



Integrating Environmental and Sustainable Development Themes in Agricultural Extension Programme in Cross River State: Challenges and Enhancement Strategies

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Abstract

This study investigated the challenges and strategies for enhancing integration of environmental and sustainable development themes in agricultural extension programme in Cross River State, Nigeria. Using descriptive survey research design, two research questions and two hypotheses guided the study. With a population of 3,740 comprising 3,670 registered farmers and 70 graduate extension personnel, the sample for the study was 250 respondents obtained through multi-stage sampling technique used to select 180 registered farmers, who have continuously participated in ADP farmer field school training and 70 graduate extension personnel. A 29-item structured questionnaire was used for collection of quantitative data while FGDs were held with respondents to obtain qualitative data. Both instruments were validated and had a reliability coefficient of 0.80 obtained through Cronbach alpha reliability method. Mean, standard deviation and independent t-test statistic were used to answer the research questions and test the null hypotheses at $p > .05$. 10 challenges and 19 strategies that could enhance the integration of ESD themes as content areas in the programme in Cross River State were found. Result of the study showed no significant difference in the mean ratings of the responses of farmers and extension personnel on challenges and enhancement strategies for the integration of ESD themes as content areas in the programme in Cross River State. The roles the Ministry of Agriculture should play to deal with the identified challenges were recommended towards enhancing the delivery and acquisition of knowledge, skills and attitudes consistent with sustainable land resource use and management by farmers.

Keywords: Challenges, Enhancement Strategies, Environmental and Sustainable Development Themes, Agricultural Extension Programme.

Introduction

Education in agriculture plays an important role in preparing farmers, researchers, educators, extension staff, and members of agri-businesses and others to make positive contributions in Agriculture. It therefore becomes imperative in the 21st century for the alignment of changes and adaptations required in agricultural education so as to effectively contribute to improved food security, sustainable agricultural production, and rural development. This underscores the need for education of farmers who are actively involved in the use of natural resources of the environment. This education is otherwise known as agricultural extension.

Agricultural extension according to Osinem (2008) is an aspect of education which involves adult learners and prepares them along their felt needs and immediate interests. The author explained that agricultural extension is borne out of the philosophy that education is action and rural people

are intelligent, capable and have a desire to acquire information and using it to better their lots. To Qamar (2005), agricultural extension is a system that provides need-and demand-based knowledge and skills to rural men, women and youths in an informal participatory manner with the objectives of improving their quality of life. In the context of this study, agricultural extension is an informal participatory educational system that provides the rural youths and adults of Cross River State with knowledge and skills leading to attitudinal change in environmental and sustainable land resource use to ensure its fertility and guarantee optimum agricultural productivity. The wise use of natural resources by farmers brings to bear the inclusion and teaching of environmental and sustainable development themes in agricultural extension programmes.

Environmental and Sustainable Development (ESD) themes according to Alawa (2015) are content areas that are ecologically non-degrading, socially acceptable and economically viable in agricultural education and extension programmes for the acquisition of knowledge, skills and attitudes consistent with sustainable use of natural resources for improved agricultural production. Smith and Smithers (1993) also conceived ESD themes as contents that are ecologically non-degrading, economically viable and socially acceptable in agricultural production to ensure maximum agricultural yields. Contextually, ESD themes are content areas that are ecologically non-degrading, socially acceptable and economically viable which are included into agricultural extension education programme for farmers to acquire knowledge, skills and attitudes consistent with sustainable use of natural resources for improved agricultural production.

There is evidence of the integration of ESD themes in agricultural extension programme. For instance, Alawa (2015) reported research evidence of the inclusion of ESD themes in to agricultural education and extension programmes in Cross River State. Food and Agricultural Organization FAO (1994) and Hazell and Lutz (1998) also revealed the inclusion ESD themes as content areas in developed and developing countries of the world into their University agricultural education and extension outreach programmes. Despite the seeming inclusion of ESD content areas into agricultural extension programme, farmers in Cross River State have not really keyed into prudent use of natural resources sustainably. This is evident in food insecurity and ecological problems experienced at the moment in the State. Interaction with key stakeholders is agricultural extension programme, that is, farmers and extension agents revealed poor funding of extension services which has a multiplier effect on both the organization and implementation of agricultural extension programmes for desired results. It is a truism that funds direct other activities of a programme or an organization and this in parts may pose a challenge to planning and development of agricultural extension services in Cross River State.

Scholars have varied opinions on this development. For instance, Chittoor and Mishra (n.d) attributed the ineffectiveness in the organization of extension services to poor training of extension staff and non-alignment of agricultural extension curricula and teaching programmes to the production needs and employment demands of the agricultural sector. Apart from curricular limitations, Van Crowder, Lindley, Bruening and Doron (1998) and Zinnah, Steele and Mattocks (1998) identified increased unemployment and displacement, budgetary and financial crisis, increase in the numbers of urban-based students who lack rural experience, rapid scientific progress and technical change, heightened environmental awareness, lack of attention to gender issues, population issues, ill-equipped professionals, low morals and motivation as constraints to proper organisation



and implementation of agricultural extension services. Others according to the authors are disconnection between agricultural education, research and extension and low status of extension education in the disciplines. Despite these odds, Williams (1995) believed that agricultural extension is a primary mechanism through which farmers can learn the reason and value for a change as well as the result that can be achieved through the change process. Viewed holistically, these challenges call for a revitalization of the agricultural extension programme through the evolution of strategies that would make farmers and other land users to be more responsive to sustainable agriculture and rural development.

A strategy generally is a long term achievement plan but it is used in this study to describe plans intended to achieve the long term inclusion, delivery and implementation of environmental and sustainable development themes in agricultural education and training programmes. Qamar (2005) stated that challenge of revitalizing agricultural extension programme to meet emergent needs of environmental sustainability is not a trivial one and stressed the need for the reshaping of agricultural extension programme towards environmental sustainability. The author explained that the extension delivery system cannot be modernized towards sustainability without a consideration of strategies such as assessment of the existing extension organizations against farmers' needs and determine whether to strengthen or restore it; decentralization of extension services after capacity building of staff and orientation of elected leaders; expansion of the technical mandate of extension to aim at broader development of human resources; formulation of national policies on extension in order to ensure political and financial commitment; incorporation of pre-service education in agricultural extension in line with modernization of extension system at the national level; promotion of pluralism in extension by involving public, private and civil society institutions and development and application of information technology to facilitate the work of extension workers. Others, according to the author, are development of original, location specific, participatory, gender sensitive and inexpensive methodologies and materials instead of applying those methodologies which are promoted as universally suitable; orientation of extension staff to major food security related global developments that could eventually affect rural livelihoods; encouragement of the extension service to empower farmers through organizing them into legal associations to constitute a strong lobby for themselves and extension; encouragement of bottom up, grassroots extension programme planning by farmers in order to make extension demand-driven and also exercise supply-driven, top-down modality for promoting common public good practices such as conservation of natural resources and environmental protection and provision of effective operational linkages between extension and research and other key relevant institutions.

In the view of Wallace (1999), a more integrated approach to extension training that models greener and more holistic procedures in both learning systems and management is imperative. The author stated that to enhance the teaching of environmental and sustainable development issues in extension training programmes consideration should be made for recognition of the changing roles of farmers and extension; modelling of environmental and sustainable agriculture explicitly in extension training; development of appropriate understanding and analytical skills in environmental and sustainable development in agriculture; tailoring technical and ecological training towards environmental and sustainable agricultural issues; equipping new entrants with pre-service extension training to equip them and make them more flexible for the career; adoption of open and

participatory approaches in extension curriculum development processes; review of environmental and sustainable development content regularly for relevance and formation of linkages with rural communities and organizations. Others are encouragement of the integration of training and extension functions; adoption of both participatory and holistic approaches to rural training; incorporation of competent practical training in the preparation of future extension workers and retraining of both training managers and trainers themselves. Radhakrishna and Veerabhadraiah (2002) argued that the rapid changes in agriculture call for the revitalization, re-orientation and re-examination of agricultural extension programmes. The authors stressed the need for agricultural extension programme to be modified to incorporate agricultural economics and sociology to meet the need of the market-driven economy through strategies such as development of courses in post-harvest technology (processing, grading, standardization, quality control and storage); organization of trainings and workshops to highlight the need and importance of in-service training; collaboration and networking with NGOs, agribusiness, mass communication, media education, local communities and farmer groups to assume greater roles in carrying out extension teaching functions and use of information and communication technology ICT to teach via distance. Others, according to the authors, are use of ICTs (internet) interactive multimedia, Geographic Information Service, (GIS), and desktop publishing to facilitate the creation of a sound knowledge base and information dissemination and community participation in the establishment and implementation of learning programmes particularly through the design and implementation of micro projects which allow for the integration of community ideas. Kroma (2003) recommends social learning process in which groups of farmers become active participant in the co-construction of knowledge through their engagement in critical reflection upon their own knowledge. The author explained that such an approach represents a shift from didactic, teacher-centred learning environment to a democratic, learner-centred participatory process of learning.

Conversely, Sulaiman, Anne and Van de Ban (2000) suggested the redesigning of agricultural extension courses around specific skilled areas of learning. Other scholars like Bawden (1996) and Lieblein, Francis and King (2000) argued for creative theme-based experiential projects that bridge and integrate various domains of knowledge across disciplines to inform systemic understanding of complex situations. Agricultural extension education outreach programme in Cross River State therefore needs reorganization to adequately include and teach ESD content areas to farmers in order to be more responsive to sustainable environmental management hence, the need to identify impeding challenges and enhancement strategies for improvement in the system.

The study specifically seeks to determine:

1. challenges in integrating ESD themes in agricultural extension programme in Cross River State
2. strategies for enhancing the integration of ESD themes in agricultural extension programme in Cross River State



Research questions

The following research questions were asked in this study

1. What are the challenges in integrating ESD themes in agricultural extension programme in Cross River State?
2. What strategies could be put in place to enhance the integration of ESD themes in agricultural extension programme in Cross River State?

Research hypotheses

1. There is no significant difference between the mean ratings of farmers and graduate extension personnel on challenges in integrating ESD themes in agricultural extension programme in Cross River State
2. There is no significant difference between the mean ratings of farmers and graduate extension personnel on strategies that could be put in place to enhance the integration of ESD themes in agricultural extension programme in Cross River State

Methodology

The study adopted descriptive survey research design. The study was carried out in Cross River State. The population for the study was 3740 comprising 3,670 registered farmers obtained from the Extension Division of Cross River Agricultural Development Programme (CRADP) and 70 graduate extension personnel obtained from the Personnel Division of CRADP. A three stage multi-stage sampling technique was adopted to select the sample of registered farmers. Stage one involved the random selection of three extension blocks from each of the three agricultural zones, that is, southern, central and northern zones of the State making a total of nine blocks. Stage two involved the random selection of two extension cells from each of the selected blocks giving a total of eighteen extension cells. Stage three involved the purposive selection of 180 registered farmers who have continuously participated in ADP farmer field school training from the eighteen extension cells chosen. The entire sub-population of graduate extension personnel was used. The sample for the study was 250 respondents. The study adopted a triangulation technique involving mixed methods of data collection, that is, quantitative and qualitative methods. A 29-item structured questionnaire was the instrument for collection of quantitative data while focus group discussions were held with respondents for generation of qualitative data. The instrument for collection of quantitative data (questionnaire) had two sections; A and B. Section A solicited demographic data of the respondents while section B dealt with research variables in the study with the following scale; strongly agree, agree, disagree and strongly disagree. The highest level in the scale had 4 points and the least received 1 point. The instrument was face validated by three experts. One of the experts each was from Crop Science and Agricultural Extension Departments in the Faculty of Agriculture and Wildlife Resources and one from Agricultural Education unit of the Department of Vocational Education, University of Calabar. Cronbach alpha reliability was used to determine the internal consistence of the questionnaire and a coefficient of 0.80 was obtained. Two hundred and fifty (250) copies of the questionnaire were administered on the respondents with the help of four trained research assistants. Two hundred and fifty (250) copies of the of the questionnaire were retrieved and analyzed using mean, standard deviation and independent t-test from SPSS version 20 to answer

the research questions and test the null hypotheses at $p > .05$.

For the research questions, the real limits of numbers were used to interpret the mean values of items. Thus, any item with a mean score of 3.50 to 4.0 was regarded as strongly agree; while items with mean scores of 2.50 to 3.49 were regarded as agree. Similarly, any item with a mean score of 1.50 to 2.49 was regarded as disagree and items with means scores from 1 to 1.49 were regarded as disagree. The standard deviation was used to determine the closeness or otherwise of the opinions of the respondents from the mean and from one another. Any item with a standard deviation of 1.96 or below indicated that the respondents were close and therefore, the item was valid while any item with a standard deviation above 1.96 indicated that the respondents were not close to the mean and therefore, the item was not valid.

The qualitative data was collected through Focus Group Discussion (FGD) with students and lecturers. The FGD data was analyzed through the development of codes (themes), patterns and establishment of relationships based on the patterns.

Results

The results of this study were obtained from the research questions answered and hypotheses tested using data collected and analyzed.

Research question 1

What are the challenges in integrating ESD themes in agricultural extension programme in Cross River State?

Research hypothesis 1

There is no significant difference between the mean ratings of farmers and graduate extension personnel on challenges in integrating ESD themes in agricultural extension programme in Cross River State



The data for answering research question 1 and testing of hypothesis 1 are presented in Table 1.

TABLE 1

Mean ratings and t-test analysis of the responses of registered farmers and graduate extension personnel on challenges in integrating ESD themes in agricultural extension programme in Cross River State N=250

1	2	3	4	5	6	7	8		
S/N	Challenges in integrating ESD themes in agricultural extension programme	\bar{X}	SD	R	Registered farmers \bar{X}_1	Extension personnel \bar{X}_2	SD ₁	SD ₂	p-value
1	Poor linkage between agricultural education, extension and research	2.94	0.72	A	3.06	2.96	0.77	0.62	0.19**
2	Engagement of ill-qualified personnel in agricultural extension delivery process	3.06	0.68	A	3.12	3.01	0.62	0.67	0.40**
3	Continued urban-bias in government policies with neglect for rural community	3.43	0.79	A	3.51	3.26	0.58	0.73	0.28**
4	Shortage of personnel in agricultural extension delivery programme	3.12	0.80	A	3.23	3.10	0.90	0.82	0.48**
5	Lack of requisite practical training on environmental and sustainable management of resources by extension personnel	2.88	0.82	A	2.92	2.73	0.78	0.81	0.35**
6	Low involvement of women in agricultural extension training thus allowing extension services in the hands of men	3.01	0.75	A	3.20	2.96	0.82	0.76	0.31**
7	Low morale and motivation for agricultural extension leading to external brain drain	3.17	0.61	A	3.35	3.12	0.67	0.58	0.37**
8	Poor budgetary/financial provision for agricultural extension education services	3.26	0.60	A	3.32	3.21	0.52	0.61	0.48**
9	Supply-driven curricula based of agricultural extension education programme with inputs only from experts.	3.30	0.56	A	3.42	3.21	0.60	0.58	0.11**
10	Predominance of theoretical training as against practical training ESD themes on the part of extension programme	3.11	0.70	A	3.16	3.09	0.72	0.62	0.52**

Key: N1=180; N2=70; 1 = Mean of group one, 2 = Mean of group two, SD1 = Standard Deviation of group one, SD2 = Standard Deviation of group two; p α .05, df = 248; ** = Not significant; SA =Strongly agree; A=Agree.

Table 1 column 3 and 4, presents the mean ratings and standard deviations of respondents on challenges in integrating ESD themes in agricultural extension programme in Cross River State. The data in column 3 indicated that the ten (10) challenges had mean values that ranged from 2.88 to 3.43. This implies that respondents agreed that the ten isolated items are challenges in the study area. The standard deviations of the ten (10) challenges in integrating ESD themes into agricultural extension programme (column 4) ranged from 0.56 to 0.82 and were less than 1.96 (95% confidence limit). This indicated that the respondents were not far from the mean and from one another in their responses thus, adding value to the reliability of the mean

Interaction between the researcher with farmers and graduate agricultural extension personnel of the CRADP through focused group discussion showed that agricultural extension services are not

properly funded, while few staff are involved in extension outreach programme. Both farmers and extension personnel complained of low involvement of women in agricultural extension programme even though they are more in number engaged in farming.

The result of the test of hypothesis column 6-8 indicated that the ten (10) challenges in integrating ESD themes in agricultural extension programme had p-values that ranged from 0.11 to 0.52. The values were greater than 0.05 indicating that there was no significant difference in the responses of the two groups of respondents (farmers and extension personnel) on the ten (10) challenges in integrating ESD themes in agricultural extension programme in Cross River State.

Research question 2

What strategies could be put in place to enhance the integration of ESD themes in agricultural extension programme in Cross River State?

Research hypothesis 2

There is no significant difference between the mean ratings of farmers and extension personnel on strategies could be put in place to enhance the integration of ESD themes in agricultural extension programme in Cross River State

TABLE 2

1	2	3	4	5	6	7	8		
S/N	Strategies for Enhancing the in Integration of ESD Themes in ADP Extension System	\bar{X}	SD	R M	Registered farmers \bar{X}_1	SD ₁	Extension personnel \bar{X}_2	SD ₂	p-value
1	Adoption of a variety of methods to facilitate the teaching of contents on environmental and sustainable development in agriculture.	2.83	0.37	A	2.85	0.35	2.77	0.42	0.14**
2	Organization of regular workshops on environmental and sustainable management of resources in agricultural production	3.51	0.78	SA	3.60	0.76	3.37	0.83	0.92**
3	Provision of adequate facilities for the teaching and demonstration of environmental and sustainable issues in agriculture	2.91	0.43	A	2.92	0.42	2.90	0.48	0.79**
4	Organization of agricultural shows and exhibition to encourage competition among farmers	2.88	0.39	A	2.90	0.37	2.84	0.43	0.29**
5	Motivation of extension personnel to reside in rural communities and monitor the adoption of sustainable practices in agricultural production	3.56	0.74	SA	3.61	0.73	3.46	0.77	0.14**
6	Equipping new entrants with pre-service extension training to prepare them for a flexible career on environmental and sustainable agricultural development	2.91	0.36	A	2.92	0.35	2.89	0.40	0.49**
7	Adoption of open and participatory approaches between farmers and extension personal in environmental and sustainable development curriculum process	3.60	0.68	SA	3.65	0.66	3.50	0.73	0.11**



8	Collaboration between rural communities and other agricultural organizations to promote environmental and sustainable development in agricultural production	2.96	0.45	A	2.96	0.44	2.97	0.50	0.87**
9	Adoption of participatory and holistic approach to rural training on environmental and sustainable development in agricultural production	2.97	0.44	A	2.95	0.42	2.96	0.51	0.94**
10	Capacity building of training managers and trainers on environmental and sustainable agricultural development	3.66	0.67	SA	3.69	0.64	3.57	0.73	0.22**
11	Collaboration with NGOs, agribusiness and mass communication outfits to facilitate information dissemination on sustainable agriculture	2.96	0.46	A	2.96	0.44	2.97	0.51	0.87**
12	Use of ICTs to teach environmental and sustainable development issues.	2.96	0.45	A	2.97	0.42	2.98	0.50	0.93**
13	Involving the community in the establishment, implementation and development of micro-projects to facilitate the teaching of sustainable developments in agriculture	2.97	0.44	A	2.97	0.42	2.97	0.51	0.99**
14	Collaboration with NGOs and private companies to supplement government's efforts in the provision of facilities	2.90	0.45	A	2.90	0.43	2.91	0.50	0.89**
15	Provision of processing facilities to encourage farmers to apply the knowledge and skills acquired through training on environmental and sustainable agricultural development.	2.88	0.39	A	2.88	0.37	2.89	0.47	0.97**
16	Provision of rewards to farmers who have fully adopted sustainable cultures in their agricultural production	2.91	0.43	A	2.73	0.40	2.90	0.50	0.97**
17	Provision of adequate storage facilities to encourage farmers to apply the knowledge, skills acquired through training on environmental and sustainable agricultural development.	2.85	0.42	A	2.85	0.39	2.86	0.49	0.98**
18	Regular farm visitation by agricultural extension agents to monitor and evaluate the adoption of sustainable practices in agricultural production by farmers	2.98	0.48	A	2.90	0.41	2.91	0.50	0.96**
19	Organization of market for the sale of agricultural produce to enable farmer obtain the benefits of their farm business and sustain their interest.	2.91	0.43	A	2.92	0.41	2.93	0.50	0.95**
Grand mean		3.06	0.48		3.05	0.46	3.02	0.54	0.71**

Key: $N_1=180$; $N_2=70$. \bar{X}_1 = Mean of group one, \bar{X}_2 = Mean of group two, SD_1 = Standard Deviation of group one, SD_2 = Standard Deviation of Group two; $p \alpha .05$, $df = 248$; ** = Not significant; SA =Strongly Agree; A=Agree.

Table 2 columns 3 and 4 presented the mean rating of respondents on strategies that could enhance the integration of ESD themes in ADP extension system. The data revealed that 4 out of 19 ESD strategies received mean value ranged from 3.51 to 3.66. This implies that respondents strongly agreed that the four items are strategies that could enhance the integration of ESD themes in ADP

extension system. The data also showed that 15 out of 19 strategies had mean values ranged from 2.83 to 2.98. The implication of this result is that respondents agreed that the strategies could enhance the integration of ESD themes in the extension programmes of the State. The standard deviations of the 19 strategies that could enhance the integration of ESD themes in agricultural extension programme (column 4) ranged from 0.37 to 0.78 and were less than 1.96 (95% confidence limit). This indicated that the respondents were not far from the mean and from one another in their responses thus, adding value to the reliability of the mean.

The information gathered through FGDs by the researcher with farmers and extension personnel revealed the need for measures such as training and recruitment of more extension staff; posting of extension agents to local communities where farmers reside; provision of teaching facilities to include internet services; provision of enhanced salary packages and allowances; professionalization of agricultural extension programme; timely release of loans to farmers to correspond with the period of need and subsidization of farm inputs. Other measures according to the participants included post-harvest handling of agricultural produce; provision of medical facilities for livestock and tractor hiring facilities/services. The qualitative data sought through FGDs with farmers and extension personnel in ADP extension system complimented the quantitative data and added value to providing answers to the research question.

Discussion of results

The finding on the challenges that could impede the inclusion and teaching of ESD themes as contents in agricultural extension programme showed that poor linkage between agricultural education, extension and research, engagement of ill-qualified personnel in agricultural extension delivery process, continued urban-bias in government policies with neglect for rural community, Shortage of personnel in agricultural extension delivery programme, lack of requisite practical training on environmental and sustainable management of resources by extension personnel, low involvement of women in agricultural extension training thus allowing extension services in the hands of men, low morale and motivation for agricultural motivation for agricultural extension leading to external brain drain, poor budgetary/financial provision for agricultural extension education services, supply-driven curricula based of agricultural extension education programme with inputs only from experts and predominance of theoretical training as against practical training ESD themes on the part of extension programme. The finding agrees with Van Crowder, Lindley, Bruening and Doron (1998) and Zinnah, Steele and Mattocks (1998) Chittoor and Mishra (n.d) who attributed the ineffectiveness in the organization of extension services to challenges such as poor training of extension staff and non-alignment of agricultural extension curricula and teaching programmes to the production needs and employment demands of the agricultural sector. Other challenges according to the authors are increased unemployment and displacement, budgetary and financial crisis, increase in the numbers of urban-based students who lack rural experience, rapid scientific progress and technical change, heightened environmental awareness, lack of attention to gender issues, population issues, ill-equipped professionals, low morals and motivation as constraints to proper organisation and implementation of agricultural extension services, disconnection between agricultural education, research and extension and low status of extension education in the disciplines.



The finding on the strategies that could enhance the inclusion and delivery of ESD themes as content areas in agricultural extension programme revealed that adoption of a variety of methods to facilitate the teaching of contents on environmental and sustainable development in agriculture; organization of regular workshops on environmental and sustainable management of resources in agricultural production; provision of adequate facilities for the teaching and demonstration of environmental and sustainable issues in agriculture; organization of agricultural shows and exhibition to encourage competition among farmers; motivation of extension personnel to reside in rural communities and monitor the adoption of sustainable practices in agricultural production; equipping new entrants with pre-service extension training to prepare them for a flexible career on environmental and sustainable agricultural development; adoption of open and participatory approaches between farmers and extension personal in environmental and sustainable development curriculum process; collaboration between rural communities and other agricultural organizations to promote environmental and sustainable development in agricultural production are strategies that could enhance the inclusion and delivery of ESD themes as content areas in agricultural extension programme. Others are adoption of participatory and holistic approach to rural training on environmental and sustainable development in agricultural production; capacity building of training managers and trainers on environmental and sustainable agricultural development; collaboration with NGOs, agribusiness and mass communication outfits to facilitate information dissemination on sustainable agriculture; use of ICTs to teach environmental and sustainable development issues; Involving the community in the establishment, implementation and development of micro-projects to facilitate the teaching of sustainable developments in agriculture; collaboration with NGOs and private companies to supplement government's efforts in the provision of facilities; provision of processing facilities to encourage farmers to apply the knowledge and skills acquired through training on environmental and sustainable agricultural development; provision of rewards to farmers who have fully adopted sustainable cultures in their agricultural production; provision of adequate storage facilities to encourage farmers to apply the knowledge, skills acquired through training on environmental and sustainable agricultural development; regular farm visitation by agricultural extension agents to monitor and evaluate the adoption of sustainable practices in agricultural production by farmers and organization of market for the sale of agricultural produce to enable farmer obtain the benefits of their farm business and sustain their interest. The findings agree with Wallace (1999), Radhakrishna and Veerabhadraiah (2002), Qamar (2005) who argued for the revitalization agricultural extension programme to meet emergent needs of environmental sustainability through the consideration of strategies such as assessment of the existing extension organizations against farmers' needs and determine whether to strengthen or restore it; decentralization of extension services after capacity building of staff and orientation of elected leaders; expansion of the technical mandate of extension to aim at broader development of human resources; formulation of national policies on extension in order to ensure political and financial commitment; incorporation of pre-service education in agricultural extension in line with modernization of extension system at the national level; promotion of pluralism in extension by involving public, private and civil society institutions and development and application of information technology to facilitate the work of extension workers. Others according to the authors are development of original, location specific, participatory, gender sensitive and inexpensive

methodologies and materials instead of applying those methodologies which are promoted as universally suitable; orientation of extension staff to major food security related global developments that could eventually affect rural livelihoods; encouragement of the extension service to empower farmers through organizing them into legal associations to constitute a strong lobby for themselves and extension; encouragement of bottom up, grassroots extension programme planning by farmers in order to make extension demand-driven and also exercise supply-driven, top-down modality for promoting common public good practices such as conservation of natural resources and environmental protection and provision of effective operational linkages between extension and research and other key relevant institutions.

Conclusion and Recommendations

Environmental degradation related problems have persisted in Nigeria generally and Cross River State in particular and may be aggravated if conscious efforts are not made to guide the use of land resources by farmers. It therefore becomes very imperative to reposition agricultural extension outreach programmes charged with the responsibility of imparting to knowledge, skills that would imbue positive attitudes to farmers on environmental management and sustainable agricultural development. The Federal and State ministries of agriculture in recognition of the contributions of the extension outreach services to sustainable resource management and national development recommended the integration of ESD contents into agricultural extension programme. In spite of this development, environmental degradation is still on the increase with implication for a decline in agricultural production. This development may not be unconnected with how agricultural extension programmes are organized and implemented in Nigeria generally and Cross River State in particular. The determination of challenges that impede the integration of ESD themes and enhancement in agricultural extension outreach programme in Cross River State in particular and Nigeria in general were handled in this study. It is hoped that if these challenges identified and strategies are put to use, land users (farmers) would be environmentally conscious hence, reduction in human influenced environmental degradation. It was recommended that the ESD integration challenges identified should be squarely addressed while the ESD integration enhancement strategies are implemented by the government through the Ministry of Agriculture and agricultural extension personnel to enhance the delivery and acquisition of knowledge, skills and attitudes consistent with sustainable land resource use and management by farmers.



References

- Alawa, D. A. (2015). Appraisal of the integration of environmental and sustainable development themes into agricultural education and extension programmes in Cross River State. PhD thesis submitted to the Department of Vocational Teacher Education, University of Nigeria, Nsukka.
- Bawden, R. (1996). A learning approach to sustainable agriculture and rural development: Reflections from Hawkshury. <http://www.fao.org/sd/EXdirect/EXan0010.htm>
- Chittoor, J. S. & Mishra, S.K. (n.d). Agricultural education for sustainable rural development in developing countries: Challenges and policy options. *Journal of Education and Learning*, 6(2), 119-132
- Food & Agricultural Organization (1994). *Integrating environment and sustainable development themes into agricultural education and extension programmes*. Rome: Food & Agricultural Organization.
- Hazell, P & Lutz, E. (1998). Integrating environmental and sustainability concerns into rural Development policies. In: E. Lutz (Ed). *Agriculture and environment: Perspective on sustainable rural development*. Washington, DC: World Bank.
- Kroma, M.M (2003). Reshaping extension curricular for 21st century agricultural development in Sub-Saharan Africa. Proceedings of the 19th Annual Conference of AIAEE, Raleigh, North Carolina, USA.
- Lieblein, G., Francis, C. & King, J. (2000). Conceptual framework for structuring future agricultural colleges and universities in industrial countries. *Journal of Agricultural Education and Extension*, 6(4), 213-222.
- Osinem, E.C. (2008). *Managing agricultural education and training: Resources, principles and methods*. Enugu: Belony International Publishers.
- Qamar, K. M. (2005). *Modernizing national agricultural education and extension systems: A practical guide for policy makers of developing countries*, Rome: FAO
- Radhakrishna, R.B & Veerabhadraiah, V. (2002). Revitalizing agricultural extension curricula in the 21st century: Implication for Indian agricultural universities. *Proceedings of the 18th Annual Conference, Durban, South Africa*.
- Smith, B & Smithers, J. (1993). Sustainable agriculture: Interpretations, analysis and prospects. *Canadian Journal of Regional Science*; 3, 449-524
- Sulaiman, R. & Anne, W. & Van den Ban, (2000). Orienting agricultural extension curricula in India. *Journal of Agricultural Education and Extension*, 7(2), 69-78
- Van Crowder, I., Lindley, W., Bruening, H. & Doron, N. (1998). Agricultural Education for sustainable rural development: Challenges for developing countries in the 21st century. *Journal of Agricultural Education and Extension*, 5(2), 71-84.
- Wallace, I. R. (1999). Training for extension in environmental and sustainable agriculture: Lessons from a study in South-East Asia. *Journal of International Agricultural Extension Education*; 9(1), 5-11.
- Williams, B. A. (1995). *Rural development in Nigeria*. Ife: University Press
- Zinnah, M., Steele, R., & Mattocks, D. (1998). From margin to mainstream: Revitalization of agricultural extension curricula in universities and colleges in Sub-Saharan Africa. Rome: FAO