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Appropriate Technologies to Rehabilitate Multiple-use Zone of Allah Valley Protected Landscape in Lake Sebu, South Cotabato

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Background of the Study:

Study Site:

Lake Sebu, located in the southwestern part of the province of South Cotabato, is relatively small compared to other prominent lakes in the country. Yet, it is one of the most significant and impressive lake ecosystems in the Philippines. The Municipality of Lake Sebu attracts relatively considerable numbers of visitors who want to witness the impressive views (mainly the lake, water falls, rivers and remaining forest) in the area *(Lake Sebu Socio-Economic Profile, 2007)*.

Lake Sebu has been identified for Conservation Priority Areas with Extremely High Critical (EHC) classification. (Ong, P.S. et. al., 2004).

Presently, Lake Sebu is under the initial component of the National Integrated Protected Area System (NIPAS) as part of the Presidential Proclamation No. 2455 dated September 24, 1985 declaring the 92,450 hectares as Allah Valley Watershed Reserve.

Photo 1. The experimental area before the establishment of plots with different treatments (January 2015).

Photo 2. The experimental area with soil erosion catchments installed at different plots. (May 2016).

Photo 3. The experimental area with planted corn and hedge plants (September 2016).

Photo 4. The experimental area after harvesting of corn. Planted hedge plants are starting to form a thicket. (October 2016).

Photo 5. The experimental area during the land preparation for planting of corn for the second cycle. (November 2016).

Significance of the Study:

As a party to various multilateral environmental agreements, such as the Conservation on Biological Diversity (CBD), Ramsar Conservation, World Conservation Heritage, ASEAN Agreement on the Conservation of Nature and Natural Resources to name a few, the Philippines fully supports all the provisions that ensure the conservation of the country's biodiversity resources within and outside the Protected Areas (PAs). Generating scientific information through R&D thus needed for sound management. (Integrated ENR-RDE Framework, 2011-2016).

In the area of jurisdiction of MDARRC, specifically in the study site within the Allah Valley Landscape (AVL) in Region XII (SouthCentral Mindanao), massive deforestation continues. The AVL has a total area of 261,000 hectares and the total forest area is 163,793 has. Out of the total forest area, 102,350 hectares is classified as Protected Area.

The Allah Valley Development Alliance (AVLDA, 2014) cited that based from the ADB Study, that of the total Allah Valley watershed forest reserve (102,350has), the open area in 1981 of 12,296 hectares increased to 25,354 hectares in 2000. (106% increase in forest denudation)Weak enforcement of Forestry laws, leading to massive deforestation. This triggering factor led to the formation of the Allah Valley Landscape Development Alliance (AVLDA) through the Signing of a Memorandum of Agreement (MOA) among stakeholders in March 2003.

This study is implemented to generate and develop technologies that will fit for the rehabilitation of the degraded multiple-use zone protected areas.

Objectives:

To generate/develop and field test sustainable technologies to rehabilitate degraded terrestrial protected areas.

Specifically, the study aims to:

1. To determine baseline data such as biologic, physical and socio-economic characteristics of the study site.

2. To determine the cost and benefit of the technology per

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hectare for rehabilitating degraded multiple use zone protected areas.

3. To institutionalize partnerships with the LGU partners and the community to sustain rehabilitation efforts through the application of generated technologies.

4. To build the technical capability of the project staff and partners/community on the rehabilitation of degraded areas.

Expected Outputs:

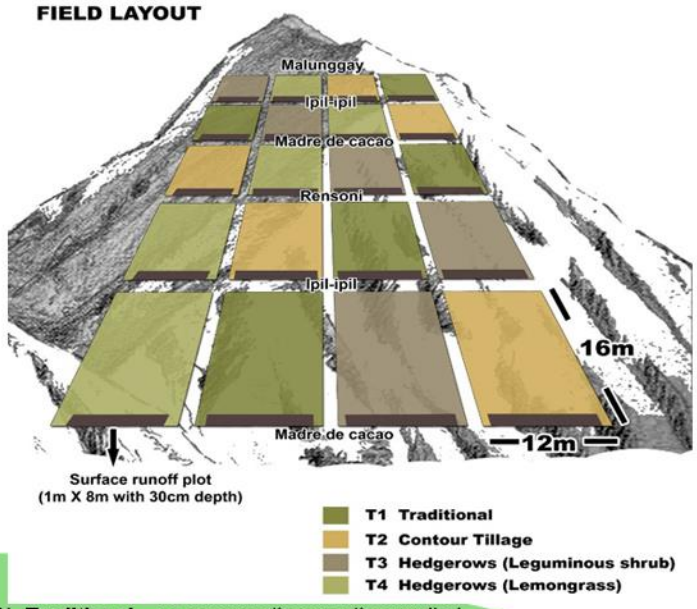
- o No. of rehabilitation technologies generated and developed;
- o Rehabilitation practices/technologies documented and packaged;
- o Enhancement of stakeholders' skills and technical know-how;
- o Project/Technical Staff Trained;
- o Draft policy recommendation
- o Benchmark data generated (Multiple Use Zone Protected Area Database); and
- o Technology Manual packaged and produced.

Expected Outcomes:

- o Rehabilitation technologies generated and applied by stakeholders in rehabilitating degraded multiple use zone protected areas;
- o Area established as learning site in showcasing rehabilitation technologies for degraded multiple use zone protected areas;
- o Developed skills of stakeholders as special extension service providers;
- o Technical Expertise of project staff enhanced and ready to extend services as pool of experts in the Center of Excellence for Mining and Degraded Areas; and
- o Policy paper disseminated and adopted by concerned sectors/ stakeholders.

Methodology:

The study uses the Randomized Complete Block Design (RCBD) with five replications. Five plots measuring 12m x 16 m with 2.0 m isolation strips between the plots were established in each block. These plots are being supported by the following treatments:



T1. Traditional – no conservation practice applied.
T2. Contour Tillage – Plowing the soil following the contour line.
T3. Hedgerows (Leguminous Shrub) – Vegetation strips of Malunggay or horse raddish (Moringa olifera) planted across the slope inside the plots.
T4. Hedgerows (Lemongrass) – Vegetation strips of lemongrass planted across the slope inside the plots.

Activities involved site preparation, to include establishment of contour line using A-Frame. Plots shall be established based on the specified uniform lay-out following the contour lines. Hedgerows in between plots were planted with flemingia, madre de cacao, and rensoni that was chosen by stakeholders). All plots were planted with corn for two successive cropping and to be followed by peanut for another two cropping.

Finding the exact contour lines is a critical component of the study. As a process, one leg of the A-frame is planted on the ground while the other leg is swung until the carpenter's level shows that both legs are touching the ground on the same level. The spot where the rear leg stands is marked with a stake. The same level finding process is repeated with stakes every 2-3 meters distance along the way until one complete contour line is laid out, and until the whole slope is covered. The closer the contour lines to each other, the more potential erosion control occurs. Also, more nutrient-rich biomass is produced and made available to the crops growing in the alley.

Surface runoff plots measuring 1x 8ft with a depth of 20 cm were established within each treated plot. The runoff plots were bounded by steel sheet buried to a depth of 30 cm. Runoff from individual plots are being collected every after rain. In the case of rain occurrence in the evening to dawn, run-offs are collected 1st hour in the morning and recorded in terms of its dry weight on a per kilogram basis.

Initial Results:

Based on the initial results of the study, planting hedgerows such as leguminous shrub (Malunggay) planted inside the plots and lemongrass planted across the slope inside the plots can minimize soil run-offs thus conserving soil fertility.

(Above, from left to right) Planting of lemongrass at the experimental plots with Treatment 4 (T4); Each plot is planted with corn. (Below, from left to right) Rainfall data is gathered and recorded; Plant growth is monitored and growth performance is recorded.

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