

Defying poverty and extreme weather at 4000 meters above sea level in the southern Andean Highlands of Peru is a serious challenge. **Javier Coello Guevara** describes the work of Practical Action to bring about improvements in living conditions through the application of appropriate technologies.



Practical Action

Intermediate Technology Development Group (ITDG) - now Practical Action - was founded in England in 1966 by Dr. E.F. Schumacher whose book *Small is Beautiful* inspired a pioneer approach to development. Practical Action has regional offices in the United Kingdom, Kenya, Zimbabwe, Sudan, Bangladesh, Nepal, Sri Lanka and Peru. In Peru, Practical Action has been working since 1985 implementing projects in various regions of the country to help the poorest populations find practical solutions to poverty through the use of appropriate technologies. An appropriate technology is one that, starting from a specific need, takes into account the social, cultural, institutional and environmental characteristics of the population that uses this technology and is in harmony with them. Practical Action works to develop appropriate technologies in agro-industry, farming, renewable energies, disaster prevention, local governance, and information and communication technologies.

Practical Action has been working since 1991 in the Cusco region, particularly in the high Andean Canchis province. Most of the activities were developed in valley bottom areas (3200 to 3800 metres) and basically focused on improving food security for the benefit of poor rural Quechua families by increasing their food production capacity,

improving infrastructure, organizing small irrigation systems (for 1340 hectares of 2130 families in 26 rural communities), and promoting local technical assistance markets (training in local language for 200 technological farmer trainers known as *Kamayoq* who provide farmer-to-farmer technical assistance without subsidies and according to the rules of rural economy).

In 2003, Practical Action started working with communities in areas above 3800 metres engaged mostly in alpaca farming and also in the production of native potato varieties.

Alpaca Farming Communities in Peru

While official figures are not available (a census of alpacas is planned for 2006), according to various sources there may be from 3 to 4.5 million alpacas in Peru, representing 85% to 90% of the world population. It is also estimated that the production of alpaca fibre may range from 4600 to 6400 tons per year, representing 80% to 90% of the world production. About 85% of the alpaca fibre produced in Peru comes from small family production units with an average of 20 to 100 alpacas per family. There may be about 170,000 mostly Quechua

or Aymara families (about 1.5 million people) engaged in alpaca farming in Peru.

According to some estimates 95% of these families live in extreme poverty and, together with some Amazon indigenous communities, are the most vulnerable groups. Some researchers have even suggested establishing a category lower than 'extreme poverty' to classify Peruvian alpaca herders. It is worth mentioning that only two human groups in the world are settled in areas above 4000 metres: the populations of the high Himalayas and the alpaca raising communities in the Andes. There is almost no vegetation and people's livelihoods are reduced to alpaca farming and the production of native potato varieties. Alpacas are the animals that best adapt to the harsh conditions of natural pastures in these high areas and form the economic base for these poor families. On the other hand, the production of native potato varieties is favoured and is the staple food for these families. Almost all the production of native potato is used for self-consumption.

Two seasons are clearly distinguished in these areas: the rainy season (from December to April) and the dry season (from May to November). During the rainy season rains can fall for 72 consecutive hours and are usually accompanied by hail and snow; this season coincides

with parturition time for the alpacas. As a result of the heavy rains, the shelters fill with water and mud causing the spread of infectious diseases, such as enterotoxemia, among alpacas. The snow covers the pasture making it difficult to get food for the animals. This results in a high death rate among alpaca offspring. On the other hand, during the dry season there is a lack of pasture and the freezing weather, with temperatures as low as -10°C , results in serious damage to the animals, particularly those who are sick or pregnant. The lack of food coincides with the last stage of pregnancy among alpacas resulting in malnutrition at parturition time for mother and offspring.

A phenomenon known as *friaje* (big freeze) usually occurs between June and August in these high areas. This phenomenon, which occurs every 4 to 5 years, brings extremely cold winds from the South Pole with temperatures as low as -20°C and unusual storms. The result of the *friaje* is the loss of pastures that get covered under thick layers of ice brought about by the freezing weather. The return period of the *friaje* is reducing progressively as the effects of climate change become more evident in these high areas, particularly due to the melting of the glaciers (Peru has the largest number of tropical glaciers in the world). In Peru this phenomenon affected 196,000 people in 2002 and 390,000 people in 2004.



just 2 'high production' cows: to reduce risks.

Instead of the fibre diameter issue, the proposals should focus on increasing the shearing frequency and fibre production. It is estimated that under the most favourable conditions an alpaca could produce from 7 to 11 pounds of fibre per year. However, in most of the high Andean alpaca raising communities the production is only 3.5 pounds and, in many cases, this is a biannual production. To overcome this situation, a series of elements that include shepherding, food, animal sanitation, shearing and fibre management should be improved. However, the biggest challenge will be to have more equitable selling systems for the alpaca fibre, otherwise alpaca producers will not be able to overcome poverty even if their production volumes are doubled or tripled.

Most of the alpaca fibre produced by the nearly 170,000 alpaca raising families is sold through intermediaries. It is estimated that 78% to 90% of the production of fibre is absorbed by three business groups (the remaining percentage is used for self-consumption, for yarn by artisans and export to Bolivia). Eighty five percent of the production is exported as greasy fibre by these business groups. As a result, Peru's participation in the international market for fine fibre garments is only 1% although it is the country with the largest production of alpaca and vicuña fibres in the world. It is necessary to take immediate action to reverse this trend to export raw fibre and promote in-country garment manufacturing instead. We must also consider the fact that while the participation of the high Andean alpaca producers in the alpaca textile productive chain continues to be marginal they will not be able to overcome the chronic extreme poverty they undergo. It is necessary to develop technological alternatives that will enable them not only to be producers of low-cost quality alpaca fibre but also to be able to add value. A strategy that has been yielding

satisfactory results is direct contact between producers and business groups. This strategy cuts out intermediaries and increases profit margins for producers. The results of some tests indicate that the manufacturing of quality garments at artisan-level for export is not only feasible but also profitable.

Natural colour fibre could provide a good testing ground. Many enterprises have been paying less for coloured fibre and this has resulted in a dramatic and sudden reduction in the number of coloured animals. Experts say that some of these colours might be about to be lost completely. Yet alpaca garments manufactured with natural colour fibre have a higher price in the international market than white and artificially coloured garments. So why are small producers paid less for their colour fibre?

The illegal trade in alpacas is also a problem that calls for immediate attention. The government has started putting microchips in animals of high genetic quality to help the poorest alpaca herders benefit from the export of these animals. According to sources from the Agriculture Ministry, 90% of the alpacas exported by Chile to the United States, Australia or England might have come illegally from Peru. Specimens that in Peru are obtained for less than £35 may have been illegally taken to Chile and then legally exported at prices between £6,000 and £10,000.

The National Strategy for the Development of the Domestic Camelidae Productive Chain in Peru was introduced recently. It is the result of a planning process led by the Agriculture and Production Ministries with the support of various institutions and individuals involved in the alpaca and llama sector. But the size and complexity of the plan, which includes 27 strategic objectives and a long list of projects, as well as the lack of funding, might threaten its implementation. Two years ago there was an agreement to make a census of alpacas, but due to the lack of funding it has not been carried out.



WOULD YOU LIKE TO HELP US IMPROVE THE LIVES OF HIGH ANDEAN ALPACA BREEDERS?

To implement its activities Practical Action gets funding from government or multilateral development agencies and individuals. If you would like to help us, please contact us through our website www.practicalaction.org or the Free phone 0800 389 16 24.



How Practical Action is Helping

Practical Action formed the first group of Kamayoq farmer trainers for the communities of the Maranganí district between 2002 and 2003. The land of these communities is located both in the valley bottom and high areas.

The Kamayoq played a major role in the emergency relief actions implemented after the big freeze that hit the southern highlands of Peru in July 2004. Two hundred and fourteen shelters were installed to protect new born alpacas; 3,418 alpacas were nurtured with hydroponic crops; 26 medical kits for animal care were made and about 48,500 alpacas of more than 900 families in 18 communities received the attention of the Kamayoq. These emergency relief actions were possible thanks to the support of the European Commission Humanitarian Aid Department (ECHO) and Save the Children.

More recently and with the support of the Heifer Project International (HPI), quality animals are being acquired and distributed to improve the alpaca herds in the region. At the same time and with the support of the McKnight Foundation and the Regional Fund for Agricultural Technology (FONTAGRO) of

the Inter-American Development Bank (IDB), a project that aims to improve the production and commercialisation of native potato varieties - that originate right in the southern highlands of Peru- is in the initial stage of implementation.

Nonetheless, the work in this region is just beginning. The extreme poverty and high climate vulnerability of these communities call for an integrated intervention with emphasis on the most critical aspects: income generation and provision of basic services. To this end, Practical Action proposes the application of an approach that will invest directly in the assets with most potential in this region: people, alpacas and water resources.

Funding is required for the implementation of a more comprehensive pilot project that includes investment in irrigation infrastructure to increase pasture availability; implementation of water supply systems for human consumption; technology testing of alpaca fibre processing within communities; strengthening the organizations of producers so that they will be able to accumulate production volumes and negotiate with business groups under better conditions; improving education in terms of infrastructure and curricula; and most of all capacity building to help small producers improve their lives through improved alpaca management.

These extremely harsh climatic and environmental conditions affect not only people, who are not well protected in terms of housing, dress and food, but also their main source of survival: the alpacas. There is a high death rate (over 50%) and a low fertility rate (about 40%) within alpaca herds. That is why it is almost impossible for these small producers to carry out an adequate selection in their herds; they are forced to keep the highest possible numbers to reduce risks, regardless of the poor yields in fibre production (3.5 pounds/shearing) or shearing frequency (every two years). These problems result in a poor income that is insufficient for even the smallest food basket.

Quechua farmer communities are certainly the most vulnerable group in the country. According to some estimates, 75% of the 69,000 people who died between 1980 and 1999 as a result of the political violence in Peru were Quechua farmers. Within this group, the communities living in areas above 4000 metres are the ones who face the most severe and harsh conditions. The women of these communities are subject to discrimination for being poor, farmers, indigenous, Quechua speaking (usually illiterate), and simply for being women. This discrimination is real even though women are the ones who take the responsibility not only for raising the children but also for taking care of the alpacas, which are the main source of income for the family.

Alpaca Raising Communities Assisted by Practical Action

Practical Action has been working for two years in the Quechua alpaca farming communities of Acco Acco Phalla, Chapichumo, Condorsencca, Los Andes, Molinopampa, Pata Anza, Pataccalasaya, Pujio Pujio Chumo, Pumanota, Pumaorcco and Tingabamba (in the Sicuani district); Chillihua, Choquecota, Quenamari, Tañihua and Tocsaccota (in the Marangani district); and Palccoyo (in the Checacupe district). All these communities are located in the Canchis province, in the Cuzco department.

Almost all families in these communities fall into the category of extreme poverty under any measurement system. The family income is usually not more than £150 per year. Child death and chronic malnutrition rates are high and the illiteracy rate is over 30%.

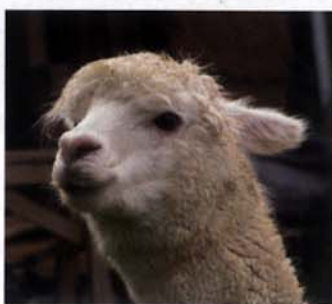
The isolation, low population density and difficult access to this area have made it difficult for the government and private agencies to reach these communities. As a result, it is one of the areas most disregarded in the

Peruvian highlands. Elementary school teachers attend schools that operate on a 'one-teacher' basis in 12 communities an average of three days per week and school infrastructure is poor and scarce. People have to walk long distances for 6 to 10 hours to reach a health care facility. There is no public transportation and the few rural roads are usually closed during the rainy season. There are no water supply systems for human consumption and no basic sanitation services.

The human development levels for this region are extremely low. The Human Development Index used by the UN measures three basic dimensions of human development: (i) a long and healthy life, as measured by life expectancy at birth; (ii) knowledge, as measured by the adult literacy rate and the combined primary, secondary and tertiary gross enrollment ratio; and (iii) a decent standard of living, as measured by GDP per capita.) The HDI for the Canchis province is 0.518, whereas for the districts where the alpaca raising communities are settled it is 0.468 (the average for Peru is 0.762 and for the United Kingdom 0.939). In practice, these figures translate to a situation in which the scarce family income obtained from sales of alpaca fibre is used to buy three essential products: matches, salt and food.

Alpaca Farming as an alternative to Overcome Poverty

In spite of these difficult and discouraging conditions, alpaca farming is the only feasible economic activity. Besides, due to the low production levels of the sector, it has a high growth potential. However,



the strategies and actions that have been tested and implemented so far have not been comprehensive enough and culturally appropriate to respond to this complex situation.

For example, the emphasis now is on the problem caused by the increase in the alpaca fibre diameter. According to some estimates, 8% to 20% of the total amount of fibre produced in Peru corresponds to baby alpaca, up to 23 microns, 35% to fleece, 23.1 to 26.5 microns and the rest to fibres of wider diameters. The current average diameter is 28.5 microns. Some authors say that



20 years ago the average diameter was 18 microns, while others say that it was actually the average 5 to 6 centuries ago! Various public and private institutions are currently working toward recovering the alpaca genetics so as to reduce the number of microns. However, we should carefully consider the following: should the fibre diameter decrease its size, who would it benefit? We are not looking at some important facts such as, for example, that with current fibre diameters the price of some alpaca garments in the market is no less than £200, but alpaca herders are paid £0.8 for the same amount of fibre used to make these garments. According to some information, there are some specimens that can actually produce 12-micron fibre that might be being passed off as vicuña fibre (12 to 14 microns), which costs about £200 per pound.

However the results of some research indicate that it is not fibre quality which has decreased but the number of animals with fine fibre. This is similar but is not the same. According to some estimates, there may be only about 100,000 specimens with a very good genetic quality. Small producers are usually blamed for not managing their alpaca herds properly, but consideration should be given to the reasons behind this. Why should a small producer, who receives less than £3 per year for his fibre, improve the quality of his animals if he continues to be paid £3 or less for his fibre, regardless of its quality? And, if he wanted to improve the

quality of his animals, what resources could he use if his annual income is no more than £150?

We often forget that the survival strategy of small producers in the high Andes is by definition, a risk reduction strategy. However, many agencies and public institutions try to introduce foreign risk management approaches ignoring the fact that these populations have traditionally been exposed to and coped with various types of threats and risks. The best proof of this is their ability to have made it through very severe conditions. This prevents us from understanding, for example, that crossbreeding alpacas and llamas does increase fibre diameter, but also increases the survival of the animals. It also favours the production of heavier fibre, which may be an advantage if the fibre is to be sold by weight instead of quality. On the other hand, some scientists have found a relationship between the increase in fibre diameter and the wider availability of pastures as a result of some climate events such as El Niño. Small producers are blamed for not selecting the animals in their herds, but we forget that the high death rate and the low fertility rate make it impossible to replace them. We also forget that any small alpaca herder in the high Andes will prefer to have 50 weak animals instead of 15 strong and healthy animals for the same reason that any small farmer in a low area will prefer to have 6 sickly cows instead of