
TRADITIONAL USES OF NATIVE SHRUBS IN THE SOUTH OF PUNO

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INTRODUCTION

Although production systems in the High Andes have been described on several occasions, knowledge of them is very incomplete. The use of trees and shrubs in particular has been largely overlooked by researchers and development workers. However, the work carried out by the ARBOLANDINO Project on *c'olle* (Poma, s.f.) could be regarded as a model approach to the type of information which is required for each species. Much of this information is presented by Reynel (1988).

The particular interest in this paper is with the criteria and ways of using each species. Special consideration is given to the reasons given by villagers for their management decisions, with the aim of using the information to facilitate the introduction of new technologies.

METHODOLOGY

This study is based on interviews with (a sample of) farmers in Pomata, Zepita and Huacullani districts in Puna province, Peru. The work was carried out in the original nine communities of the ARBOLANDINO Project, where the villagers had enough confidence in the Project to allow reliable information.

The researchers (two men and two women) talked to male and female villagers separately. Interviewees were chosen at random, as they were encountered in the nearby fields and paths. In order to avoid interviewing people in their homes (villagers are seldom at home during the day) and to keep the survey relatively informal, there was no selection from lists of names beforehand. An average of 40 to 50 people were interviewed in each village, giving a total of more than 400 people.

After introducing themselves and explaining the aims of the study, the interviewers invited each villager to list known and most frequently used species. For each species mentioned the villager was asked, through a guided informal conversation, for details of use, harvesting, processing and marketing. Reference was then made to species which the interviewee had not mentioned. At the end of the interview, which took about half an hour, the interviewee was asked his/her name. Around five people were interviewed each day. Notes were not taken during the conversation, unless this was suggested by the villager. Between interviews the information was noted and checked.

Once the data table had been examined and initially processed and analyzed, the team went back to gather information for a second time, to check incomplete or uncertain information, or to investigate new hypotheses. In each community the same number of people were questioned, but only about 30% of them were interviewed twice. In the second interview the following information was collected: the stage (height) at which the villagers preferred to cut the different species, reasons why ash was not used as fertilizer, 'passive care', marketing problems and restrictions, use of species as fodder, the perceived reasons for the decline in the resource and proposed alternatives.

In order to counteract the relatively 'rigid' form of questionnaire, to which responses could have been somewhat stereotyped at times, more detailed information was sought from 1-2 people in each community, chosen for their traditional knowledge of native species. This was done at a one day workshop at which the participants were asked for their reactions to some of the first conclusions of the study and to make corrections where necessary.

ANALYSIS OF USES

Range and Importance of Uses

Almost all species mentioned by the villagers are used as firewood (reflecting the scarcity of fuel in the area) and medicine. Approximately half of them are used as an 'indicator', fodder or as a raw material for making tools. The uses of plants for flavourings and for their timber are also important, but each one depends on a single species. Other uses included wall protection, detergent, **llujta** (ashes used when chewing coca leaves), or for disease control uses. However, it is important to study these further so that this knowledge can be passed on to the other communities.

The species use pattern was similar for both sexes, except that men reported almost three times as many uses of fodder species, and women almost twice as many uses of species for making tools (brushes, tools for weaving, etc). The number of uses reported differed vastly from one community to another. The main factor appeared to be species availability, which declined in the environmentally harsher and higher areas.

TABLE 1: USES FOR WOODY SPECIES REPORTED BY VILLAGERS

USES	NUMBER OF REPORTS*	NUMBER OF SPECIES MENTIONED FOR EACH USE
Firewood	159	19
Medicinal	80	15
Indicator	53	8
Tools	32	6
Fodder	12	4
Flavouring	13	1
Timber	12	1
Protection	4	1
Detergent	3	1
Llujta	2	1
Phytosanitary	1	1
Explosives	1	1

* The total number of species mentioned was 19 and the maximum possible number of reports would be 342 (19 species x 9 communities x 2 types of information)

C'oa (including **c'oa macho** and **c'oa hembra**) is particularly important since it was considered

`essential' for all the nine uses reported. Of the other species, **c'olle**, **t'ola**, **suput'ola**, **añaguayo** and **huaych'ja** were considered to be essential for no less than three uses. In addition, **c'oa** and **c'olle** were the only species providing flavouring and timber respectively. Unsurprisingly, species preference was not uniform across communities of different altitudes. The low degree of adaptation of most species to higher altitudes makes it important to find alternative species which are better adapted to the conditions.

Firewood

The most important sources of firewood were, in descending order, **t'ola**, **suput'ola**, **t'canlla**, **c'olle** and **añaguayo**. Ashes, a by-product of burning firewood, were used as fertilizer or for treating nests of maggots or lice in approximately 40% of cases, generally the poorer villages without economic alternatives.

Fodder

The majority of shrubs are found in the hills surrounding the pampas, and form an important component in winter grazing sites. An interesting gender difference was found in the enumeration of species for fodder: the use of **añaguayo**, **c'anlla** and **t'canlla** is only mentioned by men; **k'ela** is only mentioned by women, and **c'olle** by both men and women. According to the villagers' perception of their nutritional value, the bushy species could be put in the following order: **c'olle**, **c'oa**, **k'ela**, **mascapaqui**, **c'anlla**, **añaguayo** and **t'canlla**. Supplies of all the fodder species were decreasing, except for **c'olle**. According to villagers the decrease in availability of **k'ela** is caused by population increase and harvesting of roots, whilst the depletion of other species is due to lack of rain, exhaustion of the ground and over-harvesting of small plants.

Agriculture

Shrubs are little found in agricultural areas, except in terrace walls where their presence indicates careful management. However, as a result of ARBOLANDINO's activities, **c'olle** and some other exotic species used for wood are beginning to appear on agricultural plots. These plants are often difficult to protect on communal land.

Medicinal Uses

There is a rich traditional knowledge of medicinal uses of native species, which has been documented by the project.

Indicators

Various species are used as an `indicator', either as a biological clock which signals the best time to carry out agronomic tasks, or as a way of predicting harvest levels. For example, between October and November, when **huaych'ja** flowers, it means that it is time to sow the potatoes, whilst sowing on lower land should not begin until the **c'oa** flowers. Also, when **c'anlla** flowers profusely, it is thought there will be a good crop of barley, or when **t'ola** flowers and produces a lot of fruit a good crop is predicted in the area where it flowers (either high up or lower down).

Disease Control

C'oa is used as an insecticide in barley cultivation by passing a branch through the foliage in a brushing motion. It is also used to protect barley and **oca** (root vegetable) seeds — especially from maggots.

Periods of Use

Native shrubby species are used as fodder between July and November, when there is no other

fodder available. This corresponds with preparation of the land for crops in the **aynocas** (land cultivated communally) when animals cannot stay on the land and where they were grazing the waste. From December to January grass grows again and the animals are transferred to the fields.

Although shrubs are sometimes used as firewood between August and December, they are used most between January and March. This is the rainy period when there is no dung, which is preferred in the dry season because it burns for longer. When it is wet, shrubs dry faster than dung.

Use of **c'oa** for disease control occurs between January and February or when barley seeds are being stored between May and October. As one would expect, shrubs are used as an indicator throughout the growing season (August to March). In almost all cases of use as detergent, material for explosives, tools, timber, medicine, wall protection and flavourings, there is no definable period of collection or use. The restriction of cutting for timber at the end of the year is an exception, whilst the use as wall protection is sometimes concentrated in the rainy season.

MARKETING SYSTEM

Marketing of products from shrubs is infrequent and usually occurs only when there is economic pressure. Barter is also of little significance, as the shrub resource is not abundant and there is a lack of transport. There is some increase in marketing and barter in the more accessible villages. Sometimes the inhabitants of distant villages are unaware of the opportunities for commercialization of shrub products in the larger towns.

Of the 19 species mentioned by villagers, only 8 were used in a commercial activity. Of these, on average, there is only marketing or exchange in 26% of cases. The species most frequently mentioned in connection with marketing are **c'oa**, **t'ola** and **c'olle**. **C'olle**, **quishuara**, **suput'ola** and **torotoro** are noteworthy for a higher number of instances of marketing; thus their collection is partly motivated by the possibility of sales.

PROTECTION SYSTEMS

The majority stated that they practised some form of protection or management of woody species. The most frequently used protection system for woody species was the restriction of grazing, although this appeared to be the result of protecting fields under cultivation rather than protection of the shrubs themselves.

The 'protective' method of harvesting (not cutting small plants, not taking out the root, etc) was the second most frequently mentioned. A greater proportion of women (37/138) than men (16/181) referred to the practice of not taking small trees. The care of small trees and nursery plants has sometimes gone hand in hand with the care of children, which could explain the women's more protective attitude in this area.

There was a clear discrepancy between the lack of importance attached to restrictions on root cutting and the apparent awareness that the shrub resource is diminishing. When the effectiveness of control methods was questioned, all the participants in the final workshop stated that the protection methods were weak and that there were no clear rules.

There was an important link between shrub protection and use rights. In general communal use rights predominated, although in some areas use rights were delegated to the villager 'sectors'.

Family use rights only applied to **c'olle** and so were almost non-existent in the high areas. The restriction on taking out roots was only applied under communal use of species, whilst restrictions on animal grazing are only applied under 'sectorial' use.

DECLINING AVAILABILITY OF THE RESOURCE

Respondents detected that with the exception of **c'olle**, all species were in decline. Most attributed this to a combination of population pressure, climate change and indiscriminate use. The latter explanation was more commonly cited by men than women.

The relationship between the optimum and true cutting height should have reflected the 'pressure' exerted on each species: the greater the difference between the two, the greater the pressure. However, no difference was noted. This could be because those questioned did not know how to accurately describe the desirable cutting height or because there is in fact no relationship of this type.

In response to growing firewood scarcity, men were keener than women on collecting more manure for use in the rainy season, making firewood from straw and food scraps and planting **c'olle**. The preferred option of women was buying firewood in nearby villages, although most agreed on the importance of manure collection.

METHODOLOGY AND RETROSPECTIVE ANALYSIS

When the methodology of this study is evaluated retrospectively, several possible modifications occur. Firstly, the information should be gathered more informally and greater emphasis given to direct relationships with interviewees. With this in mind, there should be a much closer relationship with village assemblies, in order to choose interviewees who have expert knowledge of the region's shrubs. In the same way, at various stages of the process of analysis, verification workshops could be organized, along the same lines as the final workshop. This would help clear up any doubts at an early stage. In order to avoid mistrust, the survey guide should not be used when talking to interviewees and fluency in the local language (in this case aymará) should be the rule rather than the exception.

The end users of shrub products were not included at all in the information gathering. They too have preferences and are able to suggest alternatives when confronted with the reality of a diminishing resource. In future studies it must be remembered that it is not just primary users who are important and that others must also be involved in the search for solutions.

During analysis of the information, as an intermediate stage between the field forms and encoding prior to calculation, a table was drawn up (on a huge sheet of paper) on which all the raw data was entered. The preparation of this table was excessively laborious, but it helped to encode villagers' answers, as all the replies for each question were placed together. It is recommended for all the qualitative answers and opinions, for teams which are not experienced in data management and encoding.

DISCUSSION AND CONCLUSIONS

This study demonstrates the importance of shrubs in the life of villagers in the south of Puno and probably in the high Andes as a whole. In particular, it justifies ARBOLANDINO's decision to use **c'olle** as the principal component of forestry development in the high Andes. In order to increase the range of species, **c'oa** and **añaguayo** should be included as there are a greater number of uses for which they are considered essential. **T'ola** and **suput'ola** could also be given a degree of priority, as they are deemed indispensable in all the villages. **C'anlla** is important in the communities at higher altitude, where there are less species to choose from.

In the workshop, both men and women agreed that **t'ola**, **suput'ola**, **c'oa** and **c'anlla** were essential; women also stated that quishuara was essential, and men deemed **torotoro**, **mascapaqui** and **añaguayo** to be important.

Thus, although there was general agreement on the priority of species preferences varied from village to village, according to both availability of species and interest levels in different uses.

However overexploitation, along with other factors, is threatening the resource base. The weakness of the villagers' control systems for the shrub resource is notable. This is probably because, historically, shrubs were such an abundant resource that no one imagined they could run out. Their protection has been an indirect result of the practices of recuperation of cultivated areas, rather than a particular rule for protecting shrubs. Alternatives suggested by villagers do not appear to address the fundamental problems, and some could make matters worse, eg: spending more time harvesting; collecting from a wider area (including towards the territory of other villages); burning more dung, etc. The task of future projects is therefore to work with villagers to find practical ways of protecting and regenerating the most important shrubs, as well as identifying species and technologies for the higher altitude areas.

With adequate organization and information, there is potential to commercialize shrub products. However, increased commercial pressure on the resource could also result in its short term depletion.

Villagers have valuable knowledge of management and use of shrubs. This knowledge is not spread evenly over the area, and there is clearly interest in sharing the findings of the most expert villagers with all the communities, in order to benefit others. Reestablishment planting and planting on new sites are also particularly critical. For the former, the adaptation of protection methods, based on the same principles of rotation as applied to the crops in enclosed fields, is of vital importance. Various aspects of current farmer knowledge need to be studied. One of these is the use of shrubs as a biological clock or indicator. In effect, part of the villagers' survival strategy depends on adequate evaluation and forecasting of climatic conditions for the period of cultivation.

This study has little value unless it is acted on by experts in the area. The dialogue which started with this study should continue, so that gaps in information can be filled, descriptions of uses and processing of products can be strengthened, adding details which are of real benefit; in other words experts and villagers should continue to learn from each other.

In the future, the role of shrubs will probably be linked to aspects of subsistence in Altiplano communities, and not directly to their economic development. This does not reduce their importance for the villagers' quality of life, which should justify the priority given to these plants

in future rural development projects in the area.

SPECIES LIST

Añaguayo	<i>Adesmia miraflorensis</i>
T'ococ'anlla	<i>Adesmia spinossisima</i>
C'olle	<i>Buddleja coriacea</i>
T'ola	<i>Baccharis tricuneata</i>
Quishuará	<i>Chuquiraga jussieui</i>
Torotoro	<i>Colletia spinossisima</i>
Mascapaqui	<i>Eupatotium gilbertii</i>
K'ela	<i>Lupinus ballianus</i>
C'anlla	<i>Margyricarpus strictus</i>
Suput'ola	<i>Parastephia lepidophylla</i>
C'oa	<i>Satureja boliviana, S. parvifolia</i>
Huaych'ja	<i>Senecio clivicolus</i>

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