

The mulberry plant (*Morus alba*), tool for combating desertification the experience of the sericulture promotion and development association (Ghana)

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ABSTRACT

Desertification may be defined as the loss of fertility of the land in semi-arid and sub-humid regions of the world.

Its causes are broadly categorized into natural and anthropogenic and includes soil erosion (wind, water), soil exploitation (nutrients depletion), salination (primary and secondary) and others including soil compaction, contamination, etc.

Desertification is on-going in all parts of Ghana but it is quite extensive and more visible in the north, upper-east and upper-west regions of the country. This area is desert prone and is in the guinea savannah agro-ecological zone. It occupies about 40% of the total area of the country. The desert prone region otherwise termed as semi-arid Ghana is located between latitude eight degrees north and eleven degrees north of the equator.

The mulberry believed to be a native of India or china is said to have originated on the lower slopes of the Himalayans. It is a perennial tree from the genus morus. It is a fast growing plant and it is suitable for afforestation of marginal zones and can be planted on slopes which are subject to water erosion and other meteorological factors and in soils poor in nutrients and water.

The sericulture promotion and development association, Ghana was incorporated under the companies code of Ghana 1963 (act 179) to introduce, develop, and promote sericulture in the country. The members of the association rear silk worms on mulberry leaves to produce cocoons from which silk yarn is reeled or unwound for weaving into silk fabric.

Because of the unique characteristics of the mulberry which make it a promising tree for desertification control, the association is planting it in the semi-arid areas to control desertification and also using it to reclaim lands degraded through mining activities.

INTRODUCTION

On 6th March, 1957, the Gold Coast was declared an independent state, the first of the British Colonies in Africa to achieve independence. The Gold Coast was then renamed Ghana.

Ghana has a population of twenty-two (22 million) and comprises ten (10) regions and 170 districts. About 75 percent of the population is rural.

Ghana lies at almost the centre of the countries along the Gulf of Guinea . The country is 672 km long and 536 km wide, with a total area of 239,460 sq. km.

Agriculture is the mainstay of the Ghanaian economy. The agricultural sector supports about 70 per cent of the total population economically through farming, distribution of farm produce and provision of other agricultural related services. It accounts for about 42% of GDP. Throughout the country, rainfall is the principal determinant of cultivation.

SERICULTURE

Sericulture is an agriculturally-based self-employment rural industry with enormous potential for generating employment and improving socio-economic conditions of rural people. It is an important tool for poverty alleviation, rural development and environmental replenishment.

Activities in the Sericulture Industry

Sericulture involves four distinct phases of activity, namely:

- the cultivation of a host plant (i.e. mulberry) whose leaves are fed to silkworms.
- the rearing of silkworms for the conversion of mulberry leaf into silk cocoons
- reeling or unwinding of the raw silk from the cocoons
- the weaving of the silk yarn into silk fabric.

The Sericulture Promotion and Development Association, Ghana

The Sericulture Promotion and Development Association, Ghana is a non-profit company limited by guarantee and incorporated under the Companies Code 1963 (Act 179) by the Registrar of Companies in Ghana on the 27th May 1994 to introduce, develop and promote sericulture and the silk industry in the country to among others, create employment, generate income and diversify the country's agriculture, industry and export base.

DESERTIFICATION

Desertification may be defined literally as the loss of fertility of the land in semi-arid and sub humid regions of the world. However, the United Nations Convention to combat Desertification adopted in June, 1984 defines "DESERTIFICATION" as "Land degradation in arid, semi-arid and dry sub humid areas which is caused by a variety of factors, including climatic changes and human activities." The convention also defines land degradation and process of desertification as follows: "Land" includes soil, local water resources, land surface and vegetation or crops.

"Degradation" implies reduction of resources potential by one or a combination of processes acting on the land, and these processes include water erosion, wind erosion and sedimentation by these agents, long-term reduction in the amount or diversity of natural vegetation where relevant, and salination and sodification.

Causes of Desertification

The causes of desertification may be broadly categorized into two as follows:

- a. Natural causes such as drought, heavy downpours, etc.
- b. Anthropogenic (that is man-induced or man-made) causes.

DESERTIFICATIONS PROBLEMS IN GHANA

Desertification in Ghana:

In Ghana desertification is going on quite extensively in all parts of the country. However, it is most visible and severe in the Guinea and Sudan Savanna zones. Politically it comprises the

Northern, Upper East and West regions of Northern Ghana. These regions are subject to high-level desertification which threatens about 40 percent of the total area of the country.

Anthropogenic causes of Desertification in the Savanna Areas of Ghana

Man induced or man made causes of desertification are varied and may or may not depend on natural causes. The causes, most of which are inter related, may be itemized as follow:

- Continuous cropping and mismanagement of the soil.
- Land fragmentation, which results in unavailable production units.
- Tractorization
- Overgrazing
- Bush fires
- Lack of protection of water bodies
- Over-and / or mis-exploitation of natural resources
- Socio-economic and political (ie. non-technical) causes

Generally, the effects of Desertification in Ghana may be summarized as follows:-

1. Loss of the natural vegetation cover:

Loss of the natural vegetation cover resulting in scarcity of timber and non timber produces such as medicinal plants, fuel wood, handles for agricultural tools, thatch grass, rafters and poles, indigenous fruits and vegetables, bush meat, and drying up of natural sources of water.

2. Loss of soil and soil fertility

This includes loss of top soil and soil fertility, the economic effects of which are declining crop yields, food scarcity and increases rural poverty. The loss of some of the plants in the natural vegetation also narrows the diversity of useful plant species and threatens their adaptation to the changing environment. This further accelerates the process of desertification and the repetitive cycle of poverty and the spiral of land degradation gathers momentum.

MULBERRY TREE (*Morus alba*) FOR DESERTIFICATION CONTROL IN GHANA

The Mulberry Plant (*Morus alba*)

The mulberry tree (*Morus alba*) is believed to be a native of India and China. It is also said to have originated on the lower slopes of the Himalyans.

Mulberry is a hardy, perennial and deep rooted plant that grows under adverse climatic and physical conditions (ie.from cool temperatures to humid tropical areas, arid zones, marginal to highly fertile soils).

The Relevance of the Mulberry Tree to the Savanna Agro-Ecological Zones

In Ghana every part of the tree is seen to be of economic importance and is used.

Apart from using the leaves of the mulberry to feed silkworms, the plant is used for a variety of purposes, viz provision of medicine, fuel wood, fodder for ruminants, food for human beings and wood for furniture.

Use of Mulberry for Reclamation of Degraded Lands

In some mining communities e.g. Prestea the mulberry plant has been successfully used to reclaim parcels of land degraded through mining activities. In Prestea in the Western Region of Ghana, two acres of degraded land through the activities of the Bogosu Gold Limited has been turned into a mulberry forest.

Mulberry as Fuel Wood

In Ghana, wood is the major source of domestic energy for most people and represents about 80% of total domestic energy. The effect of the huge dependence on fuel wood for domestic energy which results in high cost of fuel wood continues to be responsible for widespread desertification and poverty in the dry lands of Ghana.

The mulberry is an energy plant suitable as a renewable energy source. The mulberry tree produces large quantities of renewable biomass in the form of branches, shoots, leaves and fruits. One hectare of mulberry garden yields up to 20-302 tonnes per hectare per year of green leaf and 4 tonnes of mulberry sticks. The energy generated per hectare is 28,000 kcal, and mulberry wood releases 4,600 calories per kg (China Swamy and Hari Prasad, 1995).

Mulberry In The Small Scale Wood Industry

Mulberry wood is used for furniture, carvings, toys making and agriculture implements. The use of mulberry wood reduces the pressure on our forests.

Potential Of Mulberry In Agro-Forestry Systems For Desertification Control

In Ghana, in the first year of the establishment of a mulberry farm, it is inter cropped with maize, cassava, cowpeas and vegetables such as okro and garden eggs.

The Use Of Mulberry Plant In Combating Desertification

Mulberry is suitable for afforestation projects and reforestation of marginal zones and can be planted on slopes which are subjected to water erosion and other meteorological factors and in soils poor in nutrients and water, since its roots can go rather deep into the soil. Some cultivars are salt tolerant, resistant to the most common fungal diseases and to extreme water scarcity. (Grekov, Kipriotis and Tzenov, 2005)

CONCLUSION

There is clearly an urgent need to create awareness at all levels with regards the problem of desertification which is going on in virtually all parts of Ghana. Some of the causes are anthropogenic and thus can be tackled.

Serious research on desertification is yet to be on the agenda of researchers in Ghana. There is therefore the need for government to support researchers to carry out research on desertification.

Poverty, lack of land policy, weak institutional capacity and inflexible traditional land tenure system are some of the factors which destroy the ecology. There is an urgent need for the government to have political will to address these problems.

The author wishes to recommend the setting up of a National Desertification Fund to access funds to NGOs, Community-Based Organizations, Farmer Based Organizations and local communities to embark on desertification control exercises.

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