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Perceptions of Constraints Affecting Adoption of Women-in-Agriculture Programme Technologies in the Niger Delta, Nigeria

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Abstract

The study focused on constraints affecting the adoption of innovative agricultural technologies disseminated by the Women-in-Agriculture (WIA) unit of the Akwa Ibom Agricultural Development Programme (AKADEP) to its women clientele. The study also ascertained the awareness and adoption levels of such introduced technologies. Findings revealed that respondents were aware of 61.9% of introduced technologies, while only 33.3% were fully adopted. The study also identified seven factors responsible for the non-adoption of women farmers' related technologies. The three highest ranking constraining factors were revealed as; high cost of inputs, low income level of women farmers and lack of regular contact with WIA extension agents. Reasons have been proffered for the relatively low technologies' adoption levels. Recommendations have also been made to enhance the technology adoption level. These include the necessity to introduce only socio- economically and culturally compatible technologies to WIA clientele, a wholesale focus on follow-up activities after initial group based technology introduction activities, and the attachment of a credit scheme to the WIA program.

Keywords:
Constraints to Adoption, Awareness, Agricultural Technologies, Women farmers.

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INTRODUCTION

Agriculture constitutes a large share of national output and employs a majority of the labour force in most developing countries; hence the sector has been integrated into any thinking about development (World Bank, 2003). However, whereas agriculture-led growth played an important role in slashing poverty and transforming the economies of many Asian and Latin American countries, the same has not occurred in Africa, including Nigeria (Diao *et al.,* 2007). According to Baker (2005), technical change is the engine of long-term growth and it becomes technically important through diffusion. This is more so for agricultural production, where the prospect of enhanced production offered by improved agricultural technologies is recognized, according to the World Food Program, as essential to improving the household food security of small scale farmers, raising rural incomes and creating national surplus that can improve the basis for economic growth (WFP, 1998).

Baker (2005) took a retrospective view at Africa's lack of robust economic growth and dearth of modern technology and concluded that technology (especially agricultural technology) diffusion appears to have failed therein. Eicher (1992) revealed that nearly 100% of the increase in food production in the West African sub-region, since 1960, has come from expanded harvest area, rather than improvements in technology, a trend which Sanders (1996) has deemed, inefficient and with negative long term prospects.

Jafry (2000), Brown *et al.,* (2001) and the Directorate for International Development (DFID, 2004), among many other authors and research scientists, revealed that women are the key farmers, food producers and natural resource managers, in most countries of sub-Sahara Africa. This is because they provide 65 – 89% of food, provide nearly half of farm labour, shoulder over 90% of domestic responsibilities and work twice as many hours as men. Akpabio (2005) also reported an African study which revealed that women carry over 80 tonnes of fuel, water and farm produce for a distance of more than one kilometer over the course of a year. Despite all these contribution, the Technical Centre for Agricultural and Rural Cooperation, asserted that women are still restricted in their roles as farmers by unequal rights and unequal access to and control over resources, especially land (CTA, 2000). Women also carry out their work without much help from agricultural support mechanisms such as extension agencies, input suppliers and credit institutions (FAO, 2000).

The Women-in-Agriculture (WIA) sub-component of the Agricultural Development Programme (ADPs) was instituted in 1988 to address gender specific agricultural problems. The focus is on food nutrition, processing, storage and utilization of crop and livestock produce, in order to raise women's income and living standards through business oriented farming and processing strategies. Ever since the introduction of the WIA programme in Nigeria, and with the current emphasis on participatory extension, various efforts have been made to elicit various types and levels of information on the activities and effectiveness of the programme in specific limited areas (states) of Nigeria and the Niger Delta. Akpabio (2005b) reported that the WIA programme in Akwa Ibom State remains less than effective, in terms of its contribution to the upliftment of the economic and socio-psychological status of rural women while Adetoun (2000) in South Western Nigeria, and Eshiett (2007) with reference to Akwa Ibom State, revealed that only a few of the technologies disseminated to WIA clientele have been fully adopted.

The importance of agricultural technologies in the development process cannot be overemphasized. It is against this background that this study sought to ascertain clientele perceptions on reasons for the reported low trend of adoption of agricultural technologies. This study however covers the larger South – South (Niger Delta) region of Nigeria, hence it was decided first of all to ascertain on a wider scale of the Niger Delta, the validity of earlier reports of Akpabio (2005b) and Eshiett (2007). In essence, the study sought to answer pertinent questions relating to: (i) the level of women farmers'

awareness of specified innovations introduced through the WIA programme and (ii) respondents' perceptions of constraints affecting adoption of technologies disseminated through the WIA programme in the Niger Delta.

MATERIALS AND METHODS

Study Area

The Niger Delta is located in the Southern part of Nigeria. It spreads over a total land mass of about 75,000 square kilometers. It is inhabited by an estimated 30 million population. The people are distributed into forty ethnic groups in about 13,329 communities/settlements in nine states. It is characterized by wetlands and water bodies, with creeks and rivers criss-crossing the entire Southern parts and is often regarded as the largest wetland in Africa and the third largest in the world. The region is however endowed with natural resources. It has the third largest mangrove forest, with the most extensive fresh water swamp forest and tropical rainforest characterized by great biological diversity. Alongside its immense potentials for agricultural revolution, the study area also hosts vast reserves of non-renewable natural resources, particularly hydro-carbon deposits in oil and gas.

The population for the study comprised all the leaders/representatives of different WIA groups who attended the various one-day interactive fora organized by the ADPs in all states in the region. Relevant data could be collated for five states. These were Akwa Ibom, Cross River, Delta, Edo, and Rivers. All the 267 participants were purposefully utilized for the study, although responses from 250 respondents were eventually utilized for data analysis (viz, table 1). A pre-tested and validated structured Interview Schedule and Focus Group Discussions were utilized to elicit relevant information from the selected sample. These activities were performed with the aid of trained enumerators.

Table 1: Selected Sample

S/N	State	Population	Sample
1	Akwa Ibom	51	51
2	Cross River	60	53
3	Delta	53	48
4	Edo	56	54
5	Rivers	47	44
	TOTAL	**267**	**250**

To ascertain the level of women farmers' awareness and adoption of specified innovations introduced through the WIA program, a list of technologies disseminated through the WIA programme was obtained, after which awareness and adoption scores were computed for each technology. Scores of 0 and 1 were recorded for awareness and non-awareness of disseminated technologies while scores of 2, 1 and 0 were recorded for adopted, discontinued and non-adopted technologies, respectively. A mean cut-off score of 0.5 was adopted to demarcate between technologies for which respondents were either 'aware' or 'not aware', while a cut-off mean score of 1.0 was utilized to differentiate between technologies which have either been 'adopted' or 'not adopted'. In essence, respondents were deemed to be aware of a technology with a mean score of 0.5 and above, while they were not aware of technologies with mean scores of less than 0.5. Similarly, technologies which recorded mean scores of 1.0 and above were perceived as adopted by respondents, unlike technologies with mean scores of less than 1.0, which were regarded as not adopted.

To determine respondents' perceptions of constraints affecting adoption of WIA programme technologies, a list of possible constraints that may hinder the adoption of disseminated technologies was drawn up with the aid of interviews and literature search. A 3-point Likert continuum of agreed (3) undecided (2) and disagreed (1) was employed to compute responses on reasons for non-adoption of WIA technologies. A cut-off mean score of 2.5(3+2+1/3 +0.5) was utilized to differentiate between 'major' and 'minor' factors for non –adoption, where a score of 2.5 and above, was depicted as a 'major' factor for non-adoption, while items with scores below 2.5 were adjudged minor factors.

RESULTS AND DISCUSSION

Awareness and adoption levels of WIA technologies

Tables 2 and 3 show that women farmers were aware of 61.9% (13 of 21) introduced

Table 2: Distribution of Respondents based on the extent of Awareness of WIA technologies

	AKADEP Technologies Food Crops	Aware (1)	Not aware (0)	Means	Remarks
1	Cassava/maize/melon planting	230 (92) *	20 (8)	0.92	Aware
2	Yam mini set	124 (49.6)	126 (50.4)	0.49	Not Aware
3	Dry season vegetable	170 (68)	80 (32)	0.68	Aware
4	Wet season vegetable	210 (84)	40 (16)	0.84	Aware
5	Rice cultivation	86 (34.4)	164 (65.6)	0.34	Not Aware
	Processing & Utilization				
6	Soya bean milk/ flour	140 (56)	110 (44)	0.56	Aware
7	Odorless fufu/garri	250 (100)	0 (0)	1.00	Aware
8	Fruit drinks	116 (46.4)	134 (53.6)	0.46	Not Aware
9	Plantain chips processing	210 (84)	40 (16)	0.84	Aware
10	Pineapple chips processing				
	Input use	200 (80)	50 (20)	0.80	Aware
11	Fertilizer use	180(72)	70(28)	0.72	Aware
12	Improved crop varieties e.g. maize	160 (64)	90 (36)	0.64	Aware
13	Agro chemicals e.g. Pesticides	84 (33.6)	166 (66.4)	0.33	Not Aware
14	Improved animal breeds	130 (52)	120 (48)	0.52	
	Agroforestry technology				
15	Snail rearing	124 (49.6)	126 (50.4)	0.49	Aware
16	Plantain /Cocoyam intercropping	196 (78.4)	54 (21.6)	0.78	Aware
17	Afang cultivation	210 (84)	40 (16)	0.84	Aware
18	Bee raising	78 (31.2)	172 (68.8)	0.31	Aware
	Tree crops planting				
19	Improved oil palm seedlings	160 (64)	90 (36)	0.64	Aware
20	Rubber seedlings	90(36)	160 (64)	0.36	Not Aware
21	Improved cocoa seedlings	70 (28)	180(72)	0.28	Not Aware

*-Percentages in parentheses

technologies, while only 33.3% (7 of 21) of the technologies were eventually adopted. It was also observed on table 3, that respondents adopted 53.9% (7 of 13) of the technologies for which they were aware. A related finding in the course of study revealed that only 59.2% respondents received information on improved agricultural technologies from extension officials of the WIA program, while 20.8% and 20% respondents received information from relatives/friends and husbands, respectively. There is a cause for concern here. This is because an extension program deliberately targeted at women farmers reaches only 59.2% of intended clientele. Many reasons have been proffered for this undesirable situation. These include; long distance from meeting venues and concomitant non-attendance at group meetings (Adetoun, 2000) lack of interpersonal contact, arising from lack of follow-up after group meetings (Udoh, 2001) and lack of relevance of disseminated messages to the amelioration of female farmers livelihood constraints (Reij and Waters-Bayer, 2001) among many others, might have led to clientele' loss of interest in extension offerings.

Table 3 also shows that none of the technologies disseminated to respondents under "input use" and "tree crops planting" classifications was adopted. Odourless fufu/garri (fresh/dried cassava paste) x = 1.96; cassava/maize/melon crops combination (x = 1.76) and intercropping (x = 1.45) were the most adopted technologies. This result corroborates Baker's (2005) and Swinkels and Franzel's (1997) assertion that compatible technologies and technologies that differed very little from the old technologies would diffuse faster since there would be less of an information problem associated with them. Pannell (1999) described four conditions necessary for farmers to adopt innovative technologies, two of which are "awareness of the technology" and "perception that technology promotes farmers objectives". It may be inferred that farmers will adopt more of the technologies for which they are aware. In essence, awareness of technology is a motivating factor for the adoption of technological packages. Hardarker, Huirne and Anderson (1997) however

Table 3: Distribution of respondents based on the extent of adoption of WIA technologies.

	AKADEP Technologies (Food Crops)	Not Adopted (0)	Discontinued (1)	Adopted (2)	Means**	Remarks
1	Cassava/maize/melon planting	0 (0) *	20 (8)	210 (84)	1.76	Adopted
2	Yam mini set	0 (0)	88 (35.2)	36 (14.4)	0.64	Not Adopted
3	Dry season vegetable	60 (24)	60 (24)	48 (19.2)	0.62	Not Adopted
4	Wet season vegetable	0 (0)	40 (16)	170(68)	1.52	Adopted
5	Rice cultivation	172 (34.4)	0 (0)	0 (0)	0.00	Not Adopted
	Processing & Utilization					
6	Soya bean milk/ flour	10 (4)	70 (28)	60 (24)	0.76	Not Adopted
7	Odourless fufu/garri	0 (0)	10 (4)	240 (96)	1.96	Adopted
8	Fruit drinks	110 (44)	6 (2.4)	0 (0)	0.02	Not Adopted
9	Plantain chips processing	4 (1.6)	16 (6.4)	190 (76)	1.58	Adopted
10	Pineapple chips processing	14 (5.6)	10 (4)	176 (70.4)	1.45	Adopted
	Input Use					
11	Fertilizer use	40 (16)	52 (20.8)	88 (35.2)	0.91	Not Adopted
12	Improved crop varieties e.g maize	24 (9.6)	60 (24)	76 (30.4)	0.84	Not Adopted
13	Agro chemicals eg. pesticides	34 (13.6)	46 (18.4)	4 (1.6)	0.21	Not Adopted
14	Improved animal breeds	40 (16)	20 (8)	60 (24)	0.56	Not Adopted
	Agroforestry technology					
15	Snail rearing	16.(6.4)	24 (9.6)	84 (33.6)	0.76	Not Adopted
16	Plantain /Cocoyam intercropping	12 (4.8)	4 (1.6)	180 (72)	1.45	Adopted
17	Afang cultivation	30 (12)	16 (6.4)	164 (65.6)	1.36	Adopted
18	Bee raising	78 (31.2)	0 (0)	0 (0)	0.00	Not Adopted
	Tree crops planting					
19	Improved oil palm seedlings	140 (56)	20 (8)	0 (0)	0.08	Not Adopted
20	rubber seedlings	82 (32.8)	8 (3.2)	0 (0)	0.03	Not Adopted
21	Improved cocoa seedlings	66 (26.4)	4 (1.6)	0 (0)	0.01	Not Adopted

*-Percentages in parentheses
** Mean Scores calculated, based on total no. of respondents- regardless of the no. of actual recorded responses per innovation.

cautioned that high level awareness of technologies does not necessarily translate into higher adoption levels. This is because farmers will only adopt those innovations which are adjudged useful and beneficial to their particular situation. A disaggregated analysis of table 2 reveals relatively high frequencies of "non-awareness" scores that were recorded for some technological offerings which were generally perceived (mean scores) as being "aware" of by respondents (viz; items 3, 6, 12, 14 and 19). Bunch (1982) and Baker (2005) harped on the importance of critical mass in the adoption of innovations. The researchers contended that that there is a higher level of adoption and less discontinuance for a new technology in which the whole community or a critical mass (proportionately larger than average) of farmers are aware of and in which they are interested. They explain reasons for this in terms of traditional communities being accustomed to living in an environment of consensus, and that schemes which entail community risk sharing are more easily imbibed than otherwise.

Constraints affecting adoption of WIA programme technologies

Results as shown on table 3 reveals that respondents perceived 7 of the 21 identified items as possible reasons for the relatively low adoption levels of agricultural technologies introduced through the WIA programme. These are: high cost of inputs (x = 3.0), low income level of women farmers' (x = 2.97) lack of regular contact with extension agents (x =2.82) old age of women farmers in the study area (x = 2.73) poor attitude towards risk and change (x = 2.55) and complexity of introduced technologies (x = 2.55). The above revealed findings find relevance in related literature. Rogers (1995) identified five key characteristics of innovations that determine their adoption potential, including: relative advantage, trialability, compatibility, observability and complexity. Reed (2001) iden-

Table4: Distribution of respondents based on perception of factors affecting non-adoption of WIA technologies.

	Reasons for Non Adoption/ Discontinuace	Disagreed (1)	Undecided (2)	Agreed (3)	Mean (X)	Remarks
1	High cost of inputs	0(0) *	0(0)	250 (100)	3.00	Major Factor
2	Lack of supporting inputs	88(35.2)	62(24.8)	100(40)	2.05	Minor Factor
3	Problem of diseases / pests	66 (26.4)	34(13.60)	150 (60)	2.33	Minor Factor
4	Non-appropriateness of the technological package to the Local environment	60 (24.1)	68 (27.2)	122 (48.8)	2.25	Minor Factor
5	Non-availability of the improved package	84 (32.80)	16 (6.4)	152 (60.8)	2.28	Minor Factor
6	Non-Profitability of the new technology	188 (75.2)	40 (16)	22 (8.8)	1.16	Minor Factor
7	Superiority of the old technology to the newly introduced one.	174 (69.6)	48 (19.2)	28 (11.2)	1.42	Minor Factor
8	Incompatibility of the new technology with the norms and customs of the local environment	144 (57.6)	60(24)	46 (18.4)	1.60	Minor Factor
9	Lack of clear understanding of the newly introduced package	12(4.8)	104(14.6)	134 (53.6)	2.48	Minor Factor
10	Low level of educational attainment by women farmers in the study area.	48 (19.2)	106 (42.4)	96(38.4)	2.19	Minor Factor
11	Low level of income of women farmers in the area	2 (0.8)	4 (1.6)	244 (97.6)	2.97	Major Factor
12	Insufficient Programs designed to convince and encourage farmers to change	12 (4.8)	144 (59.6)	94 (37.6)	2.32	Minor Factor
13	Women farmers perception of the old technology as better than the new one.	138 (55.2)	68 (29.2)	44 (17.6)	1.62	Minor Factor
14	Inconsistence of the innovation with the existing farming system, values and needs of women farmers in the area	156 (62.4)	36(14.4)	58 (23.2)	1.61	Minor Factor
15	Inadequate information about the newly introduced technological package.	50(20)	58 (23.2)	142(59.2)	2.44	Minor Factor
16	Complexity of the introduced innovation.	44(17.6)	24 (9.6)	182 (92.8)	2.55	Major Factor
17	Failure of some demonstration plots set –up by the extension agents.	138 (55.2)	58(23.2)	54 (21.6)	1.66	MinorFactor
18	Lack of regular contact with extension agents	20(8)	4(1.6)	226(90.4)	2.82	Major Factor
19	Poor attitude of women farmers towards change and risk	8 (3.2)	60 (24)	182 (72.8)	2.70	Major Factor
20	Age of women farmers in the study area	20 (8)	28 (11.2)	202 (80.8)	2.73	Major Factor
21	Lack of access and control over production resources such as land and credit facilities.	8(3.2)	96(38.4)	146(58.4)	2.55	Major Factor

*-Percentages in parentheses

tified the most significant of these characteristics, as: high relative advantage, high compatibility and low complexity. Swinkels and Franzel (1997) agreed with the submission above, but also opined that for the female gender, additional incentives for adoption may include factors like, suitability to accepted gender roles, cultural acceptance and compatibility with other enterprises.

High cost of inputs for introduced technologies and low income of respondents' were revealed as the greatest constraints to adoption of introduced technologies. Obinne (1994) and Arokoyo (1996) mentioned low income level of farmers and high cost of inputs as constraints to technology adoption, especially among low income farmers. In that wise, Baker (2005) and Hebinck, Franzel and Richards (2007) asserted that the most successful programmes of agricultural change are those that tie adoption to credit programmes. Udoh (2001) and Eshiett (2007) maintained that contact with extension agents, especially with respect to interpersonal contacts, relate favorably to the adoption of new farm practices and concomitant improved agricultural production. Obinne (1994) and Baker (2005) opined that poor attitude to risk, in terms of excessive risk aversion may severely limit adoption of technological innovations especially among female rural farmers, while Baker (2005) opined that technologies that differed very little from the old technologies would diffuse faster than

unrelated technologies, while the older generation may credibly block adoption even if the younger generation co-ordinates. Dove (1991) contended that individuals with insecure tenure will generally be less likely to invest in new technologies that require complementary immobile inputs, while Due, Mudenda and Miller (1993) asserted that although women want to increase the productivity of the resources they control, they face greater obstacles to change. One of such obstacles, according to Reij and Waters-Bayer (2001) is lack of relevance of disseminated messages to the amelioration of female farmers' livelihood constraints. (PLEASE, THIS IS NOT LITT REVIEW. THIS IS SIMPLY A COMPARISON OF FINDINGS WITH RESULTS FROM PREVIOUS STUDIES)

It is obvious that although poor female farmers in the study area are conscious of innovating in order to overcome their present precarious socio-economic situation, they are however precluded from benefiting from opportunities open to them due to various constraining factors, as have been identified above.

CONCLUSION AND RECOMMENDATIONS

It has been revealed that the WIA program, as being implemented in Akwa Ibom State does not reach out to a large number of its intended clientele base. This has resulted in an average level of awareness and concomitant relatively lower level of adoption of innovative technologies disseminated by WIA extension officials. The study also identified seven factors which combine to hinder the adoption of disseminated WIA technologies. The major constraints were: high cost of inputs, low income level of women farmers and lack of regular contact with WIA extension agents. Many reasons, backed by literature, have been proffered for this trend, including the fact that only 59.2 percent respondents regarded WIA extension officials as their source of information on innovative agricultural technologies. In order to enhance the success of the WIA programme in Akwa Ibom State, attempts should be made to ameliorate constraints which hinder extension officials' access to their potential clientele. To aid in this direction, adequate logistic support should be

provided to WIA extension agents so as to help enhance the process of contacting their expectant clientele Technologies slated for dissemination should be compatible to clientele socio-economic and cultural base and emphasis should be focused on follow-up activities, after initial group meetings. This would help to practicalize disseminated technologies on the farms and in the homes of potential adopters of technological innovations. It may also be necessary to attach credit schemes to the WIA program, in terms of linking the various women groups to various credit agencies.

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