CHAPTER I
INTRODUCTION AND DESIGN OF THE STUDY

1.1 INTRODUCTION

Rice commends recognition, as a supreme commodity to mankind, because rice is truly life, culture, a tradition and a means of livelihood to millions. It is an important staple food providing 66-70 per cent body calorie intake to the consumers. The United Nations General Assembly, in a resolution declared the year of 2004 as the “International Year of Rice”, which has tremendous significance to food security. It very eloquently upheld the need to heighten awareness for the role of rice in alleviating poverty and malnutrition (Barah and Pandey, 2005).

Rice is the staple food for about 50 per cent of the world’s population that resides in Asia, where 90 per cent of the world’s rice is grown and consumed. In Asia, India has the largest area under rice (41.66 million ha) accounting for 29.4 per cent of the global rice area. Of the total harvested area, about 46 per cent is irrigated with 28 per cent rainfed lowland, 12 per cent rainfed upland and 14 per cent flood prone. Rice is one of the largest traded commodities in the world with a total quantity traded touching 16.4 million tonnes. The southeast countries account for about 40 per cent of the rice trade in the world (Mangal Rai, 2004).

The world paddy production was 614.65 million tonnes in 2004-05, covering an area of 153.51 million ha with an average yield of 3.87 tonnes per ha. Developing countries contributed about 90 per cent of the total world rice production. India ranked first in area under paddy (41.66 million ha) and second in terms of production (85.31 million tonnes) during 2004-05 and it stood next
only to China in the world with respect to rice production. But, the yield levels in India were low at 2.05 tonnes per ha compared to other major rice producing countries viz., Japan (6.52 t/ha), China (6.24 t/ha) and Indonesia (4.25 t/ha). About 67 per cent of the area under paddy in India is under HYV’s.

India so far has witnessed 2 per cent growth in population while the growth in rice production was 3 per cent. Growth rate of rice output during the last two decades has remained well above the population growth rate, which has made the country not only self reliant in food grains but also generated surplus for export.

Rice is consumed both in urban and rural areas and its consumption is growing due to high-income elasticity of demand. To meet the growing demand, a rapid increase in paddy production is needed. But, there is little scope to increase the area; hence increase in production and productivity with an improvement in efficiency of production act as a technological breakthrough to meet the growing demand. The green revolution of 1960’s was oriented towards high input usage particularly fertilizers, irrigation and plant protection chemicals. As a result of excessive use of these inputs the cost of cultivation has escalated. This is more so in irrigated crops like paddy. The spectacular increase in production of paddy was restricted to irrigated belts of the country.

The skewed distribution of green revolution results and increased costs of cultivation have given alarming signals to the future needs of food security.

At this juncture the System of Rice Intensification (“SRI” – Rice cultivation) came into light.
SRI, the system of rice intensification is a system of production of rice. SRI is considered to be a disembodied technological breakthrough in paddy cultivation. SRI involves the application of certain management practices, which together provide better growing conditions for rice plants, particularly in the root zone, than those for plants grown under traditional practices. This system seems to be promising to overcome the shortage of water in irrigated rice. In this method synergic interaction leads to much higher yields. It offers increased land, labour and water productivity. In fact, it is a less water consuming method of rice cultivation, which is suitable to poor farmers who have relatively more labour than land and capital.

Under SRI method of Rice cultivation, root development was more and healthy, tillering was almost double and the crop does not lodge. The grain weight was more and less incidence of pests and diseases were observed. This technology uses less quantity of inputs like water, fertilizers, pesticides etc.

Technology that heralded the process of green revolution during 1970s and 1980s started showing signs of deceleration during 1990s. In the 1970s, agricultural production growth was comparatively low, growing at an average annual rate of 1.95 per cent. In the 1980s, it grew at 3.82 per cent per annum. Since 1990, production growth showed only 2.09 per cent per annum (Fan, 2000).

Technological stagnation is supported by an increasing evidence of stagnating levels of productivity growth of crops even in many potential areas as the trend in productivity is not consistently upward in many states of India. The growth has been
flat and has started declining in some of the progressive states and reversing the trend will not be easy. This is due to differential levels of adoption of new technologies, varying degrees of water control, imbalances in infrastructure development and a host of other factors. Differential levels of adoption of modern varieties are also one of the causes for stagnation in yield levels.

Adoption of modern varieties of major crops even now met with only partial success (Hossain, 1990; Azam, 1995 and Hossain, 1996) as the area under high yielding varieties (HYVs) is still low. About 40 per cent of the cropped areas in the country are under HYVs in 1996-97 and it increased from 21 per cent in 1970. The area under HYVs of crops ranged between 2 per cent and 69 per cent across the states and this differential adoption rate accentuates the income disparities among the region.

The lackadaisical pace of growth was witnessed even in rice. India is still amongst the countries with the lowest rice yields, 30 to 40 per cent of the potential yield is yet to be tapped with the available high yielding varieties sown on highly productive irrigated soils. After a long period of technological breakthrough and adoption, yield gap still exists in many of the states.

In the country, more than 50 per cent of the potential yield even in the case of rice is not realized yet. Non-price prerequisite for sustaining the agricultural production, namely the technology receded in the later periods and it’s bearing on the profitability of crops is also reflected in the output-input ratios of the many crops. The surplus production of rice and wheat could not be exported profitably as the ruling prices in the international markets remained far below the cost of procurement. Consequently with mounting
stocks, the prices of the commodities in the domestic market fell far below the cost of production. In the case of paddy a proportionate increase in the cost of production was more than the increase in income and as a result, the benefit-cost ratio declined to 1.41 during 2000-01 from 2.45 per cent in 1973-74 (Fan, 2002).

Farmers may have been able to maintain yields of modern varieties through the application of higher amounts of non-land inputs, which means a declining trend in TFP and profitability in farming. Without impressive growth in the productivity of crops, the farmers are forced to extend cultivation to marginal lands due to low profitability and this aggravates the production of sustaining the natural resource base. Therefore, potential for increasing production of crops through adoption of wide range of modern technologies has remained unexploited in many parts of the country because of unfavourable output-input prices (Ramasamy, 2004).

Efficiency is an important source of productivity growth especially in developing agricultural economies, where resources are meager and opportunities for developing and adopting better technologies have lately started dwindling. Such economies can benefit a great deal from inefficiency studies, which show that it is still possible to raise productivity by improving efficiency, a usually neglected source of productivity, without increasing the resource base or developing new technologies. Estimates on the extent of inefficiency can also help to decide whether to improve efficiency or to develop new technologies to raise agricultural productivity. Measurement of efficiency includes Technical Efficiency (TE), Allocative Efficiency (AE) and Economic Efficiency (EE). Technical efficiency is the ability of a producer to achieve maximum possible output with the available resources,
while allocative efficiency refers to the ability to contrive an optimal allocation of given resources. Economic efficiency is the product of technical and allocative efficiencies (Farell, 1957).

It is generally believed that farmers in developing agriculture fail to exploit fully the potential of a technology and/or make allocative errors with the result that yields show wide variation, usually reflecting a corresponding variation in the management capacities of the farmers. This shows that considerable scope exists for raising productivity and income of the farmers by improving their efficiency. The factors responsible for inefficiencies need to be identified and addressed properly for achieving a higher production in paddy. The launching of HYV programme in India has enhanced the importance of the study of efficiency in crop production. The concept of efficiency is vital to policy makers both at micro and macro levels. It aids in policy recommendations related to land distribution, land ceilings, agricultural education and extension services. Studies on efficiency in paddy cultivation focus on the possibility of increasing the yield while conserving the resources.

1.2 STATEMENT OF THE PROBLEM

This Research problem focuses on the economics of paddy cultivation in the Kulithalai taluk of Karur District. This agrarian taluk of late is beset with variety of problems which are adversely affecting the paddy cultivation, the major food crop cultivated in this area. The cost of labour and other farm inputs are increasing alarmingly, whereas the prices of output (paddy) are stagnant which present glimpses of lurking dangers of agrarian crisis. The farmers in the study area are now slowly switching into SRI method of cultivation. This research work attempts to compare on economic
basis the pro and cons of SRI to traditional method of paddy cultivation.

1.3 SCOPE OF THE STUDY

Agriculture is a source of livelihood for large part of population in developing countries. Agricultural sector in these countries contribute a sizeable portion of the Gross Domestic Product (GDP). In India, agriculture sector contributes as much as approximately 18.5 percent of the total GDP (Source: Recent Economic Survey 2012-13).

In view of the importance of agriculture in the overall economy, accurate and up to date information / knowledge of cost structure of crops is crucial for policy formulation in this sector. Crop-wise information on costs and returns is utilized by the farmers in allocating their scarce resources in an efficient way. Such information is also very useful to organizations which are closely related to agricultural sector.

The financial sector uses such information to make provisions of credit and crop insurance packages to farm sector. It has immense importance for administrators and policy planners in terms of decision making for fixation of Minimum Support Prices (MSP), selecting production strategies and identifying regional comparative advantages in crop production with a view to enhance the productivity and income of the farmers.

Farm income is an important yard stick of farmers’ welfare and overall rural development which in turn improves terms of trade between agriculture and industrial sector of the economy resulting in development of secondary as well as tertiary sectors of the economy.
Farm level input output data is immensely useful to perform production function analysis to assess the technical, allocative and economic efficiency of different category of farmers to frame the future strategies for improving the farming efficiency. Cost of Cultivation / production data has the potential of being used in the improvement of the System of National Accounts (SNA) by updating the various technical coefficients used in compilation of product based production accounts. Such information is the only powerful device for monitoring developmental changes in the farm sector over time and space. Cost of production survey data can also be valuable to individual research workers for in depth analysis of the available data. Such data has the potential to fill the gap in the existing data and to study the trends of the economy.

Paddy is the major food crop cultivated in Tamilnadu and this is the major crop cultivated in Kulithalai block of Karur district also. Paddy cultivation is the major source of livelihood in the district. The paddy cultivation in the study faces natural, technical, financial, marketing and pricing problems. These problems make the paddy cultivation unremunerative and unattractive. This adverse trend has far reaching consequences for the cultivators and consumers. This study attempts to explore the economics of paddy cultivation through cost benefit analysis. This work is both researchable and socially relevant to understand the agrarian crisis in the study and also suggest suitable measures to strengthen the agrarian economy and thereby food security of the country at large.

1.4 OBJECTIVES OF THE STUDY

This study is a development oriented village level study. The major thrust of the study is on the revival and development of
paddy farming sector in Kulithalai region. With this focus the study aims

1. To examine the socio-economic profile of paddy farmers in the study area.
2. To examine the nature, pattern and extent of paddy cultivation in the study area.
3. To study the cost benefit aspects of paddy cultivation.
4. To identify the current problems in paddy farming.
5. To compare and contrast the cost and returns of paddy cultivation in traditional and SRI methods.
6. To suggest appropriate measures for the development of paddy farming in the study area.

1.5 RESEARCH HYPOTHESES

Based on the above objectives the following hypotheses are formulated.

1. There is a significant difference among the farmers in the selection of different varieties of paddy for cultivation.
2. Shortage of labour is the major constraint faced by the farmers in the paddy cultivation.
3. The yield and profitability of the SRI method of cultivation is significantly higher than the traditional method of cultivation.

1.6 RESEARCH METHODOLOGY

This chapter deals with the description of the study area, the sampling design followed, the nature and sources of data and analytical techniques employed. The methodology is presented under the following major heads.

**Sampling Design:** The study was based on the input-output data obtained from sample farmers in Kulithalai taluk of Karur
districts. For selection of farmers, multi-stage sampling design was employed. In this procedure, at first stage, three major paddy growing zones following both traditional and SRI method of rice cultivation were purposively selected. From each zone, ten major paddy growing village panchayats following both the methods of rice cultivation were selected at second stage.

The sample selection was on the basis of the nature of land with irrigation facilities. The sample villages has been grouped into three zones wise fully wet land, semi wet land, partly wet land and in each group five villages has been selected for the study.

**Selection of sample Respondents**

The selection of sample respondents was based on the proportionate sampling. The selection was made on the basis of cultivators with either highest or lowest in numbers in each zone of the Kulithalai block. Keeping in view of the time and costs involved, the researcher intended to study a sample of 400 respondents from the fifteen village panchayats were chosen at random by using Tippets Table of Random Numbers. The random sample is used to eliminate the bias and prejudice involved in the selection of sample respondents.

**Nature and Sources of Data**: For evaluating the specific objectives of the study, necessary primary data were obtained from the sample farmers through personal interview with the help of pre-tested and well structured schedule. The data so collected pertained to the Kuruvai season of the agricultural year 2011-12. The data relating to general information about the sample farmers, their assets position, cropping pattern, details on various inputs used in paddy cultivation like chemical fertilizers, plant protection
chemicals, seed materials and labour and cultivation practices such as land preparation, transplanting, irrigation, inter cultivation and harvesting along with labour requirement were collected. The adoption levels of the recommended methods of SRI method of paddy cultivation, its advantages and the constraints for it were also elicited from the respondents.

**Analytical Techniques Employed:** For the purpose of achieving the objectives of the study, the data collected were subjected to the statistical analysis. For this purpose, tabular and production function analyses were employed.

**Tabular analysis:** The technique of tabular presentation was used to assess the cost, returns and profits of paddy crop in the study area. The percentage and averages were computed and compared to draw meaningful inferences. The farm management cost concept approach is widely used in India for evaluating crop profitability in production.

**Statistical tools** are used to highlight the factors influencing the paddy cultivation in different operations. Statistical packages for Social Science (SPSS) are used to relate the variables and to examine the cause and effect relations between variables. The chi-square test was used to examine the association between size of cultivation of acres of the respondents and their opinion about input applications. One way ANOVA was used to find out the difference zone wise cultivation of the respondents and their opinion about level of satisfaction. ‘t’ test was applied to have the results of the difference method of cultivation of the respondents and their opinion about level of satisfaction. Kruskal-Wallis test was used to differentiate the size of yield of paddy per acre of the respondents.
and their opinion about level of satisfaction. Mann-Whitney test was used to differentiate ownership of land of the respondents and their opinion about level of satisfaction. Percentages, ratios are extensively to show the magnitude of the variables concerned. To have more clarity and attractiveness bar diagrams and pie charts are used.

The Research Questions pertaining to the study: “An Economic study on Paddy cultivation in Kulithalai Taluk of Karur District, Tamil Nadu” are

1. How far paddy cultivation in the study area is remunerative and sustainable?

2. To understand what the systems of Rice Intensification are is adopted by the farmers?

3. Is the SRI method of cultivation is more considerably more profitable than the traditional method of paddy cultivation?

4. To what extent the government patronage is helping the farmers to go for special Rice Intensification System?

1.7 PERIOD OF STUDY

The study covers a period of one year (2011-12). There are three major agricultural seasons in a year, viz., Kuruvai, Samba and Thaladi. Data from the paddy cultivators are collected for all the three seasons.

1.8 LIMITATIONS OF THE STUDY

The cases documented in this report might have limited details due to the non-availability of information, particularly with regard to adaptation strategies for rice cultivation.
Limited facilities and resources at the disposal of the researcher have also prevented in accessing necessary information. The data from the respondents were collected within a particular period of one year i.e., 2011-12 hence the opinions of the respondents were also limited to the situation which existed during that period only.

The collection of data on some of the variables was very difficult especially in case of income and expenditure. Because most of the respondents were illiterates it was very difficult for them to give correct information regarding income and expenditure. It is difficult to approach them and elicit data from them and it involves strenuous work on the part of the researcher. Besides they are not maintaining accounts of their activities so the data furnished them may suffer due to recall bias.

1.9 RESEARCH GAPS

The Research Gaps identified by the researcher in the broad area of paddy cultivation in India are listed below:

1. There plethora of research studies conducted in India on paddy cultivation. But no sertous effort is made to know the reasons for the dwindling paddy production.

2. There is no study evaluation on the System of Rice Intensification which is very popular in the study area.

3. There is dearth of researcher in comparative analysis of traditional method of cultivation and the modern System of Rice Intensification.
4. There is no previous studies which comprehensively measured the Benefit Cost Ratio of traditional and System of Rice Intensification of cultivation.

This present research work aims to fill the above mentioned gaps in the field of paddy cultivation.

1.10 CHAPTERISATION

The present report has been organized into six chapters.

Chapter one: INTRODUCTION contains the introduction to the problem. It includes the objectives and hypotheses of the study, the scope or significance of the study, and methodology of the study and its limitations.

Chapter two: CONCEPTS, THEORITICAL BASIS AND REVIEW OF LITERATURE. This chapter is presented in two parts as the first one state the review of literature on earlier studies that are having relation to the objectives of the present study. And the second is brought forth the theoretical understanding of paddy cultivation.

Chapter three: PROFILE OF THE STUDY AREA. It gives general profile of Karur and the frame work of the land utilization, cropping pattern, nature of work, wages and the economics of paddy cultivation in Kulithalai taluk in particular.

Chapter four: DATA ANALYSIS AND DESCRIPTION OF THE STUDY deals with the interpretation of data and tabulation analyses present results under appropriate heads.

The fifth chapter depicts the RESEARCH FINDINGS, SUGGESTIONS AND CONCLUSIONS.
REFERENCE

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