

Full Length Research Paper

Paradigm shift in the agro-technology transfer system: Case study of Agricultural Development Programme in Enugu State, Nigeria (2001 to 2009)

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The study examined response of agricultural development programme (ADP) to changes in the operational environment. Forty eight purposively and 12 randomly selected extension workers were used. Data were collected by use of questionnaire and analysed using means, percentage, and one - way analysis of variance. There is no significant different in level of involvement and coverage of ADP organization in about 95% areas of service delivery to farmers over the years (2001 to 2009). Only respondents' perception of involvement in arable/cash crops (M=2.8, 2.5, 2.6) showed a significant different ($p \leq 0.5$), but in a declining pattern. ADP had strong linkages with national agriculture research institutes (M=3.2, 3.2, 3.1) agro-processing firms (M=3.5, 3.9, 4.3), and NGOs (M= 3.4, 3.3, 3.2) between 2001 and 2009. However, linkages with other institutions were relatively weak. Analysis of variance shows significant difference ($p \leq 0.05$) in respondents' perceived extent of involvement in training in ICTs, biotechnology, group dynamics and communication/human relation. Training efforts on building capacity in specific subject areas in these areas were at a very low ebb. Overall, ADP extension organisation has not substantially responded to the emerging service and training needs of the farmers and extension workers. Linkage attitude of the organization has improved but is limited to only few areas. The study therefore recommends that government should increase extension support, initiate linkage framework and policy to enhance the organization capability to make internal and external adjustment whether for service delivery, linkage, or training in response to changes in the environment.

Key Words: Agricultural technology transfer, agricultural development programme, linkages, extension service.

INTRODUCTION

Changes in the working environment within which an organization functions force the organization to make necessary adjustments if it wants to continue functioning effectively and efficiently (Qamar, 2001). Without such adjustments, the organization will either collapse or keep working inefficiently, moving gradually towards obsolescence. These changes often termed as "forces of change", vary in nature and scope. They could happen regionally, nationally or globally. The impact of these forces may be immediate, medium termed or long term, and they may be directly or indirectly, in short or long run. In response the organization may make adjustments

internally, externally or both. Agricultural extension organizations are no exception to this rule. Extension organizations are directly or indirectly affected by change and in response make internal or external adjustment in order to keep functioning at some level of efficiency.

Agricultural technology delivery approach in Nigeria has been evolving in response to variations in the environment and client system. However, given the dynamics of the society, changes are inevitable, evolving in their turns with the attendant challenges and pressure on organizations. Over the years, public extension organizations have remained the dominant actors in agro technology transfer systems in Nigeria. Extension service has been in the portfolio of public agencies such as Ministry of Agriculture, national/international research institutes, ADP and others. According to Rivera and Alex

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(2003), such arrangement which is characterized by government monopoly is not the favorite option for developing countries especially in community development when competent non-public institutions are present. Moreover, the increasing criticisms of the public extension organisation for ineffectiveness, inefficiency, poor coverage and low cost effectiveness leave doubt as to the appropriateness and sustainability of the approach. Such situation explains why the intense/ advocacy of planners and policy makers for privatization of extension services in most developing countries including Nigeria.

Recently, however, extension system has experienced the establishment of new entrants; variety of private, non-governmental organizations, voluntary/community organizations, farmer associations, etc involved in delivering services to farmers. Apparently, the modality of using more than one organization, whether public or non-public for extension delivery to farm communities is on board and increasingly gaining popularity. The overall rationale is the pooling of all available resources in order to alleviate pressure from low budgets and staffs in the public extension system, as well as to let the farmers benefit from a variety of sources. This leaves behind the challenges of effective collaboration and linkages among agencies.

Moreover, extension education and technology delivery have encountered various problems. Although several extension methods have been tried, however the search for more effective and efficient mechanisms remains the target of extension. The intensification of promotion and use of information technology in all facets of life and discipline have been expected to reduce the problems. FAO/World Bank (2000) reported that the recent thrust of information technology revolution has virtually shrunk the world and has affected almost every walk of life. Information technology is indeed a tremendous power that could be harnessed by organizations including extension agencies for the benefit of humanity and clientele. They can exploit the potential to facilitate timely access and enhanced coverage of the rural population. This will help extension organizations particularly in developing countries to combat the two major problems of distance and poor transportation facilities. Such interactive information mechanisms hold the potential for regular, timely and cost effective delivery of extension services. However the challenge for capacity building is implied.

In the last decade, global debate has been on the issue of producing and consuming genetically modified food. On one side, one has to use all possible means to feed ever increasing population and on the other side, one has to retain biodiversity and be alert about potential health risks to humans and livestock from consuming genetically modified diet (FAO, 2003). However, genetic modification can be used to develop biotech crops that will produce higher and more stable yields, which could give the people more food to eat and sell (FAO, 2004).

Nevertheless, to apply the technology properly capability building especially training programmes for both extension workers and farmers are really required. Also the increased concern for food security and improved livelihood at the national, state and household levels are associated with remarkable degree of diversification of the rural economy. Source of income for rural livelihood has significantly increased. Farmers utilized both farm and non-farm strategies as sources of their income. These practices according to Carl and Edward (2009) enable farmers and ranchers to respond to new opportunities and to adapt their farm to emerging agricultural contexts. In addition it takes place in order to overcome risk and seasonality in natural resource based livelihood (Ellis, 2004) and to produce one or two exportable commodities (Delgado, 1997). This remains a huge challenge for extension workers to improve their professional performance and provide training programmes for the farmers.

Recently the USAIDS/WHO AIDS epidemic update (December, 2004), reported that 37.2 million adults and 2.2 million children over all the world were living with human immunodeficiency virus (HIV). At the end of 2004, 3.1 million people died of AIDS. The overwhelming majority of people with HIV (Some 95% of world total) live in the developing countries. (Qamar, 2003). Rivera (2000) reported that Sub-Saharan Africa is the area most affected by AIDS. There are indisputable negative effects on the work force resulting in the loss of trained, skilled and experienced workers in all disciplines including agricultural extension service. Farm labor is rapidly diminishing. The questions are: To what extent has extension system been involved in addressing the HIV/AIDS epidemic among staff and client system. What capacity exists among extension workers to provide services in the area?

Lastly is the issue of climate change which has become a global concern. Climate change is majorly caused by green house gases and global warming. Global warming as been observed in the 20th century had all occurred since 1980 (Manyatsi, 2007). A report from IPCC (2007) shows that though Africa accounts for less than 4% of the world's green house gases emission, the regions diverse climates and ecological systems have already been altered by global warming and will soon undergo further damage. The effect of climate change on agriculture cannot be over emphasized as it leads to increase in pest and disease on crops and livestock, low growth and yield of crops. In response, extension system is supposed to build farmer/extension workers' knowledge and capability to address the phenomenon. What additional trainings are provided by extension system to build extension workers' capability to provide services in this regard?

Agricultural development programme (ADP) is the major public agency of the Ministry of Agriculture mandated to provide extension service in the country. It was introduced in 1970 to correct the weakness of the

earlier extension approaches as well as replace the ineffective extension services of the erstwhile Ministry of Agriculture. ADPs extension system was therefore a reform of the ministry based extension system. On inception the programme started with pilot schemes in Funtua, Gusua and Gombe, but is currently being implemented as a statewide programme covering the 36 states of the Federation and the federal capital territory Abuja. Thus, it continues to be the most important source of information for the majority of farmers. Activities of other extension agencies, be it non-governmental organisations (NGOs), input agencies, mass media, research institutions or farmers associations, though increasing, are still restricted to certain regions, crops and enterprises. Given the above scenarios, it is therefore apt to examine the response of the programme to the dynamics of the environment and client system.

Objective

The study sought to examine the changes that have taken place in Enugu State ADP extension system over the years (2001 to 2009). Specifically it was designed to; examine changes in the level of involvement in service delivery over years; examine linkages with relevant institutions; and examine trainings provided for extension workers across the years.

METHODOLOGY

Extension workers of Enugu State Agricultural Development Programme (ADP) constituted the population for the study. Agricultural development programme employs the state agricultural delineation into three zones namely; Enugu East, Enugu West, and Enugu North agricultural zones. Enugu North and Enugu East agricultural zones were randomly selected for the study. Extension staff at the zones includes one zonal manager, one zonal extension officer; eight block extension supervisors, eight subject matter specialists and 10 to 40 extension agents, depending on the number of functional cells in the zones. In each zone, the zonal manager (1), zonal extension officer (1), block extension supervisors (8), block extension supervisors (8) were used, while 5 subject matter specialists, 7 extension agents were randomly selected, giving a total of 30 respondents for each zone. A total sample size of 60 respondents was used for the study. The lesser proportion of subject matter specialists and extension agents selected was because of their limited roles in the administrative and management functions of the organization. Questionnaire was used for data collection. The instrument (questionnaire) for data collection was divided into sections based on the objectives. To deduce information on the change in level of involvement in extension service by the organization, respondents were asked to indicate the extent of involvement in priority areas of extension service on five point Likert type scale of "very great extent (5), great extent (4), little extent (3), very little extent (1) and no extent (1) across the years under review (2001 to 2003, 2004 to 2006, 2007 to 2009). The mean perception of the respondents were calculated and priority areas with services with mean scores ≥ 3 were considered area of high involvement in service delivery; while < 3 was regarded less involved area of service delivery. Also the respondents provided information on the intensity of linkages

with relevant agencies using a five point Likert type scale of "very strong (5), strong (4), slightly strong (3), weak (2), non-existent (1). The mean perception of the respondents on the intensity of linkages was taken. Linkage with institutions with mean scores ≥ 3 was regarded strong, while < 3 = weak linkages and < 1.5 means non-existent. Furthermore, the study examined the organization's response to training in terms of extent of involvement in providing training in selected areas and specific areas training were conducted over the years. The respondents indicated level of involvement in major areas of training using five point Likert type scale of "very great extent (5), great extent (4), little extent (3), very little extent (2), no extent (1). Areas of training with mean scores ≥ 3 was considered major area of training and < 3 , minor area of training. Respondents also indicated against list of specific areas of training, the trainings received in the organization within the years under review.

Data were analysed using mean scores, percentage and one way analysis of variance. Generally, the decision rule on the mean perception of the respondents was computed thus: $5+4+3+2+1=15/5=3$ and applied accordingly. One-way analysis of variance was used to ascertain difference in respondents' perception at $p \leq 0.05$ level of significance.

RESULTS AND DISCUSSION

Level of involvement in priority areas of extension service between 2001 and 2009

Agricultural development programme provided services to farmers in several areas of the agricultural fields. Respondents indicated that between 2001 and 2009, the organization was highly involved in providing services in livestock production (small and large ruminants) ($M=3.7, 3.8,$ and 3.6), processing and storage of agricultural products ($M=3.6, 3.5$ and 3.8) and input procurement and distribution ($M=3.4, 3.6$ and 3.5) (Table 1). Largely, the findings agreed with Ozor and Madukwe (2005) who identified fishery extension, processing and storage and input distribution as priority areas of coverage by Enugu State ADP. The respondents also perceived that ADP extension organization was less involved in several other areas of services within 2001 to 2003, 2004 to 2006 and 2007 to 2009. These areas include marketing and distribution of agricultural products, credit procurement and utilization, snail farming, rabbitry extension, grass cutter production, credit procurement and utilization, natural resource management, climate adaptation/mitigation information and others.

Remarkably, there was no significant difference in respondents' perception of the level of involvement of the agency in service delivery over the years. Only involvement in arable/cash crop/nursery management extension showed a significant difference ($n < 0.05$) based on respondents' perception; though, an inconsistent perception in 2001 to 2003 (2.8), 2004 to 2006 (2.5) and 2007 to 2009 (2.6). Contrary to expectation, the finding suggests a decreasing effort in delivering services in arable/cash crop extension, perhaps an indication of inadequate supply of appropriate technology and logistic supports for extension. Ideally, arable/cash crop/nursery management

Table 1. Mean score on level of involvement in extension service delivery to farmers.

Area of training/service delivery	2001 to 2003	2004 to 2006	2007 to 2009	
	M	M	M	Sig
Training on genetic conservation/improvement	2.8	2.7	2.8	0.07
Marketing and distribution	2.7	2.8	2.6	0.06
Farm management and record keeping	3.5	3.4	3.6	0.06
Agro-forestry	2.3	2.3	2.5	0.06
Credit procurement/utilization	2.7	2.6	2.8	0.06
Livestock production	3.7	3.8	3.6	0.06
Fisheries	3.4	3.6	3.7	0.06
Processing and storage of agric-products	3.6	3.5	3.8	0.06
Bee-keeping	2.4	2.3	2.5	0.06
Snail farming	2.6	2.7	2.7	0.07
Poultry production	2.3	2.4	2.6	0.06
Rabbitry extension	2.8	2.8	2.7	0.06
Arable/cash crops/Nursery management	2.8	2.5	2.6	0.05
Grass-cutter production	2.7	2.7	2.8	0.07
Mushroom farming	2.2	2.3	2.5	0.07
Input distribution	3.4	3.6	3.5	0.06
Natural resource management	2.6	2.8	2.7	0.06
Climatic information/mitigation measures	2.5	2.8	2.5	0.06

Mean \geq 3 high involvement, $p\leq$ 0.05 level of significance.

extension should receive maximum extension efforts given its pivot role in national food security and poverty reduction; particularly among vulnerable rural communities.

Overall, the results show that 95% of the extension services of Enugu state ADP in the prioritized areas were stagnant over the years. The whole situation shows a level of inefficiency, low performance and an evidence of insensitivity of the system to the increasing diversification of the rural economy. This explains the intense criticism for inefficiency, ineffectiveness, low-cost effective currently leveled on the public extension system by policy makers and development planners, and consequently the wide advocacy for private sector involvement in extension delivery. Reasons for this have been variously reported. According to Agwu and Chukwuone (2005) the system has suffered serious setbacks due to poor funding and funding instability following the expiration of the World Banks component of the funding arrangement. More so, contribution from state and federal governments always fall grossly short of budget, hence hindering proper implementation of extension programme (Zaria, 1984). Furthermore, apart from few extension agents responsible for a very large number of farmers (Njoku, 2000; PCU, 2000), the system is bedeviled by several other problems ranging from inadequate and poorly trained staff, ineffective agricultural research – extension linkages, inappropriate agricultural technology and low participation of farmers in programme development (Agbamu, 2005).

Linkages with relevant agencies (2001 to 2009)

Table 2 shows that ADP extension organization had strong linkages with national agriculture research institutes (M = 3.2, 3.2, 3.1) agro-processing firms (M= 3.5, 3.9, 4.3), and NGOs (M= 3.4, 3.3, 3.2) between 2001 and 2009. Linkages with university and colleges of agriculture (M= 3.2) were perceived strong only in 2004 to 2006. The respondents indicated that the organization had weak linkages with agricultural cooperatives, media organizations, input/par-veterinary, agricultural equipment/machinery firms, finance institutions and others across the years (2001 to 2009). The result corroborated with Dimelu and Anyanwu (2008) who reported that ADP and NGOs had strong linkages with research institutes but linkages with other service providers were either weak or non existence. However, further analysis shows significant difference ($p\leq$ 0.05) in respondents' perception of the strength of linkages with research institutes, university of agriculture, input/paraveterinary, agricultural machinery firms, agro-processing firms, and financial/credit institutions. The perception of the respondents indicates an improvement in the strength of linkages with national research institute, input/paraveterinary, agro-processing firms, agricultural machinery firms and financing institutions, and a decrease in strength of linkages with university/colleges of agriculture. Largely the result revealed a positive change in altitude of ADP extension system to linkages and interaction with relevant agencies,

Table 2. Mean score on linkages with relevant agencies.

	2001 to 2003	2004 to 2006	2007 to 2009	
	M	M	M	Sig
National research institute	3.2	3.2	3.1	0.07
Agricultural cooperative	2.7	2.5	2.4	0.06
University/College of Agriculture	2.3	3.2	2.8	0.04
Media organization	2.4	2.4	2.3	0.06
Input /para-veterinary enterprise	1.5	1.8	2.0	0.02
Agric Machineries firms	1.7	1.9	2	0.05
Agro-processing firms	3.5	3.9	4.3	0.04
NGOs	3.4	3.3	3.2	0.08
Standard setting regulatory body	2.5	2.1	2	0.06
Credit institution	2.1	2.4	2.8	0.05

Mean ≥ 3 =strong linkage, $p \leq 0.05$ level of significance

perhaps in response to increasing calls by administrators for effective linkages and collaboration targeted at optimal use of limited resources, personnel, funds and logistics to increase extension coverage (Koyenikan, 2008). Linkages among service providers facilitate exchange of information, skill, knowledge and resources which invariably determines innovative strides in the whole systems. Also agencies explore the benefit of synergy and complementarities for improved performance of individual organization.

Specific areas of Linkages

Majority (91.7, 91.7 and 83.3%) perceived that linkages were formed for staff training/capacity development in 2001 to 2003, 2004 to 2006, and 2007 to 2009 respectively (Table 3). In 2001 to 2003, a lesser proportion (41.7, 41.7, 41.7 and 33.3%) indicated the existence of linkages for extension outreach programme, joint research and development, exchange of personnel and exchange of information/experience, respectively. Between 2004 and 2006 a slight increase (41.7%, 50.0%) in proportion of the respondents revealed that linkages were formed for exchange of information/experience and personnel. Relatively, greater proportion (58.3, 58.3, 50.0 and 41.7%) indicated the existence of linkage for exchange of information/experience, exchange of personnel's, joint research and development and extension outreach programme in 2007 to 2009. The result revealed increasing interest in formation of linkages in crucial areas of research/ extension processes. However, the linkage efforts seem to be more concentrated on staff training and development and personnel exchange. This is possible because of the several joint training opportunities for stakeholders (research institutes, ADPs, University NGOs and private sectors) such as the monthly technology review meetings

(MTRM), on- farm adaptive research (OFAR), annual training workshops, and diagnostic survey etc accessed within research extension-farmer input-linkage system, (REFILS); a component of national agricultural, research projects (NARP) in the country. It affords stakeholders opportunity to formally and informally interact, exchange experience and link up for greater efficiency of individual organization and the entire research- education extension processes.

Involvement in training between 2001 and 2009

Table 4 shows that the major training conducted by Enugu State ADP in 2001 to 2006 was on building staff capacity for communication and human relation (M=3.0, 3.2). Also within the same period, training in information communication technology (ICTs) (M= 2.4 and 2.9), group dynamics (M=2.9, and 2.7), participatory farm led -extension (M= 2.8, 2.8), climate change (M= 2.2, 2.1), and HIV/AIDS (M= 2.0, 2.2) were perceived as minor areas of trainings. However within 2007 to 2009, the respondents indicated that the major staff trainings conducted were in communication/human relation (M= 3.9), ICTs (M= 3.1) and group dynamics (M= 3.0). This suggests increased interest in building staff capabilities in these areas. In other words trainings in these areas received greater attention in 2007 to 2009 compared to other years. Analysis of variance shows significant difference ($p \leq 0.05$) in respondents' perceived extent of involvement in training in ICTs, biotechnology, group dynamics and communication/human relation. Apparently, it shows a re-orientation of extension toward participatory and cost effective approach. Although issues such as climatic change, HIV/AIDS have become a global concern, training efforts in these areas are still poor. This might result to poor capability of extension workers to provide information and services in these areas. The nation's

Table 3. Percentage distribution of respondents based on specific area of linkages with agencies.

Area of linkage*	2001 to 2003 (%)	2004 to 2006 (%)	2007 to 2009 (%)
Exchange of information /experience	20(33.3)	25(41.7)	35(58.3)
Staff training /capacity development	55(91.7)	55(91.7)	50(83.3)
Extension & outreach programme	25(41.7)	20(31.3)	25(41.7)
Joint research and development	25(41.7)	20(31.3)	30(50.0)
Joint funding/project proposal	10(16.7)	15(25.0)	15(25.0)
Exchange of personnels (for example SMS)	25(41.7)	30(50.0)	35(58.3)
Joint publications	15(25.0)	15(25.0)	15(25.0)
Joint radio programmes	5(8.3)	5(8.3)	5(8.3)
Exchange of infrastructure	15(25)	15(25.0)	5(8.3)
Farmer/ Community Mobilization	10(16.7)	10(16.7)	5(8.3)

Involvement in training between 2001 and 2009.

Table 4. Mean score on level of involvement in training for extension workers.

Emerging areas of training	2001 to 2003	2004 to 2006	2007 to 2009	
	M	M	M	Sig
Information and communication technology	2.4	2.9	3.1	0.04
Climate change phenomenon	2.2	2.1	2.1	0.07
Biotechnology	1.9	2.4	2.9	0.03
HIV/AIDS	2.0	2.2	2.0	0.08
Participatory farm led extensive	2.8	2.8	2.7	0.08
Group dynamics	2.9	2.7	3.0	0.05
Human relation/communication skill	3.0	3.2	3.9	0.05

mean ≥ 3 = major training ,p ≤ 0.05 =significant

quest for food security and poverty reduction demand that extension organizations should step up staff trainings to build farmer's adaptive/mitigation capacity to climate change phenomenon between 2001 and 2009.

Information communication technology

Specific areas of training for extension workers

Table 5 shows that in 2001 to 2003 a greater proportion (40%) of respondents had training in the use of GSM phone/ multimedia facilities; while only 20.0, 16.7 and 16.7% received training on use of internet, information file management, and data documentation and analysis, respectively. Similarly, between 2004 and 2006 about 43 were trained on the use of GSM phone/ multimedia, internet (20.0%) information file management (20.0%) and data documentation and analysis (16.7%). On the contrary, within 2007 to 2009, majority (53.3%) of the respondents received training on GSM phone/multimedia, while about 28, 20 and 13% had training experience in information file management, use

of internet, data documentation and analysis, respectively. There is a progressive change in proportion of respondents trained over the years. Relatively greater proportion received training for the use of GSM phone/multimedia facilities and information file management. This confirms FAO (2000) which reported that use of GSM/cellular phones is a routine practice and the equipment was reported to be used for rural development project in Bangladesh and over 30% of extension staff in Estonia used internet. Notably, the percentage of respondents trained in other areas of ICTs facilities across the years is relatively low. The development in ICTs has shrunk the world and has affected almost every walk of life FAO/World Bank (2000). It is a tremendous power that could be harnessed by organizations for the benefit of humanity. It holds potentials to reduce the problems of physical distance and poor transport facilities associated with face to face contact. Above all, the experiences of rural telecasters in the developing world show that ICTs can help in enabling rural development workers to gather, store, retrieve, adapt, localize and disseminate a broad range of information needed by rural families (Davison et al (2005)

Climate change

Table 5 shows that in 2001 to 2003, the respondents had training on causes and effects of climate change (20.0%), adaptation and mitigation (20.0%), climate change disaster risk management (16.7%) and others. Relatively, greater proportion (30.0, 25.0 and 16.7%) had training on climate related and Tran's boundary pest and disease, causes and effect of climate change and climate change and disaster risk management from 2004 to 2006, respectively. Between 2007 and 2009 there was slight change in proportion of respondents trained in causes and effect of climate change (35.0%), climate change and disaster risk management (20.0%) data collection and impact assessment on climate change (16.7%) and green house effect (16.7%). On the whole, the proportion of respondents exposed to climate change training is still at very low ebb. Across the years the slight shift in training efforts observed from 2007 to 2009 is grossly insufficient for the capability required to contribute toward addressing the information need of farmer on climate change phenomenon. Climate change is widely recognized as the most serious environmental threat facing our planet today. Food production system will be adversely affected resulting to food shortages and loss of sources of livelihood (www.nigeria.climatechange.org). The role of information in addressing the problem of climate change and communicating relevant information to the public especially the farmers is very crucial. Training for extension workers on issues of climate change is thus an imperative for extension organizations.

Biotechnology

A small proportion of the respondents within 2003 and 2004 had training in back cross breeding (16.7%), artificial insemination (13.3%) and genetic modification (13.3%). A similar proportion (16.7, 16.7 and 13.3%) of respondents also received training in the same subject matter between 2004 and 2006. In the same manner, training of staff in biotechnology remained very low in 2007 to 2009, except for slight increase in proportion of respondents trained in micro propagation (23.3%). Training of extension workers in modern biotechnology techniques is yet to receive attention despite increase awareness as well as utilization of genetically modified products among farmers as reported by Adenoma and Oladele (2008), and Mathew and Adesope (2008). Commenting on the attitude to biotechnology, Onoja and Audu (2005) observed that given the potential of biotechnology in poverty and hunger reduction; It is rather worrisome to note that Nigeria is not taking the lead and adequate imitative in enunciating policies of biotechnology in Africa. Although, application in agricultural production in Nigeria is more prominent in crop produc-

tion than animal production (Ukpabio, 2004), but the fact that farmers are already utilizing the products holds implications for training by extension organizations.

Human immunodeficiency virus and acquired immune deficiency (HIV/AIDS)

Entries in Table 5 show a decline in proportion of respondents trained in causes/symptoms of HIV/AIDS (35.0, 30.0 and 25.0%) and effects of HIV/AIDS infection (35.0, 3.3 and 3/3%) within 2001 to 2003, 2004 to 2006 and 2007 to 2009, respectively. The percentage of respondents trained in prevalence of the disease rose to 20.0% in 2007 to 2009 as against 10.0% (2001 to 2003) and 3.3% (2004 to 2006) recorded previous years. Generally, efforts towards providing training opportunities in HIV/AIDS issues have been minimal in the organization. Consequently involvement in delivering services in this direction might be low. The result confirms UN (2000) report that extension system in developing countries is yet to incorporate HIV/AIDS in their programme and service delivery. Human immune virus/AIDS epidermis has also affected agricultural extension organization in the sense that there has been deaths and long absenteeism among staff. Indisputably, it has negative effects on the workforce resulting to loss of trained, skilled and experienced workers in all discipline, including farm labour. Since extension education targets improved livelihood of the farm families, building capacity to contribute to the health and labour productivity of clientele is an imperative.

Conclusion

The study revealed that ADP public extension services for farmers have not improved both in terms of intensity of involvement and coverage. The result showed that arrays of services were delivered to farmers, however, involvement over the years remained low and stagnant. Although linkage of ADP organization with other agencies showed slight improvement, linkage efforts concentrated on staff training. These probably due to the several formal training programmes provided within the REFILS component of agricultural research development project. During the time under review, involvement in providing trainings in some areas like ICTs, group dynamics, biotechnology indicates a positive change. However, efforts to improve capability of extension workers in specific subject areas were poorly taken care of by the organization. Overall, the Enugu State ADP has not substantially responded to the training needs of farmers and extension workers. Ideally, challenging issues in the operational environment of ADP organization and clientele system are expected to make the system more inclusive in areas of service delivery and training.

Table 5. Percentage distribution based on the specific area of training (n = 60).

	2001 to 2003 (%)	2004 to 2006 (%)	2007 to 2009 (%)
Information technology			
Telephone/GSM Phone (use of multimedia facility)	40.0	43.3	53.3
Use of internet	20.0	20.0	20.0
Information file Management	16.7	20.0	26.7
Data analysis and Documentation	16.7	16.7	13.3
Website design and publishing	3.3	3.3	6.7
Programming	3.3	3.3	3.3
Climate*			
Climate related and trans boundary pest and disease	15.0	30.0	20.0
Climate change and disaster	16.7	16.7	20.0
Risk management adaptation and mitigation measures in agriculture, forestry and fisheries	20.0	13.3	16.3
Climate change, water and food security	20.0	25.0	35.0
Data collection and impact assessment on climate change	13.3	6.7	16.7
Green house effect	13.3	3.3	16.7
Biotechnology			
Tissue culture	3.3	3.3	6.7
Micro propagation	6.7	6.7	23.3
Gene cloning/genetic modification	13.3	13.3	13.3
DNA extraction	13.3	16.7	10.0
Back cross breeding	16.7	16.7	10.0
Artificial insemination	16.7	13.3	10.0
Multiple ovulation/embryo transfer	13.3	6.7	13.3
Animal cloning	6.7	10.0	6.7
Gene insertion	10.0	13.3	-
HIV/AIDS*			
Causes/symptoms	35.0	30.0	25.0
Effects	35.0	3.3	3.3
Prevention and control	6.7	16.7	10.0
Transmission	13.3	3.3	13.3
Progression of the disease	6.7	16.7	6.7
Prevalence of the disease	10.0	3.3	20.3
*Multiple response			

Inability to affect changes shows level of inefficiency, irrelevance and poor performance of the system. The study therefore recommended that government should increase extension support to enhance the organization capability to make internal and external adjustment whether for service delivery or training in response to changes in the environment. Secondly, favorable policies are expedient to institute the strategy of comparative advantage in service delivery and subsequently create enabling environment for increase private sector participation. Policies guidelines are also required to initiate and foster operational linkage framework and stimulate positive attitude toward building linkage

leadership and orientation of stakeholders for functional and sustainable interaction in the system.

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