



Full Length Research Article

PRICE INSTABILITY AND CHANGE OF TERMS OF TRADE IN SMALL FARMING SECTOR IN SRI LANKA (WITH SPECIAL REFERENCE TO CULTIVATION OF PADDY AND VEGETABLES)

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ABSTRACT

Decline farm product prices and the subsequent effect of diminishing farm income become a core factor of sustaining peasant agriculture in developing countries. The small holding agriculture concentrated on paddy and vegetables farming in Sri Lanka also suffered from the issue causing many threats to sustain the industry. Nearly 30 percent of the labour force in Sri Lanka occupied in agriculture and thus deteriorating farm income has become core issue in national development. The paper aimed to review the factors influenced in declining terms of trade of paddy and vegetable farming and assessing its implications on the Sri Lankan economy. The analysis based on the deductive method showed parity ratio between paddy and non-farm items has declined continuously in the recent past with a greater variation. However the effect on the vegetable cultivation was not so significant since frequent price fluctuations offset the farm income. Though the governments of Sri Lanka implemented fixed output price scheme for purchasing paddy and fertilizer subsidy to mitigate the issue, still farmers suffered from the issue badly. The impact was worsen by outward looking policies associated with global economy. Thus, it is a comprehensive issue to be addressed by a broad policy framework.

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INTRODUCTION

As in many developing countries, price instability and subsequent diminishing terms of trade in small farming sector has become one of the crucial issues in domestic agriculture in Sri Lanka today. Though the price fluctuation occurs due to cyclical effects of agricultural production pattern associated with uncertain agro climatic factors (Ellis, 1994), its impact is vital on determining food supply, food security, occupation and farm income. Nearly 72 percent of total population in Sri Lanka is living in rural agricultural sector and 30 percent of labour force is occupied in the paddy and vegetable farming. Paddy/ rice is the staple food of the country and thus paddy production become an important economic activity of the country both in terms of livelihoods of rural community and national food security. Similarly vegetable and fruits are also cultivated as the alternative food crops or mixed crops. Thus paddy and vegetable farming becomes a main occupation of many small farmers in Sri Lanka and price instability and subsequent effects of losing farm income become a crucial factor of sustaining peasant agriculture.

The recent studies on non-plantation food crops in Sri Lanka revealed that price instability and losing farm income is not simply a matter related to domestic production factors; it also associated with imports of farm inputs and exporting food products (Somaratne, 2002). Paddy and vegetable farming is heavily relied on imported chemical fertilizer that cost nearly Rs. 45000 million annually for fertilizer imports. So the causes and effects of price instability become a vital issues to be addressed both in view of political and economic dimensions. As a tropical country, Sri Lanka is predominantly famous for plantation crops such as tea, rubber and coconut. It also grows many food commodities such as paddy, vegetables, fruits and yams as well as variety of spices. The total land area of the country is 65610 sq. km and nearly 2.3 billion people live there. Paddy (rice) is the staple food of the nation and it has been cultivated throughout the country since ancient times. The total paddy land area in 2012 was 1067,000 ha and it accounts for nearly 15% of arable land (Central Bank of Sri Lanka, 2012). According to statistics of the Department of Census and Statistics, the total extent of paddy lands has increased from 390,313 ha in 1951/52 to 1067,000 ha in 2012/13. Almost 700,000 farmers were engaged in paddy and vegetable farming. The majority (65 percent) of paddy growers belong to small holdings that own less than 2 acres.

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Paddy cultivation is determined on the source of water i.e. irrigated water supply and rain fed water supply. Thus 55 percent of total extent of paddy lands were located in major irrigation schemes including Mahaweli settlements areas. 21 percent were located in minor irrigations schemes and the balance, 24 percent were cultivated in rain fed areas (Henegedara, 2011). The total paddy production in 2012 was 5836 thousand metric tons and it fulfilled almost 100 percent of the nations' rice requirements. (Central Bank of Sri Lanka, 2012). In Sri Lanka, vegetable farming is only second to paddy cultivation. It includes a wider range of vegetables that are grown in the wet zone and dry zone areas. Vegetable varieties that are grown in Sri Lanka are categorized mainly into two as up country vegetables and low county vegetables (Gunawardena and Chandrasiri, 1980). It is also referred to as wet zone and dry zone vegetables in view of agro climatic factors and soil conditions. Thus carrot, beetroot, beans, leeks, capsicum, potatoes and tomatoes are mainly grown in wet zone up country areas and bring jail (eggplant), pumpkin, cucumber, snake gourd, bitter guard and ladies-fingers (okra) are cultivated in low country dry zone areas. However, some of these varieties are now cultivated all around the country irrespective of said factors. The total extent cultivated under vegetable cultivation was nearly 90000 hectares in 2010 and it produced 832,000Mt of harvest in the same year (Department of and Statistics, 2011).

Decline output prices relative to input prices of paddy and vegetables were greatly influenced to reduce farm income and to increase income inequalities in the rural sector. Though the successive governments of Sri Lanka have implemented various policies and strategies to protect small producers in paddy and vegetable farming, majority of paddy and vegetable growers still suffered from price fluctuations and subsequent negative effects (Sandaratne, 2011). Thus, the main objective of the paper aimed at reviewing factors influenced in price instability and subsequent effect of changing terms of trade of paddy and vegetable farming against consumer food items and farm inputs. It also reviews the state agricultural policy and its implications on sustaining paddy and vegetables farming in Sri Lanka. The paper consists of six sections. Thus section one explains the background information about the topic. The section two explains materials and methods followed for the study. Results derived from data analysis was presented in section three. It highlights price behavior, variation of parity ratios and the causes influenced in changing parity ratios of paddy and vegetables. Section four presents the discussion in view of government policy and the policy implications along with conclusions and recommendations.

MATERIALS AND METHODS

The methodology of the paper was based mainly on secondary information that published by the Department of Census and Statistics, Department Agriculture and the Hector Kobbekaduwa Agrarian Research and Training Institute. These data were categorized as inputs and output prices in view of measuring key indicator i.e. Terms of trade (parity ratio), Cost of production, yield and net returns. Though the concept of "Terms of Trade" refers to relative price ratio of a country's imports in terms of its export, it also use as a parity to measure relative price ratios of agricultural and non-

agricultural commodities. Thus an improvement of this ratio shows a surplus of trade and the depreciation indicates a deficit of trade of the respective country. Terms of trade is estimated by using price indices of exports and imports. The term is also used as a ratio of output prices to input prices over time (Ellis, F. 1994). Accordingly terms of trade is measured by counting parity ratio. The parity concept was introduced by the Agricultural Adjustment Act established by USA in 1933 as a cornerstone of agricultural policy. It is measured in real and nominal terms (Campbell, McConnell and Brue, S. L.2002).In real terms, parity means that year after year for a fixed output of farm products, a farmer should be able to receive same amount of goods or services resulting same real income (ibid). Thus if a farmer could sell a one bushel of rice today and buy a shirt, he should be able to sell and buy a same after some time. Parity is measured as an index as follows;

Parity Ratio= Prices received by farmers/Prices paid by farmers

The parity is measured for a given period by dividing prices received by farmer for his output by prices paid him for inputs or other necessities. So if the price of consumer items, farm inputs or industrial products purchased by farmer has gone up than the value of agricultural products sell by farmer, it implies that the farmers' terms of trade of agricultural products have declined against the prices of consumer items, inputs or industrial goods purchased by farmer. Under any circumstances, the impact of declining farm output prices relative to its input prices has badly affected decline in the living standards of farming community. The parity ratios of paddy and vegetable were estimated by counting and comparing prices of some food items i.e. sugar, milk powder and fertilizer as the main farm input. Thus analysis was done by comparing paddy and, vegetables prices with consumer food items and fertilize for 1984-2012 period. It highlighted price variation, parity ratios and costs and returns of paddy and vegetables. Prices of paddy and vegetables were estimated by counting farm gate prices determined at local market forces and the fixed prices recommended by the government, Prices of consumer food items were calculated by taking retail market prices of respective commodities. It assumed that farmers' demand for consumer food items and fertilizer determine on disposable income and substitutes while the farm supply was determined on the seasonal and cyclical variation of paddy and vegetable cultivation.

RESULTS

Table 1 summarizes variation of prices and parity ratios of paddy, consumer food items such as milk powder, sugar and fertilizer for 1984-2013 period. The price of one Kg of paddy has increased from Rs. 2.99 in 1984 to Rs. 33.00-35.00 in 2013. Similarly Price of sugar has increased 9 fold while the price of milk powder (450g/h) as increased by 15 fold. Accordingly price gaps between paddy and milk powder has appreciated indicating that terms of trade of paddy has been deteriorated over the past. Though prices of sugar and fertilizer also increased, effects were minimum because increase in paddy prices were able to offset the effects. However required amount of paddy to purchase one kilo gram of sugar has fluctuated between 3.53-3.57Kg during 1999-2012. period

Table 1. Price Variation and Parity Ratios of Paddy between Food Commodities and Fertilizer (1984-2013)

Year	Paddy Price (Rs/Kg) 1	Sugar Price (Rs/Kg) 2	Sugar// Paddy Price ratio 2/1	Milk powder Price 3	Milk Powder/ Paddy price ratio 3/1	Fertilizer Price (Rs/450g) 4	Fertilizer /paddy price ratio
1984	2.99	12.3	4.11	21.02	7.03	2.85	0.95
1990	5.27	24.94	4.73	31.95	6.06	3.65	0.69
1995	7.42	29.35	3.96	57.56	7.76	6.85	0.92
2000	13.00	26.24	2.02	82.49	6.35	6.30	0.48
2005	15.00	37.19	2.48	134.6	8.97	12.00	0.80
2010	30.00	98	3.27	260	8.67	25.00	0.83
2012	30.00	100	3.33	260	8.67	25.00	0.83
2013	35.00	110	3.14	395	11.29	30.00	0.80

Table 2. Parity ratios between some vegetables and of Milk powder (450g) During 1990-2011 Period

Year	Bitter gourd	Brinjals	Cabbage	Carrot	Beans	Green chilies	Ladies Fingers	Snake gourd	Tomato
1990	2.99	3.55	4.71	2.48	2.22	1.66	3.05	4.69	2.49
1995	4.07	5.08	4.88	2.82	3.01	2.22	5.08	6.80	2.40
2000	3.38	4.97	6.12	3.13	2.69	2.72	5.40	6.09	3.30
2005	4.49	5.47	6.52	3.13	2.70	2.68	6.52	8.16	3.53
2010	3.71	7.99	7.38	3.83	3.22	2.78	7.16	8.28	4.40
2011	3.17	5.69	6.10	3.23	2.51	1.88	5.40	6.09	3.61

Source: Market Bulletins, Hector Kobbekaduwa Agrarian Research & Training Institute (1990-2011)

Similarly the required amount of paddy for buying one packet of milk powder (450gram) has increased from 7.03Kg in 1984 to 13.7Kg in 2004 and declined to 9.4 in 2012. Prices of fertilizer also increased from 2.85 in 1984 to Rs. 30.00 in 2013. The normal trend of price behavior is upward irrespective of farm or non-farm commodities. But the relative price ratios in terms of sugar, milk powder and fertilizer have fluctuated unfavorably for paddy. When examine the variation of paddy and fertilizer prices for the respective period, the fertilizer/paddy price ratio has changed with a wider variation. Both paddy prices and fertilizer subsidy rates has increased during 1984-2013 and subsequently fertilizer/paddy ratios has changed favorably farmers. It was high in 2000 indicating 1: 0.48 ratio in 2000 and 1: 0.80 in 2013. Accordingly, farmers had to pay only 80 percent of fertilizer prices prevailed in 2013 indicating that fertilizer subsidy provided by the government had great influence on offsetting paddy/fertilizer price ratio.

The Table 2 presents change in parity ratios of selected vegetables i.e. cabbage carrot, beans, snake gourd, bitter gourd, tomatoes, ladies fingers, and green chilies. Prices were estimated for a twelve year period from 1990 to 2011 by taking the mean value for twelve months of each year and dividing it by 12 for the respective year. Thus prices have increased over the years as the change of demand and reactive supply conditions. It signifies the nature of production cycles of vegetables and the demand and the supply responsiveness. Prices have fluctuated throughout the year indicating the low and high prices according to change of supply during the season and off season. Prices of all vegetables examined for the study had increased more than 50 percent during the 1990-2011 periods. Significance of the price fluctuation reflected by parity ratios, which estimated by comparing market prices of packet of milk powder (450g). Thus parity ratios changed with a greater variation over the year indicating higher values for off-season and lower values during the harvesting period. Though the average market prices of many vegetables seem stable or decline, prices increase in a one or two times a year due to limited supply during the off-season. Thus the bad effects were offset within a short period without much harm to growers.

Factors influenced in Deteriorating Parity Ratio

The factors influenced in depreciation of farmers' TOT of paddy and vegetable cultivation in Sri Lanka were related to demand and supply factors. The demand factors were associated with consumer preference, income elasticity and substitute crops while the supply factors were associated with cost of production and changing agro climatic conditions. Though both demand and supply factors are equally important in view of policy formulation, the study has focused mainly on the supply factors because demand analysis is more complicated and requires a comprehensive data base. Five factors were identified with respect in supply factors. it includes Increased cost of production, Matters related to crop/product planning and management, Increased global input prices, Marketing problems and lack of supporting services i.e. credit and crop care etc (Sandaratne, 2011). The high cost of production and low net returns becomes the main problem of paddy cultivation. According to statistics in relation to costs, yield and returns, both cost and returns had increased simultaneously during 2003-2010 period. Nonetheless, net returns, which indicate the profit over the costs had increased at a slower pace than the increase of the production costs. Accordingly, paddy cultivation is profitable only in the irrigated farming areas and net returns in rain-fed areas in Kandy are negative or negligible even so as to retain the cultivation.

With regard to vegetable farming, the gross income and net returns from cultivating one acre of farm were substantially higher than in paddy farming in the same extent of farm. Thus the gross income of up- country vegetables such as cabbage and carrot was Rs.350130 and Rs.352440 respectively and the net returns remained at Rs. 208319 and Rs.197623 respectively. Similarly net returns from tomato and capsicum cultivation were 381285 and 139120 respectively. The profits would be less when cost of family labour and own inputs are calculated as imputed costs. Vegetable cultivation in low country irrigated areas is also profitable as in up country areas. Thus the gross income from one acre of brinjal cultivation in Anuradhapura area was Rs. 360,368 and the net returns was Rs. 227,627 per acre. But the recent trend in the vegetable

market is highly unstable. Both up country and low country vegetable growers mentioned that prevailing market prices are unpredictable and change suddenly. The small scale paddy and vegetable farming in Sri Lanka characterize with features of subsistence farming such as lack of planning for mitigating climatic conditions, water scarcity and marketing problems. Thus risk management or risk aversion strategies followed by farmers were low indicating a high vulnerability. The main issue of decreasing output prices of paddy and vegetables during the harvesting period could be avoided through an effective planning and risk management (Abramovitz, 1986). The prices of fuels and imported inputs such as fertilizer and chemicals increased often and subsequently cost of production of paddy and vegetables were also increased at the same or higher rate. Depreciation of Sri Lankan rupee value relative to US\$ and other foreign currencies has also caused to the aggravation of the problem in the recent past. The value of Sri Lankan rupee equal to US\$ has depreciated from 51.25 in 1990 to 130.00 in 2013 and consequently prices of many imported food items have increased. Marketing difficulties in relation to paddy and vegetables, particularly during harvesting period still remain as the key factors of reducing farm income. The market margins for paddy and many vegetables from producer to consumers are around Rs. 10 and consequently a huge price variation exists between urban and rural markets.

DISCUSSION

Deterioration of farm income or farmers' Terms of Trade of small farming sector in Sri Lanka is a very crucial factor that would affect food security, food safety, nutrition, public welfare and living standards of rural community. Since nearly 70 percent of total population is still living in rural sector, the influence would be more serious on the sustainability of domestic farming sector. So, any remedy for the issue should be addressed the sustainability of peasant agriculture and the food security of the nation. Loss of farm income of small producers in paddy and vegetable farming in Sri Lanka becomes a vital economic and political issue of the country that to be addressed promptly by policy makers. When one examines the situation of peasant agriculture carefully, it seems that it is an uncertain and risky industry that inherited with typical features of inelastic demand and supply responsiveness for agricultural crops (Lekhi and Singh, 2004). As indicated in Cob-web theorem, it is a long standing question addressed by agricultural economists (Hill and Ingersent, 1977). Along with the broad theoretical analysis of the issue, declining Terms of Trade of agricultural products relative to farm inputs and consumer items were also recognized as the key issue of Sri Lanka (Sandarartne, 2004). So if the price received by farmer remains constant or declines compared to what he pays for inputs and other necessities, it will jeopardize for survival of farming community and sustainability of production process. Thus the implications were reflected vividly as follows.

- Youngers are moving from farming to other occupations due to high risk and low profitability
- When the industry becomes unprofitable and unstable it would affect to reduce the food production leading to increase the food prices

- Increase prices of rice and vegetables has tremendously affected decline public welfare, particularly for decreasing living standards of low income families.
- Lack of coherent and stable agricultural policy has worsen the issue and subsequently abrupt political decisions were taken irrespective of visionary and consolidated plan
- The macro liberal policy framework that has linked with the IMF and WTO policy prescriptions were discouraged the protection of domestic agricultural commodities

The main research hypothesis that focused on "terms of trade of paddy and vegetable farming in Sri Lanka has deteriorated relative to values of consumer items and the farm inputs purchased by farmers" was proved implying that prices paid by paddy farmers for their food items and fertilizer had increased more than the prices they received for paddy which sold. Similarly TOT of vegetable farming has also depreciated but findings were somewhat ambiguous due to variation of vegetable prices throughout the year. However variation of TOT has adversely affected for living standards of farming community and the survival of the industry. Therefore, policies should be formulated in order to overcome courses and the effects in view of macro and micro policy perspectives as follows

- TOT could be improved either through regulating market prices or providing input subsidies. Both of these policy options were implemented by the Sri Lankan government in the past for paddy farming, with a broader perspective of protecting small producers and assuring national food security.
- Since it is evident that the government intervention for domestic food crop sector was very effective in maintaining the farmers' TOT at a stable position, it provides valid argument in deciding whether government intervention is necessary or to allow market mechanism to determine the prices of commodity market. However, need to justify the fact that how it is reasonable to protect local farmers from the global market, which has tremendous comparative advantages producing same product at lower cost. It is an eternal policy dilemma faced by many countries weather to import chief products at a lower price than the local production cost or to protect inefficient local farming industry by neglecting opportunity to import some food items chiefly. If the local production is inefficient in terms of the comparative advantage theory, protecting such inefficient industries would negatively affect the overall resource allocation of the country. If the resources were misallocated inefficiently, it will negatively affect public welfare as well. So it becomes a very sensitive issue both in terms of political and economic aspects. However, the issues related to domestic food crops sector cannot be decided merely on the economic factor. Broadly it should be looked through the macroeconomic issues such as employment, food security, utilization of natural resources and environmental protection etc. So the government intervention for the domestic food crops sector is essential. But it should be decided on national

priorities and more logical manner rather than the abrupt political commitments.

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