

GENDER ISSUES ON POVERTY ALLEVIATION PROGRAMS IN NIGERIA: THE CASE OF THE NATIONAL FADAMA 1 DEVELOPMENT PROJECT IN ABIA STATE, NIGERIA

EL GENERO EN LOS PROGRAMAS DE ALIVIO DE LA POBREZA EN NIGERIA: EL CASO DEL PROYECTO DE DESARROLLO NACIONAL FADAMA 1 EN EL ESTADO DE ABIA, NIGERIA

Chima I. Ezeh^{1*}, Chidozie O. Anyiro¹, Iheanacho O. Ehiemere¹, and Ngozi Q. Obioma²

¹ Department of Agricultural Economics and Extension, Abia State University, Umuahia Campus, PMB 7010, Umuahia, Abia State, Nigeria.

* Corresponding author E-mail: chimaezeh@ahoo.com

² Department of Extension, Abia State Agricultural Development Programme Headquarters, Ossah Road, Umuahia, Abia State, Nigeria.

ABSTRACT

This study determined the gender issues on poverty alleviation programs: the case of the National Fadama 1 Development Programme in Abia State, Nigeria. A multi-stage random sampling technique was used in the selection of the local government areas, communities and sample size of 150 respondents (75 men and 75 females). The instrument for data collection was a well structured and pre-tested questionnaire. The result of the poverty profiles indicated that the poverty incidence of male and female Fadama1 farmers was 0.67 and 0.56, respectively. The result on the poverty gap (measures income shortfall) showed that men required 46.0% and women 48.0% of the poverty line to get out of poverty. The result also posted the Gini-coefficient (measures the extent of inequalities in income distribution) of male and female Fadama farmers to be 0.233 and 0.347, respectively. The result of the paired t-test revealed that farm size and annual Fadama farm income were statistically different and significant at 99.0% and 95.0% confidence level, respectively. The land tenure system which causes fragmentation of land should be abolished and a policy aimed at redistributing Fadama land equitably should be put in place.

Key words: gender, poverty alleviation, poverty incidence, National Fadama.

RESUMEN

Este estudio analiza el tema de género en programas de alivio a la pobreza: el caso del Programa Nacional de Desarrollo Fadama 1 en el estado de Abia, Nigeria. Se usó la técnica de muestreo al azar de niveles múltiples en la selección de los gobiernos locales, comunidades y tamaño de la muestra de 150 personas (75 hombres y 75 mujeres). La información se recogió con un cuestionario bien estructurado y preevaluado. Los resultados de los perfiles de pobreza indicaron que la incidencia de pobreza en hombres y mujeres del programa Fadama fue 0,67 y 0,56, respectivamente. Los resultados de la brecha de pobreza (mide falta de ingresos) mostró que los hombres requieren 46,0% y las mujeres 48,0% para salir de la línea de la pobreza. Los resultados también indicaron que el coeficiente de Gini (mide las desigualdades en la distribución del ingreso) de los hombres y mujeres del programa Fadama fue 0,233 y 0,347, respectivamente. Los resultados de la prueba de t pareada indicaron que el tamaño del predio y el ingreso anual del predio Fadama fueron estadísticamente diferentes, al

99,0% y al 95% grados de confianza, respectivamente. El sistema de tenencia de la tierra que causa fragmentación debe ser eliminado y establecer una política dirigida a distribuir la tierra Fadama con equidad.

Palabras clave: género, alivio de la pobreza, incidencia de la pobreza, Programa Fadama.

INTRODUCTION

Low production and productivity have continued to characterize Nigeria's agriculture limiting the capacity of the sector to perform its traditional role in economic development. In order to break this cycle and improve the performance of the agricultural sector, the Nigerian government has introduced and implemented several policies and programs aimed at recuperating the sector (Ajibefun and Aderinola, 2004). A more recent effort towards production and enhancement of farmers' welfare is the introduction and implementation of the National Fadama 1 Development Project, funded by the World Bank between 1993 and 1999, which was built on the success of pump and wash bore based farming and supervised by the Agricultural Development Projects Supervised (ADPS) (Blench and Ingawa, 2004)

The word "Fadama" is a Hausa name for irrigable land, usually flood plains and low-lying areas underlined by shallow aquifers and found along Nigeria's rivers system (Qureshi, 1989; Ingawa et al., 2004; Nwachukwu 2006; and Ezeh, 2007). The project aimed at reducing poverty and increasing the income of rural dwellers, especially those that use Fadama facilities (Bello, 2008). The National Fadama 1 Development Project (NFDP) was established to ensure year-round crops production in all the states of the federation through the exploitation of shallow aquifers and surface water potentials in each state, using tube well, wash bore and petrol-driven pumps technology (World Bank, 1992; Bauchi State Agricultural Development Project (BSADP), 1999).

The first Fadama Development project (Fadama 1) was initiated in the early 1990 to promote simple and low cost improved irrigation under the World Bank financing. It was designed as a major instrument for achieving the government poverty reduction objective in the rural areas of Nigeria (ADF, 2004). Its beneficiaries are the private economic agents who achieve their livelihood directly or indirectly from the exploitation of the natural resources in a given Fadama area. The beneficiaries are group of people with the same economic interest, with a minimum of 10 memberships. The mandate given by the NFDP states that the group must be registered with the Ministry of Commerce and Cooperatives as Fadama Resource User Group, and that a maximum

of 10 Fadama Resource User Groups can form a Fadama Community Association within a particular community.

There is evidence that both men and women were involved in the National Fadama 1 Development Project (Ezeh, 2005). Women constitute not only the major agricultural labor force but they are often also the farm decision makers. The Food and Agricultural Organization (FAO, 2004) recognized that the empowerment of women is a key issue to raise levels of nutrition, and improve the production and distribution of food and agricultural products. In fact, a gender equitable mode of irrigation farming is likely to be more productive than male dominated Fadama farming. This is because small farm enterprises characterized by gender role flexibility were found to have much better survival chances than similar farm enterprises lacking such gender role flexibility (Safilious-Rothschild, 2003). Evidently, such agricultural growth will not only contribute to gender equity but also to long-term poverty reduction.

It is important to note that agricultural production in Nigeria has always been seen as dominated by men. This implies that crops produced were limited to those produced by men, ignoring those produced by women and other downstream value-added activities such as marketing and processing, which mainly involve female farmers. This assumption helps perpetuate the vicious cycle of poverty and undermines women's involvement in agricultural production (Oladipo et al, 2011).

Nwaru (2003) has indicated that gender specific nature of farming seems to be disappearing fast, resulting in changes in the role of women in farming, who are increasingly taking over tasks that used to be carried out by men traditionally. Boserup (1987) opined that nearly all tasks connected with food production or the so called agro-industry are performed by rural women, with the exception of tree cutting and other heavy land preparation jobs that are performed by men. In this regard, Durno and Stuart (2005) noted that these women were not recognized as farmers, were not critically involved in the process of farm problem analysis, planning and decision-making, and did not receive the training, credit and support they needed. They also noted that development opportunities are usually available to people who are better educated. These people are

usually men. Many extension programs focus on the family head that is usually the husbands. The presumption is that women are less economically efficient than men. In sum, in today's farming system, which largely depends upon women's efforts as farmers, the issues of gender and irrigation in smallholder agriculture have become important.

The design and implementation of a system for agricultural growth and irrigation development that strengthens land production and water rights of women, and prevents exploitative family labor relations have become critical. Production potentials will increase by ensuring that both men and women producers directly control production factors and reap the benefits of their efforts. Evidently, such agricultural growth will not only contribute to gender equity but also to long-term poverty reduction not only in Abia state but in Nigeria in general. The null hypothesis tested was that there are no significant differences in farm income, farm size, use of labor and output between male and female Fadama participants in the state.

The objectives of the research were describe the selected socio economic variables of the females and males involved in Fadama 1 program in Abia state; determine the poverty incidence and poverty gap of the rural men and women involved in the program in the state; determine the degree of inequalities in income distribution among the rural men and women participants; determine and compare the impact of Fadama 1 technological packages on rural men and women farmers' incomes, farm size, labor use and farm output in the state; and make appropriate policy recommendatios based on research findings.

MATERIALS AND METHODS

The study was carried out in Abia State. The state was chosen because of its involvement in the National Fadama 1 Development Project. Abia State was created out of Imo State on August 27, 1991. It has a land area of 700 km² with 17 local government areas. The state lies between longitudes 7°23' and 8°02' East of Greenwich meridian and latitudes 5°49' and 6°12' North of the equator. Abia State is bounded on the East by the Cross River and Akwa Ibom State, on the North by Ebonyi and Enugu States, on the West by Imo State and on the South by Rivers State. Abia has three agricultural zones, namely: Aba, Umuahia and Ohafia. The population of Abia State is 2,833,999 with 1,434,193 males and 1,399,806 females.

A multi-stage random sampling technique (Ezeh, 2007) was used in selecting the local government areas (LGA), autonomous communities and respondents. The three agricultural zones of Abia

(Aba, Ohafia and Umuahia) were included in the study. In stage 1 one LGA was selected at random from each agricultural zone. The selected LGAs included Umuneochi in Ohafia zone, Umuahia South in Umuahia zone and Ugwunagbo in Aba zone. In stage 2 one Autonomous Community was randomly selected from each of the LGAs. Stage 2 involved the random selection of 25 males and 25 females Fadama 1 participant in each community, bringing sample size to 150 people. The sample size was selected from a sample frame of 350 members belonging to a Fadama Community Association. Instrument of data collection was a well structured and pre-tested set of questionnaires. Data collected included socio-economic variables of the Fadama farmers (male and female) such as age, educational level, Fadama farming experience, input-output coefficients, prices, Fadama farm size, income and expenditure variables.

Descriptive statistics such as mean, percentages and tables, were used to analyze socioeconomic variables. Per-capita poverty indicators were used to draw conclusion on poverty incidence, while the degree of inequality was analyzed with the use of Gini-coefficient (Ayobatele and Amudipe, 1999), and the impact of Fadama project was assessed using paired "t" test.

The following specifications were used to determine poverty level according to Ezeh (2007).

$$H = q/n \quad (1)$$

where: H = the head count ratio; q = numbers of male and female Fadama 1 farmers living below the poverty line; and n = the total number of Fadama 1 farmers.

The poverty gap was calculated as

$$I = \{(Z-Y)/Z\} \quad (2)$$

where I = the poverty gap; Z = the poverty line using the mean household expenditure; Y = the average income of male and female Fadama farmers.

The Gini coefficient was calculated as

$$G1 = 1 - \sum^n (XK - XK - I)(YK + YK - I) \quad (3)$$

$$K = 1$$

where: G1 = Gini coefficient; XK = the cumulated proportion of the population variables for K = 0, ..., n with X₀ = 0; X_n = 1; YK = the accumulated proportion of the income variables, for k = n with Y₀ = 0, Y_n = 1.

Paired t-test was used according to Koutsoyianis (1977) thus:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S^2_1}{n_1} + \frac{S^2_2}{n_2}}}$$

With $n_1 + n_2 - 2$ degree of freedom

where $t = "t"$ statistic; \bar{X}_1 = mean values of crop output, farm size, farm income, and use of labor of male Fadama participants; \bar{X}_2 = mean values of crop output, farm size, farm income, and use of labor of female Fadama participants; S^2_1 = variance of the male variables; S^2_2 = variance of the female variables; n_1 = number of observation (sample size of males); n_2 = number of observation (sample size of females).

RESULTS AND DISCUSSION

The distribution of the two groups (male and female) of Fadama 1 farmers are shown in Table 1. The result show that 69.33% of men and 68% of women Fadama farmers were in the age range of between 21 and 50 years of age. The implication is that most males and female Fadama 1 farmers were within the productive workforce that

can effectively withstand the rigors and tedium involved in Fadama farming. These results are consistent with previous results reported by Ezech (2007), who noted that number of older people in the rural areas of Nigeria is decreasing.

Levels of educational attainment of both male and female Fadama 1 farmers are displayed in Table 1. The result shows that 89.34 and 76.0% of the male and female Fadama farmers, respectively, had formal education. The level of literacy would enable the participants to adopt modern and better methods of farming. These results also agree with Ezech (2007) indicating that the ability to read and write would enable farmers to make an effective and efficient use of available farm resources.

Table 1 also shows the distribution of male and female Fadama 1 farmers according to their annual Fadama income level. The result shows that the majority (56% of males had annual Fadama income levels in the range of ₦51,000 – ₦100,000.00, and above ₦100,000.00 (US\$ 340-666.67 and above US\$ 666.67) (1 US\$ = ₦150) while the major

Table 1. Socio-economic variables of male and female Fadama 1 farmers in Abia State, Nigeria, 2008.

Tabla 1. Variables socioeconómicas de agricultores Fadama 1 hombres y mujeres en el estado de Abia, Nigeria, 2008.

Variables	Males		Females	
	Frequency	%	Frequency	%
Age (years)				
21-30	10	13.33	8	10.67
31-40	24	32.00	27	36.00
41-50	18	24.00	16	21.33
51-60	13	17.33	11	14.67
61 and above	10	13.33	13	17.33
Education (years)				
No formal education	8	10.67	18	24.00
First school leaving certificate (FSLC)	23	30.67	28	37.33
West Africa School Certificate (WASC)	44	58.66	26	34.67
Ordinary National Diploma (OND)	-	-	1	1.33
Bachelor of Science degree (B.Sc.)	-	-	2	2.67
Annual income (₦ Naira)				
Less than 50,000.00	33	44.00	40	53.33
51,000.00 -100,000.00	31	41.31	28	37.33
101,000.00 and above	11	14.69	7	9.33
Farm size (ha)				
0.1 – 0.5	39	52.00	44	58.67
0.6 – 1.0	27	36.00	25	33.33
1.1 – 1.5	9	12.00	6	8.00

Source: Field survey data.

1 US\$ = 150 Naira (₦)

richness (53.33%) of the female Fadama farmers had income levels below ₦50,000.00 (US\$ 333.33). This underscores the low income status of the female Fadama 1 farmers. These results are in accordance with Okorji (1999) who indicated that annual income earners of less than ₦ 50,000.00 (US\$ 333.33) are low.

Results referring to farm size of the two groups of Fadama 1 farmers are also shown in Table 1. The results indicate farm size ranges from 0.1 to 1.0 hectare for the majority of the Fadama 1 farmers (88.0% of male and 92.0% of females). This implies that Fadama land sizes pose serious challenge to the production potential of the farmers (Udoh, 1999).

The poverty profiles of male and female Fadama 1 farmers in Abia State, Nigeria, is shown in Table 2. These results show that the incidence of poverty, also known as the head count ratio, for male and female Fadama 1 farmers was 0.67 and 0.56, respectively. This implies that 67.0% and 56.0% of the male and female Fadama 1 farmers,

respectively, in the study area were poor. In fact, their incomes fell short of the mean household expenditure used as the poverty line (₦61,070.00 (US\$ 407.13) for men and ₦52,387.00 (US\$ 349.25) for women. This result is lower than those reported by Ayobatele and Amudipe (1999), who found out that 76.4% of working women in Ondo State, Nigeria, were poor.

The poverty gap, also known as the income shortfall, is also shown in Table 2. This allows for the assessment of the depth of poverty among male and female Fadama 1 participants in the study area (Ezeh, 2007). The results of the study showed that the poverty gap index for male and female Fadama 1 farmers were 0.46 and 0.48, respectively. This indicated that poverty was more endemic among the women rather than men and that economic measures are required to alleviate poverty. This means that male farmers required at least 46.0% and the females farmers at least 48.0% of the poverty line to get out of poverty. Nwankwo (2004) and Ezeh (2007) obtained similar results.

Table 2. Poverty profiles of male and female Fadama 1 farmers in Abia State, Nigeria. 2008.

Table 2. Perfil de pobreza de agricultores Fadama 1 hombres y mujeres en el estado de Abia, Nigeria. 2008.

Poverty indicators	Males	Females
Poverty incidence (%) (Head count ratio)	0.67	0.56
Poverty gap (%) (Depth of poverty)	0.46	0.48
Gini coefficient (%)	0.233	0.347

Source: Calculations from field survey data.

The results of the Gini coefficient (GI) signaling the inequality of incomes between male and female Fadama 1 farmers are also shown in Table 2. This Gini coefficient for male Fadama 1 farmers was 0.233 while it was 0.347 for female farmers. This means that the degree of inequality in incomes was 23.3% and 34.7% for male and female Fadama 1 farmers, respectively. This indicates that female presented higher poverty with a lower income level than their male counterparts. This result is consistent with Ezeh (2007) who had a Gini coefficient of 0.25 for the rural women in Umuneochi Local Government area of Abia State, Nigeria, and also with results reported by Ayobatele and Amudipe (1999) who equally obtained a low GI for women farmers in Ondo State, Nigeria.

The impact of the Fadama 1 packages on rural women and men Fadama farmers' income, farm size, labor use and farm output is shown in Table 3. The estimated cultivated mean farm size of the male Fadama 1 farmers was 3.25 ha while that of the females farmers was 2.69 ha. The difference in mean between the cultivated land held by male and female farmers was 0.56 ha. The result of the paired t-test for difference in mean showed that this is statistically significant at 99.0 percent confidence level. This is because the calculated t "value" = 2.917 > the tabulated "t" 0.025 = 1.980. Therefore, the hypothesis of no difference in farm size is rejected. These results compare favorably with Nwachukwu and Ezeh (2007) who obtained similar result.

Table 3. Paired samples variables for male and female Fadama 1 participants in Abia State, Nigeria. 2008.**Tabla 3. Variables de muestras pareadas para hombres y mujeres participantes en el proyecto Fadama 1 en el Estado de Abia, Nigeria. 2008**

Variable		Individual mean	Mean difference	Standard error	Value
Fadama farm output, kg	Males	374.09	39.93	31.78	1.23
	Females	335.16			
Fadama farm size, ha	Males	3.25	0.56	1.66	2.92
	Females	2.69			
Fadama farm income (₦)	Males	82,066.67	15,733.34	5912.04	2.66
	Females	66,333.33			
Fadama farm labour use (Man days)	Males	8.13	-0.19	0.28	-0.66
	Females	8.32			

Source: Calculations from field survey data.

1 US\$ = 150 Naira (₦)

The mean incomes generated from the sale of various fadama crops (vegetables, rice, maize and okra) from both groups of Fadama 1 farmers (male and female) were compared. The results showed that the mean annual farm income of male Fadama 1 farmers was ₦ 82,066.67 (US\$ 547.11) while that of the females was ₦ 66,333.33 (US\$ 442.22). The mean difference was ₦ 15,733.33 (US\$ 104.88). The result of the paired t test showed that this is statistically significant at 5.0% risk level. This is because the calculated $t = 2.66 >$ the tabulated $t = 1.982$. Therefore, the hypothesis of no difference in farm income is rejected. Given that the mean values of male participants were higher than those of their female counterparts in mean annual farm income and farm size, it could be inferred that the Fadama 1 project has a greater impacted males than on female Fadama 1 farmers.

It is therefore recommended that a deliberate policy aimed at increasing the Fadama farm size and incomes of the women Fadama 1 farmers should be embarked upon by the federal, state and local governments. The land tenure system which causes fragmentation of land should be abolished and a policy aimed at redistributing fadama land equitably put in place. Given the differential income levels between male and female farmers, governments (Federal, state and local government) should formulate policies and programs aimed particularly at reducing the poverty levels of the women Fadama 1 farmers. This is with a view to increasing their (females) disposal income from other basic necessities of life that are not to be provided by government.

CONCLUSIONS

The research revealed that the bulk of Fadama 1 farmers in the study area were young (21 and 50 years), energetic with an average annual Fadama farm income ranging from ₦ 51,000-100,000.00 (US\$ 340-666.67 and above) for male farmers and below ₦50,000 (US\$ 333.33) for females, who had one form of formal education (89.44% and 76% for male and female respectively), and cultivated on a farm size range of 0.1 to 1.0 ha.

The result of this study also revealed that the incidence of poverty for males was 0.67 while it was 0.56 for women, which implies that 67.0% of men and 56.0% of women Fadama I farmers in the study area were poor. Results further showed that the poverty gap (poverty depth) index was 0.46 for men and 0.48 for women.

The Gini coefficient showing the inequality in income distribution was 0.233 for males and 0.347 for females. It further revealed that the degree of inequality in income was 23.3% and 34.7% for men and female, respectively.

This research also showed that both farm size (0.6 ha) and farm income ₦ 82,066.67 (US\$547.11) of males were significantly higher than those of females, at 99.0% and 95.0% confidence level, respectively.

LITERATURE CITED

ADF (Nigeria). 2004. National Fadama Development Programme Appraisal Report. African

- Development Foundation (ADF). Federal Ministry of Agriculture and Rural Development, Abuja, Nigeria.
- Ajibefun, I.A., and E.A. Aderinola. 2004. Determinants of technical efficiency and policy implication in traditional agricultural production; empirical study of Nigeria food crops farmers. Final Report. Bi-annual Research Workshop of African Economic Research Consortium (AERC), Nairobi, Kenya.
- Ayobatele, J.T., and B.A. Amudipe. 1999. Poverty profiles of working women in Akure North and South LGAs of Ondo State, Nigeria. In Y.C. Fabiyi, and C.O. Idowu (eds.) *Poverty Alleviation and Food Security in Nigeria*. Nigerian Association of Agricultural Economists (NAAE), Ibadan, Nigeria.
- Bello, A. 2008. Fadama Needs. Instrument for millennium development goal. p. 3. Fadama II update. (PCU-NDDO). National Fadama Development Office, Abuja, Nigeria.
- BSADP (Nigeria). 1999. Annual Report of the National Fadama I Development Project. Bauchi State Agricultural Development Programme (BSADP). Bauchi PME Unit, Bauchi, Nigeria.
- Blench, R.M., and S.A. Ingawa. 2004. A practical guide to National Fadama Development Project II on conflict management. The World Bank PCF/Government of Nigeria PCU Fadama II. National Fadama Office, Abuja, Nigeria
- Boserup, E. 1987. *Women's role in economic development*. Martins Press, New York, USA.
- Durno, J., and R. Stuart. 2005. Gender issues in sustainable agriculture. p. 24-37. In Overholt C. (ed.). *Gender roles in development projects*. New Delhi Fox Publisher, New Delhi, India.
- Ezeh, C.I. 2005. A comparative study fadama and non fadama crop farmer in Osisioma Ngwa LGA, Abia State, Nigeria. *Journal of Sustainable Tropical Agricultural Research* 13:26-31.
- Ezeh, C.I. 2007. Poverty profiles and determinants of expenditure of rural women households in Nigeria. *Nigerian Journal of Development Studies* 6(1):187-204.
- FAO. 2004. Sustainable development and management wetlands; Wetland contribution to livelihoods in Zambia. Food and Agricultural Organization (FAO), Rome, Italy.
- Ingawa, S.A., A. Oredipe, A.A. K I dafor, and C. Okafor (eds.) 2004. *Facilitating Project Implementation Manual for Second National Fadama Development Project*. Federal Ministry of Agriculture and Rural Development, Abuja, Nigeria.
- Koutsoyiannis, A. 1977. *Theories of econometrics*. 2nd ed. Macmillan Press, London, United Kingdom.
- Nwachukwu, I.N. 2006. Efficiency of vegetable production in Imo State; The case of fadama *Teifairia occidentalis*. M.Sc. Thesis. Department of Agricultural Economics, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.
- Nwachukwu, I.N., and C.I. Ezeh. 2007. Impact of selected rural development programmes on poverty alleviation in Ikwuano LGA Abia State, Nigeria. *African Journal of Food, Agriculture, Nutrition and Development (AJ-FAND)* 7(5):1-17.
- Nwankwo, I.I.M. 2004. The impacts of community banks on women farmers poverty levels in rural Abia State, Nigeria. M.Sc. Thesis. Department of Agriculture, Abia State University Uturu, Okigwe, Nigeria.
- Nwaru, J.C. 2003. Gender and relative production efficiency in food crop farming in Abia State, Nigeria. *Niger. Agr. J.* 34:1-10.
- Okorji, E.C. 1999. Consequences of agricultural productivity of crops stereotyping along sex-line, Anambra State. M.Sc. Thesis. Department of Agricultural Economics, University of Nigeria, Nssuka, Enugu State, Nigeria.
- Oladipo, F.O., F.O. Aderati, L.L. Adefalu, O.W. Kareem, S.R. Olaleye, and I.O. Ibitunde. 2011. Women Farmers Assessment of Fadama II programme in Kwara State, Nigeria. *Benin International Journal of Agricultural Economics and Extension Services*, Nigeria. 1(2):124-130.
- Qureshi, M. 1989. Water management in Fadama crop. National Workshop on Fadama and Irrigation Development in Nigeria. Zaranda Hotels, Bauchi, Bauchi state, Nigeria.
- Safilios-Rothschild, C. 2003. Gender role flexibility and smallholder survival. *Int. J. Ag. Resour. Govern. Ecol.* 2(2):187-200.
- Udoh, E.J. 1999. Commercial production of water leaf among urban women: A case of Calabar Municipality of Cross River State. Nigerian Association of Agricultural Economists, Nigeria.
- World Bank. 1992. Staff Appraisal Report. National Fadama Development Project Kano, Nigeria. Available at www.undp.org (Accessed 3 February 2008).