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Perennial Rainwater Effects on Rural Women Inhabitants in Agriculture

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Abstract

The main sustenance in economic development before now in most countries of the world was on agriculture. With advent of modern technologies and a shift to service industry, agriculture which had been a major source of national income in Nigeria was jettisoned in the advent of oil discovery, which apparently seemed more lucrative. However, of late, the volatility of the oil industry and its uncertainty in pricing has led to the need for diversification of the nation's economic base. As such, government policies are geared towards reviving her economy of which agriculture plays pivotal role in improving her Gross Domestic Product. Historically, antecedents surrounding Agricultural development in places like sub-Saharan Africa, particularly Nigeria were predominantly housed by rural inhabitants. Axiomatically, there are still a size-able number of people living in the rural area of which women are in the majority who are predominantly involved in agriculture. Recently, the unpredictability of weather due to climate change has precipitated the perennial rainwater effects on rural women. The study employed the use of questionnaires, interviews and observations to ascertain if any, perennial rainwater effects on women in agriculture and results showed that rural women have been affected by the orthodox constant change in weather especially undulating rainfalls.

Keywords: Perennial rainwater, Women in agriculture, rural inhabitants

1.0 INTRODUCTION

The prop of economic and overall development in most developing countries lies on agriculture. Initially, agriculture was associated with farming. However, agriculture goes beyond farming. It encapsulates: vegetable/fruit cultivation, forestry, fishery, dairy, poultry, bee keeping, processing, marketing and distribution of crops and livestock products etc. In addition to providing food and raw materials, agriculture also provides employment opportunities to very large percentage of the population (http://agriculturegoods.com, 2013). Antiques have it that agriculture in the past had been a major source of national income and export goods in Nigeria. Indeed, Nigerian economy before the advent of oil was sustained by agricultural products (Sekumade 2009). Sadly, the mainstay of the economy which was agriculture was relegated to the background post oil discovery, which apparently seemed more lucrative. However, of late, the volatility of the oil industry and its uncertainty in pricing has led to the need for diversification of the nation's economic base. As such, government policies are geared towards revamping her economy of which agriculture plays pivotal role in improving her Gross Domestic Product (GDP).

It is asserted that a larger percentage of farmlands are in the rural areas (GRAIN Reports 2014) and sub-urban. In essence, rural inhabitants refer to people living in rural areas as defined by National Statistical Offices. It estimated that about 75% of the world poor people live in the rural area and about 80% of the rural inhabitants depend directly or indirectly on agriculture for their livelihood (World Development Report). Axiomatically, there are still a sizeable number of people living in the rural area of which women are in the majority who are predominantly involved in agriculture. Traditionally, women were mostly used for agriculture. In times past, a great farmer was known for his wealth by the number of wives he had. These women were expected to have children who will in turn assist them in farm work. Their reward was tied to the span of farmland they were able to work on. This led a lot of women to have as many children as possible. Still, in some places, women comprise the majority of small hold farmers (Dioula et al 2013; GRAIN reports 2014). Nonetheless, history has supported the fact that women are the mainstay of many of the world's feasible agro-ecological system (FAO 1992a); and are as such the lifeblood of the development of rural and national economies (Verveer 2011, MuGeDe 2013). Interestingly, the then First Lady of United States of America Hillary Clinton, on one of her trips noted a

comment made by a government official about how women in his country had no role in the country's economy. Mrs. Clinton was said to have stopped him and said, "Sir, as far as the eye can see, (they were traveling in a van), women are bent over with children on their backs doing the farming, carrying wood, carrying water…if they all stopped but for a day, your country would shut down" (Verveer, 2011).

Notably, as important as agriculture is, its products need to be produced in significant quantity to make an impact in the GDP. Many factors contribute to expected yield in agricultural products. One of the agents for a better yield is water among other variables like soil nutrients and photosynthesis. Rainwater is the most effective natural mode of watering in agriculture. It has vivid effects on agriculture and is important for plant survival. Pervasively, agriculture is seasonal for rural inhabitants. There is the planting season and harvest season. Importantly, therefore is the effect of rain water, on both seasons. Practically, farmers eagerly wait for rain to start planting their crops. Even so, in as much as rainwater is vital to healthy plants, too little or too much quantity of it can be detrimental to both plants, animals and human beings involved. In many parts of the world, where either too much or too little rain falls, and often at the wrong time, might lead to water scarcity, droughts and crop failure (International Atomic Energy agency; Practicalaction.org/rainwater-harvesting-8). According to Hubbard (2013), Flooding and wet weather are so costly to agricultural land because they cause delays in and reduction of crop harvest. William Morfoot, posited that in agricultural land drainage, specialists are well aware of the necessity of farm land having the optimum amount of saturation to successfully yield crops. Subsequently, flooding can lead to erosion thereby washing away some vital soil nutrients which invariably affects plants' yield whereas drought can destroy crops. If soil is too wet it can cause harmful fungus growth (Blazers) and can result in poor conditions for the crops to grow (Hubbard 2013). According to Hubbard (2013), when soil is well drained then the oxygen, nutrients and trace elements that the plant needs are available. He further reiterated that if the soil is too damp, the field's yield is potential severely reduced. Furthermore, various crops require different quantities of water for optimal performance while high rainfall causes the chilling of young animals and birds soon after parturition as a well as increases the production of tsetse flies that reduces animal growth and may even have a fatal effect. In addition, it leads to low milk production (Iwena 2012).

Initially, farmers plan the planting season and harvest time but climatic changes have affected the predictability of amount of rainfall in either wet or dry season. Climate change is disrupting the world's rainfall patterns, meaning that some parts of the developing world are suffering from a drastic drop leading to a fall in water levels in many reservoirs and rivers. In sub-Saharan Africa, 90% of agriculture is rain-fed, making it even more vulnerable to changing weather patterns (Practicalaction.org/rainwater-harvesting-8). Most rural dwellers may have little or no formal education and as may not be adequately informed about the importance of metrological reports and at times the reports are not specific but generalized to a particular area. Therefore, those who have understanding among the rural inhabitants may doubt the authenticity of weather reports. In the light of the above, this paper seeks to ascertain perennial rainwater effects on rural women inhabitants in agriculture.

2.0 REVIEW OF RELATED LITERATURE

Women comprise the largest percentage of the workforce in the agricultural sector, but do not have access and control over all land and productive resources. According to FAO estimate, women are the majority of the world's agricultural producers, playing important roles in fisheries and forestry as well as in farming. Worldwide, women produce more than 50 percent of the food that is grown (FAO, 1995). Also, it is asserted that in many places of the world, women are responsible for providing food for their families, if not by producing it then by earning the income for its purchase. Besides, traditionally, women are generally responsible for food preparation for their families. In addition, women still face constraints economically, health wise and otherwise that may machinate to underestimate their work and responsibilities, reduce their productivity, place upon them a lopsided work burden, discriminate against them and hinder their participation in decision-making and policy-making (FAO, 1995).

During the last ten years, many African countries have adopted new land laws in order to strengthen women's land ownership rights (Odeny 2013). This has helped improve the situation of rural women. To this effect, the lack of appreciation of the role of rural women in agriculture is harmful and gives rise to a lack of specific policies, which sometimes are misdirected; high levels of poverty, illiteracy and non-involvement in the design and planning of programs and policies, which involves a process of mutual learning that reflects the real and specific needs of rural women. Despite the important roles they play in agricultural economies, rural women in Africa suffer from the highest illiteracy rates and are the most visible face of poverty. Women comprise the

largest percentage of the workforce in the agricultural sector, but do not have access and control over all land and productive resources (FAO, 1995; Verveer, 2011; MuGeDe, 2013; Sahel, 2014).

Realizing the importance of rural women in agriculture is an important aspect of gender relations. In many countries, the role of women in agriculture is considered just to be a "help" and not an important economic contribution to agricultural production. Social customs dictate, moreover, that women, especially rural women, should - in addition to agricultural activities - be responsible for cooking, carrying water and fetching firewood, limiting their participation in decision-making processes and their exposure to those economic opportunities that arise, thus increasing the level of inequality vis-à-vis their partners. Nowadays many governments tend to pay more attention to the agricultural sector than ever before (Randy, 2008; MuGeDe, 2013, Maile, 2014; Raidimi, 2014).

2.1 Women's Involvement in Agriculture

Agriculture plays a pivotal role in growth and development of any nation. Most agro allied industries depends on agricultural products for the supply of raw materials. Thus, it can aid poverty reduction. Also, it is said that a healthy nation is a wealthy nation, meaning that agriculture is necessary for the sustenance of the people in a nation who will work and invariably grow the economy. However, as important as this sector is, it is underperforming in many countries because women who are crucial resources in agriculture and rural development face a lot of constraints (SOFA team & Doss, 2011). Remarkably, over the years, women have established more defined roles in agriculture (Sahel report, 2014). Another issue of concern is that although women comprise the largest percentage of the workforce in the agricultural sector, they do not have access and control over all land and productive resources (Verveer, 2011). This is because traditionally, women are less likely to own land. They are also less likely to own livestock in large scale or, adopt new technologies. These have negative effects on them as they will not be able to get credit facilities or financial services that would require them to use a landed property as collateral to get some financial assistance. In Nigeria, women are more involved in production, processing and utilization in addition to farm work. Women as a result of their great efforts in agricultural production, help to guarantee their self-sustenance and that of their families, especially in rural areas. Still, what they get from their farms and other agricultural activities are not enough to carter for the entire family (FAO, 1992, 1995). However, aside being limited by access to land is the issue of climate change, which includes irregular rainfall, floods, droughts and cyclones, whose effects have a greater impact on rural women and make their life difficult. Since Agriculture is the main alternative for Rural Women, on one hand, it would have been better if given more access to land and; resources for the prevention, adaptation and mitigation of climate change and on the other hand, training rural women on how to deal with cultural resistance and adapting to various manifestations of this phenomenon (Verveer, 2011; MuGeDe, 2013) might be helpful.

Pragmatically, the relationship between women and agriculture revolves around their concerns for ensuring their family is provided with food, firewood, water among others. It is asserted that women hold a huge expanse of responsibility for, and knowledge of sustainable agricultural system, whether reference is made to Sub-Saharan Africa or the Caribbean, where women produce 60-80% of the basic foodstuffs; or to the Indian subcontinent where it is estimated that 70-80% of food crops grown are produced by women, or to Asia where over 50% of the labor involved in intensive rice cultivation, or to Indonesia or central and South America, where their home gardens represent some of the most complex agro- silvopastoral system known (FAO, 1992). This underscores women's contributions to supply of raw materials to agro-allied industries and their family wellbeing, and invariably contribute to national development, although these contributions seems imperceptible to policy makers, and program planners.

At this point, we will align with the definition of rural inhabitants to refer to people living in the rural areas as defined by National Statistics Offices. Generally, a rural area is a geographical area located outside cities and centres of town (Word Net Sear 3.1). Women who are the mainstay of the development of rural and national economies (MuGeDe, 2013), comprise the largest percentage of the workforce in the agricultural sector, but do not have access and control over all land and productive resources. Secretary Clinton described a woman farmer's typical circumstances this way: "She lives in a rural village and farms a piece of land that she does not own. She rises before dawn and walks miles to collect water–if there is water to be found. She works all day in a field, sometimes with a baby on her back. If she's lucky, drought, blight or pests don't destroy her crops, and she raises enough to feed her family–and maybe has some left over to sell. But there's no road to the nearest market." Moreover, her work is not counted in many economies "as economically active employment" (Verveer, 2011 citing secretary Clinton).

In Nigeria, women account for 75% of the farming population in Nigeria (Federal Ministry of Agriculture & Rural Development, 2014). Traditionally, women are not expected to acquire land; hence, they work as laborers alongside their male counterpart. Although women constitute a large portion of the farming population, their contributions are yet to be adequately evaluated and acknowledged accordingly by policy makers. Thus, women's role in the agricultural sector is highly affected by socio-economic factors such as income, education and access to infrastructure (Sahel, 2014). For instance, there is estimation that in many African countries at least a third of rural households are maintained by women. All these are but some of the major aspects of socio-economic features that have been contributing to the growing burden of rural women's responsibilities in maintaining their families in virtually all parts of the developing world (South Commission, 1990; FAO 1990, 1991b; Palmer, 1991; Spring, 1991; UNFPA, 1991; Jacobson, 1992) in FAO report. In some cases, women do not even control the use of their own time. Many reports stated that the vast majority of literature reviewed confirmed that women are just as efficient as men and would achieve the same yields if they had equal access to productive resources and services (FAO, 1992, 1994, 1995). Concerning agricultural activities, FEEDS (2005), posits that women engage in animal husbandry, crop farming from tilling, planting, harvesting and to processing then marketing. They also engage in collection of firewood used for energy and cultural artifacts as in Gbagyi women and as a source of income for the family.

2.2 Perennial rainwater effects on rural inhabitants

Rainwater has both positive and negative effects on rural inhabitants. Rural inhabitants store rainwaters in clay pots and other water storage facilities such as drums, jerry cans and buckets with cover. They use rainwater for drinking, cooking and washing. During drought, the stored water is used to water the farm during planting season (Practicalaction.org/rainwater-harvesting-8). On the negative note, it affects firewood as they would be too wet to catch fire. Collection of water of water also increases the breeding of mosquitoes which are agents of malaria parasites. Other ecological habitats of mosquitoes are stagnant ponds, gutters, bushes around the home and some economic trees like banana (Enonsolease & Awodu, 2005). Once an infected person is bitten by mosquitoes, it is transmitted to others. Nigeria is a high endemic country for malaria (Umaru & Uyaiabasi, 2015) and has formed a major public health problem accounts for more cases of deaths than any other country (Economic section of US Embassy in Nigeria, 2011). It was estimated to have affected about 3.3billion people in 106 countries which is over half of the world's population. The report further stated that 216 million cases of malaria occurred in 2010 and 81% in Africa. Similarly, out of the 55,000 malaria deaths in 2010, 91% occurred in Africa. In Nigeria, about 97% of the populace is at risk of malaria. The report estimated cases of malaria at 100 million and over 300, 000 deaths per year compared to 215,000 deaths/per year by HIV/AIDS. Also, about 11% of maternal mortality rate has been attributed to malaria (Economic section of US Embassy in Nigeria, 2011). In a study carried out by Enonsolease & Awodu (2005), it was revealed that the prevalence of malaria was higher during the wet season (May-October) with a prevalence of 56.7% with August and September having the highest prevalence; whereas during the dry season (November-April) the prevalence of malaria was 43.3%. Some studies posited that marked seasonality and quasi cyclic occurrence of heavy rains lead occasionally to endemic or serious exacerbation of malaria parasitaema in sub Saharan Africa (Onwujekwe et al 2000; Kamwi, 2005). Rural women inhabitants do not live in isolation and can only work on the farms if they are well and healthy. Their productivity at this point will be very low. An adage in Igbo land asserts that when a woman is sick, the whole household is sick. This is informed by the traditional roles of women in Nigeria. In taking care of the sick person (s), agricultural activities are suspended. At the long run, if weeding is postponed and other agricultural activities not carried out the right time, the result will be poor yield.

2.3 Perennial rainwater effects on Agriculture

Agriculture that depends upon rainwater represents about 80% of the total area under cultivation and produces the majority, or about 60%, of global food (International Atomic Energy agency). Agriculturist in time past could predict seasons as pertaining to agriculture; nonetheless global warming and climate change have become an essential contemporary issues in every country. Odua (2012) opines that it constitutes a challenge to socio-economic programs of Governments all over the world; especially for sectors such as agriculture, air, land and sea transportation, construction and hydro- electric power generation. She further posited that rainfall has the most profound impact on these critical factors. In an agrarian economy like Nigeria, where agriculture virtually depends largely on rainfall, the timing of rainfall and agriculture especially in the rural areas are like Siemens twins. That is, the commencement of the growing seasons is tied to the timing of the onset of rainfall. However, it affects the establishment of crops, agricultural production and eventually regional economies. NIMET report (2012) posits that a failure in the early establishment of rainfall usually affects farmers negatively in Nigeria. According to the report further stated that is why farmers in Nigeria identified the onset date as the most single

desirable piece of forecast information. FCT Abuja is Guinea Savannah agro ecological zone. In 2012, NIMET predicted 900-1700mm of annual rainfall and length of growing season estimated from 163-233days in that zone. In 2013, the predictions were more specific: for Abuja Metropolis the figure given was 1474mm of annual rainfall spread across 215 days whereas in 2014, the prediction for Abuja metropolis stood at 1474mm of rainfall across 197 days; Gwagwalada 1087mm of annual rainfall across 197 days while Kuje and Chukuku were predicted to have 1091mm of annual rainfall (197 days) and 1107mm of annual rainfall (199 days) respectively. NIMET report (2014) encouraged farmers at the Central and Southern states of the country to take advantage of the predicted normal onset of rains to plant crops early enough for a good yield. In 2015, NIMET predicted drop in annual rainfall in Abuja metropolis to 1464 mm and increase in length of growing season to 219days as compared to the previous year. Gwagwalada and Kuje are expected to witness increase in both amount of annual rainfall and length of season days 1134mm (206 days) and 1138mm (207 days) respectively.

Every living thing requires a certain amount of water for its survival and sustainability. Thus, the variability of water has been ascertained as the most critical factor for sustaining crop productivity in rain fed Agriculture (Harvest Choice, 2010). Adequate quantity of rainfall is desirable; whereas deficient quantity or excess is hazardous. However, adequate quantity of water required varies from crop for optimal performance. Ideally, the preparation for planting of early seasonal crops starts from March, while that of Rain-fed crops start in April and continues till the month of May. Planting of yam starts from March and continues till even June, depending on rainfall. Planting of melon, maize, early millet starts from April while Groundnut, guinea corn and cowpea is done in May. Within this period, weeding takes place especially in areas were melon are planted (FCT Farming Activities Guide, 2014). In this regard, it is necessary to note that too much of water affects weeding which if not removed at the appropriate time will affect crop yield. This therefore goes to buttress the effect of fluctuations of rainfall to agriculture as farmers can no longer plan their farming season as was done some years past.

2.4 Climate change, Flooding and its effect on rural women Inhabitants in Agriculture

Climatic change has resultant effects on different types of weather. Scientists' have projected increase in the frequency of heavy rainstorms, putting many communities at risk for devastation from floods (www.nrdc.org/health/climates/floods.asp). Flooding has been asserted to cause a range of health impacts and risks, including: death and injury, contaminated drinking water, hazardous material spills, increased populations of disease-carrying insects and rodents, moldy houses, and community disruption and displacement. Flooding and wet weather are so costly to agricultural land because they cause delays in agricultural activities and reduction of crop harvest. According Hubbard (2013) William Morfoot, posit that specialists in agricultural land drainage, are well aware of the necessity of farming land having the optimum amount of saturation to successfully yield crops. If soil is too wet, it can result in poor conditions for the crops to grow; when soil is well drained then the oxygen, nutrients and trace elements that the plant needs are available. If the soil is too damp, the field's yield is potential severely reduced [Hubbard, 2013].Consequently, as rains become heavier, there may be an overflow of streams, rivers, and lakes. Also, there may be increasing the risk of water-borne pathogens flowing into drinking water sources. Further to this, persistent or heavy downpours of rain can also damage critical infrastructure like sewer and solid waste systems, triggering sewage overflows that can spread into local waters (www.nrdc,org/health/climates/floods.asp). In fact, climate change is said to affect agriculture in a number of ways, including through changes in average temperatures, rainfall, and climate extremes (e.g., heat waves); changes in pests and diseases; changes in atmospheric carbon dioxide and ground-level ozone concentrations; changes in the nutritional quality of some foods; and changes in sea level (Food and Agriculture Organization). Climate change is also asserted to have already started affecting agriculture, with effects unevenly distributed across the world. Furthermore, future climate change will likely negatively affect crop production in low latitude countries, while effects in northern latitudes may be positive or negative (International Food Policy Research Institute). Climate change will probably increase the risk of food insecurity for some vulnerable groups, such as the poor (Harvey et al, 2014).

Recently, Nigeria suffers from seasonal flash floods during rainy season. These flash floods are sometimes disastrous, especially in the rural areas or overcrowded slums, where drainage is poor or does not exist at all (www.reuters.com/articles/2012/0909/us-nigeria-floods-idUSBRE888003212099). Flooding caused by heavy rains across southern Nigeria caused at least 15 fatalities in the last week of June 2014 (Hill, 2014). Homes might be carried away during floods and women and children are mostly venerable at such times. Traditionally, the women are expected to take care of herself and the family, no wonder the name 'housewife'. Hence, when there is flooding, she runs around to protect the children or at least save their lives and other members of the family not minding her own state.

3.0 METHODOLOGY

This study was carried out in Gwagwalada Area Council and Chikuku town in Kuje Area Council, of the Federal Capital Territory (FCT), Abuja. These areas were chosen because they house most rural dwellers in the FCT. Chikuku town is at the boundary between Gwagwalada and Kuje Area Council; hence, it was included in the study. Gwagwalada and Kuje Area Councils are in the North Central Geopolitical Zone of Nigeria. The estimated population of the city is about 157,770 people with a land mass of about 1,043Km^2, while Kuje Area Council has a population of about 97,367 people and a land mass of about 1, 644Km^2 as at the 2006 population census (Abuja Geography, 2009; National Bureau of Statistics). These Area Councils are made up of immigrant settlers ranging from Hausas, Fulani's, Ibo's Yoruba's, Egbira's, Idoma's, Igala's, Efiks/Ibibio's etc. There are mainly, civil servants, businessmen, traders, skilled and unskilled artisans and students and it is estimated that women make up 48% of the population (Ukonu & Tafamel, 2011).

Perceived family support was assessed by adapting the multi-dimensional scale of perceived social support. Three parameters were assessed, physical support, emotional support, and communication. Each parameter was given a minimum score of 1 and a maximum score of 7 with a total score of 21 using the Likert scale. Very strongly disagree was represented by 1, strongly disagree -2, mildly disagree -3, Neutral -4, mildly agree -5, strongly agree-6 and very strongly agree -7 (Zimet et al ,1988). Selected items were items number 3, 4 and 11. Scores were categorized into three levels of acuity: 3-12 is low, 13- 17 is moderate and 18-21 is high. The higher the scores the higher the family support

We used both primary and secondary data. Primary data was obtained using questionnaires and interviews while secondary data was gotten from Institutions, Federal Ministry of Agriculture; Women in Agriculture wing of Fadama office in Gwagwalada, textbooks, journals and other relevant documents. Taro Yamane's formula was used to arrive at the sample size of the population which is 177.65 but some of the rural women who would have been included in the study declined. Some of the reasons given was the fear of the outcome of the entire exercise; hence, only one hundred and fifty (152) women were recruited for the study.

The main aim of this study was to ascertain if perennial rain water has any effect on rural women in agriculture. Data collected were keyed into and analysed with IBM SPSS 20.0. Means, Median and Standard Error were used to measure averages. Chi square was used to test association between two or more categorical variables whereas Univariate analysis of variance was to determine the effect of perennial rain on rural women inhabitants. $P<0.05$ was considered as significant.Yamane (1967:886) provides a simplified formula to calculate sample sizes. The formula below was used to calculate the sample sizes for this study

Equation

$$n = \frac{N}{1 + N\,(e)^2}$$

Where n is the sample size, N is the population size, and e is the level of precision.
N = 157,770 + 97, 367 (Population of Gwagwalada and Kuje Area council respectively)
N = 255137
e = 0.075 and $e^2 = 0.005625$
n = 177.78

4.0 RESULT

One hundred and fifty two (152) women were recruited into the study. Their age ranges between 20 and 70 years both years inclusive. The mean age ± Standard deviation was 41.6 ± 10.2 years. Number of children was from 0 -10 with mean of 3.2 ± 2.3. Out of 152, 95.4% were still of active service age that is less than or equal to 60years which is the retirement age in Nigeria setting (Public Service Regulations, 2004 reforms). 12.5% had no form of formal education and 55.3% were married. Mean perceived family support score and standard deviation was 4.8 ±3.7.

Table 1: Socio Demographic factors of respondents

Variables	Frequency (%)
AGE GROUP	
≤30years	24 (15.8)
31-40years	55 (36.2)
41-50years	48 (31.6)
51-60years	18 (11.8)
>60years	7 (4.6)
MARITAL STATUS	
Single	20 (13.1)
Married	84 (55.3)
Divorced/Separated	16 (10.5)
Widowed	32 (21.1)
EDUCATIONAL STATUS	
None	19 (12.5)
Primary	14 (9.2)
Secondary	57 (37.5)
Tertiary	62 (40.8)
FAMILY TYPE	
Monogamous	83 (54.6)
Polygamous	63 (41.4)
Polyandry	6 (4.0)
PERCEIVED FAMILY SUPPORT	
Low	146 (96.1)
Moderate	1 (0.7)
High	5 (3.3)
GEOPOLITICAL ZONE	
South East	7 (4.6)
South South	5 (3.3)
South West	6 (3.9)
North Central	88 (57.9)
North East	37 (24.3)
North West	9 (5.9)

From table 1 above, highest number of rural women in agriculture fell between 31-50years. About 55.3% of them were married and 59.2% have less than tertiary education. It was observed that 57.9% of them were from North central. This is assertive as a Federal Capital Territory Abuja is a catchment area of the North central. North east geopolitical zone accounted for 24.3% of the respondents. This is likely because the insurgency experienced in the north east has increased the number of internally displaced persons in Abuja.

Table 2 below shows factors that either push or pull in Gwagwalada into agriculture.

Table 2: Pull and Push factors of women in Gwagwalada into Agriculture

Factors	N (%)
No Job	40 (26.3)
Poor Salary	8 (5.3)
Desire for Autonomy	17 (11.2)
Self-satisfaction	19 (12.5)
Retrenchment	28 (18.4)
To support my family	125 (82.2)
Not willing to be confined as a housewife	6 (3.9)
Widowed	9 (5.9)
Poor education	34 (22.4)
Desire to make money	82 (53.9)

Some of the respondents entered into agriculture for more than one reason. The desire to make money was the second highest. Although 82 (53.9%) entered into agriculture with a desire to make money, the main aim was to support their family. Unprecedented, was to support family from agricultural activities. Of the 152 respondents, 125 (82.2%) purported that the entered into agriculture to support the family. Other salient reasons are retrenchment (18.4%), poor educational status (22.4), self-satisfaction (12.5%), desire for autonomy (11.2) and others.

Figure 1: Association between level of education of rural women and type of Agricultural activities engaged in.

From the figure above, we can infer that there is a statistically significant association between level of education of rural women and type of Agricultural activities engaged in ($p < 0.05$).

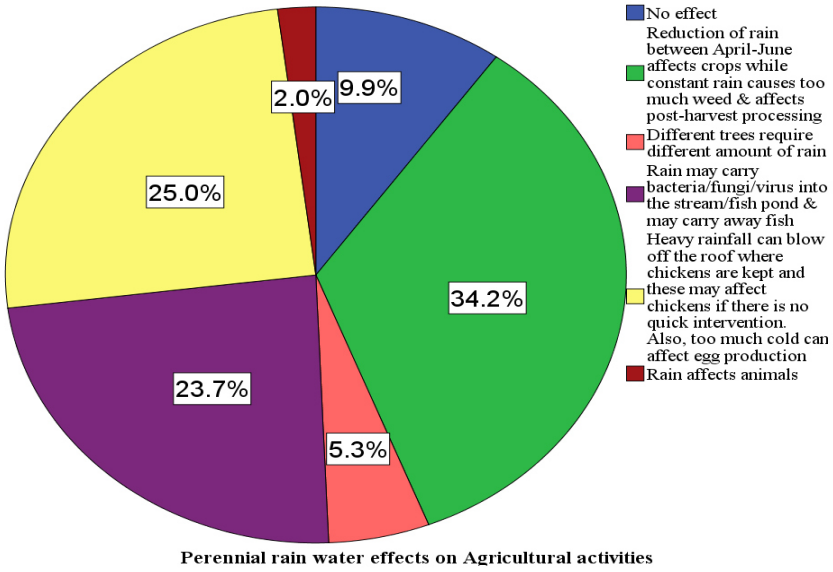

Figure 2: Perennial rainwater effects on agricultural activities

Women in agriculture were asked perceived effects of rain on agricultural activities and the figure above expresses their perception. For the sake of this paper, their responses were collated and summarized on the figure2 above.

4.1 Effect Of Perennial Rain On Rural Women In Agriculture

Table 3 below shows the perceived effect of perennial rain on women in agriculture. It could be seen that perennial rain affects those in general farming more than that of other types of agricultural activities ($p<0.05$). This is factual as they spend more time in the farm and there is the tendency for them to be beaten by rain in the farm. Most of the times; Gwagwalada rains come with a lot of raging dust which is devastating. The dust carries a lot of air borne diseases with it. This may inform the high rate of effect of perennial rain of women in farming activities against other women in other agricultural activities. The researchers in the course of this study observed some of the rural women as they come back from farm on rainy days. Some of them carry big loads on their heads, couple with the fact that the roads leading to and fro the farms are bad, walk on muddy roads, sometimes holding little babies who are 'too young' to be in school.

Table 3: Univariate Analysis of Variance showing Perceived effect of rain on women in agriculture according to the type of agricultural activities engaged in

Agricultural activity	**Perceived effect of perennial rain**				**Total**
	No effect effect N (%) (%)	**Mild effect N (%)**	**Moderate effect N (%)**	**High N**	**N (%)**
General Farming only	4 (12.1)	5 (10.9)	10 (28.6)	26 (68.4)	**45 (29.6)**
Poultry Farming	15 (45.5)	15 (32.6)	5 (14.2)	5 (13.2)	**40 (26.3)**
Fish Farming	8 (24.2)	16 (34.8)	10 (28.6)	4 (10.5)	**38 (25.0)**
Others (snail farming, animal husbandry, tree planting, or a combination of farming, poultry, fish farming)	6 (18.2)	10 (21.7)	10 (28.6)	3 (7.9)	**19 (19.1)**
Total	**33 (100.0)**	**46 (100.0)**	**35 (100.0)**	**38**	**152 (100.0)**
F	**14.467**				
P	**0.00001**				
R^2	**0.227**				
Adjusted R^2	**0.211**				

5.0 DISCUSSION

Agriculture is vital for the sustenance of an economy and the entire populace. This is because, people need food to survive and fight sicknesses and disease. Apart from food, agriculture provides raw materials for other agro allied industries. Hence, the import of this sector of the economy cannot be overemphasized also as studies have shown that women play vital role in different forms of agriculture. However, as important as this sector is, it is underperforming in many countries because women who are crucial resources in agriculture and rural development face a lot of constraints (SOFA team & Doss, 2011). One of the constraints faced by women is inadequate perceived family support from family members. This is not far from the traditional role of the woman as a home maker. Notably, antiques have it that women are made to care of the home and children. This has led to some men hiding under this guise to shift the burden of the upkeep of the home to the women. We discovered from this study that 82.2% of the respondents entered into agriculture to support their families. Even though some respondents gave other reasons for undertaking agriculture either as a part-time or full time job, the underlying factor is still to support the family, this information was elicited from interviews. On the contrary, 96.1% of the respondents perceive that they have low support from family members. Of note also is that about 12.1% of the women had no form of formal education, about 46.7% had primary and secondary education. This is a major area of concern. Although, government is doing so much to ensure that every girl child gets formal education, level of literacy among these rural women is still low. There is an assertion that rural women in Africa suffer from the highest illiteracy rates and are the most visible face of poverty (MuGeDe, 2013). This is where policy makers have to take a further step to ensure every girl is educated.

Apart from literacy challenges, rural women in agriculture are affected by irregularity in weather due to climate changes, which includes irregular rainfall, floods, droughts and cyclones, whose effects have a greater impact on

rural women and make their life difficult (Verveer, 2011). Perennial rain affects agricultural activities as well as those engaged in them. Reduction of rain between April and June affected their crops for those in crop farming. Some of the respondents planted crops expecting them to be watered by rain but the seizure or reduction of rain caused some of the crops that had not fully germinated died. Maize on the hand according to them does not need much rain and when rain is heavy; it affects its growth at that early stage and will invariably affect harvest. Those who had their farmlands close to Fadama which is the Hausa word for irrigable lands, flood plains and low lying areas (Dalil & Nsini, 2014) where affected by flooding as a result of too much rain. Some crops were washed away and some soil nutrients were also washed away and thereby reducing the fertility of the soil which will in turn affect productivity. However, Highland rice is not affected by much rain unlike low land rice. Instructively, women are mostly involved with weeding. Majority of them asserted that it was difficult weeding under rainfall if they were working in the farm when it starts raining. But, if the rain started by the time they are about to set out to go to farm, they will not be able to go to farm. The delay in weeding adversely affects crops and the more the weeds grow, the more difficult it will be to clear them.

Other ways rain can affect women in agriculture can be psychological. Those in poultry, animal husbandry and fish farming have more of psychological effects which arises as they watch the fierce storm that precede rainfall in Gwagwalada blow off the roofs of their pens. One of those heavy rainfall carried away many fish from a fish pond and left the owner devastated and in great debt. During processing, grains take time to dry. Those products that did not dry properly will form moths and will be wasted. Those who use firewood will not be able to cook with wet wood or fry their garri after processing. As a matter of fact, some of the farmers complained of pneumonia, cough, catarrh and other diseases afflicting them due to rains; especially, in situations where the rains met them in the farm. Sometimes, they need to trek long distances from farmland drenched in the rain with no means of modern transportation due to bad roads. Verveer (2011) posit that rural women have to walk, moreover, long distances to carry water and fetch firewood, which is harmful for the health of humans, causing high rates of infant and maternal mortality, reversing progress in education and endangering food sovereignty, as well as food security and nutrition.

Paradoxically, there is dearth of information about what has been done by the government at different levels on the effects of perennial rain on rural women in agriculture. Also, it is imperative to look into this issue due to the physiology and make up of women. It is either a woman is menstruating, carrying a baby or is pregnant. Some of the women interviewed by the researchers had babies at the back and were holding little babies and at the same time removing husk from beans. According to them, they were hired to do so. Some of the core rural women who are illiterates do not consider orthodox family planning method and are seen carrying a baby at the back, holding one and pregnant of another baby. The researchers are axiomatic of the fact that this might be a reason for their fragility and susceptibility to effect of rain. This research has established the effect of rain on the respondents which can be used to predict what happens to women in agriculture at the parts. Hence, we recommend that government put workable policies and programmes to encourage women in agriculture over their constraints, be healthy and more productive.

6.0 Conclusion and Recommendations

This study has been able to establish the fact women are pivotal to economic development through agriculture but appreciation given to this effect is not commensurate to their contributions. It was observed that rainwater effects does not only affect crops or other agricultural activities but also, those who are directly or indirectly involved. Perennial rainwater effects can come as the crow flies or ramblingly, it can be physiological or psychological. But from whichever perspective, it was established that it has effects on rural women in agriculture. Also, apart from money making, majority of the women entered into agriculture to support their families. It is therefore pertinent to ensure that women in agriculture are given ample support in order to improve their capacity and stay healthy. Remarkably, from this study is the lack of family support as asserted by the respondents in the study; despite the fact this most of these women went into agriculture to support their family, some of them asserted that they received little or no support from family members.

In the light of the above, this study recommends that policy makers should incorporate into their policies more pragmatic approach to ensuring that women in agriculture receive adequate fund with less complexity in access to loan; as they might not have as much properties as will be required to be used as collateral. Infrastructure such as good access roads to farm should be constructed and subsidized transport facilities be made available for the women to help them carry the farm produce from the farms to where they will be stored or marketed. Well-equipped primary healthcare should be located very close to the farmers in the rural, as we observed that most of

them go for herbs or patent medicine store. Also, onus lies on the government to enforce education of these rural women by providing close by and strategically located schools to give them acquire education. These schools have to take either evening or weekend classes/lessons and the teachers should be those that have special skills in andragogy especially in teaching those ones that have little or no education. Meteorologists can be encouraged by government and other agencies to go the rural areas from time to time to educate the women about climate changes. Most especially, regular health talk and free medical checks should be carried out for the rural women dwellers; as this will help to nip prospective sickness at the bud. They should also be taught on prevention of controllable situations such as malaria by reporting any feverish feelings to the primary healthcare centre and also other safety measures during storms.

In conclusion, this study recommends more training for the rural women in Agriculture on food processing and storage.

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