THE NEGLECT OF ENDOGENOUS KNOWLEDGE BY LAND USE PLANNERS IN AFRICA: A RETHINK FOR FOOD SECURITY.

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ABSTRACT

Conventional knowledge in agricultural land management being sponsored by World Bank and other international agencies in order to achieve food security in Africa is not being sustained by the rural people/ farmers at the end of the funding period. The observation been made is that the farmers end up reverting to their endogenous technique of managing their land for food production after the expiration of the loan. This is because the conventional technique they were made to adopt is financially and culturally unsustainable by them. This simply informs that endogenous knowledge of land management exists but unfortunately has been relegated by the planners who disseminate the conventional knowledge alone through the agricultural extension workers to the farmers. The importance of endogenous land management practices is therefore, brought out by citing case studies from some parts of Africa. It is therefore recommended that, endogenous knowledge of land use and its management should be integrated into the school curriculum side by side with the conventional. Ultimately, both knowledge should be integrated and applied in practice in order to have their synergistic effects on land productivity for food security in Africa.

1.00 INTRODUCTION

In Africa, over 80% of the people live in the rural areas and more than 60% derive their livelihoods from agriculture (Abalu, 2008). In spite of the large percentage of rural farming populace using outsiders' conventional knowledge in agricultural production in many parts of Africa, yet, low productivity is still recorded and un sustained by them. The conventional

knowledge in Agriculture has been internationally funded by the World Bank amongst others and disseminated to the different parts of Africa in the last three and a half decades. At the end of the funding the application of the knowledge became un sustained

Against the background of the magnitude of this problem, the first goal of Millennium Development Goals (MDGs) articulated at global level is "Eradication of extreme poverty and hunger". This problem yearning for solution has been classified under Target 1c; "to halve, between 1990 and 2015, the proportion of people who suffer from hunger which is due to food insecurity". In Nigeria, President Yar'adua's 7point agenda also list "Food Security" as one of the top priorities.

Therefore, it can be stressed that low agricultural productivity by the farmers who are the majority rural populace has led to poverty and food insecurity in Africa (Abdulrahim and Shehu, 2008). The unfortunate "three sided dice" should perhaps not have been so, if the factors of agricultural production have been taken seriously by complementing conventional knowledge with endogenous knowledge which is culturally and financially amenable to the rural farmers in managing our agricultural systems. This is especially so in the aspect of land which is germane to agricultural production and the subject matter of this paper.

This paper is divided into five sections. Besides the concept of land/soil, endogenous knowledge and food security in section two, the neglect of endogenous knowledge in favour of conventional knowledge and practice is discussed in section three. The fourth section contains the case studies of endogenous knowledge practices and its relevance in sustainable agricultural practices amongst the rural farming people for sustainable development. The concluding remarks are presented in the last section.

2.00 CONCEPT OF LAND, ENDOGENOUS KNOWLEDGE AND FOOD SECURITY

Land is a fundamental resource for human existence. It is defined in legal conception as *Quicquid plantature Solo Solo Cedit Maxim,* meaning that, land include the surface of the earth, the subsoil and the air space above it, as well as all things that are permanently attached to the soil. (Olawoye, 1974). It includes streams and ponds.

To the African farmer, land simply means the soils on which he plants his crops. Soil serves as medium of nutrient supply and mechanical support for plants. The soils "lives" and can become "sick", or get well just like human beings; depending on how it is treated. Thus, improving the health of the soil is, all things being equal, tantamount to increasing food production for food security.

The managers of this land/soil in Africa and elsewhere are the farmers – the majority rural people who have their knowledge of land / soil management which is indigenous to them because they have developed the knowledge within their socio - cultural and physical environment and that makes it endogenous knowledge. Endogenous knowledge is largely constructed from past experience by the farmers and their adaptive capacity allows them to manage extremely complex systems. For example, in western Kenya, farmers have managed to sustain their families on less than one hectare! (Tittonell, 2007).

This endogenous knowledge in land use and its management possessed by the rural farming populace have been observed only to have been relegated and neglected by the agricultural land use planners through the extension workers. They do not take cognisance of endogenous knowledge of managing the land for sustainable agricultural production for food security.

Security, according to Longman Dictionary of Contemporary English, is defined as protection from danger or protection from bad situation. By deduction, food security means protecting food from danger or bad situation. Heterotrophies including human beings who are secondary consumers (omnivores) depend on food crops for existence. Therefore, the need for sustainable crop production for food security in order to avoid starvation is quite imperative. This is partly addressed in this short paper within the context of land management,

According to WHO, (1996), The outcome of the World Food Summit defined food security as “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”. From the definition, the concept of food security includes both physical and economic access to food that meets people's dietary needs as well as their food preferences. In many countries, especially in African continent, health problems related to dietary excess are an ever increasing threat, In fact, malnutrion and foodborne diarrhea have become double burden.

3.00 CONVENTIONAL AND ENDOGENOUS KNOWLEDGE.

Centralized urban and professional power, knowledge and values have flowed out over and often failed to recognize the knowledge of rural people themselves (Chambers, 1983; Rao, 2000;). That knowledge is spread from the outsiders to the rural people alone is also

acknowledged by Hatch, (1976) who noted that, "the development professions suffer from an entrenched superiority complex over the small farmers. We believe our modern technology is infinitely superior to theirs. We conduct our research and assistance efforts as if we knew everything and our clients nothing" The excuse often adduced to the under-rating of the indigenous knowledge is that the links of modern scientific knowledge with wealth, power and prestige condition outsiders to despise and ignore rural people's own knowledge (Gunther, 2002)

Furthermore, the association of outsiders /foreigners who possess modern scientific knowledge with wealth, power and prestige generates and sustains beliefs in its universal superiority. Indeed it believes that it is the only knowledge of any significance (Chambers, 1983). Even though, occasionally, the knowledge of the people at the "grassroots" has tended to be presented by outside observers they often represent their own professions and disciplines.

This is however, adduce able to the fact that none of these professionals are people from the grassroots, and therefore, grassroots knowledge is interpreted as "others" and by insinuation understood to be "primitive" or "unscientific" (Mwesigye, 1996). Professionals' knowledge is therefore said to have the task of "education" and "modernizing" local people. The professionals' claim is that, after all it is this knowledge which has made possible the cities, roads, railways, telephones, transports, schools, hospitals, medicines and guns which have penetrated and transformed many rural areas. By this understanding, to the uneducated rural people, they see and realize that this sort of knowledge, acquired through schooling leads upward and away from rural life to urban opportunities and rewards. Thus, they also on their parts develop inferiority complex compared to the outsiders and those among them who have acquired formal education and training to have a personal stake on the foreign system.

This is because whenever these possessors of outsiders' knowledge (modern knowledge) live and work either as a school teacher, health worker, agricultural extension staff believe that the knowledge and skills they have acquired are superior and that uneducated and untrained rural people are ignorant and unskilled (Chambers, 1983). This situation is however, unfortunate because, it further shows that the indigenes who possessed endogenous knowledge and have acquired this "modern knowledge" are already culturally washed out, intellectually debased and colonized to the extent that they had forgotten that they, apart from the so called 'modern knowledge' possessed their local / indigenous/ endogenous knowledge *ab initio* which they now neglect. Should they continue to neglect their endogenous knowledge in this way, who would then, promote their own endogenous knowledge? The extent of the neglect of their own developed knowledge is so grievous

that Chambers (1983) noted that; "the urban based professionals, specifically planners, in the third world countries right down to the lowest extension workers possessed a common assumption that the modern scientific knowledge of the centre is sophisticated, advanced and valid and conversely, that, whatever rural people may know will be unsystematic, imprecise, superficial and often plain wrong". These believe by most of the third world planners is akin to the cultural adage that "a bastard points at his fathers' house with left hand". To buttress this fact an interview was conducted on the local knowledge among the Shona people of Zimbabwe, by Mararike, (1996) with a specific question that, "I think the knowledge, which elders have accumulated over the years, was no longer needed by the present generation?" the respondent who is elderly in this reaction also promptly asked; "who wants to hear anything from an old man like me?" This response has two implications, one is on why extension work is conducted in the village and another is about the present discussion, which is on the disregard for existing stocks of endogenous knowledge. Evidences have shown that the extension workers go out to "teach" the villagers, not to "learn" with them or from them (Mararike et al, 1994). To them, development entails disseminating this modern, scientific and sophisticated knowledge to inform and uplift the rural masses. By implication, they already believe that the foreign knowledge is superior to their native (endogenous) knowledge, forgetting that, they can also uplift their rural masses by the application of the endogenous knowledge. Knowledge now flows in one direction only downwards from those who are strong, educated and enlightened, towards those who are regarded as weak, ignorant and in darkness. They forget that knowledge is a two way directional and circular process.

Therefore, they should also listen and learn from the farmers whom they are working for as well since they are to eventually apply the entire knowledge to be introduced to them (Acres, 1985; Warren et, 1989; Gunther 2002). The famers should have a say by way of contributing his acquired technological base on his long-standing experience in order to be successful in the practice. In other words, the famers and the foreign researcher should be partners in progress and not distancing each other. The worry is however; in as much as the indigenes who acquired this formal education turned away and refuse to apply their long acquired endogenous knowledge, who else would have convinced the foreigners who brought down the so called foreign knowledge that the indigenous/rural people's knowledge is relevant to their cultural environment if not even superior to the foreign knowledge?

Fortunately, in response to the latter question, social anthropologists have excelled in the study of indigenous knowledge and understood the rural people' knowledge (Warren et al, 1989; Warren, 1989; Sillitoe, 1998). Moreover, they have concentrated somewhat on remote and isolated people who often prove to have rich and complex endogenous

knowledge system (Abdulrahim, 2004). They have taken pains to experience cultures other than their own from inside, and to learn and understand the values and knowledge of those cultures. The result has therefore, been recognition of the complexity, variety and validity of endogenous knowledge system (Brokenshaw et al, 1980, Mararike et al 1994). This is indeed, one significant outlet for the outsiders towards understanding the extent of the neglect of endogenous knowledge, which is currently gaining recognition and popularity.

Other hindrances of endogenous knowledge from being recognized by the outsiders are many forces, which include feeling of prestige, lack of contact, problem of language, sheer prejudice and gap between practitioner and academic culture as well as because the knowledge is not written down (Titilola, 1993).

In the area of research, for example, in crop researches, export crops such as cocoa, rubber, sisal, cotton to mention but a few are concentrated upon, while neglecting researches on peoples' crops such as millet and sorghum for subsistence. In the sphere of livestock research concentration is in favour of exotic cattle to the neglect of goats and donkeys because they are localised. This is evident in the establishment of National Animal Production and Research institute (NAPRI) in Zaria, Nigeria, which concentrates on the research in respect of the exotic cattle. Similarly, little or no attention is paid to indigenous tree species in forestry research in support of exotic trees introduced by the foreigners. This discrimination against popularisation of local crops and livestock is factorised by capitalism.

These few highlighted hindrances made the outsiders not to have appreciated and learn from rural peoples' knowledge. However, the involvement of social anthropologists in understanding the endogenous knowledge would surely go a long way to facilitate chances of disseminating the need for the recognition and the application of endogenous knowledge side by side with the outsiders' knowledge.

4.00 CASE STUDIES ON ENDOGENOUS KNOWLEDGE OF LAND CLASSIFICATION AND MANAGEMENT FOR FOOD SECURITY.

Rural people's knowledge have many dimensions. These include linguistics, medicine, clinical – psychology, botany, zoology, ethnology, ecology, climate, agriculture, animal husbandry, craft skills and ethno soil science (Titilola, 1993, Sillitoe, 1998; Gunther, 2002). As aforementioned, its validity and range of contributions have been neglected in all of the above listed fields. In favour of reversals in the attitude and behaviour of outsiders in the light of the focus of this study on land/soils, the contribution of the indigenous knowledge system to land management practices is hereby highlighted.

Towards judicious land management for food security soil and land types is one of the domains where endogenous local knowledge is strongly based (Fujisaka 1986; Warner, 1991; Van der Molen, 1999; Dialla, 2002). Soil types are usually distinguished by Colour, taste, texture and relief (Marc, 2000). Some farmers in Nigeria used Colour to identify degree of fertility (Netting, 1968). They use this method of classification relying on observation and experience.

The study conducted at Shamusalli and Gusami villages in Zamfara state of Nigeria by Kyiogwom et al, (1998); revealed that the farmers, on the basis of soil texture and colour classified their land as *Jigawa/Sakwanya* or *Marji, Laka* and *Fako*. *Jigawa* is a general term for sandy, light soils, which are the most predominant in the survey area. On the basis of colour and crop production capabilities, the '*Jigawa*' is further divided into smaller units thus:

Farar jigawa – bright in colour, soft and light with low fertility. *'Janbali'* –this is reddish upland hard soil with higher water holding capacity which is more fertile than '*Farar jigawa'. 'Bakar jigawa* – this connotes dark, soft and fertile than *'Janbali'* but found mainly around valley areas. *Tsakwanya* or *Marji or Burji* – refers to red colour, shallow hard soil that contains high proportion of gravel. The soil is difficult to till both by manual and animal traction, often damages farm implement and possesses low water holding capacity.

'Laka' – this connotes dark, hard, heavy soil that cracks when dry. It is susceptible to water logging. *'Fako'* – this refers to land whose top soils has been washed away by erosion leaving a hard pan on the surface, thus it has poor water holding capacity. Furthermore, on the basis of local knowledge of topography, there are two major classes. These are *'Bayen fadama '*and *'Bayen tudu'*

'*Bayen fadama*' is the soils mostly found in valleys. It is a mixture of *'yashi'* (sand), *'Laka'* and *'Taibi'* (shallow silt). It is usually hard and difficult to till. By and large, it is characterized by high water holding capacity with high fertility.

The typical land areas subject to flooding are recognized as fertile and cultivable all year round. In Northern Nigeria they are generally known as *"fadama"* and *"Akuro"* in western Nigeria and *Aja Uro* in eastern Nigeria.

'Bayen tudu' – these are the soils found on uplands. They are with less water holding capacity and less fertile than '*Bayan fadama*'.

It has also been reported by Abdulrahim, (2004) that in the northern part of Sokoto state of Nigeria, soils are also classified into three categories based on taste; as sweet *'gishiri'*, neutral *'babu'* and sour '*datchi'* categories, which correlate significantly with pH levels. The pH levels are conventional method, which has 14 levels of reading unlike the endogenous

method of the Hausa that has three levels of readings. Nevertheless, the correlation between the approaches in measuring the acidity is positive. On practical terms, the taste that is neutral is akin to the acidity scale of pH7. The sweet taste category falls within greater than pH7 and pH 14, and is referred to as alkaline or base, while the sour categories ranged between pH 1 and less than pH 7 are regarded as acidic in conventional knowledge. The weakness on the part of the endogenous as compared with the conventional method is that, the latter has more detailed range of acidity level categorization with a development instrument to measure up to higher precision level. This is unlike the former method which has only three levels that relies on the sense of human tongue which could not be the same when two or more people are asked to taste the same soil samples.

This is because of the high possibilities in the differences in the sensor of their tongues. However, with the few categorizations, the method of using tongue to taste the salinity level for instance is tolerable by the people. What has also been achieved in this case is the contribution of the endogenous knowledge to the fundamentals of acidity and alkalinity, which forms the bedrock of other chemical properties of soil required by plant growth.

Thus this endogenous knowledge of land management is surely sufficient to manage the land in respect of modifying the acidity level to plant requirements by additives of oganic wastes for instance.

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In another study on how Minianka farmers classify and manage their land in Siwa area, Mali by Toure et al (1992) and Kante and Defoer (1994). The farmers in the Siwa area, which comprise of six villages have about 6,500 in habitants, with a total land area of 16,605 hectares in the circle of Koutiala, south Mali have classified their land into two broad levels: the higher and lower levels. The higher-level units are mainly differentiated on the basis of two criteria; (i) topographic / geomorphology and (ii) the presence or otherwise of coarse elements.

In respect of the apex, middle and basal part of the slope they are called *"Niangua","Niangferegue" and "moura" (guechien and tawogo)* respectively. The *moura* being divided into two are next to the channel of the stream being referred to as *faa (faa – pourou)*. *The moura* and *faa* are characterized by colluvial /alluvial matter similar to the land type referred to as *"fadama"* in northern Nigeria. The *niangua and niang feregue* are said to consist of compacted earth, loose surface matter that are gravel and sand stone outcrop with colluvial matter respectively. In the *niagua*, species such as *combretum glutinous, deuterium microcarpum, burkea Africana* are dominant.

The second broad level is the lower level unit. This is differentiated according to constraints on their cultivation and their underlying potentials (Kante and Defoer, 1994). On criteria relating to constraints about whether land is fit to be worked after the first rains of the season by the farmers in Siwa area, the farmers use texture of the topsoil to differentiate. The authors further reported that; "in this way, sand texture is referred to sandy soils '*guechiens'* and clay texture to clayey soils '*tiogo'*. Furthermore, the degree of soil adhesion (due to clay content) can be a hindrance to cultivation and to a large extent dependent on texture. Also, some soils are heavy, such that cultivation is only possible when the land is wet enough and may also require the removal of stones. In addition, their studies revealed that presence of a shadow impermeable layer might indicate a likelihood of temporary water logging or insufficient moisture. This can delay working the soils.

Erosion was also reported as a constraint in land management by Kante and Defoer (1994) but not mentioned by the farmers as a classification criterion based on constraint. At this juncture, it is important to note that, the Minianka farmers possess similar knowledge as that of possessors of conventional knowledge as regards the use of relief and soil constraints for land classification. For instance, developing nations, have adapted the developed system of land evaluation for land classificatory systems pioneered by the United States Department of Agriculture (USDA) as propagated by Klingebiel, (1958); Klingiebel and Montgomery (1961). These nations include; the Canadian soil capability classification system of (1972), the Bangladesh land capability system (1966); the land resource survey of the central Nigeria project (1974); the proposed land capability classification for northern Nigeria of (1975) including the F.A.O. generalized land capability map scale of 1:500,000 produced for sokoto valley as at 1969, in northern Nigeria. These land capability classificatory systems are mostly based on the principle that; the first set of agricultural land uses should be arable agriculture, followed by grazing and forestry before water shed management. The gradation is based on decline in the intensities of use based on the several parameters, which include; relief, constraints of the soil and moisture level parameters. These parameters are used to draw up a land capability table which consequently is interpreted as follows; a gentle relief of less than 3% slope have no constraints in respects of the physico-characteristics of the soil. Thus, such soils are coded as one and assigned to the highest sensitive cultivation for arable crop. A more sloppy land follows this; with higher constrain is assigned as class two for lesser intensive arable cropping up to class four. Thereafter, the land use is switched to grazing because of its constraints that are on the increase till a point that made it recommendable for forestry, which is class eight. While the last class nine is the water shed area because the gradient is very steep slope that is greater than 24% with thin soils full of gravels. These listed land classification based on the rule that the higher the constraints, the lesser the intensity of use

with attendant allotment to the different rural land uses indeed, is akin to the above aforementioned land classification system of the Minianka farmers in the south of Mali as obtainable in many of the indigenous societies in Africa and other developing nations. Besides the constraint criterion, the Minianka farmers are reported to have knowledge in use of colours as indications of the potentials of the soil. The main colour they use are three, namely, black *(woyogo),* red *(gnei, gnigna)* and white *(fien)*. It therefore, means that, any blackish areas may be known as *"tawogo"* and any reddish area as *"tagnigua"* (ta = part).

Thus, "t*agnigua*" for example, means reddish part. To them, like other endogenous knowledge of colour in other cultures could be differentiated and be used to predict soil fertility.

At this juncture, it is significant to point out that the conventional knowledge on soil colour uses the mussel soil colour chart to compare colour of soil samples when wet and dry (Donahue 1998). This chart as observed only slightly supersedes the endogenous knowledge of soil colour in the area of more accurate Colour differentiation as regards the provision of hue, value and chroma. The endogenous knowledge is therefore, not a push over as regards its contribution to land fertility management based on colour. Moreover, the consideration of soil colour by the conventional method as an indicator of fertility through the indirect use of the physical and chemical characteristics of soil is also recognized by the endogenous knowledge of soil management. The conventional method considered that soil colour is due to two factors; humus content and the chemical nature of the iron compound present in the soil (Olaitan and Lombin, 1988). Humus is dark brown or black in colour, iron oxides are yellow, brown or red. Mineral soil particle may contain 5% or more of iron content which may exist in form of either iron II oxide (haematite or Fe_20_3) or iron III oxide (goethite or $2Fe_20_3.3H_20$) in colour red or yellow respectively (Olaitan and Lombin, 1988). A red colour is associated with good aeration and less water than if a yellow colour predominates. Too much water and an absence of oxygen cause anaerobic micro organism to reduce the ferric iron to the ferrous form and this produces a characteristic grey colour. The indigenous farmers, through the colour differentiation, knew all these characteristics as formerly highlighted.

Minianka farmers use the abundance of vegetation height and species of trees and grasses as indicators of moisture level or soil fertility (Kante and Defoer, 1994). Conversely an almost total absence of vegetation is a characteristic of degraded (or uncultivated) land or land that is becoming degraded. Furthermore, land with a flat surface or which crunches under the feet (loose silt soils) is often considered to be fertile. This quality of land is noted to be highly favoured by the people of northern Nigeria and Nigerian farmers in general

because of its high crop yielding capacity. Minianka farmers indeed possess a bank of endogenous knowledge in soil for food production.

Also of note are the Somalis who distinguish soil vegetation associations by soil colour (Chambers, 1983), the strongest distinction as in other parts of Africa being between red or dark brown and black soils. By distinguishing the Colour, the farmers use it to determine fertile from not fertile soils thereby guiding them to add organic manure to their farms when necessary. This is an aspect of land management strategy based on their endogenous knowledge of land classification by Colour.

In a study of farming system at Dagacheri village in Jigawa State Nigeria, Mohammed (1996) noted the farmer's knowledge of adding the ashes of burnt dry leaves and other wastes to their farms as a means of fertilizing their farms. Apart from this endogenous knowledge of land management, they provide different spacing for their plants based on their experience over the years of planting. The overall importance of the crop spacing on the basis of the rural farmer's knowledge is to minimize the rate of nutrient and moisture competition among the crops. Another endogenous knowledge identified by Mohammed (1996) in land management at Dagacheri is the systematic way of inter cropping of millet, sorghum, cowpea and Guna alternately on their farm ridges. This farming practices were once regarded as primitive or misguided but now recognized as sophisticated (Chambers, 1983, Richards, 1985, Kinyunyu and Swants 1996, Reij, 2001). This mixed cropping method has been found superior to the foreign/outsiders/modern knowledge of mono cropping as shown by Chambers (1983), Richards, (1985) and Yayock et al, (1987).

Firstly, mixed cropping have different rooting systems that exploit at different levels in the soil profile for moisture and one crop may provide a favourable micro climate for another. Secondly, nitrogen fixing plants fertilize non- nitrogen fixing plants. Thirdly, crops that are scattered among others are less vulnerable to pest attacks than single stands. Fourthly, labour requirements are less especially in reducing weed since labour peaks are out. Fifthly, more moisture is retained in the soils. Sixthly, returns of varieties of crops are higher per unit of land. Seventhly, successive sowing of crop mixtures supplies a mixed diet over an extended harvesting period. Eighthly, risk is less and where labour is a constraint, the returns to labour are increased at the time of the year, when labour is limited. Ninthly, it checks soil erosion due to multiple roots binding the soil and foliage cover strongly reduces soils dehydration and loss.

On the basis of these benefits already known to indigenous people, the villages of Lindi and Mtawara region of Tanzania ignored the recommended mono cropping system and the so called proper planting distances between plants insisted upon by the agricultural advisers.

They went ahead to practice their mix cropping system in order to secure their food supply and avoid their resource base from being threatened. The people, indeed, have their space regulation for crops.

Another low input technology based on the farmer's knowledge is the systematic rotation of cereals and legumes with land fallow for 8-10 years after the annual rotational cycle of 5-10 years (Chiroma, 1996). These are parts of effort by the rural farmers to use fertility of their farmland for sustainable crop production. A crop rotational system would not be feasible in the immediate future because of the current rate of exponential growth of population in Nigeria that exceeds the carrying capacity of the land for agricultural production. This proposition is obvious in view of the fact that many parts of Nigeria have large expanses of land to practice bush fallowing before but presently impossible, because of the current dense population where it used to be sparse. However, the fact that the system is currently feasible and sustainable for crop production in Futchimiram according to Chiroma, (1996) currently offers it as part of the contribution of endogenous knowledge in land management for sustainable agricultural production. This however, does not mean that the same technique of the crop rotation would be feasible in future.

Furthermore, the difficulties involved in farm yard manure application by Futchimiram farmers due to short supply and bulkiness because of transportation problem, have led to the to devise the following endogenous knowledge approach according to

Chiroma that;

"The usual practice is that farmers do not completely remove Crop residue (cereal stalks and straws) from land at the end of each cropping season, and cattle which graze the bush by day are left on the farm at night as a means of transferring and concentrating organic manure and soil nutrients. Farmers who do not own many cattle usually make arrangements with owners of cattle to graze the crop residues on their farms in exchange for manure."(Chiroma, 1996 p.44).

The endogenous knowledge in land management by the people no doubt solves the problem of transportation of the bulky manure and encouraged the supply of sufficient organic manure to the farm land. It is indeed a new dimension in organic manure addition to farm land. This measure is a stronger positive alternative to the propagated outsider's knowledge technology of improving the farmer's field fertility by the addition of inorganic fertilizers, which in Nigeria is presently rising in cost daily. This issue of expensive cost of

inorganic fertilizer to the farmer is acknowledged in all ramifications to the extent that it is made a matter of public concern because it is needed as a complement to organic fertilizer (Marc, et al, 2000). In the year 2001, in Nigeria, the cost have doubled that of 1998 and the fertilizer was not found everywhere in Nigeria. In the year 2002, the price of the fertilizer was as high as N2, 500.00 per bag with attendant scarcity in supply to the farmers by the government. In the year 2008 the price of a bag of fertilizer is actually N5,000.00 per bag but subsidized to N2, 500.00. This made it practically impossible for the subsistence farmer in the area to use inorganic fertilizer on their farmlands. Thus, the use of farmyard manure is vigorously resuscitated - endogenous knowledge land management adaptable to the people.

In another related issue, Abdulrahim, (2004) observed that within Sokoto close-settled zone, endogenous knowledge of having farmlands closer to the village being better fertilized than those farmland away is in practice by the farmers. In other words, the intensity of fertilization with household refuse and animal dropping declines as the distance from home increases. The reason is that it takes time and high financial cost to transport manure to the distant farmlands. Thus, the concept of distance as related to the level of intensity of farmland fertilization is also acknowledged in Sokoto as in the study of Dagaceri.

In Mossi traditional soil and water conservation (S.W.C) which was carried out on a very small scale, traditional contour stone lines “degutted” were built across slopes to protect valuable fields from the precious effect of overland flow during peak summer rainfall (Butterbury, 1998). This endogenous knowledge application is similar to the modern knowledge of construction of contour bunds across the slope. Thus, its introduction to the people of Mossi, by the outsider does not make it new to them but was quickly accepted by them with improvement. As Butterbury asserted, the history of soil and water conservation in Burkina Faso explains why farmers are quite accustomed to the new ideas and technique.

5.00 CONCLUDING REMARKS

The rural people’s endogenous knowledge in land management have been found as an enormous and underutilized national resources in most of the African countries. Therefore, we simply cannot afford to ignore it any longer. Albeit, so far, nearly all nations have virtually ignored this national asset, because the scientists in every nation have continued to look at the problems solely in scientific terms; the endogenous knowledge system cannot be neglected as a national asset.

Internationally recognised knowledge of land management practices is the conventional method. To recognise the endogenous knowledge as the conventional would be by documenting it and harmonising it with the modern knowledge and integrating it into school curriculum. If that is achieved, it would surely be a great asset for food security not only in Africa but in the developing world in general.

This would therefore mean that, scientists must stop looking at the problem of land management through the scientific prism only and learn from the "non scientific" source. In turn, people at the grassroots can learn from the scientists. This combination serves as knowledge interface or otherwise referred to "hybrid" studies.

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