

Community Participation on Artificial Insemination in Adamawa State, Nigeria

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Abstract

Community participation in resource management has become popular in development discourse and practice across the world. Artificial insemination (AI) is considered as a resource management tool that could improve livestock production in local communities. This study evaluates participatory development approach on artificial insemination as a community development tool in two communities. The level and extent of community participation on AI and its resources management were identified. Purposive selection of the communities and random sampling procedures were employed to select a sample of 315 participating members using structured questionnaire. Descriptive statistics was used to analyse socioeconomic characteristics of respondents' which include age, education, gender and occupation. Results on the level of awareness reveals a high level of acceptance of AI as a tool in management resources. A paired test was used to determine income generation, milk and beef production. Tremendous difference was obtained before and after the participation on AI, where income, milk and beef production have significantly increased after the participation on the AI. It is recommended that awareness on AI programme be improved up on, government should replicate similar project to other local governments across the state and more dairy cooperatives should be established.

Keywords: Community Participation, Artificial insemination, Resources Management, Yola

INTRODUCTION

Community participation is defined as an educational and empowering process whereby people, in collaboration with those to help them, identify their problems and needs, and continuously assume responsibilities themselves to plan, manage, control and access to collective actions that are necessary (Peter *et al.*, 2014). Community participation in resources management has become popular in development discourse and practice across the world, and in relation to resource management. According to Farhama (2009) the concept of community participation is a basis for success of any developmental project. Artificial Insemination on other hand is a breeding process in which sperm collected from the male are processed, stored and artificially introduced in to the female (Khanal, 2010).

The first scientific research in AI of domestic animals was performed by Spallanzani in 1780. He deposited fresh dog semen in the uterus of a bitch utilizing a pointed syringe. Sixty- two days later the bitch whelped, and all three pups resembled the bitch and the sire (Dalton, 1999). Artificial Insemination was the first great biotechnology applied to improve reproduction and genetics of farm animals and it has also had an enormous impact worldwide in many species, particularly in dairy cattle (Foote, 2002).

The early history of AI dates back to 1677 when Leeuwenhoek discovered spermatozoa but progress rested in anticipation of the first successful bitch insemination by Spallanzani in 1780 (Foote, 1999). Since 1780 the principle of artificial insemination has not changed much, however there has been improvement in the use of this technology for specific production purposes. However, the technology was widely introduced in 1940s and gained a rapid initial diffusion. Considering its positive influence on genetic improvement and profitability, AI is one of the farmer-friendly and widely adopted breeding technologies (Johnson and Ruttan, 1997). The main objective of the study was aimed at evaluating the participatory development approach in community development as a tool for effective and efficient environmental management. Therefore, community participation is about sustaining self-help effort and foster a more lasting development consciousness among the masses and especially for the purpose of raising the quality of life of the rural communities, reviving rural income and ensuring self-sustaining development by harnessing voluntary and private sector to supplement government effort (Third National Development Plan, 1975).

Therefore the main issue on sustainable resource management is about integration of members of the community in management of the resources through the approach of community participation which is defined by World Bank (2004) as a way through which communities influence and share control over development initiatives and decision on managing resources that affect them. Participation is an important factor to sustain agriculture in rural areas through local, state, federal government and donor sponsored programmes. Participation with regard to community development includes people's involvement in decision making process in implementing programmes, and sharing in the benefits of development programmes. Nwaobiala & Ogbonna, (2015).

The advantages of AI amongst others may include the reduction in expenditure in maintaining bulls in a farm, prevention of spread of certain genital diseases or infertility, elongation of sperm life span, easy transfer of sperm, handling difficult animals that refuse copulation and the increase in the rate of conception as well as the maintenance of animal number.

For many decades, top-down approach to planning was used as the way to implement National Development plans in an effort to improve living standard of the rural communities by the authorities. These have rendered many individuals and communities reluctant to participate in government programmes. The majority of farmers in Nigeria who depend on rearing local cattle breeds along with growing grains, as their main source of food and income are unable to meet their basic household demands. This is due to the increasing cost of production and price fluctuations of grain crops; and the minimum amount of milk yield they obtain from the local breeds.

To mitigate the incapacity of keeping indigenous breeds to support livelihoods of farmers, the government of Nigeria has introduced AI through Fadama as a means to improving productivity of the domestic cattle breeds by crossing them with exotic ones. However, despite the dominance of low yielding local breeds and the government's effort to provide AI at low price; the utilization rate of AI in the country in general and in Gurin and Njoboli districts in particular is very low. Similarly, a study conducted in Fogera district of northern Ethiopia, showed that 90.6 percent of the farmers use natural mating (Anteneh *et al.*, 2010), and the situation in Lemu- Bilbilo in Ethiopia is also not different (Haji, 2003). Hence, there is urgent need to identify the factors responsible for the low utilization of AI programme.

This research is motivated by the absence of knowledge about people’s participation in artificial insemination. Therefore, research need to be conducted to assess the extent to which artificial insemination gain support in the study area and also as part of Fadama project in the state.

MATERIALS AND METHOD

This study was carried out in Gurin and Njoboli communities in Adamawa State, Nigeria, located between latitudes [9° 02’ 18”- 9° 18’ 18”] North and longitude [12° 28’ 14”- 12° 55’ 41] East, at an altitude of 185m above sea level. The study area is bounded to the north with Yola north (Jimeta) and to the East with the Republic of Cameroun and to the South with Jada local government area while to the west is Demsa Local government area (Figure 1).

Gurin and Njoboli cover a land mass of 18km² and 13km² respectively with a total population of 16,002 for Gurin and 2,236 for Njoboli (NPC, 2006). The major ethnic groups in the area are the Fulani with small minority of Hausa, Verre and Batta. The settlements are considered appropriate because the Fulani’s engage in animal production and other groups in crop farming. Yola itself is an important breeding centre for cattle (Ardo, 1999). The prominent land uses in the area are for grazing, farming and residential uses. The Fulanis are generally known to be good livestock farmers particularly cattle, sheep, goats etc, while the other ethnic groups are engaged in crop farming.

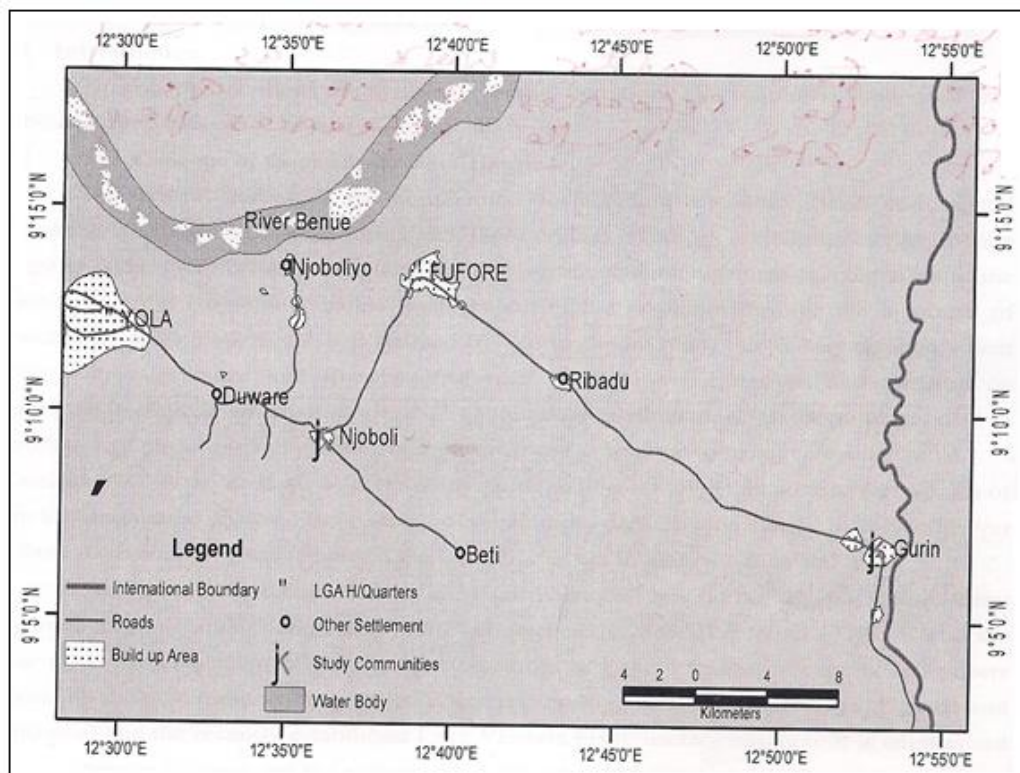


Figure 1. Map of the study areas showing Gurin and Njoboli Communities.

Population of the study is 540 members which comprises of Gurin Fadama Community Association which has Sixteen 16 FUGs and Njoboli Fadama Community Association has Eleven 11 involved in Artificial insemination. Each group has 20 members making the total of 320 and 220 members from Gurin and Njoboli respectively (Table 1).

A purposive sampling was used in selecting the FCA & FUGs and a sample was drawn using Krejcei and Morgan (1970) table of sampling. A sample size of 315 (176 and 139) members was selected based on the 540 total population from Gurin and Njoboli communities respectively. Therefore, 315 members formed the sample for detail survey see tables 1.

To take equal numbers from each group, 11 and 13 were picked from Gurin and Njoboli respectively. Thus a sample of 139 and 176.

Table 1: Population Sample and Fadama User Group (FUG) Members in Gurin and Njoboli (Mbamba) Communities. For each FUG, a sample of 20% was considered, totalling 320 for Gurin and 220 for Njoboli (Mbamba).

S/N	*Gurin	**Njoboli
1	Narral cattle rearers	Mbamba cattle breeders
2	Demol farmers	Kofare farmers
3	M.D.F farmers	Chakawuro cattle rearers
4	Alheri farmers	Upper benue women. Fattening
5	Beli men FUG	Turme age group fattening.
6	Albarka tailoring gurin	Pada cattle rearers
7	Tapare	Mbamba rumdefadama farmers
8	Gurin durobe	Sebore nomadic cattle
9	Muninga FUG	Nambare youth fattening
10	Nagarta farmers	Albarka cattle fattening
11	Gurin FUG	Njoboli livestock farmers
12	Gurin progressive	
13	Korojo	
14	Chikito breeders	
15	Muninga cattle FUG	
16	Parada fatteners	

Source: * Fadama Desk Office, Fufore **Fadama Desk office Yola

RESULTS AND DISCUSSION

The characteristics of the respondents show that 98% were males while only 2 percent constitute the female category. The sex distribution has shown that males are more in fadama activities than females. This may be as a result of the fact that men have better access to land, resource allocation, agricultural inputs and resources management. In addition, the Fulani/Muslim culture community who are known for limited participation of women in out of home activities, especially participation in associations, explaining the predominance of male participants in the communities considered.

Eighty six (86%) are married men and heads of households and by the socio-cultural background of the communities, men are having responsibility for basic needs their of the families. By implication, it is expected that impact of Fadama project on the male participants could invariably have far reaching effect on housed hold income, purchasing power and general improvement in standard of living of families and communities in general.

Education qualification on the other hand, 41% of the participants had primary education as their highest qualification, 18.1% had secondary education and 9% had HND, OND, NCE and

only 7% had access to university degree. The last two groups included civil servants and teachers who combine their profession with fadama activities.

It was also found that 24% of the respondents from Gurin community are in animal husbandry while, Njoboli had 12.1% and on the same occupation. Also, Gurin community had 10.5% of their respondents as animal farmers and 6.7% in Njoboli. This implies that Gurin had more animal husbandry activity as their major occupation of its participants when compared with Njoboli. On the other hand, Gurin had 14.9% of the respondents as crop farmers combined with animal husbandry while Njoboli had 8%. Generally, Gurin community participants are more proactive in almost all occupations.

The annual income of the respondents vary between the communities depending on their economic activities. About 27% of the respondents in Gurin earn below N30, 000 while, 20% earned the same in Njoboli community. In Gurin, 16% of the participants earned between N30, 000 – 50,000 while in Njoboli, 10.5% of the participants earn the same income. On the other hand, income category of N51, 000 - 70,000 had 8.6% among Gurin participants while, Njoboli has 7% participants. The income of 71,000 – 95,000 was having 6.8% participants in Gurin and 4.1% in Njoboli respectively. The result show that there is large gap of income difference between the two communities and it may be attributed to the fact that, Gurin community had more participants on animal husbandry with 24% while; Njoboli has only 10.5% who participate in same trade. Similarly, 18% participants in Gurin do combine other occupation with animal husbandry while, only 4.5% of participants in Njoboli combine other occupations with animal husbandry.

Extent and Efficiency of Participation on A.I.

The extent of participation is measured by the extent of participants' commitments and contributions to the project. The contribution by participants is a very important factor executing the A.I. Project. Allocated land for A.I. activities in the two communities of Gurin and Njoboli was plot of 200 x 200 (Metres) dimension. The plot of land was allocated by members of the community for the purpose of A.I project. This has indicated level of awareness, importance and acceptability of A. I. project among community members. The extent of participation show that each community contributed about N 492,000 as counterpart funding representing about 10% of the project total cost. Proportionately each participating member in Gurin contributed N7, 800 while, those in Njoboli contribute N11,200 each because they are fewer in number.

In this regard, individual cash contributions by participants in Njoboli is higher because they have fewer number of participants (140) than Gurin (175). In addition, as part of the counterpart funds, there are individual registration fees and other contributions. Apart from the cash contributions participants brought cow(s) for the insemination. Their cow number in terms of ownership has increased tremendously. Results indicate that 51% of the respondents are having between 5 -10 cows, while about 31% of the respondents had a number of cows between 11 – 20 and the remaining 18% had more than 21 cows after the A.I projects. This indicated the extent of participation and the adoption of new techniques helps in increasing the number of cows an individual participant has shown the level and extent of participation in the project.

The degree of community participation on resource management is measured on economic basis on either income and productivity levels of individual participants or the general community where the project is executed. Participants have shown that all members that participated in the project benefited as we as other members of the community. Milk and beef

during dry season were abundant, and money to buy animal drugs as a community service. The improvement in techniques, production and increase in income of the participating members have been the major variable to assess the level of the benefit participation on AI. The benefits acquired in the study knowledges AI, increase in productivity of milk from 0.6% to 2.61% in Gurin and 0.4% to 1.74% in Njoboli as well as an improved income of the participating members. Again, all 315 respondents have revealed to have benefited in term of cow milk and beef production as well as income earnings through A.I.

Estimated annual income of participants before and after A.I. project

The amount of money realized from the economic activities before the project and the amount of money realized after the project were used in the analysis. Table 2 shown the result of the Paired t- test on the income of the participating members from the two communities before and after the project. The table indicates the mean of N24, 030.55 as income was earned before by participants in Gurin N78, 594.44 as income earned after the project. While, Njoboli participants had N16, 020.37 as their income before the participation in the project, and N52, 396.29 as income earned after the project.

The income earned by participants in Gurin before and after the project shows there is significant differences by triple times N54, 564.00. Similarly, in Njoboli community the differences in income before and after shows three times N36, 376.00 of their income before. This indicates that there is difference between the income earned before the project between and within the two communities. This can be attributed to the differences observed in their occupation.

Table 2: Mean Income per Annum in (N) before and after the Project Paired Sample Statistic

Variable	Gurin	Njoboli
Mean income (N) before A.I.	16,020.37	52,396.29
Mean income (N) after A.I.	24,030.55	78, 594.44
Difference in %	66.75	66.25

Since the Paired test calculated is greater than the table value, and this called for rejection of the null hypothesis that there is no difference between the income earned before and after the participation on A.I project. Hence, we accept the alternative hypothesis that there is significant difference between the income of the participating members before and after the project.

Table 3 below shows the results of Paired Sample test were it combined mean was 90939.81. Since the computed Paired Sample test ($t = 20.223$) is greater than tabulated value = (1.66) then the H_0 is rejected at 5% level of significance. Hence, it is concluded that there difference in income earned before and after the project by the participating members of the communities.

Table 4 shows the result of milk production in the two communities were Gurin has a mean production before Fadama intervention as 0.65 litres while, the mean after is 2.61 litres. This indicates a significant difference between the litres extracted before and after; the difference is virtually three times of litres extracted before. On the other hand, Njoboli community had their mean production before as 0.43 litres while, the production after is 1.74 litres, showing an increase in productivity in Njoboli community. The difference in milk production can also be observed between the two communities when compared.

The values of 0.65 and 0.43 litres was extracted, showing difference in quantity of milk production before in Gurin and Njoboli respectively. Similar study in Ethiopia reveals that the milk production was very low before the adoption of AI technology. In order to improve the low productivity, AI is the single most important technique ever devised for genetic improvement of animals in all aspects including milk and beef production (Kaaya *et al.*, 2005).The production after intervention also shows a significant difference where Gurin had 2.61 litres but Njoboli had only 1.74 litres. The implication of these results is that Gurin has higher production than Njoboli, this may be due to larger number of participants on animal husbandry in Gurin.

The result of the paired t-test on the productivity level of the participating members before and after the project. The values indicate the total mean of 4.3426 litres of milk extracted after the project by participants and 1.0833 litres of milk before, indicating a large difference four times in volume. Since the Paired test calculated is greater than the table value, this called for rejection of the null hypothesis that state there is no difference between the litres of milk extracted before and after the participation on A.I project and accept the alternative hypothesis.

Table 3: Income Result of the Paired Samples Test

Parameters	Values
Mean income	90939.81
Std. deviation	46732.17
Std. error mean	4496.81
t-value	20.223
D.f	107

Table 4: Result on Quantity of Extracted Milk in (Litres) Before and After Fadama Project Paired Samples Statistics

Variable	Gurin	Njoboli
Before (L)	0.64	0.43
After (L)	2.61	1.74

CONCLUSION AND RECOMMENDATIONS

Findings here revealed that community participation in A.I. has brought high increase in milk and beef production. In addition, adoption of insemination by the participating communities provide skills on insemination. Collaborative efforts with Raw Material Research And Development Council (RMRDC) has also being enhanced, as the later provides milk extracting and processing machines for the project, as well as construction of Biogas plant in Njoboli community. This lead to an increase in the number of participating members of the communities that are already skilled and engaged in Yoghurt production.

Based on these findings, it is recommended that government should replicate similar projects in all local government areas of the state. This can be done through awareness on the importance of such a project so as to attain high level of resource and economic sustainability of the communities. Participating community members should plan together and share ideas on how best they could enhance the effectiveness in promoting community participation by stimulating individual and collective spirit to initiative similar projects.

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