Assessment of Public Participation in Dadin Kowa Irrigation Scheme: Toward Attaining Food Security in Nigeria

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Abstract
This study was inspired by efforts made by government through TRIMING to enhance food production amidst fear of food insecurity as a result of multi-faceted negative events which made over 60% of households vulnerable. DKIS was initiated as an institutional framework to bring succour to farmers in Gombe and Borno States who share a common river- River Gongola. This study assesses how stakeholders participated in DKIS by appraising public participation strategy used in the implementation of the scheme. The study's findings were based on the core values of public participation and the Ainstern's ladder of public participation to gauge the level at which respondents were involved in the scheme. Research findings revealed that there was low level of literacy among the respondents. Women participation was very low. They were only consulted and informed of the project as against higher levels of partnership. Respondents see the scheme as another government intervention to increase food production controlled by its officials and not necessarily owned by the people. The study recommended empowering the rural people in education to be able to make informed choices and well-articulated contributions at meetings and to be able to take up the project management.
Keywords: Consultation, Dadin-kowa, Food Security, Irrigation & Public Participation

Introduction

Food and water are major ingredients for human survival and sustenance. Without food and water, development in all ramifications will fail. Food and water can be obtained freely on the surface of the earth. Though as free as food seem to be obtained, a lot of efforts, plans and finances must be put in place in any community that needs to obtain them in sustainable quantity. Food comes in a variety of forms- crops, trees, shrubs, tuber, oil, water and animals. In the past these can be collected, consumed raw or refined. As times go by and as population and technology grow, efforts are required to obtain a balanced food that can sustain lives. As awareness grow, people discover that they do not need any kind of food, but one that can nourish their body, give them health, and strength to live and work. Similarly, planet earth has more water that is required for various uses. However, less than 1% is fresh water capable of sustaining human life. The bulk of the water is either inaccessible or not suitable for human consumption. Agriculture that provides man with food to a large extent depends on rainfall to do well, but weather variability, especially precipitation has obvious impacts on agricultural production (Cutter, Renwick & Renwick, 1991). Nigeria is among poor countries vulnerable to food shortages, a drop in the amount, and distribution of precipitation will have immediate negative impacts on food supply.

Both food and water have never been scarce on a global scale, but due to the natural unequal distribution of these resources, and anthropogenic reasons exacerbated by climate change, they tend to be in short supply at certain places and at particular times. Lack of food in a place at any particular time causes hunger, starvation, malnutrition and even death. Likewise lack of water causes dehydration, famine, draught, and diseases inimical to sustainable human survival. Of recent, the emergence of COVID-19 and its epidemic status has caused food shortages in many nations that had plenty of food and made matters worse in others that were struggling to attain

food sufficiency especially African countries. In Nigeria, particularly northern Nigeria, insurgency, banditry, kidnapping for ransom and terrorism have been having a negative impact on agriculture and have also caused an increase in the prices of food. This made over 60% of households in Nigeria to be threatened by food insecurity (Ibukun & Adebayo, 2021).

To guard against further slips into food shortages and in order to improve food sufficiency in Nigeria, the Federal Ministry of Water Resources in collaboration with the World Bank, saw the urgent need for more food production by implementing a scheme in 2018 tagged Transforming Irrigation Management in Nigeria (TRIMING) with the aim of attaining food sufficiency in the country. Objectives of the scheme among others are to improve access to irrigation and drainage services through flood irrigation, and to strengthen institutional arrangement for integrated water resource management for agricultural service delivery. The scheme was designed for states in north-western Nigeria. Leveraging on the laudable objectives and successes achieved in the northwest, the scheme was extended to other northern states with different institutional arrangement and projects, but almost similar in aim and objectives. Dadin Kowa Irrigation Scheme (DKIS) is one of such schemes placed under the management of Upper Benue River Basin Development Authority, Gombe State field office, Dadin Kowa, and is the focus of this study.

The DKIS constitutes the construction and rehabilitation of Dadin Kowa dam which will require the suspension of farming, fishing and some business activities for individuals and organizations within the project area. The proposed activity is expected to impact on farmers whose means of livelihood (farmlands, fish ponds and residences) are linked to the project area while the construction last. Some people are similarly expected to be resettled to give way for the expansion of the irrigation sites. Since it is believed that this scheme will affect peoples' residences and means of livelihood, and considering the importance attached to attaining food security and to guard against failure of the scheme, there is therefore the need to incorporate the people into the decision making process of the scheme so that they will have a sense of belonging, collaborate to make the scheme a success and own up the project after completion.

Aim and Objectives

This study is aimed at assessing public participation in Dadin Kowa Irrigation Scheme (DKIS) using Airnstein's (1969) ladder of public participation; public participation spectrum and core values for sustained participation. The study assessed stakeholders' participation in DKIS through the following objectives:

i. To review the literature on some levels of public participation in planning processes.
ii. To appraise the level of education of the public in the DKIS
iii. Identify participation disparity in gender in the scheme
iv. To assess base on 2 and 3 above, the level of public participation in DKIS

Literature Review

The Food and Agriculture Organization (FAO)(1996) defined food insecurity as 'a state of being without reliable access to a sufficient quantity of affordable, nutritious food'. Where availability of food, ability to access and utilize food is absent, the term food insecurity ensures. The United State Department for Agriculture (1997) defines food insecurity as a situation of limited or uncertain availability of nutritionally adequate and safe foods or limited ability to acquire acceptable foods in socially acceptable ways (Bickel, Nord, Price, Hamilton & Cook, 2013).

According to FAO, 26.5 million Nigerians will face food insecurity by second half of 2024. The government of Nigeria and its partner, the Cadre Harmonize Analysis projection indicates that by 2024 states including Gombe and the FCT will be affected by food insecurity occasioned by insurgency, armed banditry, soaring food commodity prices and economic downturn (David, Ann & Safiya, 2023).

Traditionally, water for irrigation can be sourced from dams, lakes, rivers among others. Irrigation serves as compensation when there is no rainfall, uncertain of when rain will fall or when the rain water will not guarantee yield. Absence of water to nourish plants, affect crops adversely and can lead to crop failure and ultimately food shortage. According to Food and Agricultural Organization (FAO) of the United Nations (2018), water scarcity represents a critical constraint to food production and a major cause to poverty and hunger in many countries. FAO (2018) further asserts that improved water management holds the key to producing enough food to alleviate the suffering of today and feed an additional three million people by the 2030. Irrigation has been responsible for turning dry lands into cultivable lands. Much of the world's deemed potentially arable lands become so only through irrigation (Cutter, Renwick & Renwick, 1991). According to Getis *et al* (2011), since 1950, the acreage of land under irrigation has tripled in order in step up food production for the growing population worldwide. The FAO estimates that total irrigated land now amount to 277 million hectares, a 54% increase over the last 30 years. New irrigation projects continue to be built (Wright & Boorse, 2011). Therefore, irrigation increases the amount of cultivable productive lands. The expansion of irrigated lands has made possible regional and global impacts of water, land, energy, and improvement of economic interaction (Ledvina, Winchester, Astrzepek & Reilly, 2018). However, recent studies in social, economic and political development reveal that for any development project to succeed, a concept of public participation is needed.

Participation has many definitions and can be referenced through multiple concepts, such as 'engagement','empowerment','involvement','consultation','deliberation','dialogue','partnership ', 'outreach', 'mediation', 'consensus building', and 'civic science' (Chilvers, 2009). Enserink *et al* (2007) define participation as "the involvement of individuals and groups—i.e., the public or stakeholders—that are positively or negatively affected by or are interested in a proposed intervention". The International Association of Public Participation (IAP2) defines public participation as the process by which an organisation consults with interested or affected individuals, organisations, and government entities before making a decision. It also refers to the on-going process of interaction between service provider, project implementers and the community with the aim of improving decision making during the planning, design, implementation and evaluation phases of the project (IAP2, 2009). Regardless of definition, the central concept is to give people a meaningful role in decisions—typically from the government—that affect them (Blair, 2000). In development, the 2030 agenda of the SDGs includes a stand-alone goal (No. 6), which aims to 'ensure availability and sustainable management of water and sanitation for all." Participation is singled out as one of the two means of implementation important to reaching its ambitious target.

Apart from addressing the issues of participatory governance, cost recovery and appropriate technology, there is also a need to take into consideration the values, attitude, preferences and capacities of the different stakeholders in the supply and management of water in rural areas (Gbadegesin, 2009). Public participation is based on the belief that those who are affected by a decision have a right to be involved in decision making process. It is a process by which an organization consults with interested or affected individuals, organization and government entities

before making a decision. According to TRIMING (2020), for a public participation to succeed, there must be genuine consultation between the service providers and the public and that the following represented the core values of public participation:

- Stakeholders, especially PAPs have a say in decisions about the actions that could affect their lives.
- The promise that the public's contribution will influence the decision.
- Seek out and facilitate the involvement of PAPs or those interested in the decisions.
- Seek input from participants in designing how they participate.
- Provide participants with the information they need to participate in a meaningful way.
- Communicate to participants how their input affected the decision.

According to European Urban Knowledge Network (EUKN), (2015) one of the most famous models for public participation is 'the ladder of Arnstein', which rungs range from non-participation to citizen control, whereby power and responsibility is delegated to citizens. The rungs which represent the levels of public participation from bottom to top are manipulation, therapy, informing, consultation, placation, partnership, delegated power and citizens control respectively and have been useful theory to describe the levels of public participation and clearly show the difference between non participation at the two bottom rungs (something that might appear to be public participation but it is no more than a window dressing); tokenism at rungs 3 to 5 (optimal participation); and citizens control at rungs 4 to 8 (actual participation). According to IAP2 public participation spectrum, there are many different levels of public participation, but all will benefit from engaging stakeholders directly in dialogue about important issues. However, the spectrum recognizes informed, consult, involve, collaborate and empower levels of public participation. In order to have a smooth management of irrigation scheme, and for an improved and sustainable food supply, a water project developer must take in to cognizance of the program that meet the specific goals, objective and circumstances of the community. Five key constituents are identified to evaluate a successful public participation as postulated by Ozerol and Newig (2008) of the EU Water Framework Directives as follow: scope of the participants (gender sensitivity), communication with the public (information), capacity building, (level of education), timing and financing of the participation.

Description of Study Area

Dadin Kowa Irrigation Scheme (DKIS) is located in Yamaltu/Deba Local Government Area of Gombe State. "The project" as it is called is sited at the borders between Gombe and Borno States. It is 38km east of Gombe, the capital city of Gombe State. It has an estimated population of 255,248 in Yamaltu/Deba LGA, Gombe State and 78, 978 in Bayo LGA, Borno State, according 2006 census. The DKIS lies between Latitude $10^0$16'N and $10^0$20'N and Longitude $11^0$30'E and $11^0$33'E. River Gongola serves as the source of water for the flood irrigation of the scheme covering a length of 58km (TRIMING, 2020).

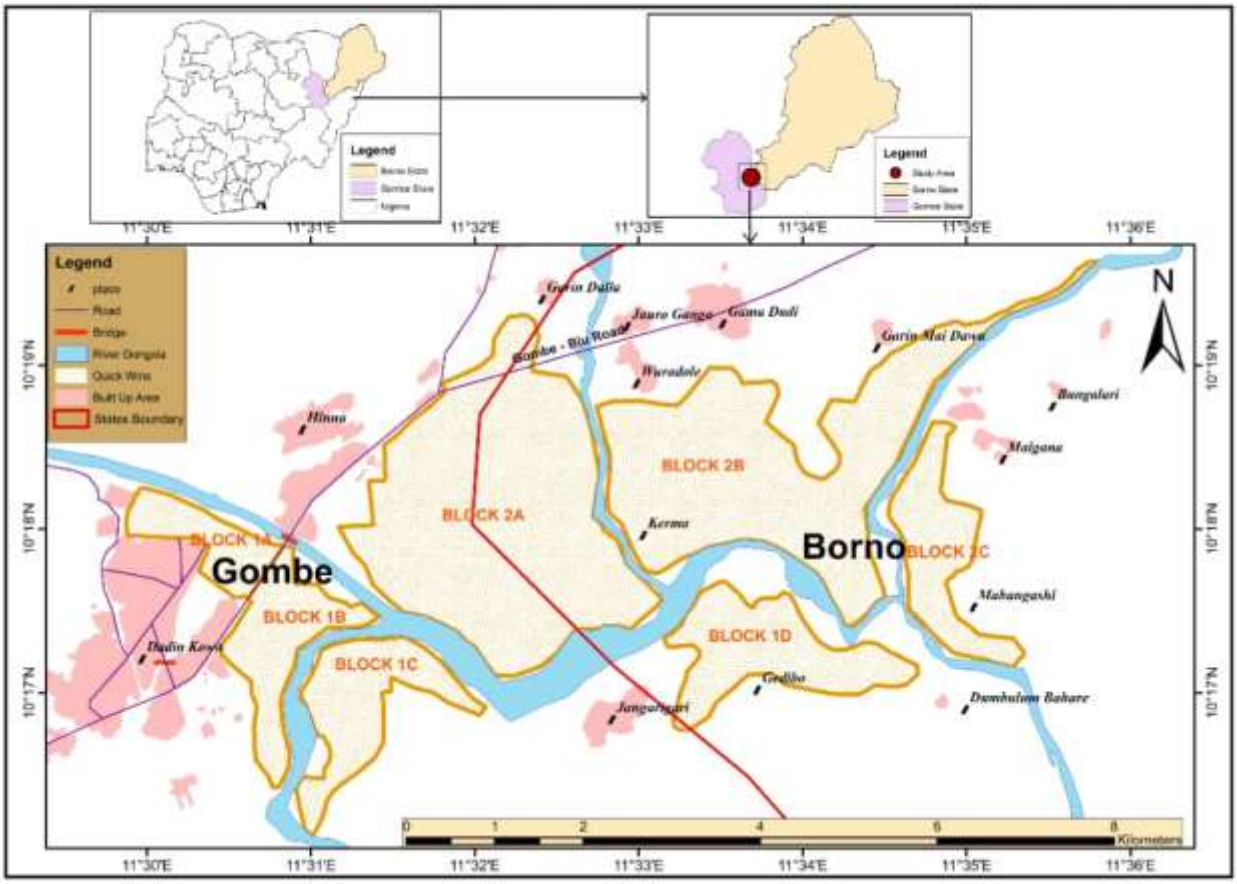

Figure 1: Map of the Study Area

Materials and Method

The data acquired for this study were management and strategy adopted in the course of the scheme implementation. This was obtained from policy and project documents of TRIMING used before and during project implementation; core values of public participation; and the appropriate criteria for assessing public participation in irrigation scheme. Information on these were obtained from the literature reviews in journals and books on public participation; focus group discussions held with government officials, village heads and field officials of the scheme convened in their offices, palace and town hall. The FGD was conducted to shed more light, clear doubts and for facts checking and the information collected on the field. These served as the secondary source of the data used for the study. The primary source of information for the study were variables describing the level of public participation (gender based, education, level) in DKIS project. Information on these were obtained from questionnaire administration, FGD, and interviews held with 156 respondents and other stakeholders in rural water management in the study area. After the data were acquired, assessments were made using the DKIS policy documents in comparison to Sherry Ainstern (1969) ladder of public participation which the rungs are outlined as follows: manipulation; where citizens were used as rubber stamps; therapy, where citizens' votes and decisions are never considered; informing, i.e. only information on the project is shared; consultation, i.e. inviting citizens opinion; placation where citizens begin to have some influence; partnership; delegated power on the project and lastly citizens control of decision making on the

project. These were used to recommend measures to be taken to improve the level of public participation on the scheme and other irrigation schemes and the core values for implementation of public participation which states as follows: Right to participate: Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision making process; influence decision making: Public participation includes the promise that the public contribution will influence the project decisions; recognize/communicate participants' needs and interests; involve those potentially affected; design how they participate and provide them with information (education) they need to participate.

Results of the findings

Management and public participation strategy at DKIS

The intervention work on the scheme is estimated to last 3 years, to be executed in phases. During this period, some farmers and businesses will be denied access to their farm lands and sheds while the work lasts. They will thus be unable to carry out farming activities. For this reason, they will be compensated and a Committee was created with the participation of those that are affected by the irrigation scheme.

Education of the Respondents

A strong public education is essential in all types of public participation. Education provides an informed and enlightens citizens with the requisite knowledge and experience to make an informed decision and contribution without which no participation will exist. However, the DKIS public participation document revealed that there was low level of literacy among the rural people. The data on Table 1below attested to that thus:

Table 1: Educational Level of Respondents

Residents Educational level	D/kowa %	G/Dalla %	J/gargari %	J/Ganga %	G/Dadi %	W/Dole %	Gedibo %	Bagari %	**Total**	**%**
Primary	40	7	3	4	7	8	6	3	**78**	**47**
Secondary	36	3	2	1	6	0	2	2.5	**52.5**	**32**
Tertiary	7	0	0	0	1	0	1	1	**10**	**6**
Others	8	1	2	3	3	4	2	1.5	**24.5**	**15**
Total	91	11	7	8	17	12	11	8	**165**	**100**

The level of education as enshrined in the criteria for effective participation and the core values of public participation are factors that determine a good level of public participation. Above findings (Table 1) indicate that 47% of respondents, had primary education, 32% had secondary education and 6% of the respondents had tertiary education. Tertiary education is obviously needed to qualify one as a well-informed citizen who can make informed contributions in the execution of plans, policies and decisions.

Gender of the Respondents

Women participation in project execution is a requirement in the core values of public participation which ensures all that are affected by a decision have a right to be involved in the decision making process**.**

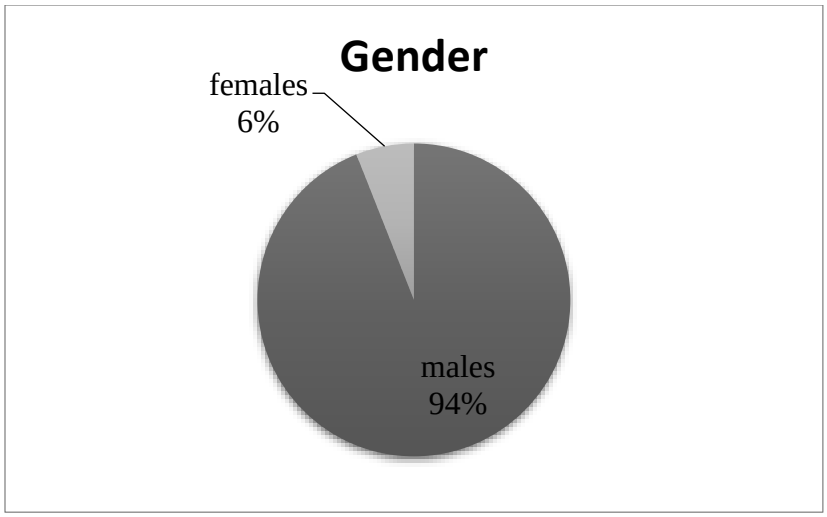

Figure 2: Gender of Respondents
Source: Field work, 2022

Women participation in public participation is an essential core value of public participation. Project document on the DKIS obtained averred that both women and men were engaged in various activities in the project and that despite efforts made to get more women in the room –making meetings more accessible and convenient by choosing a time of day, date, and location convenient for women, research findings however indicates a very low participation of women in DKIS project (Fig. 2). The low level of their participation was linked to cultural and religious value, ignorance and poverty.

Stakeholders Level of Participation

According to the project document, stakeholders' consultations were made between November, 2018 to January, 2019 with a view to intimate (inform) LGA representatives, security agencies NGOs and opinion leaders about the proposed project. The findings of the study of Ahmad, Umar, Garba and Mashkura (2020) however, considered, one of the most famous models for public participation 'the ladder of Arnstein' (1969), which ranges from non-participation to citizen control, whereby power and responsibility is delegated to citizens.
Table 2 classifies stakeholders' consultation in DKIS scheme thus:

Table 2: Level of Stakeholder's Participation in DKIS Scheme

Stakeholders	Level of participation (Sherry Arnstein, 1969 ladder of public participation)								
	Manipulation	Therapy	Inform	Consultation	Placation	Partnership	Delegate	Citizens control	Total
Farmers	30		17	18					66
Households	9		1	3					13
Fishermen	4		2	4					10
Rulers	5		12	2					34
Businesses	13		8	12					33
Officials				15	9				9
Total	61	0	40	54	9				165

The findings of the study as can be seen in Table 2 above have shown that 37.19% were manipulated into thinking that public participation is taking place. This is because; manipulation

in the sherry Ainstern's ladder of public participation serves the interest of officials. Stakeholders were consulted as confirmed by 32.72 % of the respondents. However, respondents complained that their ideas were not always used. Public consultation that is not combined with other modes of public participation is as good as manipulation. Another parameter observed was that 24% of the respondents were informed of the proposed project, but it stopped at that especially when a respondent had no compensation to receive. As such, respondents see the scheme as government's project not theirs.

Conclusion

The study made use of sherry Ainstern's (1969) ladder of public participation, core values for public participation and the TRIMING public participation spectrum as yard sticks in assessing public participation in the study area. Findings from the work revealed that there was low level of education among respondents with 47% and 31% of them with primary and secondary school education respectively. Education, however, is a critical step in the public participation spectrum.

Gender equality is also very vital in the public participation spectrum. However, the study findings revealed a very low level of female's participation (6%) in the scheme. Since the core value of public participation hinges on the belief that those who are affected by a decision have a right to be involved in the decision-making process, women should therefore be considered in the scheme.

On the Ainstern's ladder of participation, 54% of respondents believed that they were manipulated into thinking that a real participation was taking place. Some 40% said they were informed of the scheme's activity but their contribution did not really matter as they were considered uneducated to make informed contribution. There is much to be desired because 'partnership, 'delegated power', and 'citizen control' levels of the ladder were supposedly required to increase food production in the wake of food insecurity.

Though the DKIS scheme was completed, farmlands and fishing ponds, handed over to the farmers, respondents see the scheme and farmlands as government's properties not theirs. One is confident to conclude therefore, that despite efforts made by the project officials to involve all stakeholders in DKIS, public participation in DKIS was carried out at the lowest level of public participation spectrum of sherry's rungs of public participation ladder.

Recommendations

Based on the findings of the study, the following recommendations were made:

i. The study recommended for the provision of training, adequate information and literacy for community members in order to scale up the capacity of the people to contribute and manage the scheme properly. This will go in a long way to improve their skills in modern methods of farming, hence increase their agricultural output.
ii. Policy makers and service providers should involve the public in all matters concerning water projects. Evidence on the significance of this kind of support in community water resources management is emphasized in related studies in Mali.
iii. The importance of public participation in initiating and managing natural resources cannot be under estimated hence, project executors should ensure that people who are meant to benefit from the scheme are engaged at the highest level of the public participation spectrum i.e. delegated power.

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