Impact of the Grassroots Participation on Adoption and Diffusion of Improved Onions Seeds at Jebel Marra Rural Development Project, Central Darfur State – Sudan

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ABSTRACT

The study was conducted during the period 2012-2014 at Jebel Marra rural development Project- Central Darfur State, Sudan, for the purpose of learning how much grassroots participation facilitate the adoption and diffusion of agricultural innovations packages (improved onion seeds), as well as to study the impact of personal characteristics on adoption and diffusion of new technology packages within the study population. The study area was divided into three sectors, Zalingei, Wadi Salih and Nyertete. Two hundred farmers were chosen randomly, which constitute approximately 10% from the total targeted IDPs framers in displacement camps due to Darfur Crisis 2003. Descriptive Statistics were used for data analysis. Study showed that two thirds (2/3) of the respondents were in camps and their agricultural lands within the lease systems (rent), which limit women participation in agricultural work. The study also reported that farmers are skilled enough to transfer cultivation and land preparations are increased. The study also showed that farmers are skilled enough to transfer technologies and recommended cultural practices to their others counterparts, including newly acquired knowledge and expertise through their participation in the activities and programs of the Jebel Marra Rural development project. The study recommended that continuation of project financial support is highly needed for updating the principles and the methods of agricultural extension services to encourage adoption and diffusion of improved onion seeds and provide irrigation tools and pest control materials, besides agricultural research funding opportunities to strengthen and guide real integrated rural development.

Keywords: Grassroots participation, improved seeds, adoption and diffusion

1. INTRODUCTION

The Sudan has a great diversity of climatic and agro-ecological zones. The country is also very rich in plant genetic resources. However, these plant genetic resources are subject to erosion. This is due to the expansion of mechanized agriculture in the rain-fed lands of Central, Eastern and Western Sudan. Efforts to collect and utilize the genetic resources of vegetable started in the mid-1960s, led by individual plant breeders. In 1982, collaboration started between International Board for Plant Genetic Resources (IBPGR, Italy) and the Agricultural Research Corporation (ARC) of the Sudan in collecting and conservation of germplasm (cells) of horticultural crops, including vegetables. Exploration and collection visits were organized to parts of Central and Eastern regions in 1982 (Hassan et al. 1983), parts of Kordofan and Darfur in 1983 (Hassan et al. 1984) and parts of the Northern region in 1984 (Genieff et al. 1986).

Vegetables are usually produced by small farmers in rain-fed areas, irrigated private farms or big government schemes. Compared with cash crops like cotton and staple food grains, little attention has been paid so far to vegetable production. Therefore, reliable data on the area and production of vegetables are difficult to obtain. With respect to regional distribution, the Central State is by far the most important production area, followed by the Northern State. Production in the remote areas such as Western Sudan is subsistence-oriented.

Agriculture is the backbone of the economy of the Sudan; more than 80% of Darfur community depends on agriculture as the main agricultural activities due to the indigenous and traditional experiences of the community either in rain fed or irrigated agricultural practices.

Onion: (Allium Cepa) is indigenous crops for Darfur community which was introduced to Darfur in about 1940. The rest of varieties introduced as materials (from Sudan) have marked the beginning of extensive production of onion in the country. Ever since the crop has been distributed to the different parts of the country and has now become an important vegetable crop for markets and daily life of people in Darfur region as well as the country. Increasing onion production contributes to commercialization of the rural economy and creates many off-farm jobs (FAO, 2010).

This paper examines the factors which influence farmer’s decision to adopt improved onion seeds as essential part of Agricultural Innovations Packages (AIP) for Jebel Marra Rural Development Project's.
2. RESEARCH PROBLEM

Community participation places the needs, knowledge, and capacities of people at the center of development practice, as well as an understanding of the local context. The strategy for mobilizing development seeks to overcome strong and pervasive limitations inherent in top-down planning, with its reliance on technical and managerial guidance based on universal and standardized approaches (Banerjee and Duflo, 2011). The bottom-up character of participatory development helps promote greater efficiency by integrating local preferences and knowledge, as well as by giving people a greater stake in decision-making and benefit-sharing. It also is more likely to foster greater equity by creating opportunities for a range of stakeholders to engage in the project. The problem of the rural poor in the final instance cannot be solved by anyone but themselves, and all solidarity efforts must be aimed at strengthening their own capacity for independent action (Seth, 1993). Participation is an essential part of human growth that is the development of self-confidence, pride, initiative, responsibility, cooperation, without such a development within the people themselves, all efforts to alleviate their poverty will be immensely difficult, if not impossible.

This process, whereby people learn to take charge of their own lives and solve their own problems, is the essence of development; the word participation has become a catchword (Cohen and Uphoff, 1977). Yet, it can be challenging for project technical and managerial staff to engage as full partners with local communities, even when they heavily favor participatory principles.

Project staff must confront the issue of how best to carry out the project activities, including intended technology transfers and project beneficiary mobilization, within the context and capacities of the people. Participation and partnership can be easier to advocate than to achieve.

3. OBJECTIVES OF THE STUDY

The aim of this paper is to assess the level of grass roots participation in diffusion and adoption process of improved onion seeds in the area of the Jebel Marra Rural Development Project (JMRDP) through:

a. Assessing the level of grassroots participation in the project activities concerning improved onion seeds.

b. Assessing the adoption rate of improved onion seeds in the JMRDP, with emphasis on participation factor.

4. RESEARCH QUESTIONS

The study will explore the following questions:

a. To what extent did the JMRDP used a participatory approach?

b. Is the project truly participatory or still reliant on a top-down approach?

5. RESEARCH METHODOLOGY

5.1 Data Collection and Analysis

The project area was divided into three sectors: Zalingei, Wadisalih and Nyertete, which mostly consist of people residing in camps for internally displacement. A total of 200 farmers, represented about 10% of those who involved in the project, were chosen through stratified random sampling to ensure geographical distribution for the studied group. Interviews with farmers, group discussion, observations, and questionnaire were used for collecting data.

5.2 Study Area

The Jebel Marra Rural Development Project was a major program of rural development in Jebel Marra, Zalingei and Wadi Salih Districts (CDSM, 2012). The administrative attachment of the project has undergone numerous shifts since its start in the 1980s, formerly having been part of South Darfur Province and West Darfur State, and now the whole area of the project located in Central Darfur State. Its land estimated at 90,000 km. The project during the period 198-1992 was funded by collaboration between Government of Sudan and the European Union. It aims to carry out agricultural research, build rural infrastructure and provide extension and community development services with over 40 extension stations. These stations have played a vital role in mobilizing rural community with a level of direct contact that Darfur community had never seen before.

The project site's ecology, which is marked by a diversity of soils, micro-climates, and crops, is influenced by the Jebel Marra massifs (Abduelsalam, 2014). These mountains, volcanic in origin, moderate climate and increase precipitation, particularly on the western slopes.

Rainfall normally occurs from May to September, mainly falling during July and August. Irrigated agriculture is also possible through motorized water pumps as well as traditional hand lifted wells.

Planning for the JMRDP started in the late 1950s, with exploratory field studies underway by 1957.

Further investigations of the region's biophysical and social environments were conducted from the 1960s to the early 1980s before the project was finally launched. The most intense period of the project operation...
occurred from 1982-1992. By the late 1980s, for example, more than 40 extension stations had been created to foster the spread of new agro-technological packages, while an active Monitoring and Evaluation (M&E) Department carried out large-scale surveys to track project performance and to assess farm production trends (JMRDP, 1988). The constraints and challenging which faced the project include drought of the year 1984/85, tribal conflict 1987/89, division of great Darfur into three States in (1994), another tribal conflict 1996/99, shortages of funding after the termination of European Union funds 1992, in addition to the last Darfur disaster in 2003.

6. THE CONCEPT OF INNOVATIONS AND DIFFUSION

Innovations are new ideas, practices, or products that are successfully introduced into economic or social processes. Innovations can take the form of technologies, organizations, institutions, policies, or ideas, and they involve essentially the extraction of economic, ecological, and social value from knowledge. The process of innovation further involves putting ideas, knowledge, and technology to work in a manner that brings about a significant improvement in performance. It is not just an idea, but a workable idea within the particular context. In agriculture, innovations can include new knowledge or technologies related to primary production, processing, and commercialization target, which can positively affect the productivity, competitiveness, and livelihoods of farmers and others in rural families in the area as a packages or one unit of bundles (Abduelsalam, 2014).

Diffusion of innovations has been studied by many disciplines, including anthropology, sociology of various brands, education, medicine, communication studies, marketing, and business administration. Sociologist Everett Rogers’ seminal work on diffusion of innovations (1995) offers a good starting point into this topic. An innovation according to Rogers can be “an idea, practice or object” perceived as new by individuals or groups. Diffusion involves the spatial and temporal dimensions of people communicating to others about the innovation. A technological innovation usually has two components: a hardware aspect (the tool, product) and a software aspect (how to use the hardware). Rogers came up with the innovation adoption curve to describe and classify the adoption of innovation into a number of groups. The basis of this adoption is that different individuals are having various behaviors in adoption. The following are the classifications of adopter’s categories:

**Innovators:**
Those who create or develop an innovation.

**Early Adopters:**
Those willing to take the risk of adopting the innovation.

**Early Majority:**
The next cohort who adopt after seeing the outcome of the initial adopters.

**Late Majority:**
those who adopt only after it has been accepted by the early majority, when issues of risks and costs have been clarified

**Laggards:**
those who are traditional and adopt the change after its acceptance by nearly all

![Rogers Adoption/Innovation Curve](image)

7. PARTICIPATION IN DEVELOPMENT FIELDS

The concept of people’s participation is not a new phenomenon as far as rural development is concerned; it has been talked and written about since the 1950s or even before (Guilt and Shah, 1998; Nelson and Wright, 1995). There is no agreement among planners and professionals about the contribution of community participation to improving the lives of people, particularly the poor and disadvantaged. Some completely dismiss its value altogether, while others believe that it is the ‘magic bullet’, that will ensure improvements especially in the context of poverty alleviation. Community participation has been a constant theme in development dialogues for the past 50 years. In the 1960s and 1970s, it became central to development projects as a means to seek sustainability and equity, particularly for the poor.

Ownership and control of resources have a profound impact on participation in development projects (Mathbor, 1990). Emphasized four areas to be worked toward in a participatory coastal resource management program: greater economic and social equality, better access to services for all, greater participation in decision making, and deeper involvement in the organizing process resulting from the empowerment of people, (Ferrier, 1988).

8. RESULTS AND DISCUSSIONS

The economy of Darfur is largely agrarian. The main crops for food consumption are millet and sorghum, whereas groundnuts, tobacco, vegetables, and watermelon are the main cash crops. Before 2003, the main household food sources were local subsistence agricultural production. The rain-fed season starts in July-August,
weeding operations occur in September-October, and harvesting in November-December or sometimes January. Tombac (chewing tobacco) was a major cash crop. But after Darfur conflict, Tombac cultivation has declined dramatically (Hein, 2007). Endogenous varieties of onion Varieties are Furaya, Falatia in (Darfur) and kosti, Sigau-red and Kamlean-yellow all over the Sudan. Improved Onion Varieties Introduced was Bafteam Yamani and Americani. Before JMRDP, onion cultivation was practiced only by women in very small piece of land and not commercialized.

The study revealed that the project has successfully improved agricultural crops productivity mainly onion, through provision of credits and agricultural inputs. Agricultural extension services contributed positively in diffusion and adoption of innovations which observed in the project area which cultivated by onion. If we make comparison between current project and the former project, the present one is also successful in terms of technical performance, to adapt with local situation through the long run of the Project cycle from its start 1980-1996, through 16 years’ experience among villagers, conventional and traditional farmers with social relations and customs. Nevertheless, there are inherent dangers of increasing social inequality between very poor, low income farmers and nomads. If village’s development committees (VDCs) are formulated with inclusion of all community groups, inequality gap will be minimized.

8.1 Agricultural Land Tenure

The findings of the study showed that 44.5% of respondents have their owned land and also 44.5% of them depend on rental land for cultivation, because some of them are IDPs who living in Camps far away from their indigenous village. While only 10% use other methods to get land such as grant and crop sharing. Previously land is not rented either for crop sharing or other form of renting, but due to the mobility of the population far away from their native land and cogitated about more secure areas.

Accordingly some IDPs shift to other livelihoods activities such as commerce, handicrafts and brick making, while others continue practicing agriculture activities nearby towns and camps. Women depend mostly on crop sharing methods for getting land for cultivation, but men renting the land.

<table>
<thead>
<tr>
<th>Land System</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner-Operated</td>
<td>89</td>
<td>44.5</td>
</tr>
<tr>
<td>Rent</td>
<td>91</td>
<td>45.5</td>
</tr>
<tr>
<td>Grant</td>
<td>02</td>
<td>01.0</td>
</tr>
<tr>
<td>Crop sharing</td>
<td>18</td>
<td>09.0</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2: Agriculture land tenure

Source: Field Survey, 2014

8.2 Sources of Information

The study revealed that 81% of respondents have mentioned that they have an idea about improved Onion seeds, while 19% of them have not. The findings of the study showed that 44% of respondents have received ideas concerning improved onion seeds from other farmers, where 33% of them have received their information from Agricultural Extension and 8% get information from the mass media. This result shows the very week contribution of mass media in the field of technology transfer and adoption of innovation. However the role of mass media can be enhanced for increasing technology transfer and adoption coverage.

Table 3: Sources of information concerning improved Onion Seeds

<table>
<thead>
<tr>
<th>Sources of Information</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other farmers (neighbors)</td>
<td>88</td>
<td>44.0</td>
</tr>
<tr>
<td>Media</td>
<td>16</td>
<td>08.0</td>
</tr>
<tr>
<td>Agricultural Extension units</td>
<td>67</td>
<td>33.5</td>
</tr>
<tr>
<td>Crop Protection department</td>
<td>04</td>
<td>02.0</td>
</tr>
<tr>
<td>Others</td>
<td>25</td>
<td>12.5</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2014

8.3 Participation in Project Previous Training

The project from time to time organizes training sessions using community based participatory approach.

The findings of the study showed that 62.5% of onion producers did not participate in the previous training, whereas only 37.5% have been trained during the project implementation period. Regarding training location, the majority of onion producers who received training, have been trained locally in Central Darfur State.

The first farmer training Hall was established in Zalingei during the year 1979/80 as a farmers training center by Jebel Marra rural development Project. But now the hall has been attached to Ministry of Finance & human resources Central Darfur State. The study revealed that 79% of onion farmers who received training, have participated in training sessions more than five times during the project period, which consider to be acceptable for farmers to develop their awareness to adopt new technologies and diffused what they have learn.

The majority of onion producers who have been trained, have received short training sessions, about 88% of the respondents have participated in training sessions within one week. Short period of training is more suitable for farmers to attend the sessions as result as their multi-responsibilities.
Table 4: Frequency of training received

<table>
<thead>
<tr>
<th>Frequency of training received</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>more than five times</td>
<td>027</td>
<td>12.5</td>
</tr>
<tr>
<td>Five times</td>
<td>159</td>
<td>79.5</td>
</tr>
<tr>
<td>One up to Four times</td>
<td>012</td>
<td>06.0</td>
</tr>
<tr>
<td>Non</td>
<td>002</td>
<td>02.0</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2014

Table 5: Duration of training received

<table>
<thead>
<tr>
<th>Duration of training received</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>more than one year</td>
<td>005</td>
<td>02.5</td>
</tr>
<tr>
<td>one year</td>
<td>001</td>
<td>00.5</td>
</tr>
<tr>
<td>one month and half</td>
<td>004</td>
<td>02.0</td>
</tr>
<tr>
<td>one month</td>
<td>014</td>
<td>07.0</td>
</tr>
<tr>
<td>one week</td>
<td>176</td>
<td>88.0</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2014

9. RECOMMENDATION

The Study recommends the following:

a. Community participation should be adopted for all agricultural and community development activities.
b. Strengthening of agricultural extension services in the project area and cooperate with agricultural research centers to promote technology transfer is highly needed.
c. Cooperate and work together with grassroots organizations to encourage community participation process for technology transfer.
d. Implementation of comprehensive baseline surveys that evaluate current agricultural and socioeconomics situation.
e. Introduction of water harvesting techniques in the project area is necessary to accommodate the phenomenon of climate change.
f. Strengthen the field work with demonstration farm.
g. Improve and establish rural infrastructure such as roads which link production and consumption areas.

REFERENCES