

Present Status of Agricultural Production and Marketing in the System 'H' of Mahaweli.

Y.M. Wickreamasinghe,
Department of Agricultural Systems
Faculty of Agriculture,
Rajarata University of Sri Lanka,
Puliyankulama,
Anuradhapura.
Sri Lanka.

About the Author

Served one and a half years as a Divisional Agricultural Officer for Sri Lanka Sugar Corporation, Kantale (1979-1980). Thereafter served for the Department of Agriculture as an Agricultural Economist (1980-1997) and joined Rajarata University of Sri Lanka as a Senior Lecturer. At present serves as the Head, Department of Agricultural Systems. He attended various training programmes nationally and internationally and contributed to a number of national and international projects in the capacity of Agricultural Economist. Recently he published a book in research methods in Social Sciences.

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Abstract

A random sample of 1,270 farmers was interviewed soon after the cropping season Yala, 2003 in order to identify important characteristics of the production and marketing environments in which farmers of the System 'H' of Mahaweli are operating and to estimate costs and returns per acre of ten selected crops. Findings of the study revealed that farmers do face several constraints in producing and marketing of agricultural commodities. Some of these constraints could easily be relaxed by providing supplementary irrigation facilities and promoting group activities among farmers by strengthening the existing Farmer Organizations. At present, the use of farmyard manure and paddy straw are not very popular among farmers and hence, as an alternative to reduce cost of cultivation, such activities should be promoted. Crops that are capable of producing attractive profits should be promoted. In order to train farmers to keep track on their expenses and receipts farm records should be introduced. Introducing producer co-operatives might be a low cost alternative in enhancing the bargaining power of the small-scale farmer.

Introduction

Mahaweli Authority of Sri Lanka (MASL) being the administrative authority to entire Mahaweli Settlements has divided the area under its purview into several systems or zones in order to handle development work conveniently. The system " H " or Kalawewa is the part of the Mahaweli settlement that encompassed portions from three administrative districts namely; Matale, Anuradhapura and Kurunegala. The main administrative office of the system " H " is located at Thambuttegama.

Resident Project Manager (RPM) is the chief executive officer of the system while the Deputy Resident project Manager (DRPM) serves as the head of the Agriculture section of the system. Agricultural programmes are implemented by the field staff attached to the administrative blocks under the supervision of an Agriculture Officer (AO). Due to both intensified agricultural extension efforts and relatively well-developed infrastructure, agricultural programmes have been implemented successfully in the System 'H area'.

Farmers of the System 'H' have adopted improved cultural practices in crop production. However, as farmers are operating under certain constraints, this study attempts to explore some of the key issues related to production and marketing of agricultural crops. This study was restricted to crops such as paddy, soya beans, maize, brinjal, luffa, bitter gourd, big onion, chilli, banana and papaw.

Objectives of the Study.

The Specific objectives of the study were to calculate per acre costs and returns of above stated 10 crops cultivated in Yala, 2003 and to identify factors that have contributed to the existing situation in the production and marketing of those crops and to recommend remedial measures.

Methodology

A random sample of 1,270 farmers was interviewed using a specially structured questionnaire in order to gather relevant information. The sample size of a crop was determined according to the total extent under each crop and the number of farmers who had cultivated each crop during Yala, 2003. Survey data was tabulated and crop budgets were developed to represent the operations carried out by an average hypothetical farmer of the System 'H'.

Costs of all variable inputs, land rent, and depreciation of capital items were the costs included in crop budgets. Further to that, for perennial crops such as Banana and Papaw, relevant costs and returns for a period of three years were considered and all costs and returns were discounted using a discount factor of 12%.

Results and Discussion.

Production and Marketing Environment

Farmers had cultivated full extent of their paddy lands to paddy during Maha seasons and had cultivated a portion of it to paddy and other field crops (OFCs) during Yala due to shortage of irrigation water.

Yala, 2003 was an abnormal season in terms of rainfall distribution and there were erratic and unpredictable rains at the beginning of the season and a dry spell towards the latter part of the season. This had created an unhealthy environment for agriculture and had escalated pest and disease infestations. On the top of that, the Mahaweli Authority of Sri Lanka (MASL) had increased the length of interval between two consecutive water issues during the latter part of the season in order to distribute the scarcely available irrigation water in a fair manner. Under this situation, farmers who had access to lift irrigation facilities had performed relatively well and as such the MASL should look for alternative ways of providing supplementary irrigation facilities during the Yala season.

Rural poverty is another important constraint especially in areas where crop losses during Yala were frequent. Further more, resource poor farmers in remote areas had paid relatively high prices for their production inputs when they purchased them on credit.

Those farmers also had sold their produce at relatively low prices to private traders. As a result, the resource poor farmer had been pushed into the vicious cycle of poverty. As such, the farmers in remote locations do expect the MASL to function as an intermediary in input supply and agricultural marketing. Under the current policies of the government it is not possible to expand activities of the MASL and so, the MASL should look for viable alternatives to handle the situation.

Farmers had sold their produce either to private dealers visiting their villages or to the Economic Centres located at Dambulla and Thambuttegama. However, farmers were of the opinion that the price that they received for their produce was unfair. Some farmers had developed links with whole sellers who visited them frequently and they stated that the price they received were fair. Thus, the feasibility in promoting forward contracts should be explored.

Per Acre Cost of Cultivation

There are two types of cost involved in crop production namely; variable costs and fixed costs. Costs of inputs such as labour, fertilizer, farmyard manure, supports such as wooden poles etc., agrochemicals, fuel used for water pumps and tractors are considered as variable costs because the size of these costs varies according to the scale of the operation. Fixed costs include land rent and depreciation allowance of machinery, tools and equipment. Both variable and fixed costs should be considered in calculating cost of cultivation. When these 10 crops were arranged in the ascending order of their per acre cost of cultivation including costs of family labour and fixed inputs, Soya beans ranked number one with the least cost of cultivation, while banana (only cost of cultivation of the first year of banana was considered in this comparison) became the last with the highest cost of cultivation. (Table 1.0).

Table 1.0. Per Acre Cost of Cultivation Including Family Labour and Fixed Inputs.

Crop	Cost (Rs.)
Soya Bean	22,939
Paddy	23,146
Maize	25,480
Brinjal	69,810
Luffa	77,344
Big onion	85,348
Banana*	90,187
Chilli	91,352
Bitter gourd	110,267
Papaw *	154,039

- Only cost of cultivation of the first year was considered.

Thus the findings of the study revealed that farmers had invested heavily in cultivating cash crops, that bring in high returns. Costs incurred in cultivating the 10 crops listed here under this study were much higher than corresponding costs incurred in cultivating same crops during Yala 2001 in the same area (Department of Agriculture, 2002). This has resulted from increased prices of inputs and exorbitant prices of seeds of hybrid varieties of certain crops.

It is clear that the present value of per acre costs of cultivation of papaw and banana, in general, exceeds Rs. 100,000. It is worthwhile of noting that the present value of cost of cultivation of papaw has been always higher than that of banana (Table 2.0). The reason being the cultivation of hybrids and adoption of improved management practices by the majority of the farmers who had cultivated papaw. It is equally worthwhile stating that the majority of the farmers who had cultivated banana had adopted neither recommended spacing nor recommended clump management practices (Upasena and Wickramasinghe, 2003).

Table 2.0. Discounted Cost of Cultivation Per Acre of Papaw and Banana.
(Discount rate - 12 %)

Cost Item	Present Value (Rs)	
	Papaw	Banana
Total Including Family Labour & Fixed Inputs	281,285	239,167
Total Excluding Family Labour	196,417	114,368
Total Excluding Fixed Inputs	227,763	213,239
Total Excluding Family Labour & Fixed Inputs	142,896	87,826

Another factor that was observed during the field survey was that the farmers who had access to secondary sources of irrigation water other than the regular supply of irrigation water by the MASL had cultivated high valued cash crops in considerable extents.

Findings of the survey revealed that labour cost had accounted for over 50% of per acre total cost of cultivation of majority of the crops that were considered in this study. So, increasing labour use efficiency is a must in order to bring the cost of cultivation down.

Cost of farm machinery was always lower than 10% of the total cost of cultivation of an acre of all crops except that of paddy, bitter gourd and soya bean. Cost of variable inputs used for all 10 crops considered during this study had ranged from 11% to 56% of per acre cost of cultivation when costs of family labour and fixed inputs were considered. According to findings of the study it is possible to state that farmers had used more of variable inputs in cultivating high value cash crops (Table 3.0). The use of appropriate inputs at correct times and in appropriate quantities are very important to bring the total cost of cultivation down while raising the average yield. As farmer has no control over prices of inputs their efficient use is the only way that the farmer could control costs of such inputs. However, it is a difficult task for the farmer unless the farmer possesses sufficient technical knowledge.

It was observed during the study that only very few farmers had maintained farm records that are essential in modern farming. Further, it was also noticed that the individuals who had maintained farm records had controlled their costs in an impressive manner. Farm record keeping is very essential especially for farmers who cultivate perennial crops such as papaw and banana and seasonal crops that demand high levels of cash inputs.

The cost of fixed assets had ranged from 4% to 28% of per acre total cost of cultivation when the costs of family labour and fixed inputs were considered. Fixed cost has only two components namely; land rent and depreciation allowance of capital items such as tractors, sprayers, water pumps, threshers and, only 50% of the depreciation allowance was added to the crop budget. Land rent is very important in areas like system 'H' because land market there had been growing rapidly. Total cost including family labour and fixed inputs indicate the cost that the farmer had to incur in cultivating an acre if the farmer accounts for his family labour, depreciation of his own machinery/ equipment land rent or opportunity cost of land. This is an important piece of information to a person who does cultivate large extents of crops using hired labour and own machinery and implements on leased lands. Total cost excluding family labour is another type of cost that indicates the total cost to the farmer if the farmer ignores the cost of family labour while accounting for depreciation of capital items and land rent or the opportunity cost of land. The third category of cost is the total cost excluding fixed inputs. This indicates the cost to the farmer when the farmer does not account for the depreciation of his own machinery, equipment and the land rent. Total excluding family labour and fixed inputs is another type of cost and it reveals that the total amount of money that the farmer has to spent in cultivating an acre if the farmer does not account for family labour, depreciation of capital items and opportunity cost of land. In other words, this is the amount that the farmer had to pocket - out in order to cultivate an acre.

Table 3.0. Components of Cost of Cultivation Including Family Labour and Fixed Inputs

Crop	% of Per Acre Cost of Cultivation			
	Labour	Machinery & Equipment	Variable Inputs	Fixed Inputs
Chilli	60	04	32	04
Maize	54	05	19	22
Bitter gourd	42	10	36	12
Big onion	60	06	27	07
Soya bean	61	13	11	15
Luffa	43	06	45	06
Brinjal	54	08	27	11
Paddy	51	12	29	08
Papaw First Year	31	-	56	13
Second Year	49	-	25	26
Third Year	45	-	27	28
Banana First Year	57	-	32	11
Second Year	60	-	29	11
Third Year	60	-	29	11

Profitability in Crop Production

Some of the 10 crops that were covered by this study had not performed well during Yala, 2003, because it was not a normal season.

When cost of family labour and fixed inputs were considered chilli, maize, bitter gourd, big onion, luffa, soya beans, banana and papaw were the crops, that were profitable. In other words, farmers who cultivated those crops had recovered what they invested in terms of physical inputs and labour in cultivating those crops. Both chilli and papaw were highly profitable while big onion and soya beans were marginally profitable when all costs were considered (Table 3.0).

When cost of family labour was excluded all crops became profitable. However, chilli, maize, soya beans, bitter gourd, big onion, luffa, brinjal banana and papaw were the crops that had produced high profits when cost of family labour was ignored. Paddy remained unprofitable even when cost of fixed inputs was excluded. Nevertheless, even under these circumstances, chilli, maize, bitter gourd, luffa, banana and papaw were highly profitable. When only pocketed out costs were considered all crops became profitable. Under these conditions chilli, maize, bitter gourd, luffa, banana and papaw were the highly profitable.

Though the income of a crop was insufficient to cover all costs farmers had continued to cultivate it if its returns had covered the cash cost component of the total cost. Based on the results of the study it is possible to conclude that papaw, banana, chilli, bitter gourd, luffa and maize are profitable crops even when all costs were being taken into account. Therefore the MASL should pay more attention to promote such profitable crops.

The net present value (NPV) and benefit – cost ratio (BCR) were the indicators developed to measure the profitability of papaw and banana, as those were perennial crops and it shows the difference between discounted benefits and discounted costs. The NPV indicates the sum of current values of gross profit that would earn over a period of there years. This is a very popular measure in valuing long-term investment projects. If an investment to be financially feasible the NPV should be positive and as high as possible. NPVs calculated for papaw and banana were Rs. 1,160,635 and Rs. 158,104 respectively when family labour and fixed costs were included. When cost of family labour was excluded the corresponding values became Rs. 1,245,503 and Rs. 281,696 respectively. Per acre NPV of Papaw excluding family labour and excluding family labour and fixed costs were Rs. 1,214,157 and Rs. 184,825 respectively. The corresponding values of banana respectively were Rs. 1,299,024 and Rs. 30,244 (Table 4.0).

Table 4.0. Net Present Value, Per Acre of Papaw and Banana.

Description	Per Acre NPV (Rs)	
	Papaw	Banana
Including Family Labour & Fixed Inputs	1,160,635	158,104
Excluding Family Labour	1,245,503	281,696
Excluding Fixed Inputs	1,214,157	184,825
Excluding Family Labour & Fixed Inputs	1,299,024	30,244

Findings of the study depict that both papaw and banana were highly profitable crops and the MASL should promote these crops in order to strengthen the household economy of the farmers, as the crops could be cultivated in relatively large extents.

Another indicator that could be used to measure the financial feasibility of a long-term investment is the benefit – cost ratio (BCR). The BCR is the ratio between the present value of benefits and present value of costs of an investment. Any BCR value equal to or greater than one is good. If BCR is one it indicates that the present value of benefits of the investment is barely sufficient to cover the present value of costs. If this value is less than one it indicates that the present value of benefits is less than present value of cost and such an investment is not financially feasible. The greater the value of the BCR, the higher the profitability of the investment. The BCRs computed for Banana and papaw are presented in Table 5. 0.

Table 5.0 Benefit Cost Ratio of Papaw and Banana

Description	Benefit – Cost Ratio	
	Papaw	Banana
Including Family Labour & Fixed Inputs	5.1	1.7
Excluding Family Labour	7.3	3.5
Excluding Fixed Inputs	6.3	2.0
Excluding Family Labour & Fixed Inputs	10.1	4.5

Benefit cost ratio computed for papaw and banana when cost of family labour and fixed inputs were considered, were 5.1 and 1.7 respectively. When cost of both family labour and fixed inputs were excluded, benefit cost ratios of papaw and banana respectively were 10.1 and 4.5 (Table 5.0). It is possible to state that both of these crops are profitable.

Return to capital is another measure of profitability. This could be calculated by dividing gross income by cost of cultivation excluding family labour and fixed inputs. If returned to capital equals one it indicates that one rupee invested has produced an income worth of one rupee. In other words, investor is operating at a breakeven level. Any value higher than one is favorable. Results of this analysis are presented in Table 6.0. According to these values chilli, papaw, maize, bitter gourd, luffa and banana were the crops that had produced more than two rupees per rupee invested. In other words, those crops were profitable. If the farmer had borrowed money at a rate of interest of 10 % per annum to grow any crop, that is capable of producing a rate of returns to capital over 1.05, would generate enough funds to repay the loan with the interest at the end of the season. A rate of return to capital of 4.55 means a return of Rs. 4.55 per each rupee invested. Similarly, any value less than one indicate a loss. In general, return to capital values estimated during this study were attractive indicating that the majority of those crops had produced profits.

Table 5.0. Return to Capital of Selected Crops.

Crop	Return to Capital
Chilli	4.55
Maize	3.88
Bitter gourd	2.34
Big onion	1.72
Soya bean	1.87
Luffa	2.03
Brinjal	1.82
Paddy	1.27
Banana *	2.79
Papaw *	4.34

* Only gross income and cost excluding family labour and fixed inputs of the first year were considered.

Conclusions

Farmers of the study area had cultivated high valued cash crops and had earned attractive profits. Of the fruit crops only papaw and banana were the two crops considered in this study and both crops had produced attractive profits.

Due to bad climatic conditions prevailed and pest and disease infestations many crops had produced low yields. Further, costs of cultivation of these crops were relatively high. Soya bean and paddy were the crops, which had performed at low level, when costs of family labour and fixed inputs were considered.

Many farmers had used hybrid varieties of crops. This might be a result of the efforts of the agricultural extension service of the MASL. Though yield levels of many crops were low, farmers had adopted improved cultural practices. This indicates that the MASL has delivered new technologies to farmers.

Farmers do expect much institutional support from the MASL and this indicates the inadequacy in group actions among farmers and the prevalence of weak rural leadership. It is also beneficial to educate farmers on ways and means of bringing the cost of cultivation down in order to enhance their profits.

Recommendations

- Farmer Organizations should be strengthened and rural leadership should be improved in order to make the farmer strong enough to survive in the competitive production and marketing environments.
- Supplementary irrigation facilities should be provided during the Yala season and that could be done by the promotion of agro – wells, rehabilitation of existing minor irrigation tanks, constructing minor irrigation tanks in water logged low lying areas and constructing anicuts across streamlets that are found in the area.
- Farmers should be educated on the importance of keeping tract of their expenses and returns and this should be promoted at least with those farmers who practice agriculture on commercial scale and cultivate perennials such as papaw and banana.
- High value cash crops and fruits such as papaw and banana should be promoted in place of crops with narrow profit margins.
- Use of farmyard manure and paddy straw should be promoted as a low cost substitute for expensive chemical fertilizers in order to reduce cost of cultivation.
- Feasibility in introducing producers' co-operatives, as a way of enhancing the bargaining power of the small-scale farmer should also be explored.