WILL THE DRY ZONE FARMERS COPE WITH CLIMATE CHANGE IMPACTS? A CASE STUDY IN HAMBANTOTA DISTRICT

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INTRODUCTION

Climate change is considered one of the most challenging current global issues. Climate is the totality of above-ground environmental factors, which includes rainfall, air temperature, solar radiation, relative humidity, atmospheric composition, air circulation, and their long-term variation. Agriculture, especially crop production, is highly sensitive to both short and long-term changes in climate. Smallholder farmers are particularly vulnerable to changes in the climate that reduce productivity and affect their weather-dependent livelihood systems negatively.

Agriculture, especially crop production, is highly sensitive to both short and long-term changes. Agricultural production remains the main source of livelihoods for the most rural communities in Sri Lanka as it provides employment for 31 % of the population and contributed 11.1 % to the Gross Domestic Production in the year 2012 (CBSL, 2012). Climate change will have greater negative impact on poor farm households as they have a low adaptive capacity to climatic change. In spite of the technological advances made in improved crop management, irrigation, plant protection and fertilization, weather and climate remain the key factors of agricultural productivity in any country. Whether farmers could use the advanced technology to adapt to the climate change is a crucial question question. This paper aims to examine the farmers' perception about climate change and how they could adapt to these impacts.

METHODOLOGY

This study was based on a primary questionnaire survey conducted in three villages of Hambantota district: Weerawila, Pannegamuwa and Weeraketiya with a total sample size of 90 farmers. The main variables measured included demographic variables of the respondents such as age, education, and income, and the information related to climate change, knowledge on climate change adaptation and attitudes on causes of climate change, the effects on cultivation, and the level of adaptation of appropriate technology. Primary data were collected through interview schedules by conducting a social survey. The study areas were mainly dependent on agro wells or the nearby village tank for water. Thus irrigation water was not the main source.

RESULTS AND DISCUSSION

Age Distribution

The age group of the sample population was mainly 31-50 years (55%). The 18-31 year old group represented 27% of the sample population and the above the 51 years old group was only 18% (Figure 1). It showed that the younger generation is also actively involved in agricultural activities as their main livelihood. Therefore it is possible to convince them on new adaptation measures for climate change and to improve their living standards through proper guidance. More than 96% of the respondents have been living in the corresponding areas for 35 or more years. The majority (90%) of the respondents had farming experience of 30 years or more in selected areas.

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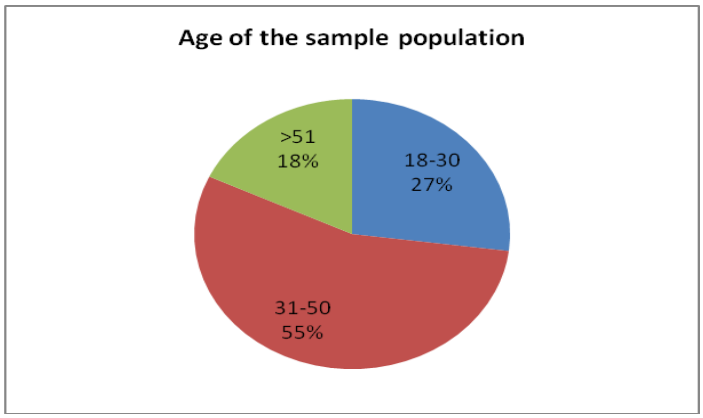

Figure 1. Age groups of the sample population

Demographic Characteristics of the Respondents

All the respondents were involved with vegetables and banana cultivation, and while 83.3% among them were heads of the households and 16.6% were spouses of households. There were 40% needs households involved in fulltime paddy cultivation. An examination of the perception of the paddy farmers and adjustment of their farm management practices in the dry zone of Sri Lanka has revealed that during the last few decades, the pattern of rainfall has significantly changed and the farmers have observed the changes in the climate affecting their livelihood. The increase in average temperature combined with decreased rainfall has forced them to change their traditional paddy cultivation by shifting to vegetable and banana cultivation and self employment.

Information sources

Agricultural information interacts with and influences agricultural sector in a variety of ways. It can help inform decisions regarding land, labour, livestock, capital and management. Agricultural productivity can arguably be improved by relevant, reliable and useful information and knowledge. Hence, the creation of agricultural information (by extension services, research, education programmes and others) is now often managed by agricultural organizations that create information systems to disseminate information to farmers so that farmers can make better decisions in order to take advantage of manage continuous changes in their production systems. But, farmers at Hambantota were not able to receive proper information. They usually use their practical knowledge with the help of friends and shop mudalalis who sell pesticides. They are unable to get good information through proper sources. Therefore, there is a need to understand the functions and use of particular agricultural information systems in order to manage and improve them. Those farmers have no knowledge of what climate change is and the status of water availability.

Knowledge on climate change

None of the farmers know about climate change or had any idea about what will happen due to climate change. They feel the increase in temperature but do not have any knowledge of global warming. No awareness programmes have been conducted by the government or NGOs. The whole sample population eagerly wants to gain knowledge on climate change and how to adapt to that situation.

Availability of water sources

The main water source for agricultural activities of 80% of the sample population is from a wewa or ela nearby whereas only 20 % depend on their agro well/pathaha or domestic well

(Figure 2). Almost 100% of the sample population experience crop damage due to adverse climatic condition. Nearly 80% of the sample population indicated that water is the main constraint for agricultural activities and 20% indicated that they do not have the technology to use the available water efficiently.

Figure 2. **(a)** Agro well **(b)** Wewa **(c)** Pathaha

Water storage is a major problem for agricultural activity in the dry zones of Sri Lanka. Agro wells are being introduced for supplementary irrigation. But the present agro well system does not follow the proper guidance on hydrological properties of the aquifer. The farmers pump water in to their farming lands through the agro wells. Most of them pump water for 3 or 4 hours continuously per day. Therefore, the lack of water in agro wells limits the extent of cultivation. The management of on-field water application systems constitutes a complex problem which farmers are faced with daily. It is often an important bottleneck for efficient implementation and large scale development of advanced irrigation scheduling practices. The irrigation technique of the farmers in Hambantota is very much traditional and it wastes the limited available water resources. Farmers do not have the technical and financial capacity to use sprinkler and drip irrigation methods to save water.

Major drawbacks

To obtain sustainable water savings, it will be mandatory to require a minimum degree of technical quality for systems and to transfer to users a true mastery in managing water in on-farm irrigation systems, so enabling the water losses resulting from heterogeneities in the distribution of water to be controlled. Present irrigation methods used by the farmers in the area of study are shown in Figure 3. This study revealed that the performance of irrigation practices and equipment, especially in the uniformity of water application, is still too low. This is due to farmers lacking the management skills to manage their irrigation systems properly. Consequences include reductions in crop yields and a waste of water resources. In the area of this study only 2% used sprinkler and drip irrigation systems. About 97% used the hose pipe flooding method as shown in Figure 3. All these systems were not suitable in the present condition. Sprinkler irrigation is often considered as being very effective compared to surface irrigation because it enables better control of water application. However, this control is dependent on a good level of quality in the irrigation system design and in the selection of equipment, and also requires that the farmers develop appropriate skills for managing their irrigation system (knowledge and control of the pressures and flows that enable the system to distribute water uniformly over the field).

Figure 3. Using hose pipe to flood the basin.

The major barriers to adaptation are lack of knowledge of adaptation methods (81%), lack of funding (62 %) and absence of prior information on climate change (51 %). Limited availability and supply of location specific technologies and know- how to cope with climate shocks and long term changes are also reasons. Lack of awareness of the complexities of climate change, the causal factors and implications of global warming is the major cause for adaptation to climate change. Agricultural extension service is diluted and one agricultural instructor covers a minimum of 1500 farm families (Dishani and De Silva, 2015). Limited agency support to strengthen adaptive capacity through consistent professional service delivery such as information, credit, relief, insurance, training and technology transfer is the major draw back. Limited local collective efforts, weak local organizations, networking and their engagement with agencies having state responsibility to assist communities cope with effects of climate change are the major reasons for the farmers to cope with climate change impacts.

CONCLUSIONS AND RECOMMENDATIONS

The study revealed that the farmers are incapable of facing the climate change impacts mainly on agricultural activates for livelihood. Lack of awareness, lack of information sharing and the financial status of the farmers are major barriers inhibiting these adaptation measures as they are the socioeconomic determinants of adaptations to climate change in Hambantota district. Specifically, policies should ensure that farmers have access to affordable credit, which would give them greater flexibility to modify their production strategies in response to climate change. Because access to water for irrigation increases farmers' resilience to climate variability, greater investments in smart irrigation are needed. Reforming the pricing policies, clearly defining property rights, and strengthening farm-level managerial capacity should also be emphasized to promote efficient water use. More importantly, given that land reform has increased the number of less experienced and unskilled farmers, extension services need to be expanded with highly qualified personnel.

REFERENCES

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