

Chapter I

Introduction

1.1 Background

Sri Lanka comprises one large island and several islets, lying east of the southern tip of the Indian subcontinent. It stretches between 5° 55' & 9° 50' of north latitude and between 79° 42' & 81° 53' of east longitude. The maximum north-south length of the island is 432 km. and its greatest width is 224 km. The island (including adjacent small islands) covers a land area of 65,610 km². The Bay of Bengal lies to its north and east and the Arabian Sea to its west. Sri Lanka is separated from India by the Gulf of Mannar and the Palk Strait. The highest elevation is 2,524 meters.

In Sri Lanka the most important weather parameter that has the greatest impact on Agriculture is the rainfall. Based on the amount of rainfall received, the country is divided into 3 major zones: Dry Zone (DZ) where the annual rainfall is less than 1500 mm; Intermediate Zone (IZ) where the annual rainfall is between 1500 - 2500 mm and Wet Zone (WZ) where the annual rainfall is more than 2500 mm.

Also, the country is further divided into three major elevation zones, Low Country (LC) from 0 to 300 m above MSL; Mid Country (MC) between 300 – 1000 m above MSL and Up Country (UC) over 1000 m above MSL.

By considering these two parameters, seven major Agro Ecological Zones have been identified (LCDZ, LCIZ, LCWZ, MCIZ, MCWZ, UCIZ and UCWZ). These agro ecological zones are further subdivided into 24 Agro Ecological Regions, considering the temperature, amount of rainfall receives and its distribution pattern, soil types and the land form pattern. Rice is grown in all the Agro Ecological Regions except in WU1, WU2, WU3, IU1 and IU2. There are diverse differences in

environmental conditions and inherent problems associated with rice growing fields in each of these agro ecological regions. Figure 1.1 displayed all 24 agro ecological regions in the island.

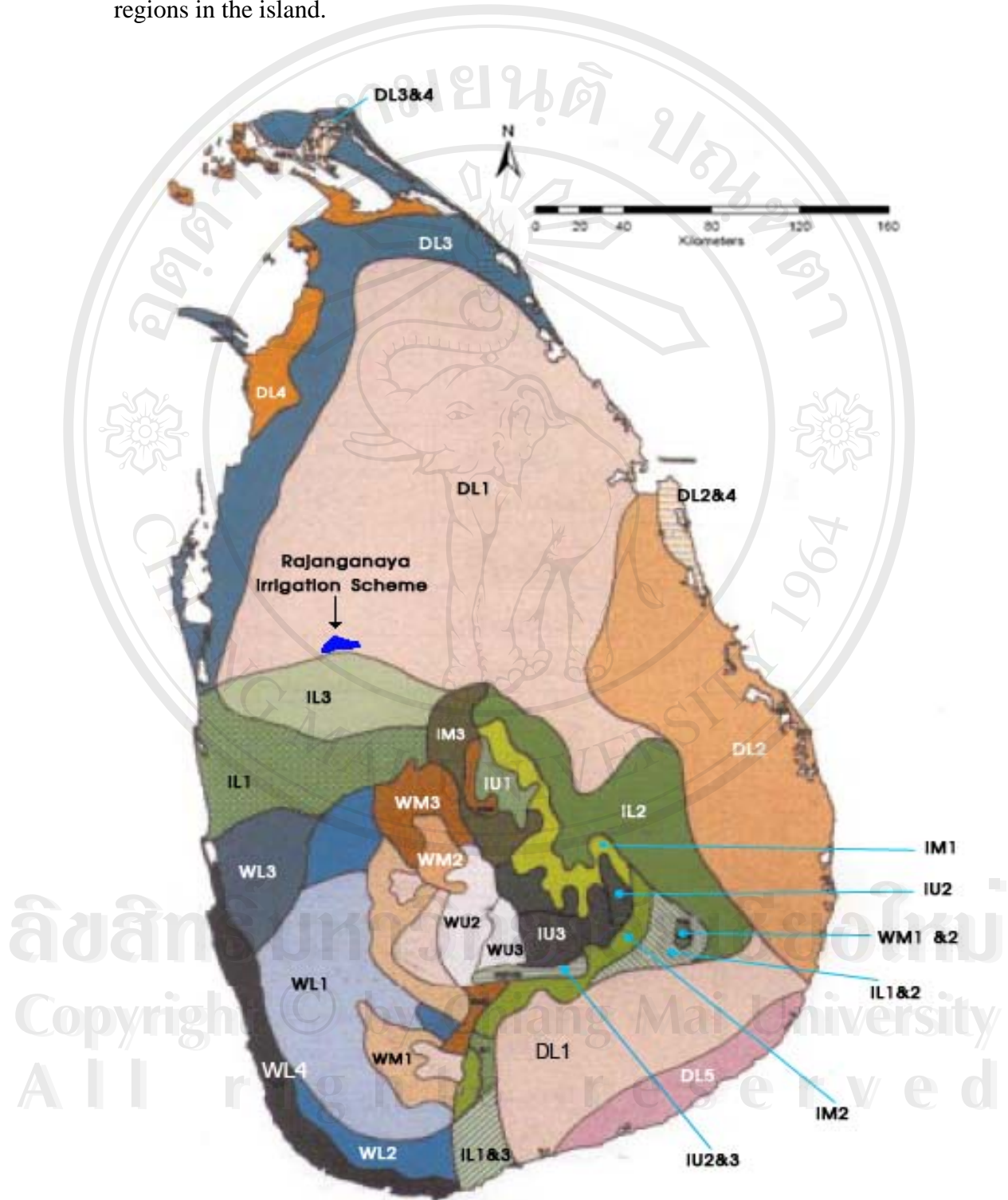


Figure 1.1: Agro ecological regions of Sri Lanka.
Source: DOA.

The country is under the influence of two monsoons namely south-west and north-east. Hence, in most parts of the country rainfall system follows a bi-modal pattern leading to a main cropping season called *maha* (October-January) and a minor cropping season called *yala* (March-July). Mean monthly rainfall figures (from year 1961 to 2001) of wet zone and dry zone are displayed in Figure 1.2.

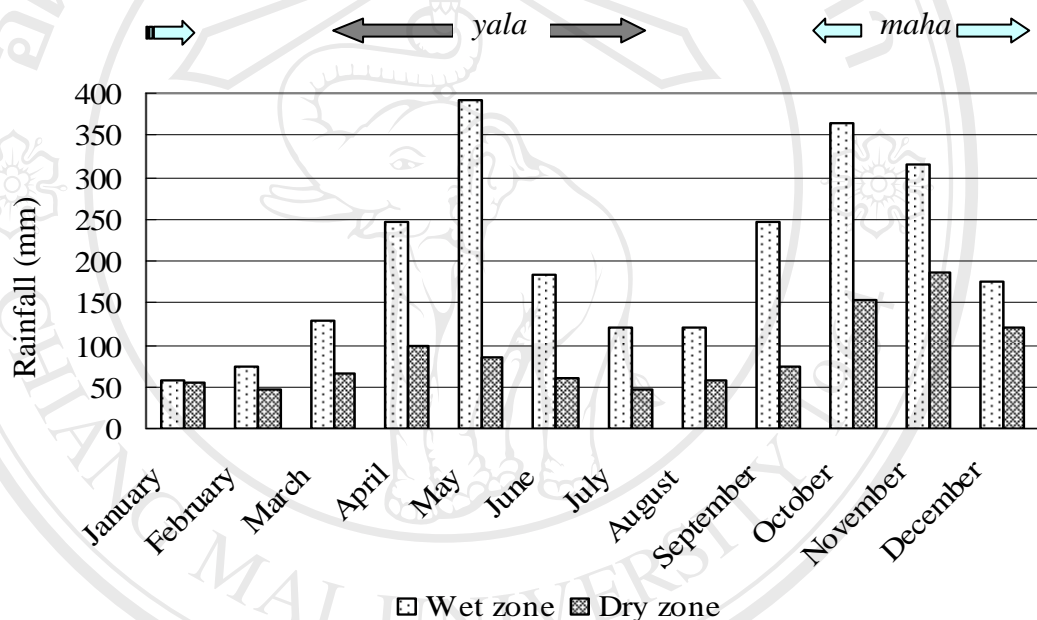


Figure 1.2: Rainfall pattern in Wet zone and Dry zone (Average 1961-2001).
Source: DCS (2003).

Total Population of the island is 19.3 million in mid 2001 and 72% of the population lives in rural area. 21.5% and 6.3% live in urban and estate sector respectively. During last few decades the share of the Agriculture sector in terms of both output and employment declined, while those of Industry and Services rose. In 2003, the Industry sector was responsible for over one fourth of the GDP and 22 per cent of total employment, while more than half of GDP and 43 per cent of employment were generated by the Services sector. Agriculture sector contributes about one fifth of the GDP (Figure 1.3).

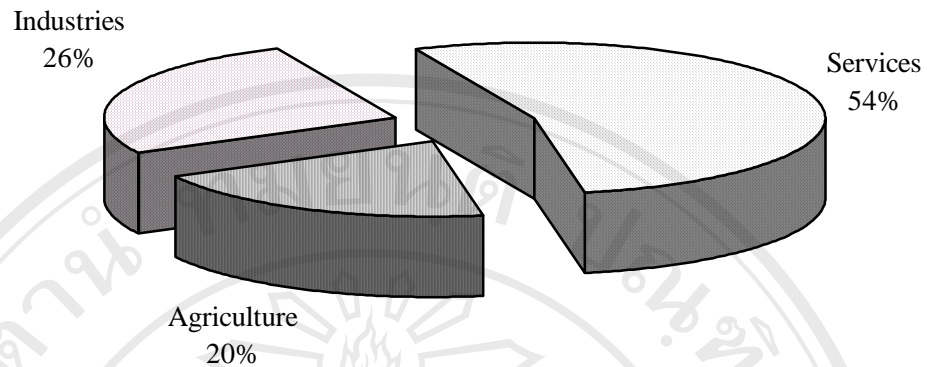


Figure 1.3: Sectoral composition of GDP.
Source: CBSL (2003).

Agriculture provides 35 per cent of total employment (Figure 1.4). However, this also shows that growth in agriculture sector has not achieved the dynamism of the other two sectors, and continues to lag behind due to inherent rigidities (CBSL, 2003).

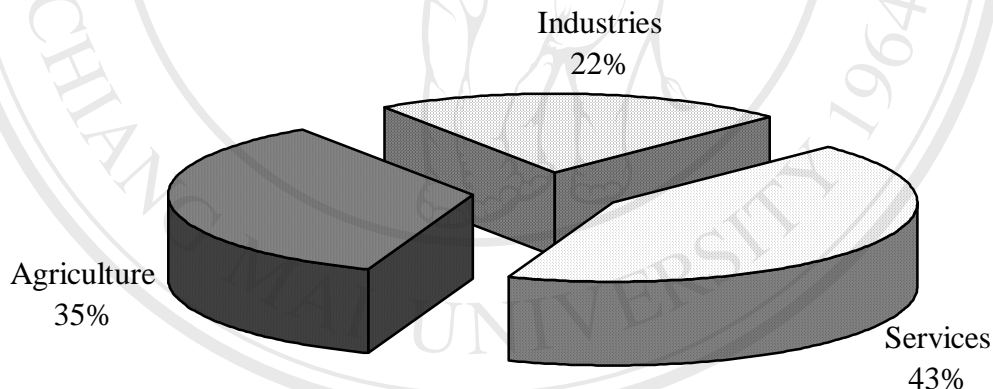


Figure 1.4: Sectoral composition of employment.
Source: CBSL (2003).

Rice dominates as the most important single crop in Sri Lanka and it contributes 20 per cent of the agriculture production as shown in Figure 1.5. The paddy production also provides a livelihood for a significant proportion of the population in the country who lived in rural areas.

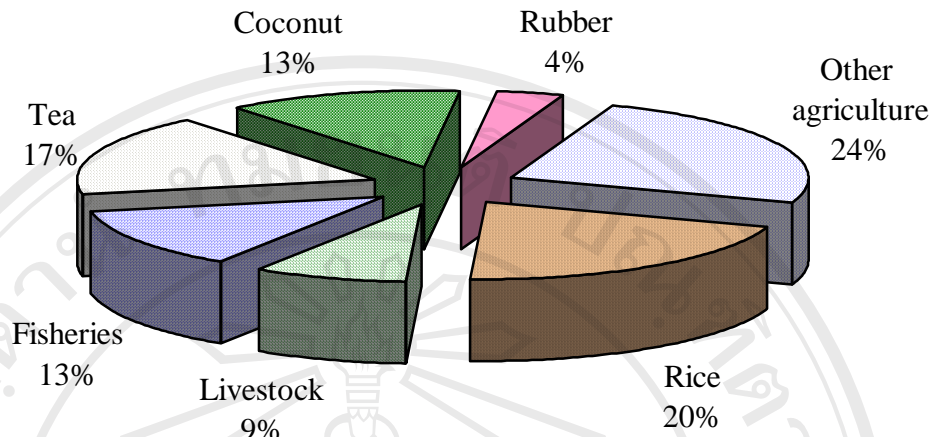


Figure 1.5: Value shares of major categories of agriculture.
Source: CBSL (2003).

1.2 Rice Statistics

Rice (*Oryza sativa* L) occupies 34 per cent of the total cultivated area in Sri Lanka. On average 560,000 ha are cultivated during *maha* and 352,000 ha during *yala* making the average annual extent sown with rice to about 911,000 ha. Cultivation during *yala* is mostly confined to the wet zone and major irrigated areas in the dry zone. About 75% of the cultivated area is irrigated during both seasons. In general, except in semi arid areas where rice cultivation is marginal, average rainfall in rice growing areas of Sri Lanka can meet at least part of the water requirement for a rice crop. Thus in strict terms there is no fully irrigated rice cultivation in Sri Lanka. Rice is a semi aquatic plant and does not need standing water for a successful rice crop. However, uncertainty of water supply, either through irrigation or rain, and to reduce weed infestation rice is always cultivated as a crop with standing water. Direct sown rice crop is less prone to drought than a transplanted crop. Highest water use is during the preparation of land, thus land preparation with minimum timing and maximum use of rain water at the correct time of the season is recommended by DOA.

Paddy production during the 2003 cultivation year reached an all time high level of 3.071 million metric tons surpassing the previous peak output in 2000 by seven per cent. Output in both seasons reached record high levels. Favorable climate as well as the cessation of hostilities in the Northern and the Eastern provinces contributed to the overall improvement. Extents sown and harvested during both seasons improved significantly. Even though the annual average yield of paddy declined for the second consecutive year after reaching a peak in 2001, the paddy yield in Sri Lanka is much higher than in many other countries in the region, though it is still below the potential yield.

About 1.8 million farm families are engaged in paddy cultivation island-wide. Sri Lanka currently produces 3.067 million metric ton of rough rice annually and rate of self-sufficiency is around 98.18 percent (DCS, 2004). Rice is the staple food of the country and it provides 45% total calorie and 40% total protein requirement of an average Sri Lankan. The per capita consumption of rice fluctuates around 100 kg per year depending on the price of rice, bread and wheat flour.

It is projected that the demand for rice will increase at 1.1% per year and to meet this demand rice production should increase at the rate of 2.9% per year. Increasing the cropping intensity and national average yield are the options available to achieve this production targets.

The current cost of production of paddy is Rs. 8.57 per kg. The cost of labor, farm power and tradable inputs constitutes 55%, 22% and 23% respectively. The labor cost has risen at a higher rate than other costs over the last few years (DOA, 2004).

While the global demand for rice will increase at 1.95% the production will increase at 1.62% per annum making the tradable rice volume to be doubled in 20 years time. As a result the rice price would decline at 0.73% per year. On the other hand the domestic price of rice on par with Thai A1 super (the cheapest in the world market) would be higher by 50 -70 \$US per metric ton than the internationally traded

rice. This situation will place Sri Lanka under increase pressure to produce cheaper and high quality rice in the coming years.

1.3 Agriculture Extension Network

During the recent past the Extension and Training Center of Department of Agriculture (DOA) has undergone series of structural and functional changes. Most of these changes were done with the aim of improving technology dissemination strategies and some structural changes were done under the influence of political power decentralization process. Center is directly responsible for the agricultural extension in the Inter-provincial areas. Extension activities of the division are mainly confined to the Inter-provincial irrigation schemes identified under the 13th amendment to the constitution and are located in Ampara, Polonnaruwa, Anuradhapura, Hambantota, Moneragala and Kandy (Minipe) districts. These areas are mainly under rice during both *maha* and *yala* seasons and covers nearly 30% of the paddy extent in Sri Lanka. Agriculture extension activities in rest of the area are under the provincial agriculture departments. Activities under taken by the extension and training centre regarding rice production are presented in Appendix 1.

Training of farmers, entrepreneurs and extension staff are another vital functions carried out by the center. The center provides mass media support for extension and training activities, which includes radio and television, programs, news paper articles etc. List of agriculture radio and television programs conducted by the center are displayed in Appendices 2 and 3, respectively. Extension services provide recommendations for field problems and communicate with research on problems that need further investigation.

Rice sector had been facing unprecedented challenges such as stagnation of yield and productions, diminishing income due to escalation of cost of production, abandoning rice lands, since early 1980s, etc. Annual production of paddy from year 1992 to 2002 is displayed in Figure 1.6. These issues were mainly due to low productivity. The rice task force appointed by the government in 1994 identified that increasing productivity in rice farming sector as the remedial measure. Meanwhile

agriculture department identified rice *yaya* (tract) demonstration as an appropriate tool to increase the productivity of the small farmer rice-farming sector.

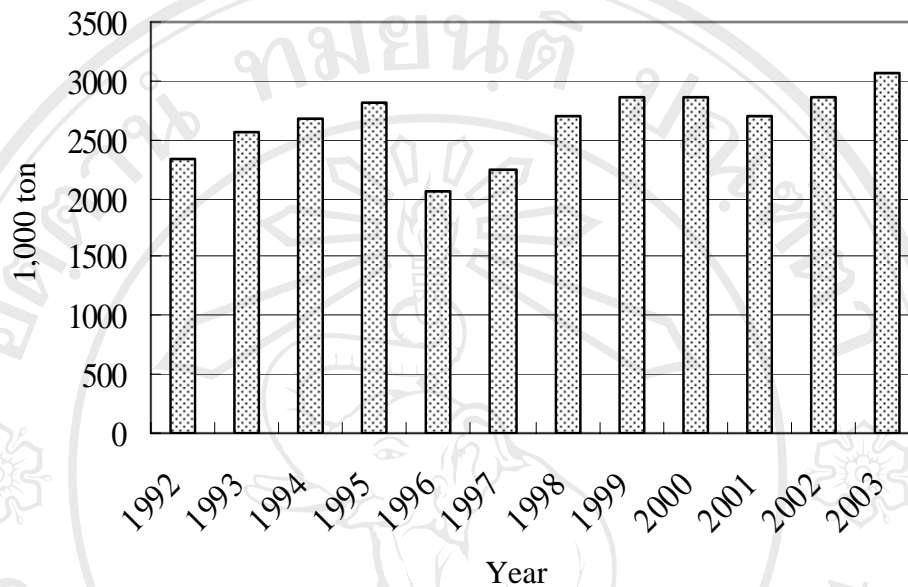


Figure 1.6: Annual paddy production in Sri Lanka.
Source: DCS (2003).

This is a farmer participatory, group holistic extension approach to increase the productivity of the small farmers, coupled with credit and input supply. The salient feature of this approach is that the cultivation of contiguous paddy land of about 20 ha block by 20-30 farmers in a favorable growing environment. Then they are formed into a group and motivated to use of integrated crop management practices giving more emphasis for soil fertility improvement with optional credit facilities. This approach is based on few major assumptions, which have contributed to the success of the *yaya* production program.

- Available technologies can increase the rice yields.
- Productivity improvement will result in lowering of cost per unit of produce.
- Productivity improvement of small farmer paddy cultivation is technically and socially feasible with the group approach.

Under this program more or less 20 ha contiguous blocks of land are selected which are cultivated by groups of about 20-30 farmers motivated to apply integrated crop management practices giving emphasis to soil fertility improvement with optional credit facilities. Program is implemented in Provincial Council and Inter-Provincial areas covering about 15% of the total national rice extent. Major activities implemented under the *yaya* program in 2002 are presented in Appendix 4.

Due to the small land holdings, lower educational level of farmers and large number of farmers, developing countries spend more money on agriculture extension than on research. Sri Lanka is not an exception and in 1989 it has spent 0.875% of Agriculture Gross Domestic Product on extension while only 0.54% on research (Wirasinghe, 1989).

The DOA has a well-expanded research network for generation and rapid identification of appropriate technologies. During the last five decades from 1950-1990, DOA has generated sufficient technologies with more emphasis on rice production practices. However adoption of these technologies in respective areas is not encouraging as expected (Weeratunge, 1998).

National Agricultural policy published by the Ministry of Agriculture and Livestock for the period of 2003-2010 states that the organizational structure of the agricultural and livestock extension service has become weak. But DOA and the Provincial Agricultural Systems implement a large number of agricultural extension programs through out the island. DOA offers a number of agricultural training programs covering all the food crops. But knowledge, skills and attitudes of farmers are yet to be improved to reap the benefits of new technologies available at research level.

Though the Department of Agriculture (DOA) has tried several approaches for diffusing new farming knowledge and its information to targeted beneficiaries, still these approaches have not been succeeded to uplift the farmer's knowledge up to the required level, so as farmers can harvest the benefit of improved technology available. Extension practitioners should design extension and training programs so as to

encourage farmers to make successful changes to their farm practices and ultimately farm profitability would be improved.

Therefore, the key research questions are:

- What factors influence the farmer's decision-making behaviour regarding recommended rice production practices?
- To what degree these factors are associated with the level of adoption?
- What are the stronger and weaker areas of adoption process?

The comprehensive understanding of farmers' decision-making processes in adoption of rice farm practices is a must in designing and implementing technology dissemination programs.

This study is based on the household level analysis of factors influencing the adoption of rice production practices in Rajanganaya area, Anuradhapura district with the following objectives.

1.4 Objectives

1. Assess the socioeconomic and institutional factors influencing rice production practices in Low Country Dry Zone (LCDZ) of Sri Lanka.

Identify the reasons for adoption and non-adoption of rice production practices by farmers.