

ENSURING FOOD SECURITY AMIDST THE ECONOMIC CRISIS¹

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1. Introduction

The poor nutritional status among children is a chronic problem in Sri Lanka which is associated with food insecurity. Although Sri Lanka's health indicators are comparable to the status of developed countries and Sri Lanka has maintained a high human development status, Sri Lanka's nutritional indicators are similar to South Asian standards. Access to food at an affordable price for all people is a human right that several governments have tried to achieve. Nevertheless, the country hasn't been able to achieve the intended goals and the ongoing economic crisis has dramatically worsened the food security situation in the country and international organizations have come forward to provide humanitarian assistance. This paper attempts to show the status of food insecurity in Sri Lanka over the past decade and the long-term and short-term factors leading to the situation today.

2. Status of Food Insecurity in Sri Lanka

Anthropometric indicators represent the food insecurity situation, particularly when the household prioritises the nutritional status of its children, and indicate the status of food insecurity in the household. When the percentage of children under 5 years affected by wasting (per cent) is concerned, Indian and Sri Lankan statistics are nearly the same and this percentage varied between 15 -20% between 2006-2016 according to FAO. The 2016 Demographic and Health Survey (DHS, 2016) reported that one in five children below the age of 5 years was underweight (20.5%), also of high public health significance. The prevalence of stunting in children aged less than 5 years has however remained relatively unchanged from 2006-2016 at a rate of 17.3%, with a marked reduction in the estate sector but not in both urban and rural sectors. Apart from protein-energy malnutrition, micronutrient deficiencies were found in children less than 5 years of age.

Budget share on food is also a proxy indicator that measures the status of food security in terms of access to food. As income increases, spending that goes for buying food in a household tends to decrease. This is observed in the lower expenditure deciles from 2012/13 to 2019. In 2012/13 Household Income and Expenditure Survey (HIES) (DCS, 2013), households below the poverty line spent 68-70% of their budget on buying food which decrease to about 60-62% in 2016 HIES (DCS, 2016) and 43% in 2019 HIES (DCS, 2019),. This is an indication that expenditure

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profiles of the lowest income groups have improved their access to food. Compared to the 2016 HIES, there is an increase in meat and egg consumption according to average monthly household quantity consumption of selected food items in the 2019 survey period.

Nevertheless, the food security situation deteriorated with the setback after the COVID-19 pandemic. The prevalence of severe food insecurity in the total population increased from 0.6-0.7% before COVID to 1.1% after the pandemic based on FAO 3-year average estimates. The economic crisis and the subsequent policies adopted further worsened the situation. Government abruptly made a policy decision to ban fertilizer and agrochemicals in April 2021, as a result of severe shortages of foreign exchange due to macroeconomic mismanagement. Consequently, this created a fertilizer and agrochemical shortage in the market. Although the government revoked the decision within a few months of its implementation in November 2021, world market prices had already increased by this time to more than the price recorded during the 2007/08 financial crisis. Farmers abandoned cultivation, and area under cultivation and production dropped. Again when the exchange rates were adjusted to its market rate in 2022 March, rupees soared against US dollar from 203 in March 2022 to 364 in May 2022. As a result, from Mid-2021 food prices drastically increased, initially with the banning of chemical fertilizers and agrochemicals and then again after the depreciation of the exchange rate. Year-to-year food inflation was recorded at 80% in September 2022, the highest in recent history.

According to the World Food Program revelation in September 2022, 6.3 million people, or over 30 per cent of Sri Lanka's population, are "food insecure" and they emphasized the need for humanitarian assistance. According to them, of the food insecure population, around 5.3 million people are either reducing meals or skipping meals. This situation can be understood by extrapolating the 2022 August poverty line statistics constructed by DCS on the 2019 HIES income statistics by expenditure decile. According to the 2019 poverty line, 11.9% of the population lies below the poverty line. This percentage increases to about 30-40% when the 2022 August poverty line is considered.

The food crop sector produces the essential food commodities in the food basket of an average Sri Lankan and supplies more than 70% of cereals requirements and more than 90% of vegetable and fruit requirements according to Food Balance Sheet of DCS (DCS, various issues). From all sources, the country supplied 2,883 kcal, 72 g of protein and 52 g of fat per person per day on average during the period from 2013-17. Plant-based products are the major source of calories, proteins and fats compared to animal base products in Sri Lanka. Of the average dietary energy supply, plant-based sources constitute more than 90%. Rice alone supplied 43% of dietary energy according to 2015 statistics. Plant-based sources provide more than 75% of protein and fat for an average Sri Lankan. According to 2015 statistics, protein supply through animal sources was only 23%. Rice supplied 33% of protein to an average Sri Lankan. Although the country produces 90% of the rice requirement, excepting in the years affected by drought, Sri Lanka is a net food importer of main food commodities. In 2020, the year affected by COVID-19 and with restricted imports, the country spent US \$ 439 million importing cereals, primarily

wheat (Central Bank, 2020). Together with non-cereal food imports, this caused a net trade deficit of US \$ 416 million in the year 2020. The other main imports were onions, lentils, chilli, potatoes and garlic.

Not being able to produce food crops at a lower price has been a long-term issue that has contributed to food insecurity in Sri Lanka. Productivity growth in the domestic food crop sector has been too low compared to neighbouring countries to be competitive in international trade, and to produce to meet the domestic demand for many crops. The Sri Lankan food crop sector has been protected by implementing various import substitution policies ever since the food crop sector was opened to foreign trade competition in the early 90s. These include tariffs, quotas, subsidies, administered prices and various other macroeconomic supportive environments. Moreover, a complex para-tariff structure has been imposed to compete with imports under different free trade agreements. Food prices are therefore relatively high and food inflation is higher than general inflation. This long-term trend sharply ascended with the economic crisis which was followed by the COVID pandemic.

The long-standing problem of the non-competitive nature of the food crop sector can be attributed mainly to two important factors; low productivity and the increasing wage rate in agriculture. Annual TFP growth of agricultural crops in the region is compared, Sri Lanka has low productivity growth in the agriculture sector compared to competing trading partners (Table 1). According to USDA (USDA, 2017), countries that have achieved higher growth in agricultural productivity have experienced larger reductions in the prevalence of food insecurity.

Table 1: Annual Total Factor Productivity (TFP) Growth based on USDA/ERS estimates

	1961-1980	1981-2000	2001-2019
Vietnam	0.5%	1.8%	2.0%
India	0.8%	1.2%	2.9%
Bangladesh	-0.3%	0.1%	0.9%
Sri Lanka	1.3%	-0.5%	1.8%
South Asia	0.8%	1.3%	2.6%

USDA, 2017

Rising wage rates due to non-agricultural capital formation is the other factor causing high food prices. Increasing the wage rate has significantly substituted labour through mechanization in the last few decades and increased the adoption of other labour-saving management practices. Owing to private sector investments, Sri Lanka has a largely mechanized agriculture sector in

South Asia. Although mechanization has contributed to net cost reduction in some crop sectors and to increased labour productivity, it is marginal to compete in the region. New challenges brought by escalating world market fertilizer prices and the soaring exchange rate have made the country at risk of supplying the minimum requirement of chemical fertilizers. To further aggravate the situation, the government lacks the fiscal capacity to provide subsidies to farmers. Food import prices have also become very high in consumer markets.

3. Reviewing history and learning Lessons from the past: Sri Lankan Experience in Food Crop Sector

The following historical account emphasizes the factors accountable for the food crop sector's performances over the last few decades and the main three underlying factors; appropriate technology- institution- policy mix required in achieving productivity and growth in the food crop sector, the role played by market, government and international partners in different periods in the history and the influence of changing world order in realizing the domestic efforts; are considered in subdividing the period from the Green Revolution to today. Based on these underlying factors, the following sub-periods have been identified to review the food crop sector milestones.

- The period of the Green Revolution spanning from the 1940s to the mid-1980
- From the mid-1980s to 2000
- After 2000

3.1 The period during Green Revolution and Post-Green Revolution to mid-1980

Farm mechanization was identified as one of the early technological developments in the west that brought scale economies in agriculture and labour productivity increases in their economies. Plant breeding - the science of changing the traits of plants to produce desired characteristics, mainly high yields that brought frontier shifts - became the next technological breakthrough to ripple to countries in the South.

Production of modern crop varieties overwhelmingly dominated by public-sector research programs brought large productivity increases in developing countries, particularly in Latin America and Asia, during the period of the Green Revolution. This was about a century after modern plant breeding originated in developed countries in the late 19th century, drawing on techniques of selection and crossing. International centres were extraordinarily successful in producing modern varieties, primarily by providing elite materials to national programs in developing countries.

The period of the Green Revolution which is characterized by developmental states, the philanthropy capital for technology development and free gene sharing for varietal development is the starting of Sri Lankan food crop sector development. During this period international agricultural research centres acted as a global biological commons in genetic resources sharing, and this formalization was implemented through an elaborate system of international nurseries with a breeding hub, free sharing of germplasm, collaboration in information collection, the development of human resources, and an international collaborative network. Rockefeller, Ford and USDA were the core funding agencies that provided technological capital.

This period in Sri Lanka was also characterized by direct government support in developing domestic agriculture through various policies, public expenditure programs and the establishment of supportive institutions through Acts. Sri Lanka was successfully engaged in collaborations with international partners, particularly CGIAR, during this period. Gene transfers for developing NIV of paddy during the Green Revolution period is a historical breakthrough in technology generation. Adam Pain noted that Sri Lankan agricultural research in the '60s to '80s offers evidence of a vital and competent research organization and programme (Pain, 1986). According to him, Sri Lanka's record had been impressive in terms of the production of improved techniques and plant varieties, and adaptable techniques and varieties. The International Rice Research Institute has designated two varieties of paddy from Sri Lanka, BG 367-4 and BG 367-7, as the best high-yield varieties in South East Asia and Africa.

Of the government capital budget, 25-31% was allocated during this period to developing irrigation infrastructure, and to the accelerated Mahaweli development program, of which more than 50% was foreign assistance. Fertiliser subsidy was introduced and institutional support for input markets, credit markets and insurance was facilitated. Liberalization of the economy in 1977 opened the international markets for machinery and agrochemicals to come to the domestic market.

Domestic policies, institutions, international support and philanthropy capital enabled the country to achieve varietal development breakthroughs and the adoption of new technology by farmers. The momentum gathered during this period of the Green Revolution coupled with large-scale irrigation investments made it possible for Sri Lanka to become self-sufficient in rice production by the mid-1980s.

3.2 From mid-80s to 2000

This is one of the most turbulent periods in the history of domestic agriculture. Domestic structural changes and uncertainties and the changing development assistance during this period caused Sri Lanka to drift away from its relative position in the region. Significant factors include liberalization of the economy and opening the market for the private sector, gradual withdrawal of government intervention, structural reforms and establishment of the provincial administration, civil disturbances and loss of NGO trust.

Ethnic riots in 1983 and the youth uprisings in the late 80's led to an unsettling and uncertain state of affairs in all sectors in the late 1980s. Devolution of power of the central government, the solution brought to the ethnic issue in 1987, devolved the agricultural extension to be administered by the Provincial Councils established. The entire cadre of field-level extension officers was transferred to the Janasaviya program, an activity totally outside agriculture, making the extension a weaker institution in transferring technical knowledge to farmers. The devolution of agricultural administration and extension systems negatively affected the dissemination of technology. The achievements in the food crop sector during the post-Green Revolution era are not remarkable.

Meanwhile, a huge public sector investment boom assisted by a massive flow of foreign aid and the soaring fertilizer prices in the international market created a budgetary restriction for the fertilizer subsidy scheme to continue. In 1988, the government excluded certain fertilizers from the subsidy scheme and a decision was taken to abolish the subsidy scheme on 1st January 1990. In 1990/91, responding to an emerging balance of payments crisis, the government devalued the currency and initiated a second wave of liberalization. However, the fertilizer subsidy was reinstated in 1994 when the new government came to power and a urea-biased policy was adopted.

Parallel to these, the changes that happened in the international sphere badly affected Sri Lanka. With the private sector and multinational companies starting to dominate the seed industry and the patenting of plants, their subsequent restrictions on open access to genetic resources for varietal development in developing countries also affected Sri Lanka. Additionally, the development assistance to CGIAR has been contracted. However, countries like India adjusted to the change; the Indian private sector took over the main breeding programs and state capital was invested in CGIAR. The exploitation of hybrid vigour of cross-pollinated crops and some self-pollinated crops, and early research in genetic engineering (GE) are the technologies that brought large shifts in the yield frontiers during the post-Green Revolution era in other parts of the world. In Bangladesh, their NGO sector started to take a leading role in adjusting to the new situation.

The main thrust in domestic agriculture in Sri Lanka had been factor intensification through input availability after liberalizing the economy, massive public expenditure on irrigation and subsidized fertilizer. Although irrigation and fertilizer are essential inputs for the realization of yields, the absence of new technology and varietal development for higher yields, and continuous increased use of inputs lead to unnecessary resource use and inefficient production. Sri Lanka experienced yield stagnation in the 80's and 90's in the paddy sector.

With the second wave of liberalization of the economy from the mid-'90s, many agriculture input markets were privatized and brought free from tariffs.

- Three government-owned seed farms were privatized in 1993.
- In 1994, the government waived duty on machinery and equipment imports

- Imports of seeds and planting materials became duty-free in 1995.
- In 1996 the other field crop sector was opened
- The first hybrid maize variety was introduced by Ceylon Agro Industries in 1998.
- In 1998, the country started implementing a seasonal tariff imposition to protect seasonal local supplies from import competition.

Soon after the field crop sector was opened, farmers abandoned dry chilli production due to stiff competition from India which had already been affected after the Monocrotophos ban.

Table 2: Annual Total Factor Productivity (TFP) Growth based on USDA/ERS estimates

	1961-1980	1981-2001
Vietnam	-0.52	3.94
India	1.54	2.33
Bangladesh	-0.23	1.06
Sri Lanka	-0.39	-1.21
South Asia	1.42	2.14

Avila & Evenson, 2004

The agriculture sector performances have been analysed by calculating the TFP for the period from 1961 to 1980 and from 1980 to 2000 by Avila & Evenson (Table 2) and USDA/ERS (Table 1)/ These estimates compare the country's situation with the countries in the region. According to these estimates, it is evident that Sri Lanka ranks one of the lowest in South Asia and Sri Lankan performances deteriorated in the 1981-2000 period compared to the 1961-80 period while in Vietnam, India, Bangladesh and other countries in South Asia the performances have improved between those two periods.

3.3 The Period after 2000

Economic liberalization after the mid 90's paved the way to factor embodied technology transfer from overseas through exotic hybrid seeds, tractor imports and other agrochemicals and equipment imports. However, with multinational companies having dominated the seed industry and patenting of plants, open access to genetic resources and technology spillovers became more constrained. Certain imported technologies have been becoming costly and not adaptive.

The cost of importation of tractors increased from US \$20 million in 2000 to US \$ 80 million in 2017 and the pedestrian-controlled 2 wheel tractors were replaced with new-technology 4 wheel medium-sized tractors. Harvesting and threshing machinery imports increased from US \$ 0.63 million in 2001 to US \$ 34 million in 2016.

Taking a larger share of transactions through the open market, also led to several institutional innovations for technology transfer in agricultural value chains. Various forms of value chain innovations that were introduced by input and output companies were able to overcome constraints and enhance access to the adoption of these new technologies. The contract grower system which was introduced by the central bank in 1999 through its Forward Sale Contract (FSC) program made a value chain innovation in commercializing maize to become the second-largest field crop in the country. F1 hybrid technology developed in other countries, private sector investment in scaling up the technology, and policy support to implement the program are significant. Through this innovation, animal feed production began commercially and developed as a rural income avenue in poverty-stricken areas.

However, with the government withdrawing from market intervention, it is observed that the emergence of oligopsony and oligopoly markets in certain input and output markets and exploitation of farmer share of agriculture surplus. According to the 2010 national account of DCS, the grain milling product manufacturing sector has accrued 76% of gross value added in operating surplus which accounts for capital share and profit.

Although the maize sector and the vegetable sector benefited from exotic hybrid imports, other sectors are largely dependent on varietal developments of the public sector. Nevertheless, the growth of public sector investment in agriculture research and development in Sri Lanka has been the lowest compared to the statistics of the region. With these limitations, DOA has been able to develop a few new technological products that increase the productivity levels of the food crop sector. The most notable achievements were the chilli F 1 hybrid from the chilli Hybrid program of Mahalluppallama, potato tissue culture G0 seeds from the Seethaeliya research station, big onion true seed production and a few high-yielding rice varieties.

A study by Wickramasinghe et al. (2021) reveals that the TFP growth of main food crops in the period from 2001-2017 is higher compared to the period from 1990-2000. TFP growth of paddy which had been negative from 1990 -2000 shows a 1.4 % growth p.a. from 2001-2017. Maize records a TFP growth of 7.63% p.a. after 2000 and a resulting output growth of 9.15% p.a. predominantly contributing to meeting the derived demand in the processed food and feed industry in Sri Lanka. TFP growths for soybean, potato, and chilli are significant after 2000. A chilli output growth of 1.38% p.a. was achieved after 2010 due to TFP growth when the area under chilli came down by 2.24% p.a. Although technological advances and institutional innovations are significant after 2000, it has not been adequate for the food crop sector to be competitive in the region.

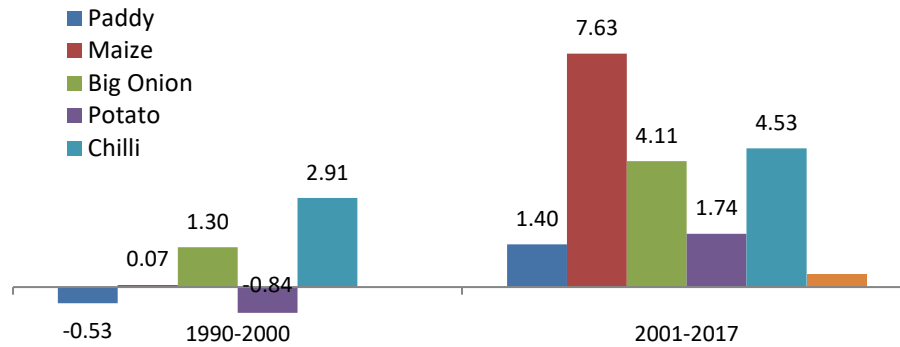


Figure 1: TFP growth per annum by crop in sub-periods 1990-2000 & 2000-2017

Source: Wickramasinghe, W. and Samaratinga, P. A.(2021)

The period from 2000 to 2018 was also not without shocks. However, in mitigating the effect of external shocks during the global economic crisis from 2007-08, the strategies that the government took were effective in the short run. World trends experienced for some years and cyclic factors merged into a crisis by suddenly increasing fuel, fertiliser and food prices, causing global inflation from early 2007. But the increased world food prices provided an incentive framework to boost domestic production although fuel and fertiliser prices increased. The government continued the fertiliser subsidy and it caused an increase in the budgetary burden and the balance-of-payment tensions. More emphasis was given to fertiliser use efficiency, and in 2013 recommendations were revised for paddy to reduce urea used as a basal application.

After the 2007/08 global financial crisis, international development partners recognized the importance of food crop sector development in their development agenda, and changed their perception of the neglect of agriculture under the policies of the Washington Consensus that followed the debt crisis.

4. Notable Observations

There is a long-term issue of lack of competitiveness in the Sri Lankan food crop sector compared to the region, resulting in domestic food/feed prices being higher than world market prices, and tariffs and para-duties being imposed to protect local farmers during the harvest season. This causes the poorer segment of the population to find it unaffordable to have a nutritious daily diet. The current economic crisis has worsened the situation in that the proportion of the population either reducing meals or skipping meals has risen to 30% of the population.

The technology-institution-policy mix plays an important role in productivity enhancement in the food crop sector. Developing countries' collective effort in search of new technology is now mostly bound to the state's capacity to invest in technology generation and to afford technology developed in other parts of the world. Therefore the country will need to become more self-reliant in the provision of agricultural R&D. The public research system has a vital share in creating new knowledge and technology as private, corporate and non-governmental sectors have limited incentives for innovations in Sri Lanka. The Department of Agriculture (DOA) should be duly supported as the main public organization effective and accountable for undertaking research and development in the food crop sector. Vertical technology spillovers from FDI by engaging in global value chains are also not significant in Sri Lanka. Local value chain innovations have been supportive of technology dissemination to farmers in poverty-stricken remote areas.

The country experienced global price escalation of fertilizer, and fuel during 1989, 2007, and 2021 due to cyclic and secular changes in the primary commodity markets. The capacity of the budget to buffer these price spikes by providing subsidies has declined over the study period requiring various structural changes in the food crop sector markets. The most recent global fertiliser and fuel price escalation that was coupled with rupee depreciation and dollar shortage restricted input availability for food production.

The food crop sector is currently faced with the long-term issue of comparatively low growth of total factor productivity in the region and lower affordability of factors for growth. In a crisis like this, which the industry is currently going through, the support of the development partners is important. Similar to the support received during the Green Revolution to improve technological advances for food crop development in developing countries, assistance for technological capital, genetic resources for variety development, and support for human capital development from international aid organizations and international development partners are crucial for technological innovations for productivity growth as committed by the sustainable goal 17 of the United Nations. New technology is usually embedded in inputs. Nonetheless, there is a paradigm shift in the new technological advancements which would determine productivity growth and would be highly knowledge-based and information intensive. Therefore strengthening the information systems and common platforms developed by the state agencies and private sector to share knowledge is a priority.

It is the state's responsibility to allow open market operations devoid of market imperfections and to undertake development planning based on principles of governance in the domestic administration. Implementing sector-discriminatory policies such as the banning of inorganic fertilizers and agrochemicals merely to manage macro-economic variables has made the food security situation in the country worse. While addressing the agriculture sector's inefficiency issues separately, the agriculture sector should not be burdened by imposing inefficiency in other sectors. Therefore it is prudent to follow a sectoral approach in determining policies related to public financing and import decisions to ensure food security and rural livelihood.

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