

## PESTICIDES USAGE AND SOCIOECONOMIC CHARACTERISTICS OF PADDY FARMERS WITH SPECIAL REFERENCE TO SAMMANTHURAI DIVISIONAL SECRETARIAT AREA IN AMPARA DISTRICT

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**ABSTRACT:** In recent times, use of pesticides in rice farming has increased rapidly and this scenario contributes significantly towards adverse effects on human health and environment. In this context, this study aims to assess the farmers' knowledge level on pest management practices and socio-economic factors influencing the existing pest management practices. Therefore, a well-designed questionnaire was developed to collect the data regarding the socioeconomic characteristics of farmers, pesticide usage in paddy production and knowledge level of pest management. Primary data were collected from farmers in Sammanthurai Divisional Secretariat area in Ampara District by means of a questionnaire survey among randomly selected 80 households during the period of February to April, 2017. Farming experience and social participation were positive and significantly contributed to farmers' knowledge on safe pesticide use. Education, income, age and family size of farmers had showed no relationship with the knowledge level of pest management. Increased social participation and, effective extension programmes are important to improve farmers' knowledge on proper use of pesticides and its effect on their health and environment.

**Keywords:** Paddy production, Pesticides use, Pest management, Sammanthurai Divisional Secretariat

### 1. INTRODUCTION

Pesticide use continued to remain the most popular method of pest control by farmers even though pesticide showed harmful effects on human health, environment and crop ecosystem (Administrative Report, 2005). The pesticide related issues have increasingly and extensively been highlighted in the media and have attracted sharp focus among industrialized and developing countries. According to the Food and Agriculture Organization (FAO, 2005), developing countries accounted for more than 99% of poisonings, although they accounted for 20% of worldwide pesticide use. To reduce crop losses due to pest attack, farmers in parts of Asia are spraying as much as 800 times the original recommended dosage of pesticides (Farah, 1994). Use of pesticides in Sri Lankan agriculture began in early 1950s, and since then the amounts used have shown a steady increase by almost 110 times between 1970 and 1995 (Wilson, 1998). There are 118 kinds of pesticides presently available in the market for use in crop production. Compared to a neighboring country like India, Sri Lankan farmers use stronger concentration of pesticide with increased frequency of applications, and also mix some pesticides together to combat pesticide resistance (Chandrasekera, et al., 1985). Hospital statistics in Sri Lanka show that on an average 14,500 individuals were admitted to government hospitals and around 1500 individuals annually died from pesticide poisoning during the period 1986 -1996 (National Poison Centre, 1997).

Ampara district is located in the coastal dry zone in Sri Lanka and it is 4415.0 Sq. kilometers in extent. The main source of revenue of the people in the district is farming, especially paddy cultivation. The total cultivable area under paddy is 55,000 hectares and the average production



is 250,000 metric tons in a season (Planning Secretariat, Ampara, 2010). Sammanthurai is a leading area in paddy farming in the Ampara district and the farmers in this area obtain 120 bushels average. Ampara district paddy farmers are known to be very capable and experienced and they work hard and have become skilled cultivators despite to the fact that whether they are small or large landholders (subaitha and athauda, 2010). With the background discussed above, present study was conducted to assess the farmers' knowledge level on pest management practices and socioeconomic factors influencing the existing pest management practices and farmers' awareness about the ill-effects of pesticides use on the farmers' health and the environment.

## 2. METHODOLOGY

### 2.1 Description of Study Area

The study was carried out in Sammanthurai Divisional Secretariat area. Sammanthurai is a town in Ampara District of Eastern Province of Sri Lanka. Sammanthurai situated at 7°22'0"N 81°48'0"E, is 4.8 km west of the Bay of Bengal coast (Figure 1). Being close to the equator, Sammanthurai enjoys a tropical wet and dry climate. Dry period prevails in the months of May, June, July and August. Days in June are the hottest period, with temperatures regularly reaching more than 30°C. Monsoons occur in November, December and January. Sammanthurai receives most of its rainfall from the Northeast Monsoon. (Department of Meteorology, 2016).

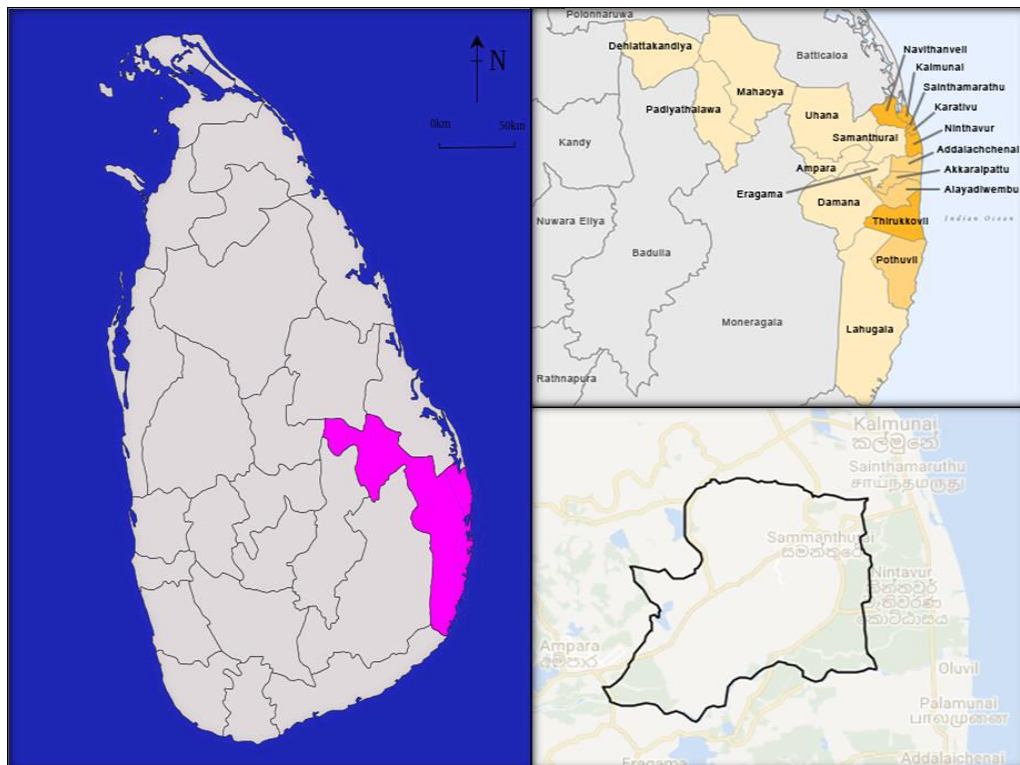


Figure 1: Sammanthurai Divisional Secretariat area

## 2.2 Data collection and data analysis

Keeping in view the objective of the study, a well-designed questionnaire was developed to collect the data regarding socio-economic variables like farmers' age, education, family size, occupation, and experience in farming, income level, extension contacts and social participation were collected as independent variables., farmers' knowledge on pesticides use practices and their awareness about the ill effects of pesticides on their health and environment were computed as dependent variable. Primary data were collected from farmers in Sammanthurai Divisional Secretariat area in Ampara District by means of a questionnaire survey among randomly selected 80 households during the period of February to April, 2017. Secondary data were collected from Sammanthurai Divisional Secretariat and Agrarian service center. Finally, data were spreaded in MS Excel and SPSS (Version 22) for the analysis to assess the farmers' knowledge level on pest management practices and socio-economic factors influencing the existing pest management practices.

## 3. RESULTS AND DISCUSSION

### 3.1 Socioeconomic characteristics of farmers

#### a. Gender

Distribution of farmers by gender shows that 99.0% were males while the remaining 1% were females. Mostly women this area are responsible for most of the households and child rearing activities as well as rearing of small live-stocks. Women are generally less able than men to participate in economic opportunities because they face a work burden that men. Therefore contribution percentage of men in farming activities is higher than females in Sammanthurai.

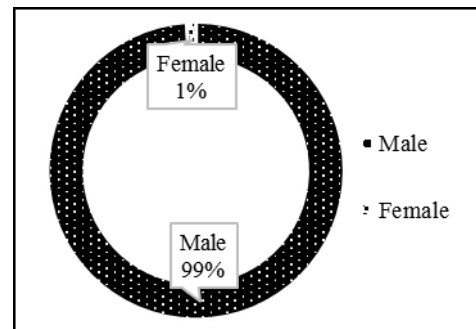


Figure 2: Gender Distribution

#### b. Household members

Distribution of farmers according to household size shows that majority (48%) of the farmers interviewed have between 3 and 6 people in their houses. This has implication on paddy production because most of the farmers used both family and hired labour in their farm operations. The former form of labour would therefore be benefited from the farming household as a cheaper alternative.

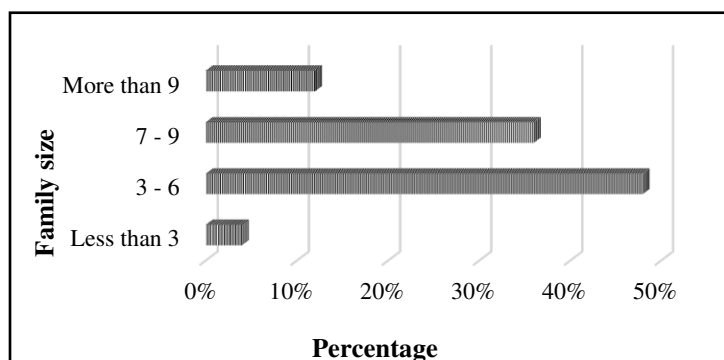


Figure 3: Household members

**c. Age**

Figure 4 shows the age distribution of farmers in Sammanthurai area. With regard to age distribution, approximately 40% were between 41 -50, 24 – 20 % were between 30 -40 and 20% were between 61-70 years of age. This is an interesting result since farmers within 40-50 years of age are the very active labour force and can be easily undergo adoption of improved farming methods and/or technology to enhance the rice yield. This makes the prospects of an improved rice production very positively.

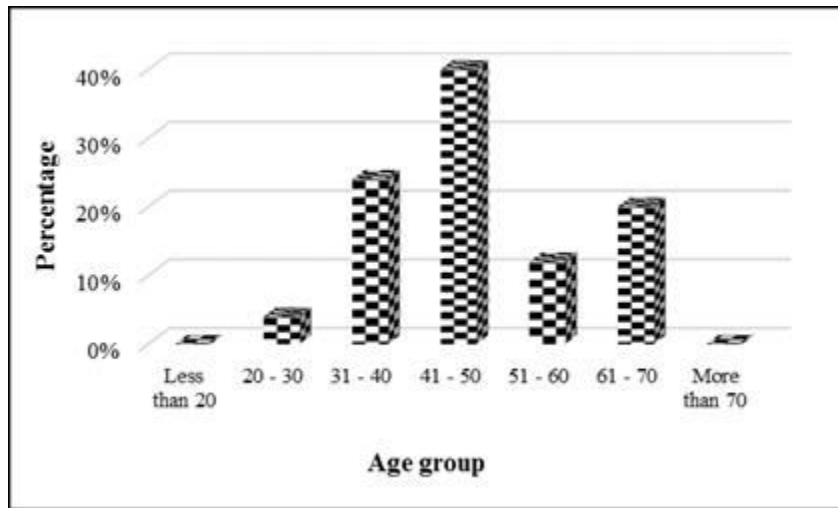


Figure 4: Age Distribution

**d. Experience**

Distribution of farmers according to years of experience in paddy production shows that 28% of the farmers interviewed had 11 to 15 years of experience and 28% of the farmers interviewed had 16 to 15 years of experience and 20% of farmers had more than 30 years and of experience. This indicates that farmers would have adequate technical knowhow which may positively influence pesticide use in crop production. Therefore Farm workers with few years of experience might be at higher risk when using pesticides, possibly due to difficulties in understanding the use instructions and safety procedures included on the product labels. A high level of knowledge was recorded among the participants who had a many years of experience leads to higher education level regarding the pesticide usage.

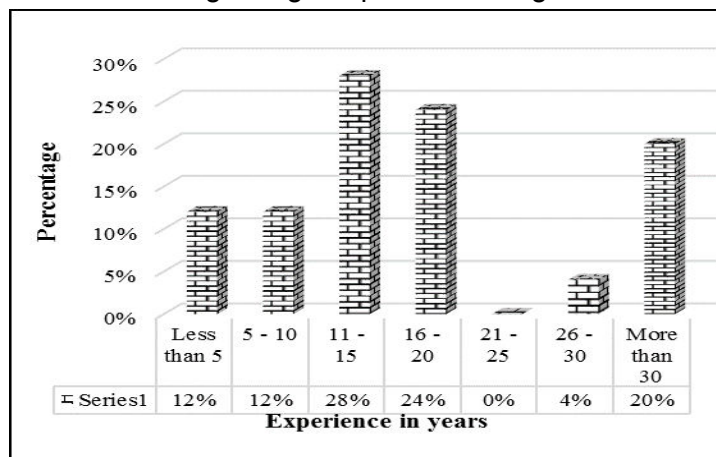


Figure 5: Farmers' Experiences

**e. Educational**

**level**

Education status of the farmers indicates that larger percentage of the farmers (48%) has primary education, 20.0% attended secondary school, and 32% have no formal education. Of the 80 farmers interviewed, only 68 % were able to read and write and were likely to understand instructions on pesticide containers' labels, whereas 32 % had received no formal education (Figure 6). Therefore only 68 % of the farmers claimed that they always read labels on pesticide containers while the remainder said that they never read labels before and after buying pesticides. This is likely to have effect on their management of resources and adoption of innovation in paddy production. The educational background of the farm workers in the study area was moderate. Similar results were also reported in other developing countries (Recena et al., 2006). Farm workers with little formal education might be at higher risk when using pesticides, possibly due to difficulties in understanding the use instructions and safety procedures included on the product labels. Farm workers with good pesticide knowledge were more inclined to use pesticides according to the recommended guidelines for protective measures, a finding that was inconsistent with other studies. In Lebanon, assessments of pesticide use in farm workers were done by Salameh *et al.* (2004), who reported high levels of knowledge of pesticide use, but the use of protective measures was poor.

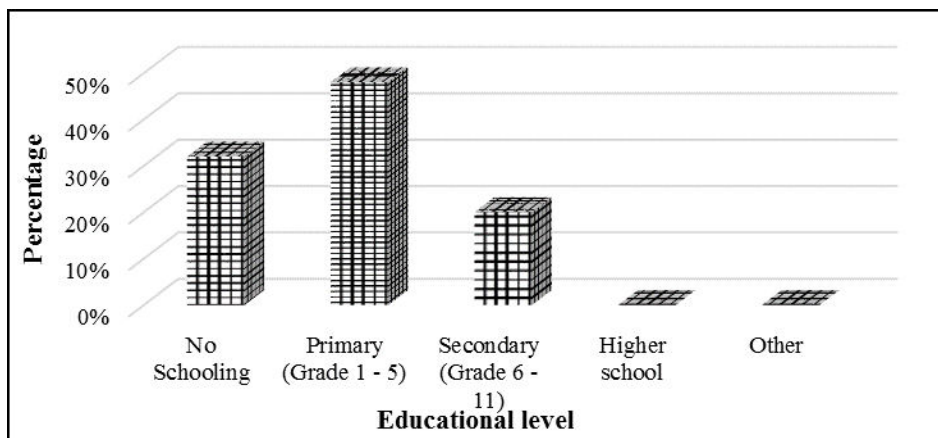


Figure 6: Educational level

**f. Land size**

Also, distribution of farmers according to farm size shows that majority of the farmers interviewed have farm size that was less than 2ac while 4.0% of farmers cultivated in low land between 7 and 8ac in *Yala* and 20% in *Maha* season.

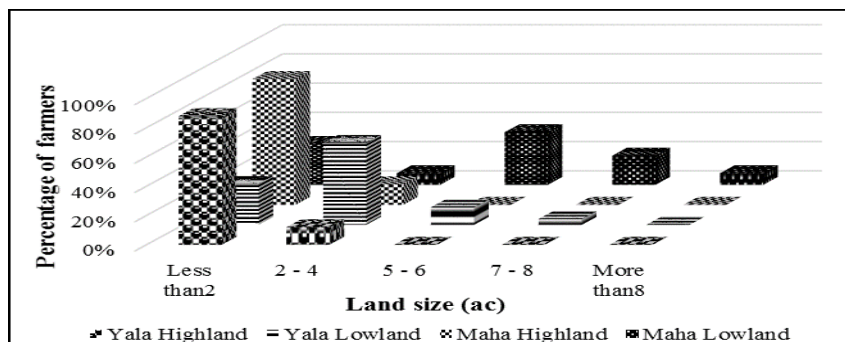


Figure 7: Land size

### 3.2 Pesticide usage in paddy production

#### a. Trend of purchasing pesticides

Most of the farmers (76%) are regularly change the pesticide for paddy production in each and every season and only 12% of farmers always using the same pesticides in every season (Figure 8).

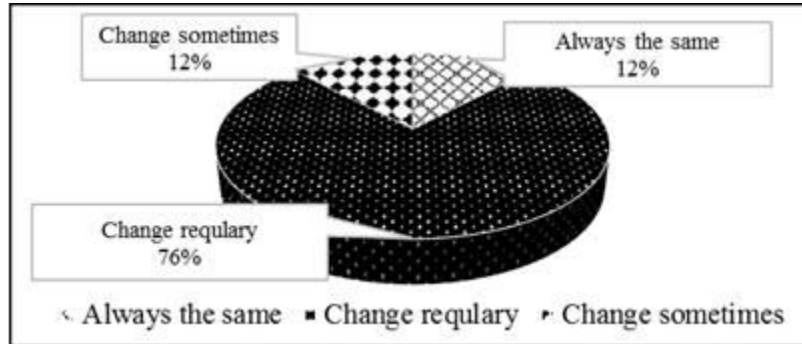


Figure 8: Trend of purchasing pesticides

#### b. Risk level while using pesticide

Figure 9 shows that risk level of using pesticide in Sammanthurai Divisional Secretariat area. Most of the farmers (around 30%) said that using pesticide is no risk or small level of risk. Only few amount of farmers said that using pesticides is dangerous and very toxic. In general, the frequencies of pesticides application by farmers were higher in the study area. Such heavy use of pesticides may result in frequent contact with pesticides, which can lead to significant health problems. Excessive application of pesticides may lead to high levels of concentration on the plants, which may be dangerous to the farmers themselves and to consumers of the final product.

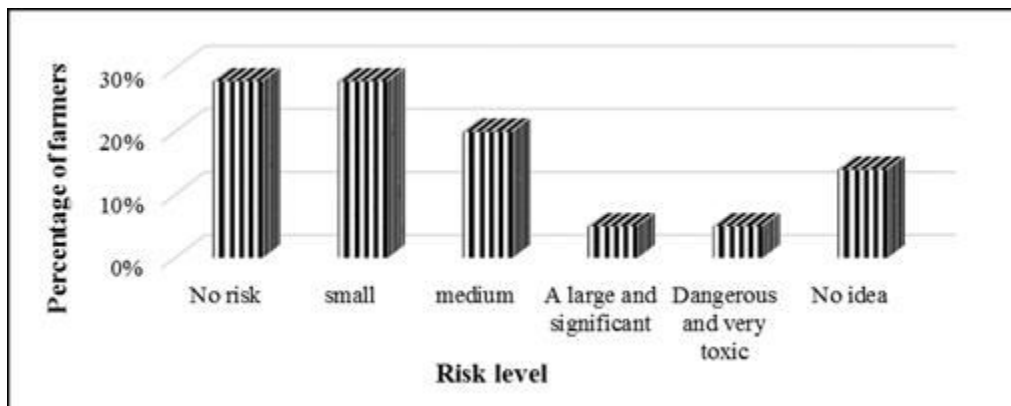


Figure 9: Risk level while using pesticide

#### c. Pest control techniques

Nearly 90% of the farmers had poor level of knowledge of plant protection practices. Sri Lankan farmers have a tendency to ignore technical recommendations and base usage on their own experience often leading to indiscriminate application (Wilson and Tiddsell, 2001).

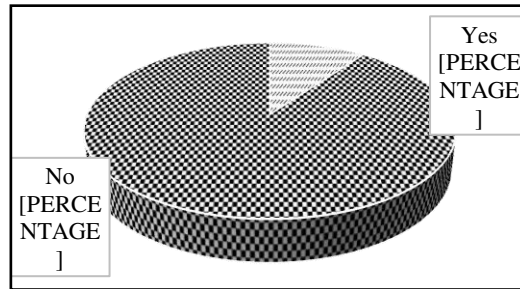


Figure 10: Pest control techniques

#### d. Safety measures while applying pesticides

From the survey it was found that the farmers of the survey area of 54 % have not been adopting precautionary measures using fully body covers such as mask, gloves and caps when using all chemicals while 46 % of farmers interviewed were using protective measures. These statistics show that most of the farmers were not having knowledge about precautionary measures while handling and spraying pesticides. The reasons for not using protective devices among the present sample could be due to low level of knowledge about the safety measures, unavailability of protective devices at governmental agricultural association and their high cost at private sectors. In addition, hot weather was among the causes of low use of protective devices as reported.

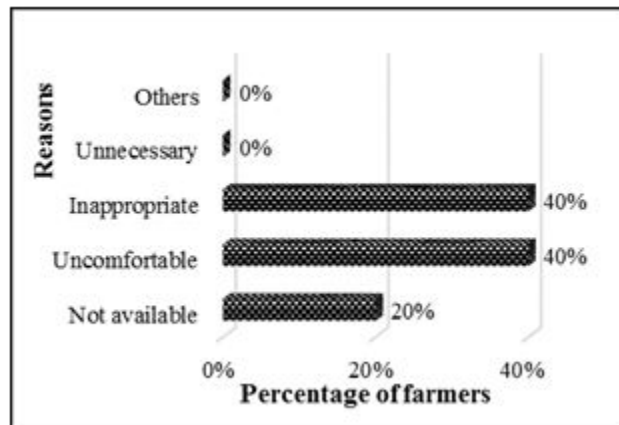
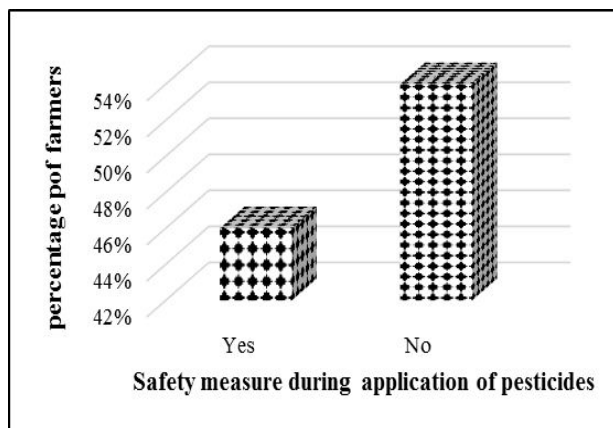


Figure 11: Safety measures while applying pesticides

Figure 12: Reasons for adaptation of safety measures



## CONCLUSION

From this study, it can be seen that the list of pesticides used in paddy farming in the Sammanthurai Divisional Secretariat area is in need of review in terms of potential risks, hazards and safety measures. Lack of knowledge on the ill effects of agrochemicals made them to over use chemicals and affects their health, sustainability of agriculture and the environment. Increased social participation

and, effective extension programmes are important to improve farmers' knowledge on proper use of pesticides and its effect on their health and environment. Agricultural extension need to be employed to follow a systematic, well planned and coordinated approach in the area for improving the knowledge status of vegetable growers towards pest management. In this regard there is a need for biological and social scientists to collaborate more closely to help farmers make better decisions regarding pesticide use. In order to tackle these problems, monitoring programme and safety training are essential to ensure the permissible exposure limits of the pesticide are complied. Besides, farmers' awareness of the specific risks of pesticides and the necessity of using personal protection equipment and proper clothing should be emphasized. In this case, personal protection equipment should be used and maintained according to instructions on the container label. Besides, this study could provide fundamental data for further studies on knowledge, attitude and practices as well as a detailed risk assessment of pesticides amongst rice farmers and on the environment in Sammanthurai Divisional Secretariat area paddy farms.

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