

The importance of Bio-cultural Diversity for Endogenous Development

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For some years already the term 'worldview' has left its academic background and entered debates of the development community. In some contexts it is referred to as 'cosmovision', while philosophy prefers to talk about 'ontology' (basic assumptions about being or 'what *is*') or 'epistemology' (basic assumptions about what we can know about being or 'what *is*'). It is interesting to see that such a concept, which seems to be very general, abstract and very unpractical for dealing with in concrete development projects, is nevertheless gaining increasing importance.

Testimony of a peasant from the Bolivian Andes

I first would like to share some ideas that might help to find out why this is happening. Let me first present you the testimony of an indigenous peasant from the highlands of Bolivia, Don Facundino, who told me the following experience while narrating his life history:

When I was elected as *Jilakata* (traditional authority) by the community, I had to learn many things that I had not known before. As authorities we have to be very careful, because if we fail in something, hail or frost can be attracted... You know, when I was Jilakata there was also frost! I had not behaved as they told me to do, being an authority. The potato fields were looking very sad! They were completely black. It was terrible and I cried a lot. Finally I went to the Shaman and with him we conducted a ritual called "water exchange"... First we climbed up to a sacred source that never dries – even in years of severe drought; from there we brought back some water to the affected potato fields. We poured this water into a completely dried well in the sector where the potato fields were situated and where the frost had hit hardest. During this ritual we chewed coca and under the guidance of the Shaman we prayed to Mother Earth to send us rain... this was the only hope left of at least partial recovery of the crops of our whole community. And then, after a long night, at daybreak, it started to rain! The plants recovered and we had a good harvest and I never failed to respect Mother Earth and the Shamans who are able to communicate with her; because of this, the community thanked me with the words "Thank you, you fed us well!"

What does this testimony tell us? It raises an interesting question: does a *relationship exist between the moral behaviour of humans and bio-ecological and climatic processes?* Does Mother Earth really sanction the disrespectful behaviour of a traditional authority with the occurrence of frost or hail? Or, we could ask here in more general words: is there a relationship between the spiritual life of humans and natural processes?

At the time I was introduced to Don Facundino's experience, I was working for the Agroecology Project of the University of Cochabamba (AGRUCO) in Bolivia. We were in contact with the community to which Don Facundino belongs and were confronted with this general question in the following way: participants asked us to tell them in a community workshop "what we, as scientists can say about this experience?" In order to give them an adequate answer, we had to study scientific points of view on this type of question more in depth. We came to realize that the sciences offer mainly two (partial) answers about the kind of experience narrated by Don Facundino.

The view of the natural sciences

One answer comes from the natural sciences and the other from the social sciences. Let's first have a look at the answer given by the natural sciences. The *natural science-based answer* is closely related to the question of what a plant *is*, and how it is related to human influences.

If we want to reach a scientific understand of what a plant is, we have to see how it is analysed and how knowledge about it is constructed. According to biology, a plant is seen as an expression of the genetic structure it represents and the interaction it has with the specific bio-physical environment in which it grows. From such a point of view it is clear that human influence can only be exerted by modifying the genetic structure of the plant, e.g. through breeding or by changing the bio-physical conditions under which the plant is growing, e.g. through fertilization, weeding or irrigation.

With regard to the climatic conditions which – in the experience of don Facundino – were first negatively and then positively influenced by his behaviour, the branch of natural sciences dealing with climatology gives a straightforward answer. Weather is understood only in terms of physical forces with causal interrelations, related for example to humidity, temperature, evaporation, condensation and gravity, which interact with the – equally bio-physical – features of landscapes. In this view, it is clear that the disrespectful behaviour of a traditional authority in a small community in the Andes or a ritual performed for counterbalancing it cannot be conceived of as a bio-physical cause capable of influencing climatic dynamics. Consequently, the possibility that human beings might successfully call for rain after frost by enacting a ritual of water change must be rejected.

The view of the social sciences

Let's now have a look at the social sciences and see how they deal with the question raised by these peasants. When the social sciences deal with the kind of experience shared by Don Facundino, they use concepts such as 'symbolic', 'cultural' or 'indigenous' views. An anthropologist or sociologist will say: "ok, what this peasant is telling is his own view of how the plant-human relationship is structured, but this is his subjective view". By saying "this is subjective", social scientists make a clear

statement proposing that there are other views considered to be objective. From a social science point of view, the question whether moral behaviour might have an influence on climatic processes is delegated to the natural sciences, as the social sciences generally deal with the subjectivities of the social world without being able to define any 'natural laws' of social behaviour.

As a consequence, the social sciences are able to systematize and make understandable to outsiders the reasons underlying Don Facundino's actions. They postulate and accept the co-existence of a high number of subjectivities (expressed in cultures, worldviews or cosmovisions). But with regard to the question how these subjective worldviews are related to natural processes, the social sciences leave the answer open or delegate it to the natural sciences. Although, the social sciences have the advantage that they can accept different subjectivities to explain certain social, cultural and natural phenomena, they do not really offer a sound basis for an answer to Don Facundino and his community's question whether a person's moral behaviour or a ritual can influence natural processes.

Philosophical implications

If we inquire a little further, we see that the underlying basis for this situation is rooted in different schools of thinking about the social and natural world. We can distinguish between two major schools – though there are many more, but I will only talk here about the two that are the most important. One is the constructivist view, according to which everything that we think as humans is constructed by humans. When asking about the relationship between what we think or feel deep inside us with 'external reality', it is assumed that humans are unable to know whether or not their inner conceptual or emotional representations reflect reality *in itself*, or whether external reality just consists of 'human' representations of external influences that might be of another quality than what we construct mentally. Thus the constructivist view is also a dualist view. It assumes the co-existence of a natural and a social system. Although the two systems are conceived of as interacting, it is assumed that their 'real quality' can never be revealed by human conscience.

Another school, known as 'scientific naturalism', is directly related to the natural sciences. It is based on the methodological assumption that observable effects in nature are best explained only through natural causes, without reference to, or assumption about, the existence or non-existence of supernatural notions. It therefore postulates that everything we think or feel is imposed – in one way or another – by external nature. Although this view is more straightforward with regard to the relation between the natural and social systems, naturalist philosophy also shares a basically dualist understanding of the natural and social worlds. While it understands the social world as imposed by natural forces on our consciousness and soul, it assumes that we cannot really know whether human reactions (concepts and emotions) to natural impositions really reflect reality as it *is*, or whether they are just representations of the impositions originating from nature.

So we see that we have a dualist worldview in underlying to natural and social sciences. Based on this dualist view of the world shared by the natural and the social sciences, we can see that the question raised by Don Facundino cannot really be

answered by either because the basic assumption of these sciences about what reality *is* (ontology) and what humans can *know* about it (epistemology) postulates a separation of the two worlds with the impossibility of really knowing whether or to what degree they are related. As a consequence, in terms of worldview or cosmovision, the 'modern sciences' leave Don Facundino – and together with him millions of people who have non-dualist cultures – in a kind of ontological and epistemological void.

Thus, we cannot give a clear answer on behalf of the sciences as they govern our universities today to the question whether any kind of relationship between human conduct, moral conduct and climatic processes might exist. Indeed, in the Western academic world, this is even considered to be a question not worth investigating any further. From a scientific point of view, the only answer is that a relationship between spiritual life and the processes of the natural world is not possible and hence it should be rejected.

However, looking at the above issue beyond mainstream thinking of established natural or social sciences there is surprisingly little proof to substantiate a rejection of a relationship between spiritual life and natural processes. In reality – as comes to mind when listening to Don Facundino – the dualist worldview is a *hypothesis* rather than something proven by experiments conducted by the scientific community. The only thing is that it has become so internalized and accepted by the sciences and the surrounding social groups that everybody has forgotten that basic scientific assumptions are only some among many other hypotheses about the relationship between mind, matter, moral behaviour, and social and natural processes. We are faced here with 'blind spots'.

Intra- and inter-ontological dialogue – a basic feature of endogenous development

The 'blind spots' concerning the ontological and epistemological foundations of the 'modern sciences' endanger the interaction between the sciences and society at large, which creates and maintains the conditions for the existence of the sciences as expressed in public universities and research programmes: when a hypothesis becomes a truth, then science becomes an ideology, making it difficult to question its foundations and establish a dialogue with other ways of looking at the world.

What does this mean more concretely? Let's quickly go through some examples. In the first place, I think that with this view summarized until now, it is clear that we have to face a new situation of science *within* society. Science is no longer the beacon that should orient society. Science is just part of society. That means that society has to define the place and role of scientific knowledge production – conserving of course the institutional independence of research and higher education but within a concept of *co-production of knowledge* between the scientific communities and the many other groups of actors involved who also hold important knowledge, e.g. NGOs, social movements, religious or political organizations, local or indigenous communities, and institutions related to the economy.

What this implies is that we have to opt for *transdisciplinary* modes of knowledge production. This means in the first place that when we are doing science with the aim of achieving a societal mode of knowledge co-production, disciplinary science is still valid, but it should be defined from a clearly societal point of view and not as an absolute position with regard to truth. In practice, this means that disciplinary science has to be redefined based on an inter-disciplinary understanding of societal and life-world-relevant views of problems negotiated beforehand with society at large.

A transdisciplinary approach to knowledge co-production therefore also means that science becomes an instrument which, rather than only describing and explaining the world, offers choices and pathways for changing it according to societally defined values, goals and visions of development.

In order to take on board problems as perceived by people in their daily lives (or life-world) in this manner, it becomes necessary to integrate an underlying dimension into the process of co-production of knowledge. This refers to ontological and epistemological foundations underlying to the different forms of knowledge which are represented by the actors involved in a certain issue of development.

We scientists have to find ways of relating with people who look at the world very differently than we do as scientists. In practice, this means that we need to cultivate an attitude of openness and that we have to forget about finding who holds 'the truth'. We should accept that truth cannot be claimed by an individual institution or by an individual person. Truth at the end of the day is nothing more than an inter-subjectively agreed upon view on certain phenomena.

It is a great pleasure to welcome some of the people here who can tell us this with much greater authority than I can do. For example, we need to look more deeply and more critically into the sciences, and revise what we consider to be the latest insights that come from science, looking maybe slightly beyond what is published in the main scientific journals. This will allow us to find the very interesting work of Hans-Peter Duerr (summarised in this book as well). He shows how a highly renowned physicist came to the conclusion that matter is not made out of matter! What exists, he states, is something that looks much more like 'mind' or 'Geist' (in German), which creates potentialities for matter to emerge, under certain conditions.

We can also learn from people in the South: when you cannot find a satisfactory answer to what you are doing right now, merely looking ahead and trying to imagine what else could be is not the only solution. It is also important to look back and find out how things were before, for instance before science became what it is now. Then we can encounter Johann Wolfgang von Goethe, for instance, who lived in Europe at the end of the 18th century and created his own scientific method (phenomenology). This, today, would be called an alternative, more comprehensive version of non-dualist natural science.



Figure 1 Morphological cycle of *Anthyllus vulneraria* leaves made visible in time and space (Klas Diederich und Urte Riggers, 2002. Der Wundklee, in *Merkurstab* 55 (1): p17)

What did Goethe do for instance to reach an understanding of what a plant is? He said that if you want to understand a plant, you should not go to the laboratory. Laboratories in those days were not the same as ours today, but many scientists already wanted to understand the world from a materialist point of view. So Goethe argued: "in order to understand a plant, try to feel how it develops". How can we do that? He proposed to attentively observe the 'movement' of the morphological development cycle and the plant's characteristic transformations (as shown in figure 1).

In the figure we see how the *Anthyllus vulneraria* leaves unfold and are shaped during the lifecycle of this medicinal plant. We could also say that this represents the plant-specific regularities of the unfolding of animated matter in time and space.

Observe now the whole cycle of metamorphoses of this plant and try to think, meditate about, or contemplate what happens here. You will see that the evolution of the plant follows a kind of movement. First there is a strong 'pushing from within', resulting in the appearance of these big and rather undifferentiated leaves. Then, when the plant becomes more and more mature, the shape of the leaves changes completely: it seems that there is something that is working from the outside, making the material plant form leaves that are smaller and far more differentiated. Growth is not one-dimensional and does not mean "always more, always larger".

From Goethe's perspective, the plant can be understood as the expression of a movement. It first expresses its material essence from within, and once it has spread out into wider space, it starts receiving non-material influences in such a way that its material expression is differentiated and significantly reduced. From then on, the plant almost disappears, reducing its material extension to the tiny size of the seed from where the whole movement can begin once again. Goethe This contemplation of the inner movement expressed in the metamorphosis of the plants led Goethe to formulate his idea of the 'Ur-Pflanze' ('proto-plant') as the ultimate (non-material) cause becoming visible behind the materialized plants. The 'Ur-pflanze' has thus to be understood as the *idea* of the plant which through its species-specific 'Gestalt' (shape or form) creates the conditions for the plant to become materialised.

This is one of the basic insights that are being used today in alternative branches of science, e.g. in homeopathy, biodynamic agriculture and organic agriculture. Thus,

people working with these alternative methods can also come to very concrete and practical solutions for curing diseases or producing high-quality, healthy and environmentally friendly food for humans and animals.

Dialoguing between different forms of knowledge

Now let us have another look at the example from Bolivia, in order to better understand what it means to engage in a transdisciplinary mode of societal co-production of knowledge, specifically in the context of rural development, and even more specifically, in an indigenous community.

When hail falls on the land tilled or grazed by a community, the peasants are always very sad because the plants are usually almost completely destroyed. Faced with this severe problem, they try of course to understand why they have been hit by hail. This is exactly the question they asked us within the context of the university programme mentioned above, looking for a scientific explanation. The natural sciences cannot say much about *why* a hail event has occurred; they focus instead on how the phenomenon normally originates: humidity rises up to very high altitudes, where it condenses due to the lower temperatures; it freezes, and when it falls, it develops high velocity, causing severe damage to crops hit by the grain- or ball-sized pieces of ice.

Science also says that it is difficult to predict *where* hail will fall, because it is a spontaneous reaction to a set of natural processes and is generated within a very short timespan, making it difficult to foresee its occurrence.



Scientific worldview	Andean worldview
<p><i>Explanation:</i></p> 	<p><i>Explanation:</i></p> 
<p><i>Interpretation:</i> Explanation is concerned with the HOW of hail formation → limited to 'external' nature.</p>	<p><i>Interpretation:</i> Explanation is concerned with WHY hail occurs → relates nature, human beings and society as a whole</p>

Figure 2 Comparison of scientific and Andean explanation of hail

Now let's look at what Bolivian peasants do in the communities when there is a hail event. They immediately start going from house to house to see whether there was a case of violent bloodshed in one of them. This may have been caused by a fight between people, or by an abortion that isn't tolerated. Once the persons involved in this violent bloodshed are identified, they are invited to go through a series of rituals

that are necessary in order to appease Mother Earth. As the example of Don Facundino confirms, to them it is completely clear that when hail falls, it is because the community has failed to live as they should. In other words they have created their own socio-cultural technology, made meaningful on the basis of their own worldview.

We can see a new dimension of reflection on development that is arising, allowing to better express what it means to work with endogenous development: it is not enough to know *how* things happen; indigenous and many other people want to know also – in a teleological sense – *why* things happen. The example also makes clear that an answer capable of satisfying both sides can only be found on the basis of a dialogue between scientific and non-scientific people, capable moreover of establishing an inter-epistemological and inter-ontological dialogue.

Considering the epistemological and ontological dimensions of the different forms of knowledge that are interacting in endogenous development allows to unmask another myth: It is not right when science claims to have a much more 'universal knowledge' while the one held by local people is 'local' or 'contextualised' knowledge. We can see that in both cases there is an interrelationship, a specific explanation about how what happens locally is related to a global context. So the difference is not at all a difference between 'local knowledge' and 'global knowledge'; the difference is always related to the different ways of understanding what happens locally and how it is related to the global level.

Methodological implications of endogenous development

Looking a little closer at how the scientific and the manifold non-scientific worldviews shape the production, reproduction and socialization of knowledge allows us to identify another important – methodological – dimension of the dialogue between different forms of knowledge.

By comparing the basic methodology of scientific production of 'objective' knowledge with how knowledge is produced in non-academic communities, the following fundamental difference can be found: in discussions with the experts of endogenous development from Africa, India and Latin America, it was concluded that scientific methods aim to separate as systematically as possible the observer from the observed (the subject from the object). However the methodology for producing knowledge for endogenous development tries to narrow down the distance between observer and the observed as much as possible. Through this, endogenous knowledge ideally leads to an elimination of the boundary between object and subject. This in turn leads to the possibility for the knowing subject to experience the world from the point of view of a plant, an animal, a stone, a star, the sun or any other component of interest.

This means more concretely that when you want to understand a plant, you have to become a plant. How can you do that? In Bolivia, but also in many other cultures in Africa or Asia, there are several methods to create the mental conditions under which it is possible to perceive the world from the point of view of a plant. Thus, during the rituals of Carnival, in the Andean communities of Bolivia people

celebrate the shift in plant growth from vegetative growth to maturation by calling the spirits of the ancestors that are needed to help the plants 'remember' how to overcome external material growth in favour of interior processes of transformation and maturation.



Figure 3 Typical way of masking in Carnival in Bolivia (Photo AGRUCO)

A main resource for accompanying this shift is the playing of season-specific music and the performing of dances. Externally this is expressed also by masking the music players as plants (see figure 3). During three or four days people really try to be a plant, to feel like a plant, to think like a plant, and with this insight they go back to their fields and decide what they have to do with their potatoes or their pastures.

What can be concluded when we propose that endogenous development should be based on the societal mode of co-producing knowledge between scientific and other communities? How could that be organized?

We have seen that we have basically three forms of perceiving the world. We have the naturalist worldview that is related more to the natural sciences and the constructivist worldview underlying most of the social sciences; both of them are based in a dualist understanding of the social and natural systems. Of course, I am simplifying but I think it helps to understand the issue at stake. In addition, we have a

third way of perceiving the world, represented by the many worldviews based on a non-dualist or a-dualist understanding of the natural and social worlds, in which the spiritual dimension of human behaviour is not systematically excluded from understanding what happens within and between the social and natural domain.

A common ground for a dialogue between these three views can emerge if we forget about the exclusive truth claim made by the natural sciences, and if we establish a dialogue on the basis of a shared concern and the aim of coming to a shared understanding of the complex interrelationships between the mind, matter, related domains of life, and the different ways in which communities and societies organize themselves.

Political implications of endogenous development

However it is important to note that the dialogue between different forms of knowing and acting in the world is not reducible to a mere philosophical issue only; this is not something that can only be dealt with in theory. The question is always: since we have so many different indigenous alternatives all around the world, why do they have so little impact on policy, research and development? We have to become aware that endogenous development, bio-cultural diversity and the dialogue between worldviews has an eminently societal and political implication. When we aim to enhance the value of the (still) high bio-cultural richness existing all over the world, we have to be aware that there are very powerful people and institutions who definitely do not have an interest in letting this happen. It would be against their economic, political or cultural interests, which they are ready to enforce in many cases through the material, military, financial or symbolic power they have.

This means that if we really want to include what we know as representatives of endogenous development into the growth of the societies to which we belong, we have to be aware that this requires strong social movements capable of opening spaces in spite of the resistance exerted by the those relying on the power of material, financial or political resources rather than relying on the 'power of the better argument' that emerges from a democratically constituted way of dialoguing and deliberating in a non-coercive and inclusive public space. With these ideas in mind let us briefly revise the objectives of this conference, which were formulated as follows:

1. Share and assess experiences on endogenous development and initiatives for enhancing Bio-Cultural Diversity through policies, research, education and practices.
2. Recommend innovations for development, research, education and policy aiming at endogenous development, bio-cultural diversity and co-evolution of different knowledge communities and policies.
3. Strengthen strategic alliances and explore options for collaboration between Community-Based Organisations, NGOs, scientists and policy makers aiming at endogenous development and bio-cultural diversity.