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Problem analysis of rice production in wurno irrigation scheme using participatory approaches

B.Z. Abubakar[a], A.B. Aliyu[a,*], G. Bukar[a], T.A. Manga[b]

[a]*Department of Agricultural Extension and Rural Development, Usmanu Danfodiyo University, Sokoto.*
[b]*Department of Crop Production Technology, College of Agriculture, Zuru, Kebbi State.*

[*]Corresponding author: Department of Agricultural Extension and Rural Development.

A R T I C L E   I N F O

A B S T R A C T

Considering the importance of rice in ensuring food security in the nation, there is a need to investigate the problems militating against its production. Participatory methods were employed in this research. Discussion was held with 20 farmers randomly selected to draw problems inventory militating against rice production in the study area. Matrix scoring and pair-wise ranking indicated quelea bird invasion as the most pressing problem affecting rice production. Poor irrigation management and non- government intervention based on problem tree analysis are the causes of the problems. Local participation in planning operating and maintaining the irrigation facilities and waterworks should be encouraged. Adequate inputs especially fertilizer in form of subsidy or loan should be provided for increased production.

1. Introduction

Over decades, rice has occupied a prominent position as a strategic crop for food security and economic development world-wide (Saka and Lawal, 2009). It has been estimated that annual rice production needs to increase from 586 million metric tones in 2001 to meet the projected global demand

Of about 756 million metric tones by 2030 (FAO 2002 quoted in Kueneman 2006). Nigeria has witnessed as well established growing demand for rice as propelled by rising per capital consumption and consequently the insufficient domestic production had to be complemented with enormous import both in quantity and value at various times (Daramola, 2005). However recent policies by Federal Government have placed emphasis on increasing local rice production in order to reverse import trends and free up limited foreign reserves for use in other sectors (WAERDA 2003). Among such policies aimed at improving growth in domestic rice production was area expansion through irrigation scheme.

The Nigeria agricultural sector is however dominated by smallholder farmers who by virtue of their low income have dwinding capacity to acquire all the necessary inputs and working facilities. The farmers are indeed faced with a production and environmental problems capable of limiting their enthusiasm to improved rice production. Consequently, this limits the benefits of increased production despite huge investment in the scheme establishment. In view of the important role rice plays in the diet of Nigerians and its persistence deficit despite the successive programmes launched by the Federal government to increase its production, it is therefore imperative to determine the problems militating against rice production and its effects on smallholder farmers.

1.1. Conceptual framework

The creative ingenuity of practitioners worldwide has a greatly increased the range of participatory methods in use. The methods can be put into four classes: for group and team dynamics, for sampling, for interviewing and dialogue and for visualization and diagramming (Pretty *et al.,* 1995). In recent years, an increasing number of analyses of projects have shown that participation by local people is one of the critical components of success in irrigation, livestock, water, and agriculture sectors (USAID, 1987; World Bank, 1994). Participatory method had been used to justify the extension of stat control and to build local capacity and self-reliance; it has been used for data collection and for interactive analysis. Participation has been often centered on encouraging local people to sell their labour and ideas in return for food, cash, or materials. If the process by which People participate in answering questions posed by extractive researches using brainstorming triangulation, interview, questionnaire surveys or similar approaches.

2. Materials and methods

The research was conducted in Wurno irrigation project site in Sokoto state. Sokoto state is located in the Sudan savanna zone of the extreme north western part of Nigeria, between longitudes $4^0 8^{'} E$ and 6^0 $54^{'}$ E and latitude 12^0 $0^{'}$ N and 13^0 $58^{'}$ N (Mamman *et al.,* 2000). The total land area is about 32000 square kilometer and the vegetation is characterized by open grassland with 3-4 months rainfall. Major ethnic groups are Hausa and Fulani with arable and livestock farming as their major occupation. Multistage simple random sampling procedure was used in selecting respondents for the discussion. 10 farmer's groups out of 25 operating in the scheme were randomly selected in each farmer's group two farmers were randomly selected to come up with 20 farmers as participant in the discussion. Data collected were subjected to pair-wise listed by the respondents while problem tree was used to analyze the causes and effects of the problems.

3. Results and discussion

3.1. Problems inventory

Based on the discussion held with the farmer the following problems were stated.
1. Inadequate tractor for land clearing (TR).
2. Blockage of canals (BC).
3. Disease infestation (DI).
4. Inadequate supply of fertilizer (FS).

5. Lack of credit facilities (CR).
6. Quelea bird invasion (QB).
7. Problems of road network in the project site (RN).

3.2. Pair-wise ranking

This method is used to learn about local people's categories, criteria, choices nd priorities. In pair- wise ranking, problems identified were compared pair by pair and farmers were asked which of the two they consider as the most pressing problem. Matrix scoring for the rows and columns were used and the problems were ordered by participants using berries for relative scoring.

Table 1

Problem's pair-wise ranking and marix scoring

	TR	BC	DI	FS	CR	QB	RN	Score
TR	X	BC	DI	FS	CR	QB	RN	0
BC		X	BC	BC	BC	QB	BC	5
DI			X	DI	DI	QB	DI	4
FS				X	CR	QB	FS	2
CR					X	QB	CR	3
QB						X	QB	6
RN							X	1

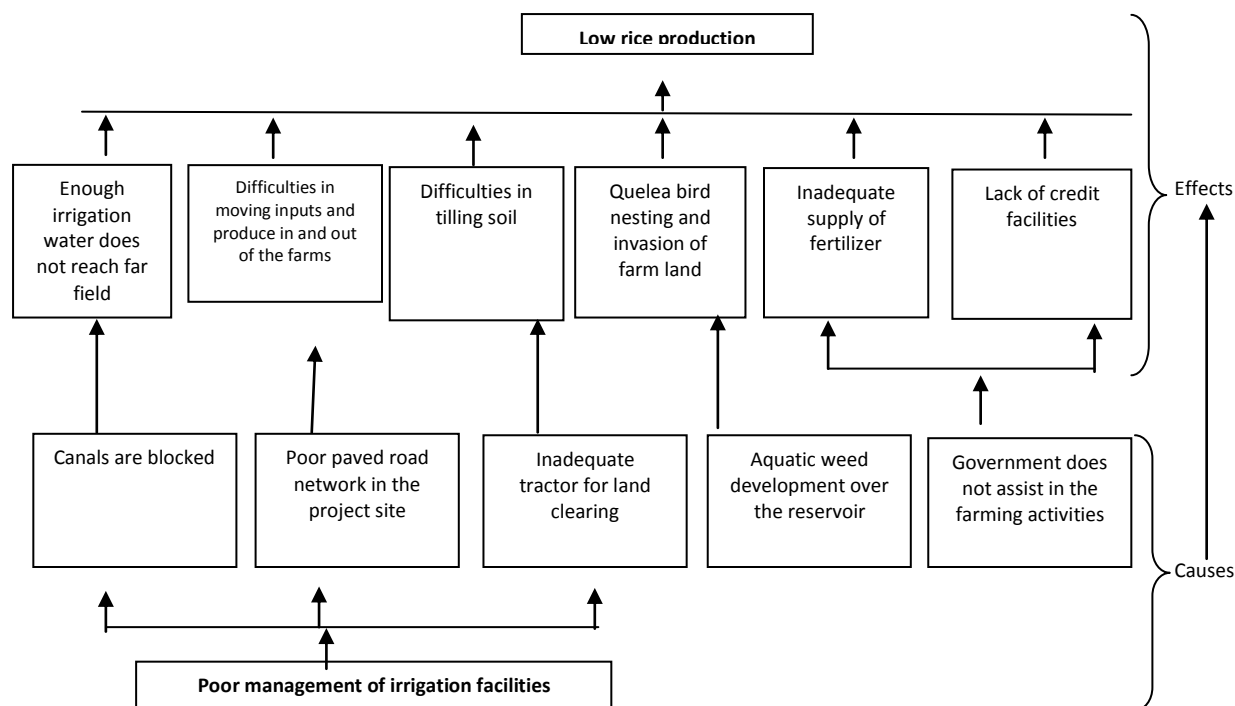**Source**: field survey, 2010.

From the above table, quelea bird invasion scored highest and therefore ranked the most pressing problem affecting rice production in the area. Blockage of canal scored second followed by diseases infestation, while inadequate clearing machine was the least problem affecting farmers in the area. The above findings agrees with that of Longtau (2003) who found that quelea bird are a more serious problem in the North and weaverbirds in the South. However, there are still n o effective means of controlling the vertebrate pests, especially birds. Thus despite the huge amount spent on quelea control, the problem still persist. Inevitably, many rice farmers have gives up in distress because of huge losses (Akande, 1986). It also stated by Akanmu et al. (2007) that while operation management for large-scale dams is being carried out to a certain extent; many of the small and medium-scale dams are facing the difficulties due to the technical data, equipment, access road etc.

3.3. Problem tree analysis

Some problems stated by the farmers such as canal blockage, poor road network inadequate tractors for land preparation are attributed to poor management of irrigation facilities. Other problems such as inadequate fertilitizer and credit are also attributed to non – government interventions. This finding agrees with Omokore (2007) who reported that peasant farmers lacked adequate funds to procure inputs. Lack of adequate extension services and government assistant were also reported.

4. Conclusion

Matrix scoring and pair-wise ranking shows that the quelae bird invasion is the most serious problem affecting rice production in the study area. Poor irrigation management and non-government assistant as indicated in the problem tree analysis are the causes of most of the problems mentioned by farmers in the area. The participation of users in managing and maintaining the water facilities and operations usually brings many benefits. It is of great importance that the local participation in planning, operating and maintain the irrigation facilities and waterworks to supply water and sanitation increases the strong likelihood that these may be well-maintained and contribute to the community cohesion and empowerment in such ways that can spread to other development activities. This justified the need to consistently promote the organization and strengthening of water users associations as a means to enhance the participation and effectiveness in water management.

Sources: Field survey, 2010.

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