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Implementation of Eco-Plans for Preserving Ecological Biodiversityascommuniuty Based Services in Debre Berhan University, Ethiopia, East Africa

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Abstract: Transforming The World: Agenda 2030 for sustainable development clearly defined the goals to sustainably manage the natural resources and to keep our surroundings or our campus ecologically rich[1].This includes the inevitable measures taken or formulation of plans to achieve the goals of environmental preservation.The plans are based on both long term and short term goals for ecological preservation and making the campus more bio diversified [2].This also involves the adoption of renewable energy resources and technologies for a makeshift and attitudinal change from the usage of non-renewable energy resources [3].

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I. INTRODUCTION

DBU is located in the northern part of the Amhara region just 130km from the capital city Addis Ababa.On the outskirts of the main DebreBerhan city in the Tabase area the university is one of its kind to work on the ecological and Environmental issues as community based services for the local people [4]. Since its establishment this university is working to achieve the common environmental goals set on the basis of short term and long term goals.Short term goals are framed to preserve the natural ecological conditions of the surrounding environment which can be achieved in a year or two years while long term planning requires specific strategies that are followed to realise the common environmental goals.In the short term goals the activities are framed on the manifestation of integrated global natural resource and community based management [5].This includes the first stage of Planning,second stage of Organising and third stage of Implementing all the Environmental plans with their target oriented and achievable goals within a given time frame[6].

1.1 Study Objective and Scope

The main focus of the paper is to study the Ecological conservation plans and specific measures taken to achieve the sustainable environmental goals for DebreBerhan University,Ethiopia.The study objectives are enlisted as follows:

- To study Bio-Conservation Plan
- To study Agricultural Plan
- To study Rural Energy Resource Plan
- To studyWater Conservation Plan
- To studyRenewable Energy Source Plan

II. MATERIAL AND METHODS

The study area is DebreBerhan University located in DebreBerhan, North Shewa Zone, and Amhara Region, Ethiopia. This University is 130km to Addis Ababa in north direction. The topography within 2 miles of DebreBerhan contains very significant variations in elevation, with a maximum elevation change of 1,270 feet and an average elevation above sea level of 9,078 feet. Within 10 miles contains very significant variations in elevation (4,393 feet). Within 50 miles also contains extreme variations in elevation (9,941 feet).

The university is located in 102hacters area. The total DBU population including regular students, staff and faculty are 13,538.This includes total number of regular students - 11,329,Administrative staff - 988,Technical assistant staff - 165 and Academic staff- 1106.This includes the collection of Primary data as well as secondary data.This involves a very time consuming and intensive surveys led by the team members to collect the information through personal interviews and questionnaires.The process of Data collection is very

daunting task with rigorous field work on the campus when different departments are contacted to collect the variety of information.This study relies heavily on the survey data.

III. RESULTS AND DISCUSSION

3.1 Biodiversity Conservation Plan

In well-defined Planning stage [7] activities are based on the framework of plans in a specified time plan and then the inputs are chosen.To preserve and protect the environment the first plan isthe biodiversity conservation plan which encompasses the main goals to preserve the natural fauna and flora of the local region[8].The natural flora with some native and endemic species are chosen and planted in the whole campus not only for ecological purpose but also to enhance the aesthetic sense.This includes the variety species like Pinusradiata,Thuja,Eucalyptus,Gravialla Robusta,Cyprus.The whole campus is having lush green area which is maintained and protected regularly.The main goal of this program is to protect and conserve endemic species and to rejuvenate the campus area when the surrounding northern area is degraded area by the reckless cutting of forests and wood both for domestic and commercial purpose[9].The implementation of this program helps to create awareness among the youth for the importance of nature and various natural and ecological systems which are under lot of stress due to human invasion or anthropogenic activities[10].

The fauna species include the native animal husbandry lifestyle of the local people since livestock and animal husbandry is their main occupation.The main focus is for the milk and its products giving livestock of 18 cows,20 ox,300 sheep and goats which are well maintained in their respective sheds and their dung is disposed of to create clean fuel like methane gas.Many projects are carried out by different College of Science or Agriculture to produce different varieties of crops like Cabbage and Potato.These are aided by adequate water supply to irrigate these crops by two big more than 5000Liters tanks installed near these cropping areas.The campus is a nesting place for different species of birds.The dung waste of various livestock is collected and is going to be utilized in near future for production of Biogas [11] since this is an integral part of Waste Management Plan[12].

3.2 Agricultural Plan

The second plan is the Agricultural plan when in the campus itself many of the local crops are grown regularly for campus kitchens use and also for local communities to be sold in the market[13].This includes varieties of crops like Wheat,Bean,Teff,Corn ,Sesame,Endemic plants and some species of oil giving plants too.This includes a specific campus area which is earmarked for these agricultural activities.This includes the aid and help of local staff and horticultural specialists when new varieties of seeds are researched for their production and good quality.This plan provides ample knowledge and research to grow new species of local crops and helps the farmers and agriculturists to testify for new varieties of crops.Local communities are served by dissemination of this research activities results on regular basis.

3.3 Rural Energy Resource Plan

The third Rural Energy based Plan is working underway(long term plan) for the setup of Campus Biogas Plant which includes the Agricultural waste [14],Animal and livestock dung waste,Dormitories waste and Kitchen waste.All the organic waste is collected for the production of Biogas and Electricity which will satisfy the energy needs of the Campus at a lower cost.Any type of organic matter can be utilized for the production of biogas.This includes livestock slurry,sewage sludge waste,and wastewater,all types of agricultural waste,food waste,green waste and human faecal waste.The need of the hour is to resort to different types of sustainable renewable energies when the future of non-renewable resources are quite uncertain.This helps to reduce the waste management problem since it is based on usage of dung and waste,and then it produces biogas as a clean kitchen fuel which helps to produce electricity for lightning or heating purposes by Biogas lamps and last but not the least the manure being generated from the digester is of high nutrient value.This is a very economical option to save money by producing gas and electricity at a very cheaper cost and this is welfare accounting when smoke produced from dung cakes are replaced by Energy [15] producing technology giving more safe and clean ecological environment.It simply means maintain good environmental health will result in good human health and raising the standard of living of people.

3.4 Water Conservation Plan

The fourth plan is the water conservation plan which includes Waste Water Treatment plant where the whole campus water and dormitories waste water collects in a Septic tank and there it is cleaned and purified as the country faces water crisis so the waste water is utilized properly to water the campus area and the agriculture feeds or animal feed plants[16].This plan also entails to do Rain water Harvesting since the water crisis is faced by many African countries.The monsoon months in this specific area are marked by heavy downpour so this water can be utilized by saving it during this season and can help to solve the water problems during the hot

summer season.The rooftops are already suitable to collect the rain water and requires the installation of pipelines from where the water flows and collects in an underground wells or pits.

3.5 Renewable Energy Source Plan

The Fifth plan is the installation of Solar Panel CellsSetup (long term plan) on the roof tops of various buildings to utilize the solar heat for the heating of water and for electricity production.The intensity of sunlight during the daytime is extremely high so this will help to charge the solar cells for the production of power[17].

IV. CONCLUSION AND RECOMMENDATIONS

4.1 Progress of Eco-Plans

The main aim is to observe and monitor the ecological plans and progress to achieve the long term plans and the short term plans with active support from the management,students and staff members.The purpose is to adopt a natural resource management approach towards the participation of all the communities and playing an active role since these resources are shared resources.All the stakeholders participate in the decision making process and can devise their own management institutions for the proper utilization of resources.The planning and management of natural resources lead to sustainable development which affects the quality of life both for the present and for the future generations.

The successful resource management approach is to divide all the activities into separate long term and short term plans for an ecologically rich campus areas.All the plans must work according to the given deadline to complete those plans.Since the concept of natural resources is directly linked to sustainability approach so the best alternatives are chosen from the renewable resource technologies for a given campus area.

Biography

DR.EKTA MADAN received the B.Sc degree in Environ-mental Science (1998), the M.Sc degree in Environmental Science (2000), the M.phil in Natural Resource Management (2003) and the Phd in Environmental Science (2013).Currently she is an Assistant Professor of Geography and Environmental Studies at University of DebreBerhan. Her teaching and research areas include Environment and natural resource management. Dr. Ekta Madan may be reached at ekta.madan2010@gmail.com.

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