

Community Participation in Reforestation El Rawakeeb Area

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Abstract – Sudan suffers from desertification, and its magnitude became more pronounced specially after the secession of its wet southern part to an independent country. In desertified areas, the role of Sudanese communities and their knowledge in natural resources management and food security become very crucial. They are usually ranked among the poorest of the poor and thus suffer from problems of sustainability of resources to sustain their families.

This study was based on survey of El Rawakeeb area and informal seminars A case study was carried out at El Rawakeeb Dryland Area “latitudes 15° - 2° and 15° - 36° N and longitudes 32° -0° and 32° – 10° E”. The system of land use is mainly pastoral except in low lands where traditional agriculture is practiced.

The aim of the paper is to reflect the participatory of the community to reforestation program in desertified area El Rwakeeb where seedling of different species distributed to the community *Acaicas*, *Azaderetica indica*, *Albizia lebbek*, *Conocarpus lancifolius*, *Pithecellobium dulce* *Eucalyptus* spp. *Lawsonia inermis* and *citrus limonum* *Risso*, according to the preferences of the community, informal seminars on some technologies applied to control desertification such as nursing of seedling and the change of the microclimate extension activities on desertification cause and effects; monthly visits was done to observe the growth of the seedling, and questioner was distributed to show the willing of the community to participate in afforestation program. The study revealed that 90% of the respondents affirmed that, water availability was a constraint to community participation in afforestation, 100% of the respondents mentions that, they prefer using water for domestic activities such as cooking and washing rather than used it in irrigating trees probably, these problems were related to Water Scarcity in arid lands, According to the survey. 90% of the respondents prefers plantation program, where only 10% didn't prefer plantation program they desire another development program (Basic Services - Infrastructure) like school, hospital, etc... From the survey, the results revealed that 68 % of the respondents prefers the citrus and Mango than other trees (shade). 32% favoring shade tree than productive they believe that productive trees need extra water for irrigation. This study provides evidence for the a strong positive relationship between community participation and the benefits that communities obtained from the afforestation projects, also results indicated that, there was a positive relationship between community participation in afforestation projects and environmental degradation.

Keywords – Arid Lands, Reforestation Programme, Rural Women, Community Participation.

I. INTRODUCTION

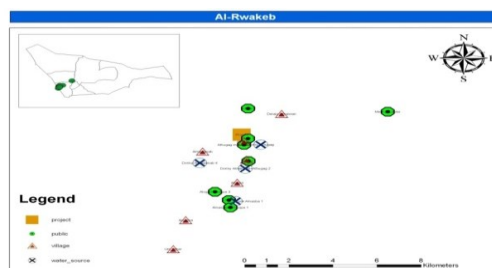
Sudan is particularly concerned with the impact of climate change as the majority of its land is quite vulnerable to changes in temperature and precipitation as well as to extreme climatic conditions such as floods and droughts that have occurred throughout its recorded history [4].

Sudan is characterized by different climatic zones ranging between hyper arid in the northern part to the dry sub humid in the southern part. In Sudan, desertification is regarded as the first environmental threat that poses a real constraint to achieving sustainable development. It is caused by climatic and human factors. The combinations of these factors produces a fragile ecosystem, developed under harsh and fluctuating climate and human activities, some of which are increased to an irreversible magnitude by weather fluctuation, especially drought [9].

II. EL RAWAKEEB VALLEY

El Rawakeeb valley (414 Km²) is located in the south western part of Khartoum at about 40 kilometers “latitudes 15°2' and 15°36' North and longitudes 32° 0' and 32°10' East, it is one of the decertified areas in Sudan. It suffers from degradation of natural resources (plant cover, soil, water and biodiversity) [11].

The residents also face sand encroachments, low rainfall and high cost of ground water exploitation, in addition to the high prevalence of poverty and illiteracy. In this valley, there is only one basic school and a small health clinic [6]. There is neither electricity supply nor water pipes. They have only four wells distributed in the valley. The water of these wells is usually sold to them depending on the quantity each household needs [7].



Map 1: El Rawakeeb Valley

Afforestation has been identified as one of the appropriate technique to combat desertification and desert encroachment, the problem is related to the ageing of the tree population as a result of overgrazing of young seedlings, which impedes the natural regeneration of trees. Over mature trees progressively lose their resilience to climatic stress, so that a single climatic event can destroy a whole area of forest. At present, tree planting is being recognized as a sector which is a key to any afforestation strategy of long-term development [3].

Participation can provide tremendous advantages for development programme. Involvement of local people helps to ensure that the programme will esteem local cultural values and will be continually oriented towards the people's felt need [13].

Community Participation Approaches

Community participatory approaches to development are one of the vital instruments by development agencies to reach and assist rural communities in developing nations. Effective participation begins with participatory efforts being developed as a process to fit the rhythms of local communities and within a time frame long enough to ensure continuity [12].

III. OBJECTIVE

This present, study attempts to validate the level of perception, participation and empowerment among the participants in afforestation programme in El Rawakeeb valley area.

IV. MATERIALS AND METHODS

Materials

Sample: In El Rawakeeb valley there are seven small villages, constituting a total of 850 households living in this area, they belong to two main tribes, the Jamuia and the Hawaweer [10]. The total population is estimated to be about 3900 residents among them 800 respondents involve to plantation.

This programme is extended program starting in 2006. Now we are in second phase. In the first phase, 800 seedling were distributed to the house hold which they prefer afforestation programme. Currently in the second phase, 1350 were distribute to reach the total of 2150 distributed seedling, different data collection methods were used which includes:

1. Questionnaire: use to collect information about the respondents and their perceptions towards the afforestation program.
2. Seminars: Informal seminars on some technologies applied to control desertification, such as nursing of seedling and the change of the microclimate due to afforestation extension activities on combating desertification cause and effects.



1



Plates 1 & 2: Seminars, source ENRDRI, 2015

2

Methods

1. Register the community group that they would like to participate in afforestation program.
2. Seedling of different species distributed to the community include; Acacias, Azaderetica indica, Albizia lebbek, Conocarpus lancifolius, Pithecellobium dulce Eucalyptus spp. Lawsonia inermis and Citrus limonum Risso



3



4

Plates 3 & 4: Distribution of the Seedlings, source ENRDRI, 2015

1. Monthly visits were made to monitor the growth of the seedlings.



Plates 5 & 6: Monthly visits, source ENRDRI, 2015

Table I. List of Trees at El Rawakeeb area, Sudan:

Trees Planting	Number
Acaicas	250
Azaderetica indica	250
Albizia lebbek	200
Conocarpus lancifolius	200
Pithecellobium dulce	200
Eucalyptus spp	500
Lawsonia inermis	150
Citrus limonum Risso	400
Total	2150

Source : ENRDRI, 2015

V. WATER SCARCITY IN EL RAWAKEEB AREA

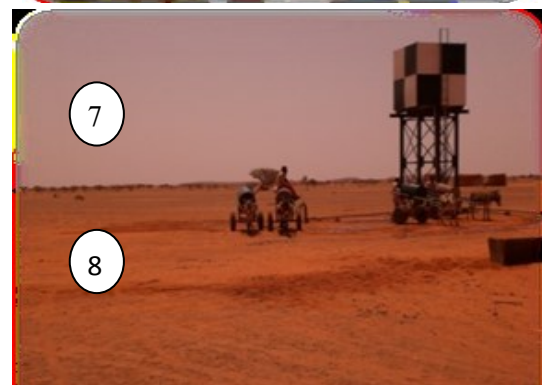
Availability of water – surface water, groundwater and air moisture – is usually the main factor limiting natural distribution of trees in arid lands, along with climate (rainfall, temperatures, wind) and soil quality. The study shows that 90% of the respondents affirmed that, water availability was a constraint to community participation in afforestation, 100% of the respondents mentions that, they prefer using water for domestic activities such as cooking and washing rather than used it in irrigating trees.

Wadi Al rawakeeb is one of the desertified areas in Sudan. It suffers from degradation of natural resources (plant cover, soil, water and biodiversity) [10]. The residents also face sand encroachments, low rainfall and high cost of ground water exploitation. They lack basic services such as safe water supply and electricity. In

addition to the high prevalence of poverty and illiteracy. Generally, the information on the magnitude of the problems of poverty and desertification in Sudan needs to be highlighted in many ways especially those concerned with the horrible health and nutritional conditions of children. These are not only reflecting the present situation but could also have a significant negative impact on their future.

There is neither electricity supply nor water pipes. They have only 4 wells distributed in the valley. The water of these wells is usually sold to them depending on the quantity each household needs.

The only water sources for this population are wells which are located as far as between to kilometers. They have to buy water everyday. Each family spends daily about 1-2 SDG. This price is very high bearing in mind that their incomes were very low. This probably increases the risk of consuming unclean water and may also limit their other usage of water causing reduced sanitary conditions and poor hygiene, which were known to be one of the strongest factors leading to diarrheal diseases and malnutrition among the under five children and consequently their death [14].



Plates 7 & 8: Water Scarcity source DRI 2011 and ENRDRI, 2015

Interviews

Interviews were held with local community to transfer seedlings plantation knowledge via training of community to the methods of plantation and seedling nurse.

Training

Women to restore plant cover by planting seeds suitable to be grown in desert environment and prepare seedlings in nursery as follows:

1. Seeds of *Acacia mellifera*, *Acacia sayal*, *Acacia nubica*, *Acacia tortilis*, *Eucalyptus* sp. and *Conocarpus iancifolius* were planted at RDLRS nursery.
2. Transfer seedlings after hardening to be planted as shelterbelts where seedlings of *Acacia* species were planted in three rows followed by two rows of *Eucalyptus* sp. and *Conocarpus iancifolius* seedlings.
3. Distribution of Gas cylinders with cookers as alternative fuel source. Gas cylinders and cookers were provided by DRI in collaboration with the National Authority of Forestry.
4. Simple technologies applied to control desertification resulted in cultivation of *Acacia mellifera*, *Acacia sayal*, *Acacia nubica*, *Acacia tortilis*, *Eucalyptus* sp. and *Conocarpus iancifolius* seeds RDLRS nursery by the local community. They also, transferred seedlings after hardening, to be planted as shelterbelts. The local community has participated successfully in growing seeds in the nursery and transferred the seedlings to construct the shelterbelts. This activity assists in restoring plant cover and induces positive environmental effects, where sand creep is significantly reduced. The results of [2] indicated that the construction of shelterbelts revealed that the wind speed was reduced significantly and thus made the sand movement decrease.
5. The action of cutting trees and shrubs in RDLRS by the local community is greatly influenced the plant cover in the area. According to [1], most of the local community at RDLRS use wood for cooking and very few use it for lighting, whereas, the majority of them use wood for both cooking and lighting. [10] indicated that 100% of local community used gas cookers and 27% of them replaced them with potages as gas cookers are easy to use and save the time expended to collect fuel wood. They have no effect on health as they do not produce smoke and reduced tree cuttings efficiently. Gas use help local community to save time and efforts to collect fuel wood and has no effect on health as it does not produce smoke and reduce tree cuttings efficiently. The use of gas technology has benefited the country in improving health, environment, and the economy and energy conservation [10].



Plates 9 & 10: Interviews, source ENRDRI, 2015

VI. DIRECT OBSERVATIONS

Visiting of each planted tree and taking observation of valuation for the evaluation of the tree growth.



Plates 11 & 12: Direct Observations, source ENRDRI, 2015

Women's Participation

Empowering women's participation in reforestation efforts and improvement of the welfare of the rural women in El Rawakeeb Area is the second rationale of this study.

Empowerment

Considered being as the right to influence direction of change through control of material and non-material resources, [5]. Within these approaches technology as one of the main resources to promote women empowerment has taken different roles that range from a tool to help women in their work to a tool that enhance women skills and resources approaches.

Reasons for Choosing Women

Some of these activities carried by women to sustain family have adverse environmental such as cutting wood from trees and grazing animals which intensify desertification process.

Women are the ones who face desertification and suffer directly and thus are the ones who accept the idea and can participate efficiently.

Knowledge about desertification cause and effect was greatly improved when oral seminars were conducted. Women were persuaded not to cut trees and also to participate in combating programs. They showed appreciated effort to help researchers in planting trees and preventing animal random grazing. Women also shared their indigenous knowledge with researchers in desert control issues. [8] indicated that many opportunities to increase awareness of the land degradation and empower women are created in order to combat desertification, however the success of these activities varies within communities and depends on the objectives, ambition, determination and interest as well as the relation they possess with the community members in the society.



Plates 13 & 14: Women's Participation, source ENRDRI, 2015

Seminars

The objectives of seminars are to increase the awareness of the community towards reforestation program and motivate the local community to take part in reforestation.



Plates 15 & 16: Lectures, source ENRDRI, 2015

VII. RESULTS AND DISCUSSION

1. Preferences of the Respondents:

Fig. (1) shows that 90% of the respondents prefers plantation program, 10% didn't prefer plantation program they desire another development program (Basic Services - Infrastructure) like school, hospital, etc...

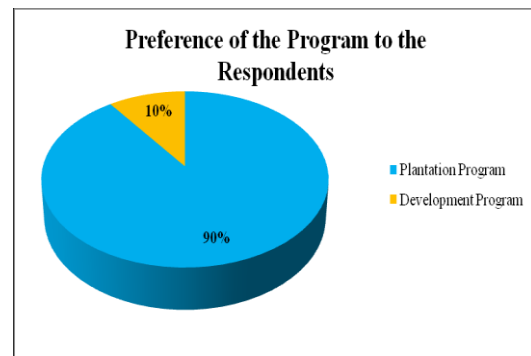


Fig. (1): Preference of the Program to the Respondents

From the survey, the results revealed that 68 % of the respondents prefers the citrus and Mango than other trees (shade). 32% favoring shade tree than productive they believe that productive trees need extra water for irrigation Fig (2).

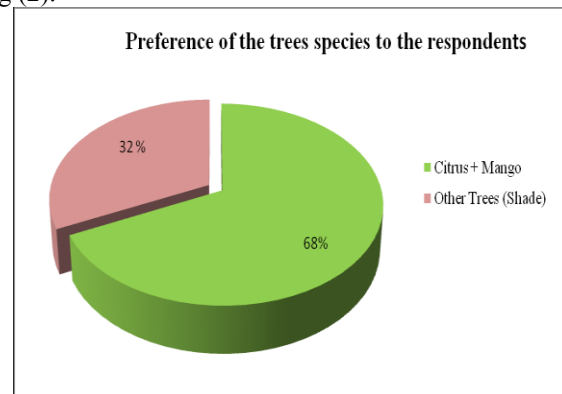


Fig. (2): Preference of the Program to the Respondents

2. Survival of the Trees

From the survey some of the trees could not tolerate the harsh environment.

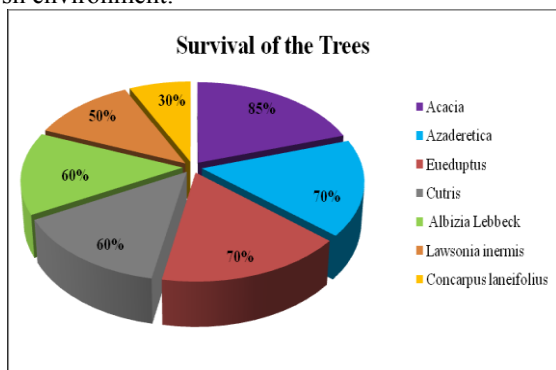


Fig. (3): Survival of the trees

CONCLUSION

The findings indicated that, there was a strong positive relationship between community participation and the benefits that communities obtained from the afforestation projects. The results also indicated that, there was a positive relationship between community participation in afforestation projects and environmental degradation.

For rural area an integrated rural development program (health, education) should be applied.

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