



Learning about biodiversity in Peru

Market fairs where products are exchanged are common in the Andes. Competitions are also very much part of Andean culture and the organisation of “biodiversity fairs”, where farmers display their plant varieties and those with the “most biodiversity and knowledge” win prizes, have special appeal.

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One of the first biodiversity fairs took place in 1989 in Aymará. It was held as a competition among farmers and highlighted the diversity of potato varieties. Farmers responded positively to the fairs and they have become annual events. Every year more families enter the competitions and the number of varieties displayed increases.

Today, biodiversity fairs are held all over Peru and have expanded to include diversity in crops other than potato. Fairs encourage farmers to pay attention to the diversity of varieties they grow. On a more practical level, they provide a space where neighbours can exchange seed and plants and, at regional fairs, they bring farmers from more distant communities together ensuring that seed stocks are rebuilt and expanded. Farmers receive recognition from government and NGOs for their efforts in managing their biodiversity and the prizes also provide strong motivation.

Colpar

Grupo Yanapai works with rural communities in Quilcas district in the Mantaro Valley, Huancayo Province. Communities are scattered over two watersheds and three different agroecological zones: the low agroecological zone or valley floor (3000-3500 m.a.s.l.), the intermediate zone (3500-3950 m.a.s.l.) and the high zone (3950-4250 m.a.s.l.).

The Quilcas community is situated on the valley floor. It has some authority over the distribution of communal resources in the area although, over the years, the importance of communal resource management has diminished at lower heights where most of the land is now privately owned. Colpar with 74 families, 47 of whom are officially registered as community members, lies in the intermediate zone. Membership of the community brings obligations, such as the commitment to joint labour in the interests of the community, and rights to a plot of land and grazing areas in the high ecozone.

Families in Colpar practice small-scale agriculture combining it with animal husbandry. Cattle, sheep and llamas are herded in the high ecozones while other animals are kept near the family home. Cattle are a source of capital, manure and traction, pigs are sold when cash is needed, and guinea pigs, rabbits and fowl provide food for household use.

The families manage small privately or communally owned plots situated at different altitudes where they cultivate a variety of crops. The average amount of land owned by each family is 0.5-1 ha. On the steep slopes, soils are generally acidic and

low in organic matter and hillsides suffer from varying degrees of soil erosion. Farmers think that since inorganic fertilisers were introduced soil health has declined (Ramos and Kauffman 1997). Subsistence agriculture dominates, surpluses are sold at the market and production depends almost entirely on manual labour.

Biodiversity Fair

Grupo Yanapai's field team decided to organise a biodiversity fair in Colpar. It wanted to stimulate farmers to maintain crop diversity and variety in their fields, provide them with an opportunity to exchange seeds and knowledge and finally to obtain more information about crops and the diversity within them.

32 participants took part, 25 women and 7 men. Traditionally, women are responsible for selecting and maintaining seed and, therefore, the presence of men at the contest was a surprise. Particularly as the first three prizes awarded for showing the largest number of crops and variability within the crops went to men. This showed that there was close cooperation in each household and that men are also interested and knowledgeable about seed maintenance. The Yanapai team failed to find out how many of the 25 women were heads of households. However, a survey carried out among 20 women in 1995 showed that 45% were either widowed or heads of households (Axman 1996).

Crops and variability

A total of 828 samples from 17 different crops (5 tubers, 5 pulses, 5 grains, 1 fibre-

oil and 1 vegetable) were presented at the fair, as well as apples, aromatic and medicinal plants (laurel and aloe) and garden produce (carrots, garlic and “rocoto” (*Capsicum pubescens*)). The variety name provided by the producer was taken as a diversity unit. Yanapai was unable to analyse whether more than one name had been given to a single genotype. There were a surprisingly large number of “unique” genotypes.

It is unclear whether the farmers or Yanapai consistently classified native potatoes and improved potatoes in two categories, although native potatoes occupy a different height niche and require different crop management and input levels. If treated as one category, potatoes were the most exhibited crop (92%) with the greatest cultivar diversity (61).

Maize

The most common crop was maize (*Zea mays*). It was present in most exhibits (82%) with 51 different variety names. It is undoubtedly an important crop in the village even though Colpar lies above the cut-off height for maize production. Maize is dominant because people from middle-height villages may have access to land on the valley floor and because ecotypes that are more tolerant to colder conditions have gradually been selected. One of the farmers said: “At first maize hardly gave any grains and was mainly cob but then after five years it began to produce more and the grain was good”. Thus, maize seems to be ascending to higher altitudes. Two prize-winning entrants presented 16 different types of grain. Maize is rarely sold and when families find they do not have enough, they buy or exchange other crops for it.

Faba bean

The second most common cultivar at the fair was the faba bean (*Vicia faba*): 27 of the 32 participants had it. The greatest number of varieties displayed was 19 and the average was 6. Farmers sow faba bean by population, planting them together rather than separating them into varieties making possible the recombination of different types through cross-pollination. This management practice has given rise to Andean faba bean ecotypes. Since the faba bean stores well, it is consumed in the period October-December when there are no more potatoes left. Dry faba bean is sold in small quantities when money is needed. It is a nitrogen fixer and an important cleaning crop in the rotation cycle because it does not suffer from the same diseases as maize and potatoes.

Improved potato

The third most common crop was the “improved” potato, which originates from breeding programmes. These are mostly hybrids between *Solanum tuberosum*, *spp. tuberosum* and *S. andigena*. 20 par-

ticipants (63%) brought varieties of “improved” potato. On average each farmer grew 3 varieties. 60% of farmers had ‘Yungay’, a late variety planted at the end of November and harvested in May. The ‘Amaya’, selected and maintained by farmers, is a variety unique to the area. ‘Revolución’, an early variety planted in October, is one of the first to be harvested. These improved varieties are grown for household consumption and sale.

Peas

Eighteen participants grew peas (*Pisum sativum*) with, on average, 2 varieties per person. Only 3 farmers had 4 varieties, including a purple mottle that “produces well but doesn’t have a market”. It is grown for consumption only on small plots in association with maize and faba bean.

Native potato

Native potato (*Solanum tuberosum ssp. andigena*, *S. gonicalix*, *S. chaucha*, *S. curtilobum*) came in fifth place. 17 people (53%) exhibited this type of potato. One participant brought in 28 different varieties. It is possible that other participants had more native potato varieties, but these potatoes are stored in the highlands and farmers may only have displayed the varieties they had on hand. Two women who had a large native potato collection travelled frequently to the highlands. They had the opportunity to pick up a more complete set of seed tubers from the highland store. This crop had the greatest diversity in the community with an average of 10 varieties per person.

Unlike maize, the native potato is grown in the highlands, which are still communally owned. Potatoes are not separated into varieties, but are planted as a mix designed as “chagro”. The community manages a seven-year rotation system and each family is allotted land in turn within the larger rotation field. Native potato seed is usually obtained through inheritance, by exchange and, as its Spanish name “*papa regalo*” suggest, as gifts. This potato is used for food, gifts, ceremonies and festivities.

Andean Tubers

Thirteen farmers (41%) had *ulluco* (*Ullucus tuberosus*) with an average of 3 varieties (one participant had 9). Eight farmers (25%) had *masbua* (*Tropaeolum tuberosum*) with an average of 3 and a maximum of 7 cultivars. Only one participant had *oca* (*Oxalis tuberosa*) and she brought 2 varieties. Farmers had stopped cultivating oca because weevil had become a serious problem and all the seed had been lost. *Ulluco*, *masbua* and *oca* are planted in rotation with improved potato, faba bean and cereals. With the exception of *ulluco*, which has a market, they seem to be losing variability and importance.

Pulses

All pulses grown have a high protein percentage and are important in soil fertility improvement because of their nitrogen fixing qualities. Even though the Mantaro valley is too cold for beans, 10 farmers brought them in. Those farmers who brought in maize also brought in a large number of bean varieties because they are grown in association. The maximum number of varieties displayed was 12 with an average of 5. Beans are mainly grown as food and are seldom sold.

Nine farmers brought tarwi (*Lupinus mutabilis*). It is grown for food and to protect small fields in the intermediate zone from livestock. The average number of different types was 3 although one participant had 7. It is the last crop in the rotation before the land is left to rest. Eight farmers brought vicia (*Vicia villosa* and *V. sativa*) to the exhibition. Yanapai introduced this crop to alleviate the scarcity of forage and it seems to be doing well.

Other groups

Cereal crops showed the least genetic diversity. Wheat, barley, oats, *quinua* and *kiwicha* averaged one variety. 10 farmers presented wheat, 6 presented barley, 4 oats and 3 *quinua*. Land scarcity and climate restricts cereal growth. Seven people brought pumpkin and there were 3 varieties. Aromatic herbs and garden vegetables were not included in the list and only a few brought samples. It should be noted, however, that various families grow garlic, onions, carrots, and a combination of aromatic and medicinal herbs.

Conclusion

Colpar’s first fair revealed that farmers grow a surprisingly large array of crops. There is a large diversity of phenotypes within each crop and great heterogeneity amongst them, suggesting contradictions between market and farmer strategy. On the one hand, the market plays a reductionist role accepting only a limited number of crops and varieties. Farmers, however, aim to maximise crop diversity as well as diversity within crops in order to cope with the complex agroecology of their land, droughts, hail, frosts, diseases, and pests. The fair highlighted once again how farmer strategies are geared towards food security and ensuring the sustainability of their agriculture. ■

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