

# Role of Food and Agriculture Sector in Economic Development of Sri Lanka: Do We Stand Right in the Process of Structural Transformation?

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## ABSTRACT

This paper examines empirically the economic problem of whether the food and agricultural sector in Sri Lanka is capable of playing its intended role proposed by Myint over the last few decades. The Myint hypotheses suggest that, as a country undergoes a process of structural transformation, there are four different roles to be played by the food and agriculture sector. These include: (1) food security - associated with annual per capita production of food (rice and other field crops); (2) labor mobility - releasing of agricultural labour force to other sectors (manufacturing and services); (3) capital formation - through domestic savings from this sector, and (4) agricultural trade - earning of foreign exchange by exporting agricultural products (tea, rubber, coconut). Both descriptive and Multiple Regression Analysis were carried out to analyze the secondary data covering the period of 1970 to 2004. The results suggest that this particular sector performs satisfactory with respect to many of these areas, especially earning of foreign exchange, food security and capital formation; however, there are prospects for enhancing these performances. Yet, it was not capable of releasing the excessive labor it possesses to work in other sectors as specialized workers. The study, as a whole, highlights the importance of safeguarding the food and agriculture sector in Sri Lanka, because not only it acts as the mainstay of livelihood for vast majority of people, but also it has come up to a position where it can stand right with a “little help” and a right policy framework.

**Key words:** Agricultural policy  
Agricultural trade, Economic development,  
Food & Agriculture sector in Sri Lanka,  
Food security, Structural transformation

## INTRODUCTION

A number of distinct changes to the structure of economy in Sri Lanka were occurred since the Western colonial powers governed the country starting from the Portuguese to the Dutch and finally the British. One of the key introductions to the “agriculture” sector during this period was plantation agricultural crops, including tea, rubber, coffee, cashew etc. Before that, the economy was considered as “rural” and “subsistence agriculture-based”, where a vast majority of fellow citizens was involved with cultivation of paddy and other field crops that can be used in domestic consumption. Since the independence from the British rule in 1948 to date, the successive governments came into power have taken many steps to promote the activities pertaining to these two sub sectors (i.e. paddy / other field crop and plantation crop) in the areas of production, processing, and marketing.

Since the independence, alongside the food and agriculture sector, both “manufacturing” and “services” sectors have also expanded. However, the relative performance of each sector has been uneven, where the manufacturing and services sectors grow rapidly in compared to the food & agricultural sector. The most notable feature in this regard is the *structural transformation*<sup>1</sup> where the manufacturing and services sectors make higher contributions to economic development, measured in terms of the Gross Domestic Product (GDP), than the agriculture sector (Central Bank of Sri Lanka, 2005; Sanderatne, 2005). At present, the manufacturing sector contributes about 26.5% of GDP in Sri Lanka, while agriculture, together with forestry and fishing sectors, contribute 17.9% of GDP. The historical data from the Central Bank Annual Reports (1951-2005) show that this

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is in sharp contrast to the structure of the economy existed just after the independence. In 1950, for example, the contribution of food and agriculture related activities to the GDP were nearly 41%, while that of manufacturing sector was accounted for about 16%. Combined with this process, the contribution of services sector were also rose from 41% in 1950 to 55.7% of GDP by 2005. In the beginning of 1950s, plantation crops not only contributed to a large share of agricultural output, but most of the manufacturing output and services also consisted of either processing of tea, rubber and coconut and/or supplementary or supportive of these crops<sup>2</sup> (Jayasuriya, 2003; Sanderatne, 2005).

Noteworthy, paddy production remains as the basis of domestic agriculture during all these periods. It shows a significant increase by 265% during the last three decades under the open economic policy framework introduced in late 70s. Nonetheless, it had lost its position in domestic agricultural arena to the “other food crops” (i.e. export agricultural crops, up country and low country fruits and vegetables, floriculture etc.), which at present contributed about 57% of total agricultural output in the country. Currently the contribution of plantation crops and paddy to the GDP is as little as 3.2% and 3.5%, respectively. In contrary, other food crops accounted for about 9.7% of GDP. Therefore, the emergence of food crop agriculture from a position of neglect and little importance to one of economic significance was an important economic transition took place during the post-independence period starting from 1948 (Epaarachchi *et al.*, 2002; Tudawe, 2000).

A momentous change has taken place in terms of agricultural marketing and trade also during this period. Before 1970s, for example, agricultural exports have accounted for more than 70% to 80% of total exports, while industrial exports were stagnated around 15%. Since the Western rulers, especially British, have much emphasized on developing physical infrastructure that required promoting the expansion of plantation agricultural crops,

the proportion of food imports to total exports was as high as 45% in 1950s with imports of rice it self accounting for more than 15% of total imports. The food imports were, however, remained to be the bulk of imports (i.e. 36%) until late 1970s<sup>3</sup>. However, it has reduced to 7.4% of total imports by 2004 with rice imports being less than 1% of total imports (Sanderatne, 2005).

The economic reforms introduced in 1977 reversed the food and agricultural policies pursued from 1970 to 1977, and are considered a sharp break from past economic regimes. An export-led economic strategy was a cornerstone of the new policies that recognizes the high rates of economic growth accomplish only by increasing new industrial exports<sup>4</sup>. In turn, such industries (e.g. garment products) obtained favorable terms and concessions as compared to food and agriculture-based enterprises. Accordingly, the share of manufacturing in GDP that had declined to 14% by 1977 started increasing sharply and nearly doubled (i.e. 27%) in 2004. The contribution of the services sector also increases to 55.4% in 2004 from 40.6% in 1977. Sri Lanka’s historical trade pattern reflects this clearly. For example, in 1977 value of agricultural exports accounted for more than 79% of total exports, while in 2004 it accounted for only 19%. Quite the opposite, value of industrial exports in 1977 to the total exports was just about 14%, where its current value is about 78%. Besides such changes to the basic structure of economy in Sri Lanka, it grew only by an annual average of 4.2% during the last six decades. Today, with all these changes in effect, the World Bank classifies Sri Lanka as a “*Lower Middle Income Country*” characterized by slightly more than US\$ 1200 per capita GNP per annum (Atukorala and Jayasuriya, 1994; DeRosa and Govindan, 1995).

It has been accepted that the performance of the agricultural sector should grow absolutely and that relative to other sectors should decline in the process of structural transformation, and as a result, economic life and human livelihood to be

improved. Nevertheless, there are many unresolved problems exist in the context of food and agriculture sector in Sri Lanka! For example, what is actually happening in this particular sector over time and now with respect to production, trade, and above all, well-being of the people who involved with it? Were these transformations occurred in the past “stable” and “with significance”? Once its relative contribution to overall economy diminishes, would this sector will “have a say” with regard to its specific roles to play in the process of economic development? In a moment, where the concepts such as “globalization”, “liberalization”, and “commercialization” in force, could it be able to stay alive along with other sectors? These are some, but not all, questions that we have in our hands to find favorable solutions!

Answers to these questions are imperative, because beyond all these trends and facts and from time immemorial, “agriculture” has been considered the most important pursuit of the people in Sri Lanka. It has greatly conditioned the socio-economic environment of the country and continued to dominate every sphere of the economy. Although the relative contribution of which, at present, has gone down to less than 19% of the total GDP, it must be noted that more than 70% of the 19.2 million people in the country still make their livelihood directly or indirectly based on it. Further, it provides sources of employment to about 35% of the total labour force, and responsible for a considerable amount of domestic savings (Central Bank of Sri Lanka, 2005).

In this shed of light, this paper examines empirically the performance of food & agriculture sector in Sri Lanka with regard to a number of key aspects, including (1) food security; (2) marketing and trade of agricultural products; (3) labor mobility, and (4) capital formation through domestic savings using the historical data. The analysis, in consequence and as a whole, ponders in many issues. It examines, for example, whether the structural changes the Sri Lankan economy had undergone with declining proportions of GDP from

agriculture over the years and rising shares from manufacturing and services sectors are a healthy one. Further, it assesses the implications of such changes took place in food & agriculture sector on the future of the same and on an economy in Sri Lanka, as a whole. The contribution of this paper to the existing literature in this area is significant. Although there is a great deal of literature available that reviews or provides statistics with respect to the performance of certain sectors in agriculture (e.g. tea, rubber, coconut), to the best knowledge of the author, there is no literature available that empirically takes into account of many facets of the role of agriculture in economic development simultaneously. Besides all, the Myint hypotheses (see below) are not tested with actual data from the agriculture sector in Sri Lanka, and this study closes that gap!

## METHOD

### *Theoretical Framework*

The hypotheses developed by Myint (1977, 1965) to highlight the possible relationship between performance of the food & agriculture sector of an economy and its relative contribution to economic development were used as the basis to examine this problem. According to Myint, in the process of structural transformation, the “*relative*” contribution of food & agriculture sector to total economic development in terms of its share to the Gross Domestic Product (GDP) should be *decreased*, while the “*absolute*” contribution of which with respect to a number of key areas should be *increased*. In particular, the agriculture sector should be able to:

- (1) Increase the supply of food available for domestic consumption (*food security*);
- (2) Release the labour force engage in agriculture related activities for specialized work in other sectors, i.e. industrial and services (*inter sectoral labor mobility*);

- (3) Increase the supply of domestic savings from the agriculture sector (*capital formation*), and
- (4) Increase the supply of foreign exchange earned through exportation of agricultural commodities (*agricultural trade*).

In turn, these four variables can be regarded as factors that determine the role of agriculture in national development, and represented in an empirical model consists of a dependent variable to reflect the later (i.e. national development). The estimable variables developed to represent the situation prevail in Sri Lanka are discussed below.

**Developing Hypotheses and Estimable Variables**

First, to claim that food & agriculture sector in Sri Lanka has contributed to the economic development significantly by “securing food” for Sri Lankans, the “annual per capita production of paddy and other field crops” (*PFC*) [*kg/person/year*] was taken into account. In doing so, only the domestic production of paddy and some selected field crops (i.e. maize, cassava, soya bean, finger millet, cowpea, sweet potato, groundnut, and green gram) was considered. On the assumption that there should not be any importation of these products to the island if it was in position to produce the requirement of the country domestically, the quantities of importation of these items in each year were excluded as we calculate this figure. In turn, we expect this variable to have a positive (+) value.

Second, to be in line with the condition (2) above, we can state that “the active labor force involved with the agriculture sector of a given year as a percentage to midyear population” (*ALF*) [%] should be decreased as these people should be released to work in other two sectors. This is an important pre-requisite, because the population of the country increases over the years irrespective of the facts that economic activities pertaining to the food & agriculture sector shrink (as its

relative size decreases), and those take place in other two sectors expand (as their relative size increase). In view of that, we expect this variable to have a negative sign (-).

Thirdly, it was hypothesized that “the stock of capital produced by the agriculture sector through domestic savings” (*DSA*) [*Rs. Million*] should be increased over the years. The GDP from the agriculture of a given year (*GDPA*) (see below) was multiplied by the Domestic Savings Ratio (*DSR*) of that year (i.e.  $GDPA \times DSR$ ) to derive this variable. The developments to the infrastructure and certain diversifications to the sector over time as a result of advanced technologies introduced, and use of most up-to-date knowledge, skills, and know-how etc., amongst the others, can have a greater impact on this phenomenon, since all of which are endowed with higher returns (i.e. through higher production and productivity). We expect to have a positive (+) value for the coefficient of this variable.

Fourthly, “the foreign exchange earned through exporting agricultural products” (*AEX*) [*Rs. Million in real terms*] should be increased significantly over time, although, as with the structural transformation, the ratio between this particular value and the total value of foreign exchange is to be decreased over time. The value of foreign exchange earned by key plantation agricultural crops (i.e. tea, rubber and coconut) and major export agricultural crops (i.e. coffee, cocoa, cinnamon, pepper, cloves, and cardamoms) were taken into analysis, as they were responsible for greater proportion of agricultural exports in Sri Lanka. Not surprisingly, the expected value of this variable is also positive (+).

**Empirical Model**

The four explanatory variables explained above were used to specify the following empirical model:

$$AEC_i = \beta_0 + \beta_1 \times PFC_i + \beta_2 \times ALF_i + \beta_3 \times DSA_i + \beta_4 \times AEX_i + \varepsilon_i$$

where, the dependent variable AEC explains the “contribution of agriculture sector in Sri Lanka to its overall economic development in a given year” (*i*), which was calculated as follows:

- The GDP in each year (i.e. from agriculture + manufacture + services sectors) was multiplied by “share of GDP from agriculture” of the respective year to get the GDP from the agriculture sector<sup>5</sup> (GDPA).
- Both GDPA and GDP were divided by the mid year population of the respective year to get the per capita GDP from the agriculture sector (PC\_GDPA) and the per capita GDP from all sectors (PC\_GDP), respectively.
- AEC was, in turn, the percentage between PC\_GDPA and the PC\_GDP, i.e.  $[(PC\_GDPA / PC\_GDP) * 100]$ .

### Data Collection and Analysis

Nearly 60 year time period since the independence can be bisected into two major phases based on the type of major economic policy framework adopted by subsequent governments: (1) “closed” economic policies (1948 to 1977), and (2) “open” economic policies (1978 to date). Because of lack of valid and reliable data covering the whole period, the secondary data published in the “Annual Reports of the Central Bank” and other publications from the “Department of Census & Statistics” only for the period of 1970 to 2004 ( $n = 35$ ) were used in the analysis<sup>6</sup>. Multiple Linear Regression techniques were adopted with the Least Square methods (Green, 2000) to estimate the coefficients of variables included in the model<sup>7</sup>.

### RESULTS AND DISCUSSION

This section describes both descriptive statistics associated with and estimates of coefficients of variables included in the model.

Figure 1 illustrates that both GDP and GDPA (i.e. GDP from agriculture),

where the nominal prices of each year were deflated to get the real prices using 1970 as the base year, were increased, although with different rates, over this period.

The Mean value of the GDP during this period was Rs. Million 28,947 [Standard Deviation (SD) = 12,992], and that of GDPA was Rs. Million 6,601 (SD = 2,321). The Mean of the “share of agriculture to the GDP” was 23.87 (SD = 2.84) with the “Minimum” and “Maximum” values of 18.4 and 28.3, respectively. The Coefficient of Variation (CV) (i.e.  $SD / Mean \times 100$ ), which can be used to have an idea on extent of variability of a factor over the years, of the GDP and GDPA was 44% and 35%, respectively. This indicates that these values related to both manufacturing and services sectors have been changed with higher variation over time in compared to that from the agriculture sector, which was, of course, a characteristic associated with structural transformation. Throughout this period, however, there was no substantial change to the values of the GDPA occurred, in absolute terms. For example, the average increase of GDPA was just 1.4 times higher in 1980s as compared to the 70s (i.e. 5954 to 3991 Rs. Million) and remained at the same rate in 1990s as compared to 80s (i.e. 8345 to 5954 Rs. Million).

While the diminishing contribution of agriculture sector to the national economy accepting, the major interest in this analysis was to examine whether this sector was capable of accomplishing the “responsibilities” that it is assigned for! Table 1 depicts the descriptive statistics of the variables used in the empirical model.

We can say that, from the “food security” point of view, the performance of this sector has been moderate. The historical data show that total production of paddy and other field crops over this period has been increased with a slight positive trend (Mean = 2849 and SD = 451 Metric Tonnes) (Figure 2). However, this was characterized by year-wise fluctuations (CV = 13.8%).

With regard to the per capita availability of food, as oppose to our expectations, it shows a slightly “negative” trend (Mean of 177 and SD = 24.5 kg/person/year and CV = 13.8%) (Figure 3).

This does not say that agricultural sector in Sri Lanka has utterly failed to produce the per capita requirement of the major staple food product, because it is not the production but the distribution of what has produced has become a major political issue with respect to agri-food industry in Sri Lanka. Yet, the prevailing conditions signal policymakers that the importance of further increasing of domestic production of paddy and other field crops so that Sri Lanka can reach and maintain the condition that per capita availability of major staple food is tally with the population growth rate.

Also, the descriptive statistics suggest that there was no significant change occurred with respect to releasing of agricultural labor force to other sectors during this period, where the value of the CV was just 4.6. The value of domestic savings from the agriculture sector has, however, been increased with a positive trend (Figure 4). It can be noticed that this value remains more than Rs. Million 1000 since 1990, and it has reached to almost Rs. Million 2000 in the recent years.

The foreign exchange earned by exporting agricultural products has increased substantially during this period, and this was much prominent since the open economic policies introduced in late 70s. There was a huge gap between Mean values in 1970s to 1990s with a CV more than 95%. For the entire period, the Mean values representing the agriculture and all sectors (i.e. agriculture + manufacturing + services) were Rs. Million 28,971 (SD = 27,395) and 120,112 (SD = 152,510), respectively (Figure 5).

The total foreign exchange earned by all sectors together has increased considerably over the years, mainly because of ever-increasing exports from the manufacturing and services sectors. For that reason, a wide gap has been created

between agricultural and total exports during this period. As a result, the ratio between foreign exchange earned by agriculture and that earned by the entire economy decreased drastically (Figure6).

Table 2 presents the results from the Multiple Regression analysis. The relatively higher  $R^2$  value of 0.69 indicates that the four explanatory variables included in the model show a significant contribution to the dependent variable, or in other words, the variables PCF, ALF, DSA and AEX explain about 69% of the variation of AEC.

The results suggest that three variables, namely AEX, DSA, and PCF, were significant at different probabilities ( $\rho$ ), i.e. 0.01, 0.05 and 0.10, respectively, and the signs of coefficients of these variables were also same as expected. However, not only the estimate of the variable ALF is not significant, but was also in contrary to the expected sign (i.e. negative). These revealed that in the process of structural transformation this particular characteristic has not performed in the way it is anticipated.

The results highlight that various policies adopted by successive governments to increase the domestic paddy and other field crop production have provided favorable results. However, increase of the population in Sri Lanka at a rate above 1%, which results total population of Sri Lanka to increase from about 12.5 millions in 1970 to 19.25 millions in 2003, still acts as an impediment to achieve the objective of “feeding the nation with domestically produced food”. If we could fulfill this condition satisfactorily along with structural transformations to the economy, the food & agriculture sector in Sri Lanka will be in a right track with regard to the issue of food security.

Increase domestic savings from this sector, at least marginally over the years, may be attributed to the transformation of subsistence-based agriculture into profit-oriented agribusinesses in various types and scales, and establishment of a range of facilitative institutions (e.g. rural banking and co-operative systems) with the aim of promoting agro-entrepreneurship and

**Table 1 - Descriptive statistics of the variables used in the model:**

<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation (SD)</b>	<b>Coefficient of Variation (CV)</b>	<b>Minimum</b>	<b>Maximum</b>
AEC	23.9	2.8	11.7	18.4	28.3
PCF	117.7	24.5	20.8	127.0	223.0
ALF	19.6	0.9	4.6	18.5	22.1
DSA	964.9	469.5	48.6	310.0	1994.0
AEX	28,971.6	27,395.4	94.5	1693.0	89,682.0

**Table 2 - Estimates of the coefficients of variables:**

<b>Variable</b>	<b>Parameter Estimate (Standard Error)</b>
PCF – Per capita food consumption	0.0171* (0.0083)
ALF – Agricultural labor force	0.0202 (0.0179)
DSA – Domestic savings from agriculture	0.0018** (0.0007)
AEX – Agricultural exports	0.6206*** (0.0342)

Significance at  $\rho = 0.01$  \*\*\*;  $\rho = 0.05$  \*\*, and  $\rho = 0.10$ \*

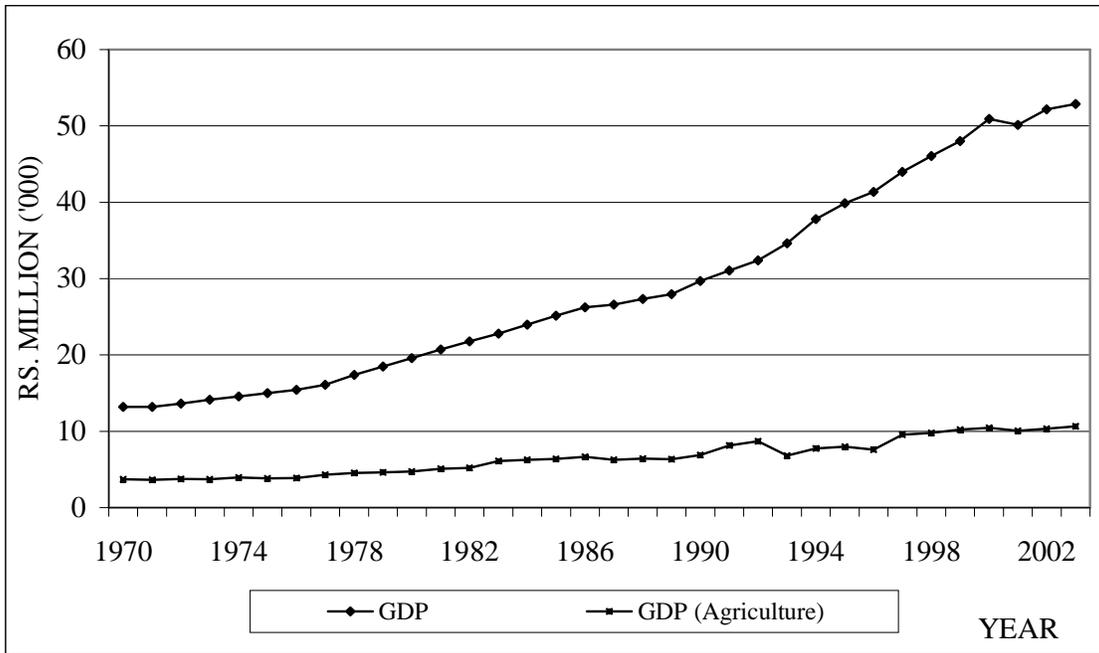


Figure 1 - GDP form agriculture and the entire economy (1970 – 2004):

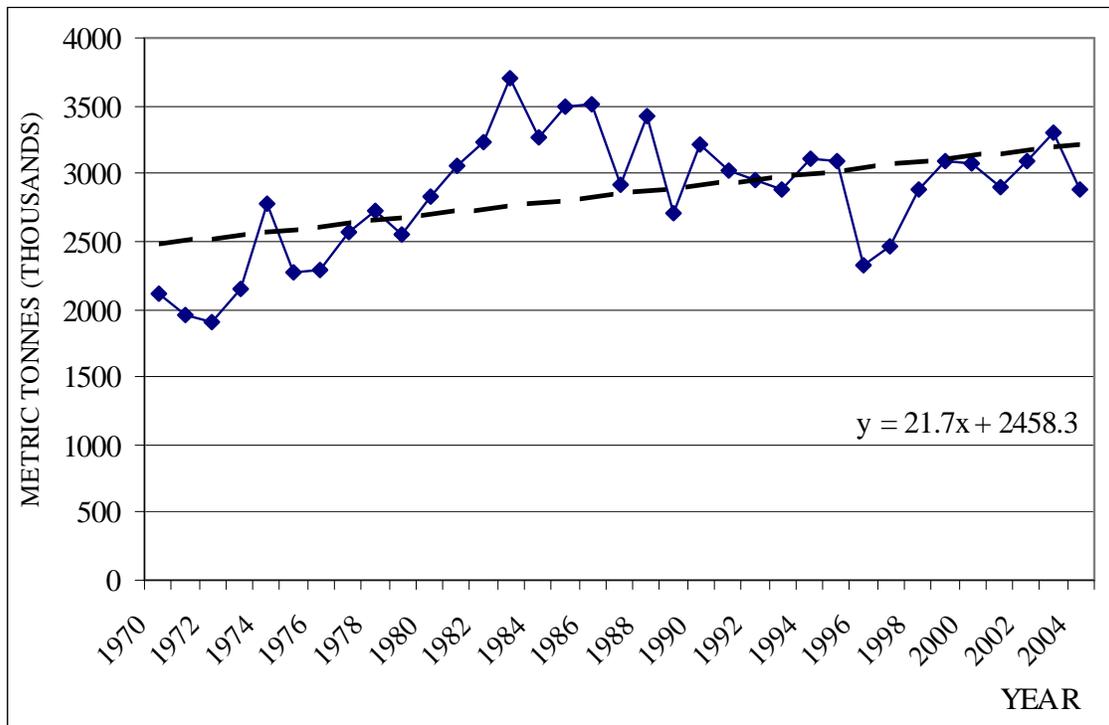


Figure 2 - Major staple food crop production in Sri Lanka (1970 – 2004):

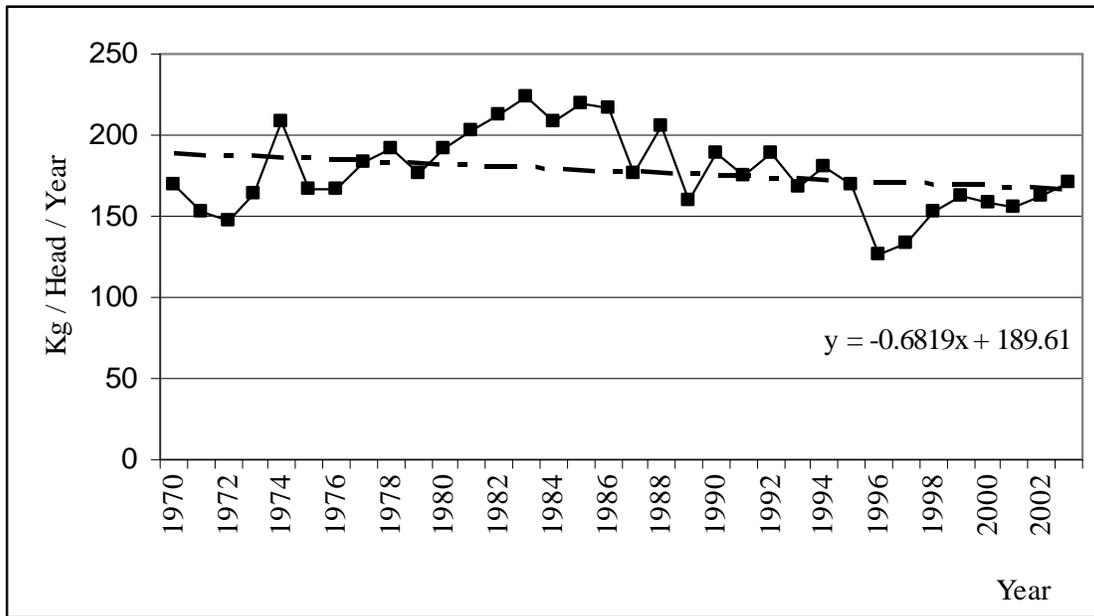


Figure 3 – Per capita production of major staple food crops:

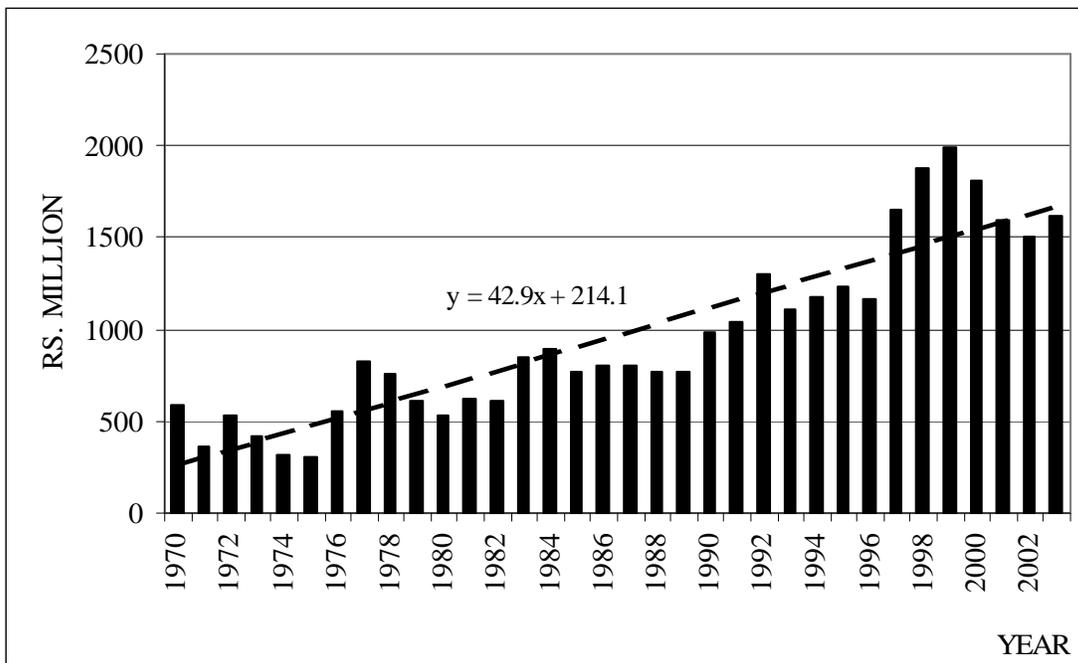


Figure 4 - Domestic savings from agriculture sector (1970 – 2004):

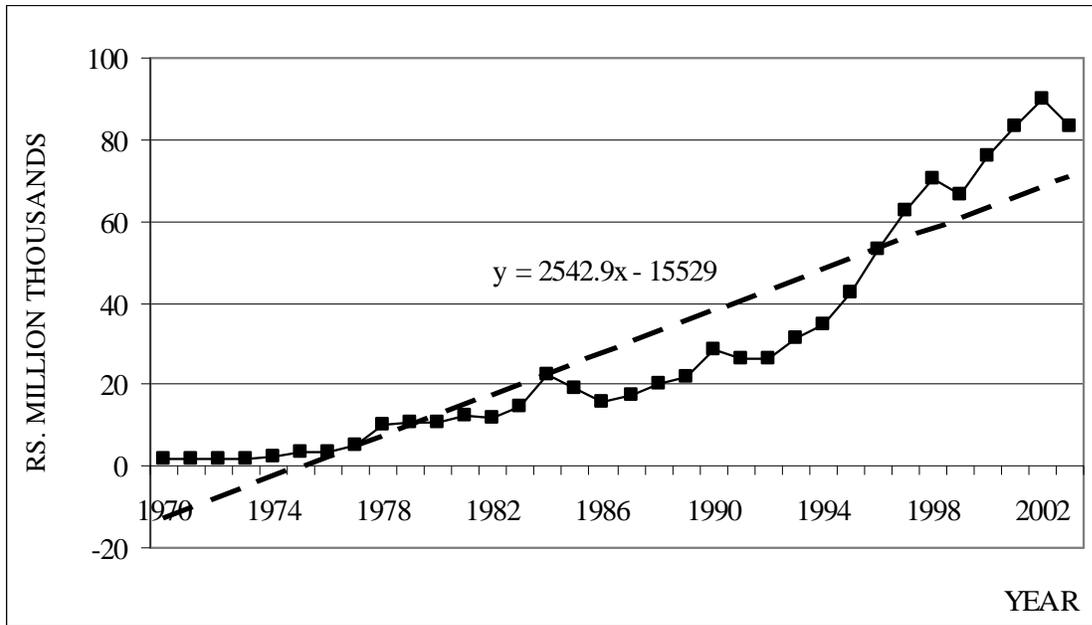


Figure 5 - Value of agricultural exports in Sri Lanka (1970 – 2004):

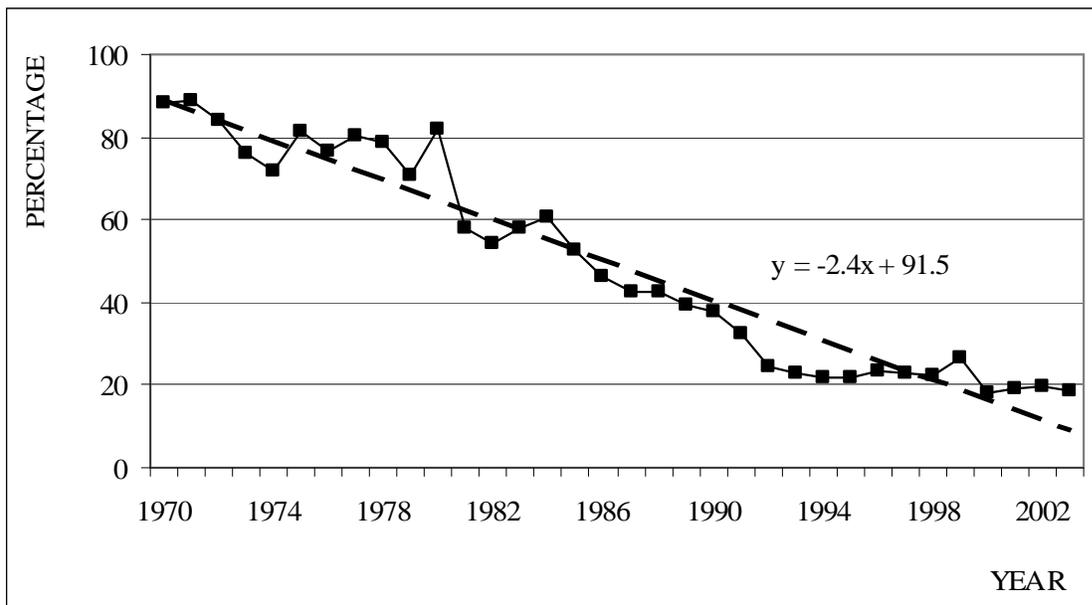


Figure 6 - Percentage of agricultural exports to total exports (1970 – 2004):

financial management skills and attitudes of stakeholders in the sector. Though this development is relatively little as it is compared with developed countries with prominent agricultural sector in place (e.g. the United States, Australia, Canada, Japan and New Zealand), the gradual increase of domestic savings can be considered a bigger achievement. The results also prove that plantation agricultural crops, especially tea, rubber and coconut, have still been playing a very significant role in terms of earning of foreign exchange.

### CONCLUSIONS AND POLICY IMPLICATIONS

Although the outcome of analysis suggest that the food & agriculture sector in Sri Lanka was able to contribute satisfactorily (although, not pleasingly) towards the economic development of the country in a number of key areas, including food security, capital formation, and agricultural trade, it emphasizes that there exist lots of “opportunities” and “urgent requirements” for further improvements in these areas. Very specifically, care must be taken to release the excessive and unspecialized labor involved with agriculture to other sectors of the economy with an appropriate skill development, which was not taken place progressively in the past few decades.

The results also stress the importance of providing continuous support and targeted incentives to the food & agriculture sector similar to what are “offered” to other two sectors in the economy. The focus of which must be the vast majority of “smallholders” perform in this sector in the name of farmers, processors and distributors, so they can compete in the currently emerging agricultural markets. Alongside any financial and physical supports that focus on individual sectors (e.g. subsidies for paddy sector), there is an urgent need for establishing properly functioning economic and social institutions, both public and private (non-governmental), that can facilitate establishing strong linkages

between different sectors in the marketing channel.

Finally, the food and agricultural policies already written and to be implemented, for example the “10-year development program” that comes under the *Mahinda Chinthanaya*, must be enriched with plans and programs to cover all the important areas considered in this analysis in order to make the entire agri-food sector is “market-oriented”. In such attempts, the policy makers must be aware of “specific roles” of the individual sectors within agriculture, for example, paddy for domestic consumption and plantation agricultural products to earn foreign exchange (after fulfilling domestic needs). If that happens, the ultimate objective of “agriculture-for-development” would be able to achieve in the near future as we move into the final stages of structural transformation. At that point, a relatively small agri-food sector would be able to look after its own needs as well as the most basic needs, i.e. food, of other “giant” sectors in the economy.

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2. These included transport of fertilizer and other inputs for estates and the transport of export produce by road, rail, ship, banking, and insurance services for export agriculture.
  3. These included the liberalization of trade and exchange controls, and the introduction of an economic strategy dependent on private investment and market forces. Foreign investment was encouraged and a greater reliance was placed on exports. All these policies transformed a closed tightly controlled inward looking economy into a market-oriented outward-looking one. It was the beginning of a process that laid greater emphasis on private enterprise and lesser reliance on state owned and controlled economic enterprises (Sanderatne, 2005).
  4. The government policies mainly focus on development of economic infrastructure such as establishment of free trade zones, implementation of urban development projects.
  5. For example, if the GDP is Rs. Million 100 and the share of agriculture is 21 percent of a given year, the GDP from agriculture is Rs. Million 21 for that year.
  6. This does not provide a complete overview and exposure to the economic problem studied in this paper, so the extension to the analysis to cover the period from 1947 – 1969 is warranted. Although, greater difficulties are being faced with respect to getting valid and reliable secondary data for this particular period, the authors are in the process of extending the analysis.
  7. Although the pooling of data creates a sort of statistical error as it would combine two structural regimes, the small sample properties associated with doing so, and in turn, biased and inconsistent estimates obtained would also be in the same magnitude. Therefore, the authors decide to take entire period with Multiple Linear regression to reflect the large sample properties.

#### END NOTES

1. 'Structure transformation' is defined as a process by which increasing proportions of employment and output of the economy are accounted for by sectors other than agriculture. The economy becomes less agriculturally oriented in a relative sense, although agriculture and, more broadly, the food system continue to grow absolutely and generate important growth linkages to the rest of the economy. Structural transformation thus involves a net resource transfer from agriculture to other sectors of the economy over the long term.