



## THE IMPORTANCE OF IMPROVED EXTENSION LINKAGES IN SUSTAINABLE LIVESTOCK PRODUCTION IN SUB-SAHARAN AFRICA

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### ABSTRACT

The overall purpose of dissemination is to improve the availability of information to poor farmers, and for it to become knowledge which the farmer employs to help make appropriate decisions. This includes researcher-derived information as well as more general information that supports and enhances livestock production. The provision of this information on livestock production has in the past not usually been of high priority for centralized extension services in many developing countries. Extension services are usually designed around need to provide information on annual or perennial crops. Now the potential for increasing livestock production through the provision of improved information is growing in many developing countries. For sustainable livestock production, this paper argues that the flow of information from agricultural research to farming communities requires that continuous contact be maintained by individual able to make information comprehensible to farmers. These individuals are extension workers and are at the centre of information flow. This link can be strengthened in several ways including improved collaboration between research and extension. This paper describes the context of livestock extension information growth and looks at some of the ways in which livestock extension services and institution differ and how livestock extension could be improved.

**KEYWORDS:** agriculture, extension, livestock, sustainability, production, sub-Saharan Africa.

### INTRODUCTION

World Bank reports of 1988-90 observed that about one in four people in sub-Saharan Africa did not get enough to eat and food emergencies remain an all-too-frequent reminder of poverty (FAO, 1992). To fight hunger, African countries need economic growth and food security, which implies food availability and access or capacity to purchase food. If the human population continues to grow at about 2% a year, food production should grow by at least 4% per year if the region is to meet the demand for food (Kyomo, 1992). Agricultural research and extension institutions can help bring about this increased production. However, these institutions cannot operate in a vacuum, irrespective of how good they may be. There are a number of prerequisites for research and extension to operate successfully. Firstly, there must be government commitment to agriculture and agricultural research and extension. This presupposes that economic policies must be supportive of agriculture and the institutional environment must be supportive of research and extension. Second, public research and extension should not work in isolation. Closer working relations between research and extension organizations must be encouraged. Research and extension are long-term processes and returns on investment may take at least 10 to 15 years to realize. Public-sector research and extension require considerable investment of capital and operational budgets to be effective (FAO, 1992; Kyomo, 1992).

Agriculture is a strategic sector in the economies of sub-Saharan Africa, e.g. about 80% of the total labour force is engaged in agriculture and agriculture accounts for between 35 and 60% of foreign exchange earnings. Agriculture contributes about 35 to 50% of the gross domestic product of the countries under consideration (Roling, 1990). Research in this context can be defined as the development of better crop or livestock germplasm to suit a particular demand or the generation of new technology to solve a particular constraint. Extension can be defined as the furthering and popularization of knowledge. It signifies the stimulation of desirable agricultural illumination. It can also mean information flow into farming communities and flow of information from farmers to researchers, input and services suppliers and policy makers. Extension plays an important role in the formulation of policy for agricultural development and sits at the centre of the agricultural information network. It is not a passive conduit but an active system that can be directed, it seeks out and organizes information and then channels it to and, equally important, from farmers (Roling, 1990).

Globally, agriculture provides a livelihood for more people than any other industry. Growth in agricultural production and productivity is needed to raise rural incomes, support the increasing numbers dependent on the industry and to meet the food and raw material needs of the faster growing urban populations. Enhancing agricultural productivity contributes to industrial growth by providing cheap labour, capital investment, foreign exchange and markets for manufactured consumer goods (Upton, 2004).

Agriculture has a key role in reducing poverty since most of the world's poor live in rural areas and are largely dependent on agriculture, while food prices determine the cost-of-living for the urban poor. About half of the total poor live in South Asia, and half the remainder in Sub-Saharan Africa, with smaller numbers in the rest of the developing world. The global objective, of having poverty levels by 2015, is unlikely to be reached at current levels of assistance to agriculture (Upton, 2004).

Livestock provide over half of the value of global agriculture output and one third in developing countries. Rapid growth in demand for livestock products (LPs), in the developing countries, is viewed as a 'food revolution'. LPs are costly in relation to staple foods, so developing country consumption levels are still low, but increase with rising incomes. Pig and particularly poultry meat consumption are growing fastest. Growth in consumption is at the expense of increasing net imports of all LPs. Increased production, and higher self-sufficiency would save foreign exchange. Livestock also contribute to rural livelihoods, employment and poverty relief. They integrate with and complement crop-production, embody savings and provide a reserve against risks. Some livestock have special roles in traditional culture (Upton, 2004). The importance of agriculture in economic development goes beyond its contributions to growth in national income, the livelihoods of rural people and meeting the nutritional requirements of increasing populations. Agricultural development is also seen as having a key role in the reduction of poverty. This follows from the knowledge that a majority of the poor in most developing countries (with the exception of countries in Latin America) live in rural areas and that food prices are a major determinant of the real income of both the rural and urban poor.

Following a series of international conferences proposing targets for the reduction of poverty, over the previous decade, The United Nations General Assembly (UN 2001) adopted a set of eight Millennium Development Goals. The first of these goals was to halve, between 1990 and 2015, the proportion of people whose income is less than US\$1 a day and the proportion of people who suffer from hunger. It is estimated that, globally, 1.2 billion people are in extreme income poverty, as defined by the US\$1 limit, and 75 % of these work and live in rural areas (IFAD 2001). More than two thirds of the poor live in Asia, with nearly a half of the total in South Asia alone. About a quarter of the total number live in Sub-Saharan Africa (IFAD, 2003).

Agriculture is the main source of Livelihoods for the majority of rural, people in developing countries. (Agricultural. population equals 87% of the rural population: FAÔSTAT 2003). It follows that most of the extremely poor people are making dependent on agriculture. The land-less and casualty employed farm labourers are almost everywhere among those most likely to be poor. Female headed households are often among the poorest in much of the developing world although less so in Asia. Activities are diversified with many supplementary off-farm activities. None the less the rural poor, in all developing countries, depend extensively on crop and animal production and related activities for their livelihoods. Improvements in agricultural productivity offer the most direct route to the relief of rural poverty. Despite the global objective of halving poverty levels by 2015, the share of development.

#### THE NEED FOR INFORMATION

The demand for information on livestock production is growing, both in the sense of demands expressed by the producers themselves, and in the more general sense of a growing potential for increasing production through the delivery of information. Three linked factors are at play: processes of intensification and crop- livestock integration taking place especially in Africa; increased commercialization of livestock production, particularly in peri-urban areas; and the gradual overcoming of animal disease as a constraint on production.

#### Intensification and integration

In large areas of Africa, livestock production by sedentary farmers is increasing, and old distinctions between farmers and pastoralists are breaking down. Population pressure and new markets created by urbanization have caused an increase in land under cultivation, at the expense of grazing land. In some areas the adoption of

animal traction has allowed greater areas to be cultivated per farmer, and also increased the need for fodder and grazing. Farmers have increased their livestock holdings as insurance against drought, and as a form of investment for the proceeds of cash cropping. Pastoralists have increasingly settled and started to cultivate, either as a result of impoverishment, or from a desire to establish use-rights to land before others do.

While these processes are enormously complex, the implications for extension are clear: that great numbers of livestock in Africa are now kept by people without a traditional background in livestock production, or used for non-traditional purposes within rapidly changing production systems (Rushton, 2003).

#### Peri-urban livestock production

In nearly all developing countries, urban and peri-urban livestock raising is becoming increasingly important, as urban demand for animal products rises. In India, government and donor support has enormously stimulated dairy production, and marketing through cooperatives. The liberalization of dairy marketing in Kenya has contributed to a similar trend. In the Sahel the devaluation of the CFA franc and the ending of subsidized EU beef exports have stimulated a rapid expansion of urban fattening activities. Peri-urban production in all its forms will create demands for information, as it involves people new to livestock production, or new techniques (use of purchased fodder and concentrates), and because it involves a more systematic approach to processing and marketing.

#### The overcoming of health constraints

The concentration of government services on livestock health has been justified by the immediacy of animal diseases. The control of serious diseases such as rinderpest and Newcastle disease is now more effective, and treatment for many other conditions more easily accessible. As farmers gain confidence that diseases are under control, they are prepared to invest more in animal production. New constraints, particularly in genetic potential, and nutrition and husbandry, are now becoming limiting (Morton and Matthew man, 1996).

### EXTENSION METHODS AND INSTITUTIONS TO ENHANCE LIVESTOCK PRODUCTION

#### Crop-based and animal health-based extension

Despite its growing importance, livestock production extension is a field neglected both by policy-makers and by researchers. The importance of livestock to household welfare, fertility maintenance and production is still under-recognized in many developing countries. But livestock production extension faces the additional institutional problem of being marginal to both agricultural extension and animal health services.

Agricultural extension services have developed around crop production, and remain tied largely to the seasonal nature of cropping. Such a system is less useful for livestock production, with a longer time-scale and a lack of synchronization of different animals and herds (Morton and Matthewman, 1996).

Livestock services and the ministries or departments that are responsible for them, are mainly run by vets, and focus on animal health issues: curative treatment of individual animals, preventive health, and health screening of animal products. While many special projects, area-based or sub-sectoral, concentrate on livestock production issues and are run by animal productionists. Livestock production has often held a marginal status in official circles, between two well-defined sectors with associated interest groups, sometimes neglected by both, sometimes shuffled between them.

#### Individual or group focus

Group approaches are preferable where joint action is needed, or where free-rider problems need to be resolved in cost-recovery programmes. On the other hand, needs for information will be increasingly individual, as livestock production intensifies and becomes more complex.

#### Information vs. information-with-inputs

Extension can either provide pure information or information linked to material inputs. The latter can appeal to the commercial sector involved in input sales or to marketed off take. It has also been used in more remote areas by NGOs to give users a stake in the information system and to promote farmer-to-farmer spread. Some NGO projects link extension to the provision, often on highly subsidized terms, of the animals themselves, sometimes for new sorts of livestock activity, such as sheep- fattening by women.

### Participation

Participatory or “farmer-led” extension have received much attention recently. While the need for farmer participation is real, and discussed further below, the strengths of formal systems should not be overlooked: access to a pool of research expertise, systematic procedures for turning research findings into extension messages, and the fact that the organization persists as messages come and go. By contrast, some advisory services, often run by NGOs, are based on predispositions with poor technical grounding.

Participatory approaches can play positive roles in alleviating most of the generic-problems, including the development of farmers who could perform several extension agent roles in a cost effective manner. Contracting extension services can take the form of a private sector contracting in public sector extension staff (contracting in), or public funds used to contract private service providers (contracting out) (Rivera and Zijp, 2002). In the latter case, the role of the public sector changes from service provider to regulator or quality controller and overseer of the service provider. With the advancement in the Information and Communication Technology (ICT), its applicability to extension service has recently attracted interest. Recent experiences in the application of ICT in extension services in countries like India are examples of the emerging use of the technology to reach rural communities.

The extension service experience globally has also led to the identification of the key success factors (Thropp 1996, as cited in Anandajayasekeram 2005), including participation and empowerment of farmers and communities, linkages between groups and institutions, innovative learning and communication, and supportive policy environment and political commitment. A common feature of the most successful extension services has been farmers taking the lead or sharing control in all parts of the effort. Close collaboration between research institutions, extension agencies, nongovernmental organizations (NGOs), the private sector and farmers has also been an important factor of successful extension service delivery. Moreover, mutual learning process and exchange of information between farmers, experts and scientists facilitates improved problem identification and technology development. Government commitment at all levels helps bring about change more quickly (Gebremedhun, 2006).

To counteract the effects of the enduring (generic) problems and enhance the contributions of the success factors, the agricultural extension service globally is undergoing a number of changes. an extension system should encompass five goals:

1. transferring knowledge from researchers to farmers,
2. advising farmers in their decision making,
3. educate farmers to be able to make similar decisions in the future,
4. enabling farmers to clarify their own goals and possibilities,
5. stimulating desirable agricultural development.

Extension service needs to aim at both technology adoption and human resource development. Most of the focus of extension to date has been on technology adoption (Roling 1988). Human resource development deals with the rural people themselves and their social systems, and aims at developing leadership capacity, institutions and mobilization and organization of farmers.

### IMPROVED EXTENSION FOR LIVESTOCK PRODUCTION

Responsibility for the transfer of information on livestock production to farmers has- often fallen between extension services, (which are geared to the extension of crop messages), and livestock services, (which are geared to animal health concerns). However, there is now an increasing demand for livestock production extension, not least where the integration of formerly separate farming and herding systems is proceeding, and indigenous knowledge cannot be relied on. Some of the relevant topics are:

- cultivation of fodder crops
- storage of hay, fodder and crop residues
- integration of soil conservation with livestock feed supply

Most livestock production extension in the near future is likely to be delivered under large-scale extension services, usually with a primary mandate for crop extension. Some of these will be operating to varying degrees under a “Training and Visit” system. Besides generic problems of sustainability, such services will have

problems dealing with the less seasonal basis of livestock production compared to crop production, and the greater inter-household variation in information needs. To better deliver livestock production extension, such services could and should:

- decentralize extension planning and management
- cross-train crop extensionists in livestock production and livestock extensionists in crop production
- introduce participatory needs assessment methodologies:
- draw up extension priorities at a local level:
- treat extension calendars as a general guide. not as a strict framework:
- empower extensionists to deal with variations between households; ensure direct links between livestock research and extension; and develop adaptive and participatory methodologies for livestock research. Such incremental reforms should not distract attention from the need for more fundamental reforms of extension services, both to ensure financial sustainability and to maximize farmer participation (Odeyinka, 2008).

#### Livestock Extension Within Crop-Based System

At national level, relationships between agricultural extension services and livestock ministries or departments are inherently problematic. Livestock production is both a highly specialized sub-sector with a strong claim to separate structures, and sufficiently integrated with other forms of agricultural production to warrant inclusion in extension services. One part of the solution lies in decentralization of all extension, and the integration of crop and livestock information delivery under local structures in response to local needs and condition (Morton and Matthewman, 1995).

Most models for the integration of livestock into national extension systems will require cross-training of crop-specialist staff in livestock production and vice versa.

There are thus three linked but distinguishable imperatives for livestock production extension: participatory needs/assessment responsiveness to inter-household variation, and ability to address information needs as they arise., not as determined by a calendar. In meeting these needs livestock production extension must learn from 'farmer-led extension' initiatives (Scarborough, 1996), but public sector reform is likely to be essential. Reforms to national systems can be incremental participatory needs assessment methodologies can be introduced, extension calendars compiled at lower levels, and treated more flexibly, and extension workers empowered to present options rather than set messages. But such reforms will require continued resourcing.

#### Production extension within animal health services

There are few examples of animal health services success-fully delivering production information to mixed crop-livestock farmers, other than information linked specifically to material inputs such as drugs, vaccines or semen. Disease prevention through vaccination campaigns, reduction of mortality and morbidity losses, and meat hygiene have remained priorities. This is understandable since human health is an important consideration, diseases cause visible losses and solutions are available (Morton and Matthewman, 1995).

Further, the working patterns of animal health staff tend not be conducive to regular mass extension: animal health services are usually focused on district clinics to which farmers can bring animals, or on call-outs to individual animals. Vets and paravets are unlikely to have training in communication skills. Their professional reward systems usually revolve around concrete targets of animals treated/vaccinated or drugs supplied and are not conducive to the provision of 'pure' information.

Animal health services, then, have not yet fulfilled their potential as vehicles for mass extension to mixed crop-livestock farmers. A case can be made for information dissemination to widely scattered producers through animal health and fertility camps organized by animal health services, as in India. A case can also be made for complementing animal health services with a parallel livestock extension service, possibly operating from the animal health clinics and hospitals, but staffed separately. Para veterinary projects, many run by NGOs, have a good record with pastoralists around the world (Butcher, 1994), including to some extent with production information.

Government animal health staffs are playing an increasing role in extension to more specialized livestock producers the pen-urban or the wealthier in rural areas. Pressures are increasing to make this advice available for a fee or to hand it over to the private sector.

#### RESEARCH EXTENSION LINKAGE SYSTEM

REFILS encompasses all contributions by all stakeholders to agricultural development. As a marked improvement on the tripartite Research-Extension-Farmer, Linkage. The REFILS as a concept recognizes input supply as the fourth component upon which successful farming depends. It is a linkage system where the four components will individually function ineffectively but collectively produce effective linkage that can produce activities to bring about desired self-sufficiency in agricultural production (Omolehin and Olukosi, 1996 and Arokoyo, 1999). Input is a very important aspect of technology adoption because inputs such as seeds, chemicals, mechanization, veterinary services etc are very crucial to successful farming and the logistics of their supply should not be taken for granted. The linkage existing among research extension farmers and input suppliers is by design a bottom-up approach where research is expected to start and end with the farmers. To ensure strong linkages among different actors in the agricultural knowledge system farmers are to be involved not only when research is already concluded. It should be from the planning process, prioritization of farm problems, identification and selection of technologies to be tested, testing and experimentation and evaluation as well as training of other farmers in the application of the technology. Linkage among the different stakeholders in agricultural development is carried out through the zonal research extension committees of the National Agricultural Research and Extension System network, quarterly technological review meetings, the use of subject matter specialists, and National Agricultural Research Liaison Services (NAERLS) working in collaboration with each National Research institute. All the institutes for example are expected to participate in the research extension linkage programmes namely

- ⇒ Training workshops for extension;
- ⇒ On-farm adaptive research;
- ⇒ Monthly technology review meetings;
- ⇒ Diagnostic survey and
- ⇒ Publication (Faboropde and Laogun, 2008).

#### Bridging the gap

One of the known ways of bridging the gap between research and extension is the method adopted by medium-sized and small business (Roling, 1990). Such businesses become more innovative by enhancing their capacity to utilize external information. The 'process consultation', which involves introducing a step-by-step model of the innovation process thus stimulating the creativity of company staff members and encouraging the use of external information, is recommended (Roling, 1990). In agriculture, process consultation is a useful concept as it complements the role played by expert consultation by providing an external input of information or technology. Process consultation is a means of mobilizing people, educating them and organizing them to become effective participants in the agricultural knowledge and information system. Information from external sources is crucial to the effective functioning of any information system, but if the system does not have the capacity to generate and enhance appropriate roles for its constituent parts, it will not be in a position to absorb such information.

In an attempt to improve the linkage mechanism, countries must apply a number of approaches (Roling, 1990). The annual report of a research institute is one way of linking research with extension. Other methods include surveys of farmers' problems conducted jointly by research and extension and quarterly meetings between research and extension programmes to discuss current and future activities. Regularly published annual reports are useful for scientific staff and some farmers. Annual workshops where research and extension activities are presented to a large audience is another useful mechanism. A pre-workshop meeting at which senior project officers meet to transform research findings into recommendations is also helpful. Training programmes where research officers explain details of latest recommendations to field agents (extension staff organized in groups according to agro-climatic zones) and at which extension workers can raise issues encountered in the field would also be useful. Field days organized about three times during the planting season involving researchers, extension workers and farmers are another approach.

Many companies practice 'body swapping', a system where a researcher in basic research can be posted to the research and development (R&D) department of the company. This can be applied to agriculture where similar

exchange of staff takes place in the research-extension liaison officer model. These officers can be recruited from the extension system to work in on-farm adaptive research teams, where they play an especially important role in enlisting the support of extension services once technology is ready for more widespread testing and dissemination.

The research-extension linkage can operate effectively if there is cooperation between domains or categories. For example a beef producer needs integrated information from the beef cattle production branch, the veterinary services branch, the pasture development branch and the economic services branch. Communication across branches is not always easy. One way of improving coordination has been to appoint cross-branch regional extension leaders who report directly to the overall director.

New Extension Paradigm: Numerous critiques of Training & Visit and other agricultural technology- transfer approaches have led to a chorus of calls for demand-driven extension. Demand-driven extension involves a shift from public sector extension delivery to a negotiated system through which farmers and rural community members determine their needs and have some control over extension services which are delivered by public, private, NGO or farmer organization providers. The new paradigm in extension is often referred to as demand driven extension. Demand is defined by Neuchatel Group (1999) as what people ask for, need and value so much that they are willing to invest their resources, such as time and money in order to receive the services.

The term offers an alternative to the definition of technology transfer and might be defined as an agricultural advisory service based upon the idea of two way communication promoting knowledge facilitation, knowledge generation, or knowledge sharing in a community development context and with focus on human resource development (Akinagbe and Ajayi, 2010). It generally involves changing the distribution of power and responsibilities among three sets of actors: clients, service providers and government. Neuchatel Group (1999) described its main principles as; services shall be driven by user demands, service providers shall be accountable to the users and users shall have a free choice of service providers.

## CONCLUSION

The writing of this paper was stimulated by the increasing potential in many - developing countries for improving livestock production through the provision of extension on production techniques. But livestock extension has been marginalized by major interest groups (crop-based extension and animal health services) and by a lack of a clear understanding of livestock farmers' needs. Crop production needs and animal health problems are more easily diagnosed and addressed than livestock production needs. Livestock farmers are frequently dispersed and are usually not uniform in their needs (even within a particular community).

The sorts of reforms and modifications necessary to introduce some livestock production messages successfully into crop-based extension services are now clearer. Many of these reforms are needed anyway by those services if they are to work effectively with poor farmers. Other information may be handled by animal health services, given certain reforms, particularly in professional reward systems. The choice of institutional context for livestock production extension cannot be made in the abstract, but has to be based on the nature of producers' information needs, and on available resources.

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