

IMPACTS OF AGRICULTURAL CHANGES ON SUSTAINABLE AGRICULTURE: A CASE STUDY ON MADAWALALANDA VILLAGE IN AMPARA DISTRICT

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Introduction

Gal-Oya, Minneriya and Mahaweli projects are outstanding development projects in Sri Lanka. Ampara district is one of the major agricultural areas, developed under Gal-Oya development project that has achieved a significant success story in Sri Lankan agricultural development history. But in past decades, agriculture in this area has changed dramatically due to the new technology, mechanization, increase of chemical substances, specialization and government policies. On one hand these modern practices of this intensive agriculture in this area have contributed much to the deterioration of environment. On the other hand there is a decreasing trend of productivity of agricultural land in this area. Madawallala in Ampara district, located in the eastern part of the Sri Lanka is one of the agriculturally important areas that represent the many of existing agricultural pattern in Ampara district.

The main objective of this research was to explore the possible changes of agricultural setting towards sustainable development by examine the impacts of agricultural changes on the health of environment. The secondary objectives of this research were to study the factors related to sustainable agriculture in Madawalalanda village and to find out spatial dimensions of environment problems related to agricultural setting of area using GIS. It also evaluated the economic background of farmers and their sustainability.

Methodology

Initially, the agricultural pattern and physical characteristics of study area was presented using GIS on maps. Subsequently, an attempt was made that is found out the spatial variation of environmental issues and productivity of agricultural lands in Madawalalanda village. Finally, the study explored the possible changes of agriculture towards sustainable development in Madawalalanda village.

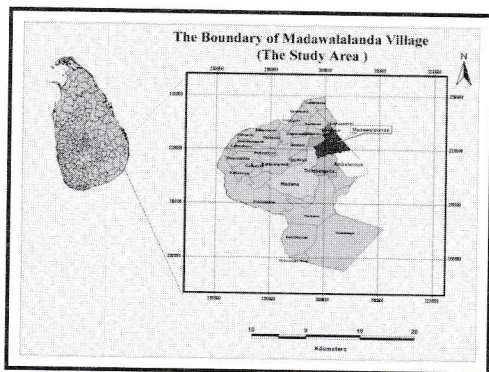


Figure 01: Location of study area

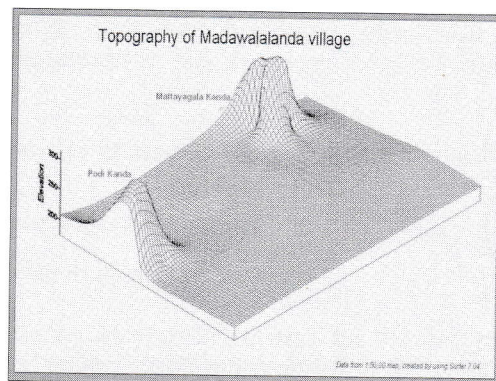


Figure 02: Elevation of area

The research vastly uses participatory observation methods to select the agricultural lands in Madawalalanda village in order to achieve final objectives in the study. Interview method is specially used to collect information for the study. Semi structured questionnaires were employed for the interview to make easy this endeavor of study. The questionnaires were mainly used to collect some important socioeconomic data and farmers' ideas for the sustainable agricultural development of Madawalalanda village. Questionnaires were given to 50 farmers those who have land ownerships of the selected agricultural land in Madawalalanda village.

The data that were collected from above methods were analyzed using following two methods. The profitability of agricultural lands was calculated per one Acre. The very common economic formula was employed for this calculation. It is

$$TR - TC = \theta$$

TR= Total Revenue (Data from farmers) TC= Total Cost (Data from farmers)
 θ = Profit

Profitability of one Acre in agricultural land = θ / Total Acres

Then, the whole profitability of lands was classified in different classification, under the following main category.

01. High profitable agricultural lands (HPAL).
02. Middle profitable agricultural lands (MPAL).
03. Low profitable agricultural lands (LPAL).

The environmental problems in the study area were evaluated qualitatively, using field-based observation methods. Then, they were classified as

01. High environmental polluted agricultural land (HEPAL).
02. Middle environmental polluted agricultural land (MEPAL).
03. Low environmental polluted agricultural land (LEPAL).

Finally, it was found the relationship between environmental problems, profitability of agricultural land and changes of agricultural characteristics of the study area in order to derive final result.

Discussion and Conclusion

The results of the study shows that the traditional agricultural pattern that include paddy cultivation, Chena cultivation and vegetable cultivation do not have a serious influence on the environment health of area but the gherkin cultivation that is one of the short term new crop are negatively impact on the environment health of agricultural land in Madawalalanda village. Sugarcane cultivation that is a direct market oriented monocrop has been increased the productivity of land while affecting the environment in a moderate way on the agricultural land in Madawalalanda village.

One of the basic findings that emerged in the course of this study is the significant influence that certain factors had on agricultural and land use practices adopted by the farmers in Madawalalanda village.

The following steps are important to increase the productivity of agricultural land in Madawalalanda village.

1. Reducing the usage of agrochemicals and encouraging farmers to use organic matter as an alternative for the agrochemical usage.
2. Repairing the irrigation canals to provide the water for cultivation.
3. Increasing the demand for agro-production in Madawalalanda village.

Following suggestions are important to protect the natural environment where there is a potential for the degradation of environment in Madawalalanda village as a result of expansion the agricultural activities.

01. Promote agricultural land suitability evaluation and allocation of land rationally among competing uses.
02. Ensure that the utilization of agricultural lands based on the capability of the land and the needs of community and their economy.
03. Enhance productivity of agricultural land to the optimum level.
04. Promote the agricultural land uses that will minimize environmental damage.
05. Reduce the vulnerability of agricultural land to natural and man made disasters.
06. Promote rational distribution of population and settlements in the village.

The study recommend that improving paddy cultivation, sugarcane cultivation with protection of environment health in village using new technology is the way to the sustainable agricultural development, rather than introducing new crops to the area.

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