ANNEX:

Study of Agricultural Policy in Sri-Lanka with a focus on Small millets

IDRC Project Number: 106506

Research Institution

DHAN Foundation

Report Type

Research Report

Location of Study

Prepared by

DHAN Foundation

Date

Part of

Revalorizing Small Millets in the Rainfed Regions of South Asia

Canadian International Development Agency
Agence canadienne de développement international

IDRC | CRDI
International Development Research Centre
Centre de recherches pour le développement international

Contents

1. Introduction and Background…… 1
2. Review of Major Policies on Subsidiary Field Crops Including Small Millets Since 1970s……. 6
3. Methodology Adopted to Develop the Document…… 12
4. Dimensions of Health, Nutrition, Livelihood and Importance of Small Millets ……. 13
5. Need of Government Policy to Develop the Sector of Small Millets ……. 16
6. Specific issues revealed in the farmer and household survey …… 20
7. Identification of Root Causes and Possible Solutions to Develop the Sector …….. 23
8. Way forward to intervene in policy formulation …… 25

References ……. 28

Tables

Table -1: Composition of nutrients of 100g of finger millet and whole maize …….. 2
Table -2: Area of cultivation of selected food crops (acres) ……. 3
Table -3: Extent and production of Finger millet (Kurakkan) …… 3
Table -4: Cultivated extent of finger millets and maize (ha) …… 7
Table -5: Summary of key policy actions after 1994 ……... 10
Table-6: Comparison of development indices (2011) …….. 14
Table-7: Agriculture labour force of different provinces of Srilanka …… 14
Table-8: Comparison of selected health indicators among selected countries ……. 15
Table-9: Weaknesses of policies and their implications ……. 19

Annexure ……. 30

REPORT ON REVOLORIZATION OF SMALL MILLETS: DEVELOPING A POLICY

1. Introduction and background

The millets are a group of highly variable small-seeded grasses, widely grown around the world as cereal crops or grains for both human food and fodder. Millets are important crops in the semi-arid Tropics of Asia and Africa, with 97% of millet production in developing countries. The crop is favored due to its productivity and short growing season under dry, high temperature conditions. The most widely grown millet is pearl millet, which is an important crop in India and parts of Africa. Finger millet, proso millet, fox-tail millet are also important crop species in this group.

While millets are indigenous to many parts of the world, millets most likely had an evolutionary origin in tropical western Africa, as that is where the greatest number of both wild and cultivated forms exist. Millets have been important food staples in human history, particularly in Asia and Africa, and they have been in cultivation in East Asia for the last 10,000 years.

Finger millet (ragi in India, Kurakkan in Sri Lnka) and fox-tail millets are the ancient millets commonly cultivated in Sri Lanka. Of all the cereals and millets, finger millet has the highest amount of calcium (344mgper 100g) and potassium (408mgper 100g). It has higher dietary fiber, minerals, and sulfur containing amino acids compared to white rice. Despite rich nutrient profile of finger millets, recent studies indicate lower consumption of millets in general and particularly in urban areas of the country. Recent studies have indicated the blood glucose lowering, cholesterol lowering, antiulcerative, wound healing properties, etc., of finger millet. However, appropriate intervention to capitalize these benefits has not been taken by the relevant authorities.

Agriculture, broadly defined as the work of cultivating the soil, producing crops, and raising livestock, is the human activity that has had the greatest impact upon the global environment. Sri Lanka inherited a dual economy, at the time of independence (in 1948). A small modern plantation sector, dominated by exports of tea, rubber and coconut, existed side by side with a large traditional domestic agricultural sector, consisting mainly of paddy and vegetables, catering to the needs of the local population. The plantation sector was initiated and nurtured by the colonial powers which ruled the country and there was hardly any concern on the domestic agricultural sector. The dualism of the sectors was evident not only in respect of the target consumer population, but also in technology (technological dualism), and in social and cultural spheres (social and cultural dualism). The national governments which came to power after independence had two major interests; to maintain and improve the productivity of the plantation sector and, to develop the neglected domestic agricultural sector. Since independence all governments have channelled vast amounts of investments in bringing about serious structural, technological and institutional changes in the domestic agricultural sector. The major turning point in the process of development was the 'green revolution' or seed-fertilizer revolution which took place in mid 1960's. Varieties of newly improved crops yielding a high response to chemical fertilizer were introduced, increasing the production and productivity of agriculture. The road networks were expanded and markets widened. A number of supportive institutions for agricultural activities were established.

Farmers started producing large surpluses for sale. Exports were expanded through production increases and diversification (expansion of product mix), and some of the earlier imports were substituted through processes of import substitution. Full integration of the Sri Lankan economy into the international markets took place in 1977, with the adoption of open-economic policies, expanding the potential for international trade. This expansionist process required quality improvements, value addition, business services, new institutions, quality certification, research, training and capacity building. Sri Lankan governments have made serious efforts in meeting these needs, although gaps between supply and demand exist. Unfortunately, this process has been purely growth oriented and there was no adequate concern for the environment and the needs of backward groups of people. Human development goals gradually started to clash with ecosystem health goals, leading to environmental degradation. Large doses of chemical fertilizer, inappropriate cropping practices, bad land, soil and water management practices, high rates of deforestation and land clearing, are all leading to declining soil fertility, water pollution, and finally a non-sustainable ecosystem.

A housewife of a remote rural area of Monaragala district wakes up early morning, performs all rituals, prepares food, cultivates lands, grinds finger millets using very heavy equipment made of granite, prepares meals for the dinner using finger millets flour and enjoys with the family members. She has no stress in life, has not much desires, no big expenditure on medicines and medical consultations and lives healthy life for a long period with her grand children. External inputs are minimum in her daily life and therefore dependency on external shocks is minimum. However, at present, the context has been changed in many areas of Monaragala district; cultivation and food patterns have been drastically changed; family relationships have been threatened; dependency on external inputs and external shocks have been increased; continuous treatments for many chronic diseases such as diabetes, high blood pressure and stress related syndromes. Issue is satisfaction or happiness of the life of the people is achieved from so called development.

Although the paddy cultivation was the main livelihood of the country, the literature reveals that cultivation of small millets and allied activities has also played a remarkable role in the history of Sri Lanka in centuries shaping the culture, language, traditions and life of the people. Out of the crops cultivated in thousand years ago species of small millets mainly fox-tail millets and finger millets were dominant (Siriweera, 1978). According to Endagama (1998) different foods prepared from finger millets and fox-tail millets were popular as main meals in 13th century. The finger millet has high nutritive value compared to other cereals and therefore it is a good alternative domestic crop to overcome malnutrition, especially iron deficiency which causes anemia, in rural poor societies. Following table shows a comparison of composition of finger millet and maize.

Table-1: Composition of nutrients of 100g of finger millet and whole maize

Nutrients	Finger Millets	Maize
Energy (Kcal)	363	363
Proteins (g)	10	10
Fats (g)	4.5	4.5
CHOs (g)	71	71
Calcium (mg)	12	12
Phosphorous (mg)	2.5	--
Iron (mg)	350	2.5
Carotene (mcg)	130	--
Vitamin C (mcg)	2	--

Shifting cultivation was the traditional cultivation method of the ancient history, however with the population growth and limitation of cultivable lands induced the requirement of irrigated and modern agriculture in later stages. Irrigation and settlement schemes have mainly focused on paddy cultivation. Government policies such as importation of rice to fulfill the gap between production and the requirement, irrigation and settlement schemes targeting paddy production, guaranteed price schemes of paddy have induced the change of food pattern of the rural people. Although the paddy cultivation of the main livelihood of the rural people in the later stage of the 21st century, they have cultivated finger millets and other field crops in uplands as shifting cultivation and in home gardens to minimize the uncertainty of the paddy production. However, especially in the wet zone, spreading of plantation crops such as tea rubber, coconut and cinnamon has reduced the availability of land for subsidiary food crops such as finger millets and other small millets.

Government policies after independence has induced the land use pattern reducing the area under subsidiary food crops. Following table shows the changes of area under selected crops.

Table-2: Area of cultivation of selected food crops (acres)

Crop	1953	1962	1971
Finger millets	93,267	23,580	50,246
Maize	37,146	12,052	44.400
Gingelly	33,634	42,786	28,218
Cassava	172,959	42,786	147,036
Potato	0	599	7,580
Green gram	12,287	2,476	8,251
Cowpea	7,711	1,925	4,060
Chilies	33,546	11,740	56,818
Red onion	12,304	5,311	16,723
Tobacco	13,692	13,300	15,734

Sources: Agricultural Survey, 1953, 1962 and Department of Census and Statistics, 1971

Table-3: Extent and production of Finger millet (Kurakkan)

Season	Cultivated extent (ha)	Production (mt)	Average yield (mt/ha)
2007/2008 Maha season	5328	5429	1.02
2008 Yala season	1056	1093	1.04
2008/2009 Maha season	5024	5571	1.11
2009 Yala season	878	862	0.98
2009/2010 Maha Season	5540	6209	1.12
2010 Yala season	1025	1098	1.07
2010/2011 Maha season	4199	4274	1.02
2011 Yala season	1052	1137	1.08

Source: Socio Economics & Planning Centre, Dept of Agriculture

Records show that the area of cultivation has reduced from 93,267 acres of finger millets in 1953 to 23,580 acres in 1962. Area under maize has reduced from 37,146 acres in 1953 to 12,052 acres in 1953.The reasons behind the reduction of the area under subsidiary food crops were the increment of the land area under paddy as a consequence of government policies promoting paddy production and giving rice ration for poor people. This indicates that the government policies has a great impact of

changing the pattern of food consumption and tendency to cultivate subsidiary food crops. In 1966, the rice ration was reduced from two pounds to one pound per head and consequently cultivation of subsidiary food crops has increased significantly after 1966. Due to reduction of rice ration and the increase of rice in the domestic market have promoted the increase of cultivation of subsidiary food crops (Marga, 1972).

During last three decades, indicators show that the growth of agricultural sector is comparatively slower than that of industrial and service sectors. Therefore, the contribution of agricultural sector to the GDP of the country has reduced to 12% and the labour force in agriculture sector has reduced to 32% by the year 2012. It shows that available resources of the country and the potentials have not properly utilized and the agriculture is not a remunerative and attractive venture for educated youth. As a result, although there are underutilized lands and other resources were available, a considerable portion of rural youth labour force has transferred from agricultural labour force to the open labour market.

There is no doubt that the agriculture has a major influence on overall economic growth, trade balance, budgetary position of the government and the level and structure of poverty, malnutrition and food security. One fourth of the total population of the country lives in rural and underdeveloped areas where poverty is mostly concentrated. As the majority of the people are involved in the agriculture sector, it has the capacity to reduce the poverty rather than other sectors. It is also the food producer with the major influence on the domestic food supply and national food security. The sector serves as the major employment generator, provider of rural livelihood activities and an earner of foreign exchange. The agriculture sector plays the role of import substitution and source of labour to other services such as industry, services including defense.

However, agriculture sector after independence gives only a few success stories. Remarkable increases of productivity in selected crops due to green revolution in 1960s, change in vegetable and fruit marketing systems to cater to the emerging supermarket systems in 1990s, increase of production of maize in 1990s due to hybrid varieties, mechanization of paddy production process including land preparation and processing and improving rice milling process with new machineries are some of the examples for success stories.

Overall the key indicators of the agricultural sector; production, imports, consumption, consumer prices, storages, proportion of household income on food expenditure .. etc show less performance than the desired level. Yields of crops and livestock show no significant improvement during last two three decades in spite of large amount of subsidies and efforts on those fields. Prices of food commodities are volatile and uncertain. Following are some of the important points showing the poor performance of non-plantation agricultural sector.

- Unanticipated price fluctuations of agricultural products, especially in vegetables, pulses and cereals
- High disparity of regional distribution of agricultural GDP
- Qualities of the output, varieties are not matched with the desire of the consumers. That means the time, form and the place utility of the consumers are not properly addressed.
- Input use such as irrigation water, fertilizer, ago-chemicals, seeds are not effective and also not sustainable.
- Quality and the adequacy of research, extension services and services delivery are not satisfactory.

- Insignificant inventions and innovations of the sector compared to other sectors
- Slow expansion of value addition and post harvest activities
- High market margins of output reflecting poor marketing mechanisms and inefficient input market

A good indicator to show the less attractiveness of the agriculture sector is the demand for agricultural education of the country. Before the year 2000, in university admission process, the agriculture degree programmes were just below the Medical and Dental degree programmes and well above the Biological Sciences and other relevant degree programmes. It means that the agricultural degree programmes were at the level of third preference. At present, the scenario has completely been changed and today agriculture degree programmes have fallen to seventh, eighth or in many years the last position in many districts in preference order of students. Another interesting story in education sector is the selection of subjects by grade ten students of government schools. A recent survey revealed that less than 10% of the students select agriculture as the technical subject among the subject basket including of agriculture, home science, information technology and health science. Especially, in Hambantota district which is predominantly an agriculture area, there are no students for the subject of agriculture in several schools. This situation highlights the fate of the agriculture at present and also future trends.

The issue is multifaceted and the government sector has to play the major and proactive role while other parties also contribute. Major component should be revising the policy framework as the outcome with present policies proved that they are inefficient to address the issue. The policy makers should learn from the past and have a long term vision. Policies should avoid biases and effective strategies. Current policy framework shows a negligence or inadequate involvement of the private sector and all the projects and programs heavily depend on the public sector. There are no public private partnerships. Public expenditure on agriculture sector is ineffective and inadequate with low accountability and not result oriented. Past public policies show a bias towards conventional sectors. Following are some of the example of partiality of recent public policies.

- Public sector involvement of all policy strategies neglecting other stakeholders such as private sector, farmer organizations, non-government organizations which are playing a considerable role.
- All policies target the increase of production and trying to push the chain rather than improvement of market and demand factors to pull the chain. This scenario is repeating every season of the harvesting period of paddy, potato and other field crops.
- More emphasis and expenditure on research rather than the extension. There is a huge knowledge gap and yield gap between research stations and the farmer. In many crops the yield gap is about 50% implying that the farmer has to cultivate more lands to obtain a yield which could be obtained from fewer areas of land and less resources.
- Policy bias towards interest of producers rather than interest of consumers. Therefore, the products have not been developed according to the market demand.
- Policy biased towards paddy rather than other field crops. Fertilizer subsidies, irrigation and purchasing schemes were all about the paddy. In irrigation schemes irrigation schedules are based on paddy discouraging other field crops.
- Highland field crops and rain-fed agriculture have been completely neglected and priorities have been given for irrigated agriculture.
- At present finger millets and other small millet cultivation is challenged and the demand is fulfilled with the imports. The room of the food basket for small millets is disappearing.

Following are reasons identified for neglecting the cultivation of small millets.

- Low productivity of available varieties and consequent low attention of the farmer resulting low land area and low production.
- Many local varieties are vanishing and loss of germ plasm.
- Although food demand is rising with increasing population, importance of finger millet is decreasing with the changing food pattern, urbanization, improved income, changing consumer taste and preferences, depletion of land fertility and constraints of water resources.
- Uncertainties of production; inter-temporal and geographical variation of production.
- Emerging labour shortages in rural area as a consequence of younger generation shifting away from the agriculture sector.
- Poor and unorganized input supply and services
- Underdeveloped marketing, value addition, processing and storage facilities.
- Price volatilities, ad-hoc nature of unplanned imports

However, the good news is that the preferences of finger millet is increasing due to medicinal value of these crops as a remedy for the treatment for high blood pressure, diabetes and many of the chronic diseases of the country. Hence, the relative price of finger millets has been increased in spite of low level of production. In the year 2000 the price of one kilogram of finger millet was equal to two kilogram of rice and by the year 2012 value of finger millet is doubled (four times) compared to rice prices.

This study aims to review the existing policies of subsidiary agricultural sector with special reference to finger millets and other millets of Sri Lanka and to develop mechanisms to intervene in policy formulation in order to develop the important but neglected sector of small millets and rain-fed agriculture.

2. Review of Major Policies on Subsidiary Field Crops Including Small Millets Since 1970s

The subsidiary field crops, also called as Other Field Crops (OFCs) refers a range of annual field crops excluding rice which is the main field crop in Sri Lanka. These include coarse grains (maize, sorghum, finger millet, fox-tail millet…), oil seeds (gingely, ground nut, soya bean..), condiments (chillies, onion, ginger, turmeric ..), roots and tuber crops (pototo, sweet potato, manioc ..) and vegetables. This sub-sector is important as the cultivated land area is about 100,000 ha and producing a variety of food items which takes a strategic place in national food security. Considering the rural poverty and nutritional status of the people of the rural areas these low cost and high nutritional crops prove the importance of the domestic agriculture. Although, the scientists have emphasized the nutritional value of finger millet and other small millets, very little improvement of the varieties and also lack of awareness in the society has led the declining trend of cultivation of these crops. This section deals with the discussion of major policies on the subsidiary food crops and their impact on production and consumption of these crops since 1970. Time periods were classified based of different regimes of the selected period.

<u>The period of 1970-1977 (07 Years)</u>

In 1970, the government resumed its inward looking policy of encouraging import substitution industries (ISI) and tightened the restriction on imports due to continuously falling of terms of trade and deteriorating current account balance. These policies targeted to cushion the impact on global crisis on the domestic economy and alleviating increasing poverty (Indraratne, 1998). Under this closed economy

during the period of 1970-77 the economic growth had fallen below 3%. Government interventions have increased in production, domestic marketing, imports and distribution of food. Due to imports of foods were restricted, production of rice and other subsidiary food crops have been increased neglecting the quality of the production. The government has invested a considerable sum of money as direct subsidies for material inputs such as fertilizer and seeds and indirect support such as research, services and extension. The Agrarian Service Centers (ASCs) were established at rural level to support small scale farmers. Establishment of Paddy Marketing Board (1972), Guaranteed Price Schemes (GPS) for rice and selected field crops were other important milestones. Several research articles show that through these inward looking policies farming community was benefitted at the cost of consumers in non-farm sector. A considerable number of new varieties were also released during this period. The green gram: Type-77, MI-4 and MI-5, Cow pea: IITA, Bombay Cowpea, MI-35, Selection-75, Arlington Cow Pea are some of the examples for new varieties. Although, new verities were not issued in finger millets, cultivation and production of finger millets also has been increased during this period. Following table shows the increase of the area of cultivation for the period from 1970 to 1977.

Table-4: Cultivated extent of finger millets and maize (ha)

Crop	1970	1971	1972	1973	1974	1975	1976	1977
Finger millets	20569	21166	22072	30181	37993	43817	39509	34602
Maize	19061	17812	20100	23946	33800	39697	38280	27468

It is clear that the extent under finger millets has significantly been increased up to 1975 and shows a declining trend thereafter. Researchers have shown that the declining trend after 1975 was due to paying more attention for paddy production to achieve the self sufficiency of food and consequent less attention on other field crops.

<u>The period of 1978 – 1989 (10 Years)</u>

Before ending the period of seven years from 1977 to 1977, the policy makers realized that the strategies adopted hindered the development of the country as a whole although there is an improvement of subsidiary crop sector. Therefore, the new government appointed in 1977, decided to focus on export oriented industrialization abandoning the past restrictions on imports. After 1977, the economic policy is classified as open economy. In November 1977, the government implemented a trade liberalization package by reducing tariff and removing import licensing and quota which were practiced during the last regime. Economic policy reforms implemented after 1977 included; reduction of protection levels for import competing sectors, provision of incentives for export oriented sectors, changing exchange rate regimes, fiscal and monetary reforms, liberalization of domestic factor and product markets from government interventions allowing free play of market forces and privatization of government business ventures (Gunawardene and Somaratne, 1999). It was a complete transition from inward-looking controlled economy to outward-looking free economy. With the new policies towards an open economy, local producers could not compete both in quality and the price with the cheap imports. However, to protect the local producers, government imposed tariff increases during the harvesting periods of potato and selected other field crops. Also the awareness about the quality of the imported products induced the local producers to think about the quality of the product. In 1989, export duties were completely phased out and import tariff rates also revised in to two band system 10% and 25%. At the same time, almost all state-owned marketing boards and corporations were either privatized or closed. It was observed that consumers were able to purchase products considering both quality and the price instead of buying whatever the product supplied by the local market. The farmer lobbies

complained about the market prices when they could not compete with the imports due to inefficiency of the crop production process. As a remedy of the situation government invest a considerable amount of funds for research in order to develop new varieties and also seed market was liberalized. Improved seeds were imported under import permits issued under Seed Protection Ordinance No.10. However, during this period extent of cultivation of subsidiary field crops including finger millets was continuously declined. Extent of finger millet cultivation was declined by 39.51% from 32493 ha in 1978 to 19626 ha in 1983. It was further declined by 39% for the period from 1984 (16927 ha) to 1989 (10199 ha).

The period from 1989 – 1993 (04 years)

The new government implemented a second wave of economic liberalization and policy reforms from 1989.The fertilizer subsidy were completely removed and private sector was allowed to compete in fertilizer marketing, together with government agencies. Interest rates of rural credit schemes were increased. During this period growth of non-plantation agriculture sector has recorded negative growth (Gunawardene and Somarathne, 1999). As a result of declining domestic production, domestic prices of subsidiary food crops were significantly increased during this period. Price of finger millets was increased from 8.54 Rs/kg from 1989 to 17.85 Rs/kg in 1983 which was more than doubled within four years.

The period from 1994-2001 (07 years)

Although, in 1994, new government came in to power, the former process was not changed as expected by the people. The national policy framework was prepared by the Ministry of Agriculture, Land and Forestry (MALF) in 1995.These policies included provision of high quality seeds and planting materials to farmers, consolidation of extension services, getting both private and non-government organizations involved in agricultural sector while government is playing a role of facilitator. In 1996, the government launched a country-wide food drive called *'Waga lanka waga sangramaya'* to face the anticipated food scarcity of 2005. The objectives of the programme were to commercialize subsistence farming, to adopt integrated farming techniques for year round cultivation and to enable farmers to increase their bargaining power. To achieve these objectives the MALF reinstated the farmer organizations which were set up earlier under the Agrarian Service Act. Ultimate target of farmer organizations was to set up farmer companies to help farmers to get remunerative prices for their products, to obtain inputs in easy terms, to increase both the quantity and the quality of the products and to increasing the bargaining power of farmers to influence policy makers. According to literature (Eparachchi et al,2002), only 22 farmer companies were in operation out of registered 85 farmer companies reflecting the inefficiency of the process. Although the Agriculture Insurance Board implemented farmer pension and social security scheme, farmers who cultivated subsidiary food cops were not benefitted through the scheme. In 1999, the Agricultural Insurance Board was renamed and restructured in order to involve private sector to undertake crop insurance. At the same time, Higurakgoda and Pelwehera seed farms were privatized in order to produce quality seed in efficient manner. Although these privatized farmers could develop the livelihood of neighboring community in different ways, development of technology for small millets was insignificant in the period. In 1999, the government encouraged private sector involvement in production of seeds and planting materials and introduced forward sales contract marketing schemes for subsidiary food crops. In spite of all policy initiatives, production of subsidiary food crops was further declined during the period from 1994 o 2001. The annual production of finger millet has dropped from 6672 mt in 1994 to 4190 mt in 2001 which is equivalent to 37% decline for the period.

The period after 2002 (10 Years)

The new government, which came in to the power in 2001, presented a document of new poverty reduction strategy which was called 'Regaining Sri Lanka' to the IMF and IBRD. This included more export oriented production and further liberalization and privatization process. As a result of the policy reform under the regaining Sri Lanka concept, Sri Lanka became one of the most open economies in the South Asia. However, within two year, the government lost the power and new government came in to the power. The national policy framework was prepared by the new Ministry of Agriculture, Livestock and Land (MALL). However, the contribution of non-plantation agriculture sector to the GDP of the country was declined from 11.9% in 200 to 10.8% in 2007. The number of people employed in agriculture sector declined to 2.34 million compared to 3.6 million in 1990. The National Agricultural Policy document of 2007 included objectives (1) to increase domestic agricultural production to increase the food and nutrition security of the country (2) to increase agricultural productivity to ensure the sustainability of the sector (3) to maximize the benefits and minimize the adverse impacts of globalization of agriculture (4) to adopt new farming systems to minimize the costs of production and to increase the profitability of crops (5) to adopt environment friendly and hazardless agricultural technologies (6) to promote agro-based industries to increase employment opportunities and value addition in the sector (7) to enhance the income and living standards of farming community. During the period of 2002-2007, although production was stable for the period, it was not sufficient to cater the demand of the increased consumption of finger millets. Therefore, a considerable portion of the local demand was fulfilled with the imports. Up to the year 2000, the total demand of finger millets (100%) was fulfilled by the domestic supply and in the year 2007, the domestic supply was sufficient to fulfill about 68% of the demand.

After 2007, it is not possible to see any improvement of cultivation area, yield and the production of subsidiary food crops. Cultivation area of finger millets in 2008 was 6079 ha and the total production was 6511 mt. By the year 2011, the cultivation extent was 6566ha and the total production was 7307 mt. However, in recent years about 30% of the domestic demand of finger millets was fulfilled by the imports.

After 2004 the government policy is based on 'Mahinda Chintana'. The Government's agricultural policy aims at realizing multiple goals including (a) achieving food security of people (b) ensuring higher and sustainable income for farmers (c) ensuring remunerative prices for agricultural produce (d) uninterrupted access to competitive markets both in Sri Lanka and abroad (e) farm mechanization (f) expanding the extent under cultivation (g) reducing wastage in transportation (h) ensuring environmental conservation (i) introducing efficient farm management techniques and (j) using high yielding seeds and improved water management. In this context, high priority is placed in achieving a broad based shift from low-value added products to high value added agriculture products accompanied by sustained improvements in productivity and competitiveness in international markets. Also, as mechanization of agricultural activities will lead to a significant shift of labour from agriculture to other economic sectors, improvement of labour productivity and satisfying labour requirements are vital in future. Following table summarizes the key policy actions during last decades.

Table-5: Summary of key policy actions after 1994

Sector	Actions
Seed and planting materials	• National seed policy approved in 1996 • National seed act approved in 2003 • Privatization of Palwehera and Hingurakgoda seed farms (CIC) • Plant protection act (1924) amended in 1999 • Revised phyto - sanitary regulations (2004) • National Agricultural Research Policy (NARP) 2004
Land	• Agrarian Services Development Act No.46 (2000) allows cultivation of other crops in paddy lands subjected to approval by Commissioner of Agrarian Services • Amendment of Land Development Ordinance (LDO) in progress • Registration of title act approved in 1998
Irrigation	• Draft national water policy formulated in 2000 • Establishment of Interim National Water Resource Authority • Transformation of Mahaweli Authority of Sri Lanka in to a River Basin management Authority • Preparation of National Water Bill
Fertilizer	• Revision of fertilizer subsidy scheme in 1997 • Increased fertilizer subsidy in 2004 • Revision of fertilizer subsidy scheme for the benefit of all crops in 2012
Trade	• Specific duties and import license for selected agricultural commodities such as rice, chilies, onions potato and edible oils • Reduction of custom duty for maize to assist animal feed industry
Domestic marketing	• Paddy marketing Board closed in 1996 • Price support schemes and purchasing schemes were handed over to CWE and corporative societies • Launched pilot programmes of forward contracts • Restructuring of CWE

Agricultural Research Policy of the Government of Sri Lanka after 1980

Several research institutes located mainly in Central Province and other part of the country are responsible for the research and development of the crops. Some of them are Tea Research Institute (Central Province), Rubber Research Institute (Western Province), Coconut Research Institute (Wayamba Province), Horticultural Crop Research Institute (Central Province), Cinnamon Research Institute (Southern Province), Minor Export Crops Research Institute (Central Province), Potato Research Institute (Central Province), Field Crops and Oil Crops Research Institutes (North-Western and Southern), Rice Research Institute (Wayamba, Western and Southern.. etc. In addition to research institutes for different crops, agricultural faculties of national universities are also playing a significant role in research and development of crops and livestock. The Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI) located in Colombo is the apex body for conducting research in the field of socio-economic analysis, policy analysis and agrarian studies. However, it is important to note that, **no research station is located in Uva Province where small millets** are mainly cultivated.

The government of Sri Lanka has undertaken a comprehensive survey of agriculture and food sector in 1983/84 in order to develop policy framework for the future. The National Planning Division of the

Ministry of Finance and Planning has established an Agricultural Research Group (ARG) which comprises of all agricultural research institutes / organizations and some senior scientists in 1983. The study report of ARG/ISNAR (International Service for National Agricultural Research) has identified the need of dispersion of research institutes and also the need of coordination of research activities. Later, in 1987, the Sri Lanka Council for Agricultural Research Policy (SL-CARP) was established under the parliament Act No.47. The SL-CARP comprises of representatives from Ministry of Agriculture, Ministry of Finance and Planning, Universities, three producers representing different categories including small holders, Directors of research institutes of agriculture, fisheries and livestock sectors. The vision of the SL-CARP is 'a vibrant and sustainable agricultural research, development and innovation system assuring socio-economic development of the country'. The mission of SL-CARP was 'to ensure agricultural research, development and innovations are directed towards national development goals through policy formulation, facilitation, coordination, monitoring and evaluation and impact assessment'. The mandate of the SL-CARP has been explained as (a) to advise the government on all matters regarding the organization, coordination, planning and execution of agricultural research and other related matters, (b) to formulate national agricultural research policy and priorities, (c) to define the overall aims and scope of agricultural research with a view to furthering national development objectives (d) to make recommendations to the appropriate authorities on the financial, manpower and physical resources required to agricultural research institutions, (e) to review institutional and departmental agricultural research programmes and make recommendations with regards to their priorities, (f) to facilitate and promote excellence in agricultural research, (g) to act as a channel of communication between agricultural research institutions and the government, (h) to arrange funds for inter-institutional agricultural research projects, (i) to arrange funds for special scientific services in entire agricultural research sector, (j) to promote linkages between agricultural research institutions of national and international level (k) to organize conferences and seminars on international, national and inter-institutional issues, (l) to arrange postgraduate training for research staff and exchange scientists with recognized research institutes abroad, (m) to review the performance of agricultural research projects, institutions and divisions as required.

The SL-CARP has a national committee on research programmes and projects (NCRPP) which is appointed by the SL-CARP Council and the responsibility of NCRPP is the management and coordination of entire agricultural research programme of the country. In addition to NCRPP the SL-CARP has appointed ten national subject committees to screen, monitor and assess research projects and proposals for funding. Followings are the national subject committees;

1. National Committee in plant breeding
2. National committee in agricultural bio-technology
3. National committee in plant protection
4. National committee in post-harvest technology and value addition
5. National committee in floriculture research and development
6. National committee in agricultural machinery and development
7. National committee in organic agriculture and forestry
8. National committee in natural resource management
9. National committee in livestock aqua-culture and fisheries
10. National committee in socio-economic and policy analysis

At present there are several research and development institutions have been established for the research in different crops and different disciplines. Further universities are also conducting research in the fields of development of technology. However, it was observed that the research studies on

development of small millets and rain-fed agriculture is minimal compared to other sectors. Although, the extent of finger millets and other small millets are scattered in Uva Province (Monaragala and Badulla Districts), there no research stations established in the area to conduct research and also it is obvious that the technology (verity, cultivation, post-harvest and preparation) used in these crops has not developed during last three decades.

3. Methodology Adopted to Develop the Document

This document is prepared to highlight the importance of intervention of different stakeholders in policy formulation to achieve better outcomes. Following steps were followed in development of the document.

Collection of information and data from published sources of data and information and reviewing the literature;

1. Reviewing literature relevant to the policy formation, policy intervention, monitoring and evaluation reports of the agricultural programmes and projects and the scholarly articles
2. Collecting information from available statistical publications of Central Bank of Sri Lanka (CBSL), Department of Census and Statistics of Sri Lanka, World Bank Publications
3. Collecting information from the government institutions where databases are maintaining; Hector Kobbekaduwa Agrarian Research and Training Institute, Sri Lanka Council for Agricultural Research Policy (SL-CARP)

Preliminary discussions were arranged with the following people before identifying stakeholders for further studies

- Director, Deputy Director of Research and Research and Training Officers of the Agrarian Research and Training Institute
- Deputy Director of Research and Research Officers of the Sri Lanka Council of Agricultural Research Policy (SL-CARP)
- Provincial Directors of Agriculture in Hambantota, Minaragala and Matara Districts

Identifying Stakeholders

After discussions of key personals following stakeholders were identified to carry out further studies, surveys and discussions

- Farmers: Farmers who are cultivating small millets in different systems (shifting cultivation under rain-fed conditions, farmers cultivate small millets in irrigated lands, mix cropping, farmers who are cultivating small millets in threshing floors and bunds of paddy lands and in home gardens, and potential farmers who are not cultivating small millets at present.

- Consumers: Who are consuming the own production, purchasing from nearby villagers, retail shops, super markets

- Middlemen: Traders who are collecting finger millets and other small millets from villagers in cultivating areas, processers, traders in roadsides stalls

- Officers of Mahaweli Authority of Sri Lanka, Department of Agriculture, Department of Agrarian Services, Extension Officers

- Community leaders: Religious leaders in small millet growing areas, Leaders of Community Based Organizations

- Cultivators of competitive crops and distributors of agrochemicals and other inputs

- Non government organizations who are involved in agricultural projects in rural areas; CARE international, Oxfam Australia and Oxfam GB, Women Development Federation of Hambantota District, Ruhunu Economic Development Agency (RUEDA)

- Officers of government development projects

- Regional level poticians in Monaragala, Hambantota and Monaragala Districts

- People involved in health sector: Ayurvedic medical personals and nutritionists

Focus group discussions with farmer groups of finger millet growing areas of Monaragala and Hambantota Districts to find out the problems associated with cultivation, processing, marketing, preparation of foods and preferences of family members.

Participatory appraisal techniques (Social mapping, Ven diagrams and problem tree) to identify the constraints and problems of finger millet cultivation and institutional support

Household survey of three places representing urban, semi urban and rural areas to find the patterns, preferences and willingness to consume finger millets and other small millets.

Market survey of roadside small scale marketing outlets of finger millets and other small millets and associated products in Hambantota, Monaragala and Ratnapura districts

4. Dimensions of Health, Nutrition, Livelihood and Importance of Small Millets

In many aspects of the development, indices in Sri Lanka comparatively higher than that of other South Asian Countries. However, development indices of Sri Lanka are lower than many of the countries of the East Asian region. Following table compares selected development indices among the countries in South Asian and East Asian regions.

Table-6: Comparison of development indices (2011)

Country	Human Development Index (HDI)	Life Expectancy at Birth (Years)	Mean Years of Schooling	Poverty Head Count Index	Population below National poverty line
Sri Lanka	0.691	74.9	8.2	5.3	15.2
India	0.547	65.4	4.4	53.7	27.5
Pakistan	0.504	65.4	4.9	49.4	22.3
Bangladesh	0.500	68.9	4.8	57.8	40.0
Nepal	0.458	68.8	3.2	64.7	30.9
Singapore	***0.866***	***81.1***	***8.8***	***-***	***-***
Malaysia	***0.761***	***74.2***	***9.5***	***-***	***3.8***
Thailand	***0.682***	***74.1***	***6.6***	***1.6***	***8.1***
Philippines	***0.644***	***68.7***	***8.9***	***13.4***	***26.5***

Source: Sri Lanka Human Develoment Report, 2012 (UNDP)

Although, Sri Lanka's progress in many development indicators are impressive compared to many developing countries, disparity between categories of people and between regions are significant. For an example gender Inequality Index (GII) is comparatively low in Ratnapura (0.52), Monaragala (0.53), Anuradhapura (0.49) and Hambantota (0.47) districts compared to Sri Lankan average of 0.57. According to Human Development Report, 2012 of the UNDP it is highlighted that some of the indicators of the development indices should be paid urgent attention in some of the regions. Iin Uva province, Income Poverty Head Count Index, Share of income of poor people, Gender inequality index, underweight children below five years and maternal mortality rate should be paid more attention compared to Western Province showing the regional disparity of development. Also, it is highlighted that poverty levels are higher in the regions where in the region's contribution of agriculture to the GDP is higher showing a positive relationship between the contribution of agriculture to the domestic production and the poverty level. The Uva province contributes the highest to the domestic production (30%) and the poverty level also the highest in the province while in the Western Province agricultural sector contributes the lowest and also the poverty level also the lowest in Western province. This incident is due to slower growth of agricultural sector compared to industrial and service sectors during last five decades. Following table shows the contribution of the agriculture sector to the domestic production and agricultural labour force as a percentage of the total labour force of different provinces of Sri Lanka.

Table-7: Agriculture labour force of different provinces of Srilanka

Province	Agriculture Labor Force %	Agriculture GDP %
Western	8.2	2.3
Central	42.3	20.1
Southern	37.1	18.3
North Western	36.9	18.4
North Central	59.4	29.3
Uva	59.3	30.1
Sabaragamuwa	40.9	20.2
Eastern	35.3	23.4
Northern	--	--
Sri Lanka (Total)	32.7	12.1

Source: Central Bank of Sri Lanka

Physical and mental health plays a crucial role in participation of people in development process of the country. Although, Sri Lanka has achieved comparatively higher level of health indicators compared to other South Asian Countries, regional disparity is not indispensable. Following table shows a comparison of selected health indicators between Sri Lanka and selected countries.

Table-8: Comparison of selected health indicators among selected countries

Indicator	Sri Lanka	India	Nepal	Singapore	Malaysia
Life expectancy (Years)	71	65	67	82	73
Infant Mortality Rate per 1000 live births	13	50	39	2	6
Under five Mortality Rate per 1000 live births	16	66	48	3	6
Maternal Mortality Rate per 100000 births	39	230	380	9	31

Policy makers should not be happy about the achievements compared to South Asian Region as the country has to go a long distance to achieve the levels of Singapore and Malaysia.

Although, the infant and maternal mortality rates are low in the country due to comparatively better health service of the country, the malnutrition indicators do not show a good pictures. Percentage of underweight children at birth in the country was 22% in 2009. Regional disparity of the percentage of underweight children is significant. It is highest in estate sector (28%) while lowest in urban sector (17%). Also the percentage of underweight children is high in Monaragala (27%), Badulla (33%), Polonnaruwa (26%), Trincomalee (28%), Nuwaraeliya (26%) districts where agricultural sector is dominant and the index is low in Colombo (14%) and Gampaha (12%) districts where industrial and service sectors are dominant. To reduce the percentage of the underweight children at birth there are four factors to be considered according to the findings of research studies; (1) mother's nutrition, (2) mother's education, (3) mother's knowledge and (4) nutritive food availability and accessibility.

The infant mortality rate (per 1000 births) is also comparatively high in some of the districts (Baticaloa 25%, Nuwaraeliya 14.8%) compared to national average of 8.5 in 2009. Also the national average of maternal mortality rate in 2010 is 39.3 per 100,000 birth while mortality rates are higher than national average in Nuwaraeliya (80.7), Kilinochchi (102.8), Ampara (85), and Monaragala (71) districts which are mainly agricultural areas.

At present Sri Lanka could nearly eradicate most epidemic diseases which can be prevented from vaccination. That means vaccination programme of the country is progressive and has achieved its objectives. Almost in all districts, vaccination programmes are successful against the disease of tuberculosis, polio, diphtheria, pertussis, tetanus, measles. At present, some of the communicable diseases which could not be prevented by the vaccination programmes are arising in most parts of the country. Some of the examples are dengue, chikungunya, leptopirosis and dysentery. Leptopirosis and chkungunya disease have made considerable adverse impacts of the livelihood of the families in rural agricultural areas.

Despite the progressive achievements of controlling communicable diseases in the country, a different set of health challenges is emerging in the recent past due to demographic, socio-economic and epidemiologic transition of the society. According to the reports of the Department of Health, about

90% of burden of health attributed to non-communicable chronic diseases. Available data indicates that deaths due to asischaemic heart disease, stroke and heart diseases are increasing both in rural and urban areas. Also, the most recent records show that about 600 patients are hospitalized daily due to heart diseases and about 20 are died per day. About 10% of the people are suffering from one of the chronic diseases such as high blood pressure, diabetes and among head of the households, about 20% are struggling with such diseases and the situation is worsening annually. The economic impact of these chronic diseases is remarkable in rural agricultural families as the diseases directly affect the productivity and earning capacity of labours. On the other hand frequent visits to the clinics and the costs of medicine are increasing the budget share of the medicine reducing the expenditure on food and other activities declining the standard of living.

There are several scientific studies has proved that the main reason behind non-communicable chronic diseases is the food habit of the people. Also it has been proved that finger millets and other small millets have the capacity to control most of the chronic diseases. Therefore, awareness programmes on importance of finger millets, processing and preparation of food from small millets may reduce the expenditure on medicines while increasing the productivity of farm families.

Anemia associated with iron deficiency is common issue in estate sector and rural sector of the country. It is reported that in estate sector, among female workers, the anemia is a critical issue. As the finger millet is rich with iron and potassium, if it is possible to persuade the people to eat food prepared on finger millets at least two three times per week, it will be possible to increase the demand of the small millets while reducing the malnutrition, chronic diseases of rural poor and therefore to reduce the huge bill of expenditure on medicines.

Although, labour force engaged in agricultural sector is about 33% of total active labour force of the country, in Uwa and North Central provinces where small millets are produced the labour force involved in agricultural sector is about 60% of the total labour force of the provinces. Therefore, development of the agricultural and related activities will make a greater impact on those areas. Moreover, female labour force can be better employed with the popularization of small millets as many of the activities of cultivation and processing of finger millets and other small millets are done by women.

5. Need of Government Policy to Develop the Sector of Small Millets

According to the document, the Mahinda Chintana vision is based on the economic philosophy that the growth in Gross Domestic Product (GDP) alone would not bring economic prosperity to the society. The Mahinda Chintana Goal (MCG) is to increase the GDP to provide benefits to every segment of society in a justifiable manner. The creation of prosperity to the majority of the people who cannot purely rely on market based solutions requires connectivity through roads, electricity, telecommunications, information technology, education and health services. Hence, the development strategy relies not only on promoting investments on infrastructure based on commercial and economic returns but also on the creation of equitable access to such infrastructure development to enable people to engage in gainful economic activities. Towards this end, providing electricity to all, popularizing mobile usage among all people, establishing Nanasala (IT centers) in remote villages and developing the rural and agricultural road network (Maga Neguma), have made a revolutionary transformation in the rural economy. Providing benefits through wider networking is supported by equally important rural centric development programmes such as rural irrigation projects, community water supply projects, storage and marketing facilities and financing and credit facilities. The Mahinda Chintana philosophy is such that the empowering people must move hand-in-hand with the development in family values as well as

vulnerabilities of women, children, and elderly are contained. It also places greater emphasis on the upliftment of moral values and liberating people from using narcotics and drugs (Mathata Thitha). This holistic approach will enable the entire society to reach new heights in their overall living standards. ***rural based employment. To safeguard the farmers from seasonal price declines, forward market contracts will be popularized for almost all these crops."*** The policy document has targeted to increase the current average annual production of finger millets (6400 mt) up to 27150 mt by the year 2015 and 44600 mt by the year 2020 while reducing the imports. According to Mahinda Chintana –2010, The Government's agricultural policy aims at realizing multiple goals including (a) achieving food security of people (b) ensuring higher and sustainable income for farmers (c) ensuring remunerative prices for agricultural produce (d) uninterrupted access to competitive markets both in Sri Lanka and abroad (e) farm mechanization (f) expanding the extent under cultivation (g) reducing wastage in transit (h) ensuring environmental conservation (i) introducing efficient farm management techniques and (j) using high yielding seeds and improved water management. In this context, high priority is placed in achieving a broad based shift from low-value added products to high value added agriculture products accompanied by sustained improvements in productivity and competitiveness in international markets. Also, as mechanization of agricultural activities will lead to a significant shift of labour from agriculture to other economic sectors, improvement of labour productivity and satisfying labour requirements are vital in future. (Ministry of Planning and Finance, 2010).

Although there are several projects targeting the development of agriculture sector of the country, such as Divi-neguma, Api-wawamu-Rata-nagamu.. etc, it is known that a good policy is better than many projects. A policy indicates the government operational principles in a particular sector with logically coherent and forward looking activities which guides future plans. Good policies are important in spite of the type of the economy; controlled or market oriented. Therefore, it is necessary to identify right mix of policies to develop the sector of small millets rather than launching the several isolated projects to develop the sector.

The finger millets also included in the overall policy document. ***"The crops which could be grown locally such as onion, chilies, cowpea, maize, green gram, finger millet and other subsidiary food crops will be given high priority for further expansion. To accelerate the production growth, research and development initiatives will be directed towards the development of high yielding varieties, good quality seeds and advanced cultivating practices. By moving toward the self sufficiency in these crops, opportunities will be provided for Sri Lankan farming communities to enhance their incomes and generate***

To be a successful policy, following criteria are imperative

Clear vision and objectives
Implementable plan capable to put vision in to actions
Effective implementable strategy
Do-ability and sustainability
Close supervision
Results oriented evaluation rather than evaluation of the process

Policies are an outcome of a bargaining process between politicians and citizens (all kinds of other stakeholders). Citizens mean the individuals who demand some actions in exchange for political support. Citizens when organized can demand their special interests from the policy maker effectively compared to unorganized individual citizens. Without the demand from the citizens, the state also can have its

own policies to pursue the vision of the country for specific purposes such as food security and self sufficiency. During last decades it was observed that organized groups have made substantial impact on policy making process in spite of sustainability. Fertilizer subsidy, guaranteed price schemes are some of the examples.

Politicians have their own individual objectives and also a certain degrees of autonomy. To be re-elected, to maintain the legitimacy, to improve the welfare of their constituency or pursue some vision of the country may be some of the objectives of politicians. Many examples of Sri Lanka show that the policy making process is not a collective action and it mainly through authoritarian process of politicians. The affected parties of policy decisions, mainly farmers, are not organized for bargaining in policy making process. Therefore, the policy making follows a top-down approach. It is obvious that organized groups of citizens can have strong influence over the policy making process. The power of such lobbies depends on their ability to overcome the costs of their organization and free riding. In India there are several geographically organized groups which have better bargaining capacity.

To be effective influences on government policy making process, such lobbies need (i) financial resources (ii) human capital such as skills to influence the people (ii) social capital such as strong membership organizations. Due to dispersed nature of the farmers, a large number of small scale farmers, and lack of financial resources, farmers who cultivate small millets are not organized and no strong lobbies for them. Therefore, farmer's real needs and interests are not represented in the policy making forums in case of small millets. It is evident that in policy documents of the government, small millets have been neglected or given less priorities.

At present policy instruments are not efficient as a result of policy formulation is not based on research data and adequate information and also due to politically motivated decisions. While developing sectoral policies it is essential to identify major national policies and cross cutting themes such as food security, poverty reduction, employment, environment etc.. while identifying sectoral and specific themes of food security, food consumption, production and consumption trends and patterns, production and profitability, price variables (movements, stability, uncertainty), related services and input, marketing of inputs and output, institutional framework, research and training and the extension.

In GOSL, a common phenomenon is sectoral policies which are not coordinated. Also there are several institutions for the same sector which are not working towards a common vision and objectives. In agriculture sector, scattered nature of the policies and projects is a grave issue. Several ministries and departments are working to achieve different targets. Different government intuitions are working to achieve their own objectives neglecting others objectives as the objectives and strategies are not coordinated.

Several studies identified the failures of policies especially in non-plantation agricultural sector in Sri Lanka. Following table summarizes the deficiencies of agricultural policies in different areas which lead to low level of farm productivity and low agricultural household income (about 26% in rural areas).

Table-9: Weaknesses of policies and their implications

Area	Weaknesses	Consequences
Lack of national agricultural policy	Week links between research and extension Collapse of public extension system Inadequate legal framework for Research and Development Restrictive quarantine regulations Absence of clear seed regulations and IPR Limited private sector participation in seeds and technology markets	Limited access to technology and low productivity Limit access to credits Limits investments Limited incentives for crop diversification
Lack of water policy	Weaknesses of institutional related water delivery Poor water distribution and delivery	Limited incentives for crop diversification Low farm productivity
Restrictive land policy	Control / limitations on crop grown Lack of tenure security	Limit access to credits Limits investments Limited incentives for crop diversification
Poor rural infrastructure	High transaction costs of inputs and marketing	Low profitability
Week trade policy	Increased price uncertainty Distort incentives Discourage investments	Low productivity Low profitability
Restrictive labour regulations	Reduce incentives for value addition, storage and processing	Reduce market demand and prices of agricultural commodities Low profitability
Macro policies (High fiscal deficit)	Limit credits High interest rates	Reduce investment Low productivity

Based on the findings of the studies, different authors have suggested measures to develop the subsidiary agricultural sector which is sluggish during last two decades. Policies of followings areas should be revised through a dialogue in order to develop the subsidiary agriculture sector according to the available literature.

1. National agricultural policy and strategy
2. Land reform and land administrative policies
3. Water policy
4. Labour policy
5. Commodity marketing policy
6. Incentives for private sector
7. Rural education and rural infrastructure
8. Trade policies

6. Specific issues revealed in the farmer and household survey

Production related issues

Crop damage from wild elephants: The locations are closed to forest reserves and crop damage from wild elephants is the common issue faced by many of the farmers. Electric fences surrounding forest reserves are not properly operating. It is essential to intervene for remedial measures for common human elephant conflict. Although, the environmentalists and the general public are sympathetic towards the elephants, feelings of the suppressed and affected people are opposite. They think that, elephants are worth than human being to the government and policy makers.

Crop damages due to wild animals such as porcupine and peacocks: People in dry zone areas (Monaragala and Hambantota districts believe that population of peacocks and porcupines has been increased during last decade. The reason may be hunting practiced by many villagers two decades ago is not practiced in the present generation due to absence of guns according to the villagers. Environmentalists express that the reason is increasing of peacocks and porcupine is due to declining population of carnivorous animals such as wolfs and jackals. The same problem of peacocks is common in upland cultivation in Matara and Rtanapura districts.

Uncertainty of rainfall in drought periods: Finger millets are cultivated expecting rain in the Maha season for many years in the reason past pro-longed drought was a serious issue which reduced the yield. Therefore, need to think about drought resistant varieties, water saving technologies, synchronization of cultivation period with the rainfall and agronomic practices to overcome the water scarcity should be considered in future activities. Low costs of cultivation compared to other field crops due to low external inputs are a positive factor in cultivation of finger millets. However, there are some of the incidents reported such as stem borer attack and it is needed to pay attention in selection and breeding programmes. Some of the farmers have made attempt to irrigate their crops using small scale irrigation sources such as tube wells, agro-wells or lifting water from existing small water streams.

Less remunerative: As the yields are at very low level of existing varieties and also the market prices are low, no farmer is willing to cultivate finger millet in commercial scale as a cash crop. They consider the crop in subsidiary level just for family requirement and as a low risk alternative compared to other crops. Introducing high yielding varieties is necessary to popularize the crop.

Non availability of quality and reliable seeds: More than 95% of the farmers depend on their own seeds or neighbors which are not reliable for their seed requirement. Therefore, intervention in seed supply is a must to popularize the finger millet in the area. Many farmers are not aware about high yielding varieties. All farmers know about traditional and low yielding varieties. Attention of popularizing new varieties is important to popularize the finger millet. Also the source of the seeds is from their own production and from neighbor which leads uncertainty of the yield and consequently less remunerative production.

Pests and diseases: It was found that blast and stem borer attack are the common pest and diseases for finger millets. It is necessary to pay attention to control these pests and diseases through recommending measures and also developing varieties resistant to common pests and diseases in long run.

Labor scarcity: Family size is comparatively small and therefore labour availably is questionable for labour intensive activities, especially for cultivation, harvesting and processing of coarse cereals. In case of paddy farming almost all activities are mechanized and farmers are using labour saving technologies especially in harvesting. In case of finger millets, harvesting is still a labour intensive practice. Therefore, finding labour saving and attractive technologies may be useful to popularize coarse grain production.

Harvesting is difficult in available varieties as maturing is occurred in several stages in existing varieties. Therefore it is necessary consider this phenomenon in breeding programmes and also in cultural practices.

Post-harvesting and processing issues

Although technologies have well developed for rice processing, for small millets technologies are primitive and highly labour intensive. Separating seeds from the panicle is highly labour intensive. Therefore it is necessary to develop technologies for processing.

The proportion of edible seeds to crop residues is very high in finger millets and other coarse serials compared to rice. Therefore, it is necessary to use crop residues as a livestock feeding or some other alternative uses as practiced in India and other Asian countries. It is necessary to think about approaches to integrate livestock and crop management to utilize crop residues. Also, it is important to consider this in future breeding programme.

Market related issues

As the people are cultivating in small plots (about 0.25 – 0.5 acres), marketable surplus of each farmer is very small. Therefore, farm gate prices are very low (about Rs.70/kg) although the prices of the processed flour are very high in the retail market (about Rs.300/kg). Intervention for value addition and marketing are the areas should be considered in promotional programmes. That may be organizing farmers forming farmer clusters, farmer companies to collect sufficient marketable surplus for the processing centers or developing supply chains integrating farmer processors and retail outlets.

Supermarket channels need a continuous and quality supply of food to maintain the food chains. However, small farm units are not possible to maintain such continuous channels. Therefore, intervention of a external party to develop market channels or to form farmer organizations to maintain a sufficient and continuous marketable surplus is necessary to increase the farm gate price of the products.

Consumption related issues

Low preference: Especially children of farm families are reluctant to eat food made of finger millet. That may be due to less attractiveness compared to modern development of recipes of other foods. Preparation styles of finger millet products (*thalapa, pittu, roti, helapa*..) are remaining unchanged during last decades compared to other foods. Therefore, attention of food scientists is required in development of attractive recipes.

Time for preparing food from finger millet is higher compared to rice and other types of foods. Therefore, busy house-wives in urban areas are not interested to prepare finger millet based food

although they are aware about the nutritive value of finger millet. Therefore, it is necessary to develop easy recipes from finger millet to popularize finger millet among urban dwellers.
Awareness and knowledge about methods of preparation of food from finger millets, foxtail millets and other coarse serials is very less among younger generation. Therefore, they are reluctant to prepare food from finger millets.

People who are suffering from chronic diseases such as diabetes, high-blood-pressure and hypertension are aware about the importance and medicinal properties of finger millet in order to get rid of those diseases. This awareness can be capitalized to popularize and consequent increase of demand of the finger millet within the local market as the incidences of such diseases are increasing.

Finger millet flour can be mixed with wheat flour and rice flour in preparing bread, rotti, chapathi and other preparing while increasing taste, appearance and nutrients. In general finger millet is getting more popular among educated people after realizing the medicinal benefits of the finger millet based food.

Gender Issues

Majority of the male members of the families in general and particularly young people are not interested in low remunerative agricultural activities as they are having opportunities to find considerably high income from non-agricultural activities. Almost all the activities including cultivation, harvesting, processing and preparation of finger millets and other small millets are mainly done by women. Therefore idle women labour can be effectively utilize to the production process of finger millets. Also targeting women groups in training and development programmes may be more effective.

Cost of cultivation: As finger millets need low level of external inputs and also less amount of water I can be considered as a sustainable crop which can be cultivated in resource poor areas. As the need of chemical fertilizers and other agro-chemicals are minimal susceptibility to the external shocks anticipated adverse environmental impacts are also trivial.

As about 40% of the households are below the poverty line, there is a great potential to intervene to increase the income of poor families through cultivation of finger millets. The households expectations to increase the production were (1) food processing and different recipes which are more attractive (2) development of new equipments and machines for processing industry for finger millet, (3) fertile seeds and new varieties, (4) training and skill development, (5) cultivable lands, (6) irrigation facilities and (7) methods to controlling threats from wild animals.

Health benefits: Finger millets has a very low glycemic index thus making its digestion process slow and helping in keeping the blood sugar levels at a constant ratio. Therefore, it recommended for diabetes patients. Finger millets are rich in thiamine, iron and calcium. As it rich in dietary fiber, it eases the digestion process a remedy for constipation as it act as a natural laxatives. As the finger millets and other small millets are low in fat it recommended for obese people as a treatment.

Studies have proved the not only finger millet, also fox-tail millets has shown medicinal properties of reducing blood sugar and cholesterol without having adverse side effects. It lowers triglyceride, total and low density cholesterol while increases the high density cholesterol levels. All small millet species has shown of anti-oxidant properties and high amount of phenol content to be a healthy food.

Of all the cereals and millets, finger millet has the highest amount of calcium (344mg%) and potassium (408mg%). It has higher dietary fiber, minerals, and sulfur containing amino acids compared to white rice. Despite finger millet's rich nutrient profile, recent studies indicate lower consumption of millets in general by urban people.

7. Identification of Root Causes and Possible Solutions to Develop the Sector

After reviewing the literature and field studies, it was taken efforts to identify the root problem related to sector of small millets in generally and finger millets in particularly. The problem is multifaceted. There are several reasons behind low and insignificant attention paid or negligence of small millets in policy documents of the government during last several decades after 1970s. On one side, there were several ad-hoc attempts have taken to popularize finger millets and similar traditional crops by the government, private sector and non-governmental organizations time to time. There are several articles written on news papers and magazines showing the importance of finger millets as a healthy and nutritive food. It is grown well in un-irrigated rain-fed areas with low level of external inputs. People are aware about the cultivation methods and preparations. In spite of all positive factors of which in favor of cultivation and production of finger millets and other small millet species, the cultivation area and the production records show a declining trends and imports of these crops are increasing reflecting the increasing demand. The study revealed that following factors are mainly responsible for declining trend of production of finger millets and other small millets.

- **Low yield of existing varieties:** The yield difference between old traditional varieties and newly introduces verities such and Ravana, Ravi, Oshada or MI is not significant. Yield component has not been significantly developed during last fifty years. (About 1000kg/ha)

- **Policy biased towards paddy and selected crops neglecting small millets:** In fertilizer subsidy, irrigation, technology improvement, crop insurance, price and marketing, and research policies these crops are completely neglected.

- **Low bargaining power of the farmers:** Isolated and scattered small poor farmers who cultivate small amount of finger millets have no bargaining power in decision making process in pricing the product. They sell at very low prices making the crop is less remunerative compared to other crops while urban people have to pay higher prices.

- **Media centered altering food behavior of the urban people:** Food consumption pattern of the people are driven by the market forces and media which gives no attention for these millet crops. Therefore, the finger millets and associated foods are replacing with other foods in the food basket. In other words, finger millets are becoming an unimportant item in the food basket.

- **Under-developed technology:** technology of cultivating, harvesting, processing and preparation of foods are not developed during past decades leaving the crop in the primitive, traditional and disappearing category.

- **Food security and self sufficiency emphasized on selected crops:** Although, food security and self sufficiency is discussed in policy documents, all the indicators and measurements were based on rice and other selected crops such as potato and pulses. The importance of finger

millets which played a considerable role in food security in history was neglected in policy planning.

In addition to above factors, there are several factors which are not specific to finger millets but general for entire non-plantation subsidiary agricultural sector excluding paddy and a selected few crops.

However, this study identified that the root cause of all hindrances was the failure of agricultural and trade policies during last decades. In brief, policies have not paid necessary attention on this important group of crops. The policy makers cannot be blamed for the situation as this failure may be due to lack of information of this sector and lack of voice from the farmers of finger millets and associated crops. Policy makers should be directed or persuaded by the people using the bargaining power of the people. On the other hand, farmers cannot be blamed for not demanding policies which favorable for these crops, as the farmers of this category are scattered, resource poor, powerless and un-organized. Individual farmer or individual stakeholder doesn't have a power to bargain in policy formulation forums. Therefore, the top-down approaches of policies in this sector has diverted the sector in to a bad position.

It is obvious that to develop the sector, although an individual has a role to play, outcome of isolated attempts of individual stakeholders or institutions may be trivial. Therefore, holistic approach coordinating all the responsible parties is necessary to develop this important but disappearing and neglected sector of small millet. As a chain, this will not be smoothly moved by pushing the starting point. It is necessary to push the start and to pull the end while removing bottlenecks and frictions at the middle. The study suggests following measures to be taken simultaneously.

1. Measures to increase the production: New high yielding verities through breeding programmes or importing necessary seeds, research for cultural practices and technologies, efficient water and soil management, efficient cropping systems, attractive packages of technologies, unbiased subsidy policies, remunerative prices for products and inputs

2. Measures to increasing consumption and demand: Processing and preparation of attractive recipes, efficient marketing channels, developing the processing industry, media inveiglement to emphasize the importance of small millets, attractive and marketable products

3. Removing the bottlenecks and frictions: Developing technologies for harvesting and processing, policies and technologies to protect the farmers from crop losses (crop insurance ...etc), favorable trade policies

For this process, formulation of agricultural policies alone is not sufficient. Trade policies, education policies, health and nutrition policies, land policies, irrigation and water policies are more or less important in this process. Therefore, it is obvious that without involvement of political leaders, the formulation of policies in order to develop this important sector is not possible. However, initializing a dialogue is important at this juncture, at least for better results in long run. Although, all stakeholders need a change, individuals cannot play a significant role. Therefore, it is necessary to develop a platform to meet different stake holders with the same requirement to share the ideas and also to be organized as a powerful organization of powerless individuals to lobbing to persuade policy makers to formulate policies which are favorable to develop this important sector of small millets. Next chapter explain the ways of intervening in policy formulation.

8. Way forward to intervene in policy formulation

Through the study it was identified that in spite of cost effectiveness, use of low level of external inputs, can be cultivated in rain-fed arid and semi-arid areas without irrigation, the cultivation of finger millet, fox-tail millet and other small millets is limited to small areas of Southern, Uva, Sabaragamuwa and North-Western provinces of the country. In those areas also, the cultivation extent is gradually declining. Many studies and experiences have revealed that finger millet has medicinal properties to cure many of the chronic diseases such as high blood pressure, diabetes and digestive problems. Government bill is for treatment for those chronic diseases are rapidly increasing. However, awareness of the importance of the finger millets and other small millets is very less in the society due to less attention for these crops during last decades.

Further, the study revealed that government policies were not favourable for the subsidiary food crops, especially for finger millets and other small millets during last decades due to policy bias towards rice production and other selected remunerative crops. Not only the policy formulation, the policy implementation and strategies are also questionable. In policy formulation, several stakeholder groups have played no role as they do not have a forum to express their ideas. Moreover, in farmer organizations, small millet cultivators are not dominant compared to farmers who cultivate paddy and other cash crops. Altogether, the lobbying capacity is almost zero in case of cultivators of small millets. As a result, policy formulation in favour of small millets cannot be expected and middlemen can exploit the small scale and scattered growers of small millets. In addition to absence of policies in favour of small millets, the past evidence shows that implementation of existing policies is also not effective due to bad governance.

Quite often, systems of governance in Sri Lanka are blamed for their "Top Down Approach", which is considered as 'bad governance'. Governance could be defined as "*the whole of public as well as private interactions that are initiated to solve societal problems and create societal opportunities. It includes the formulation and application of principles guiding those interactions and care for institutions that enable them*". Governance is not what governors do, but also the totality of all interactions between the governing system and the system to be governed. This brings us to the concept of interactive governance. Policies that aim at achieving a certain goal are often formulated without the participation of all relevant stakeholders and thus may not lead to the development of an optimum set of strategies to achieve such a goal, finally leading to sub-optimal outputs. Such failures result from the fact that systems (to be governed) are quite diverse, complex and dynamic. Interactive Governance has been proposed as a solution to deal with above-noted inefficiencies in this system, which addresses "diversity through inclusiveness, complexity through rational, holistic, integrative approaches and dynamic through an interactive and adaptive framework. Simply this means processes of good decision making, appropriate policy formulation and good governance, through an interactive process of all relevant public and private actors.

The study identified the need of intervention to organize a forum in order to make interaction between government and different kind of stakeholders in order to develop the small millet production sector which is under developed, although timely important. Such interactive forum will provide and opportunities to share the knowledge among different stakeholders and also provide opportunities to coordinate the activities of different parties which are scattered in nature. Also it will allow minimizing the total cost of all parties by avoiding costs of duplicating the similar activities. The Arthacharya Foundation wish to intervene to develop such forum in order to integrate all parties for the development of small millet sector.

The objectives of such interactive forum will be;

- Providing a forum for sharing knowledge and experience among stakeholders
- Avoiding repetition and overlap of activities to minimize wastage of resources
- Sharing resources among stakeholders, economizing on costs
- Facilitate exchange of mutual assistance among different organizations to achieve the development objectives efficiently and effectively
- Identifying and exploration of underutilized and untapped resources
- Utilization of region's resources efficiently to maximize the output
- Facilitate constructive dialogue among stakeholders
- Providing a platform for researchers, policy makers and other stakeholders to stage their findings and views

The Arthacharya Foundation expects that through this forum the voice of the all kind of stakeholders including small scale farmers of the remote villages and also responsible government officers and politicians will have a bargaining power in policy formulation and implementation in a considerable extent. In addition to policy directions, Indigenous Knowledge Systems which are disappearing gradually will be documented in the field of small millets in order to conserve for future generations. Further, new innovations will be generated and shared in the interactive process facilitating the rapid development of the sector.

The proposed process of intervention

The proposed process will be started at regional level and later will be developed for national level. Proposed activities are;

- Identifying stakeholders including local politicians (partly completed)
- Communication with selected stakeholders with a draft document
- Preliminary formal meeting with selected stakeholders to identify further stakeholders and role of different stakeholders
- Publicity through mass media, inviting the press, press conferences
- Writing news paper articles and discussions in Radio Programmes (Existing allocations in different regional services can be used)
- Inviting political leadership by organizing public events to popularize the finger millets
- Organizing a exhibition / fair for preparation of finger millets and showing the importance of the finger millets and other small millets
- Providing a platform for discussion, knowledge and information exchange, cooperation to deliberate upon the difference experiences and to suggest innovative approaches to develop the sector
- To suggest mechanisms of implementing such innovative approaches, this may include, but not limited to the following.

    a. Capacity building
    b. Institutional strengthening and development
    c. Appropriate policy changes and policy guidelines
    d. Appropriate governance mechanisms

Prepare a 'Planning Document' for subsequent preparation of policy document

In order to improve awareness, deliberation, policy and decision making processes through cooperation, research, analysis and advocacy the forum will use a variety of means to outreach to broad audiences, including policymakers, private enterprises, farmers organizations, scholars, the media, etc., which may include the following.

- *Workshops*
- *Involvement of Media (eg articles in newspapers, discussion on the radio, …)*
- *Exchange with international partners*
- *Competitions*
- *Public awareness*
- *Participation campaigns*
- *Forums*
- *Conferences*

Mass media should be utilised as far as possible as mass media can change the mindset of the people. At present policy direction is mainly decided by the mass media. After preparing a brief policy document it should be handed over to the local and national political leaders and officers as the policy makers and politicians have the sole authority for formulating policies.

References

1. Abeysekara T,(2002), Sri Lanka – A Review of Public Expenditurein Agriculture, 1980-2000, Sri Lanka World Bank Mission, Colombo

2. Ahmmed S and P Ranjan, (1995),Promoting Growth in Sri Lanka: Lessons from East Asia, World bank Policy Research Working paper No.1478

3. Athukorala P and Kelegama S, (1996), Agricultural Trade Liberalization in the Uruguay Round: Implications on Sri Lanka Agriculture, South Asia Kathmandu Seminar, Nepal

4. Athukorala P and S Jayasooriya, (1994), Macroeconomic Polcies, Crisis and Growth in Sri Lanka 1969-90, The World Bank, Washington DC

5. Bhattacharyya B and Vijaya Katti (1996) Regional trade enhancement: SAPTA and beyond. IIFT Working Paper, Indian Institute of Foreign Trade, New Delhi

6. Central bank of Sri Lanka, (2011), Economic and Social Statistics of Sri Lanka

7. Department of Census and Statistics, (2004), Statistical Abstract

8. Endagama, P (1998) Traditional food pattern in Srilanka, 198, Hector Kobbekaduwa Agrarian Training and Research Institute, Colombo

9. Epaarachchi R, S Jayanethhti and A Weliwita, (2002), Policies and thei implication for the domestic agricultural sector of Sri Lanka: 1995-2000, Institute of Policy Studies, Colombo

10. Gunathilaka R, (1998), The Integrated Rural Development Programme, Lessons and experience for poverty reduction, Institute of Policy Studies, Colombo

11. Gunawardene P J and W G Somaratne, (1999), Economic polcy regime and non-plantation agriculture sector in Sri Lanka: Trends, issues and prospects, Sri Lankan Journal of Agricultural Economics, 3(1)

12. Hathurusinghe CP, R Rambukwella, R Vidanapathirana and TG Somaratne,(2012), Production and marketing of other field crops: A reviewResearch Report No.44, HARTI, Colombo

13. Indraratne AVD De S, (1998), Fifty years of Sri Lanka's independence: A Socio-economic review, Sri Lanka Institute of Social and Economic Studies

14. Kelegama S (2000), Development of independent Sri Lanka, What was wrong?, Economic and Political Weekly, April 22, 2000

15. Lakshman WD, (1994), Structural Adgustment policies in Sri Lanka: Imbalances, structural disarticulation and sustainability, Proceedings of the International Conference on Economic Liberalization of South Asia, Australian National University, Canbera

16. Mahaweli Authority of Sri Lanka, (1999), Mahaweli Statistics Handbook 1999, Planning and Monitoring Unit, MASL, Colombo

17. Marga Instutute, (1972), A Comparative Study of Population and Agricultural Change in Sri Lanka, Marga Institute, Colombo

18. Ministry of Planning and Finance, (2010), Mahinda Chinthana Vision for the Future, The Government Policy Framework of Government of Sri Lanka, Department of national Planning, Ministry of Planning and Finance

19. Saravananthan M (2000) Indo-Sri Lanka free trade- hype and reality. *Economic and Political Weekly*. **35** (14): 1157 – 1158

20. Siriweera, WI (1978), Agriculture in Medieval Sri Lanka, Ceylon Historical Journal, Vol XXV, 1978, 42-44

21. United Nations Development Programme, (2012), Sri Lanka Human Development Report

22. Warasakoon M B and D E F Suraweera (1999) Status of agriculture in Sri lanka. *proc of APO seminar on structural adjustments in agriculture. Asian Productivity Organization* (APO), Tokyo, Japan: 282 –295

23. Weerahewa J (2002) *Globalization and female poverty in Sri Lanka: preliminary results*. Monograph. University of Peradeniya, Sri Lanka

24. World Bank (1996) Sri Lanka: *Non-plantation crop sector policy alternatives*. Report No. 14564, Agriculture and Natural Resource Division, Country Department, South Asia Region, The World Bank, Washington DC.

25. World Bank, (2003), Promoting Agricultural and Non-farm Sector Growth, Volume I and II, Rural Development Unit, South Asia Region, The World Bank, Washington DC

26. World Bank, (2004), Sri Lanka Development Policy Review, Poverty Reduction and Economic management Sector Unit, South Asia Region, World Bank

27. World Bank, (2008), World Development Report, Agriculture for Development, World Bank, Washington DC

28. World Trade Organization, (1996), Trade Policy Review of Sri Lanka -1995, Geneva

Annexure

Table-1: Cultivated area of selected cereals (ha)

Crop	1996	1997	1998	1999	2000	2001	2002	2003
Paddy (M)	498928	472998	573845	546586	549246	478986	510403	601584
Paddy (Y)	249815	256812	277419	345467	328748	319274	342126	381033
Finger millet (M)	5300	4730	5090	5570	5670	4990	4830	6240
Finger Millet (Y)	820	830	950	920	880	650	650	1120
Maize (M)	23390	23820	27530	26820	26340	23730	20330	23450
Maize (Y)	1500	1970	2260	2080	2300	1980	3080	3610
Meneri (M)	180	120	120	90	80	60	70	150
Meneri (Y)	130	80	100	70	110	40	20	50
Sorghum (M)	180	170	70	140	130	40	180	200
Sorghum (Y)	30	30	40	60	30	30	40	80

Source: Statistical Abstract 2004, Department of Census and Statistics, Sri Lanka

Table-2: District wise analysis of upland area under selected cereals

District	2002/ Maha				2003 Yala			
	Finger millet	Maize	Sorghum	Meneri	Finger millet	Maize	Sorghum	Meneri
Sri Lanka	6233	23448	203	145	1123	3611	75	49
Colombo								
Gampaha								
Kalutara								
Kandy	108	251	2		15	69		
Matale	281	480			19	104	17	
N'Eliya	200	248			38	93		
Galle	-							
Matara	10	6			2	1		
H'tota	1078	942	74	51	115	74	2	6
Jafna	18	3			138			
Kilinochchi	22	33	3		29			
Mannar	4	8			1	2	2	
Vaunia	46	80	2					
Mulatiu	23	125			5	4		
Baticaloa	29	635	9		10	67	2	
Ampara	292	2889	44		30	422		
Trinco	17	348			15	53		
Kurunegala	359	709			45	118	2	
Puttalam	125	355			59	173		
A'pura	1721	5480	35		79	270	6	1
Polonnaruwa	62	44	3		34	163	3	
Badulla	225	5253			123	1106		
Monaragala	1219	4479	19	80	160	359	30	2
Ratnapura	358	474	12	14	131	128	11	30
Keygalle	2	8			1	3		
Mahaweli H	34	195			74	402		

Table-3: Total production of selected cereals (MT)

Crop	1995	1996	1997	1998	1999	2000	2001	2002	2003
Finger millet (M)	4090	3400	2990	3800	4220	4290	3770	3660	4540
Finger Millet (Y)	790	510	510	590	590	560	420	410	730
Maize (M)	33340	31430	23630	31450	29280	28540	26660	23240	25750
Maize (Y)	1500	1530	2060	2420	2190	2510	2090	3170	3900
Meneri (M)	120	120	70	70	60	50	40	50	100
Meneri (Y)	140	80	40	70	50	70	30	20	30
Sorghum (M)	200	180	170	40	90	100	30	120	130
Sorghum (Y)	20	20	20	40	50	20	20	30	70

Table-4: District-wise analysis of production of selected cereals

District	2002/3 Maha				2003 Yala			
	Finger millet	Maize	Sorghum	Meneri	Finger millet	Maize	Sorghum	Meneri
Sri Lanka	4542	25745	134	96	725	3900	68	32
Colombo								
Gampaha								
Kalutara								
Kandy	80	262	1		11	52		
Matale	175	499			12	129	15	
N'Eliya	111	184			21	71		
Galle								
Matara	5	6			1	1		
H'tota	514	734	42	18	65	61	1	3
Jafna	10	2			111			
Kilinochchi	14	23	2		16			
Mannar	2	9				2	1	
Vaunia	19	38	1					
Mulatiu	16	105			3	3		
Baticaloa	12	675	4		3	48	1	
Ampara	170	4549	32		17	587		
Trinco	13	387			9	48		
Kurunegala	328	706			25	122	1	
Puttalam	68	287			32	73		
A'pura	1270	5081	27		52	320	5	1
Polonnaruwa	47	491	2		26	170	2	
Badulla	224	5024			81	942		
Monaragala	1223	5952	13	71	119	474	32	2
Ratnapura	219	384	10	7	76	96	10	26
Keygalle	1	8				2		
Mahaweli H	21	339			45	699		

Table-5: Prices of selected cereals (Rs/kg)

Crop	1999	2000	2001	2002	2003
Rice	12.60	12.31	12.48	13.74	12.43
Finger millets	25.40	25.45	28.08	27.20	26.53
Maize	14.20	14.77	14.65	18.11	19.54
Meneri	23.01	28.15		48.63	37.75
Sorghum	30.01	26.31		32.55	33.63

Table-6: Extent and production of Finger millet (Kurakkan)

Season	Cultivated extent (ha)	Production (mt)	Average yield (mt/ha)
2007/2008 Maha season	5328	5429	1.02
2008 Yala season	1056	1093	1.04
2008/2009 Maha season	5024	5571	1.11
2009 Yala season	878	862	0.98
2009/2010 Maha Season	5540	6209	1.12
2010 Yala season	1025	1098	1.07
2010/2011 Maha season	4199	4274	1.02
2011 Yala season	1052	1137	1.08

Table-7: Imports and exports of finger millet (Kurakkan)

Year	2008	2008	2009	2009	2010	2010	2011	2011
	Qty (mt)	Value (â€˜000Rs)	Qty (mt)	Value [UTF-8?](â€˜000Rs)	Qty (mt)	Value (â€˜000Rs)	Qty (mt)	Value (â€˜000Rs)
Imports	2,881	68,079	3,272	92,674	2,052	59,704	3,622	105,366
Exports	12.4	1521	1.96	333	3.0	329	13	1,628

Table-8: Cost of cultivation of finger millet (Maha 2010/2011)

Total cost(Rs/ha) (Including imputed cost)	Total cost(Rs/ha) (Excluding imputed cost)	Net return(Rs/ha) (Including imputed cost)	Net return(Rs/ha) (Excluding imputed cost)	Unit cost(Rs/ha) (Including imputed cost)	Unit cost (Rs/ha) (Excluding imputed cost)
58,869	8,767	(-592)	49,509	56.59	8.43

Source: Socio Economics & Planning Centre, Dept of Agriculture

Table-9: Contribution of Agriculture to the Gross National Product (Rs. M)

	2003	(%)	2004	(%)	2005	(%)	2006	(%)	2007	(%)	2008	(%)
Agriculture	**241,122**	**13**	**262271**	**13**	**289906**	**12**	**333137**	**11**	**418104**	**12**	**589998**	**14**
Agriculture livestock and forestry	210,963	**12**	228,760	**11**	270,679	**11**	297,887	**10**	363,404	**10**	522,064	**12**
Tea	26,278	**1**	30,540	**1**	32,985	**1**	34,865	**1**	49,283	**1**	57,500	**1**
Rubber	5,410	**0**	7,383	**0**	10,377	**0**	18,341	**1**	21,553	**1**	28,029	**1**
Coconut	28,259	**2**	27,254	**1**	30,646	**1**	30,076	**1**	40,742	**1**	65,251	**2**
Minor Export crops	7,791	**0**	7,854	**0**	10,296	**0**	10,889	**0**	1,134	**0**	14,477	**0**
Paddy	31,141	**2**	31,375	**2**	40,110	**2**	39,006	**1**	44,630	**1**	99,822	**2**
Firewood and Forestry	10,758	**1**	11,724	**1**	16,235	**1**	20,663	**1**	26,655	**1**	31,022	**1**
Gross National Product (Sri Lanka)	**1,805,933**		**2,070,109**		**2,422,733**		**2,898,232**		**3,539,634**		**4,311,527**	

Table-10: National Annual Sown and Harvested Extent, Average Yield and Production of Paddy 1990 – 2008

Cultivation Year	Sown		Harvested		Average Yield		Production	
	000 Acres	000 Ha	000 Acres	000 Ha.	Bushels/Acre	Kg/Ha	000 Bushels	000 Mt.
1990	2,109	853	2,046	825	66.97	3,452	121,674	2,538
1991	2,018	817	1,954	791	65.89	3,397	114,471	2,389
1992	1,985	803	1,893	766	66.52	3,430	112,184	2,340
1993	2,061	835	2,026	820	67.97	3,504	123,213	2,570
1994	2,297	930	2,215	897	65.23	3,363	128,630	2,683
1995	2,261	915	2,198	889	68.58	3,536	134,678	2,810
1996	1,850	749	1,631	660	68.15	3,514	98,807	2,061
1997	1,804	730	1,705	690	70.19	3,619	107,333	2,239
1998	2,096	848	2,048	829	70.52	3,636	129,044	2,692

Cultivation Year	Sown		Harvested		Average Yield		Production	
	000 Acres	000 Ha	000 Acres	000 Ha.	Bushels/Acre	Kg/Ha	000 Bushels	000 Mt.
1999	2,205	892	2,154	872	71.10	3,665	136,942	2,857
2000	2,169	878	2,056	832	74.79	3,857	137,085	2,860
2001	1,973	798	1,890	765	76.68	3,953	129,134	2,695
2002	2,106	852	2,025	820	75.50	3,893	137,029	2,860
2003	2,428	983	2,250	911	72.94	3,761	146,983	3,067
2004	1,924	779	1,779	720	79.25	4,086	125,943	2,628
2005	2,316	937	2,261	915	76.86	3,963	155,577	3,246
2006	2,250	910	2,224	900	80.24	4,137	160,163	3,341
2007	2,018	816	1,966	796	85.38	4,386	150,059	3,131
2008	2,602	1,053	2,552	1,033	81.20	4,184	185,723	3,875

Source: Department of Census & Statistics (2008)

Table-11: Performance of different agricultural enterprises (2008)

Enterprise	2000	2001	2002	2003	2004	2005	2006	2007	2008
Tea	53133	61602	63105	65936	74897	81482	91667	113565	137600
Rubber	2179	2129	2552	3717	5155	4724	9674	12089	13538
Coconut	9174	7348	8009	8926	11453	11400	12898	15636	18532
Other agricultural produce	11784	12174	16016	14490	16446	18439	20242	25655	31069
Total Agriculture Value	78270	85254	91684	95072	109955	118050	136487	168952	202747
Total Export Value	420114	430372	449850	495426	583967	638276	716579	845683	881321
Agricultural exports as a percentage of total exports	19	20	20	19	19	18	19	20	23

Source: Central Bank 2008