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Necessity for an Application of Environmental Management into rural Areas (Special Reference to Malimboda Divisional Secretariat Division)

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ABSTRACT

Environmental management is a systematic approach to finding practical ways for saving water, energy and materials and reducing the negative impacts. Environmental problems have arisen due to human influences on environment in the worldwide. Many environmental problems like air pollution, illegal waste dumping, water pollution, green cover reduction, and noise pollution can be identified in urbanized areas, and mostly human impacted areas. But as a developing country, as well as affected by globalization, many rural areas in Sri Lanka are threatened by environment related issues , but there is no a considerable attention to identify environmental problems and threats in rural areas. This study is done for identify the necessity of application of environmental management into rural areas. Specific objectives are to identify, main reasons for those environmental problems, and to identify strategies that used by the community to prevent environmental problems. The study area is Malimboda Divisional secretariat division. Data collection is done using primary and secondary data sources. 40 questionnaires, 5 interviews, and field observations are used to collect primary data. Published and unpublished literature sources, books and internet are used to collect secondary data. MS Excel and SPSS are used to quantitative data analysis and some data which are received with interviews and observation are analyzed qualitatively. Results of analysis showed the major environmental problems as soil salinisation, water salinization, water pollution, water quality decreasing, soil degradation, deforestation, and bio diversity degradation are arising. There is a high necessity of application environmental management into Malimboda rural area. The rural community should be informed about future threat to increase existing environmental problems, and promote to use environmental management activities locally. It should pay the attention of governmental and nongovernmental attention to the rural areas, with establishing active laws and regulations.

KEYWORDS: *Environmental management, environmental problems, rural areas, necessity*

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1. INTRODUCTION

Modern world's society is reshaped to the natural environment by large dense populated urban areas, immensely long roads and transport networks; the industrialization of row material extraction and food production and twentieth century mass consumption of goods. With the human influences on the environment, it was threatened by environmental pollution. Environmental pollution can be simply defines as "the release of potentially harmful contaminants in to the environment. With the human influences on the environment, it was threatened by the environmental pollution. Environmental pollution can be simply defined as "the release of potentially harmful contaminant into the environment" (Sutton, 2007). Global poverty directly links with environmental pollution in the world, local / sub national level and national level.

An environmental problem arises whenever there is a change in the quality or quantity of any environmental factor which directly or indirectly affects the health and well-being of man in an adverse manner. Environmental problems can be studied from two different viewpoints. The first one is, simply to look for adverse effects without regard to their origin in order to detect trends that call for further investigation. The second one is to try to understand the cause and effect relationships, which make better prediction and proper management possible.

Environmental problems have arisen due to environmental crisis not just term of pollution. Traditionally it is accepted that environmental damages have arisen due to rapid economic growth. But tremendous growth of population is also became a main reason for those environmental threats (Dutta, Dutta & Pandey, 2009).

Global environmental degradation is another way of arising environmental problems. It is caused overpopulation and over use of resources. Intensive farming depletes soil fertility and also pollution (Dutta, Dutta & Pandey, 2009).

Globally land degradation and desertification can be identified as major environmental issues related the land. It is "a human induced or natural process which negatively affect the land to function effectively within an ecosystem by accepting, storing and recycling water, Energy and nutrients". Land degradation is caused land clearing and deforestation, agricultural mining of soil nutrients, urban conversion, irrigation and pollution. It mainly stresses on accelerated erosion by wind and water, removal of nutrients, acidity increase, salinization, alkalization, destruction of soil structure and loss of organic matter (Dutta, Dutta & Pandey, 2009).

Environmental planning and management is needed in every country. Both rural and urban areas in every country have environmental problem. In rural areas agriculture and various cropping patterns are highly caused for environmental issues. Irrigations in rural areas strongly link with agriculture. Therefore, rural environmental planning and management should be included agricultural planning, irrigation planning and water bodies planning (Sundar, 2002).

Environmental management can be easily defined. Environmental management is a diverse set of activities that may be practiced by individuals and groups holding. It focuses on decision-making which "more concerned with the management of human activities and their impacts than with the management of the natural environment". It Influences the course of development acting as a system that anticipates and avoids, or solves, environmental and resource conservation issues".

The management of water resources is complex because it is included variety of disciplines ranging from climatology, hydrology, geology and ecology as well as a consideration of the economic political and social aspects of the subject (Owen and Unwin, 1997). Aspects of

environmental management is involved direct regulation by state of national government, the political and governance of these functions (May *et.al.*, 1996).

There are two main approaches of environmental management as management based on standards and management based on best practicable means. First approach requires statutory provisions for standards for each pollution that have the ability to polluter to select suitable technique to pollution control based on their evaluation for technical feasibility and economic variability. In second approach polluter especially industries can select suitable method which both technically and economically capable (Pandey, 1997).

Environmental management may be defined as a process concerned with human-environment interactions which seeks to identify what are environmentally desirable outcomes, what are the physical, economic, social, cultural, political and technological constraints to achieving those outcomes and what are the most feasible options for achieving those outcomes.

Rural environmental management should aim to help people who live in rural areas to manage their own environment and to plan their own sustainable development.

2. BACKGROUND

The Ministry of Environment in Sri Lanka has identified land degradation due to soil erosion, depletion of coastal resources, loss of biodiversity, waste disposal and inland water pollution as key environmental issues in Sri Lanka. Air pollution, land fragmentation, deforestation, waste dumping and mining on the environment are the other issues that can be identified in Sri Lanka.

Matara District lies in the south-western part of Sri Lanka in the southern province of Sri Lanka, about 160 kilometers from Colombo. Total extent of the District is 1282 sq.km with a human population density of 620 (per.sp.km). The total extend of forest cover is 16%. Matara District's terrain consists of steeper hills towards the northern part and low hills and undulating plains in southern coastal part of the District. The main water source in the Matara district is the River Nilwala which originates in the Matara District and forms the Nilwala River basin (National Atlas, 1997). Matara District gets an annual rain fall between 2000-2500 mm mainly southwest monsoons, while the annual mean temperatures for Matara District range from 25-27 ^{O}C.

Environmentally, Matara is important due to it is situated in wet zone, close to Indian ocean, better vegetation cover with a few rainforests, and basin Nilwala river with higher discharge of water. Malimada Divisional Secretariat Division is situated in Matara district and same environment can be seen in Malimbada. Because of increasing population, economical activities related the environment and intensive land and resources usage may be affective on natural environment as mentioned above about the global condition. This study is conducted for identify necessity for an application an environmental management.

The main objective is to identify major environmental problems in Malimbada divisional secretariat division and necessity of environmental management. Specific objectives are to identify major reasons for environmental issues in the area and to identify indigenous environmental management strategies that used by community to prevent those problems. Therefore, the research problem of this study is why environmental management is necessary to rural areas.

3. METERIAL & METHODS

The study is conducted in a Geographical perspective. Study area of the study is Malimboda Divisional Secretariat Division in Matara District. Uninduwela and Malimboda

south Grama Niladari Divisions were selected for collect data.

Local community is a main resource that can be obtained detailed data about environmental issues in the area. Primary data collected through questionnaire survey using 40 respondents. Respondents were selected under snow ball sampling. Five direct interviews and deep observation in the area are also used. Books, published and unpublished literature sources, and institutional data used to collect secondary data.

Data were analyzed both quantitatively and qualitatively. Questionnaire based data mainly analyzed quantitatively using MS Excel and SPSS packages. Data that collected through interviews and observations were simply analyzed qualitatively.

4. RESULTS & DISCUSSION

To collect data, 20 questionnaires are completed from Malimboda south Grama Niladari division and 20 questionnaires are completed from Uninduwela Ggrama Niladari division. The data are analyzed using MS excel and SPSS.

All of the respondents live in the area since their born. Respondents are older than 19 years and mostly they were elders and according to their age and experience, many comparative data could to be collected about the environment.

As an agrarian area, environment was directly link with their agricultural activities and lands. For identify environmental issues and management needs, it should be identified land features and threats on natural environment with agriculture firstly. Land ownership was identified as highlands and paddy lands.

According to highland ownership of respondents in two Grama Niladari Divisions, Pearson's chi square is shown 2.241^{a} value and 0.326 of variation. The number of d.f is 1 because, two Grama Niladari Divisions used for analysis. H_0 was there is no variation of amount of highland ownership in each Grama Niladari Division and H_1 was there is a variation of amount of highland ownership in each Grama Niladari Division. According to output of SPSS analysis, H_1 can be rejected because it should be 3.84 in 5% of variation level in 1 d.f. So numbers of highland that respondents have in each Grama Niladari Division are differing.

SPSS output of paddy land ownership is shown as 0.440^{a} value and 0.507 of variation between two Grama Niladari Division. H_0 was there is no variation of amount of paddy land ownership in each Grama Niladari Division and H_1 was there is a variation of amount of paddy lands ownership in each Grama Niladari Division. H_1 can be rejected because it should be 3.84 in 5% variation level in 1 d.f. A mount of paddy lands mostly vary between Grama Niladari Division.

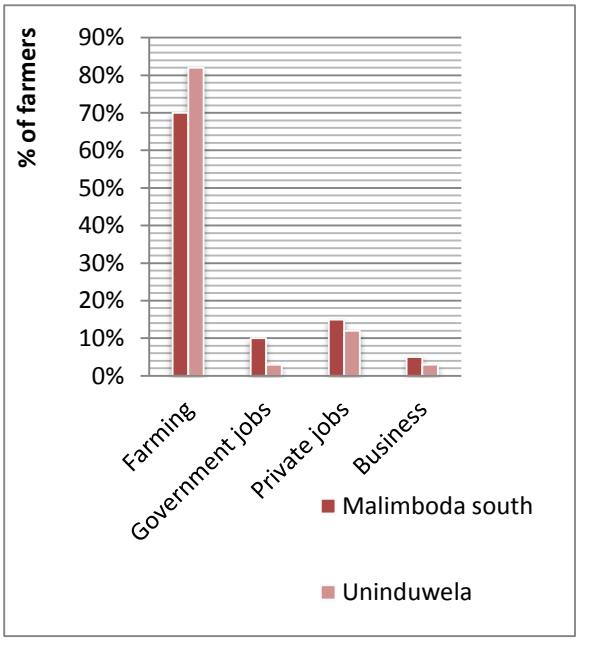

Figure 1. Economical background of respondents
Source: Field survey – 2016

Economical activities in lands should be identified to study environmental issues and related factors. It is shown in figure 1.

The majority of respondent are involving with agriculture. Though they have governmental jobs, they do farming. Paddy cultivation and low country vegetable cultivation are main agricultural activities in the area. Tea, coconut and other export crop varieties are included to planting sector in the area. Agro chemical and fertilizer usage is common in the area. With the interviews of farmers, it was found that they need pesticides and chemical fertilizers for their paddy and vegetable cultivation. Chemical usage is traditionally accepted that directly affect to oil I the area. Figure 2 and 3 shows the pesticides and fertilizer usage of selected farmers.

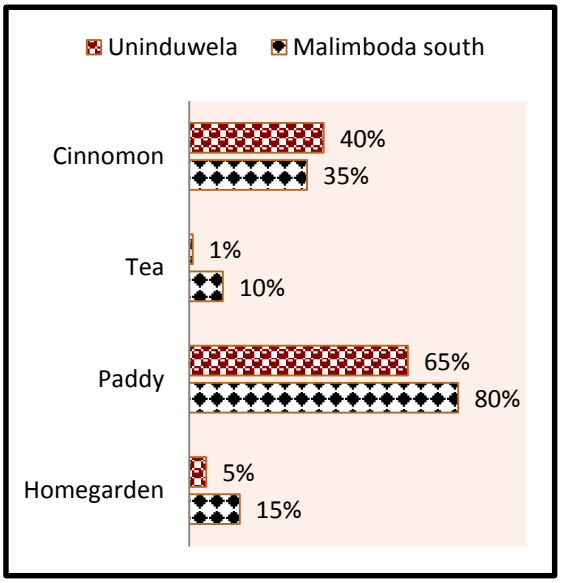

Figure 2. Chemical fertilizer usage of selected farmers
Source: Field survey – 2016

Chemical fertilizer usage into agricultural lands become a worldwide environmentally effective factor and it cause to make different type of environmental problems. Figure 1 shows the percentage of farmers that use chemical fertilizers into paddy lands. According to discussions with them, they use more organic fertilizers also. Higher usage of organic fertilizers may affect to environment than chemicals with increasing organic matters in the soil. Pesticide can be identified into three main types as insecticides, fungicides and herbicides.

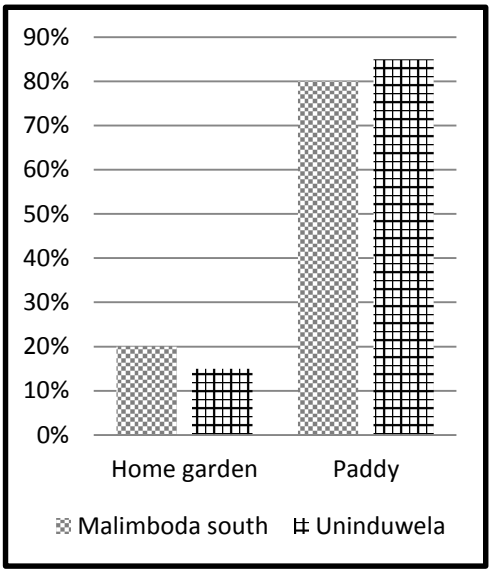

Figure 3. Pesticide usage of selected farmers
Source: Field survey – 2016

None of studied farmers used pesticides for tea, cinnamon or another cultivations. But all of paddy and vegetable cultivators use pesticides and a few of them use pesticides into the home garden also.

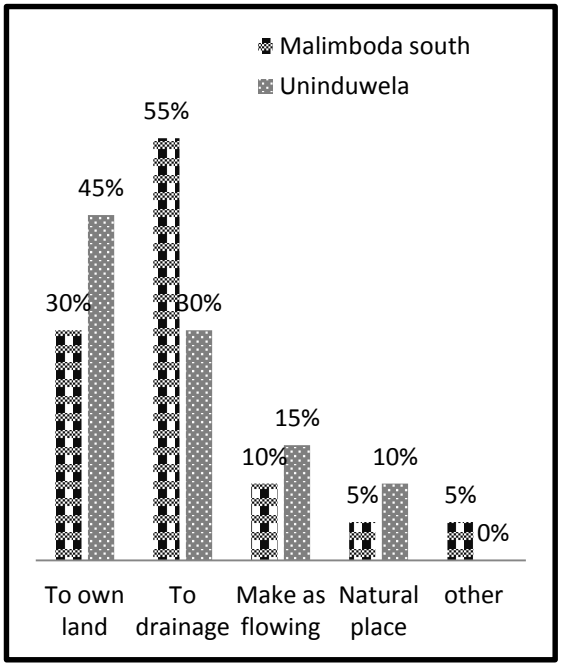

Figure 4. Waste water disposal in selected area
Source: Field survey – 2016

The community use tube wells, natural wells, streams and tap lines for obtain water. Waste water disposal may be affected to natural environment. Figure 4 shows the formation of waste water disposal in the area.

There was a drainage system in the area for waste water disposal near the main road. But that waste water disposal system finally linked with natural water way. Color of that water was yellow.

With the observation, interviews and discussions, it found a few environmental issues in the area.

Figure 5 shows the main environmental issues according to the community.

The questionnaire covers natural and manmade environmental problems that can be seen in the area because some natural phenomena can be related to make environmental problems.

Flood is main phenomenon that affects the area very often. River Nilawala is situated in the area. South western monsoon gives a higher rainfall and higher discharge of water in River Nilwala affect to flooding very often.

According to the community, Nilwala project that presented for flood protection is also affecting the area. Therefore, flood has become a common natural fact that makes many environmental problems.

Water pollution and quality decreases are main issues in the area. Community mostly identifies the water pollution by its color and odor. According to the community, water in the area was very clear in past but now it is changed especially near cultivating areas and near the river. Continuous higher usage of fertilizers is the main man made factor for water and soil salinity. The fertilizers that used by farmer are existing in the land for a long time. With flood or water flow this fertilizers materials and particles are distributing and infiltrate to the soil. It directly and curvedly affect to water salinization.

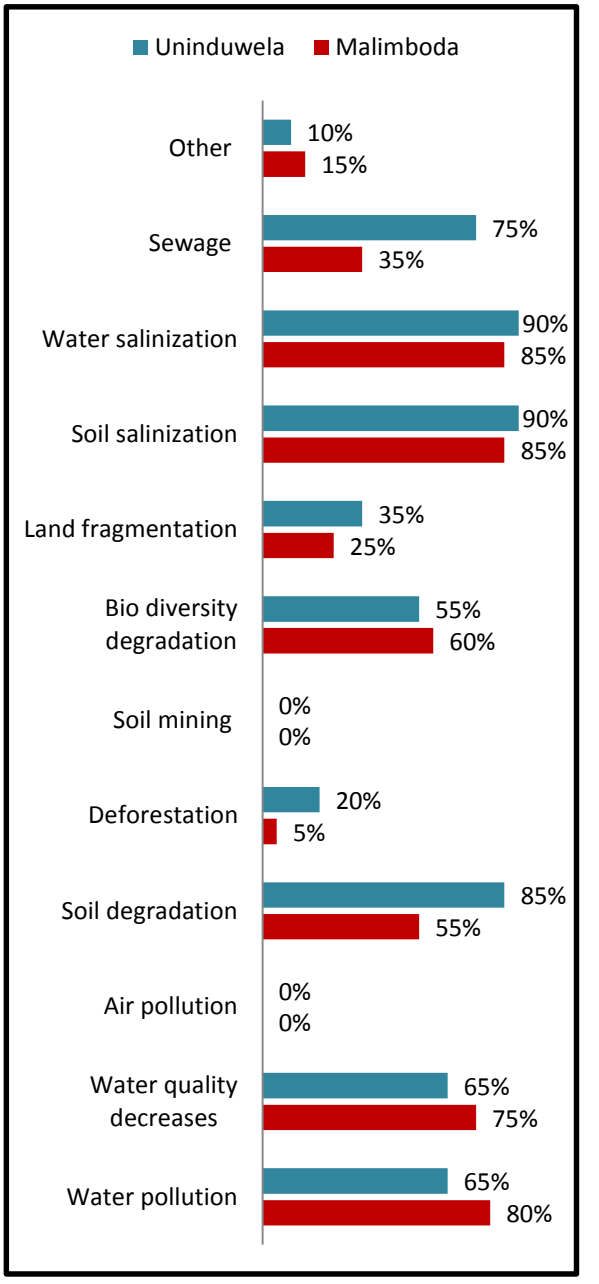

Figure 5. Environmental issues in the Malimboda area
Source: Field survey – 2016

Land fragmentation could to be identified in a few places that lands are going to sell. The farmers said that some flora and fauna varieties are vanished. Specially, some aquatic plants and medical plants that were in their lands earlier are disappeared at the present.

The number of crows, hens and other birds were decreased in the area. Soil degradation means the reduction of the quality of soil. Soil salinisation is one of the problems that affect to soil degradation and on the other hand highly intensive agricultural and some other activities directly affect to make soil degradation. Riverine buffers are naturally grown two sided but due to Cinnamon and Tea plantations, as well as crocodile human conflict, those vegetation cover is affected with removal the vegetation cover near the river by the local community.

The main reasons for these environmental issues are agriculture, Nilwala project, flood, climate change and crocodile threats. Enrichment with nutrients such as Nitrogen and Phosphorus due to agriculture, aquaculture and domestic solid waste can be seen in rural areas (Bay Of Bengal Large Marine Ecosystem project, 2013). Environmental issues have arisen due to development process in the area. Road development is a main development practice in the area and it affects to sensitive natural environment (Road development authority, 2007).

Nilwala Flood Protection Scheme (NFPS) is a drainage project implemented for protects Matara and surrounded areas that mostly threats with flooding. It has been affected to the paddy lands, natural hydrological regimes in the flood plain, increase acidity, increasing salinity of water and sol. Paddy landsin the right bank of River Nilwala have abandoned due to negative impacts of project (Fernando & Surangee, 2009).

The community has a good knowledge and experience about environmental threats that is arisen in the area. According to statements of interviewed persons, it is clear that there is a necessity for an application of environmental management.

Interviewer No 01 "We haven't proper places for waste disposal. So we put them around our lands. We know that they mix our own paddy lands, but we haven't another option"
Interviewer No 02 "I have a garage. I can't continue it within rainy season with flood. Nilwala dam is a big barrier for us. It caused to increase our problems".
Interviewer No 03 We can't do paddy cultivation like ancient time. Soil is not good. We should use fertilizer. Then also we can't get a good harvest. Water in our lands also not suitable for drink. Some fishes in our lands are vanished now. Water flowers also not sprout properly
Interviewer No 04 "I am a teacher. Actually our lands are threaten by various problems. I had a big home garden with various plants. Now some flower plants and medicinal plants are vanished".
Interviewer No 05 "We use drinking water from our wells. In past, water was so cool and taste. But now it's taste is changed. We use water for paddies from river. We use many chemicals for lands, In rainy season water in wells in paddy lands get abnormal color, It may be cause chemicals in our own lands

Environmental management can't be easily done due to it's a complex process. There should be a basic idea about capabilities and challenges to apply environmental management.

A simple SWOT analysis is conducted to find out those capabilities and challenges.

Strengths, weaknesses, opportunities and threats to apply environmental management in the area

Strengths • Traditional experience, and knowledge of farmers about agriculture and environment • Community knows about issues • Community has ideas about reasons for environmental issues
Weaknesses • Lack of knowledge about manage agricultural activities technically • Lack of financial availability, less accessibility to obtain external resources • Shortages of strategic approaches to rural areas
Opportunities • Governmental concern to Matara area with existing development practices • Ability to conduct continuous research with University that located in the area
Threats • Environmental threats • Changes of natural environment and climate

5. CONCLUSIONS & FURTHER WORK

With the findings of the study, it can conclude that there are a few highly distributed environmental problems. They are, water salinazation and soil salinazation due to floods, and fertilizer usage in agriculture, water pollution, soil degradation, land fragmentation and water quality decreases. Biodiversity degradation and removing vegetation cover are another two environmental issues in the area, which are less distributed. Identified environmental issues are not affected in an extreme level for the area, but it is a threat to future of natural environment in the area.

There are no special strategies that community is using for environmental management but, planting various plants and trees in their home garden is a strategy for make cool the environment. It gives environmental advantages like provides of habitats for animals, protects vegetation cover in the area and some other uses Though Malimboda is a rural area, it is located near to Matara urban area.

Therefore some urban characteristics are shown in the area. But mostly rural activities are done by the local community and a few major environmental issues are arising in the area. Overall result is noted that there is a high necessity for an application of environmental management in to this rural area concerning agricultural, plantation and domestic sector of the area as well as evaluating impacts of Nilwala project.

Environmental management strategies or programs should be established in the area with integrating community and governmental and nongovernmental institutes. It should be provided sustainable methods, technology and knowledge for each economical activities that doing in the area to decrease negative impacts on the environment. Awareness programs should be launched focusing agrarian community.

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