The Influence of Fadama Activities on Women Empowerment in Ede North Local Government Area of Osun State, Nigeria

Martin Binde Gasu

Abstract

The study was conducted to assess the influence of Fadama activities on women empowerment in the Ede North Local Government Area of Osun State, Nigeria. Primary data were obtained purposively with the use of 240 structured questionnaires in a survey of 24 Fadama Users Groups (FUGs) whose representatives constitute 6 Fadama Communities Associations (FCAs) in the study area. Secondary data were, on the other hand, obtained from existing literature. Data were analyzed with the aid of Statistical Package for Social Sciences (SPSS) to obtain both descriptive and inferential statistics. The findings show that 58.8 percent (mostly women) were into agro-processing, 25.4 percent into farming, 12.5 percent into poultry, and 2.9 percent were into fish farming. The results further show that only 16.25 percent of the respondents received an average monthly income of N29.000-N39.000, 4.16 percent received above N40.000 before the commencement of the program. After the program, 45.00 percent now earned an income of N29.000-N39. 000 while 42.08 percent earned above N40. 000. The result of the factor analysis reveals that the total variance explained by each component extracted made up to 69.61 percent of the total variance, with variable one gender explaining 31.34 percent. The findings from the study revealed that the Fadama program in Ede North Local Government increased the participation and income of rural women farmers in agricultural production, which has helped in reducing the problem of gender discrimination. This trend, we assume, could reduce poverty and advance the success of Sustainable Development Goals (SDGs).

Key words: Fadama; women empowerment; poverty reduction; community driven development.

Faculty of Environmental Sciences, College of Science Engineering and Technology, Osun State University, Osogbo, Nigeria.

*Corresponding Author's e-mail: martin.gasu@uniosun.edu.ng

Received on July 28th, 2022/ Accepted on October 11th, 2022

Ghana Journal of Geography Vol. 14 (2), 2022 pages 145-174

Doi: https://dx.doi.org/10.4314/gjg.v14i3.6

Introduction

Food and Agriculture Organisation (FAO, 2009) has observed that agricultural production in sub-Saharan African (SSA) countries has been on the decline since independence. FAO posited further that agricultural production per capita showed marked growth from the early 1960s to the early 1970s, with occasional short growth periods in the mid-1970s and 1980s. It was, however, observed that the overall trend was on a decline, which seriously contrasted with other developing regions. This trend is very worrisome since it has negatively influenced the food security of the sub-region, where 30% of the SSA's population is labelled as food insecure (Pfister et al., 2011).

Irrigation farming is not new to mankind as it can be traced to the Tigris and Euphrates valleys (Iraq) and the Nile Delta (Egypt) in Mesopotamia and Egypt civilizations, respectively, where shadoof and canal irrigation systems were practiced some 6,000 years ago (Oyeleye, 2001). The Nile Delta area was described as an area of most unusual fertility, covering flat expanse of deep rich loam and black mud dissected by the uncertain branching river and cut by numerous canals (Oyeleye, 2001). Other prominent irrigation schemes in Africa include Gezira Scheme in Sudan, and extensive riverine and flood-based irrigation in West Africa, popularly known as the *fadama* and the Wabi Shebelle project in Somalia (FAO, 2002). In Africa, land under irrigation covers about 35 million ha (1.4 percent) of the total land area in the region. It accounts for nearly 2 million ha (29%) of actual irrigated land, which supports a population of over 7 million inhabitants. It should be noted that the remaining irrigated area in the region occurs within the other farming systems, especially the Large Commercial irrigation systems in South Africa and smallholder systems in Namibia, and the Rice-Tree crop system in Madagascar (FAO, 2002).

In Africa, several systems for irrigation purposes exist which attempt to control flood receding water or rising flood water mostly through channels for *fadama* activities in the Niger Rivers,

Benue Rivers, and other inland rivers flood plains in west Africa and the *dambo* system in the Zambezi Rivers flood plains in East Africa (IWMI and AWS, 2009). Similarly, in East Africa and particularly in parts of Sudan and the highlands and foothills of the Great Rift Valley from Ethiopia to Mozambique, irrigation farming is very advanced. Thus, there is a seasonal diversion from rivers via small dams, gabions, and channels through canals for furrow irrigation. In some other countries where shallow aquifers are in abundance, they make use of groundwater systems from where water is drawn from shallow aquifers for agricultural production, especially on the Borotse flood plain in Western Zambia, or for watering of cattle in West Africa (IWMI and AWS, 2009). There is also extensive cultivation of rice between the Senegal and Gambia Rivers, which has been made possible by the construction of dykes, These constructed dykes retain fresh water and prevent crops from salty tidal surges along the West African coast (Carney, 2001). According to Postel (1999), many of the systems were supported by a system of the lifting of water (shadoofs) to increase the inundation of these areas for continuous agricultural production.

Globally, it has been acknowledged that women's empowerment, politically, socially, economically, and health-wise, is crucial in bridging the gender divide and is also essential in achieving the 2030 Agenda for Sustainable Development, particularly, Goal five, which focuses on gender equality (UNFPA, 1994; UN, undated). It has equally been observed that women's empowerment could boost economic productivity and increase economic diversification and income equality in addition to other potential positive development outcomes. For instance, it was noted that in countries where the female employment rate was increased in Organization for Economic Cooperation and Development (OECD) to match what pertains to Sweden, such countries boosted their GDP by over USD 6 trillion (IMF, 2018; PWC, 2018). The World Bank (2018) noted that there are over 2.7 billion women globally who are legally restricted from having

the same choice of jobs as men. ILO (2016) reported that there is a lot of gender inequality in employment and job quality, which results in gaps in social security in pension, unemployment benefits, and maternity protection, where 40% of wage employment globally does not have access to any form of social protection. In Nigeria, women have been perceived as housewives or farmers' wives rather than farmers, and this gender ideology is reflected in policies that affect access to the means of production and the social relationships of production, which *Fadama* activities form part (Ogbona and Nwaobiala, 2014). It has equally been observed that if disparities between men's and women's statuses, access to resources, control of assets, and decision-making process persists, sustainable and equitable development would be undermined (Ajah, 2010; UN, undated).

Similarly, it has been noted that women farmers significantly lack access to independent rights to own land, possess property, and undertake business transactions and productive activities that their male counterparts do (Edoka, 2008; FAO, 2015). Land is considered the most important economic asset but globally, women represent only 12.8 percent of agricultural land holdings. However, a third of women's employment is in agriculture, which includes fishing and forestry (E/CN, 2018). Agricultural production has been identified as a major tool to bridge the gap between hunger and poverty (Umar, 2019), and women in Nigeria have been identified to play very significant roles in all areas. Ogungbile et al. (1991), cited in Ehiemere (2008) in a study of women in Muslim and non-Muslim areas of Northern Nigeria, observed that women's activities include land preparation, planting, harvesting, food processing, livestock, and transportation. Similarly, it has equally been reported that women are involved in food production, processing and marketing (Rahman et al., 2004) and produce 60-80 percent of food and agricultural labour in Nigeria (Buchland and Haleegoah, 2006; Mgbada, 2000). Furthermore, Akangbe et al. (2012) noted that out of 95 percent of small-scale farmers in Nigeria, 55 percent of them are women who produce the bulk of

agricultural products. Studies have shown that many governments' agricultural intervention development programmes in Nigeria have not had a lasting impact on agricultural development and that many have not yielded the expected results of a sustained increase in food production (Baba and Singh, 1998).

The National *Fadama* Development Project (NFDP) in Nigeria is one such programme in states with *Fadama* potentials. Nigeria is blessed with potentially good land and water resources required for sustainable agricultural development. The National *Fadama* Development Project (NFDP) is a project of the Federal Government of Nigeria, through the pooled World Bank loan, to finance the development of *Fadama* lands by introducing small-scale irrigation in states with *Fadama* development potentials. *Fadama* is a Hausa word meaning 'the seasonally flooded or floodable plains along major savannah rivers and or depressions or adjacent to seasonally or perennially flowing streams and rivers.' It is called *Fadama* in Hausa, *Akuro* in Yoruba and *Akpauru* in Igbo. *Fadama* in Hausa describes irrigable, land-usually low-lying plains underlay by shallow aquifers found along Nigeria's major river systems (Blench and Ingawa, 2004). Such lands are especially suitable for irrigated production and fishing and traditionally provide feed and water for livestock. The enormous potential of this land is only very partially developed. The *Fadama* I and II projects successfully refined approaches for improved utilization of these *Fadama* lands. *Fadama* II implements an innovative local development planning (LDP) tool and builds on the success of the community-driven development initiative. The cumulative impact of these earlier successful World Bank-assisted projects attests to the robustness of the small-scale and community-based approach to *Fadama* development in an environmentally sensitive manner. The World Bank's *Fadama* III Project, a follow-up to the *Fadama* II Project, which has affected the lives of rural farmers, especially women, raising their incomes by 63 percent, is showing early results in 36

Nigerian states and the Federal Capital Territory (FCT) (NFDP II, 2003). It was at the backdrop of all these that the study was conceived to assess the influence of *Fadama* activities on women empowerment in Ede North Local Government Area of Osun State, Nigeria, to improve women's productivity.

Conceptual/ Theoretical Framework

Community - Driven Development (CDD)

Several theories and concepts could be employed as a framework to assess the roles of gender in *Fadama* activities. Some of these theories and concepts include Citizen Participation, Community Development, Social Inclusion, Sustainable Development as well as Community- Driven Development (CDD). The concept of Community-Driven Development has been identified as critically relevant to this study. The World Bank defines CDD as "a development approach that gives control over planning decisions and investment of resources to community groups and local governments" (Dongier et al., 2003: 3). This is so because CDD provides communities with a voice and control over all project stages, it is believed to i) enhance sustainability; ii) improve efficiency and effectiveness; iii) allow poverty reduction efforts to be taken to scale; iv) make development more inclusive; v) empower poor people, build social capital, and strengthen governance; and vi) complement market and public sector activities (Dongier et al., 2003; van Domelen, 2007; Baird et al., 2009; Binswanger et al., 2010, Aduse-Asante and Hancock, 2012). Therefore, in this approach, community groups are organized to plan, implement and manage the process. CDD can also be defined as an approach that empowers local community groups, including local governments by giving direct control to the community over planning decisions and investment on resources through a process that emphasizes participatory planning and

accountability (World Bank, 2006). CDD is, therefore a way to provide social and infrastructural services, organize economic activities and resource management, empower poor people and improve governance and enhance the security of the poorest (World Bank, 2003). Importantly, the strategy represents a shift from public sector domination to a Community-Driven Development (CDD) approach, which is built around community-defined priorities where each community has a comparative advantage over a resource. The participatory component of the project was based on *Fadama* user groups with common economic interests, such as farmers, fishers, pastoralists, women, the disabled, and students (NFDP II, 2003). The project encouraged these groups to develop plans. Then each group request money to pay for income-generating "community-level assets," such as fishing nets, fertilizer, water pumps, or generators, to name but a few.

Community organizations decide how the resources are allocated among the priorities that they identify, and they equally manage the funds. Extensive facilitation, training, and technical assistance are provided through the project to ensure that women and vulnerable groups, especially the physically challenged, participate in the collective decision-making process. The projects help by giving voices to the communities and promoting transparency and accountability in the planning and management of public investments within the Local Government Areas (LGAs).

Ejiofor (2007) in Ibeawuchi, & Nwachukwu, (2010) "explained that the CDD strategy makes it possible for beneficiaries to play leading roles in:

(a) identification and prioritization of their needs;

(b) deciding and preparing of micro- projects required to address the identified needs;

(c) co- financing the micro- projects;

(d) continue to operate and maintain the micro-projects thereby ensuring sustainability;

(e) learn to do things for themselves and in so doing their capacities are built; and

(f) ownerships of the micro-projects are guaranteed by active participation of beneficiaries in all the phases of the micro-projects cycle (identification, planning, prioritization, designing, implementing and maintenance of Intervention measures)".

Fadama Activities

Fadamas have been sources of economic power to many groups of individuals called *Fadama* Users Group (FUG). *Fadama* Users Groups, according to Blench and Ingawa (2004), are farmers, pastoralists, fisher folk/fisherwomen, hunters, and others (e.g., gatherers) who directly depend upon the natural resources of *Fadama* for their livelihoods. According to Baba and Singh (1998), the *Fadama* lands have high potential and agricultural values several times more than the adjacent upland. *Fadama* development is a typical form of small-scale irrigation practice characterized by flexibility of farming operations, low inputs requirement, high economic values, and minimal social and environmental impact and hence conforms with the general criteria for sustainable development (Akinbile et al., 2006). Furthermore, Akinbile et al. (2006) submitted that pumping water from wells in *Fadama* helps control the water table and is thus an anti-water logging device. The NFDP was established consequence of the failure of large-scale irrigated schemes, which the country has pursued for the last 2 decades to yield the anticipated increase in food production (Baba and Singh, 1998). Presently, the NFDP is widely being implemented in all 36 states of the Federation and the Federal Capital Territory (FCT). These states have been categorized into the core states and the facility states. The core states include Bauchi, Gombe, Jigawa, Kano, Kebbi, Zamfara, and Sokoto, while the remaining states and the FCT constitute the facility states (Baba and Singh, 1998).

In Osun state, 8,000 farmers have benefitted from phase III of the project. Some of the communities who have benefited from this *Fadama* project include Egbedore, Ife-east/area office, Oriade, Ila, Odo-Otin, Orolu, Atakumosa-West, Iwo, Ola Oluwa, Irewole, Irepodun, Olorunda, Atakumosa-East, Ifelodun, Boripe, Boluwaduro, Isokan, Ife-central, Ife-south and Ede-north. The third National Fadama Development Project (NFDP) is funded by the World Bank, the Federal Government, State Government and Local Government to the tune of $450m (Osun State, 2010). The objectives of *Fadama* III are to increase the income of *Fadama* lands and increase water resources users in our local communities. By increasing their income, it will help reduce poverty, increase food security and contribute to the attainment of the MDGs/SDGs. Unlike *Fadama* II, which covered only 18 states, *Fadama* III covered 36 states and the Federal capital territory.

According to the Project Implementation Manual of *Fadama* III, the strategic objectives of *Fadama* III are to enhance growth in all sectors other than oil to achieve increased food security, reduce poverty, and create employment in rural areas. In addition, *Fadama* III is to increase opportunities for rural economic development and contribute to the realization of the agenda for a secure future. The target population of NFDP III is 2.2 million rural farming households, smallholder male and female farmers, pastoralists, fisher folks, traders, processors, hunters and gatherers, the disadvantaged and physically challenged groups, widows/widowers, the handicapped, the unemployed youths, aged and people living with HIV/AIDS (PLWHIV).

To achieve the strategic objectives of NFDP III and to reach the target population, viable FUGs and their apex FCAs were formed. Support was provided for acquiring group-owned productive assets, inputs, and rural infrastructure through the community-driven development (CDD) approach. For FUG to benefit from this project, upfront payment of 30 percent beneficiary contribution for productive assets is required for 70 percent corresponding matching grants by the

project, and 50 percent matching grant on inputs. On the other hand, vulnerable FUGs enjoy 100 percent matching grant for both productive assets and inputs and 15 percent repayment from proceeds of activity is expected from them. For FCAs to benefit from infrastructural support, 10 percent beneficiary contribution is required for 90 percent matching grant by the project. The *Fadama* Community Association (FCA) is an apex organization of economic interest groups (FUGs), which derive their livelihood from the shared natural resources of the *Fadama* land. 10 to 15 *Fadama* User Groups (FUGs) constitute FCA.

A *Fadama* User Group (FUG) is a group of persons (average of 10-15) who share common economic interests such as crop production, animal production, agro-processing, agricultural marketing, etc. In Osun State, on average, there are seven to eight FCAs in each of the twenty Local Government Areas covered by *Fadama* III. For any FCA/FUG to benefit from the project, certain guidelines had to be put in place by the Osun State *Fadama* Coordination Office (OSFCO). These include; payment of counterpart funds (10 percent for rural infrastructure, 30 percent for pilot asset acquisition, and 50 percent for inputs support). Farmers are instructed first to pay their counterpart funds to service providers that would execute such projects, and inspection would be done before the counterpart fund from the NFDP III is released. All FUGs/FCAs are expected to open bank accounts for FUEF (*Fadama* Users Equity Fund) savings and pay into such accounts once operations of activities commence; there is efficient monitoring and evaluation as well as record keeping.

According to the National Planning Commission (NPC, 2012), Nigeria's development efforts have over the years been characterized by lack of continuity, consistency and commitment to agreed policies, programmes and projects, as well as an absence of a long-term perspective. Due to this, there has not been much improvement in the overall welfare of Nigerian citizens because of rising

unemployment, inequality and poverty (National Planning Commission NPC, 2012). Despite this assertion, the National *Fadama* Development Project (NFDP) III has played significant roles in infrastructural support and acquisition of productive (income-generating) assets by able-bodied groups, women, unemployed youths and other vulnerable groups in Nigeria.

According to Akinbile (2007), Nigeria has had many intervention programs in the agricultural sector, which have not had a lasting impact on agricultural development nor yielded the expected result of a sustained increase in food production. It is, therefore, necessary to assess the NFDP to prevent the programme from suffering the same fate as the earlier ones. Baba and Singh (1998) noted that the lack of post-harvest technologies, poor handling, poor road network, and the lack of means of preservation were major constraints of *Fadama* products preservation. High-yielding crop varieties are highly susceptible to diseases such as stem, leaf, and root rot, blight, blasts, aphids, and stem borer. Other problems identified include; pests such as Quelea quelea birds, migratory locusts, grasshoppers, insects, and diseases whose devastating effects could cause crop losses as high as 25-30 percent (Oladoja et al., 2008).

The 2030 Agenda for Sustainable Development

The new development agenda popularly known as the 2030 Agenda for Sustainable Development seek to build on the Millennium Development Goals and complete what they did not achieve. They seek to realize the human rights of all and to achieve gender equality and the empowerment of all women and girls. They are integrated and indivisible and sought to balance the three dimensions of sustainable development: the economic, social and environmental (UN, 2015).

The UN, while setting the targets for this new agenda stated “that, between now and 2030, to end poverty and hunger everywhere; to combat inequalities within and among countries; to build

peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the lasting protection of the planet and its natural resources. It is also to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all, taking into account different levels of national development and capacities" (UN, 2015, 3).

Goal Five. Achieve gender equality and empower all women and girls

5.1 End all forms of discrimination against all women and girls everywhere,

5.2 Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation,

5.3 Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation,

5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate,

5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life,

5.6 Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences,

5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws,

5.b Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women,

5.c Adopt and strengthen sound policies and enforceable legislations for the promotion of gender equality and the empowerment of all women and girls at all levels.

The UN (2015) stated further that it was determined to mobilize the resources required to implement this Agenda through a revitalized Global Partnership for Sustainable Development, based on a spirit of strengthened global solidarity. The focus here is particularly on the needs of the poorest and most vulnerable and with the participation of all countries, all stakeholders and all people. Goal (5.a) of Agenda 2030 on sustainable development discusses women empowerment and rights to economic resources, as well as access to ownership and control over land, which is in concordance with one of the objectives of the *Fadama* program to empower women and ease their access to land for *Fadama* activities.

Study Area

Ede is a town in Osun state, southwestern Nigeria. It lies along the Osun River at a point on the railroad 180 km from Lagos. Ede is one of the older towns of the Yoruba people founded about 1500AD by Timi Agbale a hunter, is predominantly Muslims who make up to 90 percent of the population (Eades, 1980). It has an area of 11km^2 and population of 159,866 at the 2006 census (NPC, 2007) and projected to 226,064 inhabitants in 2017. It lies between latitude 7° 31’ and 7° 55’ N and longitude 4° 15’ and 4° 40’ E. It is bounded in the North by Egbedore, to the South by Ayedade, to the East by Atakumosa and Osogbo and to the West by Ejigbo and Ayedire Local Government Areas of Osun State. It is drained by river Osun, Shasha and their tributaries.

Alluvial soils rich in Agriculture are formed along the courses of rivers and streams in the study area especially on the flood plain (Gasu, 2013). These are soil types that derive their comparatively high productivity from their water holding capacity; the concentration of nutrients washed down from the adjacent slopes and the great depth of easily worked fine alluvium (Areola, 1978, Okusami, 2011). The area is characterized by tufted savannah grasses and dotted with trees especially oil palms. The annual rainfall is between 1500mm and 2000mm, mean annual temperature of 27℃ and Relative humidity of over 80% in the morning, which falls to 50-70 percent in the afternoon (Smyth and Montgomery, 1962). The availability of alluvial soils with high water holding capacity and for the digging of shallow wells and high annual rainfall, provide a conducive environment for the thriving of Fadama activities in the study area. Some of the traditional irrigation techniques that could be adopted to take advantage of the water facilities include shadoof, pumps, gravity or national flow and calabash/bucket methods (Apata and Saliu, 2016).

Research Method

The research made use of two types of data, primary and secondary data. The primary data was obtained by the administration of questionnaires to respondents and through field inspection and observation. This was achieved purposively by administration of 240 structured pre-tested questionnaires in a survey of 24 Fadama Users Groups (FUGs) whose representatives constitutes six Fadama Communities Associations (FCAs) in the study area. The administration of the questionnaire focused mainly on the FUGs, which have more female users' groups than males. Ten members each from four FUGs in the 6 FCAs were administered the questionnaires, totaling 240 questionnaires. The sample frame used for this research is the membership register of all the existing Fadama Users Groups (FUGs) whose representatives constitute Fadama Community

Associations (FCAs) in the study area. There are eight (FCAs) out of which six were purposively selected. Each of these Fadama Community Associations contain ten to fifteen Fadama Users Groups (FUGs) from which four FUGs each were equally purposively selected with preference given to those with higher number of female members. Each of the Fadama Users Groups consists of nine to fifteen members. Data analysis made use of Principal Component Analysis (PCA), tables and frequency distribution. The secondary data on the population of study area was obtained from the National Population Commission (NPC, 2006), climate data (rainfall, humidity and temperature) was collected from the Osogbo Meteorological Station on the climatic characteristics of the area in relation to *fadama* activities. Other relevant data like location, road map, *fadama* users groups and *fadama* communities were collected from the Ministry of Urban Development and the *fadama* Coordinating Office at the Local Government headquarters. Information on soil characteristics and water holding capacity of soil was collected form journals, textbooks and other relevant agencies.

Factor Analysis

This study made use of factor analysis for it is an important tool that provides a rich multivariate approach towards exploring the underlying features of multiple and interrelated variables, without any preconceived judgment (Hair et al., 1998; Field, 2005). Ahadzie et al. (2010) observed that this tool is widely acknowledged as useful for screening and properly managing the interpretation of the too many variables often encountered in many research designs. Ahadzie et al. (2010) while drawing lessons from the results of his own research emphasized that factor analysis reinforces the potential of the tool towards helping to understand the complex relationship that exists amongst the many multiple variables often associated with research designs. Researchers have held the view

that factor analysis is very useful for exploratory research, identification of underlying factors, screening of variables, data summarization, clustering of objects, sampling of variables, index building, and more importantly, establishing the construct validity of any potential measures without imposing any preconceived judgment (Stapleton, 1997; Hair et al., 1998; Field, 2005).

Results and Discussions

Gender Status of Respondents

The result in table 1 shows that *Fadama* in the study area is gender sensitive. The survey reveals that 80.4 percent are females while 19.6 percent of the respondents are males. This conforms to the views of Mgbada, (2000) and Rahman et al. (2004) that Women provide about 60-80 percent of agricultural labour force and contribute to well being of their households through their income generating activities. More women participated in this Local Government Area than men did because most of the *fadama* activities were specifically designed to empower women and, in some cases, women were given a lot of incentives with their counterpart funding out rightly paid for by Members of House of Representatives, Senators and some NGOs.

Table 1: Gender of Respondents

	Frequency	Percent	Cumulative Percent
Male	47	19.6	19.6
Female	193	80.4	100
Total	240	100	

Source: Author's fieldwork (2019)

Average Monthly Income before and after Joining Fadama

The results in table 2 show that 54.17 percent of the respondents received an average monthly income of N18.000-N28.000, 25.41 percent received below N18.000, 16.25 percent received N29.000-N39.000 while 4.16 percent received more than N40.000 before the commencement of the program. Similarly, Table 2 shows that 45.00 percent of the respondents earned an income of N29. 000-N39. 000, 42.08 percent received N40. 000 and above, 7.5 percent earned N18.000-29.000 while 5.4% percent earned less than N18.000 after the program. Comparatively, the results in table 2 show that before *Fadama,* 54.17 percent earned an income of N18, 000 - N28,000, while after *Fadama,* it was reduced to 7.5 percent, 45 percent earned N29, 000-N39, 000 after the program compared to 16.25 percent before, while 42.08 percent earned N40, 000 and above and after the program compared to 4.17 percent before the commencement of the program. The implications are that *Fadama* activities have made a remarkable improvement in the income of the participating farmers, which has moved most of them out of the region of poverty. These results were in tandem with the target of 40 percent set to be achieved at the end of *Fadama* III program though below 60.8 percent results obtained by Umar (2019) in Northern Nigeria. If this is sustained, could improve the livelihood of the participants, reduce poverty, create jobs and create value chain addition.

Table: 2: Average Monthly Income before and after Joining *Fadama*

Respondents Income before joining *Fadama*				Income after joining *Fadama*		
Amount in Naira (N)	Frequency	Percentage	Cumulative percent	Frequency	Percentage	Cumulative Percentage
Below 18,000	61	25.41	25.41	13	5.42	5.42
18,000-28,000	130	54.17	79.58	18	7.5	12.92
29,000-39,000	39	16.25	95.83	108	45	57.92
40,000 and Above	10	4.17	100	101	42.08	100
Total	240	100		240	100	

Source: Author's fieldwork (2019) 1$ = 441.7 NGN

Fadama Farming Activities

Table 3 shows that 32.1 percent of the respondents were into cassava farming and processing while 16.7 percent were maize farmers. Similarly, 14.2 percent were tomatoes/pepper farmers while 13.3 percent of the respondents were into oil palm processing. In the same vein, 12.5 percent were into poultry while 4.6 percent were vegetable farmers, 4.2 percent were into locust beans processing, and 2.5 percent were fish farmers. These findings were in tandem with E/CN (2018), who observed that a third of women globally are employed is in agriculture, which includes fishing and forestry. Similarly, the results were in concordance with the views of Ogungbile et al. (1991) cited in Ehiemere (2008) in a study of women in Muslim and non-Muslim areas of Northern Nigeria, who observed that the activities of women include land preparation, planting, harvesting, food processing, livestock, and transportation. The findings also aligned with the work of Rahman et al. (2004), who reported that women were involved in food production, processing, and marketing. It must be noted that despite the significant role women play in some productive activities, they are seriously limited by access to and control of land, where FAO (2015) noted that they account for only 12.8 percent of agricultural landholding in the world.

Table 3: *Fadama* Activities undertaken

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cassava	77	32.1	33.5	33.5
	Leaf vegetable	11	4.6	4.8	38.3
	Tomatoes/pepper	34	14.2	14.8	53
	Maize	40	16.7	17.4	70.4
	Oil palm	32	13.3	13.9	84.3
	Fish production	6	2.5	2.6	87
	Poultry (egg production)	30	12.5	13	100
	Locust beans processing	10	4.2		
Total	240	100			

Source: Author's Fieldwork (2019)

Fadama Economic Activities

Figure 1 shows that 16.2 percent of the respondents observed that the *Fadama* activities they were engaged in have helped in the increase in food production in the study area. Those who opined that it was a source of working capital constituted 14.6 percent of the respondents closely followed by those who saw it as a major source of income who made up to 12.9 percent. The respondents who benefitted from the *Fadama* program by paying their children school fees and purchased electronic gadgets constituted 12.1 percent each. Some of the respondents saw *Fadama* as a better exposure while 5.0 percent had benefitted from it by building houses. However, some benefitted from the program by acquiring new knowledge through capacity building while few of them opined it increased social interaction. The findings were in tandem with Umar (2019) where increased productivity led to improved standard of living. All these activities could assist in the attainment of the SDGs.

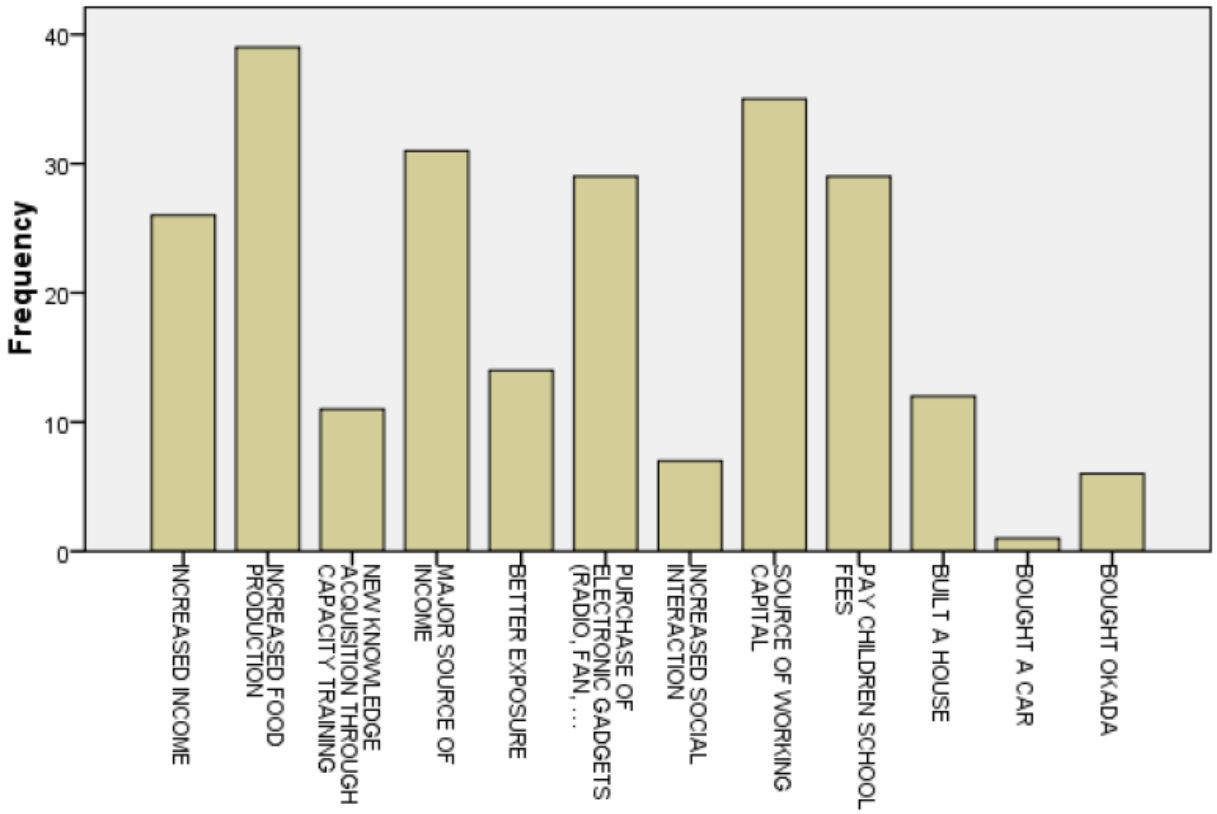

Figure 1: Benefits from Fadama activities

Source: Author's Fieldwork (2019)

Factor Analysis

The Kaiser-Meyer-Olkin measure of sampling adequacy is an index for comparing the magnitudes of observed correlation coefficients with the magnitudes of partially correlated coefficients. Table 4 shows the result of the Kaiser-Meyer-Olkin-Bartlett's test of sampling adequacy with a value of 0.788, significance of .000 and degree of freedom (df) 179. This result shows that KMO and Bartlett's tests of data suitability for factor analysis was good and was within the acceptable range where (0.50 was considered poor, 0.60 was acceptable, 0.70 was good, 0.80 was commendable and greater than 0.90 was considered exceptional) for a well-specified model. These results were

in tandem with findings of earlier studies by Henry et al. 2003; Ahadzie et al. 2010 and Fadare and Gasu, 2011.

Table 4: Kaiser-Meyer-Olkin-Bartlett's Test for Fadama activities in Ede.

KMO and Bartlett's Test		
	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.788
Bartlett's Test of Sphericity	Approx. Chi-Square	1651.831
	Df	179
	Sig.	0

Source: Author's Fieldwork (2019)

Table 5: shows that the value of communalities ranges from between zero and one with higher observed values representing the fact that a greater share of common variance is explained by the extracted components. Communalities indicate how the indicators combined to identify components (Henry et al., 2003). The communalities ranged in value from 0.444 and 0.853, which could be considered to fall within an acceptable range. All the indicators proved highly explanatory of the *Fadama* activities shown in table 5.

Table 5: Factor Analysis

Commonalities	Initial	Extraction
Gender	1	0.567
Age	1	0.819
Marital Status	1	0.795
Educational Level	1	0.444
Occupation	1	0.805
Average Monthly Income before joining Famada	1	0.654
Female User Groups more than the Male User Groups	1	0.779
Average Monthly Income after joining Fadama	1	0.776
Fadama Activities Undertaken	1	0.853
Source of Labour	1	0.538
Source of Finance	1	0.626

Extraction Method: Principal Component Analysis.

Source: Author's Fieldwork (2019)

Table 6 shows the results of the component matrix for indicators measurement in Ede. The absolute value of the coefficients for each indicator represents the degree of correlation between the component and the indicator. Therefore, large absolute values indicate a high level of correlation, while low values indicate a lower level of correlation. For the correlation to be considered significant at 0.01 level, a minimum value of 0.18 is required (following the Burt-Banks formula) but at best screened for those above 0.300 (Henry et al., 2003). Positive coefficients indicated the direction of the relationship between the indicator and the role of women in *Fadama* activities, hence as the value of the indicator increases, so does the value of the component. Negative coefficients indicated an inverse relationship between the indicators and the role of women in *Fadama* activities in Ede.

Table 6: Component Matrix

	Initial	Extraction
Gender	1	0.567
Age	1	0.819
Marital Status	1	0.795
Educational Level	1	0.444
Occupation	1	0.805
Average Monthly Income before joining Fadama	1	0.654
Female User Groups more than the Male User Groups	1	0.779
Average Monthly Income after joining Fadama	1	0.776
Fadama Activities Undertaken	1	0.853
Source of Labour	1	0.538
Source of Finance	1	0.626

Extraction Method: Principal Component Analysis.

Source: Author's Fieldwork (2019)

Table 7 shows four level components of PCA with Eigen values greater than 1.0 extracted using the factor loading of 0.50 as the benchmark of explained "Common Variance" to be considered representative of a common underlying dimension. The relatively high value of the loaded factors above (0.50) for more than seven variables lend support to the favourability of the sample size for the analysis in tandem with earlier studies by Ahadzie et al. (2010); Fadare and Gasu, (2011). The size of an Eigen value represents the amount of variance in the PCA explained by the component, hence the larger the Eigen value, the more the components are explained by the model's indicators (Henry et al., 2003). With reference to the Eigen values, four variables were extracted because they had Eigen values greater than one. The variables include; one-'gender' which contributed 31.3 percent, variable two-'age' contributed 17.6 percent, variable three-'marital status' contributed 11.2 percent and variable four-'educational level' contributed 9.4 percent. Variables one-four contributed 69.61 percent of the total variance that explains *Fadama* activities in the

study area. The result shows that the four variables are the most important factors in assessing *Fadama* activities in the study area.

Table 7: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.448	31.342	31.342	3.448	31.342	31.342
2	1.941	17.647	48.989	1.941	17.647	48.989
3	1.234	11.222	60.211	1.234	11.222	60.211
4	1.034	9.397	69.608	1.034	9.397	69.608
5	0.922	8.379	77.987			
6	0.754	6.85	84.837			
7	0.635	5.773	90.61			
8	0.37	3.36	93.97			
9	0.288	2.615	96.585			
10	0.252	2.29	98.875			
11	0.124	1.125	100			

Extraction Method: Principal Component Analysis

Source: Author's Fieldwork (2019)

Table 8 shows the factor analysis for four factors extraction where factors loadings considered significant in explaining indicators were set at 0.50. Results on the table 8 show that five factors loaded on components 1 and these were named-Livelihood support on gender, three factors loaded on component 2 named-Characteristics of Fadama labour, two factors loaded on component 3, which were named-Active working class while one (1) factor loaded on component 4, which was equally named educational level. The combinations of various components named above (Livelihood support on gender, Characteristics of Fadama labour, Active working class and educational level) constitute the combinations of factors that gave the most appropriate explanations underlying Gender and Fadama activities in Ede, which was in tandem with earlier

studies by Ahadzie (2010) and Fadare and Gasu (2011). The highly loaded factors on component one 'Livelihood support on gender' in this study may indicate the presence of a viable livelihood support which is gender sensitive, that need to be explored for sustained growth. (2011). The highly loaded factors on component one 'Livelihood support on gender' in this study may indicate the presence of a viable livelihood support which is gender sensitive, that need to be explored for sustained growth.

Table 8: PCA Components Extraction of Factor analysis

Variables	Factor 1 Livelihood support on gender	Factor 2 Characteristics of labour	Factor 3 Active working class	Factor 4 Educational level
Age		0.649	0.611	
Marital status		0.625	0.503	
Educational level				0.602
Occupation	0.855			
Monthly income before Fadama	0.578			
No. of female user groups	0.779			
Monthly income after Fadama	0.669			
Fadama activities	0.769			
Source of labour		0.586		
Source of finance				

Source: Author's Fieldwork (2019)

Conclusion

The *Fadama* project in the study area shows a gender-sensitive nature as illustrated by 80.4% female respondents in the study. As regards *Fadama* activities, majority 58.8% were into agro processing and 25.4 percent were into real farming. About 54.17 percent earned N18,000-N28,000 while 25.41 percent earned an average annual income of below N18,000 before joining the

Fadama programme. When compared to income after joining *Fadama*, there was increase in their income level as 42.00 percent of the respondents received N40, 000 and above and 5.42% of them receive below N18,000 minimum wage. Similarly, 16.2 percent agrees that *Fadama* has increased food production, 14.6 percent sees it as a source of working capital, while 12.1 percent benefitted from the program by paying their children school fees and purchasing of electronic gadgets, which attests to the effectiveness of the Community-Driven Development (CDD) initiative, which should be adopted to drive similar development programmes. Similarly, the result of the PCA shows that four variables were the most important factors in assessing *Fadama* activities in the study area, contributing 69.61 percent of the total variance.

The highly loaded factors in component one (Livelihood support on gender) in this study indicate the need to improve the overall livelihood support system of the rural dwellers to make *Fadama* a viable and gender friendly. If the lessons from *Fadama* are anything to go by, they should be extended to reach all other development strives geared towards poverty reduction and economic development. Therefore, agricultural production, which is the mainstay of the rural sector, needs to be seriously improved to bring meaningful development nearer to the people and improve their access to good things in life. For *Fadama* to drive this change, there is a need to review our agricultural practices, especially the slash-and-burn agriculture, shifting cultivation, and land holding system (with women in focus). Based on the findings of the study, it is evident that the *Fadama* program in Ede North Local Government has increased the participation of rural women farmers in agricultural production.

The following conclusions were drawn. It was concluded that the program made appreciable impacts on gender, farmer's income before and during *Fadama.* This shows that *Fadama* has helped to solve the problems of gender discrimination in Nigeria by increasing the participation of

women in *Fadama* activities, increased income for women *Fadama* participants, which has ultimately increased their purchasing power and therefore bridged the gap in liquidity between men and women. The National *Fadama* Development Project (NFDP) based on the development of wet, irrigable land popularly referred to as *Fadama* is a complete package that adopts the Community-Driven Development (CDD) approach to agricultural development and rural transformation. This study offers opportunities for government authorities and other stakeholders to share, influence, and empower their citizens using the CDD approach, which can go a long way to create jobs through value chain addition, reduce poverty, and offer the opportunity for all folks to earn a living and transform the whole rural landscape for sustainable living and advance the achievements of the Sustainable Development Goals (SDGs).

References

Aduse-Asante, K. and Hancock, P. (2012). Theories in Community-Driven Development operations. A case study of Ghana Local Government system. *European Journal of Business and Social science,* 1 (5), 83-98.

Ahadzie, D. K., Proverbs, D. G. and Ankrah, N. (2010). Analyzing quantitative data using factor analysis: reflections from an empirical study. In Laryea, S., Leiringer, R and Hughes, W. (Eds), *Proceedings of the West African Built Environment Research (WABER)* Conference, 27- 28 July 2010, Accra, Ghana, 177-88.

Ajah, J. (2010). Participation of Women in Households' farm production decision-making in the South Eastern Nigeria in Agricultural Society of Nigeria (ASN). *Proceedings the 44th Annual Conference "LAUTECH, 2010J"* held at Ladoke Akintola University of Technology, Ogbomoso, Oyo State Nigeria. 18th – 22nd October (pp 367).

Akangbe, J.A., Ogunyinka, W., Ayanda, I.F., Achem, B. and Adisa, R.S (2012). An assessment of effects of Fadama II project on Livelihood of farmers in Orire Local Government Area of Oyo State, Nigeria.

Akinbile L. A. (2007). *Agriculture technology development and dissemination in Nigeria.* Faculty Lecture of Faculty agriculture and forestry, University of Ibadan.

Akinbile, L. A; M. A. Oladoja; F. M. Awoniyi and B.O. Adisa. (2006). Effect of community participation on perception of sustainability of rural water projects in Oyun Local Government Area of Kwara State, Nigeria. *J. Food agric. Environs 4: 257-261.*

Apata. O. M. and Saliu, O. J. (2016). Impact Assessment of Fadama Project on Agricultural Development in Kwara State, Nigeria. *American Journal of Experimental Agriculture* 10 (4): 1-7.

Areola, Olusegun (1978). Soils and vegetal resources. In J.S. Oguntoyinbo, O.O. Areola, & M. Filani, (Eds), *A Geography of Nigeria Development* (pp105-206): Ibadan, Heineman Educational Books (Nigeria) Ltd. 2nd Edition.

Baba, K.M and Singh, (1998). Sustainable development of Fadama lands in northern Nigeria. A view of the potentials and challenges in Nigeria. *J. Rural Sociology* 2: 95-105.

Baird, S., McIntosh, B. & Ozler, M. (2009). Targeting in a Community–Driven Development Binswanger–M. H.P., Jacomina P. de Regt, Spector, S. (2010). Local and Community Driven

Binswanger, I. A., Merrill, J.O., Krueger, P.M., White, M.C., Booth, R. E., Elmore, J. G. (2010). Gender Differences in Chronic Medical, Psychiatric, and Substance-Dependence Disorder among Jail Mates. American Journal of Public Health, 100(2): 467-482.

Blench, R. and Ingawa, S.A, (2004). A practical guide for national *Fadama* Development to facilitators on conflict analysis and management.

Buchland, L. and Haleegoah, B. N. (2006). *Gender Analysis in Agricultural Production.* IITA Research Guide 58. Training Programme. International Institute for Tropical Agriculture (IITA), Ibadan, Nigeria.

Carney, J. (2001). *Black rice: The African origins of rice cultivation in the Americas.* Harvard University Press.

Dongier, P., Domelen, J. V., Ostrom, E., Ryan, A., Wakeman, W., Bebbington, A., Alkire, S., Esmail, T. and Polsky, M. (2003). "Community Driven Development." In Poverty Reduction Strategy Paper Sourcebook, Washington, DC: The World Bank.

Eades, J.S. (1980). *The Yoruba today.* Cambridge University Press.

E/CN, (2018). 6/2018/3. Available at: https://undocs.org/E/CN.6/2018/3.

Edoka, M. H. (2008). Gender – related issues in Agriculture: A critical view of Olamaboro, L.G.A., of Kogi State, Nigeria in Agricultural Society of Nigeria (ASN) *Proceedings of the 42nd Annual Conference Held at Facility of Law Auditorium, CAS Campus Ebonyi State University,* Abakiliki, Nigeria 19th – 23rd October, 2008 Pp 999.

Ehiemere, I. A. (2008). *Gender Issue in Poverty Alleviation Programme*: The Case of National Fadama I in Abia State. A Research Project Submitted to Abia State University Uturu (Unpublished).

Ejiofor, (2007). in Ibeawuchi, I. Echeme & Nwachukwu, C.C. (2010), An Investigation on the Impact of FADAMA II Project Implementation in Imo State. *American Journal of Scientific and Industrial Research, Science* Huβ, http://www.scihub.org/AJSIR, ISSN:2153-649X Doi: 10.5251/ajsir.2010.1.3.532.538.

Ekong, (1996). *Effect of climate change and weather on food crops in Nigeria*. Macmillan press Limited, pp 3-7.

Fadare, S.O. and Gasu, M. B. (2011). "Study of poverty in the rural hinterlands of Ede, Nigeria": *Ife Journal of Environmental Design and Management,* Obafemi Awolowo University, Ile-Ife, Vol. 5, No.1: pp. 1-14 (Nigeria**).**

FAO, (2015). *Gender and Land Statistics Recent development in FAO's Gender and Land Rights* Database (Rome, 2015). Available at http://www.fao.org/3/a/-i4862e.pdf.

Food and Agriculture Organization (2009). Technical papers from the Expert Meeting on How to Feed the World in 2050. FAO. Retrieved 11 November 2018, from http://www.fao.org/wsfs/forum2050/ wsfs-forum/en/on.

FAO, (2002). Sub-Saharan Africa: www.fao.org.Acessed 1/7/2022.

Field, A. (2005). *Discovering statistics using SPSS*, Sage Publications, London.

Gasu, M. B. (2013). Socio-economic characteristics and livelihood assets of wetlands users at Ede region, Southwestern Nigeria. In: S. Laryea and S. Agyepong (Eds). *Procs 5th West Africa Built Environment Research (WABER) Conference (*pp. 227-234), 12-14 August 2013, Accra, Ghana.

Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1998). *Multivariate data analysis*, Upper Saddle River, Prentice Hall, New Jersey.

Henry, C., Sharma, M., Lapenu, C., and Zeller, M. (2003). *Microfinance poverty Assessment* tool. Technical Tools Series No. 5, September 2003. Consultative Group to Assist the Poor (CGAP) and The World Bank, Washington, D.C.

International Monetary Fund (2018). *Pursuing Women's Economic Empowerment,* https://.imf.org/en/Publications/Policy-Papers/Issues/2018/05/32/pp053118 pursuing-womens-economic-empowerment.

ILO, (2016). Women at work: Trends 2016 (Geneva, 2016). Available at: http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/ publ/documents/publication/wcms_457317.pdf.

International Water Management Institute & AgWater Solutions (2009). Situation analysis and national consultation: Zambia national consultation. Retrieved from http://awm-solutions.iwmi.org/situation-analyses-national-consultations.aspx. Accessed 1/7/2022.

Mgbada, J. U. (2000). Production of Stable Crops by Rural Women in Enugu and Ebonyi States. In T. Olowu (Ed.), Extension in Poverty Alleviation in Nigeria. *Procs. of the 6th Annual National Conference of Agricultural Society of Nigeria (ASN). Pp.10– 12.*

National Population Commission (NPC) (2006). Nigeria Census Figures for State and Federal Capital Territory.

NFDP II (2003). *Fadama II poverty reduction through empowerment*. A publication of PCU-NFDO, Abuja, Nigeria.

Ogbonna, M.O. and Nwaobiala, C.U. (2014). Effect of Fadama III Project on Rural Farm Women Production in Gombe State, Nigeria. *Journal of Agriculture, Food and Environment. 10(1):13-18.*

Ogungbile, A. O. (1991). Women's Participation in production. In M.O. Ijere (Ed.), Women in Nigerian Economy (pp. 66 – 68). ACENA publishers, Enugu.

Oladoja, M.A., Adeokun, O.A. and Fapojuwo. (2008). Determining of socio-economic factors affecting farmers use of communication method of information sourcing in Oluyole Local Government Area of Oyo State, Nigeria. *J. Soc. Sci. 5:51-56.*

Okusami, T.A. (2011). Sustainable Land Use: Pedology Perspective. Obafemi Awolowo University Inaugural Lecture Series 237, Obafemi Awolowo University printing press pp 27-64.

Osun State Fadama Bulletin. Osun State Government publication, (2010). Program: Applications & Acceptance in Tanzania's TASAF. Washington, DC: World Bank.

Oyeleye, D. A. (2001). Settlement Geography. University of Lagos Press, Nigeria.

Pfister, S., Bayer, P., Koehler, A., & Hellweg, S. (2011). Projected water consumption in future global agriculture: Scenarios and related impacts. Science of the Total Environment, 409(20), 4206–4216. https://doi.org/10.1016/j.scitotenv.2011.07.019

Postel, S. (1999). Pillar of sand: Can the irrigation miracle last? W.W. Norton.

PWC, (2018). *Women in Work Index.* Available at: https://www.pwc.co.uk/services/economics-policy/insights/women-in-work-index.html.

Rahman, S. A., Gabriel, A. T. and Marcus, N. D. (2004). Gender Differentials in Labour Contribution and Productivity in Farm Production. Empirical Evidence from Kaduna State of Nigeria. *Paper Presented at the National Conference on Family Held at New Theatre Complex, Benue State, University of Markurdi, Nigeria 1- 5 March.*

Smyth, A. J. and Montgomery, R. F. (1962). Soil and Land Use in central western Nigeria, Government printers, Ibadan, Nigeria. Pp.10-84.

Stapleton, C. D. (1997). Basics Concepts in Exploratory Factor Analysis (EFA) as a Tool to Evaluate Score Validity: A Right-Brain Approach Texas A and M University, http://ericae.net/ft/tamu/EFa.HTM (accessed, 22/12/2006).

Van Domelen, J. (2007). "*Reaching the Poor and Vulnerable:* Targeting Strategies for Social Funds and Other Community–Driven Programs." Social Protection. Discussion Paper 0711, Washington DC: World Bank.

Umar, A. M. (2018). Assessment of the effect of Fadama III project on Women Farmers in Shelleng Local Government Area, Adamawa State, Nigeria. *International Journal of Innovative Social Science & Humanities Research* 7(3), 56-65.

UN Secretary General's High-Level Panel on Women's Economic Empowerment, Leave No One Behind (undated). A call to Action for Gender Equality and Women's Economic Empowerment. Available at: http://www.empowerwomen.org/-media/files/un%20women/empowerwomen/resources/hlp%20briefs/unhlp520full%20report.pdf?ha=en.

UNPF, (1994). Women Empowerment: Issue 7, ICPD POA, Cairo.

World Bank (2018). Women Business and the Law 2018. (Washington, D. C. 2018). Available at: http: wbl.worldbank.org/.

World Bank (2003). Nigerian Poverty-Environment Linkages in the Natural Resource Sector. Empirical Evidence from Nigerian Case Study with Policy Implications and Recommendations. Africa Environment and Social Development Unit, World Bank Institute.

World Bank (2006). Report No. 25972-U GEF project document on Proposed Grant from the Global Environmental Facility Trust Fund to The Federal Republic of Nigeria for the II National Fadama Critical Ecosystem Management Project March 2006.