



Using Radio to Improve Local Responses to Climate Variability: The Case of Alpaca Farmers in the Peruvian Andes

Author(s): Yezelia Caceres Cabana

Initiative Overview

Livelihoods in high mountain areas are precarious at the best of times, and made more so by climate vulnerability. This case study focuses on radio's contribution to sustainable mountain livelihoods in the Peruvian Andes.

Peru has the largest number of South American camelids (the animal group that includes llama, alpaca, vicuna and guanaco) in the world, with more than 5 million of the four species of which 3.6 million are alpaca; more than 85 per cent of the world's total (Fernandez et al 2008). Camelid rearing takes place all along the Andes at altitudes of 3,500-5,000m, where other forms of agriculture are uneconomic (see Figure 1). It is therefore key to the economic survival of those living high in the mountains, supporting more than 65,000 families in Andean Peru alone.



Figure 1: Alpaca Farming in the High Peruvian Andes

Alongside a more general warming that is slowly extending the range of arable land, and squeezing that available for alpaca farming, the more immediate problem for all farmers has been an increase in climate variability. In particular, there have been a set of unexpected cold snaps, with heavy snowfall,

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which have caused serious problems. These include water scarcity leading to a reduction in available pasture, and an increased death rate particularly of pregnant (up to 20 per cent dying) and young (more than 30 per cent dying) alpaca. With alpaca farming being the main income source, this loss of animals condemns further those who are already living in conditions of severe poverty.

Underlying these problems was a lack of adaptive capacity among the farmers; capacity that would enable them to take short-term actions to cope with sudden climate variations, and longer-term actions to improve the income they could derive from alpaca farming. To address this, the CAMELTEC project was initiated by Peruvian NGO Desco¹ with the financial support of Oxfam GB; running from 2008 to 2010. It was focused on the main alpaca-producing regions of Puno and Arequipa; most particularly on 31 communities of 1,725 families.

CAMELTEC was broad-ranging in its remit; aiming to address technological, social, political and institutional issues that affected these communities. There was a strong informational component based mainly around radio and offering meteorological warnings but also advice on husbandry to reduce the impact of climate variability on animal disease and death. Such advice was provided both in preparation for cold spells or other weather events, and during those events themselves. The project also addressed itself to factors such as markets and market pricing for alpaca wool, and the organisation of the alpaca farmers and the institutional support provided by local government and others.

Application Description

A key component of the CAMELTEC project was broadcast of the radio show *Amanecer Alpaquero* (Alpaca Farmer's Daybreak) starting in May 2008 and running until March 2010. The scheme bought radio time from two local stations² and produced a 20 minute show once a week. The programme could be received not only in the two selected districts of Puno and Arequipa but also in the neighbouring department of Cusco and in nearby areas in Bolivia (see Figure 2).



Figure 2: Map of Radio Broadcast Area

¹ Centro de Estudios y Promoción del Desarrollo – Centre for the Study and Promotion of Development

² In two zones: Radio Onda Azul for listeners from Puno and Radio San Antonio de Callalli for listeners from Arequipa.

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Each show typically introduced a situation relevant to Alpaca farming, followed by a short recorded discussion among farmers with input from experts solving a particular problem. The show was popular with all members of Alpaca farming families not just because of the vital information provided, but also because of its use of humour and music in transmitting its message. Vivality, broadcasts were made not only in Spanish but also Quechua – one of the most important indigenous languages in a region where many living in remote communities have a poor command of Spanish. The broadcasts were also pertinent to the farming seasons, for example how to make hay during the seasons when pasture was mature, or a programme broadcast during the birthing season from January to March which focused on the importance of disinfecting the navel in offspring - a practice which alone can reduce mortality of new-born alpaca up to 30%.

Radio broadcasting is inexpensive with low set up and operating costs, including writing and production expenses. It requires little investment and as almost everybody has a radio, any programme can broadcast to many people dispersed over a wide area instantaneously. The availability of cheap battery-powered AM radios means that the majority of Alpaca farming households have access to local radio broadcasts. Farmers are also able to take radios with them to the field since reception coverage is close to universal (see Figure 3).



Figure 3: Alpaca Farmer with Radio

Formal Drivers

Climate variability in the Peruvian Andes seems to consist of three main effects:

- On the one hand, there has been a general warming associated, for example, with glacial retreat: a reduction of 22% in area in the past 35 years (MINAM 2010).
- On the other hand has been *friaje* (the freezing) defined as "an event characterised by low temperatures, a drastic reduction and abnormal average temperature, which is accompanied by snow" (FAO 2008). Associated with the meteorological phenomenon of a cut-off low, it corresponds in practice for the alpaca farmers with temperatures as low as minus 24°C and snow up to 50cm thick. Occurrences of snow, ice and hail storms have more generally been increasing; for example from 7 in 1995 to 531 in 2005 (INDECI 2006).

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- Thirdly, water availability has declined due to changes in rainfall patterns with a decline in total annual rainfall and an increase in the number of consecutive dry days. Combined with the average rise in temperatures, this has led to predictions that "Andean deserts" will start to emerge in the regions above 3,800m (Huamani 2005).

For the alpaca farmers, the result has been a set of harsh cold spells that have killed livestock, reduced birth rates, introduced new diseases, and reduced productive yields of their herds. All of this has reduced incomes for those who are already living on a financial knife-edge.

Alpaca family homesteads are distantly located from each other, typically 10 km apart due to the amount of land needed for grazing. Both men and women take responsibility for raising livestock although increasingly this work is left to women as recent climate events have forced men to travel for at least four months per year to the valleys and cities, seeking employment in temporary infrastructure projects to improve their income. Meanwhile, the price of alpaca wool, the main commodity, has decreased due to a reduction in demand for products caused by the worldwide economic crisis.

There are short-term adaptive actions that the farmers must be made aware of and enabled to implement: building water storage facilities; planting grass and other fodder sources; building infrastructure to protect their livestock; monitoring disease. In the longer-term, too, farmers need to incorporate breeding programmes to improve the quality of their herds, including the yield of derivatives such as alpaca wool. If possible, the *alpaqueros* also need to try to move up the value chain since they gain relatively little from their wool. As an example, farmers receive an average of about US\$2.50 per pound of wool; yet an alpaca scarf (which weighs much less than a pound) sells for US\$30 on the local market and US\$80 on the international market.

Obtaining information for awareness, advice and guidance is a first step for these adaptive actions. However, due to the Andean topography of high peaks and deep valleys, it has historically been cost-prohibitive to construct infrastructure such as paved roads, electricity and fixed telecommunications up to the farmsteads. There are some fixed telephony and Internet connections in the district capitals and main towns, but these do not reach to the villages and the farmers' homes. The only communication mechanisms for them are therefore wireless. Mobile phones do have their uses – and some 90% of alpaca farmers own or have access to a basic mobile. However, their utility is limited because the farmers' homes are not within the coverage area and so they have to travel to find a signal. It is thus radio that forms the sole reliable means of modern communication, and hence it was radio that was the technology selected for the CAMELTEC project.

Objectives/Purpose for ICT Usage

Overall, the CAMELTEC project aimed to use radio and other means to achieve three goals:

- Strengthen local organisations such as farmer co-operatives to enable the introduction of sustainable (including climate-sustainable) livestock practices
- Improve the quality and quantity of alpaca wool being produced, through good husbandry and reproductive management practices
- Improve income through changes to wool output and through better market access

Thus, some radio broadcasts had a specific aim of helping farmers cope with *friaje* through better water conservation, improved fodder growth and storage, construction of barns and sheds and corrals (see Figure 1 above), better animal husbandry and treatment of disease. But alongside this, CAMELTEC had much wider aims that sought to address the totality of the farmers' fragile livelihoods. This included working with officials of the farmer co-operatives and with staff in local government, and the training of selected (educated) individuals from within the communities with skills they could share with neighbouring farmers.

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Stakeholders

As summarised in Figure 4, the main stakeholders in the initiative are alpaca farmers and their families. They have lives of subsistence and insecurity, with high poverty rates and housing that lacks water, electricity or heating. The CAMELTEC project was led by Desco, an NGO with 46 years of experience in promoting development in the Peruvian alpaca sector via improved socio-economic conditions. This project was Desco's first experience in using radio broadcasts with alpaca farmers, and necessitated a partnership with De Frecuencia AM – a small local broadcasting organisation with very limited resources – and the two local broadcast stations. Oxfam GB sponsored and financed the project with each broadcast prepared by a professional broadcaster with the assistance of specialists according to the topic.

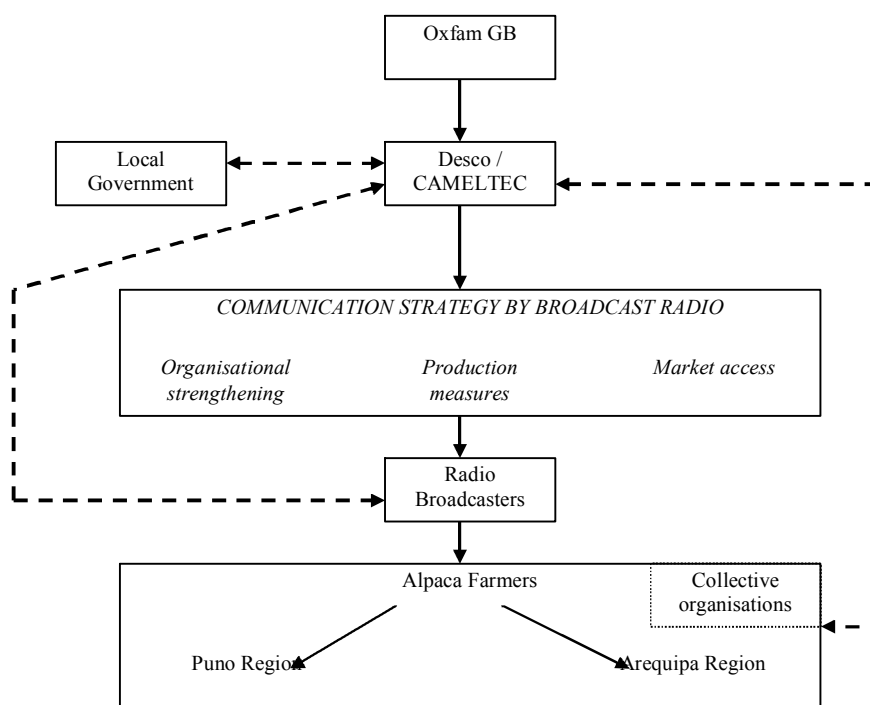


Figure 4: CAMELTEC Project Stakeholders

Impact: Cost and Benefits

The total direct cost of the initiative was US\$900 per month, comprising the production and broadcast costs for each of the radio programmes. As noted above, one main climate-related activity was the attempt to reduce the level of death and also diseases within livestock – typically diarrhoea, pneumonia, fever and enterotoxaemia – that rose during the cold snaps. CAMELTEC produced radio programmes on each of these diseases with basis guidance on diagnosis and action to mitigate the effects.

To take one example, the normal annual mortality rates among alpaca herds is 18% in adults and 25% in crias (alpaca calves). If there are extreme cold spells, this rises – for instance to 35% in crias. Since the start of the radio broadcasts, the overall mortality rate has been reduced to 12%; saving an equivalent of US\$500 worth of livestock on average per farmer. Of course, the radio broadcasts are only one relatively small part of this – alongside other work by Desco to help farmers improve protective dwellings for their animals, sanitation, handling procedures, etc – and it is not possible to attribute any specific impact to the broadcasts.

Radio is also seen as valuable in addressing gender barriers. For cultural and family reasons, women are often denied access to community farming meetings and have not been able to participate in sharing skills and ideas. Radio broadcasts break at least one part of this by giving farming women opportunities for learning which were unavailable before.

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Evaluation: Failure or Success

The radio broadcasts can be seen to have contributed to a number of positive outcomes. As noted, programmes related to disease prevention and control, including protection of babies, and improved calving techniques have contributed to a significant decline in herd mortality rates. Those focusing on construction of shelters, water and fodder conservation, and emergency feed and treatment have done the same specifically for *friaje*. Programmes have encouraged a more systematic approach to breeding, the utilisation of farming co-operatives for marketing of alpaca wool, and a more commercial approach to farming; all of which have helped to either maintain or raise income levels.

The reaction to the radio broadcasts has been overwhelmingly positive among the target audience as evidenced in a feedback survey undertaken by Desco in 2010 showing more than 80 per cent of respondents said they regularly tuned in to the show.

The following testimonies illustrate the feeling from the target audience towards the broadcasts:

"The radio show seems very nice. I listen to it every Saturday and I greatly appreciate the work of Desco. I think it has worked very well for us, as we live in the countryside dealing with the cold, the hail and the snow, grazing our herds. Our alpaca wool price has considerably decreased, and it is not enough to feed our children so we are asking for more help."
(Marcelina Campos Quispe. Alpaca farmer from Vila Vila District, Puno region)

"The show is very funny and it teaches us to prevent livestock illnesses, depending on the season. It has helped us a lot with our lives and we are very grateful. We would also like to have more programmes like this about the latest genetic developments and more about sanitary prevention." (Roberto Huaynacho Condori. Alpaca farmer from Vila Vila District, Puno region)

Given the project has only recently finished, it is not possible as yet to ascertain how sustainable any improvements will be. However, the project did show that – despite low technical capacity and limited financial resources – it is possible for radio broadcasts to reach and affect a large audience; suggesting it is a model that others can consider for agricultural adaptation projects.

Enablers/Critical Success Factors

Deep local knowledge and experience were vital to the CAMELTEC project, building as it did on Desco's many years of working with local farmers. Within Desco itself, a key was the use of NGO workers who were drawn from the local area, who spoke Quechua, and who had long experience of the specific rural development issues faced by mountain alpaca farmers.

The same was true of the two local radio stations – Radio Onda Azul in Puno and Radio San Antonio in Arequipa – both of which had worked for a long time in their respective regions. They each had the largest audience share in those regions, based on understanding those audiences, broadcasting significantly in the local language rather than only in Spanish, and offering services such as transmission of messages to family members in remote locations.

The project therefore also brought together a **collaboration of specific expertise**; with Desco providing the development and agricultural components fused with the broadcasters providing the technical components. Finally, **appropriate radio programme design** made an important difference to ensuring a sizeable audience for the shows, but also to ensuring that messages were heard, understood and created the basis for action. When funding to Desco ran out in 2010, some local radio stations attempted – in response to requests from farming families – to provide similar programming. However, lacking the NGO's expertise and lacking the funds to design high-quality programmes, the results have been disappointing.

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Constraints/Challenges

The **limitations of radio as a medium** must be recognised. It provides only one-way information at specific times rather than the 24/7 interactivity of other information and communication technologies. Its role is to raise awareness and perhaps to change attitudes, but it cannot deliver skills and is relatively poor at delivering knowledge. Therefore its limited role within any agricultural development and adaptation project must be recognised.

The **general asset constraints** of the target population constrained their ability to turn broadcast messages into actions. Their poverty, malnutrition and limited education all worked against this. And they were also hampered by simple asset problems like the limited availability and high cost of radio batteries.

Finally, **the skew of climate change policy towards mitigation rather than adaptation** is unhelpful. Peru does have policies on climate change but – perhaps following the agenda and lead set by the global North – these have had much more to say about mitigation than about measures to adapt to climate change (Cancino et al 2011). This despite the fairly self-evident fact that a developing country like Peru faces immediate and increasingly widespread problems due to climate change, and makes little contribution to the world's overall carbon outputs.

Recommendations/Lessons Learned

Income is central to adaptive capacity and therefore it is appropriate for projects dealing with ICTs, agriculture and climate change to themselves have a central focus on income generation. This was the case with the CAMELTEC project. The broadcasts and other work on protection from cold snaps were only one small part of a much bigger picture that aimed to improve alpaca herd quality, farming practices, and market access – all this with the main goal of increasing the farmers' income since money is far and away the single most important asset that helps households adapt to climate change.

Radio should be part of a much broader intervention package. The emphasis in this case study has been on the role of radio, and its relation to climate variability. However, looked at overall, the CAMELTEC project was only in small measure about radio. The ICT was therefore used to support – by building awareness, reinforcing messages, and shifting attitudes – the main thrust of the project, which lay around training, market survey visits, formation or strengthening of collective enterprises, negotiation of purchase agreements, participatory budgeting workshops, and a breeding programme. Projects involving ICTs will only be effective if set within this type of broad approach since delivery of information – on its own – achieves little; it only becomes effective in synergy with other interventions that enable information delivery to be converted into action.

Address foundations and not just symptoms. The project could have focused on diseases and animal husbandry. But the root causes of problems in mountain areas typically fall back to issues of income (noted above) and the weak institutional and organisational foundations for the poor. Therefore, as just described, the CAMELTEC project invested much of its work in institutional development activities: training representatives from farming communities; creating collective enterprises such as community wool collection centres; and strengthening the farmer co-operatives so that they could, for example, negotiate better market prices and also engage with local government for participatory budgeting exercises. In all this, ICTs can have some role, but it is relatively limited.

Strengthen radio programming related to climate change adaptation. This would start with a clear understanding of information and communication needs (something many NGOs working with local communities may already have); shape radio programme design to those needs including use of a broad range of local languages; and enable interactive components for example through phone-in segments that make use of the relative accessibility of mobile phones within rural populations.

Data Sources & Further Information

Information for this case study was drawn from the CAMELTEC project including recordings of the broadcast programmes, internal reports, and interviews with representatives of Desco and from the radio stations.

Yezelia Caceres Cabana
Calle Jorge Polar 413, Miraflores, Arequipa, Peru
E-mail: yezelia@gmail.com

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EDITORS:

Richard Heeks
Angelica Valeria Ospina

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