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**Section A: Environmental Science**

Review Article

## Unfavorable Influences on Natural forests at Refugees Camp in Qala Elnahal Locality, Gedaref State

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**Abstract:** The settlement of refugees in the area created an environmental problem such as the misuse of natural forests, extensive cultivation, continuous cutting down of trees to satisfy their basic needs for energy and removal of trees from land for cultivation and housing purposes. The objectives of research consist of estimation of the area cleared from forests, the numbers of trees cleared, and the consumption of firewood and charcoal and to suggest suitable recommendations to minimize the environmental degradation in the area. The methodology depends on using the archival methods done by the legal authorities for calculation of the total area cleared, removal of trees, consumption of firewood and charcoal. The results explained that the total area cleared for settlement and agriculture are equals to 14290 ha while the total trees cut down for housing and renovation, agriculture, settlement, firewood and charcoal were equals to 24844320 trees. On the other hand the total consumption of firewood and charcoal were equals to 331800 cubic meters and 3981600 sacks of charcoal respectively. The results explain the scale of environmental degradation in the natural forests is grieved to anyone who loves the nature.

**Keywords:** Agriculture, Area, charcoal, firewood, and housing.

## INTRODUCTION

During the civil war in Ethiopia between the government and Eritrian resistant groups more refugees fled to the Sudan for security, food and fodders for their livestock. As a result six refugees camps established in 1969 in Um Sagata, Um Zarzur, Um Brush, Salmin, Dehema and Adingrar<sup>1</sup>. The camps were established in area of 6900 ha. Um Sagata camp was in the center of the whole camps. The distance from Um Zarzur camp to Um Sagata camp is about ten kilometers (Km) to North, Um Brush is about eight Km to west, Salmin is about eleven Km to North, Dehema is about five Km to South west and Adingrar is about six Km to South west. Qala ENahal Refugees camps were established in 1969 and repatriated in 1999 and half of Salmin and UmSagata refugees camps return again to their settlements<sup>2</sup>. The total population in the six refugees camps were about 27650 and the households are 5530 and the rate of growth is not included. The Ethnic Compositions are Asaurta, BeniAmer, Baria and Marya<sup>3</sup>.

The land allocated for agricultural was about 23750 ha ( 4.2 ha for each family). The area of the camps was covered by dense vegetation. The natural forests are endowed with different trees, shrubs and tall grasses. The dominant such as *Acacia seyal* and *Acacia senegal* associated with other trees like *Acacia mellifera* and *Balanites aegyptiaca*. Also the mountains scattered in the area were covered with species of *Boswellia paprefra*, *Ficus cycomrus*, *Sterculia sitigra* and *Compretum hattmanii*. The average rainfall is between 450-600 mm annually<sup>4</sup>. The activities of refugees concentrated on cultivation dura, sesame and herding.

The land was cleared from trees for housing, agriculture, building materials and cutting down of trees for fire wood and charcoal. The huts were built from *Acacia seyal* (talih) trees and renovated each five years, because the woods are damage by termites and wood bores<sup>5</sup>. Refugees collected firewood and made charcoal to satisfy their needs for energy from the natural forests near the camps even the trees on the hills and Khors. They used traditional stoves such as mangad, tri- stone ladaia for cooking as reported by the Manger of refugees in Sefawa camp<sup>6</sup>. The director of forests at State level in Gedaref reported that the Refugees Settlement Administration established small plantations around the camps with an area of not more than 615 ha. The native population who settled in the area depend on their energy and building materials on those plantations. He added the agricultural lands allotted for refugees were distributed to native population after the refugees were repatriated to their country of origin.

The National News of Jakarta<sup>7</sup> said that: according to official records, the refugees have just destroyed, among other areas, 450 hectares of protected forest in the village of Kateri, Malaka Barat district, 50 hectares of forest in the village of Bipemnasi Swamohok, Kota Atambua district, and another 12 hectares of forest in Selim Kovalima district.

## RESEARCH PROBLEM

The settlement of refugees in the large numbers in the study area has led to the damage of the ecosystem in the area. This was done through their different activities represented in continuous cutting down of trees to satisfy their needs from energy, clearing land from trees for cultivation and housing. These factors collectively have contributed to disappearance of large area of forests, the trees on the hills were also cut down and became like (a head of bold man). The cultivation lands became infertile and give low yields. The grasses in the area have also disappeared due to extensive grazing. These unfavorable conditions compelled the native population and refugees to go as far as distance to the Ethiopia border to collect their

building materials and energy. On the other hand their livestock also cover go long distances to find suitable grazing lands.

**Research objectives:** The objectives of research are as the follows:

1. To estimate the area cleared from trees for settlement and agriculture.
2. To assess the number of trees removed from the land.
3. To find out the consumption of firewood and charcoal.
4. To suggest recommendations to minimize scale of degradation in the study area.

## METHODOLOGY

In order to assess the degraded area, removal of trees and the total consumption of firewood and the use of charcoal the following methods were used:

### (a).Archival methods:

- The average of one hectare (ha) of natural forest in East, West and South of Gedaref State which contains 720 trees<sup>8</sup>.
- An area allocated for housing per family<sup>9</sup> is estimated at 0.13 ha.
- Each family is allotted three huts and to be renovated every five years<sup>5</sup>.
- An area allotted for agriculture was about 4.2 ha per family<sup>9</sup>.
- Number of trees cut down for building one hut was 60 trees<sup>5</sup>.
- Two cubic meters of firewood is the consumption of a household every year<sup>9</sup>.
- One ha of a land produces 168 cubic meters of firewood<sup>9</sup>.
- Each family of refugees is supplied with two sacks of charcoal per month<sup>6</sup>.
- One cubic meter of woods produces three sacks of charcoal<sup>8</sup>.

**(b).Interviewed method:** The officials in charge of forest and stakeholders in Qala Elnahal locality people were interviewed to collect the relevant information for the study.

## RESULTS AND DISCUSSION

### 1. Area cleared from trees:

**1.1 Area cleared for camp settlement:** The results explained that, the total areas cleared for settlement was equals to about 719 ha, if you multiply 5530 families' x 0.13ha/family. Then the number of trees cleared for settlement was equals to 995400 trees, which are 16590 huts x720 trees/ha. The calculation applied according to the method of Tom<sup>8</sup>.

**1.2 Area cleared for agriculture:** The total area cleared for agriculture was 13571 ha, when you change the area into trees removed from the land for agriculture was equals to 9771120 trees, when you multiply 13571 ha x 720 trees/ha. This is the same as reported by the National News of Jakarta<sup>7</sup>.

### 2. Cutting down trees:

**2.1. Cutting down trees for building huts:** Each household is allotted three huts. The total huts built were equals to 16590 huts. This was obtained when 5530 families multiplied by three/huts/family. Then the number of trees cut down for housing was equals to 995400 trees that is (16590 huts x 60 trees/hut).

**2.2. Cutting down trees for huts renovation:** The huts are renovated every five years because the wood is affected by termites and wood borers. The total huts renovated were equals to 99540 huts that is (16590 huts x 6- fold increase). If you calculate the total number of trees cut down for renovation it will give the equivalent of 5972400 trees (99540 huts x 60 trees/ hut). UNHCR and FNC<sup>5</sup> archives are used.

### **3. Consumption of firewood:**

Each family consumes two cubic meters of firewood every year. The total consumption of firewood is equals to 331800 cubic meters, if you multiply (5530familiesx 12yearsx2 cubic meters).Using the archive of COR<sup>9</sup> as reported. When the consumption of firewood is changed into trees the result is 1422000 trees (331800 cubic meters divided by 168 cubic meters /ha and multiplied by 720 trees /ha).

### **4. Consumption charcoal:**

The total consumption of charcoal was equals to 3981600 sacks of charcoal, which is (5530 families x two sacks/family/month x 12 months x 30 years). When change we the consumption of charcoal of removal trees the result is 5688000 trees. This is obtained by (3981600 sacks divided by 3 sacks/ha and 168 cubic meters/ha and multiplied by 720 trees/ha).

The result revealed that the total area cleared for housing , agriculture, cutting down trees for firewood and charcoal were 719 ha,1371ha,110600ha and 7900 ha respectively, which is equals to 120590 ha. While the trees cut down for agriculture, building huts, renovation the huts , firewood and charcoal were 9771120 trees, 995400, 5972400 ,1422000 and 5688000 trees respectively, The total trees removed from the area were 24849320.The area damaged by refugees is greater than the area planting by Refugees Settlement Administration, that is (1 to 6).This indicates that, plenty of trees were damaged by refugees. Mohamed<sup>10</sup> said that the deforestation caused by refugees, recently has caused some problems, for example it has become difficult for people to get building materials, and firewood and desertification become real problem. Also the elders of the community<sup>2</sup> interviewed, said that the refugees had converted the forests into agricultural land so as to anticipate a possible shortage of food because they were depended on themselves when the humanitarian agencies stopped their food distribution to the refugees.

## **CONCLUSION**

The results show that the natural forests were subjected to heavy damage caused by the settlement of large numbers of refugees in the area. The malpractices of refugees have led to deterioration of the environment. The agricultural land gives low yield due to extensive cultivation and over grazing. Wildlife escaped to the border of Ethiopia. The land and hills become naked, ugly scenery, decertified and the forest products are unavailable. Before the settlement of refugees, the area was famous for honey production, but now honey is rarely found in the area. Because the bees have migrated to the area with abundance of vegetation cover, where the flowers and inflorescence are available.

## **RECOMMENDATIONS**

The study has come out with following recommendations:

1. The refugees' camps area should be established after advanced study to avoid the fragile forest areas such as hills, depressions and khors.
2. Raise the environmental awareness to decrease the damage that may occur around the area settled by refugees.
3. Establish large plantations in refugees' areas to provide them with the necessary building materials and fuel wood.
4. Control the cutting down of trees in refugees' settlements area.

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