INTERWEAVING OF INDIGENOUS KNOWLEDGE AND THE MANAGEMENT STRATEGIES TOWARDS A SUSTAINABLE AGRICULTURAL DEVELOPMENT IN SOUTH-WESTERN NIGERIA.

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ABSTRACT

Knowledge is power when used positively to the benefits of mankind and very invaluable when shared and transmitted beyond the frontiers of a Community. Knowledge gained or transmitted through generations should not be static as external initiatives are bound to constantly moderate such knowledge. Man over centuries have helped extensively on how knowledge is generated, exchanged, transformed, consolidated, shared, retrieved, disseminated and utilized most especially in agriculturally related fields of crop production and animal production. This paper takes a cursory look at the conceptual meaning of indigenous knowledge, the nature of indigenous knowledge and agriculture, sustainable development in indigenous knowledge management and specific examples of viable indigenous knowledge in agriculture. Recommendations to improve on the existing situations are given to government and private institutions.

INTRODUCTION

Every human knowledge has its own origin. Knowledge is held, controlled and generated by different people in a society.
Knowledge is not evenly distributed. Different individuals are recognized as "Specialists" in particular fields and are the key in the transmission and interpretation of knowledge within a community or family (Swift, 1979, Fierman, 1990; Go and Go, 1993). The questions that readily come to mind are- How do we have knowledge?, How do we know what we knew? How is knowledge shared and transmitted? As Fairhead (1990:23) asks:

> *Do people 'know', 'believe', 'think', or 'suppose' all this (indigenous technical knowledge) and how much disagreement is there? How do farmers came to 'know' and how do they become confident in what they know? Who talks to whom about it?*

The Oxford English Dictionary defines 'indigenous" as: 'born or produced naturally in a land of religion; of, pertaining to, or intended for the natives". It is associated with 'oral'-information is not written down and thus remains outside recorded history.

It is a recognized fact that knowledge is not static as local people constantly react to external initiatives and also exchange their own ideas with innovators and external bodies, knowledge is closely related to "power". Bhaskar (1979) indicated that knowledge and power are both 'ever present conditions' and continuously reproduced outcomes of human agency. The power of knowledge has propelled man since time of creation to be involved in farmer experimentation; and, trial and error on the farm in respect of planting crops and raising livestock for use. These have led to the examination of various alternatives which have assisted in progressive learning on the farm. Braidwood (1967) argues that a number of innovations in farming have occurred without intervention from outside and referred to this as "atmosphere of experimentation" since the period of Neolithic farmer when agriculture started.

In the words of McCarthy (1984:54)"
"The subject of knowledge is neither in transcendental ego nor an absolute spirit but an embodied, labouring subject whose capacities develop historically it? the changing forms of the confrontation with nature that is the perpetual natural necessity of human life"

The intimate knowledge of local situation is often referred to as These are ideas, experiences, practices and information that either have been generated locally or are generated elsewhere but have been transformed by local people and incorporated into that way of life. IK is deeply embedded in the local, cultural, social and economic context. It is not abstract like scientific knowledge; it is concrete and relies strongly on intuition, historical experiences and directly

perceivable evidence. (Veld huizen, Bayer and Zeeuw; 1997).

In the words of Posely (1985), indigenous knowledge is a rich and often untapped source of information that is specific to a given locality.

Certain questions come into fore when a contextual meaning of "Indigenous knowledge" is sought According to Scoones and Thompson (1994), such includes:

"How is knowledge produced? What are the differences between indigenous knowledge and exogenous knowledge? Who creates the distinction between these forms of knowledge, bearing in mind that many of the scientific underpinnings of Western knowledge are derived from non-Western (Indigenous?) Sources?

To answer such questions it is necessary to analyse the ways in which knowledge is generated, exchanged, transformed, consolidated, stared, retrieved, disseminated and utilized".

This paper reveals the conceptual meaning Nature, and the understanding of the components of indigenous knowledge, the concept of sustainable development in indigenous knowledge management, specific examples of IK from Nigeria and other parts of the world, and the management initiatives of the local farmers in IK for agricultural development.

The nature of indigenous knowledge and agricultural development

Indigenous knowledge (IK) is local knowledge that is unique to a given culture or society (Warren, 1990). It is a knowledge that is nature and unique in a given culture or society. Titilola et al (1993) called it the sum of experiences and knowledge for decision making in the face of familiar and unfamiliar problems and challenges. According to Atteh (1990) indigenous knowledge is identifiable management strategies employed by rural people to exploit the environment.

The history of indigenous knowledge (IK) is as old as the human race. This knowledge has always been very important for the people who generate it and it is a matter of survival for them. Indigenous knowledge is therefore a localized knowledge that is unique to particular societies and ethnic groups. It is the basis for local level decision making in agriculture, health care, food preparation, education, natural resources management, and a host of other activities in rural communities. Such knowledge is passed down from generation to generation by words of month and it has a host of potentials.

Farmers have been primarily seen as adopters of technologies introduced from outside but not as creators of their own solution. The image we have come to accept according to Schultz (1964) is that peasant agriculture is stagnant and that impetus for change must come from extraneous credit, education and new technologies. Any innovations or technological breakthrough made by farmers on their own were thought to be accidental and to have developed unsystematically through trial and error. A small but growing literature however challenges this view of the passive, small scale producer in developing countries. Rhoades (1987) and Richards (1987) argued that the archaeological and historical records show a long strings of important agricultural technological breakthroughs made by farmers in traditional societies although their rapidity and diffusion might have been slower than innovations in modern agricultural science.

Recent work on sustainable agriculture according to Titilola and Marsden (1995) focus on the utilization of fewer external inputs and on utilizing the traditional knowledge of farmers. This is on the assumption that their methods, having been tried and tested over generations represent the best fits under circumstances which are often marginal. Also, under conditions in which the concentrated use of chemical fertilizers, pesticides and herbicides are causing concern for human health, most of the farmers return to their indigenous practices even after adopting, "recommended packages".

According to McCorkle (1994), farmers are a rich source of agricultural research. If their micro-economic knowledge and ethno scientific skills can be put to work alongside Western-Scientific techniques and knowledge, agricultural research and development is sure to profit.

Concept of sustainable development in indigenous knowledge management

Over the last few decades, the concept of sustainable development has enjoyed so much attention with Non-governmental agencies, donor agencies, governmental agencies, International bodies etc. In respect of human needs in all facets of endeavours especially in agriculturally related fields.

It is a continuous improvement on the management of resources to satisfy changing human needs while at the same time maintaining or enhancing the quality of the environment and conserving natural resources in their day to day activities.

Sustainable development posses the following characteristics;

- ❖ economically viable at a risk level which is acceptable: ecologically sound to resist shock and stress::
- ➢ socially just in respect of equal access to assets in respective of socio-economic background

In relating these attributes to indigenous knowledge management, it is instructive to understand how the natives accept and store information for future uses on their various farms.

The detailed knowledge of the rural people over what they have been to for centuries usually enable them to have continuous adaptation to social and ecological change. However, many modern interventions and colonial administrations have ignored the importance of local knowledge and skills, resulting in an erosion of knowledge and an undermining of formal and informal institutions that were central to sustainable management of agricultural biodiversity. These institutions include rules about use of biological resources and distribution of benefits, tenure, conflict resolution mechanisms and methods of enforcing rules, cultural sanctions, and beliefs (Pimbert, 1999).

Our local and indigenous knowledge have been relegated and some have even been discarded as a result of some religious beliefs that have been counterproductive on the part of the natives. Of recent, farmer experimentation have led to the development of more indigenous knowledge which have yielded positive results in terms of production outputs, processing and storage techniques.

It is commendable that people will opt to use natural resources sustainably only if such actions constitute part of a socio-economically optimal livelihood strategy (Milner-Gulland and Mace, 1998).

Example of viable Indigenous Knowledge

Circumstances of farmers vary from one year to the other, thus all farming system must be dynamic. The indigenous knowledge of some countries are herewith discussed;

1. Indigenous Knowledge in the Maldives.

Traditional pest control practices which rely on local knowledge and materials have traditionally been a vital component of farming system in most parts of the world. Some amounts of processed food are adequately stored in sealed containers on the outside of smoke fillied kitchen, environment which is not favourable to storage pests. The major pest problem on the field and store are caused by vertebrate .such as rats, fruit bats and birds. To combat attacks by these pest, a variety of resourceful traditional pest control practices were employed which are still in use today. In addition too some of these methods are practiced in several parts of Nigeria and some other African Countries, They are described below:

(a) Barriers and Wrapping

Rats cause serious losses in coconuts and cereals especially maize. As such barriers are placed around the trunk of the trees. A large palm leaf splited along the midrib was wrapped around the trunk below the crown and another set wrapped in the opposite direction. This forms an effective barrier to climbing rats.

Wrapping of tin sheets completely around the trunk of the tree also prevents the rat from getting a foothold. Maize cobs can also be protected by enclosing them in a large breadfruit leaf or the maize leaves themselves.

(b) Traps

Rats were caught by means of stone or stick traps. Stone-traps are made using a large flat piece of coral stone levered over a bait of dried fish or coconut.

(c) **Scaring devices**

Use of tin clangers and other hand operated scaring devices are fixed on top of trees to chase fruit bats, house crows and water hens that damage valuable fruits. These devices are activated by periodically pulling the strings during the night. Oil lamps and human effigies are often placed on trees while fishing nets hung over fruit trees to prevent access to the fruits.

(d) **Handpicking**

Using fine coral gravel in the crown of coconut tree would deter rhinocerous beettle from burrowing and feeding on the growing point of the palm tree. Group of people would also catch the beetle by handpicking and destroying them.

A giant African snail, a voracious feeder of vegetable and fruits was controlled by handpicking too, similarly placing ash around the base of plants or digging trenches to check the snail movement was also effective.

(e) **Burning**

The practice of burning which is used in the bush fallow system heats the soil thus helping to keep down the number of nematodes and soil borne pathogens while simultaneously giving a nutrient boost to the soil

An Indigenous Knowledge Post Harvest Technology in India

The use of neem leaves in storage bags to prevent damage to grains (wheat & paddy rice) by pests. For generations this practice has been employed by farmers in four major states in India to protect wheat and paddy, the leaves are used to line the storage, container in which the grains were stored and this prevents the pest from entering the grains.

Neem leaves are environment friendly and cause no damage either to plant and animal or to human beings. The technique can be used for other types of grains elsewhere in the country and in other parts of the world.

3. **Indigenous Knowledge in Nigeria**

In Nigeria, crop varieties are classified by farmers based on a number of criteria such as soil and water requirements, cropping season, crop duration and time of sowing. According to Adekunie (1995) and Osunade (1988) Yoruba farmers determine soil types year round, irrespective of season, while soil types were identified by their texture and colour characteristics, certain grasses, shrubs, trees, weeds and were defined principally by texture.

In Kabba area, Nigeria according to Atteh (1980), some leaves are never used for mulching, while some plants are used in homes to drive mosquito away. Others are burnt as pesticides and some are, planted along the village perimeter to prevent snakes from entering the housing area.

According to Oga (1992), farmers used smoking of maize over the fireplace for maize storage and preservation. Smoke fumigation according to him is used to control insect pest which are the principal cause of damage to maize.

Cassava is stored by leaving the tubers unharvested in the ground until needed.

Ulliwishewa (1992) in his submission said the indigenous control methods for pests and diseases which are time tested, environmentally sound and economically viable include:-

(a) **Biological Control Method":** Traditional farmers use birds, a major biological agent, in pest control, various methods have been devised by farmers to attract, birds which feeds on harmful insects.

(b) **Magico - religious Practices:-** These are through offering to local direction offering consisting of a mixture of roasted pulse food, flowers and lighted oil lamps. The roasted pulse food attract the birds while the lighted oil lamp attract insects. The birds feeds on the insects thus reducing insect population.

(c) **Botanical Pest Control Methods:-** According to him, many plants have a protective mechanism which assist them in resisting and repelling pests. Many plant species produce substances which assist them in resisting and repelling pests Many plant species produce substances which repel or poison the insects. Various parts of these plant such as fruits, leaves, bark and seeds are used in various ways to control pests e. g pawpaw.

Other indigenous knowledge which are time tested include;

(a) Use of a piece of charcoal placed on grounded beans, for preparling a local delicacy known as bean cake (akara),

prevents the ground beans from getting sour before cooking.

(b) Likewise use of tied leaves inside the pot of wrapped steamed beans ensure that the wrapped steamed beans is well cooked especially when the food is prepared by a pregnant woman.

For sustainable agricultural development, farmers own science ought to be incorporated into the development programmes making farmers part and parcel of development efforts. The farmers experiences must be taken into considerations when managing initiatives or extending innovations.

Indigenous knowledge in Livestock Production

Diversified indigenous technologies abound in the areas of livestock production, processing and storage of the animal products and by-products. In Nigeria and some other countries of Africa,some age-long practices in the lives of our people have been gradually eroded due to civilization..

Some indigenous knowledges practiced in livestock production include;

- The use of bean seeds in dairy milk preservation over a reasonable period of time. Bean seeds are usually added to freshly produced milk to prevent them from getting sour during transportation over a long period. This is mostly used by the Fulani's in Nigeria.
- Animal dungs and faeces when dissolved in water and sprinkled on crops act as repellants to some pests on the farm thereby preventing them from destroying valuable crops or eating the leaves, flowers, fruits and seeds e.g. Maize, Yam etc.
- Some local herbs when squeezed in water have been known to effectively control diarrhea in some ruminants in Northern Nigeria.
- Sun-drying is a form of Ik which has proved very efficient in preserving animal meat over a very long period in Northern Nigeria. The hot sands of the desert help in this processing and preservation.
- Local fowls (Gallus gallus) have been used to hatch eggs of guinea fowls, turkey, geese etc in some parts of South Western Nigeria and middle belts Local fowls have good Mothering abilities which put them in good stead to perform the function better.
- Wastes from Cattle especially the Urine have medicinal values especially for children that suffer from convulsion and shocks.
- Cement ponds for fish rearing have gained prominence especially with the knowledge that poultry waste has a curing potential on the toxic chemical produced from cement.

Management initiatives of local farmers in agricultural development

The high point of improved agricultural development is in the understanding, regular and continuous use of local technologies which have been generated and disseminated among the rural farmers in a particular area.' The process of technology development is closely linked with a process of social change.

Rural people's capacity to cope with and stimulate change will be of crucial importance if the challenge of raising the level of agricultural production while safe-guarding the land is to be met. It has become increasingly evident that scientists alone cannot generate site specific technologies for the wide diversity of conditions of resource-poor farmers throughout the world, or even within one country (Reijntjes et all, 1992).

It is imperative to recognise that farmers hold these to their future development. Regular encouragement amongst farmers, their groups and the communities to review regularly and systematically what has been achieved in making them less dependent on outsiders regarding local exchange of ideas and technology propels them to greater heights.

NGO's in Indonesia have facilitated such review meetings every three months for more than 10 years now (Musante and Kingsley, unpublished). Experiences from other parts of the world will put this in a better perspective.

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 programmers and research stations, actively seeking new ideas and technologies, and to report back to their communities (Gubbels, 1988).

In Tabacundo Ecuador, the radio school service organized a weekly pregrramme called "mesanje campesino" [the peasants message] which is produced by farmers for farmers with help of 'radio auxiliaries' Volunteers who have received a short training in how to operate a cassette recorder. The farmer recorded audio - materials of their own choice; This simple initiative have encouraged the communities to increase exchange amongst group of communities. Twenty villages have formed local associations since the beginning of the programme (O'Sullivan - Ryan and Kaplan 1979).

RECOMMENDATIONS

It is recommended that the management initiatives into IK shoud also take the form of the following or at best an adaptation from same.

- Compilation and processing of information with reference to experiments undertakes by farmers [Scheverimier' [1988]
- Productions of 'idea-kits"; these are collection of a great number of potentially relevant technological options, together forming a pool of ideas which the extension worker can use in dialogue with local farmers. Field workers will use the information contained in the kit to develop materials in local languages and adapt illustrations where necessary (Gonsalves, 1990).
- Production of folk/drama and audio/visuals, such as in the Kenya Woodfuel Development programme in Kakamega District. Local actors and comedians were employed to stage an amateur drama incorporating local sayings 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 provides a reflection of the wood fuel 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 (KWAP, 1991).
- A comprehensive approach to the extension of IK among local farmers should be developed among farmers in groups or in co-operatives. This will quicken the rate of information exchange among the peasants.
- Packages of some IK can be sold outright by peasants to government research institutes for them to improve on the procedures and applications of such IK before releasing them for the public. An example of this relates to improved processing techniques of Cassava productions in South Western Nigeria.
- Regular radio and television programmes can be initiated to further disseminate new ideas on IK across a large spectrum of peasant farmers in the rural areas. This assistance could be rendered by NGO's that are solely committed to community and rural development.

SUMMARY AND CONCLUSION

Overwhelming evidences abound on how the peasant farmers over centuries ago have been able to manage their domestic problems in relation to crop production, livestock production, soil erosion, pests management, diseases management, storage, processing of farm produce etc. Indigenous knowledge are Oral information passed on from generation to generation. It is an established fact that most scientific knowledge take their roots from indigenous knowledge and they have proved to be very efficient when administered appropriately. When such knowledge are combined with external initiatives, the level of efficiency increases.

The impact of the colonialists affected the Ik development negatively resulting in the erosion of knowledge and undermining of our traditional values in respect of the conservation of our ecosystem and agricultural biodiversity. Efforts should be constantly made to unravel the various 1k in respect of Livestock and crop

production in areas of processing, storage and marketing.'

Getting to know more about the 1k has helped a great deal in areas of traditional medicine and alternative medicine as practiced in some African and Asian countries. This goes a long way to confirm the multidisciplinary nature of agriculture. Efforts should be made to have a detailed dossier of all known 1k in different fields of agriculture for use by research institutes to verify their level of potency. It is believed these will go a long way to improve the much trumpeted sustainable agricultural development.

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