

The Future of Paddy Farming Its Challenges and Constraints

A Case Study of Small Farmers in the Hambantota District

The euphoria generated by the bumper harvest of paddy has been gathering momentum during the past few months. One cannot ignore that rice production for the past few decades had been fluctuating causing much anxiety in the minds of farmers, policy makers, politicians and the consumers. The anxiety is mainly rooted from the fact that in the short run farmers fail to sell their output and in the long run the country fail to sustain consistency in production levels. The current bumper harvest, although attributed to extraneous considerations such as favourable weather conditions has added value to the economy and ensured food and income security for the country's population. Yet, a fundamental question pertaining to our ability to sustain this achievement remains unanswered. Against this background, the study uses a combination of both macro data on rice production at national levels and micro data on paddy production from the district of Hambantota to examine the potential of the paddy sector, its challenges and constraints.

Rice economy during the past few decades has advanced in terms of land under cultivation, yield per acre, and total production. Nevertheless, paddy producers and a section of researchers have expressed concern with respect to its viability. The question of viability relates to factors such as the cost of paddy production at the ground level and farm gate prices on the other. Over the years, the cost of production has shown a persistent and substantial increase, amidst slow and inadequate increases in farm-gate prices. This has led to a so-called 'scissors crisis' for paddy production in the country (Lakshman, 1990, Dunham, 2000). The acreage under paddy, although erratic during the recent years, has demonstrated a long-term trend of decline particularly since early 1990s. Meanwhile, issues concerning the welfare of rice consumers and taxpayers of the country deal with the conflicting interests of paddy producers on one hand and the overall welfare of rice consumers and resource users on the other (World Bank 1996). The economic viability of paddy cultivation in the context of domestic resource cost leads to an examination of the opportunity cost of paddy cultivation vis a vis rice imports from other

countries (World Bank, 1996 and 2001; Samaratinga, 2000; Parakrama, 2003). Currently, the CIF price of rice has been about 30-40 per cent less than the price of domestically produced rice. This has supported the argument that unless the cost escalations in rice production is contained it may be beneficial to import rice at a cheaper cost from the world market, which will in turn raise the overall welfare of the rice consuming public in the first place and rationalize allocation of scarce resources including fiscal allocations, land, and labour in the country. This paper is an attempt to examine this controversial issue of paddy cultivation, its costs and benefits to paddy producers and to rice consumers.

The economics of rice production-national trends and patterns

Rice is the staple food of Sri Lankans. The annual per capita rice consumption is estimated to be 106 kilograms (CBSL, 2000). It is estimated that the local production of rice provides about 65 per cent of the annual cereal intake of Sri Lankans. The balance 35% is obtained from imports of rice and import of other cereals of which wheat occupies a substantial position. Even though Sri Lankan consumers prefer local rice varieties to imported varieties the price advantage of imported rice makes it competitive in the local rice market.

However, the demand for rice as the staple food may undergo changes in the context of changing life styles, preferences, income levels and urbanization, etc in the years to come. On the contrary as indicated by the Consumer Finances and Socio Economic Survey of 1996/97 the increased standards of living in the short run could generate a higher demand for rice, as it is perceived as a superior substitute to wheat products like bread (CBSL, 2000). In the long run however, with economic development a shift from rice to other cereals may be expected.

Currently, about 30 to 35 per cent of food energy is imported in the form of wheat. The volume of wheat imports has been in

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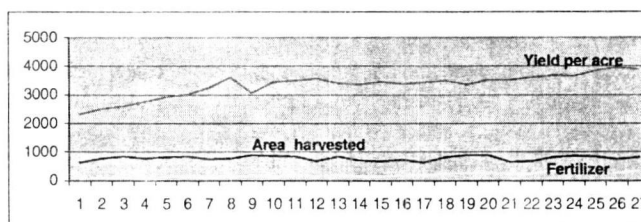
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the range of 7,89,000 metric tons in 1997 against 10,75,000 metric tons in 1995 (CBSL, 1976-2002). This means that there is a stable food energy supply component of about 8,00,000 metric tons of wheat, which has to be imported. Therefore achieving self-sufficiency in the total cereal requirements of the country seems optimistic. Yet, mere self-sufficiency in rice component is not difficult as it only requires a few isolated measures or a combinations of measures such as increasing the cropping intensity and the acreage under paddy, raising the acreage under high yielding varieties, correct application of fertilizer, and upgrading the yield per acre and/or lowering the post harvest losses to the minimum. These measures will not only bridge the current production gap of about 6 to 7 per cent but also exceed the above production thresholds by substantial margins.

Such an increase in production comprises the supply side of the self-sufficiency equation. The total land area under paddy cultivation, which was as high as 9,90,000 hectares in 1984, had come down to 7,30,000 hectares in 1997. The above figures depict a horrendously high vicissitude in which about 35 per cent of land under paddy varied over the years in a country where about 70 per cent of its land area receives water from a network of major and minor irrigation infrastructure. Notwithstanding this very high irrigation investment, the element of uncertainty that stems from changing weather conditions has been phenomenal.

Another issue concerning paddy production has been the high variations in the extent of land sown and the net extent of land har-

Figure 1: Data on area harvested, fertiliser usage, and yield per acre



Source: Central Bank of Sri Lanka

vested. The variations in these two different utilization levels, which are in the ranges of 12-18 per cent, reflect the high incidence of crop failure associated with paddy production. For instance, the production environment in years 1987, 1989, 1992, 1996, and 2001 has been particularly unfavourable. Conversely, the production in 1985, 1994, 1995, and 1998 has been favourable; both land under cultivation and acreage harvested have increased during these years.

The weather factor comprises the volume of rain in millimetres and its distribution patterns in terms of the number of rainy days per year. Rainfall figures for the major paddy producing districts have shown that a range between 1,100 mm to 1,300 mm distributed relatively evenly to cover about 90 rainy days per year may be considered as favourable while any major reduction in these levels is seen as adverse. Low rainfall often results in a dearth of water in the irrigation tanks. There is a symbiotic relationship between rainfall intensity and availability of irrigation water on the one hand, and the shortages of water for paddy cultivation and the cropping intensity on the other. Studies have shown that even in the major irrigation schemes the cropping intensity has been only a few percentage points above 120 in most years².

These issues demand a closer look at rice cultivation research, technology usage, infrastructure and agricultural and trade policies of the country. It seems that the ad hoc changes in policies, new plans, projects, schemes etc. have not been able to respond adequately to meet the ground situation that make paddy producers exceedingly vulnerable to different types of hazards. Unfortunately, in spite of the vast strides made in rice production technology, the performance of the paddy sector is still mostly dependent largely on weather conditions. In a context where water has become the most critical variable, adjustments and changes with respect to the choice of crops, seed varieties, cultivation techniques and cultural practices etc., should responded

Table 1

Paddy statistics from year 1983-2002: Two Decades of Performance

Period	Output '000 Metric Tons	Area Sown '000	Area Harvested '000	Yield per Acre in Kg.	Total Fertiliser use in '000 MT	Guaranteed Price per Bushel of Paddy
1976	1253	724	636	2315	74	33
1977	1677	828	783	2521	81	33
1978	1891	876	840	2613	113	40
1979	1917	839	783	2750	73	40
1980	2133	848	816	2927	145	50
1981	2230	877	837	3014	165	57.5
1982	2156	845	747	3260	141	57.5
1983	2484	824	803	3606	160	62.5
1984	2420	990	886	3076	171	62.5
1985	2661	882	865	3465	153	70
1986	2588	895	835	3500	197	70
1987	2128	781	679	3564	151	70
1988	2477	868	843	3413	204	80
1989	2063	727	707	3374	156	80
1990	2538	857	689	3453	143	110
1991	2389	817	744	3398	179	136
1992	2340	803	627	3428	207	136
1993	2570	835	820	3511	248	155
1994	2684	930	897	3363	267	155
1995	2810	915	890	3535	256	155
1996	2061	749	660	3513	237	155
1997	2239	730	690	3619	245	155
1998	2692	848	829	3678	352	155
1999	2857	896	874	3672	321	155
2000	2860	878	832	3856	262	155
2001	2695	798	765	3964	279	155
2002	2859	852	820	3895	349	155

Source: Annual reports of the Central Bank of Sri Lanka, 1976-2002.

innovatively to make a dent in the current levels of the cropping intensity. The failure of the extension services to diffuse research findings is also partly responsible for this situation.

As shown in Figure 1 the single most important consideration that has had an impact on paddy production in the country has been the yield increases. Table 1 illustrates this further. It was found that yield levels have gone up from around 2,400 in 1976 to 3,900 by 2002. Apart from fertilizer usage there has not been any other factor that could adequately explain the paddy production trends in the country. The incidence of the abandonment of paddy farming has also been reported in different degrees in different parts of the country. In the Wet Zone there has been a virtual abandonment of paddy cultivation in the districts of Galle, Matara, Kalutara and Gampaha due to a variety of rea-

Table 2-Base data on the sample and its selection method.

Waszms	Sq. Km.	Hamlets	Population	Number of households	Sample (households)	% Sample size
Weliwewa	11.0	Weliwewa 18-Cobniya Bohahawewa	1084	306	23	7.5
Ranmuduwewa	7.5	Mahaindivawa Ranmuduwewa	873	332	33	9.9

Source: Divisional Secretariat, Suriyawewa.

sons. Increased salinity in soil, salt-water intrusion, water logging, low paddy output etc., have made paddy cultivation in these areas no longer profitable. The shortage of labour is another difficulty. In the Dry Zone there is a tendency to move out of paddy cultivation in favour of other field crops. In the Divisional Secretariats of Suriyawewa, and Lunugamwehera, in which this study was conducted there has been notable shift from paddy production to banana cultivation.

One of the factors responsible for this shift has been the low producer margin from paddy. The producer margins of 72 per cent specified for Mahaweli holdings at planning stages had continuously declined to less than 20 per cent by the turn of the century. This is in spite of some notable gains in the average yield per acre. The escalations in the cost of production in all the major cost headings have contributed to this situation.

Evidence at micro levels Patterns and trends

This section attempts to examine the production levels, flow of economic returns, and viability of paddy production using micro level data gathered from a few selected villages at Suriyawewa. The micro level imperatives of paddy production examine how and why paddy production is carried out by small farmers in those villages. The data set was primarily drawn from two Gramasevaka divisions (GS) i.e., Weliwewa and Ranmuduwewa. The field survey covered 56 households and it was conducted during the period May to July 2003. Of these households 25 out of 32 households (78%) at Ranmuduwewa and 11 out of 24 households (45%) at Weliwewa were engaged in paddy cultivation. The difference in the intensity of paddy cultivation in the two GS divisions is partly due to the access to irrigation water. The Ranmuduwewa households were relatively fortunate to be served by the Mau ara development project. Table 2 here presents some basic data on population, land extent and samples drawn for this study.

The 30-year average rainfall for

Table 3 below presents data on farm structures in the area studied.

Indicator	Data	Cumulative %
Average farm size (rice)	1.17	-----
Holdings > 1 acre	24.7	24.7
Holdings between 1.1-2 acres	58.3	83.0
Holdings between 2.1-3 acres	08.4	91.4
More than 3.1	08.6	100.00

Source: Field survey data

Hambantota has been 1050 mm with a distribution of 87 rainy days per annum. It was also reported that during the droughts in 1995 and 2001 the rainfall levels fell to 610 mm and 880 mm respectively. As a result most irrigation schemes failed to provide water as tanks dried up. The Maha crop of 2000/2001 therefore was confined to a mere 635 acres of land in Suriyawewa where the total cultivable area under normal conditions amounts to 6000 acres. Conversely, the cultivation year 2002/2003 has been one of the most favourable periods in which rainfall has been adequate to cause a drastic impact on cropping intensity, yield levels and income generation opportunities.

It was revealed that 20 (36%) out of 56 households surveyed do not cultivate paddy; most of them are Chena operators. This category of farmers cannot cultivate paddy under the current setting. Of the balance 36, about 25 per cent had operated holdings smaller than 1 acre, while another 58 per cent had operated holdings between one and two acres. Another matter related to farm structures has been the right to lands, i.e., discrepancies in the ownership and operatorship of lands. In most cases the farmers have an informal or unwritten claim to use lands; they do not have guarantee of formal titles and rights and hence are deprived of the opportunity to transform land into capital. However, whether the farmers should be given legal rights to the land they cultivate has been a debatable proposition as some groups are of the view that it would expose them to land grabbing private companies. The issue of not having legal rights has led to other complications as well, and according to the GS most of the conflicts among households are associated with land ownership, operatorship, change of boundaries and use of water. Hence, most paddy farmers spend their time on dispute settlements rather than improving their lands.

There were also 8 cases (22%) of leasing out lands

Table 4 - Yield data for the study area

Indicator	Yield per acre	Cumulative data on yield
Average yield	1617 kg	-----
Yield > 1030 kg.	33%	33
1031-1550 kg	17%	50
1551-2065 kg	26%	76
2066 kg and above	25%	100

Source: Survey data

for a fixed payment of five Amuna (650kgs) of paddy, or Rs 5000 per season. These arrangements are suboptimal and they undermine the efforts and initiatives of paddy farmers. The farm structures discussed above have a direct bearing on production potential i.e., the yield per acre.

The average yield per acre for the villages was found to be 1617 kilograms. The yield levels as presented in the table depended mostly on the source and dependability of water, fertilizer applications, type of seeds, and cultural practices. About 33 per cent of the households recorded a yield less than 1030 kilograms while about 50 per cent of the households recorded a yield less than 1550 kilograms. About 24% has had a yield of more than 2066 kilograms per acre. The profitability of paddy production depends on four interrelated variables, i.e., the cost structure, farm gate prices, productivity of land/labour and economies of scale pertaining to paddy production.

Of them, the cost of production has been the most sensitive component. Discussions on the cost of production have been disturbing and controversial. Table 4 above presents a set of data on the cost of production of paddy pertaining to a typical one-acre farm in the study area. It shows the major activities and cost headings. Table 5 below was constructed using recall data based on the field survey.

According to the Table 5 below the most expensive input in the paddy production enterprise is labour (45%). However, under normal circumstances much of the above input can be

Table 5- Cost of Production for a typical one acre farm

Activity	Mechanical inputs	Chemical inputs including fertilizer	Biological inputs	Labour (uses imputed values for family labour)
Land preparation	Rs. 3000/=	Rs. 1450/=		Rs 4650/=
Seeds			Rs. 2500/=	
Plant protection & fertilizer		Rs. 5050/=		Rs. 2000/=
Harvesting and cleaning	Rs. 2000/=			Rs. 5000/=
Total	Rs. 5000.00 (19.5%)	Rs. 6500.00 (25.3%)	Rs. 2500.00 (9.7%)	Rs. 11650.00 (45%)

Source: Survey data.

generated within the household as family labour is used extensively. Therefore it was assumed that 75% of the above cost can be removed from cost estimations as any surplus generated from paddy production is eventually ploughed back to support the family. On the other hand, a unit cost of labour during the peak period of operations ranges between Rs. 200 and 250/= per day, and this is

the benefit foregone by family members by engaging in family farm operations in a labour scarce set up. The mechanical inputs include cost of ploughing which is done three times before the final levelling of paddy fields plus the cost of hiring machinery for spraying chemicals, threshing and winnowing. The biological costs include the cost of high yielding seeds which is about Rs. 25/= per kilogram. As farmers sow more than the recommended quantity of 80 kilograms, the cost of this input can unnecessarily increase by 20-25 per cent.

The most disturbing cost item has been chemical inputs including fertilizer, insecticides, pesticides and weed controlling chemicals where the price change has been very frequent. With respect to fertilizer usage the coping strategy has been reducing the combination of inputs, which could be, counterproductive as far as yield levels are concerned. The cost of other chemicals meant for weed and pest control cannot be reduced as the bulk of this cost occurs in the middle of the production season where farmers in desperation often use chemical applications to overcome adverse effects of pest attacks. In most cases the choice of type, brand, and doses of chemical inputs are based on hearsay advice of sales agents³. This has an adverse effect by way of escalating the cost of production of paddy, where extension services are weak and ineffective.

Farm gate price forms the second major variable influencing the profitability equation of paddy production. In general, the paddy market in Hambantota is somewhat peculiar as paddy producers chose to sell their produce direct to the millers. The shortening the channel length has had a positive impact on the average farm gate price of paddy, which is about 10 to 13 per cent above the price levels of most of the other paddy producing districts. Table 6 presents the three-year moving average of rice

Table 6- Three year moving averages of farm gate price of paddy

District	1997-99	1998-2000	1999-2001	Average price
Polonnaruwa	10.66	10.40	11.29	10.49
Anuradhapura	10.64	10.46	10.80	10.71
Kurunegala	10.33	10.12	10.90	10.36
Hambantota	11.70	11.41	12.22	11.76

Source: HARTI

in four paddy-producing districts of the country. It also shows that Hambantota price levels have been consistently above the price levels of the other paddy producing areas. This does not mean that the farmers have been able to enhance their income as a result of this increased margin as they now have to meet the cost of transportation themselves.

The selling price of paddy is determined by the quality of output as well. This relates to the water content of paddy sold (15 per cent > d), inclusion of waste matter including sand, the type and variety, and timing of release of output to the market. It is unfair to blame agents and collectors for paying low prices for poor quality paddy when there is a glut in the market.

The average price of paddy sold by the producers in the study area during the recently concluded Maha season was Rs. 12.76 with a standard deviation of 0.89. The price levels have varied from Rs. 15 per kilogram at the highest to Rs. 11 per kg at the lowest. About 33 per cent of the households have sold their output for less than Rs. 12 per kg while another 44.4 per cent have sold their output between Rs. 12.00 and 13.00 per kilogram. Only 22.3 per cent of the households have been able to sell their output at price levels higher than Rs. 13.00 per kilogram.

Another significant piece of information collected from the field survey was the price variation between the time of selling and one month before (or after) disposing of their output. Interestingly, farmers maintained that the view that the price of paddy a month earlier was much higher being Rs. 14.73 (16 per cent). Normally price levels start gaining value one month after harvesting begins. However, the unusually high output in Maha has glutted the market this year and as a result even after one month, the price levels were dipping. Those farmers who are late by two weeks to the market suffer a price loss of Rs. 1.97 (16 per cent) per kilogram. The study revealed that paddy farmers retain a substantial portion of their total yield without selling to meet both food

security and income security requirements. Although the average food security requirement of a family of 4.02 is around 632 kilograms of paddy per annum, the mean stock of paddy unsold was around 700-900 kilograms (about six Amuna). This reflects the income security aspects of inventory management.

Of course what was retained at home depended on the total output as well.

The below Table shows that on the average a household produces 2661.5 kilograms of rice in the Maha season. It also reveals that the highest output in Maha 2003 was 5850 kilograms.

Table 7 -Data on paddy prices

Indicator	Data	Cumulative statistics
Mean	12.76	-----
Price below Rs. 12 per kg.	12 (33.3%)	33.3
Rs 12.01- Rs. 13.00	16 (44.4%)	77.7
Rs. 13.01- Rs. 14.00	7 (19.4%)	97.1
Rs. 14.01 -and above	1 (2.7%)	100.00

Source: Survey data

grams of paddy and the highest price level recorded was Rs. 15 per kilogram. This means that in the current context for a paddy farm of 2.5 acres a gross income of Rs 87750 is the highest possible achievement per season per household. However, care has to be taken when interpreting this high figure of gross cash income.

The value generation process of rice production includes the operations performed by the millers and distributors as well. For these two categories the year 2003 has not been very. In fact even in the month of August 2003 the retail price of rice at the Hambantota market was as low as Rs. 20 per kilogram. This has made both collection, storing, milling and distribution of rice extremely uneconomical causing ripple effects in the rice market. The effects of this glut and low prices will be adversely felt on the Yala harvest as well.

These issues pertaining to rice production have arisen notwithstanding the importance attached to food security considerations of the country

Table 8:- Paddy Cultivation and Marketing in Maha Season

Indices of performance	Extent of land Under paddy (Acres)	Total output (Kilograms)	Output sold (Kilograms)	Price sold (Rupees)
Mean	1.57	2661	1828	12.70
Median	2.00	2340	1820	12.50
Maximum	2.5	5850	4450	15.00
Minimum	0.25	520	104	11.00

Source: Survey data

at national level. For rice production to continue as an economic enterprise paddy cultivators and millers should be able to generate sufficient income surpluses; however, such surpluses should not undermine the overall welfare of net consumers of rice. In fact the bulk of the rice produced in the country is still consumed by the producers themselves. This leads to a major dilemma; whether to produce rice locally or purchase it from elsewhere when it is available at an affordable price.

The economic viability of paddy production depends on three major pillars. They are the potential to increase yield per acre, possibility of increasing price levels, and increasing economies of scale in respect of paddy farming operations. Another major factor i.e., the cost of production also can impinge on its viability. However, the extent to which they could be manoeuvred depends on a set of more sensitive factors. For example the floor price of paddy cannot be raised without increasing the price of rice; this may be socially and politically difficult. The capacity of the current fiscal regime to absorb any subsidy may also be difficult if not impossible. Any change in the cost structure on the other hand could mean mechanization of current operations at a time when the cost of labour is the single most crucial component (45-50%) among cost elements.

It is within this context that the following Table presents a set of conservative estimates for different scenarios for paddy production in the country.

Accordingly it appears, that on the average paddy cultivation is not intrinsically unprofitable even when an imputed value is attached to the family labour used for different activities. Yet profits generated by the paddy sector is not adequate to sustain paddy cultivation. When family labour is fully accounted, an income surplus of Rs. 6591.00 can be generated, providing Rs. 273.00 per person per month for a household, for six months.⁴

After substituting family labour to the maximum the surpluses generated by paddy cultivation will ensure only Rs. 635 per capita. The extremely unreliable Yala season makes this situation rather precarious. Unless paddy farmers can evolve other income sources, their prospects could be bleak. This in other words means that paddy farming per se cannot assure a reasonable standard of living under normal circumstances.

This leads to the need for the development of alternative scenarios of paddy farming to ascertain how combinations such as varying sizes of holdings, per acre yields and farm gate price levels can generate different propositions of outcome.

The Table 8 above provides a number of other alternative possibilities. It is seen that 1 to 1.5 acre holdings with low yield levels are extremely non viable as they produce losses. The fourth option given in the table may only be viable when it depends exclusively on family labour, while the fifth option could assure some consolation to paddy cultivators. Although the scenarios developed herein are based on some of the empirical data on farm sizes, yield levels and price levels, they are not conclusive.

It should also be noted that the reality with respect to paddy cultivation is somewhat different from what was presented above. Firstly, there were a few paddy cultivators who were generating a much higher surplus than what is given above. The very existence of leasing out options for a fixed sum of Rs. 5000 per acre means that paddy farming is still perceived as lucrative; it has the capacity to generate a high income surplus than depicted in the scenarios given above. Secondly, the paddy farmers who were engaged in the cultivation of other field crops were enjoying higher cash income levels. Thirdly, a sizable number of paddy farmers seemed to have access to other off farm income sources that support their survival during the lean period of Yala. The above three factors have greatly minimized the adverse impacts arising from the debilitating forces that undermine the very existence of the paddy economy.

Discussion of Findings and Conclusions

Poverty in Sri Lanka is predominantly a rural phenomenon; about 87% of the poor lives in the rural sector. The lower poverty head count for the rural sector is as high as 27 percent, while the higher poverty head count stands at 41 per cent. These figures quite eloquently describe the nature of poverty among the rural community where paddy farming constitutes an integral part. About 42 per cent of the poor are farmers; many of them in fact are paddy farmers. The crisis of paddy farming therefore becomes a crisis of poverty. No national program for poverty alleviation can succeed unless the deep-rooted problems in the paddy sector can be effectively addressed.

Table 8-Costs, Incomes, and Margins: A few Scenarios

Conditions governing paddy income			Gross income	Cost of production (Rupees)			Margins (Rupees)	
Ext. of land	Yield per acre	Price per kg.	Rs. Per farmer	75% family labour deducted	labour 100% costed	75% Family labour deducted	Family labour fully costed	
1.5	1617	12.7	32241/-	16912/-	25650/-	15329/-	6591	
1.0	904	11.5	10396/-	16912/-	25650/-	(6516/-)	(15254/-)	
1.5	1290	12.5	24187/-	25368/-	38475/-	(1181/-)	(14288/-)	
2.0	1808	13.5	48816/-	33824/-	51300/-	14992/-	(2484/-)	
2.5	2484	14.5	90045/-	42280/-	64125/-	47765/-	25920	

Source: Survey data (Figures given within brackets shows negative gains)

The paddy-farming sector of the country is characterised by its meagre asset base, low and volatile returns to assets and prevalence of different types of shocks and stresses. The size of holdings is minuscular and a fair proportion of these lands do not have access to irrigation water. The extent and duration of rainfall has been quite unpredictable. Issues such as the distance to farm plots from households and tenurial complications have further exacerbated this situation. Even when land is available the absence of legal rights makes them vulnerable in the insurance, credit and other markets. These conditions stifle the initiative and effort from the point of view of paddy farmers. Apart from the general malaise of poverty, the rice sector is encountered by its non-competitiveness on the one hand and the diminishing viability of paddy farming and rice milling on the other. The issue of the diminishing viability of paddy cultivation is symbiotically linked to the first issue of its non-competitiveness.

In the first place rice enterprise needs to take control of its escalating cost of production. About 40-50 per cent of this cost is associated with labour inputs. Also it includes wasteful use of seeds, fertilizer, water and chemical inputs. Secondly, the paddy sector has to enhance its productivity i.e., yield per acre. One of the easiest ways to overcome cost escalations is raising output per acre. The system of rice intensification as practised in Madagascar has shown how paddy yields can be substantially enhanced without incurring huge costs. Other innovations including Yaya system, which was abandoned due to budgetary constraints, should be revamped.

Thirdly, the paddy sector has to ensure that its unit of production is based on sound economic principles of optimality. This issue is associated with the farm structures and agrarian reforms. When minuscular holdings fail to produce adequate output, they reproduce poverty; low producer margins of farms make paddy cultivators economically and socially vulnerable.

Fourthly, a mechanism to help paddy producers to manage their stocks at the time of harvest is an urgent requirement to help them to

minimize their already dwindling producer margins. A meaningful collaboration among bankers, insurance agencies, millers, and wholesalers of rice could help this aspect of price stabilization.

Sri Lanka cannot afford to dis-pense paddy cultivation as it closely allied to food security

at national levels and income security of those engaged in rice production at sectoral levels. This country also cannot continue to divert its scarce resources to the paddy sector unless it improves the capacity substantially to revamp its fundamentals, structures and operations. The rice economy is therefore at cross roads and decisive actions have become inevitable.

End Notes

¹ Experience of the newly industrialised countries in Asia has shown a trend towards eating less rice per capita with the growth of per capita income levels.

² Ideally cropping intensity should be closer to 200 per cent. Anything below 150 may demand further studies particularly in the context of justification given for large investment pertaining to major irrigation infrastructure. The answers may again lie on the choice of technology at farmer levels.

³ This again reflects the failure of the extension services to educate farmers in respect of correct use of chemicals. ⁴ It assumes a family size of 4.02 members.

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