

BRIDGING THE GAP BETWEEN RESOURCE-POOR FARMERS AND EXTENSION SERVICES: THE ROLE OF COMMUNITY-BASED EXTENSION SYSTEMS

H. Warburton^{1*}, R. Blake,¹ S. Coupe,¹ K. Pasteur¹ and E. Phillips¹

ABSTRACT

Over the past two decades, the NGO Practical Action implemented a range of food and livelihoods projects with farmers in some of the most marginalised areas of Africa, Latin America and South Asia. A key component of these projects was the development of local or community-based extension systems (CBES) to bring information, skills and services to farmers and livestock keepers who had limited access to government or commercial extension services. This paper looks at policy-related issues surrounding these local extension systems. It identifies the social, economic and technical factors that contribute to their success and considers how local policies and practices have influenced the variety and effectiveness of the CBES that have been developed. The paper draws on findings from a study of past projects in Bangladesh, Kenya, Peru and Sudan covering a range of ecosystems and policy environments. It assesses the sustainability of CBES several years after project support has finished and questions how CBES can complement government or commercial services. The findings show that these systems are valued by the local community and continue to provide a service to farmers even after project support ends.. CBES also provide more flexible, cost-effective and far-reaching services to resource-poor farmers in marginalised areas than government or commercial extension services. Policy-makers should consider providing recognition and support to CBES as part of an integrated and pro-poor approach to extension services.

Key words: Flexible, Local policies, Pro-poor, Success, Sustainability

INTRODUCTION AND OBJECTIVES

Smallholder farmers and livestock keepers are at the heart of world food production, producing more than half the world's food, feeding an estimated 70% of the global population and cultivating most of the world's varieties of food crops and livestock (ETC, 2009). Despite their pivotal role and growing recognition of the role of agriculture in development (World Bank, 2007; IAASTD, 2008) they receive limited support. This is particularly true for farmers and livestock keepers living in areas regarded as 'low potential' (remote, fragile, hazard-prone). Not only do they have to cope with farming under difficult agro-ecological conditions but they are often marginalised in terms of: the resources and support directed to these areas, and the influence they have over agricultural research and development. Often regarded as 'unviable' or marginal to food production, these farmers may receive food aid or other forms of safety net, but little practical agricultural support.

¹ Practical Action, The Schumacher Centre, Bourton on Dunsmore, Rugby, CV23 9QZ, UK

Recent developments in agricultural policies have re-emphasised the importance of extension services and the need for pluralistic extension systems (Swanson, 2008; Christoplos, 2010). Existing models of extension based on government services or private agro-dealers are not sufficient to meet the needs of farmers in these areas.

Over the last two decades, Practical Action² has been working with farmers, local government and other service providers to develop community-based extension systems that provide local services and information on agriculture in fragile areas. This paper distils some of the lessons learned. It draws on a review of projects in Bangladesh, Kenya, Peru and Sudan which investigated the effectiveness and sustainability of these extension approaches after the initial projects had finished. The paper argues that community-based extension can be an effective way of reaching marginalised farmers, creating income opportunities, promoting local development and building resilience of vulnerable farming communities. It considers the policy and practice changes needed to realise the wider potential of community-based extension.

Current challenges

Smallholder farmers³ face multiple challenges. They are constrained by lack of assets, unequal access to services, markets and technologies and often lack a voice to influence policy-makers, which often results in a cycle of low productivity. Many are highly vulnerable to impacts of climate variability and climate change which exacerbate existing problems of environmental degradation. Smallholder farmers and the rural landless poor also form the majority (70%) of the one billion people who lack sufficient food (World Bank, 2007).

Agricultural extension systems are vital to address the food and livelihood needs of these marginalised farmers, by bringing innovation into the smallholder farming sector through exchange of knowledge, technologies and skills relating to production, natural resource management, post-harvest and market systems. This takes on ever more urgency and importance in the context of global trends such as food price volatility and climate change, which heighten uncertainty for poor farmers.

Government and private agro-dealers are not meeting this challenge. There is a common set of problems that limit their role as extension service providers.

- Government budgets for extension have been cut back and are not prioritised, especially in more risk-prone and poorer areas. Even if extension staff salaries are maintained, operational costs are cut, so staff are confined to their offices.
- There are high costs and difficulties in finding professional officers (vets, extension specialists) willing to live and work in remote and sometimes insecure areas.
- Low purchasing power of farmers and high transaction costs in reaching remote areas often make private provision unprofitable and unviable.
- The requirements for localised solutions in crop and livestock management to meet tough environmental conditions mean that recommendations, often designed

² Practical Action is an international NGO working in Africa, South Asia and Latin America

³ The term smallholder farmers includes farmers, livestock keepers and fisherfolk

under different agro-ecological and economic conditions, are ill-suited and may not be effective or sustainable.

- Recommendations such as those promoting monocropping, use of inputs and irrigation are often unaffordable and expose farmers to both short-term and long-term risks.
- Women farmers receive much less support from extension services than men, despite making up the majority of agricultural workers.
- Advice is usually a one-way flow from extension agent to farmer. Delivery mechanisms are unaccountable to farmers, and do not consider farmers' own knowledge. There is no feedback from farmer to extension or research.

In these circumstances – where state extension has failed farmers in marginal areas and private commercial service providers do not reach them – there is a need for complementary extension approaches that are more accessible, responsive and accountable to farmers and provide more affordable and appropriate services.

Local or community-based extension systems provide such a complementary approach. These are characterised by the use of 'para-professionals'. Rather than external "expert" extension professionals, these individuals originate from, and reside in, the communities where they operate. They are practising farmers, fisherfolk, livestock keepers who provide advice, training, agricultural and veterinary services for local farmers. Community-based extension agents (CEAs) are trained by external facilitating agencies – from NGOs, the government or the private sector. The CEAs may work on a voluntary or self-employed basis. There are many variations in the structure and implementation of community-based extension systems, as they are designed and evolve to suit the local context.

METHODS, MATERIALS AND DATA SOURCES

This paper is based on the findings from an ex-post evaluation study of community-based extension in four locations in Bangladesh, Kenya, Peru and Sudan. In each case the community-based extension had developed initially under project funding, but the projects had finished five or more years' previously. The aim of the studies was to re-visit the same locations in order to assess the effectiveness and the sustainability of the extension systems.

Specific objectives were to investigate:

- The reach of extension to poorer farmers
- The sustainability of community-based extension after the project ended
- The factors affecting the success and continuation of community-based extension
- Issues for future development of community-based extension

The study formed part of a wider review of food security programmes and involved qualitative individual and focus group interviews plus structured questionnaire surveys. The main topics and questions were designed centrally. These were then adapted in each country to ensure that the questions were appropriate for the context. Questionnaires were translated into local languages and pre-tested in the field before

being finalised. The studies were undertaken by Practical Action staff from Bangladesh, Kenya, Peru, Sudan, UK and Zimbabwe.

Both household members in the community and CEAs who had been trained by the original projects were interviewed in groups and individually. A questionnaire survey of a random selection of households and a separate questionnaire of the CEAs were carried out. Key informants (including project staff and government extension staff) were also interviewed. The locations, types of CEAs and numbers of people interviewed are shown in Table 1.

Further details are included in the separate country reports (Coupe and Pasteur, 2009a; 2009b; Coupe, 2009; Coupe, 2010).

Table 1: Summary of community-based extension systems in study locations

Country and location	Extension type	Survey instruments	No. of CEAs	No. of households
Bangladesh Faridpur District 5 communities	Individual Rural Technology Extensionists: Crops, horticulture, poultry, livestock production & health Fisheries	Focus group interviews, key informants, CE questionnaire, household questionnaire	56	140
Kenya Samburu District 8 communities	Individual paravets Livestock production & health, ethno-veterinary	Focus group interviews, key informants, CE questionnaire, household questionnaire	36	58
Peru Sicuaní, Canchis Province, Cusco 40 communities	Kamayoq organisation Agriculture – mixed Livestock production & health	Focus group interviews, key informants, CE questionnaire, household questionnaire	55	51
Sudan North Darfur 5 communities	Village Extension Agents & paravets under Village Development Committees Agriculture – mixed Livestock production & health	Focus group interviews, key informants, CE questionnaire, household questionnaire	55	123

Limitations

Tracking down all those who had been trained as CEAs was difficult. Therefore the CEA sample cannot be regarded as random and has a bias towards those who are still practicing as CEAs, as they were easier to find.

As questions were modified to fit the local context, it was not always possible to make direct comparisons between locations.

RESULTS AND DISCUSSIONS

The community extension approaches varied in different locations, reflecting the institutional context, and the needs and livelihoods base of the local communities served. However, there were a number of core characteristics. Broadly, community extension agents have been supported to:

- work voluntarily or on a self-employed basis, serving households within the community and demand from outside
- build capacity of local farmers to investigate and solve their own problems and adapt new technologies with experimentation
- provide a strong link between farmers and local government officials, including for pest and disease monitoring
- for crop farmers: help local farmers to improve yields with low input techniques and technologies; give guidance on public health issues, marketing, natural resource use, and livelihoods options
- for livestock keepers: help improve animal health by recognising the most common diseases, diagnosing and treating sick animals, preventing disease occurrence through vaccination, promoting good livestock practices and breed improvement and referral of difficult clinical cases to a supervising vet.

Box 1 contains a summary of the community-based extension systems in the four study locations. Apart from the differences in subject specialisation, there are also differences in the extent to which the CEAs work as part of a wider community-based organisation, or work as individual operators. In Bangladesh and Kenya, the CEAs work as individual entrepreneurs, whereas in Peru and Sudan the CEAs are strongly linked to community-based organisations (the Kamayoq association or the Village Development Committee).

Box 1: Summary of community-based extension systems in study locations

Bangladesh

Location: Flood and erosion-prone areas of Faridpur District, including some of the riverine islands (chars).

People: Smallholder and marginal farmers

Extension specialism: Agriculture (staples and vegetables), poultry production, livestock production, breeding and health, fisheries (open and cage).

Training: Practical Action staff, government extension and veterinary staff with inputs from research institutes such as BARI.

Community extension type: CEAs work as individual agents and charge for their services. They are known as Rural Technology or Rural Community Extensionists (RTEs or RCEs)

Extension context: Government extension system exists, but insufficient resources. Agro-dealers (crops, livestock, fisheries) available in main towns.

Kenya

Location: Semi-arid areas of Samburu District – a drought and conflict-affected area. *People:* Most are nomadic or semi-nomadic pastoralists.

Extension specialism: Livestock production and health - paravets.

Training: Practical Action staff and government veterinary staff, based on Inter-African Bureau for Animal resources (AU-IBAR) guidelines.

Community extension type: CEAs work as individual paravets and charge for their services. They are known as Community-based Animal Health Workers (CBAHWs) or paravets.

Extension context: Government veterinary service exists but virtually no coverage in pastoralist areas. They do not officially recognise paravets, despite adherence to AU-IBAR guidelines. Very few agro-dealers available and only in main towns. Other NGOs also training paravets.

Peru

Location: Valleys and slopes of the Andes in Canchis Province, Cusco.

People: Smallholder farmers and livestock keepers, mainly Quechua-speaking

Specialism: Lower slopes mixed farming, e.g., maize, beans, potatoes and livestock – guinea pigs, cattle, sheep; high plateau alpacas, potatoes.

Training: The extension system builds on the tradition of the “Kamayoc” – respected, knowledgeable local people who advised on planting dates. A Kamayoq school was established in the mid-1990s and has been training local farmers to provide extension services back in their own villages.

Community extension type: CEAs work as individual agents but with strong links to Kamayoc Association. Services are sometimes free or at cost. The CEAs are known as Kamayoqs.

Extension context: there is no government extension service, but plenty of agro-dealers, especially in lower areas.

Sudan

Location: Dry and conflict-affected areas of North Darfur.

People: Farmers and agro-pastoralists

Specialism: Crop management, water management and livestock production and health (paravets).

Training: Provided by Practical Action and government extension agents, and organised through the fillage development committees.

Community extension type: CEAs work as individual agents but with strong links to the Village Development Committees who provide each CEA with a donkey and equipment. The CEAs are known as Village Extensionists Agriculture (VEAs) or paravets.

Extension context: Government extension has few resources, and many are trained to provide services to large-scale irrigated systems. Other NGOs providing mainly relief rather than agricultural services.

CEAs current work status

A total of 202 CEAs (160 men and 42 women) were interviewed – representing about one quarter of the 800 people who were trained across the four locations. The sample was biased towards those who were still active as it was not always possible to track down CEAs who had stopped working or (as in Sudan) they declined to be interviewed. In Bangladesh, for example, it was estimated by project staff that 90 out of the original 127 CEAs (71%) were still working at least part-time, but there was a higher proportion of active CEAs (89%) in the sample of respondents interviewed.

However, there is no doubt that a substantial number of people are still working several years after the projects ended (Table 2). Extension is not necessarily their full-time job, but the majority viewed it as a main source of their income.

Table 2: Community-based Extension Agents: current work status [source: CEA questionnaire]

Country	Still working	Full-time	Main livelihood	Secondary livelihood	Not working	n/a
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Kenya (n=36)	32 (89%)	9 (25%)	9 (25%)	14 (39%)	1 (3%)	3 (8%)
Peru (n=55)	45 (81%)	11 (20%)	20 (36%)	17 (31%)	7 (13%)	
Bangladesh (n=56)	50 (89%)	18 (27%)	26 (46%)	6 (11%)	2 (3%)	4 (7%)
Sudan (n=55)	49 (89%)	7 (13%)	33 (60%)	9 (16%)	-	6 (11%)

Subject specialisation amongst the CEAs interviewed was as follows: Bangladesh (livestock 29, crops 8, fisheries 19); Kenya (livestock 36); Sudan (livestock 27, crops 28). In Peru there was more overlap as many provided both crop and livestock services.

The services provided varied from advice only to provision of services, such as treatment of livestock (e.g., deworming, vaccinations, minor operations) or provision of inputs (e.g., loan of breeding animals or supply of fish fingerlings). Some CEAs also provided information on marketing and processing. In Peru for example, 35 different services were recorded, ranging from advice on integrated pest management (IPM) to supply of quality seeds or pasture management.

Key to success

The findings from the studies point to several key factors that influenced the effectiveness and sustainability of community-based extension systems.

Selection and training

Selection criteria for the CEAs were agreed by the local communities in collaboration with project staff and sometimes with local government staff. Frequently listed qualities for a good CEA across all the locations include someone who was resident and spoke the local language, trustworthy, accessible by the poor (ideally not from an elite family), knowledgeable with good farming experience and interested in new ideas, and with good communication skills. Selection depending on characteristics such as age, gender, marital status and literacy varied more; in particular government livestock departments often demanded that CEAs were literate.

Training was organised with the participation of relevant district level government staff as well as local specialists (in Peru) and project staff. Training duration varied depending on the subject; generally longer training for livestock CEAs - between 15 and 30 days, with continuous residential training (except for Peru where training was split into 3 or 4 day sessions over approximately 9 months). In each case there was follow-up support for the initial field practice and opportunities for a range of exposure visits to see technologies and techniques in practice.

The main elements of successful training identified are described below.

- Training was geared to the needs of the community and varied from specific skills (such as poultry vaccination) to wider diagnostic skills such as crop doctors or livestock health workers.

- In addition to technical issues, the training addressed how to access support and build relationships with government officers and other service providers.
- A mix of classroom and field based training methods designed to suit people with farming and livestock skills but without requiring high levels of formal education. The delivery and frequency of training considered the cultural and linguistic barriers and fitted in with seasonal labour demands.
- Allowing women to bring their children to the training sessions, or be cared for by trusted members of the community, increased their levels of attendance.
- The emphasis was on participatory approaches and farmer experimentation and approaches based on locally, available resources rather than a high dependence on external inputs.
- In the case of veterinary training, training adhered to the guidelines promoted by government ministries as they tended to demand tight control of the training schedule.
- Local government agents were involved throughout and the CEAs were linked with government services to provide follow-up training and back up.

Recognition of CBE training achievement and status

In all the four locations, certificates were issued to the newly trained CEAs. These were signed by a senior district official and a senior Practical Action staff member. These training certificates were regarded as very important by CEAs in conferring legitimacy on their practice. District official approval of training certificates was vital, especially for paravets, where the authorities required guarantees about the correct handling of pharmaceuticals. The certificate was used by some CEAs to convince new customers of their skills and had been used as a valuable asset in itself – for example, fisheries CEAs in Bangladesh had used it to enable them to access credit.

The certificate is important as the people can recognise the paravet as a special person, differentiated from all the rest. Sometimes officials come across them in the field when they are practicing and challenge them, but when officials are shown the certificate they are satisfied. **[Paravet Group Discussion, North Darfur, Sudan]**

Outreach in challenging and remote contexts

CEAs have continued to function in all the locations – including in the dry and conflict-affected areas of Sudan and northern Kenya, river-island communities in Bangladesh and the high pastures of the Andes.

When local people were asked about their access to extension services and sources of information, the availability of CEAs featured prominently. Of the total 372 households interviewed, 343 (92%) had received services from CEAs. This varied across countries as follows: Bangladesh 79%; Kenya 100%; Peru 61% and Sudan 75%.

The CEAs were also rated by most farmers as the current preferred source of information on crops and livestock in three of the four locations – a change from the situation prior to the establishment and training of most of the CEAs (Table 3). The situation in Peru differed as more households relied on agro-dealers for agricultural

information, especially in the valleys and lower slopes where dealers were easier to reach. The CEAs were an important source of information on livestock.

Table 3: Top three preferred sources on information on crops and livestock [Source: Household questionnaire]

Country	Crops		Livestock	
	2003	2008	2003	2008
Bangladesh	Other farmers No source Dealers	CEA Government Other farmers	Dealers No source CEA	CEA Dealers Government
Kenya	-	-	Government CEA Dealer	CEA Government NGO
Peru	No source Dealers Other farmers	Dealers CEA No source	Dealers No source Other farmers	CEA Dealers NGOs
Sudan	Other farmers No source Dealers	CEA NGOs Government	Government No source Other farmers	CEA NGOs Government

The local availability of CEAs was seen to be an advantage to communities. For example in Kenya, 66% of respondents rated the availability of CEAs as good, whereas only 3% of respondents rated the availability of government extension staff as good. As one respondent said:

The absence of community vets would be terrible. We would be helplessly watching as the animal dies [...] They are available in an emergency. They are near, they are ‘doctors in the house’, offering a very good service and they also give us the option to pay later. [Mrs Lajina Lerkorpita, Baragoi, Samburu District, Kenya]

CEAs focused most of their efforts on their own community and surrounding villages. This was more apparent in Sudan and Peru and is especially true for women CEAs. Livestock and fisheries CEAs tended to cover wider areas – about one third of the CEAs in Kenya and Bangladesh covered more than 10 villages, including seven livestock CEAs in Bangladesh who reached more than 20 villages.

Outreach to poorer members of the community

Although most CEAs charged for their services, there was no evidence that they focused on the better-off farmers. On the contrary, many CEAs expressed a preference for working with poorer households because they have been historically less well served by other providers and by pricing their services modestly they tapped into this underserved demand. The poorer farmers were reported to be very reliable in paying for the service, even if their payment were sometimes delayed and tended to be more respectful to the CEAs than better off farmers.

From discussions with the community, the flexibility of payment was very helpful, especially for emergencies when CEAs would provide help and sort out the payment in cash or kind later.

They [CEAs] served almost all categories of people who ask for their service. Sometimes they serve the poor free of charge. Good manners is far more important than wealth in deciding on clients. **[Focus group, Bangladesh]**

I always provide a service, otherwise the community members will criticise me in the assembly. Nevertheless, if a community member doesn't pay me for a second or third time, I remind him and if he is conscientious – if he doesn't have money he will pay me in produce – for example barley for bran. **[Juan Huacani Llallawi, Marangani, Peru]**

The flexibility in payment and compassion for those in vulnerable circumstances was evident in all locations. For example, 41% of respondents in Bangladesh said they would offer credit or provide services for free if poorer people could not afford their services. Even in Kenya, where CEAs claimed they would '*call a council of elders to force him or her to pay*' or '*I will not treat his animals again*', they also added '*in extreme cases I just help them*'. [Focus group, Kenya]

We do not have a comprehensive comparison of the costs to the farmers in using CEA services, compared with alternative service providers, but discussions with community groups indicate that they are cheaper. For example treatment of a sick cow by a livestock CEA in Bangladesh instead of by a vet based in the nearest town, represents a saving to a household of 300 Taka⁴.

In Peru, the main alternatives to CEAs are the private agro-dealers, who need to cover their travel costs:

There are other service providers that come from Sicuani and San Pedro, who offer their services at high prices. For example they charge 6 sols per dose whilst I only charge what the farmer can afford, around 3.5 sols per dose depending on the quality of the medicine. **[Fernando Mesa Charca, Puma Orqa, Peru]**

Promotion of practices and innovation relevant for the farmers and location

CEAs are working farmers and livestock keepers so they start with knowledge of the local area and farming methods. Once trained, most combined their existing and newfound knowledge from their training to experiment on their own farms. Their research strengthened their capacity to innovate and increased the productivity of their own land and livestock, and was a way of passing on the knowledge to the surrounding community.

We cannot directly attribute rises in production solely to the work of CEAs. However, the majority of household respondents rated the services provided by CEAs as good (in terms of relevance to their needs). For example, in Kenya, 83% of respondents rated the services from paravets as good, whereas only 43% respondents rated services from government services as good. In Peru more people rated the livestock

⁴ About £3 in 2008

CEAs as good (37%), than the private suppliers (20%) or other NGOs (22%). In Bangladesh 78% had 'no problem' with the service from CEAs.

In group discussions, farmers gave examples of where they had been helped by CEAs.

Now beef fattening is a simple technology to me, with which I have been rearing two cattle in a small space (15feet/10 feet) beside my house and my wife can look after them without having any hard work. I suppose beef fattening could be a vital solution to increase income as I have gained with the help of RCE [Rural community extensionist] livestock. ...I think these changes would not be happening in my life if RCE livestock Mr. Akter was not so helpful to me and if he did not follow up from time to time providing necessary services for beef fattening. [**Ainal Sheikh, Manikdoho village, Faridpur, Bangladesh**]

There is also evidence that the CEAs have been successful in developing new activities. For example, CEAs in Peru have improved alpaca production and introduced new breeds of guinea pigs. In Sudan, a quarter of the CEAs reported that they had developed practices that are innovative in the local context, such as planting seedlings from watermelon in autumn to ensure an earlier crop, or using neem as a pest control. In Kenya, CEAs introduced improved pasture management practices that allowed herders to produce more and better fodder for their animals in secure areas close to settlements. This avoided the need to move to distant areas for grazing during periods of heightened conflict and cattle raiding.

Income and livelihood opportunities

CEAs can use their training to increase their income, as well as enhance their status within the community.

In all the locations, the livestock CEAs were the most likely to have commercialised and expanded their business. Livestock services were the main source of the CEAs' income, with vaccinations and administration of drugs being the most lucrative activities. Few CEAs gained income from provision of advice on its own. Farmers were unwilling to pay for agricultural knowledge that was easily transferrable amongst them. CEAs who were commercially viable based their business on provision of skills-based services or inputs, not information alone. Often advice was delivered along with the production and sale of inputs, such as sale of fish fingerlings, quality seeds and saplings in Bangladesh.

The income earned varied throughout the year. Average monthly earnings for all the CEAs interviewed were highest in Bangladesh, where the mean monthly income was 6,792 TK (about £63⁵). Within this there were large variations, with some CEAs earning an average of 775 TK (about £7) per month to the full-time livestock extension agent earning an average of 21,400 TK (about £197) per month. Average earnings were about the same in Kenya and Peru (3,155KS, 111NS, about £25) but lower in Sudan (44SDG, about £13) where only 7 CEAs said that extension was their only occupation.

⁵ Exchange rates from 2008

But income generation was not the only motivation for undertaking extension work. This was particularly noticeable in Peru, where the desire for knowledge (74%) and an obligation to the community (46%) were the main motivations. Similarly in Kenya and Sudan, the sense of duty to the community was strong, possibly reflecting the remoteness of the communities and the emphasis given to serving the community in the training. The more individualistic approach in Bangladesh (where there is a denser population and less community organisation of the CEAs) was consistent with a lower sense of obligation.

Table 4: Motivation of CEAs to train in extension (multiple answers allowed)

	Income	Skills	Status	Knowledge	Obligation
Bangladesh n=56	92.8%	78.6%	26.8%	35.7%	14.3%
Kenya n=36	47.2%	80.6%	5.6%	72.2%	80.6%
Peru n=55	7.0%	42.1%	22.8%	73.7%	45.6%
Sudan n=55	27.3%	61.8%	5.5%		67.3%

[Source: CEA questionnaire]

The combination of additional income, knowledge and a rise in status due to their enhanced skills has been transformative for some CEAs. There are many individual cases where working as a CEA has led to increased assets, the ability to educate their children and further job opportunities. For example, a group of ten CEAs (Kamayoq) who trained in 1997 and went on to specialise in irrigation are now hired by organisations all over Peru to install and advise on new systems (e.g. sprinkler irrigation) or conduct training of producer groups.

For women in particular, working as a CEA has increased their confidence as well as income.

I have improved my knowledge whereby I share it with my children. Previously I was a silent woman, I feared expressing myself and trembled with fear. Now I have a radio programme in which I spread the word on the work of the Kamayoq and on technological advances. [**Maria Huaman Quispe, Peru**]

Accountability and linkages to wider services

As the CEAs came from the local area, they were already known to many of their customers. The local organisations involved in the selection of CEAs also monitored their progress. Therefore there was an incentive to act professionally and provide a fair and reasonable service. As noted above, factors such as duty and obligation are part of many CEAs' motivation in becoming extension agents. In a small number of cases CEAs were replaced when the community (VDCs) felt that they were not serving the community.

Facilitating working relationships between CEAs, district level extension staff and private market actors, such as agro-vet distributors and buyers, was an essential part of the training approach and gave CEAs greater awareness and contact with these

service providers. Government extension staff also provided technical backstopping to the CEAs. For example, livestock CEAs (paravets) were limited in the treatments they could give, or could only give vaccinations with permission from veterinary staff (in Sudan), so they referred more complex cases to the veterinary staff.

Most CEAs have retained those linkages. District level officials and private sector providers have supported extension agents in the field long after the end of the projects. There are mutual benefits as the CEAs mobility and flexibility make them attractive as auxiliaries for the government veterinary services. In all four locations, CEAs have been called upon by the authorities to participate in seasonal vaccination campaigns. Paravets play an invaluable role in notification of disease outbreaks in remote areas (such as outbreaks of *Peste des petits ruminants* (PPR) in Kenya).

There is some evidence that linkages between external service providers and the wider community have increased because of stronger linkages between CEAs and government staff. In Bangladesh, CEAs were also encouraged to visit and make demands on government staff.

Before the project no government staff came here and there were no other NGOs working. During and after the project more NGOs followed and now there are several here. Also the government staff linkage is increased. They didn't come here before because it is remote but now they are coming.
[Farmer, Monsurabad village, Faridpur, Bangladesh].

Updating of skills and information

CEAs need to update their knowledge in order to continue to provide useful services to the community. Through close involvement with local government and other institutions, CEAs have accessed further training. For example, in Bangladesh, 40% of the CEAs have obtained subsequent training opportunities. Courses include goat rearing and artificial insemination. In Peru, livestock CEAs have received additional training and formal certification from SENASA, the state organisation responsible for animal and crop health. This enabled them to conduct government vaccination campaigns, plus gain access to reliable supplies of inputs and veterinary medicines. In Kenya, some CEAs have forged links with private drug suppliers to ensure access to legitimate supplies (as sale of counterfeit drugs is a problem).

Although there is evidence of CEAs seeking out opportunities for further training and making use of the linkages established with service providers, the training updates are carried out on an *ad hoc* basis. We did not find evidence of strategic plans for follow-up training in government extension services.

CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS

Local or community-based extension systems have an important role to play within the context of promoting a pluralistic approach to agricultural extension. They have potential to fill part of the vacuum in extension services, particularly for poor smallholder farmers and livestock keepers living in remote and fragile areas. They can promote the exchange and dissemination of new ideas and technologies between public and private agents and farmers.

Community-based extension is complementary to other service providers. In order to function, it requires good linkages between the government and private sectors. It does not undermine existing government services; on the contrary, it can make government services with limited budgets much more effective.

There is no one perfect model. There will be variations in the type of CEAs – from those with a strong sense of volunteering as part of their community duty – to others who take a more individualistic approach, depending on the local cultural and organisational context and factors such as the population density and agro-ecological conditions. There is also likely to be a mix of full-time and part-time CEAs – some focusing mainly on their own farms while providing occasional advice and services to others, while others who aim to make extension their main occupation and income-generator. Such variation and flexibility should be welcomed.

An enabling policy environment is required to support and scale-up community-based extension. The main components are as follows:

Recognition of the role of community-based extension agents

There are some government extension departments, particularly veterinary and livestock departments, who regard CEAs as rivals or as unskilled, unqualified people who may do more harm than good. There needs to be a change of attitude towards CEAs and they should be acknowledged as potential partners, complementary to professional extension staff. They will still require access to professional staff for technical backstopping.

Creating systems or guidelines at national and provincial levels to define the status and regulate the work of CEAs is likely to be beneficial. It will encourage accountability and visibility of trained CEAs. Certification is needed, both to provide the CEAs with official recognition, and to ensure CEAs maintain standards of practice. However, training processes should avoid total standardisation; instead they should embrace and even promote adaptations that respond to the physical context and cultural traditions. Certification should be based on achieving practical knowledge and skills through field-based training, rather than requiring formal education levels that would rule out the majority of CEAs. The system should allow those that want to go further with their education to train in additional skills.

Provision of public resources to sustain community extension systems

Training of CEAs has been carried out mainly by NGOs with limited amounts by the private sector. However, relying on NGOs is not sustainable and the private sector will only fill a limited role in training of CEAs in the use of their own products (such as drug administration). There is a need for public sector investment in the training of CEAs as part of the overall government approach to providing cost-effective extension systems. Training of CEAs is not just a one-off process, as they will require refresher courses and the facility to turn to more qualified staff for technical advice.

This requires a rethinking of the role of government extension agents. Instead of delivering advice and services themselves direct to farmers, their role is geared to

teaching and supporting CEAs to provide local services. In this way, their specialised knowledge can be focused on more complex cases, while the more routine advice and services are provided by the CEAs.

Because many CEAs have occupations in addition to extension, they can match their extension activities to the changing demand for their services throughout the year. They have the advantage of being in the locality if needed, but can continue with their farming or other work when not required. This results in a flexible system appropriate in locations where demand fluctuates. It would be more difficult and costly to provide the same service through employment of government extension staff throughout the year.

Establishment of models of good practice

The traditional top-down, technology transfer model is inappropriate to a localised extension service, so it is important to incorporate the principles of participation and partnerships with other service providers and establish models of good practice. Community-based extension is part of a wider picture of extension including the government, media, the private sector and agricultural research. Strengthening the links between these different actors is vital and CEAs can facilitate a two-way flow of information between farmers and researchers. Communities should continue to have a stake in the selection of CEAs as this encourages the acceptance of CEAs within the community and more effective working relations.

The training curricula should be appropriate to local needs, cultures and ecosystems – and requires a change of attitude away from transferring new information to working with people to improve current practice. This requires ways of working with more emphasis on participation and experimentation, rather than prescribing a fixed package of information and technology. The training needs to ensure environmental responsibility, i.e., that skills taught to CEAs are consistent with sustainable agricultural approaches, do not increase risks for poor farmers and are affordable.

Scaling-up training of CEAs

The coverage of CEAs is still very sparse, but there is enormous potential to scale-up these approaches. This would require support for CEAs to be included in agricultural policy planning at national and provincial levels as a strategic approach to strengthening agricultural production and rural livelihoods.

Lastly, support for CEAs is based on the assumption that it is worth strengthening the productive capacity of poor farmers and livestock keepers in remote, fragile areas. There is a view amongst some policy-makers that investment in agriculture should be concentrated on farmers in the ‘high potential’ areas, whilst those in the ‘low potential’ areas are supported through safety net programmes. However, low productivity in these fragile areas represents untapped potential. Enabling farmers to increase their productivity is a direct way of tackling food security right where it is needed, and allows farmers more options for the future. Some may choose to invest the additional income into off-farm activities, whilst others choose to remain in farming. Breaking down the isolation of marginalised farmers through access to local extension can act as a catalyst for future change.

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