Coverage of indigenous Knowledge system in Extension Services delivery in two regions of Nigeria and South Africa: A content Analysis.

Kolawole A. E

Department of Agricultural Economic and Extension North West University Mafikeng Campus, South Africa24852902@nwu.ac.za

Abstract: This paper examines the coverage of indigenous knowledge systems in extension services delivery. This is based on the fact that agriculture extension service is the most prominent source of information to farmers in sub Saharan Africa. Agriculture is the major source of livelihoods that explore indigenous knowledge systems over years. In this paper a content analysis was used to examine the coverage of indigenous knowledge systems in the extension messages by extension officers in Oyo state, Nigeria and the North-West province, South Africa. The results of the analysis show that the proportion of indigenous knowledge systems covered in the two study locations are generally low with 15% in the South West Nigeria and 27.8% in the North West Province South Africa. This shows a higher coverage of indigenous messages in North-West South Africa than Oyo State Nigeria. The study concludes that extension services should explore more of indigenous knowledge system for the improvement of agricultural activities.

[Kolawole A. E. **Coverage of indigenous Knowledge system in Extension Services delivery in two regions of Nigeria and South Africa: A content Analysis.** *Life Sci J* 2013;10(3):2573-2578] (ISSN:1097-8135). http://www.lifesciencesite.com. 372

Keywords: Indigenous Knowledge, extension messages, Nigeria, South Africa.

Introduction

Agricultural extension has been the link between research and farmers in the technology diffusion model that has brought to bear the impact of technologies generated out of researches to production realities on farmers' fields. This information transfer function of extension has led to improvement in crop and animal production and all other activities along the agriculture value chain which include harvesting, processing and storage and enhanced access to markets for the sale of agricultural products. Added to these is the human resources development that is training farmers in administration/management, programme planning and evaluation, and youth development programmes (Anaeto, 2003).

Agricultural extension is a two way flow of information, apart from transferring agricultural technology to farmers, it also serve as a channel through which farmers' problems are communicated to research to ensure that research based agricultural technologies are adaptable to farmers' field experience. This feedback mechanism also ensures that farmers input are fed into agriculture policies formulation to guarantee farmers' focused agricultural policies (FAO, 2002). However recent reforms in the agricultural sector have established the need for extension services to go beyond agricultural technology transfer to embracing a broad based holistic approach to solving agricultural problems. This is informed by the fact that success in agricultural development is more likely to be achieved when all stakeholders in the agricultural industries particularly farmers are involved in the planning and implementation of agricultural programmes. It therefore become pertinent that extension agencies and personnel should not just be passive agricultural information transfer medium, but should be proactive and facilitate participatory approach which ensure a cross fertilization of ideas through reasonable sharing and exchange of thoughts among researchers, trainers and farmers in the synthesis of its information package. This will make extension approaches to be conformed to local situation borne out of trials and continuous adjustment to prevailing circumstances (Rasheed, 2012).

Long before the advent of modern technology farmers have devised ways of adapting and solving their farming problems through practices that evolved through many years of interaction with the local environment. It is generally described as the knowledge the local people in an area have developed over time and continue to develop (Scoones and Thompson 1994). It is a form of knowledge that empowers local communities, contributes to their development and ensures growth in their self-sufficiency (Chambers et al 1989). Indigenous knowledge, in its various manifestations, also gives cultural pride and motivation to solve local problems with local ingenuity and resources. Indigenous knowledge technologies and know-how depend on locally available skills and materials and are thus often more cost-effective than imported

technologies. It is distinctive in that it is developed out of responses to the existing natural and human conditions of a particular setting. It is dynamic and creative in that its trials and assessment are continually influenced by adaptive demands and external forces. Indigenous knowledge system is different from the international knowledge system developed by universities, research institutions and private firms. The content transverse many areas of human endeavours which include religion, local beliefs and rituals, education, institutional development and management, natural resource management, healthcare, food preparation, animal husbandry and agriculture(Warren 1991). This extent of local information coverage by indigenous knowledge has made it an essential local resource for agricultural initiatives in marginalized areas (Hart and Ineke 2006). Indigenous knowledge acts and remains a basis for local level decision making in agriculture, health care, food preparation, education, natural resource management and a number of many other activities in the rural area. Okuneye and Ayinde (2004) reported that many indigenous knowledge proven techniques have been applied and have worked in different areas of agricultural production. These include indigenous soil preparation and planting material, indigenous pests and diseases control, indigenous methods of sustaining soil fertility; indigenous weeds control methods, indigenous harvesting and storage methods (Abioye et al 2011). Adedipe et al (2004) reported the use of chilli pepper (capsicum Annum) and neem extact (Azadirachta indica) as insecticides in cowpea production, dry chilli (Capsicum Frutescens) neem ash and ash of crop residues for cowpea storage, practicing of mixed cropping to forestall crop failure and the practice of shifting cultivation to ensure the rejuvenation of soil fertility in the South West Nigeria. Nkosima et al (2010) reported that South Africa farmers use kraal manure, stubble mulch and fallowing to replenish depleted nutrients Ozor et al (2012) also reported that farmers have not only used indigenous knowledge to understand weather and climate patterns as a guide to their decisions in crop and livestock management, but have engaged in indigenous based irrigation and drainage practices and afforestation which include the planting of fast growing plant species usually leguminous trees particularly in open land areas or savanna areas primarily to enhance rapid replenishment of soil fertility, improve fuel wood production, recycling of nutrients, provision of carbon supply to soil micro-organisms, weed suppression, Striga control and improvement soil water retention capacity in South West Nigeria. Yohannes and Mebratu (2009) stated that the traditional early-warning techniques used by elderly community members to forecast a probable change in climatic conditions in Ethiopia include, the observations of stars arrangement, movement of wind and cloud, the behavior of different wild animals and the flowering and seeding of some indigenous trees. In Swaziland, indigenous knowledge influences many areas of life; its role in the social and economic well-being of the nation and in the management of its resources and the environment is immense. In the re-occurring cases of drought and occasional flood in Swaziland, communities have through observation of some adaptive behaviours of animals as indicators to predict the possible occurrence of such disasters. The positioning of the nests of specie of Black-billed weaver (Ploceus spp.) has been used to foretell a possible flood disaster. It was reported that when floods are likely to occur the nest of the Black billed weaver is made very high up the trees next to a river and when floods are unlikely the nests are positioned very low on the tree trunk. The Swazis also used the shriek of certain birds to predict rain and yields of certain wild fruit plants to predict famine. Other indigenous methods used by the Swazis to predict natural hazards include wind direction, the shape of the crescent moon and the behaviour of certain animals. Use of grass strips is another form of land management. It is a common traditional land management system. Pieces of land, one to one-and-a-half meters wide, with traditional vegetation are left between fields to control soil erosion. The strips also serve as sources of medicinal plants and feed for livestock. In another related study in Swaziland Harte and Ineke (2006) reported the ingenuity of farmers who substituted the communal commercial- style heated glasshouse nursery for the production maize seedling for planting, with a home produced compost and a locally fabricated screen in a locally made structure without the use of artificial heat glass. Farmers also devised new methods of grafting new varieties of apple on existing trees to meet the change in taste and shift in demand from the old varieties of apple to new ones. In a report on farming practices in Tanzania Vlaenderen, (1999) said the use of simple locally manufactured tools mostly curved iron blades with long handles in land clearing and cultivation by farmers have helped in the control of soil erosion due to minimal disruption of the soil layer, and in conservation of nature because forests in general were left intact. The traditional slash and burn approach used by farmers have helped in the control of diseases vectors for man and livestocks which are sometime caught up in the carefully controlled bush burning. Shifting cultivation was a major form of land use which ensures the natural rejuvenation of land other indigenous land management practices included mixed cropping and intercropping, minimal

tillage and agro-forestry, agro-pastoralism and zoning which were primarily aimed at optimal use of the available land while conserving the moisture and fertility of the soil. Ozor (2012) also reported that local communities use traditional terracing, destocking, tree planting, traditional food preservation methods, drilling traditional wells, construction of locally based water reservoirs, mixed cropping and crop diversification. Ngenwi et al (2011) also reported the indigenous climate change coping strategies among women farmers in to include alteration in planting dates, alternative use of maize and guinea corn stalk and cow dung in place of firewood for cooking, mixed farming use of local plant materials in protecting grains against weevils in storage , Storage of extra harvest for food supply separately from that destined for the market, rearing small ruminants and non-conventional livestock like snails in their backyards.

The above highlighted areas of the use of indigenous knowledge in farming and climate change adaptation and mitigation further underscores the fact that iindigenous knowledge covers a wide collection of responses to changes in the cultural, physical, or economic environment, that can provide useful insights for modern research and extension, and an evident that it offers great potentials for improved agricultural production and sustainable food security (Anyira, 2010)

Many technological solutions that have been proposed to address problems in rural communities have failed in the field because they do not take into account the local culture, particularly society's preferences, skills, and knowledge. This therefore gave the reason why smallholder farmers held to their local knowledge and their discovered methods. Although integrating indigenous knowledge into the scientific approach to achieving high production has been a major challenge, however mainstreaming indigenous knowledge system by internalizing them into extension information packages will improve its legitimacy, and complement the existing research based technological innovations and further boost options available to farmers in their production practices. It is therefore against this backdrop that this study seeks to do a content analysis of the coverage of indigenous knowledge system in extension services delivery in South West, Nigeria and the North West Province of South Africa.

Material and Methods

The study area is south western Nigeria which consists of Lagos, Ogun, Oyo, Osun, Ondo and Ekiti states. The area lies between longitude 20 311 and 60 001 East and Latitude 60 211 and 80 371N (Agboola, 1979) with a total land area of 77,818 km2 .The Southwest climate is tropical in nature and is characterized by wet and dry seasons. The temperature of the area is between 21^{o}Cand 34^{o}Cwhile the annual rainfall falls between 60 to 119inches (1500- 3000m). In the South West, Agricultural Development Programs (ADP) plays the role of extension and delivery services in the agricultural sector. ADPs liaise with the research institutes for improved technologies in order to effectively deliver services to the farmers. The organization for administrative convenience, effective mode of operation and proximity to farmers divides the States in to zones with Zonal offices, the zones are divided into blocks and the blocks are further divided into cells.

The North West Province is situated towards the western part of South Africa. It borders the Limpopo Province to the North, Gauteng to the east, the Free State to the east and South, The Northern Cape to the South and Botswana to the West and North. Altitude ranges from one to two thousand meters above sea level. It has an annual rainfall of between 515 -539mm and a temperature range between 12℃ to24℃ . The Province is mainly rural and the main activity is agriculture. The farmers are mainly served by the Department of Agriculture, Conservation and Environment personnel in the province. The Directorate that works directly with farmers is the Developmental Field Services Directorate and it is split into three regions to ensure effective coverage of the province. These regions are Western, Central and Eastern Regions which are headed by directors. The regions are further divided into districts with district officers called the Agricultural Development centers. There are also agricultural extensions offices in the villages referred to as the Field Service Units (FSUs) who have direct link with the farmers.

Results

The extent of coverage of indigenous messages was determined using simple proportion as explained by the formula below:

$I/n \times 100$

I= no of items on indigenous knowledge

n= total number of extension messages

Result

Proportion of extension messages in South West Nigeria

Percentage of indigenous knowledge coverage:

$$^{3}/_{19} \times 100 = 15\%$$

Percentage of conventional messages:

$$^{16}/_{19} \times 100 = 85\%$$

Proportion of extension messages in North West Province, South Africa

Percentage of indigenous knowledge coverage:

$$^{5}/_{18} \times 100 = 27.8\%$$

Percentage of conventional messages:

$$^{15}/_{18} \times 100 = 72.2\%$$

A list of extension messages to farmers was in the South Western Nigeria and the North West Province were obtained and a content analysis of these messages was done to ascertain the proportion of messages on indigenous knowledge and particularly messages on indigenous knowledge to adapting or mitigating against climate change in relation to other conventional messages. The list of extension messages in the South West Nigeria and the North West Province is listed in the table 1.

Table 1: List of extension messages in South West Nigeria and North West Province South Africa (2013 cropping season)

South West Nigeria	North West Province South Africa
• Land preparation (clearing, ridging/heaping, ploughing, harrowing) • Information on planting(seed rate, seed dressing, yam setts, cuttings, time to plant, spacing, planting depth, improved varieties etc) • Farming and cropping system(crop rotation, monocropping, mixed cropping, land rotation, mixed farming) • Planting of moringa seed and the economic value of moringa • Information on weed control(use of herbicide, time to weed,) • Fertilizer Application(rate, methods of application, types of fertilizer etc) • Information on pest and disease control(use of pesticide, clean clearing around the farm, handling of insecticides and the spraying pump) • Information on irrigation/ fadama farming • Harvesting(time to harvest, method of harvesting etc) • Processing and storage • Marketing outlets • Livestock(sanitation) • Breeding of small ruminants • Raising of quail birds • Daily and routine maintenance practices of farm machines • Feeding animals with left overs and peels of cassava • Organic manuring • mulching	• Land preparation: Clearing of land, stumping, tilling, ploughing, harrowing, ridging • Use of animal traction in land preparation • Recommended planting procedures: Seed dressing, Nursery preparation, Spacing, Planting depth Weed control: use of herbicides, types, rate of application, Spraying kits for the farmers, calibration • Pest control: use of insecticide, poisoning, clean weeding, fencing, • Castration • Dehorning • Deworming • Use of feed supplements • Selection for breeding purposes • Administration and Management, • Writing business proposal to get government grant • Marketing plans and how to access markets • Early warning units: weather forecast • Indigenous pest control.(Use of a grounded mixture of garlic onion and pepper in the control of insects • Indigenous control ecto-parasites and scabies with the use of used engine oil • mulching • Indigenous selection cattle for breeding using Girth , tail length, and hump • Use of organic manure

Discussion

The result shows that in the South west Nigeria only three of the extension messages were on indigenous knowledge of farmers while the remaining sixteen was on conventional methods of farming borne out research, which represent 15% of the total area of message coverage. This shows that most of the technology transferred to farmers are research based with no reference to farmers' local knowledge on these practices and the possibility of integrating them. While in the North West province of South Africa five of the extension messages were on indigenous knowledge while the remaining thirteen were on conventional research based messages. The only indigenous extension message on climate adaptation and mitigation in the two areas was mulching. However in the North West province there is a unit which alerts the farmers on changes in climatic conditions called the "Early warning unit". This group have access to mobile phone numbers of contact farmers and they send text messages to farmers on variations in weather conditions, particularly the rainfall pattern and the possibility of drought so that farmers can put in place necessary measures and plan their farming activities in respect of the weather forecast.

The lack of recognition of indigenous knowledge in the agricultural development process is mirrored in the training, and the resultant transfer of technology, to farmers in the two regions in this study. It is also discovered from this analysis that there is a poor integration of indigenous knowledge in the extension messages in the two regions despite the so many indigenous practices used by the farmers in the two regions. There is poor documentation of these practices by research institutes giving the probable reason why they are not integrated into the packages handed over to extension.

It is therefore necessary that a documentation of these practices (IKS) should be done, and possibly subjected to test or through careful observation to ensure their validity and necessary fine-tuning. Modalities should be put in place by research and extension that will warrant a more robust contribution of farmers to a participatory approach to solving agricultural problems through integration of these farmers' alternatives into their conventional packages. This can include an in-service training made up of non-formal and formal educational programmes that can create opportunities for professionals to be aware of indigenous knowledge system practices in the various areas of agriculture and their contribution to sustainable agriculture. This can be a means for professional to acquire skills to identify, collect, and develop indigenous knowledge into modern, functional formats. Efforts should be focused on examining the relationship between scientific knowledge and indigenous knowledge with an intention to explore the synergy between the two forms of knowledge

Corresponding author
Kolawole A. E
Department of Agricultural Economic and Extension
North West University Mafikeng Campus, South Africa
24852902@nwu.ac.za

References

1. Abioye A and Zaid Y (2011) Documenting and Disseminating Agricultural Indigenous Knowledge for Sustainable Food Security: The Efforts of Agricultural Research Libraries in Nigeria
2. Adebayo K., Dauda T. O., Rikko L. S., George F.A.O, Fashola O. S, Atungwu J. J., Iposu S. A., Shobowale A. O., Osuntade O.B (2011) Emerging and Indigenous Technology for Climate Change Adaptation in Southwest Nigeria African Technology Policy Studies Network RESEARCH PAPER | No. 10: 1-54
3. Adedipe N. O., Okuneye A, and Ayinde I. A.,(2004) The relevance of local and indigenous knowledge for Nigerian agriculture: Paper presented at the international conference on porridging scale and epistemologies. Linking local knowledge with Global science in multiscale assessments: Moustapha, A. A.(Ed.) March 16-19, 2004, pages 1-30
4. Agboola S.A. (1979): An Agricultural Atlas of Nigeria, Oxford University Press, Nigeria Pp.248
5. Anaeto C. F, (2003) Concept of Rural Development in Nigeria: Issues, Prospects, Problems and Solutions. The Nigerian Academic forum: 4(2)121-130
6. Anyira, I., (2010) The role of libraries in the preservation and accessibility of indigenous knowledge in the Niger Delta Region of Nigeria. Library Philosophy and Practice. Available athttp://www.faqs.org/periodicals/201006/2095013311.html
7. Chambers R, Pacey A and Thrupps L. A (1989) Farmer first: Farmer innovation and agricultural research.London: Intermediate technology Publications
8. FAO (2002) Experience and assets in decentralization: FAO General Information Cell, Italy.

9. Hart T. and Ineke Vorster (2006) Indigenous Knowledge on the South African Landscape: potentials for agricultural development 1-44p
10. Ngenwi A. A, Mafeni J.M. and Etchu, K. A (2011) Climate change and adaptation strategies: Lessons from women's indigenous knowledge practices. Climate change symposium Africa Adapt 10-20p
11. Nkosinomusa B.A, Jeffrey H.A and Albert M.B(2010) The use of scientific and indigenous knowledge in agricultural land evaluation and soil fertility studies of two villages in KwaZulu-Natal, South Africa © 2010 19th World Congress of Soil Science, Soil Solutions for a Changing World 1-6August 2010, Brisbane, Australia.
12. Okuneye P. A., and Ayinde I. A. (2004) The relevance of indigenous knowledge for Nigerian Agriculture. Available at http://ma.
13. Rasheed S. V, (2002) The "New Extension" Plus: Roles, strategies, and capacities to strengthen extension and advisory services. Global Forum for Rural Advisory Services (GFRAS) 1
14. Scoones, I and Thompson, J (1994) Knowledge, power and agriculture- towards a theoretical understanding. In I scoones and J Thompson(eds) Beyond farmer first: Rural peoples' knowledge, agricultural research and extension practice.London: Intermediate Technology Publications.
15. UNEP (2008) Indigenous Knowledge in Disaster Management in Africa
16. Vlaenderen, H. van. (1999). "Local knowledge: What is it and why and how do we capture it?" Kauzeni A. S, (Ed). Selected papers from First National Workshop held in Morogoro, Tanzania, 22-23 June 1999. Gender, Biodiversity and Local Systems [Links] to Strengthen Agricultural and Rural Development, Links Report No. 2, February 2000.
17. Warren D.M, (1991) Using indigenous knowledge in agricultural development. World Bank Discussion Papers No.127. Washington DC: World Bank.
18. Yohannes G.M, and Mebratu K, (2009) Local innovation in climate-change adaptation by Ethiopian pastoralists PROLINNOVA–Ethiopia and Pastoralist Forum Ethiopia (PFE) p1-25
19. Ozor N., Urama K., and Mwangi W., (2012) Climate Change Vulnerability and the Use of Indigenous Technologies for Adaptation among Smallholder Farming Communities in sub Saharan Africa Journal of Agricultural ExtensionVol. 16 (2).

8/22/2013