



Reducing vulnerability of agriculture to climatic change through indigenous knowledge: an initiative to forecast weather depending on environmental indicators (A study based on Hambegamuwa and Ralapanawagama villages in Sri Lanka)

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Abstract

It is apparent that world climate is changing in mainly resulting in global warming and associated consequences such as sea level rising, growing hot spot, ice malting and varying rain fall. Therefore now a days the word "Climate Change" has become a topic of forefront dialog at both national and international level. Many efforts are being made by world to overcome the problems in two ways one is minimizing some of causes for climate change such as reducing CO₂ emission to the atmosphere. The other is making strategies to adopt to the changing climate.

Keywords: climate change, global warming, adopt, strategies

1. Introduction

The traditional knowledge is thing that farmers practiced through years of experience, living with the nature. It is not harmful to the nature. The prime aim of it is to enhance the feasibility of win over the nature while live in harmony with the changes in the environment. However, today the traditional knowledge is overpowered with modern scientific knowledge. There is lack of interest among the young generation to take forward the traditional know-how due to the popularity of modern technology.

Sri Lanka had so many traditional adaptations applied in the agricultural activities. However, most of them are not popular or not have been given attention of the future planners. Therefore under present day climatic variation these indigenous methods have a significance that should be taken into consideration, when future planning of agriculture development strategies are made. But in the Sri Lankan context, indigenous methods used by people in this field have been focused less attention. Instead mega projects and modern techniques are used. On the other hand the scientific relevance of indigenous adaptation is needed to be emphasized when such strategies are formulated. In this context it is very important to identify three aspects one, what are the traditional adaptations assist in relation to climatic variation in the Agricultural sector in relevant area, two how their scientific relevance and three, the fact that whether there is a possibility of developing such adaptive techniques an the field of Agro climatology

2. Theoretical Framework

The influence of a climate in agriculture sector is altered by a change in the climate state and has indicate impacts on physical and social systems. The outcomes can be complex, resulting from direct and indirect effects of several climate and non-climate factors. The level of impact is modulated by the adaptation strategies. Here is more valuable Indigenous adaptation strategies, most of their adaptation result of

interrelationship with environment. Indigenous Adaptation to Climatic Variation in Relation to Agriculture Activity is a function of the knowledge, experiences, degree of exposure environmental indicators, sensitivity of the system, and the capacity for adaptation (Figure 01).

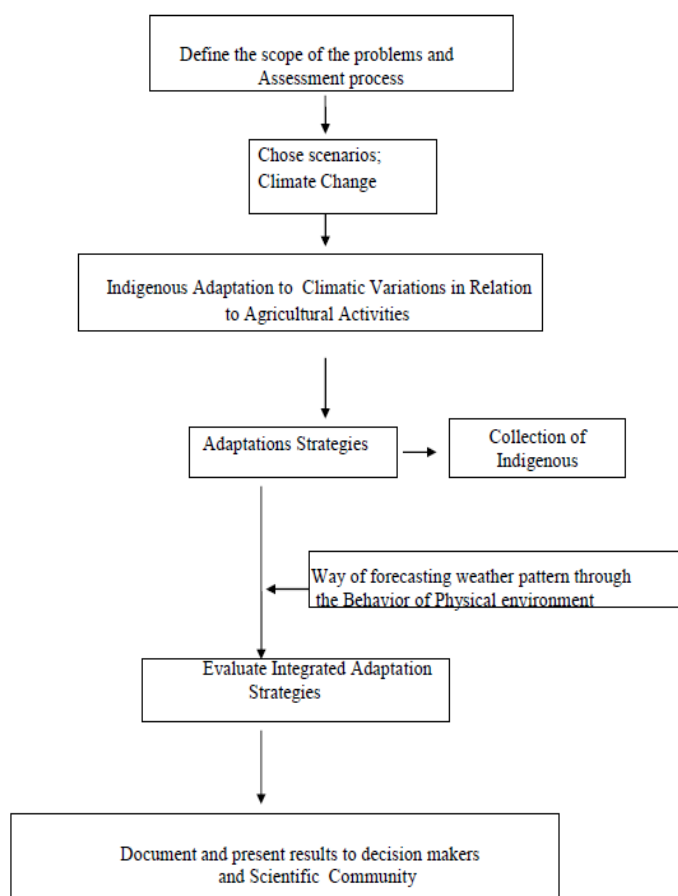


Fig 1: Conceptual framework

3. Methodology

3.1 Study area

The study areas were, Anuradapura district and Monaragala districts, In Anuradhapura *Ralapanawagama* village (8° 05'30.72" N, 80° 08' 05.07" E) was selected in the Dry zone. This village climate is typical of that of the Dry zone of Sri Lanka which receives less than 1400 mm average rainfall during whole of the year. In Monaragala districts *Hambegamuwa* village (6° 22' 22.72" N, 81° 03' 42.66" E) was selected as another study area. This area belong to intermediate zone, the environment of Moneragala is basically determined by the seasonal spell of rains which receives less than 1800 mm average annual rainfall (Figure 2, 3).

3.2 Objective

In this research main objective is to prepare indigenous

adaptation methods use by the farmers to identify Climate Variation in Anuradhapura and Monaragala districts.

3.3 Hypothesis

In accordance with the research objectives following hypothesis are formulated to be tested.

- 1) Indigenous knowledge and customs practiced in agricultural systems of Dry Zone of Sri Lanka have a significant reality.
- 2) Indigenous knowledge and customs practiced in agricultural systems of Dry Zone of Sri Lanka have not significant reality.
- 3) Such practices can be develop as future agricultural strategies.
- 4) Such practices cannot be develop as future agricultural strategies.

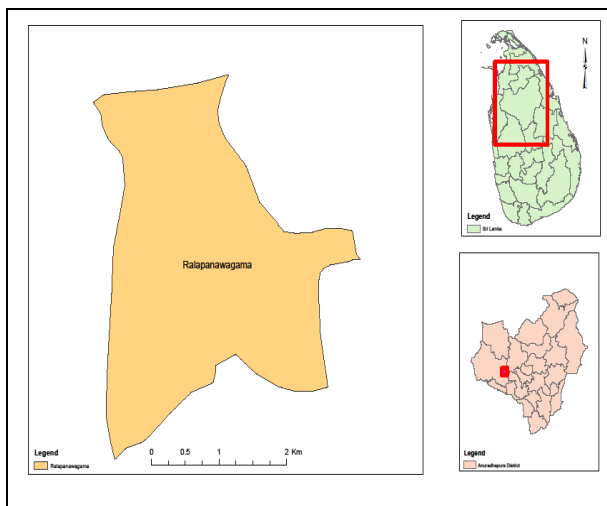


Fig 2: Study Area in Anuradhapura District

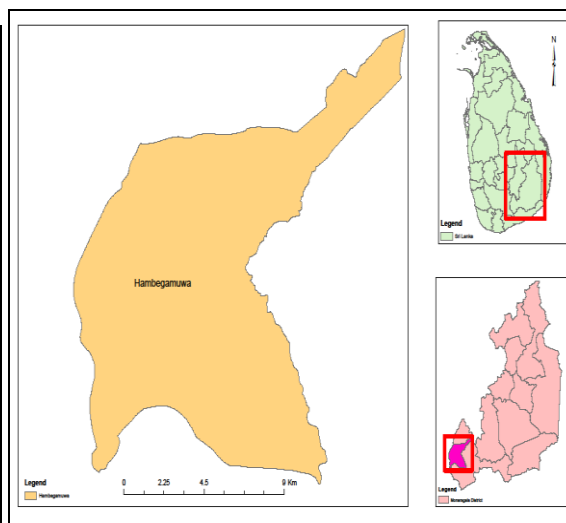


Fig 3: Study Area in Monaragala District

3.4 Selection of Sample

According to snow balling method, firstly, visited the field and met the Grama Niladhari of the area and explained to him about this aim of this study. Then met people in the area who are with experience and can understand weather patterns based on the changes in the environment. In the exercise according to the sample method, information was taken from each person and with the guidance of the Grama Niladhari 50 people were selected in respectively both villages. Priority was given to the elders with many years of experience.

3.5 Analysis of Data

Four methods were used to analysis data. Based in the data collected on the field how they adapt to the changes in the climate were directly noted while preparing a document categorizing the factors that helps to forecast the weather as through the behavior of animals, changes in the trees and plans and changes in the physical environment. A quality initiative was built for the data analysis through sketches according to the information given by them adaptation according to the changes in the environment. Secondly, to analysis qualitative data mainly consist event history of the farmer's in the study areas. Thirdly according to farmer's view, to measure the scientific relative of indigenous adaptation,

basically their adaptation strategies were compare with the annual meteorological station data where they are so closed and instant of that the historical newspaper article found to prove the statement according the historical experiences

4. Results

Some of the farmers in the area use their traditional local knowledge to forecast weather depending on environmental indicators. In the present as well as in the past people in these areas were able to adjust their lifestyles according to the changes in the environment. They cultivate paddy in a land situated below the tank and the "Gangoda" where the farmers reside located between the paddy field and the tank. Chena cultivation was carried out on a circular basis. Under this system vegetables, legume crops and other dry grains were cultivated. Every household had a three or four buffalo and for their use there was a buffalo wallow at the end of the paddy field. The area between the village and jungle was used for pasturing.

The area called "Pillewa" located in the two ends of paddy fields were used as a resting area for the animals who were used for agricultural activities. There were plenty of trees as villagers let trees to grow wherever there is a space. But this environmental context had been vastly changed now.

Rural agriculture environment in the dry zone had become very complex due the ever increasing population. Thus, in order to recast rural village life atyly and environment pattern it is necessary to classify all the factors in to one group at the village level.

Sometimes it is amazing to see how the farmers in the area forecast weather based on environmental indicators. It is happy to note that at least some of these practices have been preserved until today.

Farmers observe the shape of clouds during the month of August. They can have an idea about the rain according to the shape of a cloud. If clouds in the shapes of a big pandol or a big tree is visible before the rain at the northeastern side of the sky then there will be enough rain for 15 days ploughing. Similarly, if clouds in shapes of buffaloes, elephants, sharks, crocodiles and lions are visible in the sky before the sun rise, there will be rain after a week.

If clouds in shapes of wild flowers, red lotus and vultures elephants then rain can be expected after 12 days.

Similarly, of you can see alleyways and reddish clouds in the sky then it will take at least three months to rain. Also, if broad rainy clouds or nimbus are visible, then it is a sign of heavy rains.

According to villagers in the area the sign to commence agricultural work is given by *Ak Wessa* falls at the end of the drought. People in Monaragala call this "*Kadhan Pupurana Wessa*". It is "*Bim Mal Pipena Wessa*" in Anurdhapura. This does not occur during a same period of time in every parts of Sri Lanka. This rain starts from the hill areas of the country. Then gradually spreads to the others parts. This difference occur depending on the physical structure of the environment. To identify these changes farmers carefully observe behavior of animals, physical changes in trees, and other visible changes.

Thus, according to the changes in the environment most farmers at present plan their cultivation timetable. When carefully studying this timetable one can see it has done giving priority important factors such as specious colour spectrum of the sun, rain, fertilizer, microbiotic process, lifestyle of wild animals and lifestyle of insects. In fact, it is amazing. In January red is the prominent colour of the colour spectrum of the Sun and it is a sign of heavy rain with thunder and storms. It is only harvesting that is taking place at the paddy fields during this time. Reaping the harvest will start in February. Leaves start to fall during this time. This is a very dry period. Microbiotic process is not happening properly due to the dry weather. A thick layer is created on the surface of the earth due falling of leaves. In March, first rain of the year of *Ak Wessa* begins to fall. Half of the sky is covered with clouds. The earth during this time is properly moistured and and that helps the microbiotic process to function properly. Leaves rapidly decay. During this time purple is the prominent colour in the colour spectrum. Rooting and flushing will speed up.

The in April, tress grow well as it receive sustenance from earth as well as nitric acid from thunder bolts which are frequent in the season. In the month of May there will be a period for the trees according to their duration of growth. Trees begin to bear fruits in June. Fruits start to mature in July. August is the harvesting time. According to this timetable trees grow with natural fertilizer and natural water avoiding threats posed by insects and wild animals. Farmers

in the old days as well as some are today use this timetable to grab these changes and plan their activities on time.

5. Conclusion

Some Indigenous adaptation very important to further scientific study. Most of indigenous adaptations strategies depend on last generation of community in Anuradhapura and Monaragala districts when end of this generation the wide range of indigenous knowledge will comes to end. Many of adaptation strategies had been changed as results of change natural environment. Monaragala and Anuradhapura districts has some similarities and changers of adaptations strategies through forecasting weather pattern with behavior of animals. Indigenous knowledge has to powerful advantages over outside knowledge it has little or no cost and it is readily available. There are situations in which modern science is not appropriate, and use of simpler technologies and procedures are required to solve problems. Thus, indigenous knowledge provides basis for problem solving strategies in local communities, especially the poor.

6. References

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