

Rural innovations and knowledge systems development and dissemination among cassava cooperative farmers in Southern Nigeria

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Abstract

Modern day extension models pay greater attention to farmer's knowledge exchange interaction and farmer first approaches unlike the top down and transfer of technology etc, where actions of farmers were mostly receptive in areas of adoption of such imported technologies. The farmer to farmer knowledge exchange system takes its roots from indigenous knowledge development which is a predominant feature of peasant cassava farmers in Southern Nigeria. Cassava is a major source of dietary energy for low income consumers in many parts of tropical Africa and it is one of the most efficient crops in biomass production. In comparison with many other crops, it excels under sub-optimal conditions and can withstand drought conditions. It is a poverty alleviation crop and since the crop is mostly grown by the rural poor, they should be capable of initiating and expanding economic investments of their own. In collaboration with the other farmers, extensionists and scientists, they have helped to a greater extent to develop and disseminate some of the rural indigenous knowledge among themselves. This paper examines the nature of rural innovation and indigenous knowledge systems development, the theories and models of innovation and indigenous knowledge, techniques of information and knowledge dissemination among cassava co-operative farmers, and the benefits of co-operative movements in knowledge exchange among others in Southern Nigeria. Based on the available literatures and specific examples, some recommendations are made on better ways to harness these potentials in the rural areas for the overall National and continental sustainable agricultural development.

Key words; Models, farmer first, top-down, transfer of technology, farmer to farmer, indigenous knowledge, peasant, adoption, extensionists, rural innovation, poverty alleviation etc.

1. INTRODUCTION AND JUSTIFICATIONS FOR FARMERS' INNOVATION AND INDIGENOUS KNOWLEDGE EXCHANGE SYSTEM

Innovation as a basis for economic development has been emphasised by Economic Commission for Africa and the United Nations Millennium Project (2005). Innovation can be defined as all the scientific, technological, organizational, financial, and commercial activities necessary to create, implement, and market new or improved products or processes (OECD, 1997). An innovation is an idea, behaviour, or object that is perceived as new by its audience and usually, it is seen as an end result of the urge to improve livelihoods and make them more sustainable for economic uses by man. "Innovations around the most basic humanitarian needs are always top priority, but helping communities get back on their feet and start to function as economically-independent units is just as important as emergency aid support" (Michael Pritchard MBE, 2013)

Innovation as a concept is used here in this paper with indigenous knowledge (IK) system in relation to agricultural productivity particularly by cassava farmers in the rural areas of southern Nigeria. Cassava farmers have been able to improve their production level and income through innovations and the development of indigenous knowledge exchanges among fellow farmers within their neighbourhood and beyond. This is borne out of the fact that interaction among fellow farmers is itself a poverty reduction strategy

The importance of this traditional knowledge for the protection of biodiversity and the achievement of sustainable development is slowly being recognized internationally (Gadgil *et al*, 1993). The poor farmers themselves appreciate their situations better and must therefore be involved in the design of both formal and informal means to better their lot in their immediate

communities. Such improvements can be in the types of crop varieties grown, diseases and pests control, processing and storage techniques, sales etc. It is through these and several other approaches that they can be involved in the true concept of sustainable livelihood. ***“A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base” (DFID, 1997).***

Cultures from all over the world have developed different views of nature throughout human history. Many of them are rooted in traditional systems of beliefs, which indigenous people use to understand and interpret their bio-physical environment (Iaccarino, 2003). The ultimate aim of understanding our bio-physical environments and nature is to be able to tackle poverty once and for all. DFID's sustainable livelihoods (SL) approach aims to increase the agency's effectiveness in poverty reduction in two main ways: the first is by mainstreaming a set of core principles which determine that poverty-focused development activity should be people-centred, responsive and participatory, multi-level, conducted in partnership, sustainable, and dynamic. The second is by applying a holistic perspective in the programming of support activities, to ensure that these correspond to issues or areas of direct relevance for improving poor people's livelihoods (Krantz, 2001).

The nature and intensity of innovations have over the years improved farmers' level of awareness, sustainable livelihoods and consequently reduced the poverty level amongst their households. Being aware of improved production and storage practices will in turn improve their income, health and standard of living. There is no doubt that effective participation by the poor in grassroots projects initiated by government and other private agencies all over the world enhances overall project performance. Indigenous knowledge is often well displayed in such instances and a clear example here is the cassava multiplication programme (CMP) of International Fund for Agricultural Development (IFAD) initiated in Nigeria in 1985. The potential role of indigenous knowledge (IK) in improving agricultural performance is widely recognised in developing countries (Hart 2007). Transfer of IK from generation to generation is mostly done through oral tradition or by demonstration.

Knowledge management (KM) has been successfully adopted by many organisations in order to build their competitive strength and achieve a sustainable growth pattern (Ichijo Nonaka 2007). KM practices in closed systems or formal organisations are likely to be more successful than those in informal systems or open systems because they have formal structures and rules to which members of organisations adhere (Mosia and Ngulube, 2005).

Knowledge assets are key elements that facilitate knowledge creation processes. Those assets include:

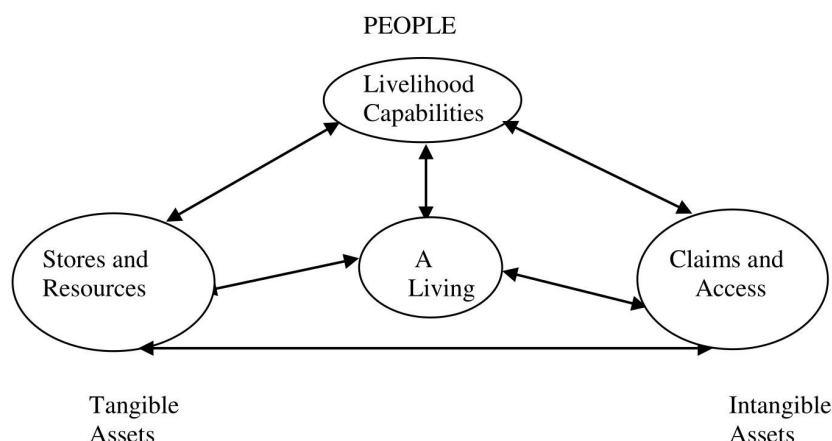
- experiential (i.e. skills and know-how)
- conceptual (i.e. concepts, designs and methods)
- systemic (i.e. technological platforms, manuals and patents and licences)
- routine (i.e. know-how in daily operations) (Lwoga, Ngulube and Stilwell, 2010).

The beauty of knowledge is in the development and preservation for future uses. However, KM should also be applied in the rural communities of developing countries for equitable and sustainable development because knowledge is an important resource for socio-economic growth. Rural communities have an extensive base of IK which is at risk of becoming extinct if appropriate measures are not taken to manage it. KM can be used to manage and share IK in communities that desire to achieve development agendas (Ngulube, 2008).

Many indigenous populations have relied for centuries or even millennia on their direct environment for subsistence and autonomy. Over time, they have developed a way in which to manage and use their resources that ensures their conservation into the future..... Natural resource management is based on shared meanings and knowledge (Berkes, 1993). Innovations are essential in traditional societies because of the various interests in improving as well as preserving their own social, cultural and environmental stability. In general, traditional knowledge systems adopt a more holistic approach, and do not separate observations into different disciplines as does Western science (Iaccarino, 2003).

2. THE THEORIES AND MODELS OF INNOVATION AND INDIGENOUS KNOWLEDGE SYSTEMS

As it has been indicated earlier, the basis of innovation is for the improvements of the environments economically for the benefits of mankind. Usually, the long term effect is to make livelihoods more sustainable for mankind. Innovation as a concept can as well be referred to as a process of an enduring change since it normally involves a group of people with a mission that are interconnected and constantly interacting among one and another and serving as agents of positive change.



Source: Krantz (2001).

Fig: 1. UNDP'S approach to promoting sustainable livelihoods

The sustainability of livelihoods becomes a function of how men and women use asset portfolios on both a short- and long-term basis. Sustainable livelihoods are those that are:

- able to cope with and recover from shocks and stresses through adaptive and coping strategies;
- economically effective;
- ecologically sound, ensuring that livelihood activities do not irreversibly degrade natural resources within a given ecosystem; and
- socially equitable, which suggests that promotion of livelihood opportunities for one group should not foreclose options for other groups, either now or in the future.

Indigenous ways of knowing are based on locally, ecologically, and seasonally contextualized truths. In contrast to the aspirations of some Western scientific traditions for universal truths, Indigenous epistemologies are narratively anchored in natural communities. Those natural communities are characterised by complex kinship systems of relationships among people, animals, the earth, the cosmos, etc. from which knowing originates (Ermine, 1995: 101-112).

According to Robinson (2009), "Diffusion of Innovations offers three valuable insights into the process of social change:

- What qualities make an innovation spread?
- The importance of peer-peer conversations and peer networks.
- Understanding the needs of different user segments.

Based on these distinctions, one can also distinguish between two types of innovations: cumulative innovation motivated by the need for improvements that has been identified through routinized activities, and discrete, independent development that often indicates the beginning of a new technological paradigm (Dosi and Nelson, 1994; Klevorick et al., 1995).

Pressures from a societal problem can bring about an innovation and gradual positive response from the people particularly when it involves a local means of communication. Production of folkdrama and audio-visual such as in the Kenya Woodfuel development programme in Kakamega district was also a successful exercise. Local actors and comedians were employed to stage an amateur drama incorporating local saying and songs. The experiences gained in collaborative experimentation with respect to tree planting and management with a limited number of farmer groups were fed into a drama which is staged on market days. The drama provided a reflection on the woodfuel problem, tells about the experimentation done by the initial groups, and encourages participants to develop their own ideas as to how the situation can be improved (Kenyan Wildlife Agricultural Programme (KWAP), 1991).

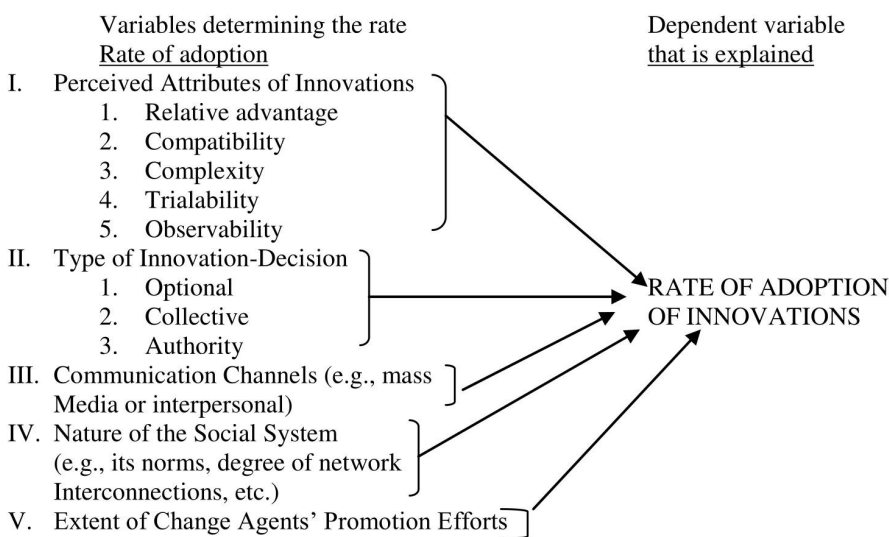
Hammersmith (2007) quoting from previous works agreed that Indigenous communities generally describe Indigenous knowledge as:

- * practical common sense based on the teachings and experiences passed on from generation to generation.
- * knowing its home country. Indigenous knowledge covers knowledge of the environment - snow, ice, weather, resources - and the relationships among things.
- * holistic; it cannot be compartmentalised and cannot be separated from the people. It is rooted in the spiritual health, culture and language of the people. It is a way of life.
- * a traditional authority system; setting out the rules governing the use of resources - respect, an obligation to share. It is dynamic, cumulative and stable. It is truth.
- * a way of life - wisdom is using traditional knowledge in 'good' ways. It means using the heart and the head together. It survives because it comes from the spirit.
- * giving credibility to people.

- * serving community needs and interests first.
- * having the potential to realise that the real contributions of local and traditional knowledge incorporate knowledge of the ecosystem.
- * relationships and a code of ethics, govern the appropriate use of the environment.
- * recognising that this code of ethics includes rules and conventions promoting desirable ecosystem relations, human-animal interactions and even social relationships.
- * enabling traditional knowledge to articulate with non-traditional knowledge to form a rich and distinctive understanding of life and the world.

Quoting from Mayor (1994), Hammersmith (2007) indicated that “the world’s Indigenous people possess immense knowledge of their environments, based on centuries of living close to nature. He points out in an Opening Address (Mayor 1994: 1-6) to a 1994 UNESCO Lifelong Learning Conference in Rome, that living in and from complex ecosystems, these people have an understanding of the properties of plants and animals, the functioning of ecosystems and the techniques for using and managing them that is particular and often detailed. His address continues that in rural communities in developing countries, locally occurring species are relied on for, sometimes all, foods, medicines, fuel, building materials and other products. In addition, he says that peoples’ knowledge and perceptions of the environment, and their relationships with it, are often important elements of their cultural identity. Most Indigenous people make use of traditional songs, stories, legends, dreams, methods and practises as a means of transmitting specific human elements of traditional knowledge. Sometimes they are preserved in artifacts handed from one generation to the next. In the *context* of Indigenous knowledge systems, there is usually no real separation between secular and sacred knowledge and practise. They are one and the same. In virtually all of these systems, knowledge is transmitted directly from individual to individual.

Onu (1990), opined that participation in various farmer social organization is generally considered an important variable that enhances farmers’ adoption of new practices Nigerian farmers who participate actively in the life of their communities, membership in, and leadership of social organizations such as former co-operative societies, thrift and credit societies, church organizations, social clubs, age grades, village council and contact farmership etc are more likely to be exposed to communication message that are related to farm innovations and adoption more than their other counterparts due to group dynamic effects.



Source: Rogers (1995).

Fig. 2. Variables determining the rate of adoption of innovations

3. RESEARCH AND DEVELOPMENT REGARDING INFORMATION AND KNOWLEDGE DISSEMINATION AMONG CASSAVA CO-OPERATIVE FARMERS

Researches and development into cassava crop are not recent in Nigeria and in Africa as a whole. Government’s intervention and efforts of non-government organizations (NGOs) in the cassava sub-sector have led to a number of measures and interventions both nationally and continentally since 1970’s by International Fund for Agricultural Development (IFAD), World Bank, Food and Agriculture Organisation (FAO) etc. IFAD has a mandate, unique among such institutions to combat hunger and rural poverty, focusing in particular on the low income food deficit countries that receive well over 80% of its loans. It directs funding and mobilizes additional resources on concessional terms to finance rural development projects involving the world’s poorest populations; small farmers, landless poor, artisan, fishermen, nomadic herdsman and poor rural women. The aim is to increase their food production, raise their

incomes, improve their health, nutrition and educational standards, and ensure their well-being in a sustainable and environmentally safe way (IFAD, 1998).

Cassava is a major source of dietary energy for low income consumers in many parts of tropical Africa, including major urban areas. In line with its adaptability and tolerance, the Food and Agriculture Organisation (FAO, 1998) indicated that Cassava (*Manihot esculenta*) is grown over a harvested area of 16 million hectares with a global production of 161 million tones (1995), cassava is one of the most efficient crops in biomass production. In comparison with many other crops, it excels under sub-optimal conditions and can withstand drought conditions. The five highest producers are Brazil (16%), Nigeria (13%), the Democratic Republic of Congo (11%), Thailand (10%) and Indonesia (10%) of global production.

In a broader sense, it targets the “poorest of the poor” and it ensures food security for all. The Cassava Multiplication Programme (CMP) of the International Fund for Agricultural Development (IFAD) is one of the numerous agricultural development programmes aimed at increasing production and is therefore essentially growth – oriented, with the understanding that such growth will eventually induce development on the part of farmers, reduce hunger among the larger populace and increase their economic status. Romanof and Lynam (1992) argue also that cassava plays a famine prevention role; where cassava is widely grown, famine rarely occurs because cassava provides a stable base to the food production system. This is one of the reasons why IFAD focuses on project – type interventions to alleviate human sufferings in food availability through a collective efforts and participatory approach.

According to FMANR 1997,v) “the IFAD-assisted Cassava Multiplication Programme (CMP) was conceived following severe attack on cassava crop by two alien pests, cassava mealy bug (CM) and cassava green spider mite (CGM), in the late 1970s and early 1980s and the resultant decline in production. At the instance of the Federal Government of Nigeria (FGN), the IFAD approved a loan of United States dollars \$12.05 million in 1986 for cassava improvement programme in the Southern State of Nigeria.

According to IFAD 1994:4), “Cassava is a crop of the poor and occupies mainly agriculturally marginal environments. These and other features endow it with a special capacity to contribute to food security, equity, poverty, alleviation and environmental protection”. Improving this crop is a way to direct various benefits toward the poorest of rural populations. Several efforts have been directed towards this by the FGN in contributing to efforts to distribute improved cassava planting materials since the inception of the CMP of IFAD in 1986. Since the development and gradual introduction of the tropical manihot selections (TMS) i.e new cassava varieties, hectare yield has improved significantly over the use of the old varieties. According to FMANR (1999:3), ‘the new varieties have demonstrable high yield potentials of 30 – 35 metric tonnes per hectare well above the indigenous varieties which yield less than 10 tonnes per hectare. The major problem with the breeding programme was the slow pace of development and long delay in the release of new varieties’.

The new TMS varieties are gradually spreading to all the nooks and crannies of the rural areas and the relevance of farmers on fellow farmers is high regarding the spread and acceptance by them. Since the TMS is a new innovation and idea, the readiness to accept them and put them into practice varies from farmers to farmer depending on each farmer’s previous experience with new ideas; the personality of the farmer and the amount of land and other resources available at his disposal.

Frequently, when ideas about the TMS are shared with friends, seed materials are exchanged; new products gain recognition usually along trading routes, local markets and farmers’ forum meetings. Agricultural ideas relating to the TMS have also enjoyed much dissemination from the extension workers attached to the ADPs in growing areas. According to FMANR (1997:5), “the extension activities of the ADPs led to the rapid adoption of improved cassava varieties and expansion of the area planted to cassava in the major cassava producing states with the result that the new varieties are progressively replacing the traditional ones. In most of the developing countries, the reliance of farmers on fellow farmers is high regarding research and extension services than on government extension officers. At local and regional level, the ability of farmers’ organisations to influence research and extension depends on the structure of the system itself.

In a decentralized system, farmers organizations tend to have better access to individuals, within the system as they are physically closer at hand. This is very common at village and rural levels in the cassava growing states of Nigeria. Friends and relations constantly bring about innovations and exchange ideas, seeds of crops, planting materials of cassava among themselves and this system seems to be much more efficient than the conventional government extension services.

Spontaneous diffusion of technologies (that have been proved successful) occurs frequently when ideas are shared with friends, seeds and materials are exchanged, and new products gain recognition along trading routes. Local markets or meetings may be important venues for sharing agricultural ideas. A great variety of method -drama, song, Jokes – may be important locally to carry agricultural messages. There is now increasing recognition of the importance of indigenous common networks (Box, 1989; Simpson, 1994).

In line with the above, Veldhuizen et al (1997) agree that farmers may indeed play an important role and take over responsibility in spreading experience on agricultural innovations. This is known as farmer-based extension. Farmers distinguish land races by local names which are often descriptive of the physical characteristics of the plant, such as the colour of certain parts, height and canopy size, yield potential, bulking period etc. Such names may also describe the original source of the genotype, such as the place or institution from which it was introduced for the first time, or the individual who brought it originally. The local names may also be an indication of an event which coincided with the introduction of the genotype in the village (Jones, 1959). Examples are Maadan, Olengasiya, Oreke, Mafamipa, Oko Iyawo, Dalejoro etc in Western Nigeria. Involving farmers’ organization in the innovation, adoption and spread of some varieties of crops and technologies has proved very successful in some other parts of the

world. Tables 1 and 2 below represent the findings from a research work conducted on knowledge about the new cassava varieties in Southern Nigeria between 1997 and 2001:

Table 1. Distribution of Respondents by Traditional and Social Status

S/N	Traditional/Social Status	Frequency (No.)	Percentage (%)
1.	Village head	11	3.3
2.	A sectional head	41	12.4
3.	A chief	14	4.2
4.	An ordinary member	195	58.9
5.	A politician	38	11.5
6.	A club member	19	5.7
7.	A religious leader	13	3.9
8.	A musician	0	0
	TOTAL	331	100.0

Field survey, (2000).

Table 1 show that 11 (3.3%) of the cooperative farmers were village heads, 41 (12.4%) were sectional heads, 14 (4.2%) were chiefs and 195 (58.9%) were ordinary members. The table also shows that 38 (11.5%) were party politicians, 19 (5.7%) were members of social clubs while 13 (3.9%) were religious leaders. None of the farmers was a musician.

Table 2: Distribution of Respondents Regarding Knowledge About TMS

S/N	Source of Knowledge	Frequency (No)	Percentage (%)
1.	Friends	38	11.5
2.	Agricultural bulletins	1	0.3
3.	Newspapers and Magazines	1	0.3
4.	Extension workers of ADP	256	77.3
5.	From Radio	0	0
6.	Market/Trading routes	0	0
7.	Cooperative Societies	6	1.8
8.	From government	0	0
9.	NGOs	4	1.2
10.	OFAR	25	7.6
	Total	331	100.0

Field survey, (2000).

Table 4 shows that 38 (11.5%) of the cooperative farmers got their knowledge about TMS from friends, 1 (0.3%) from agricultural bulletin, while 1 (0.3%) from newspapers and magazines. The table also shows that 256 (77.3%) got their knowledge about TMS from extension workers of ADP, 6 (1.8%) from cooperative societies, 4 (1.2%) from non-governmental organizations and 25 (7.6%) through On-Farm Adaptive Research (OFAR). None got the knowledge from radio programmers, market and trading routes and also from government sources

4. STRENGTHS AND WEAKNESSES OF THE LINKAGES AND NETWORKS AMONGST COMMUNITIES TO PROMOTE INCLUSIVE INNOVATIONS FOR SUSTAINABLE DEVELOPMENT

Cooperation and active participation by farming communities in government programmes are variables required for rapid development and transformation of such communities particularly in tropical Africa. Linkages and networks amongst communities are taken to mean cooperative movements among the rural farming communities in this paper. There is no doubt that functional cooperative movements are synonymous with rapid agricultural transformation of the rural areas.

According to Bello (1996:41) "Co-op is a natural phenomenon engendered and nurtured by inbuilt survival instincts. This has been demonstrated by all living creatures – man, animal and plants – in one aggregation or the other..... On the spiritual plane, religious concepts were formulated, believed and acted upon by people of such sect only because there is a mutual agreement to share and worship together, i.e. co-operate" In getting the desired cooperation, the traditional institutions as well as local societies and unions must be adequately empowered to maximally function. Traditional and customary institutions in the rural areas are given due considerations because of their significant roles they play too in adoption and spread of any innovation. By customary institutions, we refer to those relationships that have long been the basis of social organization. These include kinship networks, tenure rules, local concepts of "the community" the rules governing gender, relationships, local criteria determining who has authority and how decisions get made etc. these are the rules institutions that are most deeply band into the organization of rural life, and which make most sense to, and have most hold over rural people (Moorhead and Lane, 1993).

The history of co-operative (co-op) movement is as old as man. The present efforts of scientists and technologists worldwide towards globalization are as a result of everyday co-operation which is fast yielding good results. The all encompassing benefits of co-operatives are no doubt evident in our everyday life and the continual exploitation of these benefits will make life more meaningful to all. The impact of all these is the newer concept of "Global neighborhood" instead of the old term of "Global village" which has made the world at the reach of all and sundry with the press of a button from an electronic terminal of a computer set. In rural areas, informal co-operation is demonstrated when resources are pooled by individuals to clear farm land, cultivate, harvest, process farm produce, hunt animals, build houses or engage in social and cultural activities. One principle that stands out clearly in co-operation (be it economic, non-economic, social or cultural) is that it results in the attainment of a desired objective of the relevant units (Nweze, 1997:1).

In Bassar, Togo (two years after the facilitator of World Neighbours left), 12 village communities were continuing to meet annually to analyse and evaluate the previous season's experiments and schedule the research agenda for the coming season. At this meeting they also choose a limited number of delegates to make the rounds of various agricultural development programmes and research stations, actively seeking new ideas and technologies and to report back to their communities (Gubbels, 1988). Mosse (1993), for instance, argues on the basis of evidence from the Kribhco rain-fed farming project in Western India, that village appraisal and planning initiatives that did not build on existing authority structures were likely to be obstructed by village leaders. Quoting the works of Rivera-cucicanqui (1990), Bebbington et al (1994) wrote on a similar lesson which comes from the experience of an NGO research and extension project working in the Bolivian Andes, which tried to create local organizations. These organizations were intended to be the village – level counterpart for the programme. Consequently, the organizations created by the NGO project attracted the interest of these young adults, who saw them as a means of gaining authority that traditional rules did not allow, and the project unwittingly created parallel authority structures in communities that essentially pitted the young adults against the old. In this case, the attempt to create and then work through local organizations led to conflict in communities rather than a more farmer responsive and effective research/extension programme.

Balbariho (1994) reported in Veldhuizen et al (1997) stated that farmer experimenters join annual research review meetings at research institutes, as done by FARMI in the Philippines. Ability of these farmers to participate in formal meetings and contribute in adoption and spread of innovations are as a result of their knowledge of culture, local and traditional documentation. Documentation by farmers of their experiences in FPR activities plays a very important role in spreading the ideas; it helps to make these experiences accessible for other villages and areas. Traditionally, experiences are kept in the memories of the people, or are translated into songs, jokes or simple drama for the benefit of future generations; this is a local communication means of preserving culture and farming.

The dominant roles that cassava farmers play in tropical Africa in areas of staple food supplies cannot be overemphasised. The rural nature of the cassava farmers makes poverty to be prevalent among them. There is growing recognition that poverty is not only about income, but about social risks such as discrimination, unequal distribution of resources and power in households and limited citizenship (CPRC, 2008). "Cassava is a crop of the poor, and occupies mainly agriculturally marginal environments. These and other features endow it with special capacities to contribute to food security, equity, poverty alleviation and environmental protection" (CIAT, 1999:4).

Infact, cassava is also an important source of cash income for poor farmers, as well as prosperous ones. Apart from its potential as a source of increasing total income from agriculture, cassava may also play a role in achieving a more egalitarian pattern of income distribution and stability thus:-

- a. Cassava may be harvested and sold in small amounts at frequent intervals. It can provide a steady flow of cash income over many months
- b. It is relatively easy to combine with domestic chores and other income-earning activities on a daily or weekly basis. This is an advantage, especially for rural women, who may find it difficult to specialize, even temporarily, in harvesting, processing, and or marketing a single crop, and who lack the working capital or social position to mobilize the labour of others (Guyer, 1980).
- c. Cassava may be harvested and sold in bulk to take advantage of favourable prices or provide producers with liquidity to finance lumpy consumption of investment outlays. The in-ground, self storing capacity of cassava permits flexibility in harvesting and marketing which can be advantageous to specialized, fully commercialized producers, as well as to smaller, diversified, and/or partially commercialized ones.

Berry (1993) reported that in Nigeria and Congo Democratic Republic, and elsewhere, there are both large and small-scale farms on which cassava is grown entirely for sale, by both full – and part-time farmers. In Nigeria for example, in the mid-80s, rising food crop prices and the oil recession reduced economic opportunities outside of agriculture, and many people (including wage and salary earners, professionals, traders etc) established cassava farms. Such investors used working capital from other sources to hire labour for land preparation, planting and initial weeding; then sold the crop in the ground to buyers who assumed full responsibility for further weeding, harvest and sale.

These are indications that the crop is indeed a poverty alleviation crop for producing households.

5. RECOMMENDATIONS ON WAYS TO HARNESS INDIGENOUS KNOWLEDGE SYSTEMS TO PROMOTE INCLUSIVE INNOVATIONS FOR SUSTAINABLE DEVELOPMENT

Innovations at all levels of human endeavours are mostly directed at making life pleasurable and sustainable for mankind in day to day interactions within their immediate and outer environments. Innovation should benefit all and sundry within a society in diverse ways to assist in combating the menace of poverty. The followings are hereby recommended:

- Awareness and mobilisation efforts of National governments should be intensified in the areas of the introduction of new varieties of crops particularly staples and also helping to make them available to farmers at subsidised rates
- Development of IKM system among rural communities through a cost effective strategy and information retrieval system.
- Government agencies and NGO's should assist in encouraging diversified livelihoods of the rural people by helping them to understand their bio-physical environments through waste to wealth strategy and entrepreneurship education.
- Traditional institutions should create awareness and encourage people to belong to social and religious organisations as these have been found to increase innovation techniques and adoption rates.
- Local agencies like the cooperatives and farmers unions should ensure that new innovations, technological and scientific feats build on existing indigenous knowledge.
- Establishment of farm settlement schemes and encouragement of improved processing techniques of cassava into various products eg- cassava flour to gradually replace wheat in baking of bread etc.
- Wide uses of various mass media – TV, radio, posters, hand bills, bill boards etc in the dissemination of various research results among farming communities should be encouraged.

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