



Production Potentials and Strategic Constraints of Natural Resource Management in Gedeb District, Gedeo Zone, SNNPR, Ethiopia

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Abstract

Gedeb district is known for its traditional agro-forestry system and various natural resources conservation mechanisms although some socio-economic and institutional factors among others were the main bottlenecks of trials of natural resources conservation by various stockholders. Therefore, this study was conducted to identify and document the main efforts made to conserve natural resources and constraints in their conservation/management so as to base research and development works on the output. To achieve these objectives, checklists were prepared; sample Kebeles, focus group discussion (FGD) participants and key informants were purposively selected, interviewed and discussions were made. Secondary data were collected from the districts and selected Kebeles. The data collected were analyzed using descriptive statistics. The result indicated that trends of using indigenous soil fertility improvement practices such as FYM, and compost; physical SWCs such as soil bunds, micro basins and Biological SWC such as stabilizing by using Desho grass, pigeon pea; use of irrigation; suitable sites/lands for nurseries and good water availability; practices of agroforestry such as boundary plantation, homestead plantation, Backyard, Live fence, Road side, Dispersed trees in the farm, trees and shade trees were identified as major potentials and opportunities of natural resource management. Whereas declining soil fertility; high soil erosion; lack of interest to be involved in SWC activities, declining forest resources and fast growing of deforestation; endangered tree species such as Dokima, podocarpus, hygenia abyssinica; bamboo diseases; Forest tree disease and poor regeneration, root and leaf disease which dries up eucalypts and bamboo were identified as major constraints of natural resource management. Based on these results, researches and trainings on soil fertility improvement works; on SWCs; on afforestation and reforestation; research on how to rehabilitate engendered tree species; researches and trainings on bamboo and other trees disease management; research on forest tree poor regeneration; and trainings on strengthening extension system among others were some of the ways forward recommended to be undertaken to achieve sustainable natural resources base in the study district.

Keywords: natural resources, conservation efforts, constraints, descriptive statistics

1. Introduction

Ethiopia is endowed with ample of natural resources. Its numerous water bodies, lots of natural and plantation forests, immeasurable wild life, diversified agro-ecology, and attractive landscapes are some of the resources the country is endowed with among others. Gedeo zone is internationally known for its agro-forestry system that covered vast area of the zone where coffee, enset, indigenous trees, root crops, and shrubs were composed of. This agro-forestry system is well observed in Gedeb district of Gedo zone, and has evolved for a long time without

remarkable degradation and loss of biodiversity because it is based on indigenous knowledge of environmental management and land use system (EMCTARCCH, 2020). However, in Ethiopia, natural resources are under the influence of various interconnected factors like population pressure, agricultural expansion, migration, rapid urbanization, resettlement, climate change, and environmental pollution. Due to that, Many of its resources are not properly identified, well managed, and fully exploited (Wassie, 2020). Therefore, this study was conducted to identify and document the main challenges faced in managing fundamental natural resources of Gedeb district of Gedeo zone and principal efforts made to conserve these resources so as to base research and development works on the output. Assessing and properly quantifying major constraints, and working on them had been crucial to enhance sustainable natural resource base and doing that is believed to enable use these limited resources efficiently.

2. Research Methodology

Two Kebeles of Gedeb district were selected based on natural resource endowments and management practices by the district's agriculture office experts, which were believed to represent the natural resources and management constraints of the district well. The Kebeles were Gedeb Gubeta and Harmufo. One FGD per each Kebele consisting of 8 participants were formed, and discussions were conducted based on the FGD guiding questionnaires and checklists. The participants were from various social strata including model farmers, kebele administration representatives, Elders, women and youth. In addition, key informants were purposively selected, interviewed and discussion were conducted using checklists. Secondary data were also taken from Kebele repositories. Finally, the data were analyzed using descriptive statistics and the findings were narrated as well.

3. Results and Discussion

3.1. Description of Gedeb district

Gedeb district is one of the 7 districts of Gedeo zone. It is located at the southern part of Gedeo zone. Agro-ecologically, the district is 75% Dega (Highland) and 25% woinadega (Midland) (GARDO, 2021). Two representative sample kebeles namely Gedeb Gubeta and Harmufo were selected from Gedeb district to understand the main challenges faced in managing natural resources and efforts made to conserve them. The mean land holding of the District was 0.5ha with minim of 0.125 and maximum of 1.25ha. Astronomically, the district is located at 7° 19' North latitude and 39° 17' 0" East longitude. The altitude ranges from 2250-2367masl. The figure 1 bellow shows map of Gedeb district.

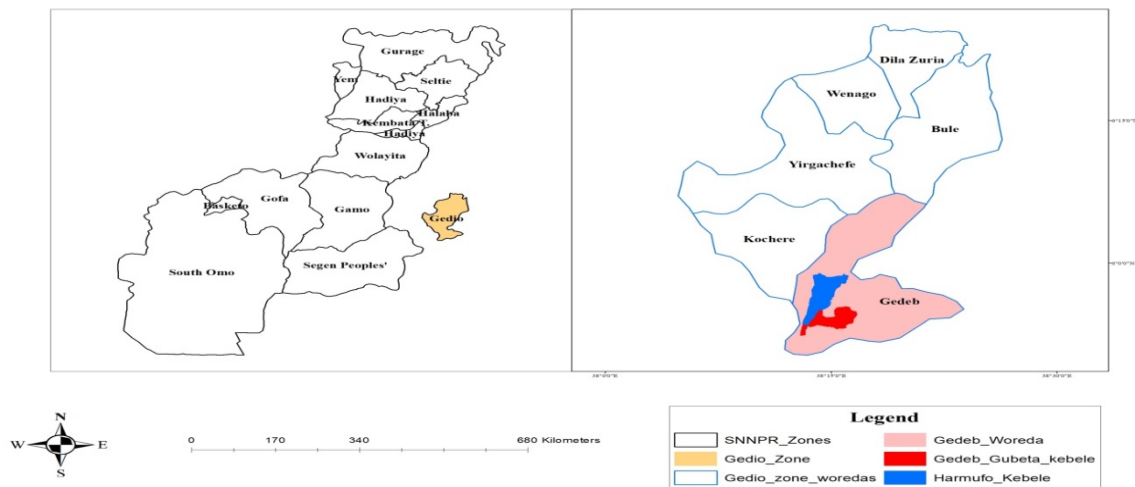


Figure 1. Map of Gedeb District

3.2. Natural Resources Management of Gedeb District

3.2.1. Soil and Water Management

Farmers in the district perceived land related problems such as declining soil fertility and high soil erosion as the major soil related problems. However, soil acidity and salinity were minimal in the area. Farmers said that there is no drainage problem due to excess water and vertisols. Forms of land degradation in the area include flooding, soil erosion, and siltation. The indigenous soil fertility improvement practice in the district were farm yard manure and compost, whereas, introduced soil fertility improvement practice in the district involve the use of recommended nutrient rates of NPS and urea.

3.2.2. Soil and Water Conservation Practices

Exotic SWC practices mentioned by farmers include soil bunds and micro basins, and biological SWC measures in the areas consists of planting biological stabilizers, such as, desho grass and peigon pea. In the district, maintenance and management of soil and water conservation practices were responsibilities of farmers and community who make SWC tasks. Farmers in area try to plant less moisture demanding crops such as finger millet as strategies in relation to erratic rainfall (late start, early ceasing, and inadequate rain). The sustainability of integrated watershed development was being conducted via government initiated watershed programs which involves maintenance and construction of SWC structures.

Major problems related to SWC in order of importance include proximity of the area to the town, lack of interest of farmers to be involved in SWC activities. In some parts of the district the watershed program was not based on the principles of watershed development i.e, starting development from the upper watershed damages that create runoff and sedimentation to the lower catchments.

3.2.3. Climate smart agriculture (CSA)

Presently, there are no climate CSA practices in the area such as zero tillage, minimum tillage, mulching, vermin-compost, bio fertilizer, bio slurry, fallowing land fragmentation due to increase

in population and no residue left over due to feed shortage and fuel demand hence trends of adopting and utilizing CSA is decreasing.

3.2.4. Irrigation Practices

There are nearby rivers suitable for irrigation where conventional irrigation practices are utilized but there is no irrigation scheme in their area. Though there are rivers suitable for irrigation scheme no body is interested to install the irrigation scheme Major crops grown by using irrigation by conventional methods are vegetables such as carrot, maize, and cabbage. Pepper and maize were also being irrigated by conventional method. Farmers use the traditional furrows by opening and irrigation at day and night time. The water amount minimizes in dry season but never dries. They do have their own agreement for managing conventional furrows.

Major problems related to irrigation include:

- Vegetables attack by disease which can be seen by the drying of leaves
- Seed shortage,
- Lack of pumps to fetch/pump water since using hand is difficult and time consuming.
- Sprinklers are also few and there is a great demand of this for manual irrigation

3.2.5. Forestry

In major areas of the district forest resources is declining coupled with fast the of deforestation rate in the areas The major woody products from the forest are *Mellitia ferrguinea*, *Syzygium guineense*, *Podocarpus falcatus*, *Croton macrostachus*, *Hygenia abyssinica* and *Eucalypts spp.* The endangered tree species are *Syzygium guineense*, *Podocarpus falcatus*, *Hygenia abyssinica* whereas, the endangered non-timber forest product is mainly bamboo disease which damages the roots and the leaf. Regeneration status in the area is limited due to low afforestation. Farmers get seeds of the indigenous tree from the tree planted at the scattered trees in farmlands for exotic trees. They collect seeds from private seed multiplier. For example, Eucalypts seedling is collected from private raisers and others from far seedling nurseries of other far seedling nurseries.

Opportunities related to forestry include suitable sites/lands for nurseries and good water availability. Major Constraints related to forestry include forest tree disease and poor regeneration; root and leaf disease which dries up eucalypts and bamboo; white spot leaf which damage eucalypts. the only non-timber product bamboo was diminished from most parts of the district due to its poor regeneration and disease.

Indigenous and introduced control measures for pests and diseases were burying and burning of the infected trees. Ownership and management of natural forest were limited to only the remnant trees which are privately owned in homestead and scattered trees on farm lands.

3.2.6. Plantation Forest

Among the exotic trees eucalypts tree is preferred due to its fast growth and its contribution for construction of homes, and from indigenous trees *Syzygium guineense* and *C. africana* are preferred for their resistance to termites and, uses for making different home furniture respectively.

The good culture of Gedeo people to plant trees and good rainfall distribution and water

availability are Opportunities for the future.

3.2.7. Agroforestry

Major Agroforestry practices in the district were boundary plantation, homestead plantation, backyard, live fence, road side/wind break, dispersed trees in the farm, trees and shade trees.

Table 1. Farmers' preference of agroforestry trees

| Farmers preferred tree species | Indigenous | Exotic | Purpose | Source of seed /seedlings | Constraints |
|--------------------------------|------------|--------|---|--------------------------------|---------------------|
| <i>Cordia africana</i> | X | | Timber furniture making, soil fertility, shade for coffee | Self-regeneration | |
| <i>Hygenia abyssinica</i> | X | | Timber, wood, Indigenous pharmacycal value | from mother tree in the farm | Limited seed source |
| <i>Milletia ferruginea</i> | X | | Shade fertility improvement | regeneration from fall of seed | |
| <i>Syzygium guineense</i> | X | | Construction of home | Mother trees | It is slow growing |

3.2.8. Communal Natural Resource Management

The major communal natural resource in area incudes wet lands and grazing lands. In addition to free grazing, some farmers implement cut and carry systems in order to manage the grazing lands. Some farmers try to manage wet lands to drain through making ridges. Farmers have by-laws to manage and utilize communal natural resources.

3.2.9. The way forward

Based on the above results

- Researches and trainings on soil fertility improvement works
- Demonstrations and researches on introduced soil and water conservation practices.
- Researches on adoption of SWCs
- Trainings and researches on afforestation and reforestation
- Researches on valuation of forest products
- Research on how rehabilitate engendered tree species
- Researches on bamboo and other trees disease management
- Research on forest tree poor regeneration

These are the ways forward recommended among others to be undertaken to enhance sustainable natural resources management in the study district.

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