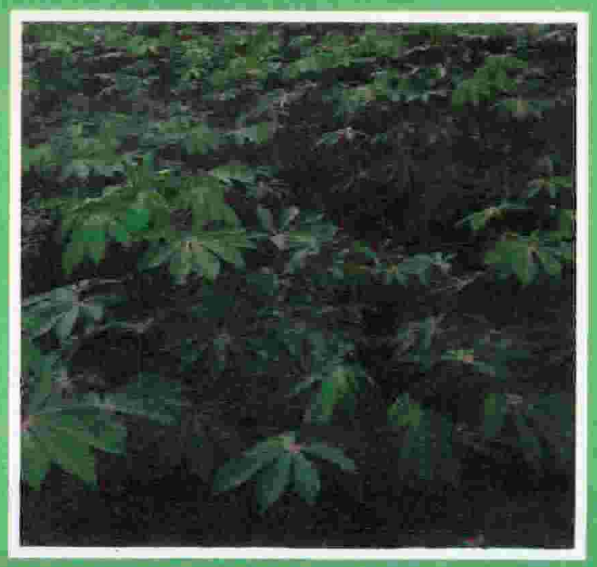
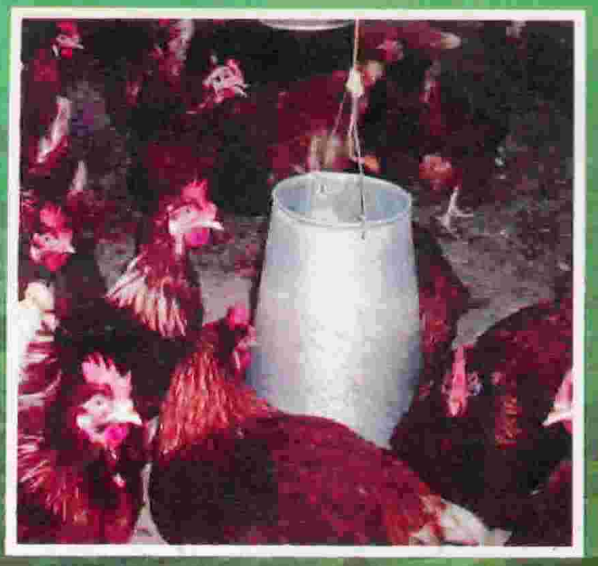
CHALLENGES TO SUSTAINABLE PRODUCTION IN AGRICULTURE AND ENVIRONMENT: NIGERIA IN PERSPECTIVE


Edited by

H. M. IJEOMAH

&

A. A. AIYELOJA

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EDITED BY:

H. M. IJEOMAH
(Senior Lecturer and Head, Wildlife Management Unit)
Department of Forestry and Wildlife Management,
University of Port Harcourt

AND

A. A. AIYELOJA
(Senior Lecturer and Acting Head)
Department of Forestry and Wildlife Management,
University of Port Harcourt

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COMPARATIVE FUNCTIONALITY ANALYSIS OF AGRICULTURAL EXTENSION SYSTEMS IN TRANSITION AND THEIR CHALLENGES

[1]INYANG, E.B., [2]ADINYA, I. B. and **AWOLUMATE, S.**
[1]Department of Agricultural Economics and Extension, University of Uyo, P.M.B. 1017, Uyo, Akwa Ibom State. embainy@yahoo.com.
[2] Department of Agricultural Economics, Cross River University of Technology (CRUTECH), Obubra Campus, Cross River State, Nigeria. bon4all_2006@yahoo.com.
[3]Department of Agricultural Extension and Management, School of Science and Technology,National Open University of Nigeria, 14/16, Ahmadu Bello Way,P.M.B. 80067, Victoria Island, Lagos. Email: awolumatesam@yahoo.com

Introduction:

This chapter analyzed the state of agricultural extension systems in some selected countries in the world by adopting antecedence, transaction and outcomes approach of evaluation and also discussed some of the basic concepts in the field that would best explain the agricultural extension as a development programme aimed at solving problems and also as an academic discipline to train development educators. Agricultural extension programme is very dynamic in nature and its subject matter has no restriction provided it would contribute significantly to sustainable development of the socioeconomic well-being of the members of any community, especially the rural communities. Due to this unique characteristic of agricultural extension systems across the world, each can only be assessed based on its own merits and demerits, particularly, when adopting mixed method of evaluation to conduct a formative and summative assessment of the degree of the system's responsiveness to its organizational objectives. Since the situation surrounding executions of different models of extension are different even in a given location, there should be no reference judgments on the performances of any system to another system except for programme reformation.

The Concept of Agricultural Extension as a System

Agricultural extension system can be explained as a set of integrated practical units of administration or services that is required for organizational management and goals to be achieved. It is usually comprised of units and or components with clearly defined functions that operate for realization of the sets of primary and secondary desirable objectives that were clearly stated for any group, area, region, province or

country. In history, what is known as agricultural extension had been in practice as old as the existence of human, but it was in the nineteenth century that it became formalized having recognized its potential towards sustainable development. The concept of agricultural extension or approach became a subject of discussion in regional conferences and sessions of the Food Agricultural Organisation (FAO) Technical Committees on Agriculture, Forestry and Fisheries in 1986, which emphasized coordination of extension with other services, particularly research and education, increased involvement of cooperatives and farmers' association in extension, a greater focus on women, better condition of service for extension staff and the introduction of population education among other subjects of recommendations. Recent sessions of the Technical Committee on Agriculture, even the latest in 2011 have called for modification in extension systems to better serve the needs of target groups; establishment of more effective linkages with research, supply of inputs, credit and marketing; and better programming and management. The committee on Forestry wanted extension and social sciences included in the training of foresters and harmonization of extension programmes in agriculture and forestry. In committee on Fisheries, emphasis was placed on the role of extension in the development of artisanal fisheries communities.

The Global Consultation on Agricultural Extension held in Rome in 1989 pointed out that, in spite of a significant effort on the part of the developing countries as well as the continuing investment and technical assistance support to agricultural extension work by bilateral and multilateral agencies, there are still many problems and issues to require attention if agricultural extension is to perform its function adequately and effectively. Agricultural extension as a subject matter evolved as a development programme purposefully aimed at achieving certain goals. Extension programme is normally organized with different directorates, departments, divisions or units with specific functions to achieve the overall objective of the organization. Of paramount importance for agricultural extension system is the education and communication services unit, the programme planning unit and as the monitoring and evaluation unit. Agricultural extension system in any part of the world is primarily designed for functional education; tailored to address the pressing needs of the targeted beneficiaries. Technically, the extension system is driven by principles embedded in two fields of learning; communication arts and education, while knowledge in the fields of rural sociology, psychology and programme evaluation serves as complimentary specializations. Thus, it synergizes knowledge from all fields of human endeavours for the purpose of enhancing the quality of life through changing the attitude, knowledge and skills of human beings. Different authors have described the conceptual definition of agricultural extension in many ways. Notable among several definitions is that of Maunder (1973), who defined Agricultural Extension as a

service or system which assists farm people, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living and lifting the social and educational standards of rural life. Swanson and Claar (1984) perceived extension system as educational and defined agricultural extension as a non-formal education or an ongoing process of disseminating useful and relevant information to people and then assisting the people through educational approach to acquire the necessary knowledge, skills and attitude for effective and efficient utilization of this information. Mgbada (2002) in his description perceived extension system as communication process and maintained that extension service brings about exchange and sharing of information, knowledge, skills for improving agriculture, socio-economic and political status of rural communities while Eze (2006) perceived extension system as developmental tool and thus described agricultural extension as means or tool to help to empower farming communities by helping them to decide on how best to use the available resources, information and technologies.

Therefore, agricultural extension is considered as a process of activities aimed at enabling people to use these skills, knowledge and information to improve their quality of life, irrespective of their location and approaches. This suggests that any agricultural extension system is established based on purpose and could be different in programming even within a country or state or local governments as the case may be. Of course, the concept of functional approach of extension system was recognized as none of the models currently in practice all over the world is superior to another but all are driven by its purposes towards improving the quality of life of individuals and families. Agricultural extension organizations are mostly public-sector institutions. It can be combined or integrated with other technology transfer functions, from other sectors of development such as health care/nutrition, physical infrastructure and environment. Any extension organization is expected to concentrate on the educational function as earlier noted. Agricultural extension as a concept can be successfully used by different types of organizations to reach different groups of people with different messages.

The concept of agricultural extension as a system has basic characteristics or uniformity; in terms of programme intent or purpose, programme content, administrator and clientele. Though agricultural extension systems are different and vary across various countries of the world but the institutional and capacity building activities as a primary function out of several others such as supply of inputs, arrangement of credit and marketing facilities, collection of statistics and enforcement of regulations. The overall purpose of agricultural extension system is for increment in national agricultural productivity, income, or even enhancing of

actual improvement of family living (made possible by the increased income) and education for self-reliance in seeking and effecting improvements in the future. Programme content may comprise production of a particular crop or all crops, livestock, forestry, or fisheries, singly or in some combinations (Gaaya, 2000). The instructional and capacity building should expand to include marketing, other economic and management aspects, in a most comprehensive system, all of these plus conservation, maintenance of environmental quality, and social considerations such as nutrition, population growth and general improvement in family life should be taken seriously. The clientele addressed may be all men and women, adult and young farmers, or only some of these categories of rural producers.

Functional Approach Concept of Agricultural Extension as a System

In every community, socialization processes have been the way that knowledge, skill and attitudinal values are transferred across gender and generations across the world. As differences in reasoning and ideologies of individuals exist, so also family units that make up the community in any geospatial settings vary in manners of solving tasks. Despite the different socialization mechanisms, there exist shared socialization values which assisted to tailor majority of its members towards functioning in similar manner for the purpose of achieving the desired objectives either individually or collectively. These experiences of purposeful driven actions led the conceptualization of agricultural extension systems model and a given community can practice more than two models at any point in time provided the models satisfy it functionality. When the extension systems evolved in the nineteen century, its organizational style was directed towards achievement of collective goals. The emergence of the present day agricultural extension system witnessed the adoption of educational approaches that transited from family units to groups or regions, province and nation. The adoption of any agricultural extension model or approach could be economically and social needs motivated depending on the situational needs, resource availability and technical capacity at any point in time. Different agricultural extension systems have evolved in the world and out of all the models in existence in the world, four have been structurally popular across the world: community development oriented model that was invented by the Japanese recently introduced into Nigeria through National FADAMA Development Project, educational institution based extension that was popularized by United States of America and the Chinese, the training and visit system and the conventional agricultural extension models were supported by the World Bank in the third world countries. Apart from these four, there are numerous other approaches but the design and structure, are derived from the above mentioned common forms.

A. Conventional Agricultural Extension Approach

In most third world countries in the 1960's and 70's, there was dearth of personnel and institutions to drive the activities of agricultural extension. The agricultural extension organization was domicile in the Ministry. The main objectives were centered on increasing agricultural production, farmers' income and quality of life. Based on the above objectives, this approach was faced with conflicts of national and individual interests. This approach had some hitches particularly as it became more overwhelmed with bureaucratic functions and bottlenecks than educational activities.

B. Training and Visit System (T&V)

This approach arose out of the shortcomings that were peculiar to the execution of the conventional agricultural extension model in the third world countries that could not execute the formalized institution based extension model. The objectives and the focus of T&V system approach are similar to the conventional approach. The T&V system removed the administrative bottleneck, identifiable within the conventional extension approach, streamlined the multipurpose nature of the roles of the extension worker and expanded the extension workers' coverage. They key features of T&V system are professionalism, organizational structure-single line of command, concentration of efforts, specificity (farmer and field orientation, development of professional competency (regular and continuous training, linkages and coordination(close link with research and other agencies), personnel management policy (time bound work).

C. Educational Institution based Model

This approach was made comprehensive and popular in the United States of America. It is based on a collaborative arrangement among Federal, State and Local governments to fund and carryout extension work on a matching basis through one or more land-grant universities in each state. The primary focus is conducting educational programmes in selected subject matter to help clientele solve problems in such a way that is socially desirable and personally satisfying.

D. Community Development Driven Approach

This approach appears to be the most recent model adopted by the World Bank to support the enhancement of national agricultural productivity and poverty reduction in the third world country as such as Nigeria. In history, this approach evolved nally from the Japanese of cultural settings that are promoting corporate trepreneurial development, and it should be the oldest indigenous ral extension method. The community development driven approach is

urely people oriented and follows the "bottom-up" approach to sustainable rogramme development. The present day practice of the community development riven is a derivative of the original cooperative agricultural extension system in that, xtension activities are centred on groups of people with shared purpose, who pull eir resources together to embark on livelihood activities. According to Udoma *et al.* 009), the community driven development as a system is performance evaluation ented which is not prominent in the unified extension system delivery. The pproach is essentially community (group) focused and would encourage mmunities to take full responsibility of their development initiative as well as in entifying, protecting and enhancing sustainable utilization of their natural resource ndowment, prompting project ownership and foster all inclusive decision making ocess vis-à-vis needs assessment and prioritization, planning, implementation, onitoring and evaluation of community projects.

enerally, despite differences in institutional structure and operations, all gricultural models seek to improve the livelihoods and wellbeing of the eficiaries which in turn enhances national development. Because of this derlying assumption, the concept of functional approach becomes paramount as particular agricultural extension model is superior to another but each one is signed to solve peculiar needs of the people and society.

gricultural Extension Experiences in Selected Countries of the World: China, can and Nigeria

Status analysis of Chinese Agricultural Extension System

inese agricultural extension system adopted the College-based model at its eption in early 1920's. The college-based model was initially popularized by the ited States of America. A formally organized extension system came into being in 24 in the He County and by October, 1929, a legal backing was made that brought existence the law that was called Regulation of Agro-Extension and thereafter Central Agro-Extension Committee was established in December of the same ar (GAO and ZHANG, 2009). By 1930, the Chinese government put forward licies and the administrative pronouncements that led to tremendous nsformation of agricultural extension programme from old technological driven stem to the current state of the art technological driven extension system. Records ve shown that Chinese has witnessed about five stages of progressive focus in proving the performance of its extension system. Between 1949 and 1957, the dscape was characterized by establishment of basic-level agricultural extension ere much attention was focused on county-based demonstration farms and the of model labourers and technician as 'staffers' (assistants). The second stage of

Chinese extension was between 1958 and 1965 which was described as perfection of middle-level extension organizations. This stage witnessed a lot of reorganization and planning to introduce specialization of agro-technology at county level. The third was described as reconstruction of participatory extension network, which was witnessed between 1966 and 1977. During this phase, there were reduced activities by extension organization while team of farmers and technicians were greatly active. The fourth stage came up between 1978 and 1991 with the relative shift in agro-extension system based on the implementation of the reforms that reestablished "top-down" extension service system. The fifth stage that started in 1992 basically focus on intensifying reforms in agricultural extension system through decentralization of agriculture.

Structure, Features and Workings of China's Extension Service

Chinese agricultural extension system has some peculiar attributes, GAO and ZHANG (2009) made the following observations on the current formation of the system.

1. It consists of five levels extension system structure with routine extension services, which are executed at county and town levels. The five levels of extension system structures are the Central government, province, prefectures, county and town. The extension organization in china is managed in units namely: planting industry, animal husbandry, and veterinary, aquaculture and agricultural machinery.

2. Apart from basic educational function, the basic level extension organization has four departments that perform the following (a) law enforcement and administration (b) pure commonwealth services or public good services (c) intermediary services and quality product and production assurance, information generation (d) business services.

3. There are generally three sources of funding. Two main sources are fixed funds for fiscal departments and flexible programme funds from different levels of programme and the third source is all kinds of self supporting funds.

4. The Chinese agro-extension system is driven by different mechanisms; (a) trinity mechanism of research, teaching and extension (b) trinity operating mechanism of science, technology or research and development (R&D) breakthrough (c) operating mechanism of technology demonstration gardens and (d) trinity operating mechanism of enterprises, resource based and households.

Reformation and innovation of basic level extension system have become routine with the Chinese agricultural extension systems. In recent times, there has been three changes in the following areas:

(i) Administrative system to set up multiple town-covered extension stations which are branch organizations of county level

(ii) Internal administrative reforms to encourage competition among staff.

(iii) Reformation of the business entities operating system to implement the new business model.

Status analysis of Japanese Agricultural Extension System

This can be considered as indigenous construed model even before the emergence of the United State of America popularized model of College-Based Extension. The agricultural extension activities started in the early 1880's before it became formalized in 1893. The technical components of the agricultural development were generated within Japan among the farmers and ever since have undergone several transformations as a traditional agricultural advisory system. The policy of modernizing traditional agricultural advisory system which was addressed by a specific law and supported by public funds culminated in the "Agricultural Improvement Promotion Law" enacted in 1948, thus ushering in the Cooperative Agricultural Extension System which is currently in use throughout Japan (Agbamu, 2009). Article 1 of this law states that: "the purpose of this law shall be to enable farmers to have access to wholesome, appropriate and practical knowledge relevant to their agricultural issues and to increase public welfare in order to ensure development of efficient agricultural practices, increased agricultural production, and the improvement of farm households' living". Article 13 of the same law states that: "the National Government shall issue subsidy for the Cooperative Agricultural Extension Service in order to support the extension services of prefectures in cooperation with the National Ministry of Agriculture, Forestry and Fisheries". Agricultural Extension in Japan is financed by National and Prefectural Government on a shared basis.

In accordance with the Agricultural Improvement Promotion Law of 1948, the Prefectures and the National Ministry of Agriculture, Forestry and Fisheries have collaboration in agricultural extension service. According to Agbamu (2009), the Japanese Cooperative Agricultural Extension Service has the following salient features:

The Agricultural Improvement Promotion Law made provision for offices responsible for agricultural extension services at the national, prefectural and district levels.

Advisory bodies were established at each of the three levels in order to keep

extension activities democratic and progressive.

3. System and structures are arranged to ensure that extension activities focus on stimulating scientific interest and encourage scientific thinking.
4. Home improvement programmes for rural women, and rural youth training in agriculture were added to expand programmes which had hitherto been limited to the needs of male adult farmers and to foster leadership in agricultural production among young farmers. Consequently, there is a Prefectural Agricultural Academy in each Prefecture which is engaged in successor farmer.
5. The Agricultural Improvement Promotion Law provides that no person can be appointed to the post of Subject Matter Specialist unless he or she has passed a prescribed test and must have engaged in agricultural research or extension service for a period of not less than 10 years after graduation from the University.

Structure, Features and Workings of Japan's Cooperative Extension Service

According to a review by Agbamu (2009), agricultural extension in Japan, at the national level is under the Agricultural Production Bureau of the Ministry of Agriculture, Forestry and Fisheries (MAFF). This Bureau has two divisions: Extension and Education; and Home Life Improvement. The Ministry has seven regional offices throughout the country. Agricultural Extension Staff in regional offices supervise and assist extension work conducted by Prefectural Governments' Department of Agriculture. At the prefecture or state level, the Agricultural Extension Division administers extension work. This division has three sections: extension, home life improvement and rural youth. The Cooperative Agricultural Extension System has a close collaboration with research work, education and training and agricultural cooperatives. Japan's agricultural extension service was established separately from agricultural experiment stations and Agricultural Colleges. Since both the prefectural experiment stations and extension services are placed under the auspices of the Agriculture Department of a Prefectural Government, they have been operating in close collaboration. The Cooperative Agricultural Extension ...tem in Japan has three major types of programme:

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...s from the central government amounting to about 40%
...ension budget. Thus, Agricultural Extension in Japan is

nanced by the National and Prefectural Governments through a cooperative xtension service grants and subsidies, while the National Ministry of Agriculture, orestry and Fisheries allocate financial support for the prefecturers. The National overnment will then set the direction of management in fundamental matters of gricultural extension, while the Prefectural Government prepares and direct mplementation activities after consultation with the Ministry of Agriculture, Forestry nd Fisheries. Apart from the public sector stakeholders, non governmental takeholders are allowed participation via advisory bodies at the three levels of gricultural extension administration as provided by the law. Also, there is gricultural Improvement Promotion Committee at the District level. This advisory ommittee comprises representatives of farmers, members of agricultural societies nd other interested bodies in the community which articulate views and opinions for resentation through Extension Offices in Districts to Prefectural Agricultural xtension Division.

c) Agricultural Extension Development: Nigeria's Perspectives

The involvement of government in agricultural extension services coincides with advent of the British and the colonization of Nigeria. This period marked the beginning of direct involvement of government in the development of agriculture (Udoh, 2001). The inception of agricultural extension in Nigeria was more of conventional extension approach. History shows that in 1910 Moor Plantation became the headquarters of the Southern Department of Agriculture. At the same period, the Northern Nigeria also had the same pattern of Agriculture as in the south with a Department of Agriculture established in 1912. A single Department of Agriculture was then established in 1921 following the amalgamation of the Northern and Southern regions. This was the beginning of central planning and policy making. At this period, much of the efforts were directed towards export markets with little or no efforts directed at food crops. Consequently, scientific information were lacking on improvement of food crops. With the recognition of the need for training agricultural workers in general and agricultural extension workers in particular, two schools of agriculture were established at Moor Plantation, Ibadan and Samaru, Zaria, in 1921 and 1931 respectively. Twenty years later, the Department of Agriculture was regionalized following the creation of two administrative provinces in the country. The southern provinces which included the Southern Camerouns had its headquarters at Moor Plantation, Ibadan while the Northern Provinces had the headquarters at Samaru, Zaria. The ministerial structure of agriculture emerged in 1952, which gave rise to the establishment of Agricultural Extension Division. This division was headed in the north by the Chief Agricultural Officer (CAO), in the East by the Chief Inspector of Agriculture (CIA) and the West by the Chief Agricultural Extension Service Officer (CASO). In 1963 with the establishment of the Midwest

region a fourth Ministry of Agriculture was created. In 1968, with the establishment of twelve states-structure, twelve District State Ministries of Agriculture emerged and with one Federal Ministry. With the increase in the number of states to 36, the number of state ministries of Agriculture also increased accordingly.

Another significant development in agricultural extension and agricultural development in Nigeria, which deserves mentioning, is the establishment of Accelerated Food Production Project (NAFPP) in 1972 by the Federal Government. This project was designed to increase the production of six major crops in the country which include: cassava, maize, wheat, sorghum, millet and rice. It also aimed at disseminating agricultural information to farmers, enhance organized food crop farming in the country to increase farmer's income. The institution of River Basin Development Authority (RBDA) in late 1970's underscores another phase in the agricultural extension development in Nigeria. Eleven River Basin Development Authorities were established with the main function of providing water and irrigation facilities to farm communities for productive farming. The current extension agency, which seems to have stabilized, is the Agricultural Development Project (ADP). This project at inception was sponsored by the World Bank, Federal and State Governments of Nigeria. The ADP adopted the Training and Visit (T&V) system. At this point in time, when the tripartite funding was functional, the performance of ADPs in its extension functions seemed to have been the most successful in the history of extension development in Nigeria. However, since the tripartite funding stopped in the 1980's, the ADPs have continued to perform dismally partly due to poor funding and insufficient commitment on the part of field extension staff (Udoh, 2001; Inyang, *et al*, 2004). In view of the integrated nature of Nigerians farming system, it was felt that the success recorded by the use of T&V in the Crop-subsector should be applied to the other subsectors under a unified approach. Consequently, the Unified Agricultural Extension Service (UAES) was introduced and all States of the Federation were deemed to have fully complied with this policy by 31st December 1991. Thus, UAES was conceptualized as the conscious and deliberate channeling and funding of proven technological packages in all agricultural subsectors (crop, fisheries, livestock, agro-forestry, agricultural processing, etc.) to farmers through a single agent or agency (Olatunji, 2005).

Comparative Analysis of the Challenges of Agricultural Extension Systems in the World

Challenges facing agricultural extension systems differ from country to country. The variations are influenced by various factors such as the degree of sophistication of information science and associated technologies, pattern of geographical endowment, sincerity in governance and quality of functional education in the

mmunity, etc. Despite variations in the extent of challenges facing each model of ricultural extension system, there are common problems peculiar to developing ions. Furthermore, the Asian countries experiences, despite having a relatively her social, economic and scientific advancement over the African counterparts not totally different from the issues impeding the degree of performance of ricultural development programme in developing countries like Nigeria. Gao and ang (2009) identified some of the challenges facing the Chinese agricultural ension system. These include shortage of funds, shortage of trained personnel, level of farm literacy, lack of articulated organizational structure and problem of itutional Rural Youth Programmes.

ther aspect of challenge in China's Agricultural Extension System is the erarchical extension functions of governmental based extension organizations, ich are at variance with farmers' real needs for technology and information. This ve rise to poor market driven extension programmes. For a long time, farmers re not involved in the formulation and implementation of agricultural extension grammes. The main purpose of agricultural extension organizations is to fulfill the s assigned to them by government, while farmers' need of these techniques is ely taken into consideration. Invariably, there are a lot of uncertainties existing in extension activities. Promotion of a technology is usually determined by such rs as attitude of government financial departments, the knowledge and ividual behaviour of their personnel. If these financial officials do not realize the portance of agricultural technology, to be promoted, that extension programme ll usually not get support from government financial departments.

ndly, according to Gao and Zhang (2009), self-centred special extension stations educe the efficiency of agro-technology extension. The setting up of basic level ension system is based on specialty. The Agro-technology Extension Service ms are composed of five stations in most countries (agro-technology station, protection station, horticulture station, soil and fertilizer station and economic station). Some countries also setup such specialized stations as vegetable orchard station, cocoon and mulberry station, tea leaves station and forestry etc., which are under the leadership of various agricultural administration rtments. Animal and veterinary station belongs to agricultural machinery station and aquaculture station belongs to aquaculture bureau, etc. This multi-head inistrative system appears to be the origin of the problem of low efficiency and ource waste in agro-technology extension. According to Gao and Zhang (2009), simultaneous existence of "linear and block divisions" led to the disintegration of ension work by county and town level governments. Town level governments are nsible for recruiting, financing and paying salaries of agro-technology

extension staff. There is no effective cooperation between countries and towns. Country level Extension Department gradually quitted the training and business arrangement. After the establishment of comprehensive extension organizations at town level, the work of extension stations became passive due to lack of independence and money. Lack of effective cooperation among diversified extension organizations has led to unnecessary competition and waste of limited extension resources. Non-governmental organizations increasingly participated in agricultural extension work, but their potentials were concealed due to backward system of management skills.

The Nigerian experience shows that ever since that State governments became the sole sponsors of Agricultural Development Programmes various weaknesses and problems have restricted the desired results. Such weaknesses and problems include instability in agricultural policies and lack of continuity in agricultural and extension development programmes; poor coordination and poor linkages among extension agencies, research institutes and Faculties of Agriculture in the Universities. Other problems relates to inadequate involvement of farmers in extension programmes planning; weak evaluation techniques of programmes and lack of and/or inadequacy of subject-matter specialists in programme evaluation design; lack of sufficient academic and extension training and environmental sciences, inadequate facilities for educational jobs; inadequate extension staff (higher farmer: extension agent ratio) and lack of proper planning, monitoring and evaluation of extension programmes. Asiabaka (2007) noted that the Nigerian Agricultural Extension Development Programmes were one-way communication (Transfer of Technology) of useful information oriented, and farmers' problems (often time identified by the extension workers) are brought to the research via the feedback mechanism. The linear model compartmentalized researchers, extension staff and farmers into three distinct strata with weak or non-existing relationship, instead of fostering inter-synergy as major actors in the agricultural development process. In many of these linear models, problems definition tend toward research interests rather than farmer perceived problems, while research results have often not been delivered efficiently to extension workers, who, most of the time lack the necessary knowledge, skills and resources to motivate farmers to adopt improved practices (Asiabaka, 2007). Most overriding biases that have characterized extension thinking and practices in the past twenty years have been the perpetuation of the source syndrome which is the systematic overrating of scientific and research based knowledge compared to other types of knowledge that are relevant to agricultural production (Engel, 1989). As pointed out by other scholars (Chambers, 1983, Darrie, 1985), this bias causes agricultural development to deny itself the benefit of other sources of relevant knowledge, particularly the knowledge

farmers possess. The source syndrome was typically top-down, resulting in non-adoption of technologies due to farmer's ignorance, non-appropriateness of the technology as well as farm level constraints. A World Bank supervision mission to some ADPs in 1985 observed that although the ADPs claimed to have adopted the T&V system of extension, the services were characterized by, among others, (a) irregularity of visits by Extension Agents, (b) unsystematic supervision, (c) irregular training and (d) project financed demonstrations that were not impacting even on the participating farmers. A comprehensive review of the organization and implementation of extension field activities undertaken by the Federal Agricultural Coordinating Unit (FACU) in 1986 in six ADPs indicated that there was (i) no set pattern of work for extension staff, (ii) weak supervision, (iii) ineffective utilization of available manpower and transport facilities, and (iv) long chain in information flow from research to farmers.

Eremie (2006) observed that the extension model adopted by Nigerian ADPs is characteristically Top-Down in nature. The model focuses on high-input crop technologies with minimal participation by the farmers, and no direct contact with farmers, while more attention is paid by management on rural infrastructure and input distribution, resulting in generally low adoption rates among farmers. Because the T & V extension focuses more on the technical messages to be delivered, it is mainly oriented to technology transfer rather than to broader human capital development. Little or no attention is given to establishing farmer organizations. The prevailing management view among promoters of T & V is that because resources are inadequate, concentration should be on technology transfer to increase production and output. In the same vein, Ekop (1999) and Narayan *et al.* (2000) asserted that the current top-down approach allows little flexibility for farmers' participation and does not go down well for easy adoption of new technology by farmers. Similarly, Eremie *et al.* (1989) has observed that the choice of on-farm trials often does not reflect the clientele's real needs and objectives. Because of the poor orientation, farmers regard on farm trials as Government /ADPs concern. The exclusion of farmers during the technology generation and development process explains why despite numerous research findings, on-farm trials and new technologies are hardly adopted by farmers. Commonly encountered weaknesses of the T & V extension system as identified by Roberts (1989) and Eremie (2006) include: limited or no clientele involvement in programme development and service delivery, limited use of mass media which might increase effectiveness especially in reaching women and other small scale farmers, recurrent cost problems that become serious when donor funding terminates. Other weaknesses are weak links with research plus the lack of adequate subject matter specialist capacity, lack of appropriate technology, a large organizational structure

and failure of the structure to reflect the diverse agro-ecological, institutional, political, economic and social make-up of the states.

There are two major lessons that came out of the evaluation exercise of the Multi-State Agricultural Development Programmes (MSADPs) by the World Bank in 1998. First, the extension services, while successful at delivering available technologies, lack the capacity to respond to farmers' needs and work with farmer-developed technical packages to solve their peculiar problems. Without an analysis of the profitability of technical packages, the extension services were unable to assist the farmers to tackle a situation where costs and prices were changing. For MSADPs II & III, which provided for rural infrastructure and private sector input supply, the ADPs lacked the staff with the requisite community and private sector development skills. On the institutional reform agenda the ADPs which had a narrow focus on production objectives were a poor instrument for inducing institutional change within the state government. Hence, most attempts at reforming the State Ministries were unsuccessful.

Taking into cognizance the lessons of T&V agricultural extension projects in Nigeria, as well as the experience of the new generation of the extension project elsewhere, Nigeria, under the guidance and support by the World Bank acceded to the paradigm shift from top-down supply-side extension to pioneer a demand-driven participatory extension service that is not only responsive to farmers priority needs but actually empowers them. In spite of the funding and promotion by the World Bank, the T&V extension approach has been found to be ineffective. To overcome the preponderant source syndrome, top-down approach, the function of extension need no longer be conceptualized as aiming at transfer of knowledge, technology, practices or information, but instead as facilitating the identification, retrieval and integration of such element, so that new, locally-embedded and sustainable practices may emerge. According to Chambers (1993), the panacea was to change the top-down approach and embrace the bottom-up, which is exemplified by the Participatory Extension Approach (PEA). This implies mobilizing a variety of actors as sources of relevant agricultural knowledge, experiences and information, and helping them focus upon specific problems in particular situations.

Comparative Analysis of the Profile of Agricultural Extension Systems in World

As earlier mentioned, agricultural extension systems all over the world differ in organizational formation and content principally due to its set of purposes. Meta-analysis of the general extension system of countries with outstanding successes in extension delivery like Japan and United States of America reveals the dominance

two primary and indigenous models of agricultural extension system; Cooperative agricultural Extension System and College-based model respectively. The performance of the Chinese Agricultural Extension service delivery equally cannot be overlooked despite their adaptation of the College-Based model to their indigenous system of extension service. History reveals that Japan and China had their traditional methods of disseminating useful information on agriculture to their citizens in the 1800's that preceded their formally organized agricultural extension models. The Japanese Cooperative Agricultural Extension Model was formally organized in 1893; the Chinese formally organized extension system was witnessed in 1924 after the United States of America had introduced their College-Based model in 1914. It is worthy to note that USA, Japan and China have been consistent in their choice of agricultural extension model despite plethora of policy reformation overtime for service delivery responsiveness in a bid to adapt to changing phases of science and technological advancement.

The Nigeria experience indicates that Agricultural extension system before 1952 was traditionally embedded in the socialization process, evolving out of trial and success experiences of the elderly great farmers. Upon introduction of formally organized form of agricultural extension delivery, the pre-independence state of Nigeria was grossly lacking in technical capacity to adopt the Westernized College-based Model while our cultural settings was not oriented towards cooperate entrepreneurship. Therefore, Nigeria agricultural extension system witnessed several reformation in models primarily for the purpose of overcoming its challenges toward delivery efficiency as noted in the Multi-State Agricultural Development Programme report of I, II and III. Cursory analysis of the operations of agricultural extension system across the continents of the world reveals that sponsorship of agricultural extension systems has ever been primarily public financed and occasionally assisted with donor supports, particularly in the developing countries. Apart from the Japanese experience that has been oriented towards the group method approach, the USA, China and Nigeria agricultural extension mode of transaction and dissemination of innovation have been primarily through individual contacts with farmers. Furthermore, Japanese agricultural extension upholds as compulsory, the adoption of advisory services unlike the USA, China and Nigeria extension systems, which utilization of advisory services is not mandatory. USA and Nigeria seem to operate a single level State-wide organizational structure compared to the Japanese and Chinese systems, which adopt two and five levels organizational structure respectively to achieve their purposes.

There is no agricultural extension system that has not witnessed slight or major information in policy and operations; but what is certain is that modification would

continually be a characteristic feature until the challenges of poverty is reduced to a tolerable limit in any society in the world.

Conclusion:

Agricultural extension as a concept emerged as a problem solving tool that was aimed at improving and sustaining practically the rural development but as at present, it has also served as a veritable medium for urban development. Before the formalization of agricultural extension systems all over the world, the family institutions in any given geographical setting were responsible for the dissemination of knowledge through socialization process, culminating at the community based or driven tradition education with regards to agricultural activities as a means for survival. The non-formal agricultural extension in its early existence has now transited to the state of arts and scientific based programming with an universally accepted constructs and norms. Like any other positively desired efforts, agricultural extension modeling is not without challenges and gains but the extent of the two extremes vary intensely from any geospatial setting to another owing to ecology, human capital compositions and more so territorial behaviours. Literatures have noted that among the major challenges to agricultural extension efficiency in the world, the developing regions are seriously plagued with issues bothering on limited funding and information science and technology capacities, relatively dearth of scientific innovation generation capacity, specialized capacities for technical researches and as well as in rigorous methodologies for programme evaluation of the outcomes and outputs of agricultural extension interventions. In order to improve the shortcomings of agricultural extension service delivery in the developing regions of the world including Nigeria; accountability of programme ought to be prioritized and be technically mainstreamed as programme planning and management strategy.

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ABOUT THE BOOK

Challenges to Sustainable Production in Agriculture and Environment: Nigeria in Perspective is the third volume in our series. The first was ***Practical Issues in Forest and Wildlife Resources Management.*** The second was ***Book of Reading in Forestry, Wildlife Management and Fisheries.*** It is another effort in putting information in the field of Agriculture and Environment across to students, lecturers and other professionals who are yearning for new ideas and latest discoveries to overcome production challenges in their chose career.

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