

A CASE STUDY OF PLANT BIODIVERSITY AND SOME SOIL CHARACTERISTICS AT THE CLOSED OBOTAN GOLDMINE MANSO NKRAN, AMANSIE WEST DISTRICT

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ABSTRACT

This study was on the floral biodiversity and some soil characteristics at the closed Obotan Goldmine. It was carried out through the administration of questionnaires to selected local participants and deliberate field sampling of plants using 20m x 20m quadrants each with 1m x 1m subplots. Within the subplots, soil samples were collected at depths of 0-15cm and 15-30 cm from each of the seven selected sites: Waste dump (slopes one and two), Tailings dam, ROM pad, Plant site (Crusher site), Union Espanola de Explosives (UESS) plant site (Agro forestry site) and a portion of the remnant secondary forest regrowth. The soil samples were analyzed in the laboratory for pH, organic carbon, ammonium nitrogen, nitrate nitrogen, total nitrogen, available phosphorus, available potassium, calcium, magnesium, Cation Exchange Capacity, sand, silt and clay.

Response to questions during the survey indicated that respondents perceived reclaimed mine lands to be unproductive for farming; and mining was viewed to be very destructive to the environment. Most of the participants indicated that they had not benefited from the mining activities. Majority of the respondents in this study had no knowledge of environmental laws in Ghana.

One hundred and thirty-one (131) plant species belonging to Forty-nine (49) plant families were identified during the deliberate field sampling of vegetation. There were more plant species belonging to the Leguminosae family (15) in all the sites except the Agro-forestry and tailings dam sites where the Euphorbiaceae (7) and the Graminae (6) dominated respectively.

Twenty-six families (amaranthaceae, anacardiaceae, bignoniaceae, bombacaceae, bromeliaceae, boraginaceae, caesalpiniaceae, cyperaceae, connaraceae, dichapetalaceae, davalliaceae, ebeneceae, labitae, lecythiadaceae, lauraceae, myristicaceae, myrtaceae, menispermaceae, melastonataceae, pandanaceae, palmae, passifloraceae, scrophulariaceae, sapotaceae, tiliaceae and zingiberaceae) were each represented by only one specie.

Elaeis guineensis was the only species that was common to all the sites. Each site had peculiar species. The remnant secondary forest regrowth had twenty-one (21) species (*Blighia welwitschii*, *celtis mildbraedii*, *Daniella ogi*, *Diospyros barteri*, *Drypete chevalieri*, *Ehretia trachyphylla*, *Lannea*

welwitschii, *Khaya ivorensis*, *Mezonneuron benthamianum*, *Nesogordonia papaverifera*, *Parkia biglobosa*, *Petersianthus macrocarpum*, *Piptaneniastrum africana*, *Pycnanthus angolense*, *Olyra latifolia*, *Sida cordata*, *Strophanthus hispidus*, *Trichilia mondelpa*, *Trichillia tessmanii*, *Trilepsium madagascariense* and *Zanthoxylem xanthoxyloides*) whereas the tailings Dam had thirteen (13) species (*Adenia lobata*, *Aframnum spp*, *Albizia lebbeck*, *Alstonia boonei*, *Brachiaria spp*, *Dioscorea dumentarium*, *Entandrophragma angolense*, *Euphorbia heterophylla*, *Euphoria hirta*, *Gossypium aboreum*, *Panicum laxum*, *Scoparia dulcis* and *Tridax procubscens*). Furthermore, two (2) species (*Capsicum spp* and *Pesea Americana*) were peculiar to the Agroforestry site whereas five species (*Ipomoea biloba*, *Landolphin spp*, *Morinda lucida*, *Mussaenda erythrophylla* and *Pandanus candelabrum*) were peculiar to Waste Dam (slope one). The Rom pad site had six species (6) (*Citrus sinensis*, *Cochonis aestuans*, *Dioscorea alata*, *Dissotus rotundifolia*, *Panicum subcordata* and *Synedrella nodiflora*) and the Watse Dump slope two site had four (4) species (*Ocimum gratissimum*, *Physalis angulata*, *Pupulia lappacea* and *Spigelia anthelmia*).

Cassia siamea, *Chromolaena odorata*, *Leucaena glauca*, *Paspalum spp* and *Sida acuta* grew on all the sites except the remnant secondary forest regrowth. Soil analysis indicated that there were no statistically significant differences in $\text{NH}_4^+ \text{-N}$, $\text{NO}_3^- \text{-N}$ and potassium at both 0-15cm and 15-30cm depths. The total mean values of the nitrogen content of the soils from the 0-15cm depth at all the sites were also not significantly different. Soil pH, organic carbon, phosphorus, calcium, Cation Exchange Capacity levels and particle size were all statistically significant at both the 0-15cm and 15-30cm depths among some sites.

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