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Promoting Entrepreneurship and Diversification as a Strategy for Climate Change Adaptation among Rural Women in Anambra State, Nigeria

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Abstract

The study sought to identify enterprises carried out by rural women in Anambra State, Nigeria, which help them to adapt to climate change. Structured interview schedule was used to collect data from a sample of four hundred and sixty-two respondents. Data were analysed using percentage, mean scores and standard deviation. Majority (88.7%) of the rural women were involved in multiple enterprises in order to cope with climate change. They were involved in enterprises such as planting of crops (88.1%), marketing of farm produce (79.2%), rearing of farm animals (42.2%), petty trading (58.2%), among others. The study also revealed that rural women made higher incomes per annum from enterprises such as petty trading (M= ₦61,766.6), teaching (M= ₦32,625.0), sale of cassava (M= ₦16,878.0), sale of chicken (M= ₦12,983.6), among others. The study recommends that appropriate measures should be taken to develop capabilities in order to empower rural women economically to cope with challenges of climate change. This will help to reduce poverty and vulnerability among rural women as well as enhance rural development.

Keywords: Entrepreneurship, Diversification, Climate change, Rural women, Anambra State, Nigeria

Introduction

Rural women's activities mainly range from petty trading, vocational enterprises, handicraft and farming to agro-processing. Women are also involved in production of agricultural raw materials for agro- industries. Almost all agricultural production and marketing activities including animal husbandry activities are performed by women. There is seemingly a good number of women in rural farming, processing and marketing. These income yielding informal economic activities make them indispensable in the process of rural development (Aspaas, 1998). There is however an observable change in the pattern of women's work in recent times as

their participation is declining in agriculture but increasing in petty trading and other activities which according to Bryceson (2000) is called diversification out of agriculture. Islam (1997) identifies successive droughts as a result of climate change that depress income and hence increases the need for alternative incomes offering low-skill income as a distress-push factor.

Over the past two decades climate change has increasingly become recognised as a serious threat to sustainable development with current and projected impacts on areas such as environment, agriculture, energy, human health, food security, economic activity, natural resources and physical infrastructure. Although climate change impacts will affect all countries, its impacts will be differently distributed among different regions, generations, age classes, income groups, occupations and gender (International Panel on Climate Change (IPCC), 2001). The poor who are mostly women in developing countries will be disproportionately affected (Drexhage, 2006).

Women are responsible for 65% of household food production in sub-Saharan Africa. The burden of food crisis, declining affordable energy sources, and impoverishment induced by climate change are disproportionately borne by women because of their multiple roles as producers and family caretakers (Organization for Economic Cooperation and Development (OECD), 2008). There is also evidence that since women in developing countries have primary responsibility of providing for their families. They are more reliant on natural resources and are thus more careful stewards of them and the environment (Price Waterhouse Coopers (PWC), 2008). They have been engaging in various efforts that qualify as climate change mitigation and adaptation activities. In several rural areas of sub-Saharan Africa, women are responsible for feeding their families and are therefore more dependent on natural resources such as land, wood and water. However, their access to these resources is limited. They are also denied full access to loans, education and information.

According to Denton (2002), the potential of women as agents of change for climate mitigation and adaptation remains untapped. Their extensive theoretical and practical knowledge of the environment and resource conservation is not given due consideration. In terms of economic participation, they are not paid for the environmental services that they already provide (example, reforestation). The potential contribution to climate mitigation by being part of the economic cycle is not sufficiently exploited.

It is increasingly recognised that empowering women, children and other marginalised groups is beneficial not only as a policy in itself, but also as a means of strengthening the effectiveness of climate change measures (United Nations Development Programme (UNDP), 2009; Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), 2010). However, there are several ways of promoting women's economic participation while also counteracting climate change. This can be achieved through diversification in farm and non-farm enterprises which

enables them to cope with the challenges of climate change. The economic empowerment of women through climate mitigation and adaptation fosters economic growth and socioeconomic development, reduces poverty, keeps environmental problems in check, and increases the potential for adaptation, which is to the benefit of both women and men. Enhancing the economic empowerment of women is a catalyst for development, which helps boost a country's economic growth, promotes the socioeconomic development not only of women, but of the entire population, and helps reduce poverty (OECD, 2008; World Bank, 2006).

Climate change and its impact on income security for the family increases the potential for domestic violence, as it shatters the image of the man as breadwinner, which can cause psychological stress (Rodenberg, 2009). With regards to climate adaptation, it should be noted that women often do not have much of a say in decisions taken by the family or the community and are therefore unable to diversify cultivation (Rodenberg, 2009). Furthermore, it is usually women who are responsible for collecting water and fuel (example firewood) for the household. The scarcity of these resources induced by climate change increases a woman's workload and time poverty, burdened as she already is by the many roles she has to play. She is consequently left with no time for income-generating activities, education, training or participation in community decision making processes. In overall terms, climate change intensifies the existing economic and social gender disparities (Rodenberg, 2009). Greater decision-making powers for women at the family and community level with regard to agricultural cultivation and the farming of new and more resistant crops could increase agricultural production, leading to greater food security, production and marketing of surpluses and ultimately to a source of income.

This raises the following questions: What are the enterprises engaged by rural women in order to adapt to climate change? And what are the enterprises where the activities of rural women dominate in terms of greater income to enhance climate change adaptation?

The specific objectives were to:

- (i) identify types of enterprises engaged in by rural women for climate change adaptation; and
- (ii) ascertain enterprises where the activities of rural women dominate for increased income.

Methodology

The study was carried out in Anambra State, Nigeria. There are four agricultural zones in the state, namely; Aguata, Anambra, Awka and Onitsha. The estimated population of rural women in Anambra State is 2.13 million (NPC, 2006). The population of the study comprised rural women in the four agricultural zones. All

the four agricultural zones were purposively used for the study. Anambra zone is made up of four (4) extension blocks comprising 45 circles, Awka zone comprises five (5) blocks and 35 circles, while Aguata zone is made up of six (6) extension blocks, comprising 45 circles. There are also six (6) extension blocks comprising 30 circles in Onitsha zone. Two (2) rural blocks were selected from each of the zones, while three (3) circles were selected from each of the blocks using simple random sampling. In each of the circles, 20 rural women were selected using simple random sampling. Eight (8) blocks and 24 circles, comprising 480 respondents were supposed to be used for the study. Eighteen copies of the questionnaire were not filled properly and were dropped leaving 462 used for analysis. Data for the study were collected using interview schedule/questionnaire. Percentage, mean score and standard deviation were used for data analysis.

Results and Discussion

Socio-economic characteristics of respondents

Majority (60.5%) of the respondents were within the age range of 40-59 years (Table 1). The mean age of the respondents was 50.0 years. This implies that majority of the respondents were middle aged and in their productive years, hence greater involvement in both farm and non-farm activities.

A greater proportion (69.3%) of the respondents were married. This shows that most of the respondents have husbands who may be providing support for them in their activities, either financially or otherwise. Oberhauser and Pratt (2004) note that married people have responsibility for provision of household needs of their families hence greater involvement in occupational diversification for economic empowerment.

Data on level of education of the respondents (Table 1) reveal that majority (93.3%) were literate. The mean year of formal education was 9 years. This implies that with a majority of the respondents having formal education they are better equipped to enter into various occupations. The findings agree with Ranjan (2006) who asserts that level of education increases participation rate in occupations for rural women. Educated rural women are likely to possess skills which facilitate successful involvement in non-farm activities.

Majority (62.8%) of the respondents had a household size of 1-5 persons. The mean household size was 5 persons. Size of household can be a key variable in determining whether the respondents should diversify their occupations. Large household size could serve as source of labour for farming activities. This is in agreement with Economic and Social Commission for Asia and the Pacific (ESCAP), (1999) which reports that rural families are characterized by large family size, demanding for greater involvement in occupational diversification in order to meet up with household responsibilities.

About 45% of the respondents had over 19 years of farming experience with mean farming experience of 20.1 years. This implies that most of the respondents have been farming for quite a long period of time. This can help them to diversify more into farm activities such as crop and livestock production. Rural women with many years of experience in farming are more likely to diversify into agricultural activities making use of wealth of experiences they have acquired over the years.

Majority (52.0%) of the respondents reported farm sizes of 1.1-2.0 ha with a mean farm size of 1.3 hectares. This indicates that majority of the respondents were small-scale farmers who produce at a subsistence level. The finding is not surprising considering the high population density of 4.18 million in the State. This is in agreement with Africa Fertilizer Summit (2006) which reports that small scale farmers cultivate between 0.8 and 1.3 hectares of land in forest areas of the country.

Majority (84.6%) of the respondents were involved in crop production, while 51.9% of them were involved in both crop and livestock production. This implies that the respondents were involved in both crop and livestock production. This is to enable them sustain their families economically. The ability to be involved in both crop and livestock production may serve as an avenue for raising capital for non-farm activities. The finding is in agreement with Reardon (1997) who concludes that most rural women depend on crop and livestock activities for their incomes. This in itself is a form of diversification and insurance against risk.

TABLE 1
Percentage distribution of socio-economic characteristics of the respondents (n= 462)

Variable	Percentage	Mean (M)	Standard deviation (SD)
Age (years)			
20-29	5.2		
30-39	14.2		
40-49	27.1	50.0	11.72
50-59	33.4		
60-69	15.9		
70 and above	4.2		
Marital status			
Single	5.4		
Married	69.3		
Widowed	25.3		
Years spent in school (years)			
No formal education	6.7	8.5	4.53
Primary school attempted	12.5		
Primary school completed	28.8		
Secondary school attempted	11.2		
Secondary school completed	25.3		
OND/NCE holders	8.9		
HND/first degree	6.6		
Household size (numbers)			
1-5	62.8		
6-10	36.8	4.9	1.82
11 and above	0.4		
Farming experience (years)			
0-9	20.6		
10-19	34.9		
20-29	21.2		
30-39	13.2	20.1	13.62
40-49	6.6		
50 and above	3.5		
Size of farmland (hectares)			
< 1.0	35.7		
1.1-2.0	51.7		
2.1-3.0	7.8	1.3	1.08
3.1-4.0	3.5		
4.1-5.0	1.3		
Type of farming*			
Crop production	84.6		
Livestock production	43.5		
Mixed farming	51.9		

**Multiple responses*

Types of enterprises engaged in by rural women for climate change adaptation

Majority (88.1%) of the respondents were involved in planting of crops, 79.2% of them were involved in marketing of farm produce, about 42% kept goat and sheep, 40.5% kept chicken, among others (Table 2). This implies that the respondents were involved in mixed farming. This is to enable them sustain their families economically and adapt to climate change. This will also help them to guard against crop failures resulting from variations in climate as well as providing safety nets for economic empowerment.

A greater proportion (58.2%) of the respondents were involved in petty trading, 10.4% were involved in tailoring, 6.9% were teachers, 6.2% were involved in making of confectioneries, while 5.6% of them were involved in hair dressing/weaving of hairs, among others (Table 2). This implies that the respondents were involved in both farm and non-farm enterprises. This is to enable them obtain additional income to empower themselves financially in order to cope with climate change. The findings are in line with Haggblade (1999) who reports that women dominate many of the non-farm activities such as petty trading, tailoring and many services that will grow most rapidly during structural transformation. Continuing, he notes that they also hold a major interest in many of the declining rural non-farm occupations such as basket making. Consequently, women will be key actors in the economic transition of Africa's rural economy.

TABLE 2
Percentage distribution of respondents according to their involvement in enterprises for climate change adaptation (n= 462)

Enterprises*	Percentage
Planting of arable crops (yam, cocoyam, cassava, maize, vegetables and rice)	88.1
Marketing of farm produce	79.2
Processing of cassava into gari	2.6
Processing of cassava into dough (fermented flour)	2.6
Processing of cassava into chips/flour	3.5
Processing of maize into pap and flour	4.7
Processing of oil palm into palm oil	3.0
Processing of oil palm into palm kernel oil	3.4
Rearing of farm animals such as goat and sheep	42.2
Rearing of chicken	40.5
Rearing of turkey	14.7
Pig farming	5.0
Snail farming	0.2
Fish farming	0.4
Handicrafts such as making of brooms	3.5
Making of baskets	2.4
Making of hand fans	0.9
Making of beads	0.4
Petty trading on food items such rice, beans, gari and palm oil	58.2
Tailoring/making of dresses	10.4
Making of confectioneries such as cake, chin-chin, meat pie and buns	6.2
Making of soap and pomade	2.5
Frying of beans balls, yams and potatoes	3.6
Hair dressing/weaving of hair	5.6
Teaching	6.9
Traditional birth attendance	0.9
Public service	5.2
Catering service	3.2
Wage labour	0.6

**Multiple responses*

Estimated income from major enterprises

The respondents obtained income mostly from production of cassava and rearing of livestock such as poultry, goat and sheep, petty trading, tailoring, teaching, public service, as shown in Table 3. A greater proportion (61.0%) of the respondents earned less than ₦20,000 from sale of cassava, about 18% earned ₦20,001-₦40,000, while 9.6% and 8.6% earned ₦40,001-60,000 and 60,001 and above respectively. Also, 3.2% of the respondents earned ₦80,001 and above. The estimated mean income was ₦12,295. The respondents earned high income from sale of cassava which is quite impressive. This could be attributed to cassava being a staple food and constitutes most of meals served by most families in the study area. This confirms Ozor, Madukwe, Onokala, Enete, et al (2010) who note that cassava is a major crop grown in Southern Nigeria.

The results also show that 88.3% of the respondents obtained less than ₦40,000 from sale of chicken, 10.3% obtained ₦40,001-₦80,000, while about 1% and 0.4% obtained ₦80,001-₦120,000 and over ₦120,000 respectively. The estimated mean income from chicken farming was ₦12,983.6. This implies that the respondents acquire large sum of money from sale of chicken. This could be attributed to the fact that most households in rural areas consume smaller proportion of reared livestock. The respondents keep the chicken mostly for sale to obtain money which they need to meet up with their family responsibilities.

Majority (88.1%) of the respondents earned less than ₦30,000 from goat and sheep farming, 7.2% earned ₦30,001-₦60,000, while 4.3% and 0.4% earned ₦60,001-₦90,000 and over ₦90,000 respectively. The estimated mean income from goat and sheep farming was ₦9,822.7. The respondents made high returns from sale of goat and sheep. The findings are in agreement with IFAD (1995) which observed that women's earnings from crop and livestock production account for a larger share of family income.

Distribution of respondents according to estimated income from petty trading is also shown in Table 3. This indicates that 86.6% of the respondents earned less than ₦100,000 from petty trading, 6.7% earned ₦100,001-₦200,000, about 3% earned ₦200,001-₦300,000, while 2.4% and 1.2% earned over ₦400,000 and ₦300,001-₦400,000 respectively. The mean income from petty trading was ₦61,766.6. This implies that the respondents got higher incomes from petty trading. This could make the respondents to diversify more into different forms of petty trades in order to obtain high incomes. A greater proportion (95.0%) of the respondents earned less than ₦50,000 from tailoring, 4.1% earned ₦50,001-₦100,000, while about 1% and 0.2% earned ₦100,001-₦150,000 and ₦150,001-₦200,000 respectively. The mean income from tailoring was ₦6,032.

The respondents (93.1%) involved in teaching earned less than ₦200,000, followed by 5.1% who earned above ₦400,000. Also, 1.2% earned ₦200,001-₦300,000, while 0.6% earned ₦300,001-₦400,000. The mean income from teaching was ₦32,625.5. The income earned by the respondents from teaching is

quite high, this could be attributed to the fact that most of the respondents were placed on monthly salary which were mostly paid by the government.

A greater proportion (94.8%) of the respondents earned less than ₦100,000 from public service, while 5.2% earned above ₦100,000. The mean income was ₦13,878.8. A greater proportion (97.8%) of the respondents earned less than ₦100,000 from catering services, 1.2% earned over ₦300,000, while 1.0% earned ₦100,001-₦200,000. The mean income was ₦8,008.7. It implies that the enterprises serve as major areas in generating income for the rural women and efforts should be geared towards modernizing agriculture especially value chain enterprises as well as providing labour saving technologies. This is to enable them cope with climate change as they diversify into various occupations.

TABLE 3
Distribution of respondents based on enterprises that yield higher estimated income in 2010 (n= 462)

Estimated income (₦)	Percentage	Mean (M)	Standard deviation (SD)
Cassava			
<20,000	61.0		
20,001-40,000	17.6		
40,001-60,000	9.6		8988.00
60,001-80,000	8.6	16878.0	
80,001 and above	3.2		
Chicken			
<40,000	88.3		
40,001-80,000	10.3	12983.6	21605.76
80,001-120,000	1.0		
120,001 and above	0.4		
60,001-80,000	0.7		
Goat and sheep farming			
<30,000	88.1		
30,001-60,000	7.2	9822.7	18220.66
60,001-90,000	4.3		
90,001 and above	0.4		
Petty trading			
<100,000	86.6		
100,001-200,000	6.7		
200,001-300,000	3.1	61,766.6	109260.80
300,001-400,000	1.2		
400,001 and above	2.4		

Tailoring			
<50,000	95.0		
50,001-100,000	4.1	6032.0	20829.05
100,001-150,000	0.7		
150,001-200,000	0.2		
Teaching			
<200,000	93.1		
200,001-300,000	1.2	32625.5	123034.45
300,001-400,000	0.6		
400,001 and above	5.1		
Public service			
<100,000	94.8		
100,001-200,000	0.2	13878.79	7016.80
200,001-300,000	1.8		
300,001 and above	3.2		

Conclusion and Recommendations

Rural women were involved in diversification of enterprises in order to cope with climate change. They were involved in various enterprises such as planting of crops, marketing of farm produce, processing of farm produce, rearing of farm animals, petty trading, tailoring, teaching, hair dressing, public service, wage labour, among others. Diversification of enterprises also generates additional income for economic empowerment of rural women. The economic empowerment of women for climate change adaptation creates an opportunity for poverty reduction and rural development. Measures to promote the economic participation of women through capacity building should be integrated into climate adaptation initiatives. Adequate measures that provide present and future benefits are required to increase the resilience of rural women's livelihoods, diminish gender inequality, increase awareness of climate change effects and prepare them for future changes. However, for a prospect to be made, success will be tied to an integrated approach and to institutional and political measures that are required to create the basic structural conditions necessary for broad-based and sustainable economic empowerment.

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