized that these sub-sectors are not an exclusive set; productivity growth in other sectors would also have the potential to enhance farmers' incomes. The constraints in the other sub-sectors could be analyzed using the tools used in this analysis.

91. The value chain analysis identified key points where the value of the whole chain can be increased via policy interventions. The most prominent policy intervention likely involves supporting the development of market places in key rural locations. This would provide improved locations to attract larger-scale buyers, facilitate linkages between agribusinesses and producer organizations, and enable agricultural technology development and dissemination to be better tuned to meeting both farmer needs and market opportunities.

92. The findings in this report have been validated through an extensive process of stakeholder consultations, where participants pointed out a number of key constraints relating to the lack of critical infrastructure and services, weak Government systems for agricultural extension services and research, and confirmed the market-based data that the value-chain analysis is built upon. There were deficiencies in roads, markets, telecommunications, electricity, access to credit, as well as a poor flow of information on technology transfer, dominance of public sector as a service provider, and under-utilization of private sector initiatives. Poor producers receive little in the way of technical support due to the weakening of the Government's agricultural extension services and research system. In addition, they are, for the most part, disconnected from the market and largely ignored by agribusinesses as sources of raw materials. Marketing extension services could be provided as part of an intervention to help them link up with the market, tap into market information and make their production more consumer-oriented. As for agricultural extension, the Government is piloting fee-based services, but they are targeted mainly at larger commercial farmers who have the resources to pay for them. One factor that critically limits the poor farmers' production capacity is the small size of their plots. In Sri Lanka, the Government owns a large portion of the land. Farmers may obtain land from the Government through a Land Development Ordinance (LDO), but there are restrictions on using land obtained in this way—for example, it cannot be used as collateral to access credit. The combined effect of these restrictions is to reduce the farmers' incentives and capacity to make productivity-enhancing investments. In the short- to medium-term, policies are needed to give farmers full and transferable ownership rights to land and to remove policy and regulatory restrictions on buying and leasing land. Amending the LDO has been contemplated for a number of years, but so far no decisive move for change has been made despite the potential benefits such change might have.

Annex 1: Agricultural Resources

This annex presents the results of the process undertaken to identify agricultural products with significant potential to improve farmer income in the poorest regions of Sri Lanka. Farmers' key resources were evaluated through a resource audit and the results were validated using data from the 2002 Agriculture Census. Farmers' perceptions of the activities with the most potential to improve their livelihoods were gathered through field surveys conducted in the four regions. Survey results were combined with the outcomes of stakeholder meetings held to elicit the opinions of farmer groups and farmer representatives, extension officers, ministry of agriculture and local government officials, the private sector, the local chambers of commerce, local government officials and the managers of projects working with the rural sector. The overall purpose of the meetings was to gather informed local opinion on the key constraints affecting farmer incomes, the interventions they believe could help alleviate rural poverty and the enterprises that offer the best potential for improving farm incomes.

Agricultural resource audit

As part of the value chain analysis, a resource audit was conducted to take stock of agricultural products that have the highest productivity and capacity to improve farmer incomes. Results of the audit were validated using 2002 Agriculture Census data. This process led to the identification of three such products: maize, milk and lowland tropical vegetables. The results of the audit are summarized in Table 1.

Table 1: Summary of Agricultural Resources and Key Enterprises in the Poorest Regions

Resources	North	East	Uva	Sabaragamuwa
Farm size	Average for Sri Lanka	+ 40% bigger than the rest of Sri Lanka	Average for Sri Lanka	20% smaller than the rest of Sri Lanka
Animal draft	16% of nation's draft animals	22 % of nation's draft animals	35% of nation's draft animals	
Extension	Extension support partially under-provided		Extension support seriously under-provided	Extension support seriously under-provided
Enterprises				
Key cereals	Paddy	Large-scale paddy		
Key field crops		Maize, cowpeas and other pulses	Maize, green gram and other pulses	
Key fruit and vegetables	Red onion		Potato, banana, plantain, lemon, green beans and tomato	Banana and plantain
Key livestock enterprises	Dairy, goat and small-scale poultry raising	Dairy	Dairy	
Other key crops			Sugarcane	Rubber, tea

Farmers' perception of opportunities in their regions

As mentioned above, a number of stakeholder meetings (held in September/October 2006 and March 2007) and field surveys were conducted in the course of the study in UVA, Sabaragamuwa, North and East.

The key opportunities identified were milk production (in Uva and East), fish farming (North and East), maize (Uva and East) and diversification into vegetable and pulse production (all). Exploiting these opportunities will require improving market access and/or developing market infrastructure. Income-raising solutions put forward by farmers included investment in infrastructure, particularly tank irrigation systems, more rice storage facilities and effective marketplaces. Dambulla Market was repeatedly cited as an example of infrastructural investment located in the right place, with private sector participation, that had succeeded in providing market access to farmers. Producers were keen to see similar investments in their own area. They believe that such market facilities would encourage farmers to diversify into more profitable crops, notably vegetables, fruit and a range of field crops such as maize and legumes. They were enthusiastic about the role of business promoters and marketing extension officers operating in the Gemidirya and thought these activities should be included in the role of extension agents.

Table 2 brings together the opinions gathered through field surveys and stakeholder meetings in the four regions as to which enterprises could provide the most profitable opportunities to help raise farmers' incomes.

Table 2: Farmers' Opinions on the Most Profitable Opportunities to Raise Their Incomes

Opportunities	East	Uva	Sabagaragamuwa	North
Selected investments in local market infrastructure	✓✓	✓✓	✓	
Attracting agribusiness investment/buying in area/creation of linkages	✓✓	✓✓	✓✓	✓✓
Working with farmer organizations to become more effective	✓✓	✓✓		
Maize		✓✓	✓✓	
Milk	✓✓	✓✓	✓✓	
Fresh fish production	✓	✓		
Tropical fruit		✓[45]	✓[3]	✓
Vegetable production	✓[3]	✓[3]	✓✓	
Rubber				✓✓
Field crops such as groundnuts, black and green gram, cowpeas	✓[3]	✓[3]	✓	
Poultry	✓			
Goats	✓			

Key: ✓✓ primary views; ✓ secondary views.

[45] Linked to investment in local infrastructure,

Perceived constraints

The stakeholder meetings and field surveys confirmed the key constraints affecting poor farmers in the poorest regions. They were broadly in line with constraints reported by the rural ICA for the four provinces. The constraints include weak market infrastructure; poor roads and land issues. The ongoing conflict has no doubt amplified problems, particularly in the North and East. However, aside from the conflict, there was a great convergence of opinions as to the constraints that limit growth in these areas. Table 3 below presents the combined results of the stakeholder meetings and the field surveys.

Table 3: Stakeholders' Perception of Constraints

Constraints	North	East	Uva	Sabagaragamuwa
Low profitability of rice – price increases do not match rising costs	✓✓	✓✓		
Breakdown in tank infrastructure	✓✓	✓✓		
Shortage of rice storage facilities	✓✓	✓✓		
Power shortages	✓		✓✓	✓✓
Lack of local market infrastructure or poor investment decisions	✓✓	✓✓	✓✓	✓✓
Lack of market access / opportunities	✓✓	✓✓	✓	
Existing village–to-road connections	✓		✓[46]	✓✓
Lack of local investment in value added/agricultural processing	✓✓	✓✓	✓✓	
Weak extension services	✓✓	✓✓	✓✓	✓✓
Impact of the conflict – investment, transport, infrastructure damage	✓✓	✓✓		
Labor shortages	✓✓	✓✓		✓✓
Lack of water			✓✓	✓(dry areas)
Land collateral issues	✓✓			✓
Access to inputs – seeds, fertilizer, machinery	✓✓	✓		

Key: ✓✓ primary views; ✓ secondary views.

[46] Esp. Hilly areas.

Annex 2: Key Government Policies in the Milk, Maize and Vegetable Sub-sectors

The Government's strategies for agriculture aim at achieving food security and raising incomes of small farmers. The strategies include: (i) increasing competitiveness through modern technology; (ii) shifting to commercial agriculture; and (iii) promoting diversification into higher value products (fruits, vegetables, livestock, and fisheries).

Market and income facilitation policies advocated by the Mahinda Chintana Ten Year Plan include: Policie to generat investments in rural market infrastructure, increase participation and investments in the private sector, move subsistence farming to more productive agriculture, with special reference to linkage with agri-business, productivity enhancement and technology dissemination, enhancing agricultural research, especially with private sector involvement, livestock–with special focus on dairy and linkages with the private sector, greater involvement with Community Based Organization's (CBO's) and finally the transformation of country's current net importer status.

Sectors	Milk	Maize	Vegetables
Issues	Current Domestic Production is 20% and MC advocates to move to 100%	Current Domestic Production is 50% and MC advocates to move to 100%	Current Domestic Production is 100%
Policies advocated in the Agriculture section of The Mahinda Chintana	**Livestock Sector Policies:** The main goal of the sector is to achieve sustained and equitable economic and social benefits to livestock farmers and increase the domestic livestock products at competitive prices The dairy sector takes priority in the livestock development. Promoting liquid milk production is emphasized. Quality improvement of the dairy herd will be achieved though upgrading the native herd with private sector investments Import and fiscal policy on dairy products will focus on improving the competitiveness of the sector The market focies will govern the pricing mechanism with the minimum state interventions. The value addition of every aspect of the dairy industry will be encouraged	Nothing specific for Maize but Mahinda Chintana advocates broad based non plantatation sector policies. Ministry of Agriculture has their own goals to promote the sector Currently awaiting document.	Nothing specific for the Vegetable sector, but Mahinda Chintana advocates broad based non plantation sector policies Ministry of Agriculture has their own goals to promote the sector. Currently awaiting document
Objectives	Expand the number of Cows, technology, research, processing plants, increase production of powdered plants (Source: Interviews with Govt Officials)	Value addition, improve storage facilities, Thriposha (Source: Interviews with Govt officials)	Promote Value Addition, Green Farming, Improve infrastructure, update technology, post harvest processing, improve the quality of packaging (Source: Interviews with government officials)
Govt Implem Agency	Livestock Development Board (LDB)	Ministry of Agriculture (MOA)	Ministry of Agriculture (MOA)
		Department of Agriculture (DOA)	Department of Agriculture (DOA)
Government Program (Evolving)	Kirigama or Dairy Villages Api Wawamu Gemi Neguma and Gemidiriya Communities in Conflict	Kirigama or Dairy Villages Api Wawamu Gemi Neguma and Gemidiriya Communities in Conflict	Kirigama or Dairy Villages. Api Wawamu Gemi Neguma and Gemidiriya Communities in Conflict

Annex 2: Key Government Policies in the Milk, Maize and Vegetable Sub-sectors (concld)

Sectors	Milk	Maize	Vegetables
2008 Budget Proposals	Increase guaranteed price being paid to local milk producers of milk to Rs 30-40 LTR. 2) Credit facilities will be provided at concessionary rates for the importation of milking cows, development of animal husbandry and to set up small and medium milk processing centers. Proposal made to exempt milk and dairy products from VAT Funds have been allocated to grant concessionary loans to develop over 50, 000 livestock farms in East, North Central, Southern and UVA provinces Proposal is made to strenghten the legal framework to prevent the slaughter of milking cows and to increase the associated fine from Rs 250 to Rs 50000 An amount of Rs 100 million to set up cold storage and milk collection centers at the provincial levels Country spends Rs 3 billion for the importation of milk powder, sugar, fruits and wheat flour	To promote local production on a priority basis and to ensure high prices for local products a proposal is made to impose taxes on imports, seeds, and plant material and extending technical support Provisions have been made to write off the debt of small and medium millers to revive their business. Steps have been made to grant loans for cultivation at 8% interest rate under the Krushi Navodaya Program. Restrict the income tax on interest of the agricultural credit guarantee fund of the Central Bank of SL to 10% to further promote and expand facilities extended Implement an incentive scheme for agricultural extension and research officers who are working in the field. A further Rs 300 million to strengthen the Api Wawamu Rata Nagamu Program Fertilizer subsidies are available for all varieties of fertilizer at Rs. 350 per bag for paddy cultivation and to avail urea fertiliser at a concessionary price of Rs 1,2000 per bag for land owners owning less than 50 acres and Rs 15, 000 million is allocated to continue with this subsidy. Proposal to switch from chemical fertilizer to organic fertilizer and Rs 500 mn to promote organic farming. Popularize the use of appropriate carbonic/chemical mixed fertilizer over the long term in place of chemical fertilizer.	
2007 Budget Proposals	Removal of the duty waiver gradually on imported milk powder	Promoting high value agriculture and processing activities;	Promoting high value agriculture and processing activities;
	Implementing a comprehensive package providing credit and tax concessions for machinery, equipment and extension services for farmers engaged in such activities in agriculture, livestock, inland fisheries, prawn farming, fruit, vegetable, floriculture, seed development and production of organic fertilizer.		
Subsidies / Incentives		Fertilizer subsidy - Paddy Farmers who switch to producing Maize and vegetables can benefit from the fertilizer subsidy during the Yala season.	Fertilizer subsidy - Paddy Farmers who switch to producing Maize and vegetables can benefit from the fertilizer subsidy during the Yala season
		As stated in the 2006 Central Bank Report; "under the fertilizer subsidy scheme, paddy farmers who are registered at the Agrarian Services Centers were eligible to obtain fertilizer at a subsidized rate of Rs. 350 per 50 kg bag This was further extended to cover additional food crops such as chillies, maize, onion, big onion and vegetables, cultivated in paddy lands during the Yala season Later, smallholders who own less than 5 acres of tea, rubber or coconut land were also provided with a 50 kg bag of urea at a less subsidized rate of Rs 1,200.	
	Agro Livestock Development Loan Scheme - milk production, milk and milk based products and promoting agricultural crop processing (ALDL) Credit Programme - A total of Rs 5000 million at a concessionary rate of interest is expected to be disbursed under the scheme to small scale dairy farmers, liquid milk processing industries and agricultural crop processors The credit scheme has been introduced as announced in the Budget 2008.	New Comprehensive Rural Credit Schemes (NCRS)	New Comprehensive Rural Credit Schemes (NCRS)
	In addition to the above, liquid milk processing industries are also eligible to receive bank loans under the credit programme up to a maximum of Rs.300 million per industry Interest for such loans will be 14 percent per annum and a maximum of 5 years is available for repayment. Such an industry is required to make an arrangement with 2,000 to 10,000 dairy farmers to purchase liquid milk under FSCs	Further, agro-based industries are also eligible to receive loans at 14 percent per annum under the credit programme up to a maximum limit of Rs.300 million per borrower Such industries are required to enter into FSCs with 1,000 to 10,000 farmers to purchase their produce The CBSL and lending banks will assist the industries to enter into FSCs with farmers. The loans are available for the following purposes: 1 Construction of industrial buildings/modernization 2. Purchase of modern machinery and equipment 3. Storage, cold rooms and transportation services	
		Promotion of Forward Contracts (FCS) - Central Bank Regional Development Department - Establishment of a futures market for agricultural commodities	
Participating Financial Institutions	Bank of Ceylon, Ruhuna Development Bank People's Bank, Wayamba Development Bank Hatton National Bank, Kandurata Development Bank Commercial Bank, Rajarata Development Bank Sampath Bank, Sabaragamuwa Development Bank Seylan Bank, Uva Development Bank, Lankaputhra Development Bank, SANASA Development Bank		Bank of Ceylon, Commercial Bank, Hatton National Bank, Sampath Bank, Seylan Bank, Kandurata Development Bank, Rajarata Development Bank, Ruhunu Development Bank, Uva Development Bank, Wayamba Development Bank, Sabaragamuwa Development Bank, Sanasa Development Bank, The Finance Co. LTD.

Annex 3: Rationale for the choice of agricultural products for the study

This annex describes why maize, milk and lowland, tropical vegetables were selected as the products with the greatest capacity for improving the income of poorer farmers. The choices were narrowed down by the use of filters, which eliminated products grown mainly on wealthier farms and niche or new products. The three products were identified through an iterative process that included a production resource audit of poor farmers, field surveys to gather farmers' opinions on opportunities and constraints, and more general stakeholders' meetings to elicit local opinions on farmer opportunities and constraints in the four poorest provinces of Sri Lanka. Table 1 gives a general overview of the reasons for selecting maize, milk and vegetables.

Table 1: Reasons for Selecting Maize, Milk and Vegetables as Targets for Interventions

Maize	Milk	Vegetables and specifically lowland/ tropical vegetables
➢ It is mainly a dryland crop, therefore a typically poorer farmer crop. Uva and Eastern region together account for 60 percent of SL maize production ➢ Dryland farmers in Eastern and Uva regions expressed an interest in commercializing their maize production ➢ As a result of improved yields produced by the new seeds and high international prices, maize could become a highly profitable rainfed crop	➢ Three of the poorest regions, North, East and Uva, account for about 40 percent of national cattle herd ➢ Milk production is primarily a small farmer enterprise - 72 percent of the milk herd found on holdings of less than 1 ha and another 20 percent on holdings are in the 1 to 2 ha size range ➢ Producers enthusiastic about selling milk, especially to organized milk processors. They saw it as an enterprise requiring limited physical effort that would generate regular cash income not directly linked to holding size	➢ Lowland vegetables are typically associated with poorer producers as there is little comparative advantage[47] ➢ Poverty is mainly found in lower altitude areas, where only tropical vegetables are grown ➢ The analysis showed that in the poorest regions, lowland vegetable growers were generally no better off than rice producers ➢ Under projects like Gemidirya, diversification into vegetables was a high priority among communities, implying that producers believe that vegetable production would result in higher income

The sections that follow give a detailed report of the market prospects, key issues affecting the product value chain, the competitiveness and the profitability of each chosen product.

Maize: Market description

Growth in the poultry industry has fueled the expansion in the market for maize. Maize is the major ingredient in chicken feed with current demand at some 160,000 tons per annum. The domestic market for maize has historically grown by nearly 6 percent per annum only falling to 3.5 percent over the last five

[47] Although temperate vegetables and potatoes are grown in the higher areas of Uva i.e. Badulla, these areas are not associated with poverty.

years. This slowing in growth has been partly caused by the impact of concerns over bird flu coupled with the integrators controlling the supply of day-old chicks, in order to maintain prices and their margins. Sri Lanka's maize production has remained at around 30,000 tons per annum. By the early 2000s national production had fallen to less than 20 percent of supply. The cost of maize imports stands at some US$ 22 million per year (SL Rs 23 billion).

The maize market is dominated by a few major feed mills that act as poultry integrators. There are also a number of smaller-scale feed mills. Representatives of the poultry industry predicted continued growth of the demand for chicken products of between 5 and 10 percent per annum over the next decade.

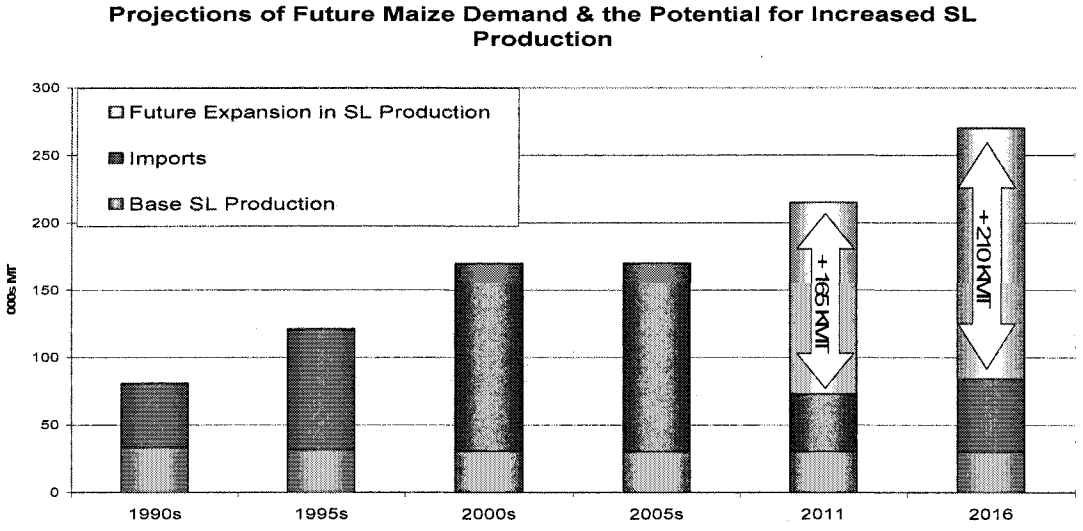
Table 2: Summary of Findings on Maize

Maize			
Market prospects	Issues	Competitiveness and profitability	How to confront challenges and constraints
Demand for maize has increased by 6 percent per annum over the last decade, but this currently been supplied by imports, now reaching over 150,000 MT pa. ➢ 65 percent increase in international prices during 2005 to 2007 due to increased demand for maize being used as feedstock for ethanol production. ➢ Major users of maize, primarily for poultry feed, are keen to purchase locally grown maize because of increasing prices of imported maize, and political and social pressures. ➢ Imported F1 hybrid seeds have significantly improved crop profitability	Key issues that need to be resolved in order for large-scale buying of maize to occur: ➢ Sri Lanka producers are assisted to consistently deliver products that matches their buying specifications e.g. moisture content of below 14 percent ➢ Sufficient quantity needs to be produced for bulk local procurement and to ensure bulk buyers a secure supply of maize[48] ➢ Sufficient price advantage for buyers to switch to locally produced maize[49] ➢ Producers need to be sufficiently organized to facilitate communication and market linkages / buying programs	The analysis of the maize sector has demonstrated that: ➢ Through the use of F1 hybrid seed, maize can be grown competitively with imported maize, even without tax and tariff protection ➢ Maize is a highly profitable crop for dryland farmers when likely long-term[50] prices are used in the crop economics; a key issue: to ensure that pricing is transparent ➢ At an average yield of 2.25 Mt/acre, to substitute for 100,000 tons of imported maize would require around 45,000 acres of land and inject an additional US$ 9 million of profit per	Animal feed industry willing to buy directly from producers if they aggregate their product into sensible volumes. This will encourage the formation of farmer groups to facilitate communication between producers and buyers, organize logistics and provide market information to improve negotiations ➢ Maize represents a significant opportunity for saving on foreign exchange ($ + 20mn/pa) and raising farmer profits ➢ A pro-active approach including: • Use of F1 hybrids, and improved crop agronomy • Developing on-farm drying techniques • Supplying buyers with critical mass of maize through farmer groups

[48] There is a need to bulk up national production. Currently production increases are mainly, and sensibly, being channeled to the higher priced, niche markets i.e. green corn as a food product.
[49] There are currently a number of disincentives for feed mills to switch from imported grain. Imported maize's price can be hedged; millers need assurance that the promised volumes will be forthcoming.
[50] Based on typical long-term international prices.

	➢ Unless proactive steps are taken, large-scale buyers would probably focus their maize promotion efforts in Anuradhapura, where maize yields are slightly higher and access is easier	year for Sri Lankan farmers	• Developing an agreed formula based on international prices to generate transparent pricing for the large-scale purchase of local maize for animal feed ➢ Incentivize the private sector[51] to develop a maize-producing sector in high poverty areas

Figure 1



Source: Team Analysis.

Since this analysis was carried out in 2006, maize production in Sri Lanka has increased significantly. The analysis shows that with improved technology, maize production in Sri Lanka is competitive against imported maize. Even at low prices, or prices without tariffs, the new technology will make the crop sufficiently profitable to incentivize expanded production and import substitution. Assuming that 80 percent of maize imports could be substituted by Sri Lankan production, this could lead to an additional 50,000 acres of maize production, an increase of 70 percent in the national maize area. This would save US$17 million in foreign exchange and generate additional net returns for Sri Lankan growers of about a billion Sri Lankan rupees.[52]

[51] Provision of private extension services, linkages to farmer groups through projects operating in these areas, facilitation of on-farm trials and practical research.

[52] This assumes an additional net return of SL Rs 20,000 acres for maize over other rain fed crops

Over time, the benefits of maize production will improve. By approximately 2015, the area under maize could exceed 80,000 acres, resulting in foreign exchange savings of about US$ 28 million per year and an additional net return over other rainfed crops of over SL Rs 1.5 billion. This production will partly substitute existing low-profit rainfed crops.

If farmers are to achieve the level of net returns suggested by the analysis, three changes will need to be made. First, farmers need to be able to dry their crop on farm and measure moisture content themselves.[53] Second, they need to aggregate their production into sensible transport loads (i.e., 10 tons). Third, if farmer groups are to negotiate with feed mills from a position of strength, they will need to understand the delivered price of imported maize. In order for the second and third points to happen, aggregation and marketing skills need to be built around community-based organizations (CBOs). Additionally, effective communication between the buyers and maize producers will have to be facilitated.

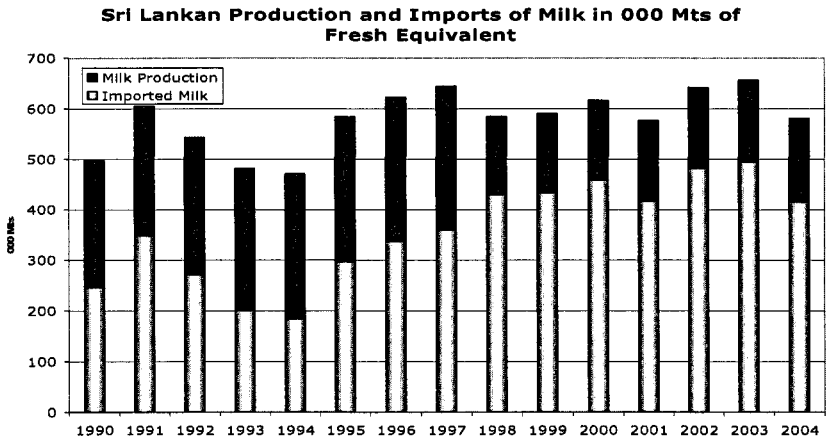
Discussions with major feed mills have indicated that a process needs to be put in place to help create a strong local maize sector. Elements are likely to be a transparent pricing formula for calculating a fair price for delivered maize, an effective communication strategy and clearly understood quality standards. Ultimately, for a successful maize sector to operate in Sri Lanka there is need for a well integrated value chain. Production needs to match imported maize both in terms of quantity and quality. The Government of Sri Lanka has the capacity to convene producers, processors and researchers to form an industry that has effective communications and can build a competitive advantage.

At the moment it is likely Anuradhapura will reap most of the benefits from increased maize production. Producers there are closer to the feed mills, and there is potential for improving their yields. Incentives are needed to encourage feed mills to operate in the poorest regions. This calls for pro-active interventions (e.g., forming farmer groups, providing agronomic advice, developing on-farm drying techniques) that have as a goal to create an efficient maize sector in the needy areas of Eastern region and Uva.

[53] This will require a practical on-farm research program, probably focusing on improving the existing crib drying techniques.

Milk: Market description

Figure 2: Sri Lankan Fresh Milk Production Declines, While Imports of Dried Milk Continue to Increase



In the early 1990s, the Sri Lankan milk demand stood at 500,000 tons of fresh milk equivalent. National production amounted to some 60 percent of demand (about 280,000 tons). By the early 2000s, total supply reached 600,000 tons, but domestic production had fallen back to some 160,000 tons or only 25 percent of demand. Milk is an important component of the Sri Lankan diet. Average consumption of milk and milk products has grown steadily, rising over time and across income deciles. Imported dairy products include butter, cheese, yoghurt and other milk by-products, but dried milk powder is by far the single most important imported dairy product. It now accounts for nearly 95 percent of total dairy imports. Annual imports of milk powder have more than doubled in the last 20 years, from 30,000 tons in 1985-87 to 67,000 tons in 2003-05. The value of imported milk products stands at some US$ 120 million, or SL Rs 13 billion, per annum.

The consumer is said to perceive dried milk powder as more convenient, more hygienic and cheaper than fresh milk. Spending on fresh milk has diminished from 0.9 percent of total food and drink expenditure to 0.1 percent during 1980/81 to 2002. Spending on milk products increased from 2.4 percent to 7.8 percent over the same period.

Currently the installed capacity for milk processing stands at 745,000 liters per day. Average utilization is only 38 percent (i.e., 280 TLPD). Two companies, MILCO and Nestlé, account for approximately 80 percent of milk purchased for processing. The Government increased farm gate prices by about SL Rs 2/liter in 2006. Farmers have responded with increased supplies. The most usual farm gate prices are in the range of SL Rs 18 to 23 and probably average around SL Rs 20 per liter (i.e., about US$ 0.18/liter). A proportion of this product is turned into milk products such as ice cream, yoghurt and dried milk. Typical retail prices of packaged fresh milk are in the range of SL Rs 60-70 per liter. Trade opinion is that the most profitable use of additional supplies of fresh milk would be as a raw material for processing dairy products.

With the rapid increase in the international price of dried milk powder (up 55 percent) from 2005 to 2008), the milk sector believes that production of milk powder is now profitable in Sri Lanka. If milk processing can be established as a sustainable business, the additional income stream would be significant and likely to flow into the poorest regions of Sri Lanka.

Table 3: Summary of Findings for Milk

Milk			
Market prospects	• Issues	Competitiveness and profitability	How to confront challenges and constraints
➢ There is increasing consumer demand and spending on milk products (8 percent p.a. in last 10 years), but a long-term decline in sales of locally produced fresh milk ➢ Prices of imported dried milk powder increased by 55 percent from 2005 to 2008 ➢ The unit cost of producing milk in Sri Lanka is approximately US$ 0.17/liter, competitive with international prices ➢ At least two companies have expressed an interest in setting up milk plants and procuring milk locally	Key issues for potential dairy processors are: ➢ A government partnership to provide funds to create the necessary rural infrastructure, i.e., village dairy societies, milk routes and long-term support to increase productivity [54]	The analysis of the milk sector has shown that: ➢ Sri Lankan farmers, especially in the poorest regions, produce milk at internationally competitive prices ➢ Key competitiveness issues relate to post production phases (i.e., collection, processing and marketing) influenced by the lack of economies of scale ➢ Recent price increases incentivized additional milk production	➢ The private sector is becoming interested in investing in the milk sector, given the current high prices of dry milk powder. Their main interest: setting up processing plants and securing raw material with well planned milk collection routes ➢ Dairy processors have to operate milk routes to secure fresh milk. Agribusinesses are prepared to buy directly from producers to overcome market access issues. This process could benefit from facilitation through an intervention that would include: ➢ The formation of milk societies around planned milk routes ➢ Investment in necessary rural market infrastructure, e.g. chiller tanks and automatic quality measurements linked to prices ➢ An on-going program for boosting productivity, e.g. genetic improvement of the herd, animal nutrition The report cites examples where a 20 percent development investment in rural infrastructure, farmer mobilization and training offers the potential for leveraging private sector investment into a system that could deliver an ongoing income stream. Development funding can be used to direct these investments into areas that have the greatest need and suitable agroclimatic conditions.

[54] Principally through feed and fodder supply, technical advice and upgrading the milk herd (i.e., AI, elite bulls, etc.).

At the end of 2007, only 20 percent of milk demand was met locally. The government has expressed an interest in filling the demand completely with locally produced milk so as not to rely on milk imports.

The annual bill for imported milk products stands at over US$ 100 million. Demand for milk and milk products is expected to continue to grow. Sri Lanka's dairy farmers are internationally competitive, especially those in the lower–altitude, dryer areas of the poorest regions. The prices of dried milk powder are currently at an all-time high, having increased 85 percent since 2005. This has created a window of opportunity for the local milk sector.

The current high price of imported milk powder has stimulated significant interest among the private sector to invest in milk processing. But for this to happen, they need a secure supply of raw material from organized producers and local market infrastructure to be put into place. Their main interest lies in processing fresh milk into various milk products such as dried milk powder, yogurt, curd and flavored drinks.

Experience elsewhere in the subcontinent has shown that once established, dairy processors operating milk routes can deliver extremely important and regular income streams to milk producers, most of whom are small-scale producers.

Development funding (i.e., in the form of competitive grant schemes) could be used to stimulate dairy processing investment into those areas with the greatest economic need.

Vegetables: Market Description

Prior analysis in this study showed that vegetable producers in the poorest regions have a high incidence of poverty, and that poverty is associated with the lower altitude areas where tropical vegetables are grown. The high-altitude, cooler areas of Uva, where temperate vegetables and potatoes are grown, are better off.

Vegetable production increased rapidly during the 1980s (CAGR 8.1 percent) and slowed in 1990s (CAGR 0.8 percent). However, census figures show that from the mid 1990s until the mid 2000s, the supply of upland (temperate) vegetables increased more than three and a half times more than that of lowland vegetables. Trade opinion was that consumers have much stronger demand for higher altitude vegetables.

Figure 3

Figure 3 shows that producer prices are typically much higher for temperate vegetables than for lowland vegetables. Upland producers in Uva and Sabaragamuwa obtain better than average prices for their produce because of the comparative advantage that their cooler climate confers. Lowland vegetables are not only lower cost items, producers in the lagging regions obtain especially low prices.

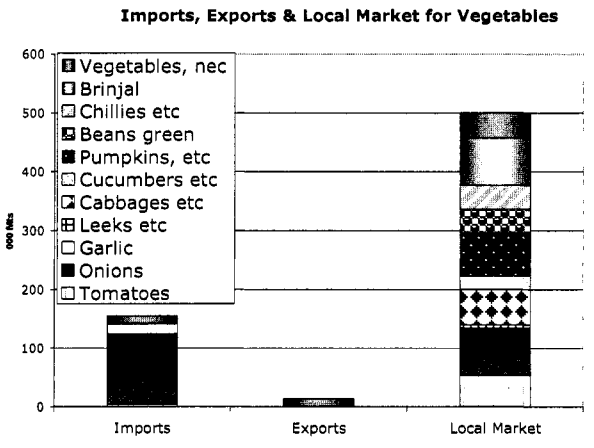


Table 4: Summary of Findings for Vegetables

Vegetables			
Market prospects	Issues	Competitiveness and profitability	How to confront challenges and constraints
For lowland vegetables, the market prospects are poor because: ➢ Consumption increase mainly in temperate vegetables, rather than lowland, tropical vegetables ➢ Vegetables in high poverty areas typically harvested at peak season or later, when prices are especially low ➢ Most producers disconnected from the market, with no understanding of changing consumer demand or market oriented production ➢ Poor market access; produce sold through a network of middlemen and poorly functioning local markets ➢ Export market and supermarket demand for lowland vegetables is weak	➢ Traders interested in establishing more direct buying relationships with producers, which would eliminate middlemen and enable producers to become more market-oriented in their production ➢ Local market infrastructure inadequate or badly planned but "smart" investment programs could facilitate local trade	➢ The analysis of lowland vegetable production has shown that producers receive low prices, especially in inaccessible locations ➢ When lower farm gate prices (14-18 percent below country average) are introduced into crop budgets, crop net returns are reduced by about 60 percent, generating the same level of gross profit as irrigated rice; this would explain why lowland vegetable producers are not better off	➢ Financial analysis has shown that higher farmer profit is highly dependent on improving market efficiency, e.g. more direct marketing linkages that lead to more market-oriented production, and better linkages between producers and the market. This is likely to involve more "marketing extension" to provide communities with some explicit knowledge of the market, but particularly implicit market knowledge ➢ Exporters and supermarkets have little interest in buying directly from lowland vegetable producers. As a result, market access issues have to be tackled differently and this report presents two potential solutions: getting farmers to aggregate their produce and take it directly to market (thereby eliminating middlemen), and building well-located markets that are attractive to the trade.

Vegetable producers in poor, lowland regions operate at a considerable disadvantage. Supply of tropical vegetables is easily expandable, but demand for them is weak. Supermarkets are mainly interested in temperate crops. Vegetables in Uva and Sabaragamuwa are harvested mainly during peak and late season, when prices are especially low. Producers have difficulty accessing the market, have no understanding of changing market demand and suffer high levels of quality reduction in transport.

In terms of possible interventions, the focus will need to be on making production more market oriented and encouraging farmers to aggregate their produce (and take over the middleman's role) and take it directly to market. There may be a case for building local markets along the lines of Dambulla.

However, any such investment will need to be based on a feasibility study demonstrating that there is a need for such a facility and that it can be built in a location that is attractive to the trade. Technological solutions for increasing farmer prices might involve using irrigation, varieties and possibly, in the case of onions, storage facilities to extend supply beyond the low priced peak seasons.

References

Asian Development Bank, 2004, *Promoting Commercialization of Agriculture in Sri Lanka,* Seneka Abeyratne.

Central Bank Annual Reports. Various years. Colombo.

Charles, S.H. (2002). Sri Lanka Agricultural Technology Policy and its Iimpact. Paper prepared for the Sri Lanka Agricultural Policy Review of the World Bank. Mimeo.

Department of National Planning. 2006. Mahinda Chintana: *Vision for a New Sri Lanka,* Colombo: Ministry of Finance and Planning.

FAO (Food and Agriculture Organization). FAOSTAT. http://faostat.fao.org/default.aspx. Rome: FAO.

National Dairy Development Board, 2005 *Livelihoods Improvement through dairying in the Gemidiriya Project in Sri Lanka, and India.*

Tabor, S.R., S. Abeyname, and R. Epaarachchi (2000). An agro-industry strategy and policy reform action plan for Sri Lanka, Ministry of Industrial Development (with the assistance of the USAID). Colombo: The Agro-Enterprises Project.

World Bank. 2003. *Sri Lanka: Promoting Agricultural and Rural Non-farm Sector Growth.* Report 25387-CE. Rural Development Unit, South Asia Region, World Bank, Washington, DC.

World Bank. 2004. *Agriculture Investment Sourcebook.* Washington DC: World Bank.

World Bank. 2005. *Sri Lanka: Improving the Rural and Urban Investment Climate*. Colombo and Washington, D.C, World Bank.

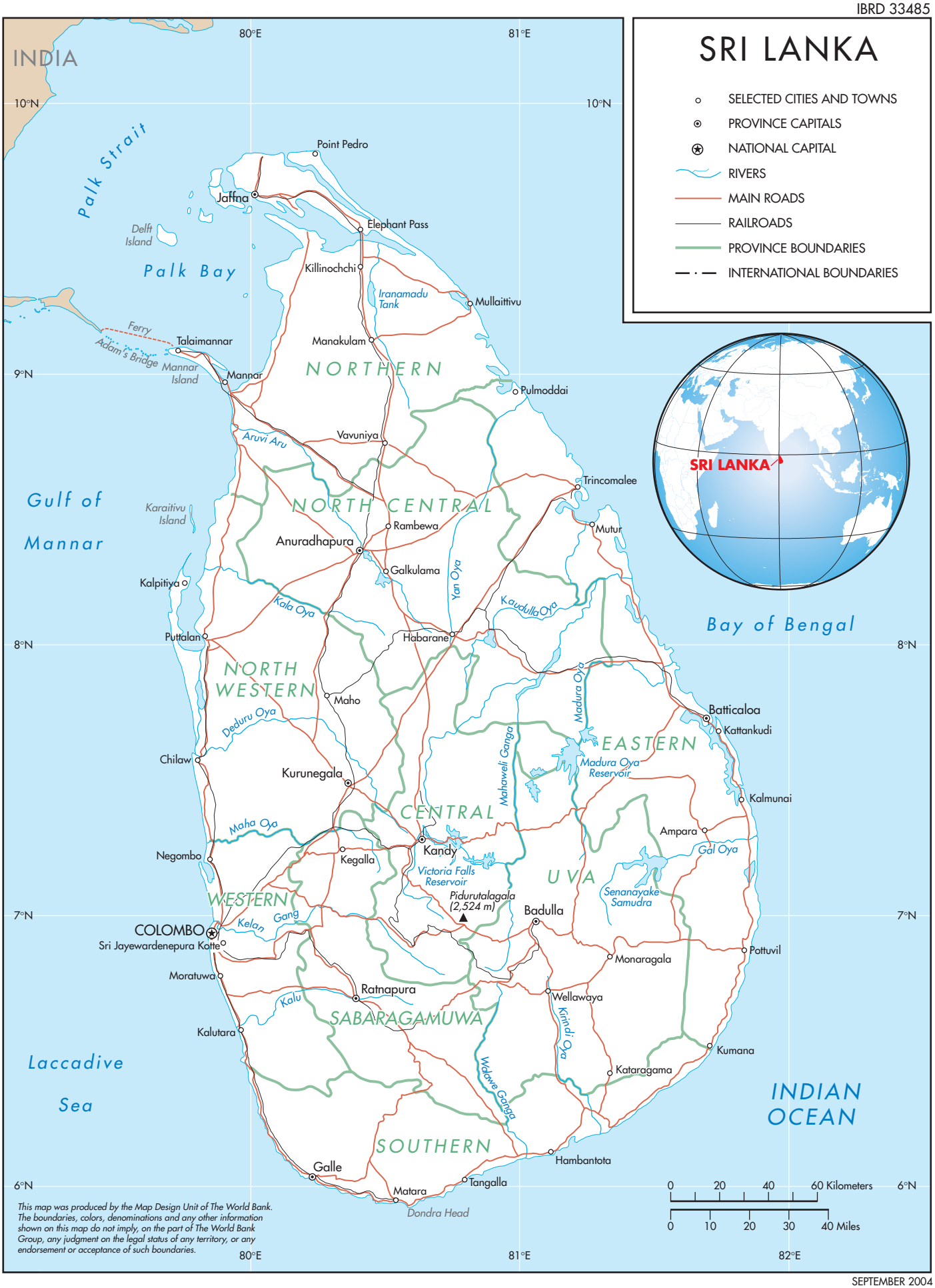
World Bank, 2006. Sri Lanka Poverty Assessment. Engendering Growth with Equity: Opportunities and Challenges.

World Bank (2006). *Agriculture Import Liberalization and Household Welfare in Sri Lanka,* Draft, World Bank.

World Bank. 2007a. "Sri Lanka Tea and Rubber Sectors: Promoting Sustained Pro-Poor Growth and Competitiveness." Draft report. SASSD, World Bank, Washington, D.C.

World Bank. 2007 "Reviving Sri Lanka's Agricultural Research and Extension System: Towards More Innovation and Market Orientation" Draft Report. World Bank. Washington, DC and Colombo.

IBRD 33485



SEPTEMBER 2004