

Variation of Terms of Trade in Small farming Sector: with Special Reference to Paddy and Vegetables Cultivation in Sri Lanka

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Abstract

Decline market prices of paddy and vegetables relative to prices of consumer food items and fertilizer inputs become a core factor of losing farm income of small farmers in Sri Lanka. Though the dropping farm income is a common problem in many agricultural countries, its impact is very crucial for a small country like Sri Lanka where nearly 30 percent of labour force is occupying in agricultural activities. Though all the successive governments in Sri Lanka have implemented various policies in this regard, still declining prices of food crops were greatly influenced to reduce farm income and subsequent it was affected for food security and public welfare of the country. Therefore, the main objective of the paper is to review factors influenced in changing TOT of small farming sector and assessing its impact on the economy. The paper was based on deductive method and used both primary and secondary sources of information.

Price variations of farm products and consumer food items were measured by calculating parity ratios of respective commodities and accordingly it found that, values of Terms of trade (TOT) of paddy and vegetable farming has been deteriorated continually in Sri Lanka, compared to imported food items and farm inputs. Thus farmers have to pay nearly 2 kilo of paddy for purchasing a one pound of bread in 2012 instead one kilo in 1984. Required paddy amount for receiving one kilo of sugar has fluctuated between 3.53 in 1999 and 3.57 in 2012. The required paddy amount for receiving one kilo of fertilizer has increased from 0.95 in 1984 to 1.65 in 2005. Similarly though farm gate prices of vegetables were also fluctuated throughout the year, the deterioration of TOT of vegetables farming is not significant as paddy farming since occasional price fluctuations were able to offset the price increases of consumer items and farm inputs. It shows that both demand and supply factors were influenced for deteriorating terms of trade of farm outputs. The demand factors were related to disposal income and substitute products while the supply factors were related with increase cost of production, matters related to crop planning, crop management and marketing. Finally it suggests some policy recommendations that required for protecting small producers in food crop sector.

Key Words; *Terms of trade, Paddy and vegetables, Small producers, support policies*

Introduction

Fluctuation of farm prices and subsequent effects of deteriorating parity ratios or the terms of trade has become a main problem in domestic food crops sector in Sri Lanka. Though the decline farm parity relative to prices of consumer goods, industrial products and farm inputs is a common problem in many agricultural countries, its impact is very crucial for countries like Sri Lanka, where nearly 30 percent of labour force is occupying in small farming sector particularly in paddy and vegetable farming. Sri Lanka as a liberal economy that linked to the global market through exports and imports, it is influenced by the global economic and market forces frequently as change of global market forces. Hence, losing farm income is not simply a matter related to domestic production factors; it also controlled by international market forces through exporting farm products and importing raw materials and some intermediate products. This relationship is reflected by deficits or surplus in Terms of Trade (TOT) and Balance of Payment (BOP) sheet of the country.

Though the concept of terms of trade refer to explain farm parity ratio and the macro terms of trade, which, indicates local and world price ratio for macro-economic transactions, the analysis focus only on the behavior of farm output prices relative to prices of consumer food items and inputs with respect parity ratio. Thus the paper consists of five sections. The section one explains the background of the topic with special reference in its terminology and conceptual base of the topic. The section two reviews the trend of price behavior in paddy and vegetable cultivation and variation of TOT. The section three reviews causes and effects that influenced for changing farmer parity ratio. The section four reviews the state policy on domestic food crop farming in Sri Lanka and finally, conclusions and policy recommendations are presented in section five.

The methodology of the paper was based on primary and secondary source of information. Time series data that published by the Department of Census and Statistics, Department Agriculture and the Hector Kobbekaduwa Agrarian Research and Training Institute were used as the secondary source of information. These data were related to local and imported food prices, income and production costs. Primary data collection was done through conducting a questionnaire survey on paddy and vegetables farming in Kekirawa, Lunugamwehera, Thalawa and Bandarawela areas. Thus 200 farmers were randomly selected from above growing areas representing 100 paddy farmers and 100 vegetables farmers.

The Background

Basically, the concept of “Terms of Trade” refers to relative price ratio of a country’s imports in terms of its export. Thus an improvement of this ratio

	(Rs/Kg)	(Rs/Kg)	Price ratio	Price	Paddy price ratio	(Rs/450g)	
1984	2.99	12.3	4.11	21.02	7.03	3.03	1.01
1990	5.27	24.94	4.73	31.95	6.06	3.37	0.64
1995	7.42	29.35	3.96	57.56	7.76	4.77	0.64
2000	13.00	26.24	2.02	82.49	6.35	8.5	0.65
2005	15.00	37.19	2.48	134.6	8.97	14.55	0.97
2009	30.00	90	3.00	230	7.67	45	1.50
2010	30.00	98	3.27	260	8.67	50	1.67
2012	30.00	100	3.33	260	8.67	52	1.73
2013	35.00	110	3.14	395	11.29	60	1.71

Source: Department of Census and Statistics and Hector Kobbekaduwa Agrarian Research and Training Institute

As shown in table 1, Paddy prices were estimated on guaranteed floor prices that determined by the government on average cost of production and minimum profit margins. Thus the nominal value for one bushel of paddy (equal ant to 20.87 Kg) was estimated on the cost of production data of paddy cultivation. Initially though the calculations were based on British measures i.e. bushel, now it is calculated on metric values i.e. kilo grams. At the end of 2013, the guaranteed prices for paddy was Rs. 32/ for one kilo gram of Nadu and Rs. 35/ for one kilo gram of Samba. Nonetheless prevailing actual market prices were lower than the floor prices recommended by the government, particularly during the harvesting period. According to media reports the actual price for Nadu was around Rs. 28 and Samba price was around Rs. 30/..

When examine the variation of paddy and fertilizer prices for the respective period, particularly with respect in Urea prices, the paddy /fertilizer price ratio has increased from 0.95 in 1984 to 1: 1: ratio in 2013 (table 2). Though the world fertilizer prices have gone up rapidly in the recent past, parity ratios were remained at lower rate due to the government fertilizer subsidy program has granted 90 percent subsidy since 2004.

Table 2: Paddy and Fertilizer Parity Ratio

Type	1984	1990	1995	2000	2005	2010	2013
Paddy Price (Rs/Kg)	2.99	5.27	7.42	13.00	15.00	30.0	35.00

Fertilizer (Urea) price (Rs/Kg)	2.85	3.65	6.85	6.30	12.00	25.00	28.00
Fertilizer/paddy price Ratio	0.95	0.68	0.91	0.84	1.61	1.12	1.00

Source: MFPD, Hector Kobbekaduwa Agrarian Research & Training Institute

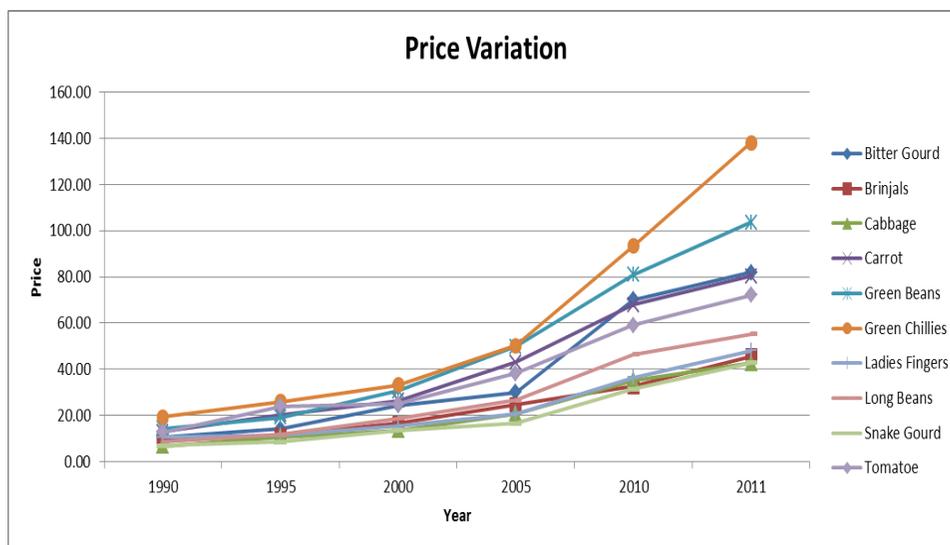
Price Behavior of vegetable

The table 3 presents price variation of vegetables i.e. brinjals, cabbage carrot, beans, snake gourd, bitter gourd, tomatoes, ladies fingers, and green chillies that cultivate in up country and low country areas. The prices that presented for 1990-2011 period were estimated by taking into account of monthly price values and dividing it by 12 for the respective year. It indicates an upward trend of increasing prices over the years as changed of demand and supply conditions of the country symbolizing the nature of product cycles of agricultural crops. The table shows the lowest and highest prices for the period reflecting the supply pattern during the season and off seasons. Prices of many vegetables were increased more than 50 percent during the respective periods. Significance of Price fluctuation is further reflected in the figure 1.

Table 3: Price Behavior of Some Vegetables during 1990-2011Period (Rs/Kg)

Year	Bitter gourd	Brinjals	Cabbage	Carrot	Beans	Green chillies	Ladies fingers	Snake gourd	Tomato
1990	10.7	9.01	6.78	12.8	14.37	19.28	10.48	6.81	12.82
1995	14.1	11.33	1.79	6	19.11	25.92	11.33	8.46	23.97
2000	3	16.60	13.47	20.4	30.66	3.28	15.27	13.54	24.97
2005	24.3	24.60	20.66	2	49.92	50.31	20.64	16.50	38.10
2010	9	32.53	35.23	26.3	80.86	93.40	36.33	31.39	59.15
2011	29.9	45.67	42.63	5	103.6	138.0	48.12	42.71	
	8			42.9	5	1			72.11
	70.1			6					
	4			67.9					
	81.9			2					
	4			80.3					

Source: MFPD, Hector Kobbekaduwa Agrarian Research & Training Institute



Source: MFPD, Hector Kobbekaduwa Agrarian Research & Training Institute

Figure. 1: Price variation of Some Vegetables 1990-2011 Variation of Terms of Trade (TOT)

As shown in table 1 and figure 2 parity ratio of bread, sugar and milk powder has increased since 1994 though it fluctuated slightly in the early years. At the same time, guaranteed price for paddy also increased time to time. Thus paddy bread price ratio has increased from 1.01 in 1984 to 1.71 in 2013 indicating farmers have to pay nearly 2 kilo of paddy for purchasing a one pound of bread in 2012 instead one kilo in 1984. Required paddy amount for receiving one kilo of sugar has fluctuated between 3.53 in 1999 and 3.14 in 2013. Similarly required paddy for receiving one packet of milk powder (lakspray 450gram) has increased from 7.03 in 1984 to 11.29 in 2013. Since the prevailing actual market prices are below the floor price, deterioration of TOT of paddy growers is high. Thus price ratio has changed due to increased international prices or the variation of local paddy prices.

If we observe the terms of trade of paddy in relation to fertilizer usage, it was fluctuated from 0.95 in 1984 to 1.61 in 2004 and it declined again to 1.0 in 2012 due to fertilizer subsidy. Fertilizer prices were gone up steadily after 2004 as increased the world energy prices. Since the increase of fertilizer prices is crucial on determining paddy productivity, the government took every effort to

protect local paddy production through implementing fertilizer subsidy programs.

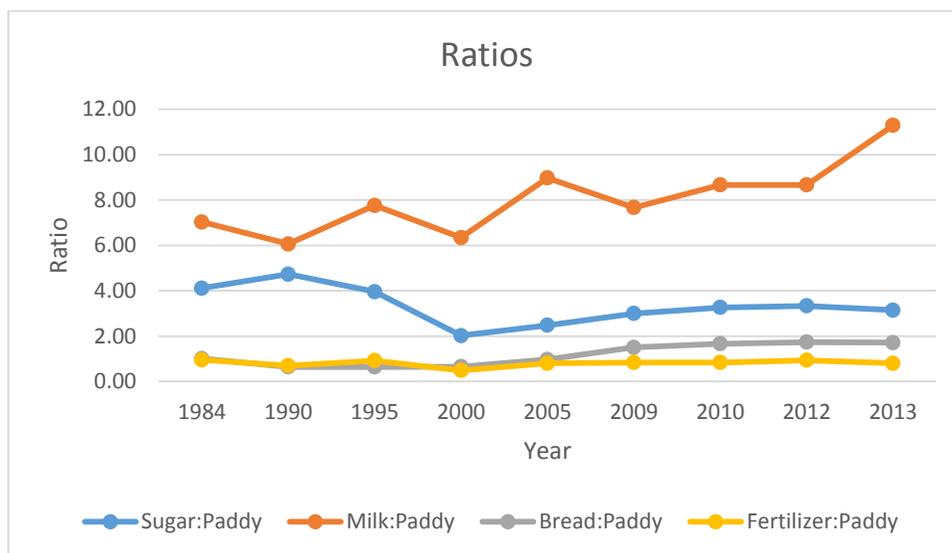


Figure. 2: Parity Ratios between Paddy, Consumer Items and Fertilizer

As indicated in table 3 prices of vegetables were behaved according to demand and supply conditions of the market. It reflects that prices have increased for off-season and decreased for harvesting seasons. Accordingly TOT of many vegetables were appreciated during the off-seasons and depreciated during the harvesting seasons. Unlike paddy cultivation, TOT was not unfavorable for many vegetables.

Table 4: Variation of TOT of Vegetable Growers as the variation of Sugar Prices

During 1990-2011Period

Year	Bitter Gourd	Brinjals	Cabbage	Carrot	Beans	Green Chillies	Ladies Fingers	long bean	Snake bean	Tomatoe Gourd
1990	2.31	2.77	3.67	1.94	1.74	1.29	2.39	2.9	3.6	1.9
1995	2.07	2.59	2.74	1.43	1.53	1.13	2.59	2.5	3.4	1.2
2000	1.08	2.27	1.95	0.99	0.85	0.79	1.72	1.4	1.9	1.0
2005	1.24	1.51	1.80	0.86	0.74	0.73	1.80	1.4	2.2	0.9

2010	1.28	3.01	2.77	1.44	1.21	1.04	2.69	2.1	3.1	1.6
2011	1.21	2.19	2.34	1.24	0.96	0.72	2.07	1.8	1.8	1.3

Source: MFPD, Hector Kobbekaduwa Agrarian Research & Training Institute

The table 4 shows the variation of TOT of vegetables in relation to prices of sugar for 1990-2011 periods. Accordingly it shows that TOT has depreciated for some vegetables and fluctuated slightly for some vegetables. It reflects that usual price fluctuations of vegetables throughout the year were able to offset the effects of price increases of consumer items and the fertilizer inputs.

Causes and Effects

The factors influenced for changing terms of trade of paddy and vegetable farming relative to consumer items and farm inputs were examined by considering policy implications and views of stakeholders involved in farming industry. Macro policy issues such as depreciation of rupee value in terms of US\$ and other foreign currencies has caused to aggravate the problem in the recent past. Thus prices of energy and imported inputs were increased and subsequently cost of production of paddy and other food crops were also increased at the same pace or higher rate.

The issue of depreciating TOT of small farming sector is not simply a problem of paddy prices; it also relates with many other factors such as increase cost of production, issues related to crop management, marketing and farm support services.

According to farmers' views, factors influenced for deteriorating TOT of paddy and vegetable farming are identical but vegetable farming is diversified with large number of varieties and climatic factors. Thus various factors were influenced for reducing TOT of paddy and vegetables at micro (field) level. Table 5 shows main factors influenced for deteriorating TOT of paddy and vegetables at farm level.

Table 5: The Factors influenced for Deteriorating TOT of Paddy and Vegetable Farming

Factors influenced	Paddy	Vegetables
Increase cost of production	100%	90%
Cultivate the same crop and same variety at the same season (Less diversification)	65%	70%
Difficult to keep long time	-	70%
	-	50%

Climatic changes	80%	70%
Marketing difficulties	70%	70%
Transport difficulties	70%	70%
No storage facilities	80%	80%
Role of middlemen in reducing prices	70%	60%
Lack of Proper marketing information system	90%	90%
Increasing prices of essential goods		

Source: Sample survey (2013)

Many of these factors were related with production, marketing and institutional aspects, particularly from policy makers' views. When examines it in view of causes and the effects of the issues, some issues are ambiguous. However, cultivate the same crop and variety by majority farmers, seasonal price decline during the harvesting period and Lack of proper marketing system could be recognized as causes. Over supply, low prices, no bargaining power, low income and subsequent low living standards could be regarded as the effects.

According to farmers' opinions mentioned in table 5, the majority of farmers mentioned that increasing cost of production and increase the prices of essential items as the root course of deteriorating TOT. At the same time, they have mentioned several other reasons that affected for cultivation. Thus, cultivate the same crop and same varieties at the same season by many farmers were affected as crucial factor to decrease the vegetable prices. Similarly, Marketing difficulties, transport difficulties, lack of storage facilities, middlemen's involvements in reducing prices, price fluctuations over the year and lack of Proper marketing information system were reported as the other important factors that affected for reducing farm prices. Though the gravity of these factors was not similar for paddy and vegetables, its influence was commonly affected for cultivation. Many of these problems were occurred due to lack of proper planning and institutional arrangements that need to be addressed promptly by policy makers. As the root cause of increase costs of production and decrease profitability could be illustrated by reviewing time series data.

Increase Costs of Production

The cost of production of paddy and vegetable farming has increased tremendously in the recent past as increased of factor prices. Similarly productivity of farm output and returns from farming were not increased to offset the increased costs. Thus high cost of production and low net returns were influenced to decline TOT of paddy and vegetable farming. The table 6 shows how cost and return data of paddy and one vegetable (brinjail) farming have changed during 2003/04-2009/10 cultivation seasons.

The average farm income of a small paddy farmer is determined on size of land holdings, water availability (irrigated and rain fed conditions) and type of crops cultivated. According to table 6,

Gross return per acre from irrigated paddy areas in Anuradhapura district in 2009/10 Maha was Rs. 69,910, but its' net return per acre was Rs.31,275 as the cost of production was Rs. 34,644. The net returns from paddy cultivation in rain fed areas of kandy district was Rs. 598/ for 2010 accompanied by Rs. 39460/ gross return and Rs. 38862/ cost of production respectively. When compared 2009/2010 Maha paddy production figures with 2003/04 Maha season, it shows that cost of production in both areas had increased by more than 50 percent. Similarly, though the average yield in irrigated areas were increased nearly by 40 percent, yield in rain fed areas were remained at the same amount indicating some features of subsistence farming.

Table 6: Cost of Production and Gross Returns for paddy and Vegetable Cultivation

District and Type of farming	Cost of production (Rs/Acre)		Yield (Kgs/Acre)		Gross Return (Rs/Acre)		Net Return (Rs/Acre)	
	2003/04	2009/10	2003/04	2009/10	2003/04	2009/10	2003/04	2009/10
Paddy Anuradhapura (Irrigated)	20372	34644	1598	2221	25812	69919	5440	31275
Kandy (Rainfed)	23117	38862	1214	1227	16644	39460	-	598
Vegetable - brinjal Anuradhapura (Irrigated)	59824	126235	4723	-	144772	339211	84947	212976
Badulla	-	-	-	9968	206678	-	67509	-

(rainfed)	139169							
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Source: Cost of Production Surveys, Department of Agriculture and the HARTI data Bank

With regard to vegetable farming, the gross and net returns from vegetable were substantially higher than the paddy farming. Thus the table 6 shows that gross return from brinjal cultivation in irrigated areas in 2009/10 Maha was Rs/Ac 339211. The cost of production for brinjail was Rs.126235 and its net return was Rs/Ac 212976 per season. When compared the production data with 2003/04 Maha season, it seems that cost and returns were doubled during the respective period. The table 5 also shows that vegetable farming in rain fed areas is profitable compared to paddy cultivation though its net returns were low compared to irrigated areas. But the recent trend in vegetable farming is not so much profitable due to unstable market.

The effects of deteriorating terms of trade as viewed by paddy and vegetable farmers were presented in table 7. It illustrates six points as foreseen by farmers.

Table 7: The Effects of Deteriorating TOT According to opinions of farmers

Effect	Paddy	Vegetables
Decline profits	80%	50%
Decrease the living standards	70%	60%
Increase the indebttness	60%	40%
Neglect farming	50%	40%
Leave youth from agriculture	50%	40%

Source: Sample Survey (2013)

Compared to paddy, effects on vegetable production were not seriously affected because price fluctuations were offset the bad effects. However, price variations have affected farmers to decline profits, living standards, move for other jobs, decrease production and increase indebttness were commonly affected for the existence of the industry.

State policy

All the successive governments in Sri Lanka has been followed various policies to overcome the bad effects of deteriorating TOT of small farming sector relative to non-farm products. It includes trade, price, marketing and farm support policy instruments. Basically these policies were aimed to regulate the market through appropriate state interventions. Though it is a perpetual issue faced by many governments, it is necessary to justify the fact how reasonable to

protect local farmer against the world price, which has the comparative advantage on be the lowest price. If the local production is inefficient according to the principle of comparative advantage, protecting such inefficient industries would affect to the overall resource allocation of the country. If the resource allocation is inefficient, eventually it will affect to total welfare of the country. Thus the government policy package was based on the following instruments.

Tariff Policy

The tariff policy was based on quantitative restrictions (QRs) on imports. Most QRs implemented in Sri Lanka on imports were introduced in 1988 as a six-band duty system ranging from 0 percent tariff for essential consumer items to 500 per cent tariff for luxury items respectively. This system was altered in 1992 and a three-band structure was introduced with rates of 10, 20 and 45% in order to relax the rigidity and correct the distortions in domestic agricultural sector. The introduction of the three band tariff structure in 1992 helped to reduce market distortions in the non-plantation sector. Since then tariff system was changed time to time as recommended by the policy makers. However, at present quantitative restrictions on imported food items are imposed abruptly considering domestic food supply.

Price Policy

Price policy was implemented as the floor price and the Guaranteed Price Scheme (GPS) since late 1940s. It was intended to purchase paddy (rice) from producers at the minimum price endorsed by the government. Thus the main purpose of GPS was to increase the market prices of paddy and thereby improve the farm incomes (Sirisena, N.L 1986). It was estimated that all paddy growers approximately (1.8 million farm families) would directly benefited from the scheme. The amount purchased by the GPS depended on the volume of production, availability of other food commodities, personal consumption needs and the price in the open market. The performance of the GPS over the past sixty five years since its inception could be divided into four stages (ibid).

1. The initial stage (1948-1956). In the initial stage the GPS was able to collect a very small share of the market surplus due to market imperfections and lack of credit facilities.
2. In the second stage (1956-1971), the market share of GPS was improved by providing credit facilities through cooperative societies in 1961. During this period the GPS was always higher than the open market prices and therefore the quantity purchased under GPS was high.

3. In the third stage (1972-1977) the Paddy Marketing Board (PMB) was established in 1972 in order to implement GPS. The paddy marketing Act No. 14 of 1971, gave wide powers to PMB in purchasing paddy.
4. In the post 1977 period, the monopoly of the PMB was abolished and the GPS was implemented as a floor price. Consequently the quantity purchased under GPS dropped from 30% (1977) to 5% (1997).
5. Though the PMB was not function for several years due to economic adjustment policies implemented by the governments since 1989, it was reestablished in 2005 to regulate market forces in paddy marketing and to stabilize paddy prices determined by the government as a floor price.

Input Subsidies

The government of Sri Lanka implements input subsidies for encouraging small producers for high yielding varieties with improved inputs. Thus 90 percent fertilizer subsidy is offered to paddy farmers in view of protecting them from international price increases. In addition, irrigation water subsidy is also offered without charging for water.

Fertilizer Subsidy

The fertilizer subsidy was introduced in 1962 to encourage the use of inorganic fertilizers in line with the green revolution. The subsidy was given for Urea, Triple Super Phosphates (TSP), imported Rock Phosphate, Muriate of Potash (MOP) and NPLO mixtures with 5:15:15 composition. Imported Ammonium Sulphate (AS) was not subsidized from 1981 in order to popularize local production. Though this system was changed time to time, a full subsidy was introduced from the manifesto of the new government came to power in since 2004. Thus the government provide 90 percent subsidy for a bag of 50 kg of fertilizer that worth Rs.1300/.

The fertilizer subsidy had a positive effect on productivity and total production of paddy (Annual reports, Department of Agriculture). The impact was very significant in the case of high yielding varieties, which were used to urea. However, the impact of reducing total production cost was marginal due to the fact that the fertilizer accounted for only 12 percent of total cost though it helped to increase fertilizer application among small producers who were not

able to bear the production cost. The fertilizer subsidy was rearranged several times after 1994 as change of world market prices.

Marketing Policies

The government was recognized the marketing as a main issue in deteriorating TOT of small producers and established regional marketing centers to avoid marketing problems and to assure reasonable pricees. Thus 07 regional economic centers were established in Dambulla, Tambuttegama, Keppetipola, Embilipitiya, Meegoda, Bandarawela and Mahabage and these centers were connected to the urban centers spread throughout the country

Institutional support programs

Institutional support programs that included implementing micro finance programs, extension and farmer organizations were implemented to reduce the rural indebttness and to encourage farmers to bear the risk of uncertainty.

Concluding Remarks

Considering the data analysis that based on primary and secondary source of information, 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 farmers for their food items and farm inputs were increased more than the prices they received for their farm products. Thus prices paid by paddy farmers for sugar, bread and milk powder were increased by 20 percent during the 2012-2013 periods But the paddy prices were increased only by 16 percent and subsequently TOT of paddy producers has deteriorated by 3.4 %. Since the main variable input of fertilizer was subsidized by 90% by the government, the price effects were not measured. However, fertilizer prices were increased continually in recent past indicating that TOT has appreciated. Findings with regard to TOT of vegetable production were somewhat ambiguous due to variation of vegetable prices throughout the year.

Factors influenced for deteriorating TOT of paddy farming were mainly related with increase cost of cultivation, lack of planning or crop diversification and low market prices. The increase costs of production relate with increasing variable input prices i.e. fertilizer, labour and farm power. Lack of planning or the crop diversification relates with selecting suitable seed varieties, no crop calendar and not concern the area requirements. It was happened mainly due to no common crop plan for the area or crop diversification methods were implemented. Though the factors influenced for changing TOT of vegetable

farming are also similar as paddy production, the nature and the gravity of the factors are different.

The effects of deteriorating tot of paddy and vegetable farming were closely related with Decline profits, decrease the living standards, increase the indebtedness, neglect farming and leave youth from agriculture

The governments' policy interventions made through trade, price and farm support policy instruments were effectively contributed for protect paddy and vegetable farmers.

Having considered the main conclusions, it recommends follow effective policy measures in order to avoid the depreciation of TOT of paddy and vegetable farming. It could be achieved either through increasing output prices or decreasing cost of cultivation or implementing both policies.

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