



# An Overview of Potato Production in Sri Lanka: Trends, Changes and Constraints

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## Abstract

Potato is one of the key annual upland cash crop, mainly cultivated in Badulla, Nuwara-eliya, Jaffna and Puttalam districts of Sri Lanka. In recent years, it has been notified that potato production is gradually declining and cost of cultivation is increasing considerably. Hence, the foreign expenditure on imports has also increased and the farm incomes as well as levels of food security have decreased. At present, the estimated potato imports were about 50% of the total national requirement and the government spent Rs. 3700 million for the importation. According to mentioned above, the study was carried out to review and investigate the trends in potato production and analyze the recent developments, changes and importation in potato production in Sri Lanka. Total production and cultivated extent displayed a similar trend for the study period with a sudden decline in 1998. Cost of production, potato imports, weather, poor storage conditions, varying availability of good seed and diseases are the major problems limiting potato production in Sri Lanka. In the year 2017, Badulla, Nuwara-eliya and other districts contributed on average 65%, 34% and 1% of the national production respectively. The sharp decline in potato cultivation in the hills occurred due to several environmental factors including soil erosion and pollution. Significant reductions in production and cost of cultivation problems have been realized with the continued efforts of the Sri Lankan government to protect the local farmers and it is expected to reduce potato imports up to 35% in 2018.

**Keywords:** Cost of production, imports, potato cultivation, production.

## 1. Introduction

Potato (*Solanum tuberosum* L.) is one of the important upland annual crop in Sri Lanka, which is cultivated in an annual extent of 5000 ha with an average yield of 15 t ha<sup>-1</sup> (DOA, 2014). It is a most popular cool-season vegetable that ranks with wheat and rice as staple crops in human diet around the world. The crop is commonly cultivated in Nuwara-eliya, Badulla, Kalpitiya, Puttalam and Jaffna. Amongst it is extensively grown in hill countries of Badulla and Nuwara-eliya due to favorable agro climatic conditions. At present scenario, the production of particularly high value



cash crops such as potatoes, chilies, and big onion has been decreasing over the past decade. For instance, the total national potato production in 2016 was 80,458 metric tons and the extent was 5092 hectares. Accordingly, potato production in 2017 was 52,998 metric tons and the extent of cultivation has decreased to 3300 hectares (Department of Census and Statistics, 2018). Higher cost of production, problems in marketing, potato imports, high cost of farm inputs and low yield are few reasons for the reduction in potato production. In addition, when compared to the other countries, the cost of production of potato is relatively high. The average cost of production of potato greatly varies due to the type of seeds and other agronomic practices (Ahilan and Kafila, 2010). These findings are relative with the statement of kamaline et al., (2008) that potato yield is gradually declining and cost of cultivation is increasing during last decades. This phenomenon leads extremely high importation in Sri Lanka. Relatively cheap imports mainly from India create a competitive market for the local potato producers. However, the local production of potato had hardly been competitive for vulnerable farmers. According to mentioned above, the objectives of the study are to review and investigate the trends in potato production and analyze the recent developments, changes and importation in potato production in Sri Lanka. Further, it tries to identify the problems encountered in potato cultivation in Sri Lanka.

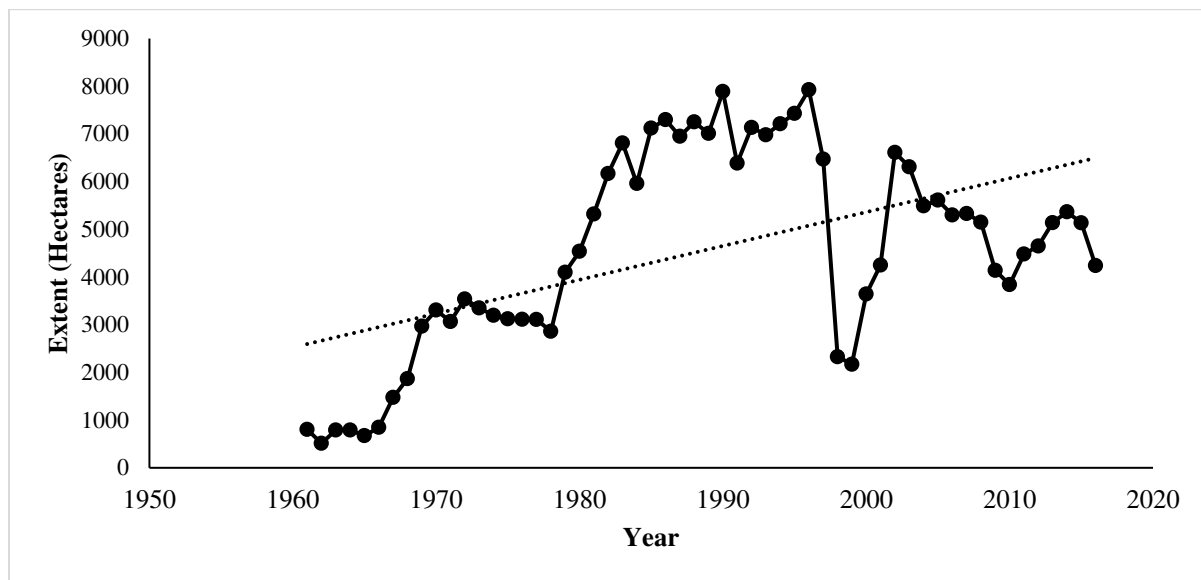
## 2. Methodology

The study was carried out at potato producing areas of Sri Lanka to investigate the trends in productivity of potatoes during the period from 1961 to 2016. Potatoes in Sri Lanka are mainly grown in three districts, namely Nuwara Eliya, Badulla, and Jaffna. However, there are namely areas that potato can be cultivated such as Puttalam, Kalpitiya, Rathnapura, Kandy etc. However, Due to many reasons cultivation are strictly limited to the above areas. Jaffna and Puttalam are the other two districts where the potato is grown in lesser extent.

This study is entirely based on secondary data available from the department of census and statistics (Agriculture and Environment statistics division), Department of Meteorology (Sri Lanka), Central bank of Sri Lanka and relevant details from various sources of published research papers, newspaper, magazines and websites. Then, the data were manipulated to express the current position of potato sector in Sri Lanka. Accordingly, graphs were produced and based on the observed patterns certain interpretations were made. Further, correlation and regression analysis were carried out to see the relationships among variables such as production and area harvested using SPSS 16.0.

## 3. Results and Discussion

Data pertaining to extent of potato cultivation is depicted by Figure 3.1 from the period of 1961 to 2016. It has been shown a variation in graphical trend line and decreasing gradually over the past years. Sathiamoorthy *et al.*, (1985) cited that generally, the cultivation of potatoes were started in 1951, but it is failed to give high yield due to various reasons, therefore it was getting lower values in terms of cultivated extent, production and yield in earlier period.



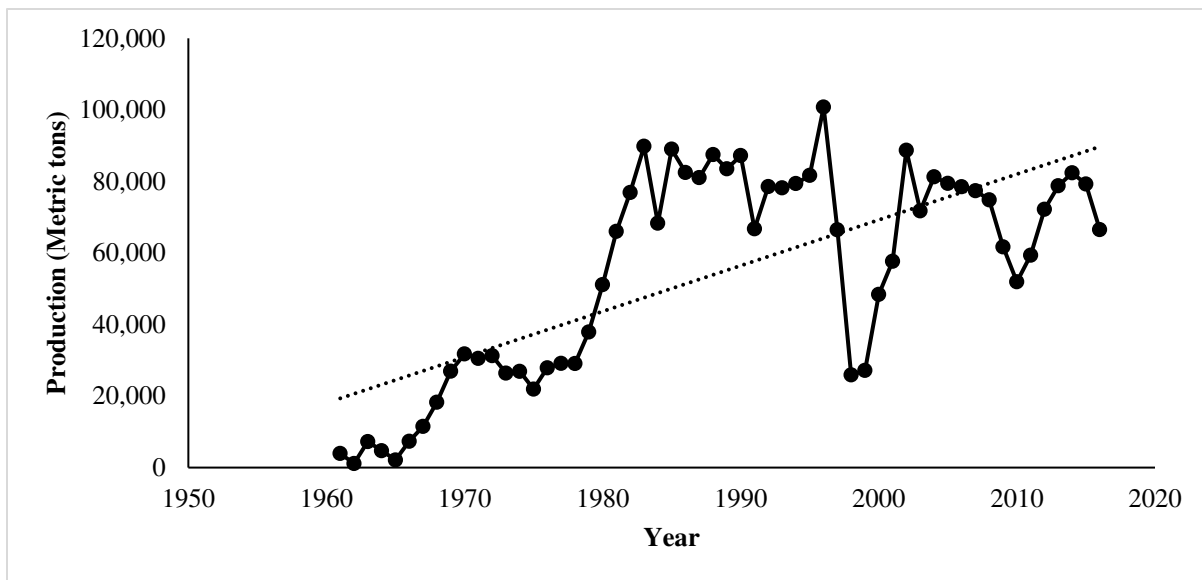
**Figure 3.1: Extent of potato cultivation in Sri Lanka (1961-2016)**

The results indicated that there was a gradual increase observed in the cultivated extent (Figure 3.1) and production (Figure 3.2) of potato after 1967. This is because of import restrictions of potatoes implemented by government to encourage local production among farmers in Sri Lanka. Thereby, this strategy was immediately enhanced the rapid expansion of the acreage of potatoes.

Further, in recent years, the sharp decline in the cultivated extent (Figure 3.1) and production (Figure 3.2) have been recorded. For instance, the extent under cultivation around 7925 ha in 1996 has decreased to 4239 ha by 2016. Further, it reveals that potato production in 2014 was 82,372 metric tons and the extent was 5365 hectares. Accordingly, potato production in 2016 was 66,534 metric tons and the extent of cultivation has decreased to 4239 hectares. Wickramaratna (2010) revealed that this drop has taken place in major potato producing areas of both Badulla and Nuwara-eliya districts. This might be occurred due to negative environmental impacts interms of soil erosion and pollution. Moreover, Abeygunasekara (2004) has reported that hill country shows the highest amount of soil erosion, about 58% of the potato-cultivated land found to be prone to

severe soil erosion. The accelerated soil erosion causes significant impacts on on-farm as well as off farm activities.

The cultivation in other districts also shows a decline over the past years. The extent of cultivation in Jaffna district has declined from 117 ha in 1998/99 to 26.76 ha in 2011/12 and the production has decreased from 687 metric tons in 1998/99 to 222.3 metric tons in 2011/12 (Northern provincial council, 2013).



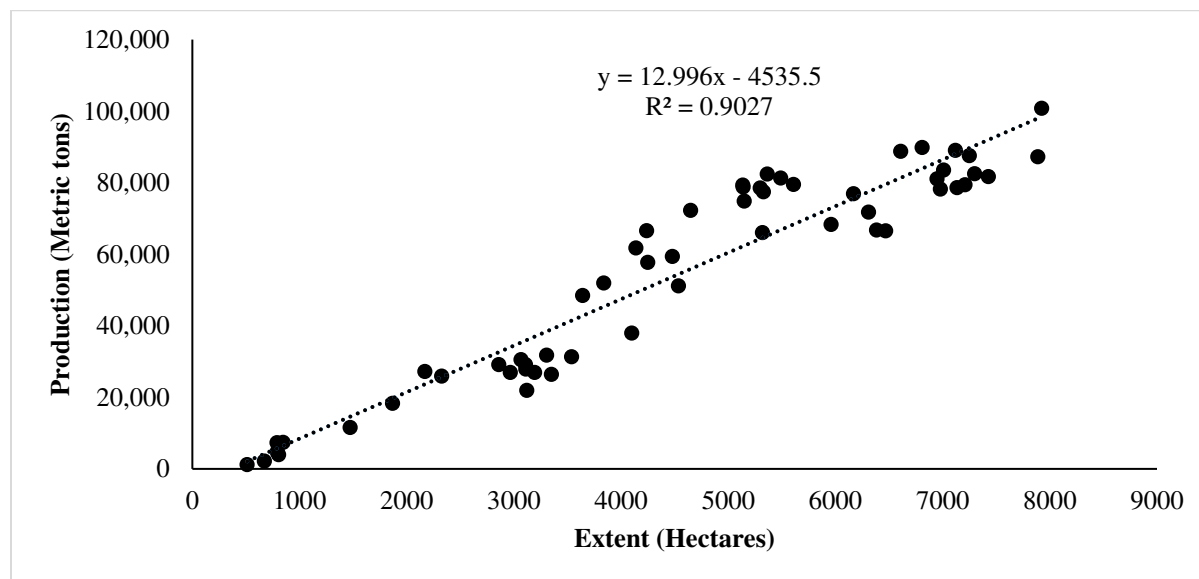
**Figure 3.2: Potato production in Sri Lanka (1961-2016)**

The major identified issues for decreasing production of potatoes are decline of producer prices of potatoes, imports of potatoes and high prices of farm inputs, crop loss and market failures. On the other hand, increased of cost of production is also considered as a leading issue in potato production. As cited (Potato council, 2012), cost of production of potato crop in Sri Lanka is relatively high when compared to the other countries. Generally, individual grower's cost of production per ton will vary greatly depending on the yield achieved in a particular year. However, the crop yield is determined by irrigation, fertilizers, crop protection measures and cropping systems. Therefore, crop yield vary from field to field within the same area (Jay and Neil, 2012).

According to the literature, the cost of production per acre is estimated at around Rs. 292,000 and productivity is around 6000 kg. The seed cost is Rs. 8750 per 50 Kg and it is also estimated that 2500 kg of seeds are required for one acre. This shows that the seeds itself accounts for about

55-60 percent of the total cost of production. Not only that, wages for the hired labours also accounts for a higher percentage of the total cost of production.

Apart from that, weather, poor storage conditions, diseases and availability of good seed are the some of other problems in potato production in Sri Lanka. Most of the growers in the up country depend on natural precipitation while growers in the coastal districts (Puttalam and Jaffna) use irrigation (Essays, UK, 2013). If the rainfall in the up country fails, potato production in the other areas is affected because of the short supply of seed potatoes. This might be the reason for decreasing production in Jaffna. The next major limitation is the poor storage facility on most farms where seed potatoes are kept in boxes in the farmers' home.

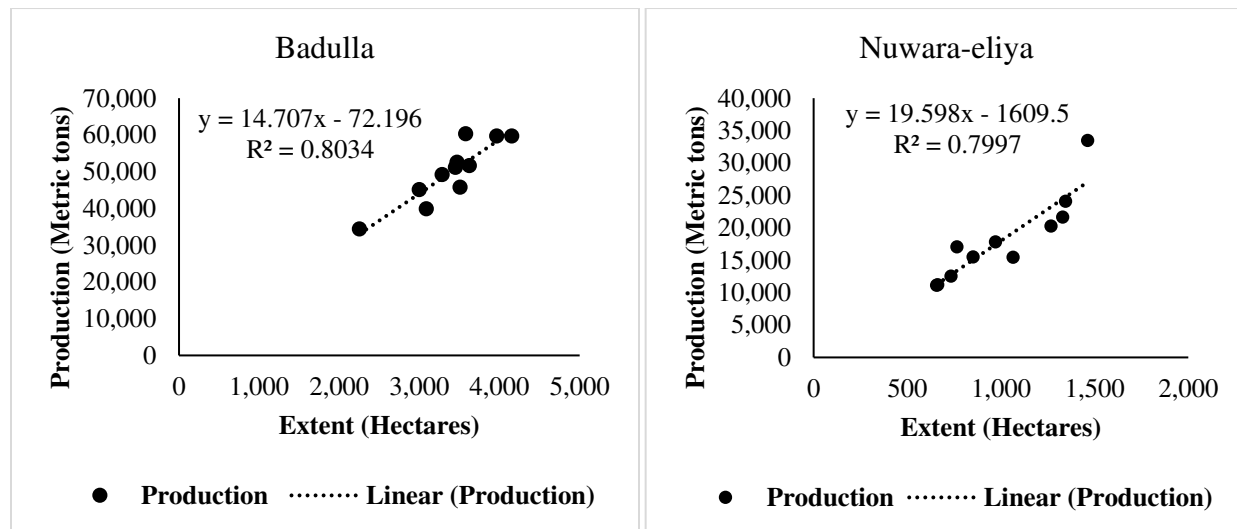


**Figure 3.3: Relationship between potato productions with cultivated extent (1961-2016)**

Results appeared in Figure 3.3 depicted that production of potato was increased with the cultivated extent, increasing trend of cultivated extent ensures the potato production in higher score. Correlation between potato production with cultivated extent was estimated as  $R^2 = 0.9027$ . It indicates that about 90.27% variation in production could be explained by the variation in cultivated extent of potato. The significant increase in cultivated extent may be occurred due to the favorable producer prices and import restriction policies prevailed during the season.

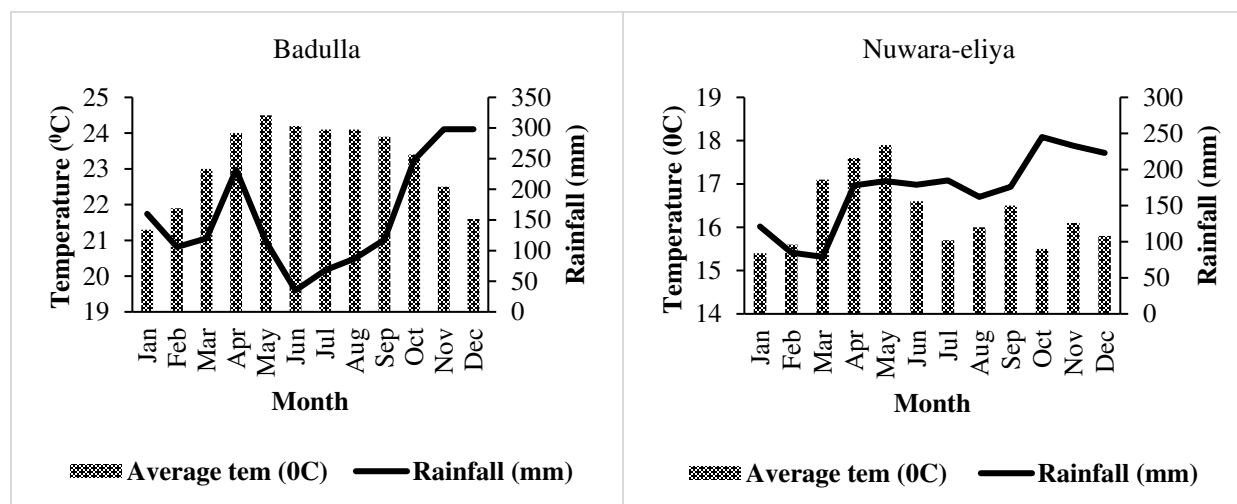
Potato is the most preferable cool season cash crop of farmers in the upcountry farming system. A number of environmental factors such as temperature, moisture, light intensity and duration are some of factors that affect growth and yield of potato. The crop is commonly cultivated in

Nuwara-eliya and Badulla districts. In Nuwara-eliya district, the potato cultivation is mainly done by commercial growers while in Badulla district it is the livelihood of many of small farmers.



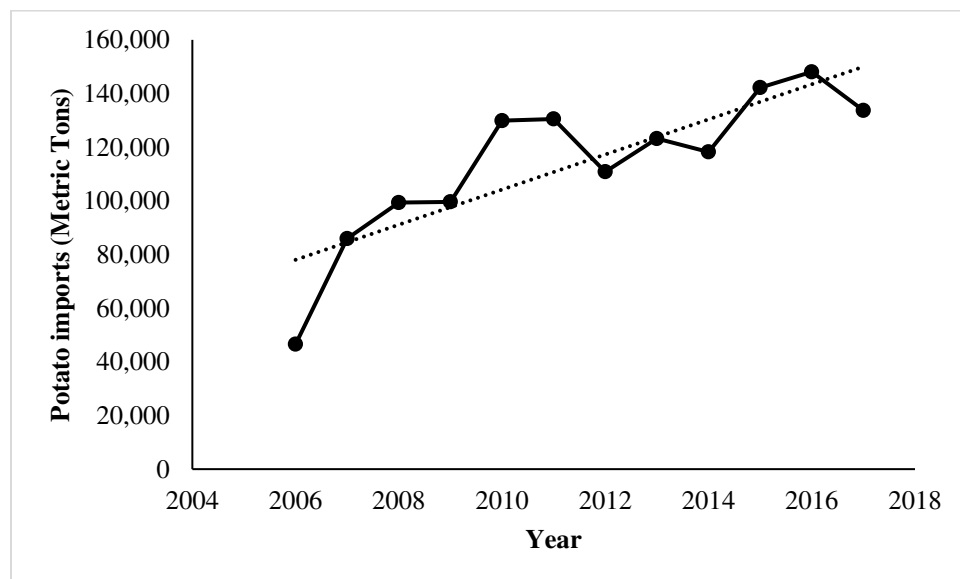
**Figure 3.4: Relationship between potato productions with cultivated extent among districts (2007-2017).**

Figure 3.4 shows the two major potato producing districts contribute to the national production namely Badulla and Nuwara-eliya. Senanayake and Rathnayake (2015) revealed that potato has been one of an economically attractive crop grown in hill country of Sri Lanka which Badulla district represents 72% of the total extent of cultivation in Sri Lanka. Almost two third of the potato is produced in Badulla followed by Nuwara-eliya. Results obtained that both districts were highly correlated in which Badulla district ( $r = 0.896$ ) was getting slightly higher value compared to Nuwara-eliya district ( $r = 0.894$ ).



**Figure 3.5: Climate data.**

At present, potato is widely grown in the up-country intermediate zone of Badulla district in paddy fields and high lands during Yala and Maha seasons respectively. This area experiences the rainfall of 1500- 2250 mm annually with 70% RH and 15-22<sup>0</sup>C range in temperature. Likewise, the other major potato cultivatable district is Nuwara-eliya (Up country wet zone) where the annual rainfall is more than 2500 mm and temperature ranges between 10-15<sup>0</sup>C with the relative humidity of 80%. The data appeared in Figure 3.5 shows the climatic requirements for major potato producing areas of Badulla and Nuwara-eliya districts. According to the statement of DOA (2018), potato can be successfully grown in up country wet, intermediate, and dry zones at temperatures between 24<sup>0</sup>C and 32<sup>0</sup>C as well as in Puttalam and Jaffna districts during Maha. However, increasing ambient temperatures, altered rainfall patterns, declining soil fertility and changed pest/ disease dynamics are key aspects of climate change that are relevant to any crop production (Rosenzweig *et al.*, 2008; Gregory *et al.*, 2009; St. Clair and Lynch, 2010).



**Figure 3.6: Imports of potato (2006-2017)**

In recent years, the cost of production has remained extremely high and poor yield has eroded the profitability of potato crop (Potato production and marketing in Sri Lanka, 2013). Therefore, there had a possibility to enhance the imports of potatoes. As above mentioned, decline in potato production also happen due to imports of potato. Hence, local producers had difficulties in competing with imports of these commodities. Farmers are now confronted with severe difficulties in marketing their products due to the availability of cheaper imports (Wickramaratna, 2010).



Figure 3.6 depicts how the imports of potato change over last 11 years. At present importation of potato is 50% of the total national requirement and the government spent Rs. 3700 million for the importation. Therefore, the government tries to encourage the local farmers even the production is low because of the high cost of production. Their future target is to reduce imports up to 35% in 2018. The provision required for imports with respect to the years 2016, 2017 and 2018 were Rs.Mn.486.3, Rs.Mn.188.5 and Rs.Mn.10 respectively (Food production National Programme, 2015).

#### 4. Conclusions

From the above findings, it can be concluded that in recent years, a sharp decline in the cultivated extent and production of potato have been displayed the similar trend. At the same time, in the year 2017, Badulla, Nuwara-eliya and other districts contributed on average 65%, 34% and 1% of the national production respectively. The drop in potato cultivation in the hills occurred due to several environmental factors including soil erosion and pollution. Cost of production of potato has remained extremely high and poor yield has eroded the profitability of potato which leads the importation. It was estimated as about 133,686 metric tons (50% of the total national requirement) in 2017. Relatively cheap imports mainly from India create a competitive market for the local potato producers. However, the local production of potato had hardly been competitive. Therefore, the government continues to impose a duty during the main producing months in order to protect the vulnerable farmers due to high cost of production and it is expected to reduce importation of potato up to 35% in 2018.

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