

## **Agricultural extension and rural advisory services: Proactiveness or reactiveness on climate change for food security in Africa**

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**Abstract:** This paper presents cases of methodologies of the use of agricultural extension and rural advisory services for mainstreaming climate changes issues for the enhancement of food security in different parts of Africa. This is predicated on the fact that majority of actors in the food security chain are in rural areas in Africa and the most prominent source of information is through agricultural extension services. Agricultural extension services is used to depict all the different activities that provide information and advisory services that are needed and demanded by farmers and other actors in agri-food systems and rural development. In this paper, these includes technical knowledge and involves facilitation, brokering and coaching of different actors to improve market access, dealing with changing patterns of risk and protecting the environment. This takes place within complex systems involving old and new service providers and even information and communication technologies (phones and mobile phones, internet, radio and television). The ‘extension systems’ are generally not very systematic and reflect the diverse priorities and accountabilities of a wide range of public, private and civil society organizations that are providing advice and information. In fact, some of these providers would not even classify themselves as “extension” but rather as community developers, innovation brokers, natural resource planners among others, however, they are all linked by a primary focus on providing advice and information. The full paper explores the methodologies such as cyber extension, community radio, drama, stakeholder platforms among others and highlights the application of these methodologies in different western and southern African countries.

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### **Introduction**

There is an increasing demand for agricultural extension throughout the world to be more responsive and proactive in delivering services. This is due to the vulnerability of the farming in the developing world is quite evident due to forces like climate change, changes in natural resources quality (including desertification over large tracts), lack of coping strategies at micro and macro levels of decision making, coupled with globalization, emerging market forces like commodity markets, sustainability constraints etc., The challenges for rural extension are never more acute than at present. Agricultural extension, in the current scenario of rapidly changing world has been recognized as an essential mechanism for delivering knowledge (information) and advises as an input into modern farming (Jones, 1997). Agricultural Extension has to reorient itself beyond the narrow mind-set of transfer of technology packages. Instead, it has to rejuvenate its vigour for “transferring knowledge (or) information packages” as the input for modern farming. In such case, extension will become more diversified, knowledge intensive, and demand driven (Zijp, 1994).

Despite their success in the development of agriculture and farm systems, extension agencies

need to continually assess the services they are providing and how these contribute to the agency’s overall objective. One of the challenges for extension agencies is to remain relevant to farmers in an ever-changing environment. Swanson and Rajalahti (2010) stated that the main task of a public extension system should be human resource development that can equip medium and small-scale farmers to solve their own problems and respond to new opportunities. However, extension has very often become prescriptive; extension agent believing that they know what is best and fails to focus sufficiently on the client’s needs (Tucker, 2000). This shift in extension cannot be blamed totally on the extension agent; farmers have come to expect a definite recommendation from their advisor (van den Ban, 1999). It has been proven that people adjust to change more rapidly when they themselves initiate, identify and solve problems that directly affect their welfare (Cohen and Uphoff, 1980).

Agricultural extension according to Leeuwis (2006) is a series of embedded communicative interventions that are meant, among other things, to develop and/or induce innovations which supposedly help to resolve (usually multi-actor) problematic situations. It has been observed that agricultural

extension is involved in public information and education programmes that could assist farmers in mitigating the effects of climate change. Accordingly, such involvements include awareness creation and knowledge brokerage on the issues of climate change; building resilience capacities among vulnerable individuals, communities and regions; encouragement of wide participation of all stakeholders in addressing climate change issues; and developing appropriate frameworks for coping/adapting to climate change effects/impacts. Besides, there is very little documentation on local adaptation to climate change (Pandey, 2006) especially when it is known that some African communities have developed traditional adaptation strategies to cope with climate variability and extreme events (Osman-Elasha, 2007). It is pertinent therefore to ascertain what effects or impacts climate change has on agricultural productivity in the study area?

Agricultural extension systems have played an important role in the shaping of modern agriculture and in particular on the practices of farm families. Successful extension services continuously adapt to changes in the agricultural environment and the needs of farm families (clients). Extension services are agents of change and must change themselves if they are to survive, be relevant and provide value for money (Carey, 2004). Extension services must continually adapt to the changing agricultural environment and to changes in farm family circumstances in order to remain relevant. One of such services is the issue of climate change and its attendant consequences. Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity (Ozor, 2009). According to Intergovernmental Panel on Climate Change (2007), the changes in climate are attributed directly to human activities and the composition of the global atmosphere over comparable time periods. Increase in Green House Gases (GHG) emission through human activities has resulted in additional warming of the earth's surfaces, with several anticipated disastrous impacts (Motimore et al, 2000). Worldwide, the net effect of climate change will be to decrease stocks of organic carbon (C) in soils, thus releasing additional carbon dioxide (CO<sub>2</sub>) into the atmosphere and acting as a positive feedback, further accelerating climate change. Indigenous knowledge in land management has been applied for emission reduction, C sequestration and carbon substitution, weather forecasting, vulnerability assessment and implementation of adaptation strategies. Some changes in the management of land can help in cutting overall emissions of greenhouse gases. This is

mainly by causing some C, from CO<sub>2</sub> in the atmosphere, to be locked up ("sequestered") in soil or vegetation. Soils that have been in arable cropping for a long period usually have a low content of organic C, so they offer scope for additional sequestration. With soils already high in C, such as those under old grassland or woodland and peat soils there is little extra capacity for additional C storage.

Agriculture's direct reliance on the natural resource base has always been a defining characteristic of the sector. Production relies directly on soil, water, and a variety of biological processes. And it also relies on the climate at the same time that its role in the global carbon cycle makes it a major contributing factor to climate change. Today, more than ever before, we understand not only the significance that climate has for agriculture, but also the enormous significance that agriculture has for the climate. The growing consensus on the need for a climate-smart agriculture emerged largely out of international awareness of the sector's negative impacts—its ecological footprint. It also grew out of the recognition that conventional forms of agricultural production are often unsustainable and deplete or "mine" the natural resources on which production relies over time. Agriculture is the world's leading source of methane and nitrous oxide emissions, a substantial source of carbon emissions, and the principal driver behind deforestation worldwide. Some 30 percent of global greenhouse gas emissions are attributable to agriculture and deforestation driven by the expansion of crop and livestock production for food, fiber and fuel. More recently, this perspective of agriculture as a source of greenhouse gas emissions and pollution has become more balanced, with a growing understanding of the environmental services the sector can provide if production is well-managed. While agriculture emits a large volume of greenhouse gases, its biomass and especially its soils also sequester carbon out of the atmosphere, and this role as a carbon sink and as a carbon store can be strategically optimized through proven farming techniques and methods that simultaneously reduce emissions. These technical elements of climate-smart agriculture are by now well understood, and in addition to their technical feasibility, they can be highly productive and profitable.

Extension services are essential to enable farmers to improve their practices and help them respond to emerging challenges. Knowledge, ideas, and skills gained through extension programmes can help farmers increase their productivity, reduce losses, and gain better access to markets. The positive impact of extension services is well demonstrated globally. Extension activities are developed through

programme development. Taylor (1981) stated that extension programming can be proactive or reactive. Extension services are considered to be proactive, responsive and collaborative organization, committed to the growth and development of people through life-long learning. Reactive programming implies actions or adaptation in response to change in which a change is considered as a loss or a threat. The extension workers expend most of their time and other resources responding to requests that have no central focus or objective. Proactive programming depicts plan for expected changes and are openness to new or multiple ways of doing things, in which change is seen change as an opportunity. Proactive Program ensures that a comprehensive educational effort specifically designed to bring about change and to have significant, positive impact on the lives of individuals and groups. "Pro" is Latin and it means in favor of or for. It also has a Greek base, meaning before, prior to, and earlier than. The programming context of the word comes from Greek. It suggests the educational program or the educational effort was well thought out. It indicates the Extension worker is well aware of the complex interrelated factors necessary to direct change. That is, the Extension worker: has a philosophical base for program development, is aware of the need and the role of an organizational structure in educational programming, understands the program development process, is aware of the resources needed, has a framework for establishing priorities. Reactive or proactive responses to change are really not two separate responses to change but rather two ends of a continuum. People can have an overall orientation toward change that means that a person most often responds in a certain way. But it is also true that, depending upon the intensity of meaning of a specific change, a person could react differently than usual. For instance, a person may usually respond to change in a fairly positive and proactive way. But, that same person could have a huge sense of loss if they lost a job or business that they felt frames who they are change. A sound concept of proactive programming reveals that one understands the need to allocate time for reactive work. An extreme amount of good Extension work is done by reacting to clients' requests. People do learn, problems are solved, and practices are changed by reactive work. The amount of time to allocate to reactive work depends on several factors. They include: number of Extension workers in the county, degree of specialization of the agent, diversity of clientele, diversity of economy, size of population and others.

#### **Cases of Extension Services on Climate Change**

**Blended Traditional and Contemporary Extension Methods:** REACCH Extension support

traditional outreach activities in the PNW cereal-based cropping systems, providing interactive learning opportunities for farmers, industry, field-based extension and government agency personnel, and research scientists. Print and web-based articles, bulletins, and technical materials relating the latest research-based findings were produced. Electronic methodologies such as video and webinars are used by Extension to convey complex information efficiently and cost-effectively. An educational video was co-produced and targeted at improving public and policy-maker understanding of the role that agriculture can play in reducing greenhouse gas emissions. Smart phone apps and web-based decision-support tools were developed to provide stakeholders with ready access to data-intensive research results necessary for on-farm management by farmers and strategic decision-making by policy-makers (Kruger et al 2011).

**Use of ICT for climate smart agriculture :** As mobile phone penetration rates continue to grow at a rapid rate throughout the globe, farmers now have access to a growing number of agricultural information services both through SMS and voice. Extension services via short text messages and the internet are changing the livelihoods of rural rice farmers in the Pampanga community in the Philippines. In some cases, these services charge farmers a fee for access to agricultural content and advice, while others provide it for free through donor subsidies, or by selling advertising and providing other services, like user surveys. Farmers use cellphone or go online to access information from the IRRI Rice knowledge bank. They also use the cyber village to access information on good rice varieties to ensure that he gets more from his one hectare plot. Many are accessed directly by the farmer, although others rely on a trusted community intermediary with access to the device. In addition to mobile phone services, a growing number of agricultural organizations and agribusinesses have been using low-cost video equipment to create locally made extension videos to share the stories of farmers who have made the change to more sustainable practices with their peers in other communities. And not to be outdone, by coupling mobile phone access with radio access, interactive radio programs are being developed that are completely transforming rural radio from a one-way disseminator of information to a two-way exchange of sharing and learning (Woodard, 2013). Grameen Foundation on its Community Knowledge Worker program in Uganda, which shares agricultural content via mobile phone, found a significant and positive impact in the use of organic manure within communities with access to this program; while research by Farm Radio

International found that having a radio station call out to farmers can increase adoption rates by up to 14%; and a pilot study on the impact of low-cost video on agricultural practices in India by Digital Green found video to be up to ten times more cost effective on a cost per adoption basis than traditional extension methods alone (although more recent analysis by Digital Green is showing slightly lower, but still significant impact) (Woodard, 2013).

**Radio Drama:** The Smallholders foundation produced 20 radio episodes in Igbo, reaching 15 million listeners, outlining how to manage climate change in their communities. Smallholder listeners clubs used solar-powered interactive radios to provide feedback after the broadcast. Smallholders in southeastern Nigeria can prepare for and adapt to the negative effects of climate change only when they understand it and recognize its impacts. The drama on the waves empowers smallholders through a 20-episode broadcast on climate-change radio drama featuring a series of climate risk management strategies with multiple benefits in the local Igbo language. This was aired on five statewide radio stations over a one-year period, reaching more than 15 million listeners (World Bank, 2012).

**Community radio:** Community radio is run by and for communities in local languages, often with programming focused on issues at the heart of local development, such as climate change and environmental degradation. Examples include:

Bravos de Zambezi (Mozambique): Launched in March 2010, 'Zambezi Braves' is an initiative that combined a 26-episode radio drama produced in two languages with training for community radio journalists to convey information around disaster risk reduction and floods and build local capacity for reporting on disasters and climate change (ELDIS, 2013).

Climate Airwaves (Ghana): Climate airwaves is a pilot initiative between the Institute of Development Studies and the Ghana Community Radio Network aimed at developing the capacity of broadcasters to conduct participatory action research, conducted on the ground and on the air, into community experiences of climate change and translate them into advocacy messages for researchers and decision makers (ELDIS, 2013).

Krishi Radio (Bangladesh): Krishi Radio offers a daily evening programme designed to address climate-related problems that farmers and fishermen commonly face, broadcasting expert advice and hosting call-in discussions to discuss potential response options. The broadcasting is offered alongside support offered by the local agricultural department (ELDIS, 2013).

**Cyber-extension:** The cyber village project, an innovative programme using ICTs tools to improve the exchange of knowledge and decision making among rice farmers in the 12 barangays (communities) of Apalit, in Pampanga, south of the capital Manila, has proved the power of e-extension. The project, collaboration between the Pampanga Agriculture College, the International Rice Research Institute (IRRI) and Local Government Units, provides information to farmers on all aspects of growing rice via online platforms. Farmers use SMS and the internet at the village level to access information from agriculture extension workers and vice versa (GFRAS, 2012).

**Entertainment-Education (E-E):** Entertainment-Education (E-E) is a striking communication strategy for reaching middle and lower socio-economic classes with climate-friendly lifestyle messages. E-E approaches promote pro-sustainability messages in an affective-orientated rather than cognitive-orientated, factual manner (Lubjuhn and Pratt 2009).

The analysis of the different extension methodologies used in the dissemination of information on climate change shows that extension services is still more reactionary than being proactive. With the magnitude of the consequences of climate change it has become more necessary that extension programmes and activities become more proactive if extension services will truly be responsive to the demands of the clients it serves.

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