COSMOVISIONS AND ENVIRONMENTAL GOVERNANCE: THE CASE OF *IN SITU* CONSERVATION OF NATIVE CULTIVATED PLANTS AND THEIR WILD RELATIVES IN PERU

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Paper presented to the International Conference

BRIDGING SCALES AND EPISTEMOLOGIES:
LINKING LOCAL KNOWLEDGE WITH GLOBAL SCIENCE
IN MULTI-SCALE ASSESSMENTS
Integrating Local Knowledge into Global Scientific Assessments

March 17 - 20, 2004
Bibliotheca Alexandrina, Alexandria, Egypt

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February 2004

Knowledge for environmental governance?

Where should knowledge for environmental governance come from? An obvious answer to this question is: certainly from environmental science. In this paper, we would like to qualify this assertion and to explore issues related to the relation between science and so called “traditional knowledge” associated with the *in situ* conservation of the diversity of native plants and wild relatives in Peru. The orientation of projects in this area is a matter of environmental governance and thus, subject to judgment, giving rise to issues of values and modes of being-in-the-world.

Thus far, there has been explicit recognition of the value of “traditional knowledge” for environmental governance in the texts of the Convention on Biological Diversity and in the Convention against Desertification. The strategy for dealing with traditional knowledge, however, has been predominantly its translation into the format of what we hereafter will call the techno-scientific approach. With respect to this kind of knowledge we will argue that this approach is confining, restrictive, and ultimately distorting.

We contend that if instead of this translation we endeavour in searching for *passerelles* between scientists and vernacular wisdom considered as holders of equally valid paths to knowledge pertinent to environmental governance, we may find that their domains of knowledge do not overlap in general. In effect, scientific knowledge is for the most part constructed within a very confining framework, that of an explanatory mechanism within a field defined by a strict consensual definition of what constitutes a scientific "fact." The fact that this definition is carried out by "experts", has, at least, two consequences: 1) laymen are kept out of it and thus popular (vernacular) knowledge is excluded; 2) the definition leaves out all spiritual (or non material) connotations: it secularizes knowledge. The first consequence derives in the need for "translations" of scientific knowledge into popular language if

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science is to fulfil its vocation for democratic pertinence. The second, in our view, precludes, within the limits of the techno-scientific domain, any deep understanding of issues of environmental governance that may have profound spiritual roots.

Conditions for the consideration of vernacular knowledge from the point of view of scientific knowledge are explored in this paper, taking the case of *in situ* conservation of the diversity of plants and their wild relatives in the central Andes of Peru.

The technoscientific approach to in situ *conservation of native plants and their wild relatives*

The case of *in situ* conservation of the diversity of native plants and their wild relatives in the central Andes is particularly interesting, since substantive knowledge is evident in the practices of the Andean peasant nurturers of agrobiodiversity who are real long-time experts in domestication of plants and animals. In contrast, scientific interest in *in situ* conservation is fairly recent. However, most of the projects now being implemented for *in situ* conservation of agrobiodiversity adopt a techno-scientific approach.

Maxted *et al.* provide a recent account of on-farm conservation of germplasm from the techno-scientific point of view, as "the sustainable management of genetic diversity of locally developed crop varieties (land races), with associated wild and weedy species or forms, by farmers within traditional agricultural, horticultural or agrisilvicultural systems." (2002: 33)

Their approach implies setting up a process divided "into three phases: (1) project planning and establishment, (2) project management and monitoring, and (3) on-farm utilisation of diversity." (*ibid*: 34)

Phase 1 or project planning and establishment include as activities "the selection of sites, communities and farmers where the conservation activities could most effectively be implemented. The objective of an on-farm project is to ensure that the maximum possible range of genetic diversity of the target crop continues to be managed by farmers within their farming systems in a given region." (*ibid*: 34-35)

Regarding the identification of project sites they propose to "identify regions where both collecting for *ex situ* conservation and on-farm conservation activities could

usefully be initiated. This will be due to a combination of high levels of genetic diversity at the site(s), interest [of] the user community in the specific genetic diversity found at or believed to be found at the site, lack of previous conservation activities, and imminent threat of genetic erosion. The overall criterion in site selection will be to maximise the conserved genetic diversity of the target crop or crops, ensure suitable environmental conditions and population levels for continued evolution and that the dynamic of the farming system is maintained." (*ibid*: 36)

One important focus is the sustainability of the conservation effort. It is to be achieved through "some form of incentives to encourage the farmer to continue cultivation of the land races. This may necessitate the commitment of substantial levels of resources over the long term to ensure sustainable genetic conservation in the reserve… If the material is lost from an on-farm project the large quantity of resources expended on establishing the project would have been wasted and the cost of rehabilitating populations using materials stored *ex situ* would have to be considered. Therefore, it is vital that the dynamics of the target crop within the cultivation system are understood and from this understanding of the relationship between the farmer, the cultivation system and the land race sustainable conservation will result." (*ibid*: 37).

A very important aspect of any conservation project is the identification of project partners, "key people and institutions with whom collaboration will be possible on a long-term basis. The main project partners in the community will obviously be farmers, but may also include, among others, the local agricultural extension office, non-governmental organisations (NGO) and community leaders of different kinds, depending on local conditions… The ultimate rationale for genetic conservation is utilisation. In the case of on-farm conservation, the conservationists (i.e. the farmers) are also the main users. However, users outside the community where the project is being implemented should also be considered when designing the management plan for the project. Plant breeders will be important long-term beneficiaries of the genetic diversity managed by the project partners, but there may also be scope for other types of scientific utilisation and even eco-tourism." (*ibid*: 38).

There follows the next step in the process, that is, the formulation of project activities as "interventions to be implemented by the project partners that will ensure sustainable conservation of the target crop within the agricultural system at that site. This will require research at the farmer, community and macro levels. The initial

focus of this research will probably be… why land races are being grown at the project site in the first place, and whether these reasons are likely to persist. To what extent farmers adopt modern varieties to replace their multiplicity of land races ultimately depends on the extent to which the varieties offered by scientific plant breeding and the formal seed industry better satisfy their household livelihood strategy. This in turn will be shaped not just by what may be termed 'culture' (belief, art, moral law, custom and religion), but also by such socio-economic factors as: access to land, labour and capital; governmental macro-economic initiatives; and the influence of extension workers… Relevant research questions at the farmer level can be divided generally into those concerned with understanding the processes of farmer decision-making, and understanding how farmers' perceptions and decisions affect genetic diversity." (*ibid*: 39).

Phase 2 consists of on-farm project management and monitoring beginning with the implementation of project activities by "a small project management team… probably … multi-disciplinary, reflecting the importance of different biological as well as social science disciplines. One of its earliest tasks will be to organize a thorough baseline study of the crop at the project site. This should document… the levels and patterns of genetic diversity in the target crop(s) at the project sites. It should also document the practices currently employed by project farmers… in managing genetic diversity through the agricultural cycle, aspects of the socio-economic and policy setting, and features of the physical and biotic environment. A participatory approach will be vital not only in carrying out the baseline study, but also in deciding on its structure and contents in the first place." (*ibid*: 41-2).

Monitoring is one of the most important aspects of the process and "will be done relative to the baseline survey and…perhaps using some of the target sites as controls… What the conservationist will particularly be on the lookout for are significant quantitative declines in genetic diversity. The details of the monitoring process will vary depending on target crop, local situations and resource availability… the following interrelated questions need to be considered in developing a monitoring regime for crop genetic diversity: 1. Where will samples be taken? In particular, in which fields, in which villages, in which agroecological zones? And how many samples will be taken in each of these strata? This will determine the magnitude of differences and changes that the monitoring regime will be able to pick up. 2. How will samples be taken? When sampling material from a field, systematic, random and stratified random strategies could be followed. 3. When during the crop

cycle will samples be taken?… 4. How frequently will samples be taken?… 5. What characters will be assessed? These could be conventional characterization and evaluation of genotypic characters (morphology, phenology, quality, etc.), farmer-recognized characters and/or protein or DNA markers. Among morphological characters, they could include features which are actively selected for by farmers and others which are not. 6. How will the data be analysed?" (*ibid*: 42).

Phase 3 of the on-farm conservation project involves diversity utilisation, whether it be traditional, general and professional utilisation: "conservation of genetic resources must facilitate their use, either immediately or in the future … The direct users of the germplasm conserved on-farm will be the farmers who have traditionally developed, managed, and exchanged land races, and continue to do so. Conservation of genetic resources is not the primary focus of farmers' activities: what they are interested in is the livelihood of their households. They grow land races because in many situations they still provide the best means of fulfilling their livelihood strategy – whether to complement the products of modern plant breeding or not. In proposing and implementing an on-farm project, professional conservationists must be sensitive to the needs of the local communities and flexible in the application of the management plan. The goal should be conservation that contributes to the quality of life of the local people." (*ibid*: 43)

Thus stated, this techno-scientific approach to on-farm conservation is, in our opinion, too timid regarding the fact that the real proven "experts" in conservation of agrobiodiversity are, at least in the case of the Central Andes, not the scientists and technical personnel, but the *campesino* nurturers themselves. They should be considered the most important stakeholders since the issue of sustainability of project results remains unanswered, unless they carry on in their own proven ways. No external institutional setup is likely to guarantee sustainability once the external funds are exhausted. In our experience, "the livelihood of their households" turns around the "conservation of genetic resources" and hence, conservation is, however indirectly, the primary focus of their concerns in undertaking agricultural activities.

How to understand "respect" in the Convention on Biological Diversity?

In its Art 8 (j), the Convention on Biological Diversity makes implicit recognition of the fact that the understanding valuable for sustainable use and regeneration of natural systems resides in practices of societies rooted in local cultures and ecosystems. It

states that each contracting party must "subject to its national legislation, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote the wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices." (Posey 2000: 381) Yet, this local knowledge still remains often undervalued, when not downright invisible.

We propose herein to understand "respect" to indigenous and local cultures in a way that goes beyond the recognition that they exist and that their participation as privileged informants is valuable as Maxted and his colleagues do. In the case of *in situ* conservation of native plants in the central Andes the technoscientific approach must also recognize that it itself constitutes an unproven alternative to the traditional forms of relating to plants. The proposed approach is based on considering the cosmovision of the indigenous and local communities in its own terms. In what follows we explore this issue as well as the preconditions for a fruitful exchange between the practitioners of the technoscientific approach and the holders of vernacular wisdom.

An approach based on the Andean campesino *cosmovision*

Innovative in its formulation, the In Situ Project (2001-5)[2] is committed to the respect of institutional diversity in technical approaches. It is carried out by six implementing agencies, both state organisations and NGOs. Taking advantage of this project policy, PRATEC, the Andean Project for Peasant Technologies, formally a NGO, has adopted in its participation an incremental approach. It coordinates ten local NGOs which accompany communities in four different regions in Peru: the Altiplano region, the Central Southern highlands, the upper Amazon region of San Martín and the northern department of Cajamarca. Our common approach tries to address the question raised by a GEF consultant: how to make a program out of a number of local projects? The demand for coherence is met by invoking the existence of a common cosmovision. Before the projects' inception we had found that, for the Andean *campesinos*[3], *in situ* conservation of plants and animals is tantamount to

[2] The In Situ Project now in its fourth year of implementation is funded by the Global Environmental Facility and the Government of Italy and managed by the UNDP local office.

[3] *Campesinos* are here called those people working in the land mostly for subsistence.

their ancestral nurturance of life as it is lived in the Andes. In other words, *in situ* conservation of the diversity of native cultivated plants and their wild relatives is equivalent to Andean amazonian peasant agriculture. Hence, PRATEC's institutional option is, very simply and directly, the strengthening of the agriculture carried out by the traditional nurturers of that diversity. Locally these people are known as *curiosos*.[4]

The strengthening of the *campesino* agriculture in the Andes has several fields of intervention: 1) the regeneration of the local landscape or *pacha*; 2) the strengthening of the *ayllu*'s organicity[5]; 3) the regeneration of the rituals and festivals related to the nurturance of *chacras* [cultivated fields] and the *sallqa* [the wild], and 4) the regeneration of the multiple and changing paths of the seeds and of the knowledge of their nurturance.

The regeneration of the local landscape comprises the area of the *chacras* or cultivated fields, the area of the *montes* [woodlands, brushwoods], and the pasture areas. The *chacras* are nurtured by the *runas* [humans] in *ayni* or *mingas* [collective work]. In the Andes, the *montes* and pasture areas are considered to be nurtured by the *waka*s or deities. Nurturance then is the basic mode of being in the Andes. All nurture and all are nurtured in every moment. An expression which is found in both native languages (Quechua and Aymara) is "we nurture while being nurtured." The diversity considered in the *chacras* belong to native species and varieties, their wild relatives and "related weeds". The wild relatives and related weeds are also found in the *montes* and pasture areas. The regeneration of the local landscape is undertaken with the *pacha*'s own knowledge of nurturance embodied in the signals of climate, soil, water, and the "secrets" of nurturance.

The *ayllu*'s organicity[6] is cared for by the so-called traditional authorities. These authorities are not bearers of power but are mother and father to the community in their tenure, which is centred on the nurturance of the whole *pacha* or local world [*chacras*, pastures and *montes*]. There are distinct authorities of the *chacra* (in charge of its care and of the communal rituals in the agricultural cycle) and of the *sallqa* (the community herds, pastures and *montes*).

[4] People with curiosity or inquisitiveness or *tukuypas* in Quechua.
[5] The *ayllu* is the extended family inhabiting a *pacha* which comprises not only humans, but the deities and natural entities as well. All entities inhabiting a local landscape form the *ayllu*.

In the Andean cosmovision, it is the affection and respect for the plants and their seeds which conserves the diversity in the *chacra* and the *montes* and pastures. They are vividly expressed in the rituals and festivals related to the nurturance of the *chacras* and the *sallqa*. They include rituals to *Pachamama* (Mother Earth), to the *Apus* or *Achachilas* (mountain deities) for the nurturance of animals, rituals to the water asking for rain, rituals to hail, frost, wind, and snow, *avios* (rituals of dismissal), in order to bring harmony to the *ayllu* in correspondence to the agricultural cycle.

The nurturance of the region where diversity is conserved is done through the strengthening of the multiple and ever changing seed paths whereby the *campesinos* exchange seeds. They include the regional pilgrimages that are ritually undertaken as well as the regional festivals for the nurturance of the deities that protect the *pacha*.[7]

This is done by the *campesinos* themselves so that the role of the network of local NGOs is to accompany them in these activities facilitating the process through the provision of limited inputs, like fresh cultivars from other regions and agricultural tools from urban origin. For the project's sake, the members of the local teams document both the diversity of cultivars and the nurturing *saberes* (knowledge) and secrets involved. They also help remember and regenerate the ancestral ways of seed provision and exchange. Typical activities are:

- Recovery and collection of local and regional germ plasm
- Collection of peasant practices published and disseminated in the form of technological booklets
- Inventory of the local germplasm
- Sowing in communal and collective lands as germplasm *chacras*
- Exchange of seeds and knowledge in communal and intercommunal workshops
- Seed festivals
- Documentation of local practices for the nurturance of germplasm
- Testing of new germ plasm

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[6] We use the term "organicity" of Andean communities to refer to an attribute pertaining to a living organism. This term contrasts with the "organization" brought by external, state institutions for the implementation of development projects.

[7] One such ritual pilgrimage takes place in June in the region of Apu Ausangate, a sacred mountain in the Cusco area, in whose protection large numbers of pilgrims congregate in a regional festival with the name of *Qoyllor Riti*.

- Gradual incorporation of new cultivars in the *chacras*

As coordinating institution, aside from administrative support, PRATEC carries out the following typical activities in support of the work of the local autonomous NGOs (called Nuclei for Andean Cultural Affirmation or NACAs):

- Accompaniment in the field in various activities of the NACAs as technical assistance
- Training programs for accompanists[8]
- Workshops for experience exchange with the participation of members of the NACAs
- Publications of books issuing from the reports of the NACAs on selected aspects of the nurturance of agrobiodiversity.

An epistemology for cultural affirmation in the Andes

The implementation of such an approach demands an entirely different epistemology which may be derived from the *campesinos*' cosmovision, from their life-world. By life-world we understand following Abram:

> The life-world is the world of our immediately lived experience *as* we live it, prior to all our thoughts about it. It is that which is present to us in our everyday tasks and enjoyments –reality as it engages us before being analyzed by our theories and our science (Abram 1996: 40).

We base such epistemology on our interpretation of testimonies of people who experience the Andean life-world and are able to lend a voice to it. Santos Vilca Cayo, an elder from the Aymara community of Aynacha Wat'asani in the district of Tilali, Puno, by the northern shore of Lake Titicaca expresses his understanding of his life world thus:

> For us, all those of us who live in this *pacha* [locality, local world] are persons: the stone, the soil, the plant, the water, the hail, the wind, the diseases, the sun, the moon, the stars, we all are a family. To live together we help each other. We are always in continuous conversation and harmony. The *chacra* [the cultivated field], being a person, is in need of everything. With my wife we are always attentive to her. For her [the *chacra*] we have to prepare soil and obtain guano for the sowing. When the time comes (in September, October and

[8] Presently a Masters' program on Biodiversity and Andean Amazonian *campesino* agriculture in agreement with a national University is being offered.

> November) we have to deal with the seeds with great care, because at that time they are going to enter into the stage of motherhood. Then we have to clothe them, hilling soil to the plants, caring for their health. Thus we nurture them with great affection and respect. In the same way they will nurture us... The *Ispalla* [new tuber seed] is the woman herself. She is the same mother who nurtures us and whom we nurture as well. The new seeds are the young and pretty women who can bear more fruits, while the seeds who have stayed for many years are the tired women or mothers... Seeds, women and *Pachamama* (Mother Earth) are the same. This we know from our dreams: the three appear as women. They have the same *qamasa* [spirit, alternate form]. For this reason women are the ones who better get along with seeds. They, with their good hands, deliver the seeds to *Pachamama* so that they regenerate..." (Chuyma Aru, 1998b: 17-19).

We retain from this testimony some characteristics of the Aymara life world: equivalence among all entities in it: all are persons, that is, they are worthy of affection and respect, be they human, natural entities or deities. Nurturance, attentive care among all persons in the *pacha* is central to this life world. Another important characteristic is that distinctions as those required by Aristotelian logic are misleading: entities partake some common attribute which make them appear the same[9]. We have found that these characteristics are also expressed in the Quechua life world.

This nurturing attribute of all entities in the Andean life world and the fact that they share common characteristics is corroborated by Romualdo Aguilar Quispe from the community of Angará Bajo, in the district of Pucará, in the Quechua side of Puno who tells of the festival in carnival time which corresponds to the collection of the first fruits in early February:

> ...when the first fruits are harvested, people are also potatoes then and the women take them out with great care, avoiding hurt to the *chacra* or *Pachamama*, who is at the same time mother of the potatoes. Then they collect the potatoes, cover them up like a baby in an *istalla* [a small ritual shawl], and converse with them and kiss them. They [the potatoes] are given coca leaves to chew, are sprinkled with sweet wine, and adorned with *misturas* and *serpentina* [shredded and coiled multicolor paper] and country flowers. Thus with the warmth that a mother offers to her child and with affection, the potatoes are carried by the women in their backs. They show them to the relatives who come to the feast, and they kiss them, caress them and say that there is already food and that we will not suffer from hunger (ASAP 2001: 42)

What regenerates life in the Andes appears to be the affection given to the persons with which life is shared.

[9] However, "sameness" has to be appreciated as belonging to the particular Andean cosmovision taking into account that translation may distort the meaning.

On the origin of the diversity of maize land races, don Cipriano Armas, from the community of Recuayhuanca in Marcará, Ancash, gives his version of an explanation which we have found widely held in the Andean communities:

> My hilling I have to finish the same day, since if leave it for the following day, my maize plants will not go together to take their bath in the sea. For this reason I have to finish the same day at any cost. Also, when you finish the following day, the part you have finished go to take their bath, but the other part are only ready the next day. Then they meet the plants that you hilled the day before on their way to the sea. When they reach the ocean, where they take their bath, they mix and return all mixed, of different colours. Then in the harvest you find different colours that you have not sowed, that is, it is not your original maize. (Urpichallay, 1999: 28)

Don Porfirio Ramos from the community of Chuquihuarcaya in Ayacucho extends this process to other species:

> Of course, at harvest time there appear *chullpis* [a maize land race] and other colors. In potato it is also the same. The same with fava beans. For this reason we select the mother of the seeds and they appear by themselves. From the glory [heaven] they return mixing among them, as people or animals do. We all walk together, is it not so? As soon as we hill the plants in the chacra, the seeds are also waiting. You have to finish hilling at any cost. Only when we finish, they then all travel together our mother of life, and return to earth, and coming from it vigorous and happy, they sit in the chacras (Carrillo and Jaulis, 1998: 141).

In our approach these testimonies are considered to be rooted in a mode of perceiving, in a cosmovision, whose central feature remains mutual nurturance among all entities of the local world. However, the epistemology that we, as external agents, bring at hand recognises that any interpretation we can make of such testimonies remains only a working hypothesis. We demand of ourselves that such interpretation be coherent but renounce to the notion of a general discourse on Andean cosmovision or of a unique way of access to it. The discourse remains limited to a specific area of application and stands or falls on its own coherence and on the consequences of the actions it suggests.

Here we recognise that epistemology is external and alien to the Andean cosmovision. The epistemological enterprise is undertaken only as an exercise in the building of *passerelles* between cosmovisions. Two limitations must be accepted in these efforts: there is inherently no possibility of completeness or of uniqueness in the expression of Andean cosmovision. Such expression is local and circumstantial.

The existence of similar explanations in different cultural and geographical settings as the one offered on the origin of the diversity of plants is illustrative but is not invoked as criterion of validity. Neither is there pretension of an objectivity that transcends the local or the circumstantial.

Governance implies moral judgment

The above account of Andean cosmovision seeks to outline a perception of the world which is radically different from that of science. It is here offered because it is at the very basis of a millenary form of approaching the conservation *in situ* of the diversity of plants (and animals) native to the Andean region, a form which has effectively conserved it.

The implicit contrast (or comparison) of such knowledge of nurturance with that of science has no intention of highlighting its merits over those of modern science. Such endeavour would be unfruitful. The idea is "bridging epistemologies" if at all possible.

The Founding Fathers of modern science endeavoured to create a space in which rational argument would prevail (Shapin & Schaffer 1985). Thus, in scientific activities, values must be neatly distinguished from facts. Mixing them up would only result in disaster. But in governance judgment, that is, determining the correct action, exercising discernment, is unavoidable.

In the account of Andean cosmovision we have offered, the "correct" actions regarding *in situ* conservation suggest themselves in the framework of an attentive accompaniment to the efforts of the *campesino* nurturers themselves. Such accompaniment consists in incremental activities to strengthen the traditional ways of conserving agrobiodiversity.

What do we need to bridge the gap opened by the value / fact distinction implicit in the technoscientific approach to *in situ* conservation? In a lecture titled "Moral Judgment and Political Action", included in his book *A Rumor of Angels* (1990: 143-166), sociologist Peter Berger advances his understanding of what the social sciences can contribute to exercising judgment. He proposes four criteria: 1) the *discipline of detachment*, that is, the exercise of the qualification of the social scientist, not as a moralist, but in his / her "trained capacity to assess empirical evidence". Even though he restricts his injunctions to social scientists, we believe

that they can be made extensive to the practice of all scientists. “Part and parcel of [their] training is the discipline of detachment, that is, an ability to look at a situation clearly, to bracket off one’s own feelings and convictions in the effort to understand what others feel and believe, to listen rather than to preach. Most important is his ability to look at *reality* even if what comes into view is very much different from what one would wish to be there. This discipline of detachment, of course, is a circumscribed, artificial act. It should not, and indeed cannot, be carried over into the rest of the social scientist’s life. Yet, even though limited to specific acts of understanding, it constitutes no mean moral achievement –the capacity to control passion without in any way abandoning it, to cultivate the calm look, to have respect for the *real*.” (*ibid*: 148).

> The second contribution is the *clarification of normative and cognitive presuppositions*. In everyday life we constantly employ both kinds of presuppositions: Norms tell us what the world ought to be and how we ought to act; but these norms are supposed to maintain in a world that is real, and we hold a large number of assumptions, or cognitive presuppositions, as to what reality is. It is important to understand that norms have little if any meaning without the cognitive presuppositions that go with them (*ibid*: 149-50)

This is perhaps the most important contribution that reflection can make to aid judgment in environmental governance. A major normative presupposition of the technoscientific approach to *in situ* conservation is that the motivation of the *campesino* nurturers of biodiversity for conserving is strictly economic. This is why a major area of field research is devoted to clarifying farmers’ decision making criteria in selection procedures, farming practices to use, size of population and seed source. In the formulation of *in situ* conservation projects this major assumption is implicit and thus, the project activities do not include field research to substantiate it. Our experience with Andean *campesino* conservation indicates that the assumption of economic motivation for conservation does not hold. However, the discipline of detachment requires us to withhold judgment until a considered look at empirical data which have not yet been gathered in the Andean region becomes possible.

> The third contribution is *the social location of actors and their interests*… the sociologist is the character who, when confronted with any statement of belief or value, will invariably ask the prototypically mistrustful question, “Says who?” This question, disagreeable though it sounds, is of great importance in clarifying any situation in society and especially any situation within which one intends to act politically. (*ibid*: 154)

This is yet another important aspect which has to do with responsibility, both personal and corporative. The proponent of an *in situ* conservation project has his / her own interests and is socially located. What interest does he / she bring at hand when participating in a project?

> Finally, the fourth contribution –*the assessment of tradeoffs*… It is the easiest thing in the world to proclaim a good. The hard part is to think through ways by which this good can be realized without exorbitant costs and without consequences that negate the good. (*ibid*: 159)

This is probably the most neglected aspect of projects. The implicit costs must be considered along with the obvious benefits of well-meaning proposals.

Function of knowledge in Andean cosmovision

Does the epistemology of accompanists of the Andean *tukuypas* conform to Berger's criteria? Our impression is that since accompaniment is situated in the technical area, it should. What are the conditions for such conformity? An obvious one is the avoidance of any partisan view of the cosmovision even if it is one's own. This would conform with the first criterion. The second criterion regarding the normative and cognitive presuppositions of the activities would require of the accompanists to be very clear and competent in the epistemological bases of both the cosmology of modern science and of the Andean cosmovision as well.

Regarding the assumption of what one holds as working hypotheses, that is implicit in the way *campesino* nurturers consider what they know as particular, circumstantial, and restricted to one's own experience: "this is how I do it" not "this is how it should be done". As long as the implicit epistemology of the *tukuypas* is adopted, we consider that Berger's third criterion, that referring to the social location of actors and their interests, is respected. The interests of the *campesinos*' accompanists reside in the learning they can obtain from their sharing a life world which will enrich their own lives, even from a technical point of view.

The fourth criterion, the consideration of necessary *tradeoffs*, the inexistence of free lunches in any intervention, is implicitly respected. It is understood as the sharing with all entities in the *pacha* [local world]. Don Modesto Machaca, a *tukuypa* from the community of Quispillaccta attests in the case of the parrot, commonly considered a pest:

> I have learned to give the parrot an *alimsu* in maize, that is, I give a piece of the field where I sow maize to the parrot. During the sowing I tell the parrot: “this is your *chacra*. I am making *alimsu* to you. Here you have your maize, this *chacra* belongs to both of us, you have to take good care of it, otherwise what are we going to eat?" (ABA 2001: 70)

Passerelles or common worlds?

At this point it should be clear that we believe in the importance of taking seriously the Convention on Biological Diversity in its opening of avenues for a fruitful collaboration between scientists and holders of vernacular wisdom. However, our experience warns us against attempting one-sided translation in the implicit belief that traditional knowledge is just an input to the scientific enterprise. Our proposal is to explicitly undertake the challenge of considering the cosmovision implicit in science and the cosmovision at the basis of vernacular knowledge as equivalent and as valid, alternative modes of approaching the issues involved in environmental governance. We contend that only with this explicit understanding *passerelles* can be built between scientists, policy makers and the public, irrespective of the culture they embody.

Perhaps the possibility should be considered that *passerelles* between science and traditional wisdom may not be viable, but we may be assured that building good common worlds in which many worlds are welcomed is always possible and desirable.

References

Asociación Bartolomé Aripaylla. 2001
Kawsay, Kawsaymama: La regeneración de semillas en los andes centrales del Perú (Seed, Mother Seed: the regeneration of seed in the central Andes of Peru). Lima: ABA.

Abram, David. 1996
The Spell of the Sensuous: Perception and language in a more-than-human world. New York: Pantheon.

ASAP 2001
"Niñez y juego en Ayaviri" (Childhood and Play in Ayaviri). In terre des hommes - Germany, *Yo juego como los sapitos : Niñez y juego en los Andes* (I Play like the Frogs : Chidlhood and Play in the Andes), Lima: terre des hommes - Germany.

Berger; Peter L.. 1990
“Moral Judgment and Political Action”. In *A Rumor of Angels: Modern Society and the Rediscovery of the Supernatural.* New York: Doubleday pp. 143-166.

Carrillo, Pelayo and Primitivo Jaulis. 1998

"Mama Kausapa Pachan". In *Crianza Ritual de Semillas en los Andes*. Lima: PRATEC.

Chuyma Aru 1998

"Rituales de la Crianza de las Semillas" (Rituals in the Nurturance of Seeds). In *Crianza Ritual de Semillas en los Andes* (Ritual Nurturance of Seeds in the Andes), Lima: PRATEC, pp. 13-65.

Maxted, N., L. Guarino, L. Myer and E.A. Chiwona. 2002

"Towards a methodology for on-farm conservation of plant genetic resources". *Genetic Resources and Crop Evolution* **49.** The Netherlands: Kluwer Academic Publishers, pp. 31–46.

Posey, Darrell A. 2000

"Biological and Cultural Diversity: The Inextricable, Linked by Language and Politics." In: Maffi, Luisa (ed.) *On Biocultural Diversity: linking language, knowledge and the environment*. Washington & London: Smithsonian Institution Press, pp. 379-396.

Shapin, Steven and Simon Schaffer. 1985

Leviathan and the Air-pump: Hobbes, Boyle and the Experimental Life. Princeton: Princeton University Press.

Urpichallay. 1999

Así converso con mis semillas. Marcará, Ancash: Asociación Urpichallay.