Towards Co-evolution of knowledges and sciences: No shortcut in integrating local and global knowledge

Paper for the Compas panel in the conference: Bridging Scales and Epistemologies: Linking Local Knowledge with Global Science in Multi-Scale Assessments

Alexandria March 2004

Bertus Haverkort

Stephan Rist

Bertus Haverkort: Compas, The Netherlands, e-mail: b.haverkort@etcnl.nl
Stephan Rist, University of Berne, Switzerland, e-mail: Stephan.Rist@cde.unibe.ch

Abstract

This paper presents experiences with and visions on the relationships between different forms of knowledge and sciences. The position is taken that, on a global level, there are numerous cultures, each having its own ways to deal with knowledge. This includes shared assumptions and beliefs about the real world; ways of learning, teaching and experimenting; ways to share information; concepts, and general principles and their application in technologies, as well as social and spiritual activities. Integrating these ways of knowing does not simply imply adding the best parts of each system; we argue that sustainable integration can only be achieved if the particularities of the forms of knowledge involved, with its political, methodological and epistemological dimensions, are addressed.

In all cultures and ways of knowing, attention is given to the question WHY things happen as well as to HOW things happen. But the emphasis and importance attached to these two dimensions may vary greatly. Western science places more emphasis on the 'how' questions, leaving the question on why things happen largely unanswered. Many of the so called 'local' ways of knowing focus more on the question 'why' things happen.

Further, also the sources of knowledge may differ: The importance attached to rationality, measuring and quantification can be combined or can exclude intuitive ways of acquiring knowledge and insights.

The question how different ways of knowing can be bridged is addressed by looking at a typology of intercultural relationships, which also influences the relationships between knowledges. The political character of the relationships between and the cultural dimensions of knowledges are considered. Depending on its historic context, the relative power of each way of knowing differs: domination, suppression, integration or isolation may occur. The investments in knowledge development as well as the ways to articulate and modify knowledge have differed. Looking at knowledge from an indigenous perspective suggests the inclusion of a wider historical, social, economic, cultural and policy contexts. This requires mechanisms to deal with cultural protocols, values and behaviours. For example, local notions of space, time, territory, numbers, sacred, rituals, visions, seniority, duality and morality need to be accepted and to be given space. Knowledge from a global or western perspective is observed to have a dominant position in the world today, to have a bias towards rationality and to give a secondary position to more intuitive and spiritual ways of acquiring knowledge.

In order to establish a relationship between different ways of knowing and sciences that benefits all parties involved, the agenda of activities to bridge western and 'local' ways of knowing requires careful planning. Recovering its own mechanisms for knowledge production and reproduction should enhance local knowledge. This includes ways of learning, mobilisation of resources, revitalisation, transformation and co-evolution. Western knowledge should become much more modest, recognising its own methodological and

epistemological deficiencies (for example, its dualistic and materialist view) and free itself form its use by ideological or economically powerful actors. To overcome these deficiencies, a trans-disciplinary approach to research and development, which aims at the including the material, social and spiritual assumptions and concepts, can be enhanced. Joint learning is one of the key concepts in the search for common space and integration of different forms of knowledge.

Endogenous development, or 'development form within' can be a key entry point: it starts with local activities aiming at the mobilisation of local actors and optimal use of locally available physical, social and spiritual resources.

The paper argues in favour of co-evolution of knowledges and sciences through intercultural and interscientific dialogues that includes at least seven steps. Papers of regional partners of the Compas programme provide information from Latin America, Europe, Africa and India.

1. Introduction

The Theme of the Conference:

The background document of the conference *Bridging Scales and Epistemologies: Linking Local Knowledge with Global Science in Multi-Scale Assessments* challenges the participants, to present mechanisms that enable the 'ways of knowing the world' in 'local knowledge' and in 'global science' to be either integrated or coordinated.

COMPAS is a programme that is engaged in dialogues between persons from different cultures in Africa, India, South America and Europe and who are representing different forms of knowing. On the basis of its experiences, this paper presents some mechanisms of intercultural and inter-scientific cooperation. Some lessons learnt and future lines of action will be discussed.

The paper takes the position that global science and local knowledge cannot simply be integrated by combining the best of both. The interface between different knowledge traditions needs a careful assessment of the existing power relations, of epistemological differences, and of the strengths and weaknesses of each of the traditions involved. On that basis, initiatives can be taken to address the strong and weak points, to handle the power relations and to decide on the collaboration or mutual learning.

Setting the coordinates: Starting points and assumptions

By doing so it is important to consider our own background. The authors have been socialised in western societies and trained in universities. After having worked for many years in different countries of the south, they were engaged in an intercultural and inter-scientific cooperation in the COMPAS programme. This programme is driven by the desire to construct bridges for more horizontally and less hierarchical relationships between the actors of different cultural communities. An important starting point is the recognition that western scientific knowledge is considered as just one form of knowledge among many others that are existing in the world (see e.g. Harding). We are not interested in finding out which one is the best form of knowledge, as we are of the opinion that no knowledge is universally applicable. We are much more interested in finding out in which way cooperation between different cultures and forms of knowledge can contribute to just and sustainable development. Instead of looking on the other through the lenses of the own knowledge, we try to be engaged in cooperation and dialogues between women and men belonging to different cultures in a process of social learning. In the Compas programme the way we interact with other cultures is based on two assumptions.

First, we think that it makes sense for all cultures to make their ways of knowing explicit because without that it would be impossible to engage in a respectful dialogue and mutual learning process. Second, in this process we want to avoid to be over sceptical to any of the ways of knowing encountered and at the same time avoid to romanticise any of cultures and their ways of knowing . We believe that it is possible to establish a respectful dialogue between different cultures based on the willingness to listen, openness to learning, responsiveness to questions and the courage to criticise when necessary.

Compas experiences

Compas is an international cooperative programme with some ten years of action research and learning from local knowledge in different cultural and ecological environments. Revitalising local knowledge and in building on this knowledge in development programmes is the final goal. Compas is involved in an

intercultural dialogue aiming at a co-evolution of knowledges and sciences. The field activities of the 25 partners organisations include support to local people in their so-called **endogenous development** processes. This is development based mainly, though not exclusively on the locally available resources, local knowledge, culture and leadership. Endogenous development has the openness to integrate traditional as well as outside knowledges and practices. It has mechanisms for local learning and experimenting, building local economies and retention of benefits in the local area.

A consortium of 9 universities is providing scientific support that includes contributions in the formulation of the specific paradigms, epistemologies and the launching of related research and teaching activities. Trough its action research, Compas has learned that local knowledges include a wide diversity of assumptions, concepts, technologies and ways of experimenting, teaching and learning that are specific to the culture and ecosystem. The work done so far also brought to light, that even with the immense diversity in the ways local knowledge is phrased and expressed, a common feature is represented by conceiving life in terms of **three interrelated domains:**

- **the natural world,**
- **the social world and**
- **the spiritual world.**

Local knowledge in the natural domain includes thematic fields related to the materials and processes characterising nature and society. The biophysical knowledge translates into specific agricultural, health and other practices. The social domain includes knowledge about local organisation, local leadership and management of natural resources, mutual help, conflict resolution, gender relations, art, and language. The spiritual domain includes knowledge and beliefs about the invisible world, divine beings, spiritual forces, ancestors, and translate into values and the related practices such as rituals, festivals. But an important feature is that none of these domains is existing in isolation. In most traditional ways of knowing every part is linked with all other components. In each situation local and outside (often western) knowledge are interacting, sometimes confronting each other, sometimes as an intercultural dialogue. The Compas partners try to understand these interactions and how to cope and influence them in such a way that social learning and co-evolution can take place.

The experiences gained suggest that knowledge that is available at local level as well as knowledge that is being used in global levels can both be considered as science. Differences are arising mainly with regard to the sources and ways of processing knowledge.

Such a perspective also suggests that a co-evolution is possible through a process of mutual learning. It is therefore important to explore the following questions:

Questions

1. What is knowledge and what is science when considered in an intercultural perspective?
2. What are the main characteristics of local and of global knowledges and sciences?
3. What types of relationships can exist between dominant science and the diversity of local knowledges?
4. What would be the most sustainable relationship between local knowledges and global knowledge?
5. How do we look upon endogenous development and how can it contribute to co-evolution of knowledges?
6 What steps could be taken to enhance co-evolution of different ways of knowing?

This paper will address these questions. We do not have the pretension to answer them all. We like to contribute to the process where different partners and actors get engaged in a process of constructive dialogue, exchange and co-evolution.

2. Sources and forms of knowledge

Co-evolution is a process where different cultures follow their own process of adaptation and development, but have accepted mechanisms for mutual exchange and joint (social) learning. Co-evolution presents a

claim for achieving just and sustainable development. It takes the diversity of worldviews, values, concepts and resources as important assets. Social action is generally connected to patterns of orientation and interpretation, which can change according to the situation: e.g. when a person is working in the laboratory that is based on a defined form of knowledge, the same person might be using a very different type of knowledge when educating his children or choosing which book to read. This means that even if it is possible to define different knowledge systems, this will not help necessarily to understand social actors better because constant overlapping and mutual penetration of different types of knowledge shape their personal or institutional knowledge.

To overcome this kind of conceptual difficulties, it is suggested therefore to speak of 'forms' of knowledge rather than of 'systems' of knowledge. The notion of 'system' implies the definition of boundaries between internal and external spheres, and involves specific structures and processes. This difficulty becomes even more evident, when taking into account that there are very few – if any – social actors who rely exclusively on only one system of knowledge. Emphasising on forms of knowledge means a focus on processes of knowledge creation and utilisation rather than on a classification of their outcomes. This is particularly helpful when taking into account that many local forms of knowledge are related to other sources and processes than those of formal science, which are essentially based on rationality. Local forms of knowledge are often related to tacit knowledge (Polanyi 1983) or it can be based on meditation, intuition, inspiration and empathy (Millar 1996).

For the sake of clarity we present our interpretation of the concepts information, knowledge and science.

Information refers to data that have been processed and analysed and to which a certain interpretation or meaning has been ascribed. Information can be carried in reports, books, or computer systems but also in songs, prayers, poems, sayings and other narratives.

Knowledge is in people. It refers to the assumptions, concepts and interpretations of information acquired by individuals or groups. Knowledge is understood here as the way in which people give meaning to phenomena and translate them into action. Knowledge production then is a process that links information with meaning, values and action that cannot be reduced to a set of 'objectively' validated information. Knowledge is inextricably linked to the social, environmental and institutional contexts (Blaikie, Brown et al. 1997).
Information and knowledge are mutually determined: A certain knowledge leads to search and production of specific information which then reinforces the knowledge.

Science is the body of knowledge based on observation of phenomena and their classification under a theoretical framework, which itself is tested in observation. (see also Balusubramania's conference paper). It includes the whole complex of producing knowledge and information with its assumptions, general principles, theories and methodologies about a range of phenomena on which a specific community has reached consensus. The knowledge acquired is always limited and subject to modification in the light of new data and information. In the society where a particular science is accepted and used, there is a professional community of practitioners of knowledge governed by some social and methodological norms.

Adopting these definitions allows stating that besides the academically established science there are many other 'sciences' referring to numerous 'knowledges' that are co-existing. This co-existence can take place in separated areas, but also but in commonly shared social and geographical places.
There is a dominant tendency to look at 'science' as only possible in a Cartesian perspective, implying that 'true' knowledge and 'objectivity' can only be acquired by quantitative methods using the senses. However, in an intercultural perspective this is not evident. Cultural as well as social sciences showed that every form of knowledge – including the one produced by natural and quantitative science - is socially constructed. This means that knowledge can not exist separate from the process of its construction. What makes a certain form of knowledge more disseminated than others is either related to its degree of meaningfulness for people or due to the degree of instrumentalisation by powerful elites within different societies or historical periods. This means that 'truth' is not so much determined by objectivity, but by 'inter-subjective validation'.

Epistemological implications of interculturality

The notion that different sciences are representing different social processes of knowledge construction, makes it relevant to investigate on similarities, differences or contradictions. Taking into account the dominant role that western science presently has on the globe, it is important to understand the differences and similarities between western scientific and local forms of knowledge.

Rist and Wiesmann (2003) analysed this question comparing the explanations as given by western science and Andean knowledge on the occurrence of the phenomena of hail. It was shown that the explanation of natural science focuses on understanding HOW the phenomenon is originated by identifying the corresponding causes that relate to factors as temperatures at different altitudes, humidity, flow of air, gravity. On this basis, hail is considered as a highly accidental occurrence, making it difficult to forecast where and when it happens.

In the view of Andean knowledge, hail is attributed to a violent spilling of blood. This understanding makes it necessary to investigate who has spilled blood, and to perform a ritual for appeasing the spirits that caused the hail. Here the focus is on understanding WHY hail is occurring in a certain place and moment. The fact that many local people in Andean communities are strongly engaged in debates and discussions trying to understand HOW this kind of interrelations are operating suggests a perceived deficiency of their own form of knowledge (Rist 2002).

This example is quite typical for many other local sciences. It illustrates that there are different ways of looking at natural or social phenomenon. By explaining the phenomenon based on causality within a rationalistic framework, focus is given on How things happen. This view requires always an original or initial cause, which is taken as the 'beginning'. If one asks for the cause of the 'beginning', the search will cover many aspects but at the end the question of the existence even of the most remote initial cause can never be explained by a logic based on cause-effect in a rationalistic framework. This situation can be overcome when there is an explanation of Why phenomena (as the initial cause) are happening. Knowing why something happens allows giving meaning to the processes. This means that for a satisfactory explanation of any phenomenon we often aim to get a coherent integration of the answers on a how and a why question.

This is not a merely academic or theoretical question because the why and how are also intimately related to social action. In social sciences it has become widely accepted that social action is essentially guided through meaning. The ways we are giving meaning to what is happening (or 'why' it happens) are becoming the bridging element between perceiving and acting. Thus, it becomes clear that the dialogue between different forms of knowledge is not possible without considering the different theoretical backgrounds and the dynamics of the ways of knowing, their epistemologies. It seems that local knowledge often emphasis is placed on explaining WHY things happen, whereas conventional positivist scientific knowledge predominantly explains HOW things happen. This difference in emphasis remains valid even when taking into account the WHY questions from biology when stating that the evolution is based on 'survival of the fittest'. Even if it would be accepted that the great majority of phenomena described by 'modern' biology are congruent with the idea of a randomly and goalless processes of mutation, adaptation and selection, it does not provide an answer on WHY this process happens. The same difficulty is inherent to the evolution of the cosmos or components of it e.g. like our planet: Modern physics have created a really impressing theory, thoroughly sustained by empirical data, explaining how earth's existence is related to a much broader process that started with the 'big bang' which is considered as the 'initial cause' of the evolutionary process. Although astrophysics could even make more progress, it can never describe more than the HOW-dimensions of the process.

WHY things happen includes the concepts of the social, spiritual and natural worlds, whereas the question HOW things happen can be explained in terms of natural and social sciences. However any result of this kind of science can only have meaning when it is related to 'WHY questions'

In making an epistemological analysis of a certain way of knowing there are also other variables that can be used. What is the source of knowing. Sources that are being mentioned by the Compas partners are: Observation, quantitative measuring, rational analyses, meditation, intuition, inspiration, rituals and empathy. (See the conference papers of Millar, Balusubramania, Delgado).

Armstrong (2002) states that there has always been ***a complementarity between two sources of knowledge***

A. Sources of knowledge rooted in intuition and silence that gives sense and meaning to life, but cannot be explained in rational terms. These sources for reflection are often formulated in terms of images,

rules, myths, metaphors or stories that were formulated to express awe, morality and or to link mysteries with the real life situation in a way similar to the way contemporary poets, artists and musicians express themselves. Their messages can be understood in multiple ways. Ascribing meaning to it requires a process of meditative reflection or exegesis to bridge the cultural differences.

B. Sources of knowledge derived from observation and rational, logical or scientific reasoning. Its concepts often claim to be universally applicable and can be applied in the development of technologies.

According to Armstrong each of these two sources of knowledge has its own specific mechanisms to deal with: She argues that it is not correct to expect deriving, morality, meaning or sense from rationality or logic, nor to interpret rules, myths, metaphors and stories as if they are directives to be followed literally.

They have different sources, meanings and demand different treatments. Together they need to be used in a complementary way. They can inspire, improve each other, but not replace one another.

Against this background it becomes clear that a dialogue between different forms of knowledge would be difficult if the sciences involved are oriented in a one-sided manner to why or how questions, to rationality or to intuitive ways of knowing. Overcoming existing one-sidedness with regard to the sources of knowledge could thus be considered as a major issue to be addressed through a dialogue between epistemologies.

It would be good to try to understand or characterise every single form of knowledge in terms of its sources. What are the sources for the WHY and what are the sources of the HOW. An important issue may be to determine a possible bias or the (dis)balance between each of these sources, the specific content and quality of each of these sources. On that basis one could identify ways and means to improve the knowledge by intercultural exchange and mutual learning

The central questions of the conference are about integrating local knowledge with western science; on defining the barriers to integrating local knowledge into an assessment process and of finding ways on how these barriers can be overcome. In our perception these questions may need to be rephrased. We feel it is too rough to talk about integration of 'global' science and local knowledge. The use of the word integration without further definition of what it implies it problematic. And, assessment of local knowledge by global scientists is very risky as global scientists have their own biases. Therefore such a one-sided assessment is not justified in an intercultural context.

But then, how can we form rules of the game for understanding, supporting individual knowledge systems. To what extent can we expect synergy or complementarity between different forms of knowledge. In the case of Compas, how can we enhance exchange between e.g. Aymara knowledge, Shona Knowledge, Hindu and Buddhist knowledge and European knowledge. During the inter-scientific dialogue we want to avoid a situation where a dominant system determines the rules of the game. Local knowledge should not be assessed by global science, or the other way around. What is necessary first is a selfassessment of the relative strengths and weaknesses of each knowledges (in terms of the sources of the knowledge, the How and the Why question) as well as an assessment of the power relation between the systems involved.

In order to come to a further definition of the interplay between different knowledges in an intercultural perspective we will present our perception of a possible typology between knowledges and sciences. It includes a historical perspective where also the elements of power, domination, conflicts and repression, resistance and resurgence will be taken into account. But before that we will look at knowledge and science from two different perspectives: Indigenous perspective and an intercultural perspective

3. Knowledge and science from an indigenous perspective

In her study: Decolonising methods; research and indigenous peoples, Linda Tuhiwai Smith argues that if she looks at science from the perspective of the Maori in New Zealand, western scientific methods are imperialistic: They look at the local situation as something that has to be described in categories and phenomena, that have the origin from outside. The local notions of space, territory, time, numbers, sacred, rituals, initiation, visions, harmony and duality, seniority and morality are described in language and concepts external to those of the locale. Local management systems and solutions to the problems as perceived by the local people are not taken serious.

The values, beliefs, practices and customs are often seen as barriers to research or at the best as exotic customs that need to be understood in order to carry out the work without causing offence in the local communities.

Often their research affirms their own beliefs and fail to include the wider historical social, economic and policy contexts in which the communities exist. Indigenous communities are blamed for their own failures and it is communicated to them that they themselves have no solution to their own problems. Rather outside solutions and management systems are imposed: "They came, they saw, they named, they claimed". She argues in favour of indigenous research methodologies that deal with cultural protocols, values and behaviours as an integral part of the methodology. They are "factors" to be built in to research explicitly, to be thought about reflexively, to be declared openly as part of the research design, to be discussed as part of the final results of a study and to be disseminated back to the people in culturally appropriate ways and in a language that can be understood.

Her solution is an approach that aims at self-determination or the decolonisation of the indigenous peoples and a revitalisation of their way of knowing that includes processes of:

- Recovery of own mechanisms for the way people explain, experiment, teach and learn, (decolonisation of the knowledge domain).
- Healing: revitalisation and restoring deficiencies and weaknesses in the way of knowing: improving outdated concepts and or updating methods of observation and interpretation.
- Transformation: aiming at psychological, political, economic and collective change.
- Mobilisation of all local resources available (natural, social, spiritual) for a sustainable use in local livelihoods

In the eyes of non-indigenous researchers this type of activity is politically sensitive and can be perceived as threatening. It can be judged by outsiders as not rigorous, not robust, not theorized, not valid, and not reliable. At the same time local communities can observe formal research as not useful, not indigenous, not just, not friendly.

Reconciling these views can be difficult, but is a major challenge. During their field activities the Compas partners are working together with traditional leaders. They learn with local people about the cosmovisions and about the way local people experiment, teach and learn. They carry out local experiments to test and improve local knowledge and practices and build development and much as possible on the use of local resources. These experiences still need to be systematized, the insights gained are still very rudimentary.

4. Knowledges and sciences in intercultural perspective

Samuel Huntington, in his analysis of the *clash of civilizations* elaborates problems in intra- and extra-civilisational behaviour. He elaborates things like feeling of superiority and inferiority, fear and lack of trust, difficulty in communication due to differences in language and values and lack of familiarity with assumptions, motivations, social relations and social practices of other people. According to him, conflicts between civilisations have to do with: struggles for control of people, territory, wealth and resources, relative power that is the ability to impose one's own values, culture and institutions on an other group.

In assessing the present global situation he rejects the simple view of the "West and the Rest "; the assumption of the dominance of the West on the globe and the idea of the universalisation of Western liberal democracy as the final form of human development as suggested by Fukuyama . He rather suggests a multi-polar and multi-civilisational world. He makes a distinction between African, Japanese, Orthodox-Russia, Islam, Western, Latin American, Hindu, Buddhist and Chinese cultures. Each of them has its own identity defined by language, history, religion, customs, institutions, and self-identification and relationship with the other civilisations.

He is criticising the western belief that western culture is universal: that assumption is false, immoral and dangerous. Western civilisation according to him is not universal but unique because its combination of

- Christianity
- pluralism

- individualism and liberty with a certain distrust of central governements
- the rule of law that include equality, democracy, and human rights
- competitiveness and focus on short term gains

By the same token, Huntington describes the uniqueness of the Indian, Islamic and Chinese civilisations Chinese civilisation he sees as the unique combination of

- Confucian ethos
- stress on authority, hierarchy, the subordination of the individual rights and interests
- importance of consensus, avoidance of conflicts, saving face
- notion of the supremacy of state over society and of society over individual
- thinking of the evolution of their society in terms of centuries and millennia and
- priority given to maximising long term gains

These descriptions show that the knowledge developed in each of these civilisations is different: They are based on different notions of causality, morality, have different perception of time, space and of the relationship between mind and matter.

Huntington is pointing at the interwovenness of belief (including religion), values, social organisation on the one hand and the sciences, concepts and technologies being developed on the other. He underlines the political character of the relationships between civilisations as well as the cultural dimension of the sciences and knowledges on this globe.

In Huntington's analysis the West is gradually losing its dominant power position. The Chinese, Indian and Islamic civilisations are gaining regional and global influence at the detriment of the western domination in these regions. But he also observes conflicts and tensions between many of these civilisations such as the tension between Hindu on the one hand and Islam and Chinese civilisation, and also between Islam, and the Orthodox Russian, the African, the Western and the Hindu culture.

He argues that it is not the responsibility of western leaders to reshape other civilisations in the image of the west. Their task is to preserve, protect and renew the unique qualities of western civilisation. If non-western societies are to modernise, they must do it in their own way: building upon and employing their own knowledge, institutions and values.

When applying these ideas to our process of inter-scientific dialogue or to intercultural learning we need to be very careful and we have to consider the following questions:

- To what extent are we running the risk that the dominant system is imposing the rules of the game?
- To what extent are those educated with a western focus, continuing to use and suggest methods to solve a problem that to a certain extent have been the root causes of this problem. In other words, to what extent is the focus on rationality and a second position for intuitive and spiritual ways of acquiring knowledge and insights, part of the problem?
- Can we imagine what different shapes modernisation (i.e. evolution of knowledge and developing and applying new techniques) in non-western societies can take, given the fact that they are based on different values and concepts of life?
- Is it possible to find ways and means to support such a diversity of modernisation efforts?
- Under which conditions is intercultural exchange positive and under which conditions it could be a threat for the minority cultures and for the dominant culture?
- What mechanism could be used to engage in a synergetic exchange and social learning process between cultures and forms of knowing that are so different?

In order to make a beginning of answering these questions we subsequently will present a typology of the relations between different sciences and forms of knowledge. Then we will look at some experiences

of endogenous development, and finally we will propose some elements of a strategic approach for co-evolution of different forms of knowledge.

5. Relations between different sciences and forms of knowledge

Interaction between different cultures may result from trade, migration, missionary activity, tourism, war or mass communication as well as from friendships and solidarity based networks of solidarity and cooperation. The degree of reciprocal influence may vary greatly. In many cases the more powerful culture dominates and deliberately or by implication has an influence on the less powerful culture. When analysing the different ways in which sciences and forms of knowledges interrelate it would be impossible to discuss them all. There are many differences in the way different positions in power and differences in effectiveness of available technologies, are being used and many differences in the way people react to domination.

Without claiming completeness we have presented some of the possible relations between different forms of knowledge in the table below.

Table 1: Typology of relations between different forms of knowledge

Type	Characteristics	Examples
1. Clash or hostilities	Violent occupation, wars, resistance, fights between civilisations.	Fights between religions or political lines; Independence or resistance movements; Terrorism and anti terrorism
2. Going Underground	The suppressed knowledge continues to exist but not openly. In order to avoid repression, hostilities or rejection local knowledge continues in a clandestine way.	Many local knowledge systems: Sjamanism in Sri Lanka; Spirit mediums in Africa; Traditional leaders in the Andes.
3. Parallel knowledges	Different ways of knowing co-exist openly without interaction ; Cultural or scientific apartheid.	Conventional medicine and Ayurvedic medicine co-existing in India Islam, Christianity and other religions co-exisiting in Europe Conventional and bio-dynamic or organic farming Voluntary isolation of certain aspects of international exchange of a country like Butthan
4. Utilitarism and selective inclusion	Elements of local knowledge which can be scientifically understood or validated are accepted for enhancing the stock of scientific knowledge; may imply assessment of local knowledge by outside scientists and lead to ex-situ conservation of local knowledge.	Aspirin is made based on a local practice which already the Egyptians and the Greeks were using, without knowing its active ingredient. Local medicinal practices for Malaria treatment Adoption of Arab mathematics and Chinese gunpowder by western scientists
5. Suppression and substitution	The dominant system forces the introduction of exogenous concepts to substitute local traditions.	Missionary activities to substitute traditional religions, privatisation of land, introduction of European languages as national language, exogenous rule of law to replace traditional juridical systems, republican and democratic systems of governance, hygiene measures as

		conditions for export..
6. Paternalism	Traditional knowledge is a starting point but is must be 'up-dated' by scientific contributions	Transfer of technology in education, health and agricultural extension programmes
7. Syncretism	The dominant and dominated systems merge and incorporate each others rituals, beliefs and knowledge in such a way that **both** systems belief that their knowledge is in fact the one that is dominant	European knowledge with Carthesian knowledge and Catholicism merged with and Andean or Maya beliefs, health practices and rituals
8. Complementarity	Two different ways of knowing use mechanisms of exchange and mutual learning aimed at complementing each other	FRLHT in India with activities to exchange and compare different health care traditions
9. Romanticism	Local knowledge is romanticised and considered basically 'good' and should have the right to remain as it is .	'Going native', rejecting possible contributions of global science; enhancing capacity of resistance of local actors
10. Co-evolution	Different forms of knowledge evolve simultaneously, in the first place on the basis of their own dynamics (revitalisation) and partly as a response to their interaction/dialogue with other forms of knowing	Experiences of Compas partners in Europe (co-existing farming styles), Africa (Ghana and Zimbabwe) Latin America (Picads)
11 Transcultural and transdisciplinary synergy	Sciences are aware that they represent one type of knowledge among others and that knowledge is always culturally embedded and forming part of historic development. Both can be benefiting from comprehensive interaction	Development of holistic medicine and health care in industrialised and developing countries or the clarification of interactions, which are not (yet) scientifically explainable. Work of Lovelock, Sheldrake, Wilber and others …

Issues

The typology makes clear five mayor issues, which have to be considered when looking for an interrelation between different types of knowledge:

First, the term *Integration of (scientific and local) knowledge* as suggested by the conference is problematic. It does not differentiate the starting position of the relationship and hence does not take into account the way the power differences are being handled . This way, the mechanisms for their sustainable interrelation can not properly be identified.

Second, an intercultural perspective means also to recognise that - due to global interdependence and communication – almost any type of knowledge available today, is in some way or another influenced by others. This makes it almost impossible to address the pure differences between different 'knowledge systems'.

Third, by adopting a intercultural point of view it becomes manifest that every position has a clear political dimension and departs from different ethical positions. This means that there is no 'objective' or value free relationship between science and local knowledge and (or) between different ways of knowing.

Fourth, in the interscientific dialogue emphasis needs to be placed on a reflection on what the specific starting position of each form of knowledge is: What are its sources (the How and the Why question, the role of rationality and intuition, the values involved and the way meaning is ascribed to things); How it relates to the natural, social and spiritual worlds; How it is placed in terms of power and conflicts. On that basis a process of endogenous development can be designed that takes into account the revitalisation of the form of knowledge and links it to other mechanism of social, material and spiritual development

Fifth, in order to establish a sustainable relationship between different types of knowledge, a mutual learning process and dialogue are important which involve the dimension of power, values and worldviews and the outcome of endogenous development. Only this way of cooperation allows overcoming the aspects of suppression, arbitrariness and paternalism as represented in the typology. Only then a synergetic relationship and co-evolution can take place

On the basis of the reflections above we can now take a closer look at the concept, approach and experiences of endogenous development and its implications for intercultural dialogues.

6. Endogenous development

Globalisation and localisation
The ongoing process of globalisation involves the entrenchment of western modern knowledge and technologies throughout the world. The dominant education and research systems are predominantly based on global (western) knowledge and value systems. As a result, development activities have tended to enhance technologies with international standards rather than to support the needs of specific regions or populations. In agriculture the use of external inputs has increased due to extension advice and subsidy policies. In health, commodities and knowledge of western allopathic medicine has reached out to all corners of the globe.

Although these efforts have led to definite improvements in productivity and health, awareness related to the problems associated to this approach is increasing.

Environmental pollution and degradation, loss of biodiversity, international and local conflicts, poor health and persistent poverty in certain regions on the globe are serious problems. Privatisation and liberalisation have held health services and access to agricultural inputs beyond the reach of large groups. Many young people are no longer educated in the traditional way of life and are leaving the rural area. Under the influence of mass media a general westernisation of taste and consumption is taking place. These processes strain local economies as well as the social and cultural inheritance of the local communities. The confidence in traditional leadership and practices is declining and as a result social cohesion and local conflict resolution mechanisms are being undermined.

Globalization has triggered local responses, called “localization”, that emphasizes local ownership and local culture. Despite the apparent acceptance of dominant technologies, a number of indigenous institutions have survived and a wealth of indigenous knowledge still exists. It has been consistently been observed by the organisations working in different cultures within the Compas network, that although their existence is under threat, there is still much indigenous knowledge, cosmovision and traditional leadership. Indigenous knowledge and leadership have their strength and weaknesses and although often not perceived by outsiders, these still form the basis for the decisions made by the majority of rural people. Part of this ‘counterdevelopment’ are the numerous new social movements emerging around the world expressing their disagreement with the current main stream understanding of globalisation. The search for new ways of living and interacting gives rise to alternatives, e.g. small movements developing alternative fair trade based economies, organic agriculture, complementary medicine, production renewable energies, or other forms of education.

Endogenous Development
Endogenous development refers to development that is mainly, though not exclusively based on locally available resources, such as land, water, vegetation, knowledge, skills and competencies, culture, leadership and the way people have organised themselves. External knowledge and resources are often used as complements to local resources. It has mechanisms for local learning and experimenting, building local economies and retention of benefits in the local area.
Endogenous development does not imply isolation, nor does it limit its attention to local processes. It may use some opportunities provided by globalisation.

Compas’ approach and experiences
One of the agencies that supports and enhances local initiatives for endogenous development is COMPAS. Its partners have ongoing programmes in the domains of poverty reduction in marginal areas, participatory development, local management of natural resources and ecological processes, low external input and

sustainable agriculture, biodiversity, local health systems. These programmes build on local knowledge and enhance cultural diversity.
Based on their experiences the partners have concluded that the conventional approach to support development, consisting of transfer of technologies, knowledge and values from the modern world to the underdeveloped world, needs to be revised. Rather traditional knowledge and values with its technical, social and spiritual dimensions need to be accepted as the starting point for development, as 'modernisation' from within the own culture.
Compas functions as an international network that links practical interventions in rural areas with theoretical reflections about development options and thus contributes to the emergence of insights and a diversity of operational and effective approaches. The approach of the Compas programme can be described as action-research on endogenous development. It hopes to be complementary to the many organisations that have similar focus but that restrict themselves to field work or research or to the technical aspects of indigenous knowledge only. It thus hopes to support the growing movement towards endogenous development.

Supporting endogenous development does not imply a narrowly defined development approach and is neither romanticising nor rejecting traditions. Endogenous development is seen as an approach that takes place complementary to the ongoing technological and economic global processes. It wants to address local needs and contradictions, use local potentials and link local economies to international systems with optimal terms of trade. It supports co-existence and co-evolution and of a diversity of cultures. Intercultural research, exchange and dialogues will be helpful to find the most desired development path in specific contexts building on the accumulated experiences.

Indigenous knowledge and practices do not have all the answers to present day challenges. They may have certain limitations or setbacks. But farmers and rural and urban people in the south take decisions and define their relationship with outside knowledge and agencies based on their own culture and values. Therefore, for development organisations to be effective in supporting endogenous development, they need to understand the basic characteristics and acknowledge the existence of local forms of knowledge, and the worldviews that they are based on.
The Compas partners started their work on supporting endogenous development by systematic activities for learning with and from rural people about their knowledges, practices and worldviews. Subsequently initiatives have been taken to test, adapt and improve the traditional practices and to enhance endogenous development. Networking and training have taken place and a number of workshops and publications have led to a further systematisation of the experiences so far.

In the course of these processes the Compas partners have identified following components for supporting endogenous development

1. Building on locally available resources
2. Objectives based on locally felt needs and values, acknowledging the interests of different social categories
3. *In-situ* reconstruction and development of local knowledge systems: understanding, testing and improving local practices and enhancing the dynamics of the local knowledge processes
4. Maximising local control of development
5. Identifying development niches based on the characteristics of each local situation
6. Selective use of external resources
7. Retention of the benefits in the local area
8. Exchange experiences between different localities and cultures
9. Training and capacity building for rural people, development staff and researchers
10. Networking and strategic partnerships
11. Further understanding of systems of knowing, learning and experimenting

1. Building on local resources
All Compas field activities for endogenous development are based on a variety of local resources. Modifying the framework of Bebbington, we distinguish six different types of resources: Natural resources (land, ecosystem, climate, plants, and animals); Human resources (knowledge and skills, local concepts, ways of

learning, teaching and experimenting); Produced resources (Human made resources such as buildings, roads,, waterworks, equipment); Economic resources (markets, incomes, ownerships, price relations, credit); Social resources (ethnic and family organizations, leadership); Cultural and spiritual resources (beliefs, norms, language, rituals, festivals, art).
Local resources are not a given fact; they are dynamically transformed on a day to day basis by the people that depend on them. This implies, that people carry out experiments with local resources as well with combinations of local and external resources, and that they continuously adapt to changing circumstances and opportunities. The outcome of these experiments vary to a great extent, according to perceptions and circumstances of each person, family or community. But they are invariably based on the peoples' own ways of explaining reality, of sharing and transferring information, and of learning from former experiences. Local organizations, institutions and leadership form an important local resource. Often land use systems, law enforcement, local experiments and decisions are done under guidance of traditional leaders. Local experts exist in a range of field such as human health, animal health, crop protection and religions. In endogenous development a good understanding of local resources is the starting point. This understanding will not have the orientation of the outsider (looking for opportunities to use the resources for extraction or profit making by external investor) but the orientation of the insider (looking for opportunities to make use of the resources for improving livelihood).
The fact that field workers accepted and respected the peoples' worldviews contributed to the feeling of ownership of the rural people of their resources and a new look at the development process. The fields of action of the Compas partner organisations were mainly related to agriculture, natural resources and health. Examples are the use of local varieties of indigenous seeds (Green Foundation in India) and animal breeds (KPP in India), indigenous pest control methodologies (ECOS in Nepal, ECO in Sri Lanka), and local management of natural resources (Cecik in Ghana, Aztrec in Zimbabwe, IDEA in India) and local herbs for human and animal medicines (FRLHT and IDEA in India). As a result of dialogue with local communities, almost all partner organisations have realised the need to expand their range of activities to include the wider expressions of local culture. Experiences of Compas partners in this respect include supporting music, dance and theatre by IDEA in India and Aztrec in Zimbabwe, Agruco in Bolivia on marketing and trade, Aztrec in Zimbabwe on eco-tourism, Adici in Guatemala on local leadership and Green Foundation in India on festivals and rituals. Both the rural people and the field staff have learned and are still learning to re-assess the local resources and the way they can use, combine and expand them, and change the ways these are controlled in order to improve their livelihoods.

2. Building on locally felt needs

Generally, economic growth, or increased income, is the primary objective in conventional development. For rural people in many cultures of the world, however, income is not the major parameter in defining wellbeing. Other aspects, such as social cohesion, status, health, good children, natural resources, and good relations with the spiritual world are of equal importance in the development decisions. Therefore, the general goals for endogenous development may vary, to include a combination of objectives, such as poverty reduction, diminished ecological degradation, increased equity and justice, or cultural and spiritual goals. Again, the definition of the needs may vary depending on sex, social position or age. Getting insight in the diversity of felt needs, looking for ways to accommodate the most relevant ones for all categories involved, overcoming contradictions and coming to a joint definition and acceptance of the felt needs and development goals may take some time, but is a crucial condition for sustained development.

Addressing local needs was initially not seen as a problem by the Compas partners as in all stages of the development programme local leaders are being involved in the planning and implementation. However, not always has it been easy to understand and address the intra-communal differences in power, wealth and knowledge and the resulting differences in needs. Class, caste and differences play a role here and especially the latter is often difficult to handle. In the cases of IDEA, KPP and Green Foundation, special programmes have been started for women in weed management, nutrition and agro-biodiversity. In Ghana the CECIK has a special programme for women and it concluded that women are more responsible farmers than men. In Zimbabwe the spirit mediums are mostly women, and this is reflected in the staffing of and field programme of Aztrec.

It appeared that it takes time to be able to make a gender specific analysis of the cosmovision. The way in which the cosmovisions of women may differ from those of men has not been explored in all cases. Also the gender perceptions within the traditional cosmovisions, with existing taboos and limitations in rights or social positions have not always been made explicit. Strategies need to be made for gender specific endogenous development. The majority of the field workers are men and their gender sensitivity can often

be improved. Field workers are sometimes of better social backgrounds than the more marginal segments of the population. In the case of IDEA and CIKS local youth are functioning as project staff. Other partners (Green Foundation, Cecik, KPP, Aztrec make use of community based animators. This has helped in overcoming the social differences, but it also sometimes posed new difficulties of continuity of the availability of staff.
It was learned that it requires a special training to be able to bridge existing gender and social gaps.

3. Understanding, testing and improving local knowledge

Endogenous development aims at enhancing *in-situ* development of indigenous knowledge and practices. A first activity of the field workers is to acknowledge, experience and understand local processes, concepts and values. In this way they gain insights into local ways of reasoning, methods of experimentation and the system of learning and communication on which they are based. This implies that field-staff participate in local activities with an open mind, in order to understand the concepts used and the values behind them. Subsequently a participatory diagnosis can be made about the actual situation, the changes taking place and the risks involved in these. On that basis a choice could be made for options to improve the situation and these options can be tested in a systematic way. Local leaders, local concepts and local criteria play important roles in these experiments.
The capacities of rural people to make observations, to describe and explain a certain situation, and to design and test possible adaptations or innovations, to exchange information and experiences, to teach and to learn are crucial for their success in endogenous development. Therefore, enhancing the dynamics of local knowledge systems is an important task. Rural people and development workers can systematically address this activity by not only looking at the outcome of the learning, teaching and experimental process, the techniques and existing practices, but also to look at the processes involved and the possibilities to improve skills and insights in this respect, and look for ways to improve these processes
Several NGOs working in the Compas programme have dedicated themselves to re-vitalise traditional practices that had been strongly eroded in the past decades.
The difficulty of assessing indigenous knowledge and practices, is the pitfall of only measuring them according to conventional scientific standards. A way to overcome this is cross-checking between different ways of knowing. This has been a major effort of FRLHT in India. Experts of different ways of knowing (local, classical, western) assess existing traditional health practices and together suggest further testing and experimenting. A specific methodology is followed by CIKS in India. They study the ancient classical texts on agricultural practices and then carry out on station and on farm experiments to test them. This is combined with the study of present-day farming practices. They have come to the conclusion that linking the farmers' practices and the knowledge available in the ancient texts can strengthen and revitalise present day agriculture. KPP in India is carrying out on farm experiments to test and revitalise ancient practices related to local food and cattle.
Agruco in Bolivia is systematically documenting traditional Andean farming practices. It has a tremendous database of traditional practices. They also carry out several experiments in the use of traditional Andean crop varieties and crop and animal husbandry practices in close cooperation with the traditional leaders and strengthen the community organisation.
The building up of the relationship with the rural people is a time consuming aspect. In many cases rural people needed time and special efforts to understand and accept the fact that staff of NGO's indeed wanted to relate to the rural people within their culture as part of a mutual learning process, and not to prospect their knowledge for personal motives or to get the best entry point to substitute this knowledge. Active participation in traditional festivals and rituals and showing interest in learning from the traditional leaders have proven to be important ways to build up the relationship.
A clear example is given by Cecik in Ghana. Once a relationship of confidence and trust has been built up between the community and the field worker, involving consultations of the ancestral spirits, it becomes possible to identify the main development needs of the group. Together they can work on experimental designs, to improve the experimental skill using local criteria, and evaluate the outcomes.

By working together with the community it may also be possible to identify the positive and the limiting aspects of local values and practices. This implies, for example, that the field staff may encourage the transfer of information and skills from elders to youth, stimulate female participation in education and skill development, or enhance discussion about moral dilemmas related to local values. Examples are the transformation of hunting into environmental protection ceremonies in the tribal communities (IDEA), and the influence exerted by Green Foundation in India to secure the abolishment of buffalo sacrifice in India. Care is taken not to romanticise indigenous practices, nor to be too sceptical or prejudiced.

4. Maximising local control of the development process

Conventional development models have the tendency to introduce externally developed innovations to local communities. Endogenous development aims for local control and decision making about the way ahead. This includes that the members of the communities use their own mechanisms to take decisions within their local context. In this, traditional authorities play an important role and the community itself manages internal power conflicts, come to grips with gender balances and leadership systems. Based on this logic, they will decide whether to accept or reject external support and practices. The process of local control and decision making, of course, cannot avoid the problems raised by differences in interests and values amongst the various groups within a community or region. In some cases rural people themselves see the use of local knowledge and resources as a step backwards. They fear that the opportunities that external resources represent, will be denied to them. Decades of development rhetoric and commercial influences have created a firm association in many minds that 'development' implies the use of western style development alternatives and that the possibilities for building on local resources and leadership are limited.

A participatory assessment and planning process can enhance local control. But it is not sufficient. The protection of indigenous property rights is another major point. Compas partner organisations have developed different ways of safeguarding these rights, which are of critical importance in working with indigenous knowledge and practices. For example, Green Foundation in India works with 'Village Biodiversity Registers' in its efforts to protect local crop varieties, while FRLHT in the same country has promoted People's Biodiversity Registers' to protect knowledge related to medicinal plants. Once indigenous knowledge has been published it cannot be patented anymore by a (foreign) company.

The code of conduct aims at overcoming problems with local control and intellectual property rights by the work of the Compas partners. The Compas partner organisations focus their publications on the methodology and general principles of endogenous development, rather than on the technical details. In this sense Compas is different from many other initiatives to document indigenous knowledge: it focuses on *in situ* development of local practices, rather than on their *ex situ* conservation in libraries and text books.

5. Identifying development niches in the local and regional economy

In the conventional development approach rural families are often considered as potential consumers or producers of a variety of products that serve the needs of outsiders. Local producers are required to supply products that can be processed and commercialised in a uniform way for the (inter)national consumers market. In the case of endogenous development, the initiatives are based on the specific ecological and cultural characteristics of each locality that can generate additional income. Stimulating the production, processing and marketing of region-specific products opens a reservoir of untapped local opportunities. Developments based on local food items, traditional crops, and domestic animal breeds are examples of this. Also village based and locally managed tourism can be a new development niche.

Identifying and opening market possibilities for local food items, local herbs or fibres in the regional or national capitals or for the international market are important activities.

The activities of the Compas partners for the identification of development niches were done in different ways. In all cases there are indications of considerable enthusiasm of rural people and effects in terms of nutritional status, ecological improvements and learning. Effects in terms of income have not been shown in all cases, partly because some rural communities hardly function in a cash economy and partly because it takes time to establish and consolidate income generating activities. Also the opportunities to link local economies with regional or national markets are often difficult and require interventions at the level above the community.

The development niches are often found in the development and marketing of region-specific quality products: local food crops and animal products, sometimes marketed as organic produced .Practical examples of activities in this direction: local mango varieties (KPP in India), seed varieties from traditional crops and organic marketing in urban areas (Green Foundation in India), local chicken breeds (IDEA in India and Cecik in Ghana), weaving in traditional style in Timor, local cattle breeds (KPP in India) and local cheese and grain products in the Netherlands. AGRUCO has built up experiences in improving and reviving the traditional marketing systems.

Traditional areas may also have a comparative advantage in relation to international tourism, as one of the fastest growing income generating activities in poor countries. A major challenge will be to develop eco-cultural tourism into an activity that strengthens rather than weakens cultural identity. Some Compas partner □rganizations have already developed some expertise in this direction (Aztrec in Zimbabwe and IDEA in India have included traditional music and dance in the programmes for eco-cultural tourism).

6. Selective use of external resources

It is obvious that in many cases the local knowledge and resources have their limitations. Local practices, leadership, climate or biological resources can have a better potential if combined with specific external inputs. The local system can be optimised, for example, by the use of cement, a bicycle, a pump, transport systems, electricity, fertilisers, seeds, ormedicines. Loan facilities may provide financial means for the external inputs. External advisors or teachers can be called upon when local community does not have the required expertise. Information by radio, t.v., internet and personal visits can be very important: It can inform about prices, identify new market opportunities, it can warn for dangers and risks involved in use of certain external inputs, Most rural families experiment with the combination of local and external inputs, to increase the productivity of their land to achieve a more efficient utilisation of their local resources. But selective use of external resources is important. A great number of farmers have lost their property as a result of their incapacity to repay the loans provided for fertilisers. Chemical pesticides may show positive short-term effects, but pollute the environment and food system over time. A tractor without the necessary spare parts may bring more disillusion than benefits.

Therefore, in the endogenous development process, the first question to be asked is: Is it possible and feasible to solve the identified problem with our own resources; what are the possible solutions from outside and how sustainable are they? What are the advantages and risks involved in external resources? What possibilities are there for building up the capacity to reproduce and maintain external technology? And what experiences can we find in other communities, regions, or cultures, related to this problem?

The experiences show that use of external resources could be done selectively once the locally available resources were well identified and their limitation understood and accepted.

Ethnoveterinary practices and human health systems could identify essential drugs or medicines that needed to complement the traditional medicines (IDEA). Exotic tree species were sometimes used in tree planting when the local species did not have the species that grow fast enough to the taste of the farmers (CECIK). Artificial fertilisers are being used in those situations where local resources do not have sufficient potential to improve soil fertility.

And of course mobility and communication systems make use of externally developed and produced means.

7. Retention of benefits in the local area

Development initiatives are often taken by outsiders who aim at profits that will subsequently be taken away from the community. Investments in tourism e.g. are often done by foreign companies. When the management positions and most employees are taken by foreigners and food and drink items are brought from outside the community, the benefits for the community may be very limited or even negative. Prices for local producers may vary greatly throughout the year. In many subsistence economies food prices fluctuate so that producers may have to sell their produce at low prices just after the harvest, while in case of food deficits they may have to buy the same food back later at much higher prices. Storage facilities and the provision of credit to buy food items during the cheap post-harvest period often results in direct benefits for the families involved. In each situation opportunities to keep the benefits of new economic activities in the local area need to be explored: examples are the production and processing of local food, village based tourism, employment creation for the rural youth.

Several Compas partner organisations are experimenting with local storage and processing of products in the household, community or region, and enhancing the marketing of these products to ensure that added value is kept in the local area. Examples amongst the Compas partners are: preparation and marketing of mango chutney and organic vegetables (KPP in India), honey, vegetables and sunflower processing and marketing in the eco-cultural centres (Aztrec in Zimbabwe), Local marketing of traditional seeds in Green Foundation. These activities sometimes require training in storage, processing and marketing and possibly also investments in infrastructure. Rural tourism as developed in the Netherlands and Zimbabwe (VelVanla, Aztrec) is another possibility to attract income that can directly benefit the local area. The revitalisation of traditional technology based dry-freezing of potatoes by AGRUCO is an example form Boliva. An example is described by Gonese who indicates a decrease of migration of youth from the Zimuto area to the cities due to the income generating activities in the eco-cultural villages in Zimbabwe. This has been achieved through the marketing of the forest produce that have resulted from the reforestation programmes over the last 15 years, organically grown vegetables and crops, as well as cultural tourist activities to the villages. The role of the traditional leaders in the conservation of natural resources has lead to re-installing traditional conservation strategies, respected by the local population. The eco-cultural villages also function as places where communities can settle their disputes under the guidance of spirit mediums.

Van der Ploeg has presented economic data that show that this endogenous development can have economic advantages. Income of participating farmers has risen in the Netherlands as the result of cost reduction, use of new market niches and saving of time for farmers and government agencies by avoiding bureaucratic complications. Moreover the solutions developed by the farmers led to reduced pollution and hence had a positive impact on the environment.

8. Exchange between cultures

The exchange of experiences and worldviews between different cultures is part of the current Compas programme. Comparing the concepts behind the local health traditions in various cultures, for example, has resulted in striking similarities. This ongoing process has enhanced the self-esteem and dynamics of the often marginalised local health practitioners, and shown ways forward according to the insights gained. Exchange between rural people, farmers, field staff, managers and researchers may lead to cross cultural exchange, learning and cooperation.

Exchange between the different villages and population groups took place by activities such as seed fairs, demonstrations and school competitions, for example. This is supported by the dissemination of newsletters and other publications in the local languages. Exchange also takes place with other organisations in the region and at national and international level. This level of exchange is stimulated by newsletters as well as books, web-sites, calendars and CD-roms in the dominant language, such as English and Spanish

Various Compas workshops and exchange visits have been organised to share and assess the experiences. Representatives of the partners organisations have participated in conferences and have published their experiences through the Compas Newsletter, scientific conferences and other media to enhance the intercultural dialogue.

An example of international exchange between rural people is the visit of rural people from Guatemala to Mexico and production of the poster by IDEA that presents the tribal culture and was sent to the other Compas partners. In the future possibilities for exchange between rural leaders and Compas staff will get more attention.

A specific example of intercultural exchange is the comparison between Chinese and Mayan local health systems (CM No.3, p.22 and CM no. 4, p. 14), and the work on local health practices by FRLHT (India), IDEA (India) and Aztrec (Zimbabwe). This is presently stimulating further research in different countries in Latin America. Similar experiences in agriculture and natural resource management have shown the importance of comparing and exchanging information on the cultural dimensions.

9. Training and capacity building

The way pupils and students are presently being taught in the world of course is quite diverse. Yet, under the influence of the colonial system and despite the years that passed since decolonisation, in many curricula the western concepts and values still play an important role. This is more so for universities and colleges, than for primary and secondary education, but also in the latter, the way mathematics, physics, economy and also religion are being taught often are a reflection of the western worldview and value system. Learning is not a neutral transfer of data, it involves conceptual frameworks that are related to worldviews and values, and through the western biased education systems the western values and concepts are spreading and are substituting other scientific traditions.

Often development workers are trained in methods to transfer knowledge, more so than in methods to learn from and with the rural people and in ways for participatory technology development. They are more inclined to be educated in technical subjects than in social processes, methods to enhance the dynamics of local knowledge and in spiritual dimensions of the local knowledge system and culture

Therefore a systematic training and possible deschooling needs to be considered and carried out. In the short run this could take place for the field staff engaged in endogenous development. This can take place on the job, in service, and preservice.

The Compas partner organisations are revisiting the rural communities, to create time and space for renewed dialogue on endogenous development. To be able to do this, each organisation needs to develop a new set of skills to collaborate with rural people in a truly participatory way. This does not only imply the participation of field workers in spiritual activities like rituals, sacrifices and festivals of the communities they are working with; it also implies collaborating with the traditional leaders, and taking the local concepts as the starting point for the development process. This approach requires an attitude of respect, creative thinking and communication skills. Supporting the dynamics of local learning, teaching and experimenting, systematic design and implementation of experiments, understanding the background of local knowledge concepts, local networking, all need skills that are generally not taught in schools A kind of de-schooling and

re-training programme was therefore necessary for the professionals and field staff in each partner organisation, a truly eventful learning path
Most of the training activities of the Compas partners has taken place on the job. Training materials and training capacities for endogenous development are scarce and need to be developed. Compas has accumulated interesting practical experiences and with the proposed university consortium this training component will be given more attention. The training materials to be developed can also be used for other NGO's, colleges and universities.

10. Networking and strategic partnership

Endogenous development acknowledges the importance of the links with regional, national and international processes, and the necessity of looking for synergy rather than dependency, exploitation, homogenisation and external control. The local market niches are often largely determined by international trade relations. National policies influenced by international conventions and agreements. Research priorities are often influenced by the western criteria. Endogenous development can only thrive when the necessary policy environment exists. Through networking, cooperation and advocacy such a conducive environment can gradually be created. Linking with likeminded NGO's, strategic alliances with relevant government agencies at local, regional, national level, presenting experiences and ideas in international fora, interesting funders in the relevance of endogenous development, making suggestions for policy changes or research programmes, building up partnership with commercial, political or religious organizations are examples of activities in this domain. All Compas partner organisations have established their local and national networks; some have organised local, regional or international exchange and policy workshops. (IDEA, FRLHT, AZTREC, Agruco). A number of partners have newsletters in the local language, many have national or regional publications. The linkages with like minded organisations are growing, due to increased awareness related to the importance of in-situ conservation of indigenous knowledge and practices. In Africa a special programme for enhancing endogenous development has been launched. This resulted in the establishment of regional networks for endogenous development.

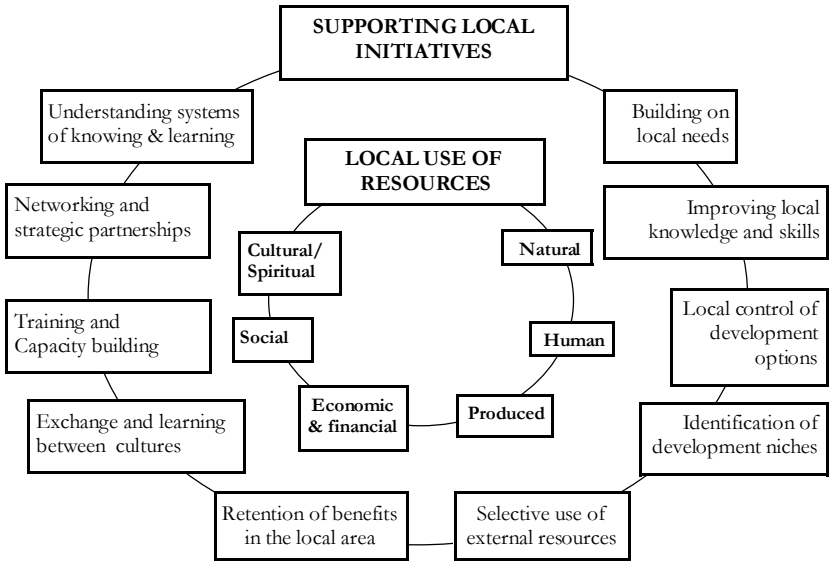
Plans to have more systematic policy dialogues are being formulates and will involve local, national and international policy analyses and dialogues.

11. Understanding forms of knowing, learning and experimenting

Understanding the basic concepts that are being used in the various forms of indigenous knowledge is important in international cooperation. The western form of knowledge with its Cartesian approach has gone a long way to develop powerful technologies. But also its limitations are obvious. Other forms of knowledge may provide elements to solve the problems the world is facing today. In many cases traditional forms of knowledge use different paradigms. For example, the Ayurvedic, Andean, Mayan, Chinese and African health practices each have their own theories and concepts about the why and how's of health and disease. The same applies to agriculture, nature and to socio-spiritual practices. The ways of knowing have been achieved within a specific worldview and by using a specific research methodology. Theories, models and typologies, concepts and definitions lead to problem definitions, and design of a method for collection and interpretation of data. E.g. the notion of time, the relationships between cause and effect -if they are used as such -, the importance of quantification, intuition and the use of conscience, the way of observing, interpreting, measuring, learning and experimenting will be different from one knowledge system to the other. This difference can manifest itself in the knowledge in everyday life, in the way this knowledge is being used and changed and in the philosophy of science (Mouton 2001).

During the initial years of the Compas programme most attention went to partner's efforts to understand the local culture and rebuild the relationship with the local people based on this.
Understanding the way of knowing, the epistemology and dynamics of local forms of knowledge, has been addressed by some of the partners. The papers of Balusubramanian, Millar, Delgado and Rist (see this conference) present more details about the preliminary insights in the different ways of knowing prevailing in the different continents.

The activities and approach for endogenous development is summarized in the diagramme:



7. Some characteristics of a number of contemporary sciences

In the Compas programme we have started to formulate the most striking characteristics of the paradigms and epistemologies of sciences in Africa, the Andes, India, and Europe. We are only at the beginning of this process. Of course there are also many differences within each of the regions but in a preliminary way we have found some characteristics.

Key words are:
Africa: A worldview with a hierarchy between divine beings, spiritual beings, ancestors and natural forces. Sacred character of natural resources. Cyclic notion of time. Powers ascribed to ancestral spirits. Use of magical powers both in negative and positive terms. In the African reality one can observe a dual system of beliefs and knowledge: traditional and modern. They co-exist and each of them goes with specific values and often lead to different of conflicting decision making.

India: The real world and he fundamental principles of organising live systems are different form those in the west. The scientific method is are not limited to the five senses; the mind, when free of prejudices such as lust, anger, greed, intoxication, delusion and jealousy can complement the senses and understand the reality from within.
The Vedic knowledge has a notion of nine existential principles and qualities.
In tribal knowledge powers of symbols and of sounds are important.
In Buddhist systems: Meditative techniques can lead to mental states that disclose a range of different powers (time, location, sounds, symbols, plants, persons).

The Andes: Sacred time space that goes beyond the physical or socio-economic domains (Pachcha Mama) the cyclic notion of time; Mutual and reciprocal relationship between humans, animals, plants; The living astrology; The role of rituals and fiestas

Europe/Enlightening: Measuring and the use of the five senses is knowing; Rational logic; Materialism; Self interest of individual or group as organising principle.

Post modernity: Uncertainty, diversity, chaos and self regulation, holism, synergy rather than generic principles and universal science or values (such as human rights, democracy, good governance)

Co-evolution of sciences
Compas wants to provide a platform for inter-scientific dialogue that can contribute to a co-evolution of sciences. In this process, each science involved is stimulated to evolve (to develop and improve their methods and theories) based on their own dynamics as well as on the basis of interaction with other systems of knowing.

The objective of the interscientific dialogues are:

- to understand, describe and exchange the epistemologies and paradigms of the sciences involved
- to determine the strengths, weaknesses and comparative advantage of each science
- to look for synergy and opportunities for mutual learning as well as for contradictions and exclusions.
- To question, challenge and criticise each other in order to determine those aspects of the science and value systems that need modification and improvement.
- To balance the power and financial resource base of the different sciences.

Activities can be:

- to carry out joint research.
- To share and reflect on methods and results of research
- To modify and improve research methods and theories
- To support under-supported and under-researched sciences to further their quest for improvement.

The epistemological interpretation of the different Asian, African and Latin American and European knowledge systems, their ways of learning and experimenting and their mutual relationships needs more attention.
Therefore, in the years to come, the partners will get support of a 'University Consortium'. A group of Compas partners and a number of selected universities will develop ways for helping people to systematize and make more explicit the concepts and theories behind indigenous forms of knowledge in order of sharing them as part of a possible co-evolution of the diversity of sciences.

Risks and code of conduct
Based on the experiences summarised above the partners of Compas realise that it is not without risks for an outsider to work with indigenous knowledge and practices.
Risks involved are:

- the extraction of local knowledge for purposes not in the interest of rural people,
- disturbing the existing status quo and dynamics at community level,
- domination of local processes by outsiders who do not understand the local values and mechanisms of decision making and
- introduction of values and lifestyle that are not consistent with or complementary to the local values.
- prying into people's private matters (e.g. beliefs and spirituality, power relations)

The partners have agreed to work with rural people according to a code of conduct that respects the diversity of ways of knowing, accepts and supports the local ownership of local knowledge and local development processes, defines a complementary role outsiders may play and accepts the need to learn from and with local people. Publications are mainly aiming at strengthening local ways of knowing, are as much as possible done in local languages. Publications will avoid mentioning technical details but will focus on the methods and strategic issues.

8. Intercultural learning and co-evolution of forms of knowledge: towards a strategy

Actors involved
Given the wide range of options in belief systems, values, practices, knowledge concepts, and power positions, there are many modalities for intercultural relations. The present dominant position of materialist

values and global technologies tends to marginalize minority cultures and diminish cultural and biological diversity. Therefore for achieving a more egalitarian, just and sustainable relationship between different forms of knowledge, new paths have to be explored.

Building on the analyses and arguments discussed so far we suggest an intercultural social learning process with a step by step approach carried out by multiple actors.

The process will include at least the following actors: Local people, their intellectual, political and spiritual leaders, local NGO's, government agencies for rural development, education and research, educational institutes and research centers. But also national and international donors and development agencies can play their role.

Each actor can contribute to the social learning process in its own unique way. Local people can share their local knowledge. NGO's and governmental development agencies can support the process of revitalisation and improvement of the local knowledge and way of knowing, schools can include local forms of knowledge into their curriculum, universities and research centers can do supportive research on the epistemologies and to support the action research programmes. National governments can put policy priority on endogenous development and revise their current mechanisms for development in this light. International agencies for research and development and donor agencies can make available funds for these activities. International media of communication can be used to give credibility and prestige to this process and to support the mutual exchange process.

In fact the choice for endogenous development and for co-evolution of forms of knowing is a major shift in paradigm that will not be done easily. The present systems for research and development have its own interest in the continuation of the status quo. Therefore a careful strategy of activities at different levels will be important.

Step by step approach

Below we present a number of activities that together could form a step by step approach to be taken by actors in the Compas programme, i.e. local communities, NGO's, universities and regional and international coordinators.

1. **Re-building relationships**

   A prime condition for a successful cooperation of these actors will be a relationship between actors that is horizontal as much as possible and is characterised by mutual interest and confidence. Hence the first step to take is to critically analyse and reconstruct the different relationships as they currently exist. NGO's working with rural people have to make clear that their role is not that of an external agent who comes with a certain message or technology to be transferred. Learning with and from local people and working on the basis of their cosmovision implies that the outsiders accept the rules of the game as expressed by the communities. The traditional codes for hospitality, confidence building, respect and communication have to be accepted and obeyed. It may imply procedures of selection and processes of initiation, and the participation in rituals, that have a different cultural background and meaning for local people than for outsiders. Universities have to accept the fact that their conventional knowledge has its limitations and also have to accept that their role in this process is predominantly one of learning. The funding agencies have to get used to a downward accountability. The international coordinators should learn from and with the regional coordinators and these with the local partners and these in their turn with the local communities. The communication and interaction will not only be about conventional professional subjects, but may involve spiritual and cultural aspects and a lot will depend on good social relations and skills. This means that the role of supporting people and organizations change radically: Instead of teaching local people on how to resolve their manifold problems they concentrate on learning form local people as the basis for exploring possible synergies between different forms of knowledge. External actors become companions and animators of communications within and between different groups related to endogenous development. Instead of aiming directly at participatory development of technologies they become agents for participatory skill and competence development involving local as well as external people, aiming at enhancing and broadening local control on development.

2. **Community dialogue and decision about possible interactions**

   An intercultural dialogue and a process of co-evolution require that the different parties involved are prepared and interested in exchange. Yet, it is not evident that local communities, traditional experts and spiritual or political leaders are positive about it. Keeping local knowledge separate, or hidden from the

eyes of outsiders can be used as a defence mechanism, as a way to protect the traditions and to be free from external influence. Also, within a community there may be different positions: not everybody will have the same interest and position. Differences in gender, age, social position, class, caste, professional background, can lead to a different knowledge, value and position towards exchange with others. Therefore, before we can assume that an intercultural dialogue is desirable and possible we need to get the view of the community differentiated by social classes, gender, age groups. How do they see their situation: the potentials and risks of exchange, possible synergies, power relationships, conflicts. What would be the strategies of negotiation and joint learning.
Which internal and external factors are local actors considering to be responsible for strengthening or debilitating endogenous development and the cultures in which they are rooted?
Which points are considered to be important for the traditional culture to be maintained, and what points from the dominant or formal system can to a certain extent be included into the traditional system and who decides on this? This then leads to a vision on the desired closeness or distance of collaboration: on the desirability of the ways, contents and partners of a co-evolution.

3. Learning about cosmovision and form of knowledge.
This activity consists in trying to understand the way of knowing within the cultures involved in this process. The cosmovision, values, the way people learn, teach and experiment must be understood better in order to define optimal forms and contents of cooperation. We could try to understand how the different sources of knowledge, like rationality, intuition, inspiration etc. are being used and combined and how they lead to the understanding of WHY and the HOW things are observed by the holders of local knowledge. Sharing these aspects could than lead to a joint reflection permitting to identify possible strengths and weaknesses of the sources and dimensions of the different sciences that take part in the intercultural dialogue; specific needs can be identified for strengthening, revitalising or enhancing each partner. On this basis possible changes required in relation to education, training, research or macro conditions and policy environment can be identified.

4. Learn from the community experience of coping with the dominant system
It is important to find out to what extent the local communities are already dealing with the dominant system. Is it possible to describe the relationship of the local culture and the way of knowing with the formal/dominant system in the area? Can the typology as presented in this paper be used to make such a description?
Can we learn from the community how they have managed to survive/change and co-evolve with the dominant/formal system? How do they do it and how shall we as NGO's, Universities or other supporting organisation relate to that, and how do we deal about this when certain value differences between them and us become clear?
What are the possibilities for intercultural dialogue in a situation where the relationship between the community and the outsiders have been rebuilt as indicated in step 1?

5. Dealing with strong and weak points of the local forms of knowledge
On the basis of a self assessment of the sources (e.g. rationality and intuition) and of the focus (How and Why) proposals can be formulated to revitalise local knowledge. Suggestions can include transformation of existing mechanism of learning and teaching, recovery of lost knowledge, mobilisation of people or resources to come to grips with local knowledge, or healing of practices that are considered ineffective or detrimental. For each of these possible options appropriate approaches can be chosen. These approaches could first and foremost be chosen from the available scale of indigenous options. This may be an important focus of the action-research activities for endogenous development of the partners involved.

6. Dealing with strong and weak points of the dominant forms of knowledge
The basic hypothesis of this paper is that western knowledge is one of the possible forms of knowledge. It is not universally applicable. It has its own strengths and weaknesses.
An intercultural dialogue based on mutual confidence and horizontal relationships can only be done if all partners involved are prepared to have a self-critical attitude. There are considerable theories and reflections on the character of western science. In the battlefield of knowledge, debates are being held on issues as objectivity against subjectivity; universalism against relativism; specialisation and disciplinarity as against holism and transdisciplinarity; quantitative method and qualitative methods; neo-positivism and actor perspectives. Delgado (2004) elaborates on theses debates in his conference paper. Hence, it is clear that also within the dominant scientific tower, there are different perspectives

and positions. Western knowledge applied into agriculture or health practices have great impact on the globe. It has lead to impressive results, but it has not been able to solve all problems related to food security, health, poverty, environmental sustainability and peace. Therefore, there is a perspective for intercultural and interscientific dialogue on condition that also western science is accepting its limitations and is interested in finding ways to deal with them. The balance between sources of knowing: rationality, quantification and the material world, on the one hand and empathy, intuition, sense and meaning, between the How and the Why need to be explored and where necessary corrected. Non-western scientific traditions can probably offer a lot to western science.

7. Exchange of experiences and Co-evolution

A subsequent step would be to look for opportunities for mutual learning and exchange and for co-evolution. It could be understood as a dialogue between partners allowing themselves to maintain a certain degree of divergence between the different forms of knowledge involved. Respectful dialogues imply the willingness to listen, openness to learning, responsiveness to information, questions and suggestions as well as the courage to criticise when necessary. It needs to avoid the pitfalls of rejecting positive elements of deficient forms of knowledge, as well as avoiding the risk to romanticise or idealise any of the forms of knowledge involved. The question whether it is feasible to reach interepistemological cooperation in the sense that it leads towards transcultural synergy and selective adoption remains to be answered. Possibly this can only be done in a satisfactory way, once the local systems as well as global systems have gone through its own processes of transformation, recovery, mobilisation and healing.

9. Conclusions

In this paper we have provided a definition of the major concepts such as information, science and endogenous development. The definition of science implies that the diversity of ways of knowing can claim to be science if there is a certain systematics in the way they go about knowledge. We have given examples of different perspectives in knowledge and science: from an indigenous perspective, from a western perspective and from Chinese. We have given a brief sketch of Indian, Andean and African knowledge.
We have tried to make an analysis of how knowledge is being created: their sources (intuition and rationality) and their content (HOW and WHY).
Subsequently we have included the political and power aspect of the relationships between different ways of knowing and made a typology of the possible relations between ways of knowing. And finally we tried to present a strategy of how different ways of knowing could co-evolve: steps to strengthen (revitalise) themselves, take a stand in how they want to relate to other ways of knowing and then make a choice in the process of co-evolution that the opportunity of Compas offers.

The paper is an effort to come to grips with the co-evolution and interscientific dialogue in a situation where the starting position of the different actors are not equitable and where the differences in status, power, resource availability are tremendous.
The authors are aware that we have to learn a lot in trying to overcome our western bias. Without wanting to throw away the good sides of it, we want to play a stimulating role in creating a platform for the dialogue and therefore we need to be open for other positions and approaches. We have to learn a lot, and we are ready to receive critics and suggestions for improvement.

In our social learning path called interscientific dialogue, we are inviting the partners of Compas to make an assessment of the own way of knowing in the concepts we have offered, but if they feel that these concepts are not adequate, they are invited to propose better ones.
The same applies to the question/invitation to the partners to indicate how they see themselves in the proposed typology, and how they see the process of revitalisation, endogenous development and co-evolution.
This is a process with double agenda: design, test and improve tools for analyses and action and at the same time apply them in our own situation. That is action research. To be able to do that effectively, there is a need for interactivity and responsiveness.

The Compas experiences in intercultural and interscientific dialogues are still rather limited. In this paper we purposefully presented more questions than answers. We are convinced that answers can result from a

continued joint learning process and dialogue between different forms of knowledge. This is a difficult process that we have to learn ourselves. What seems to be clear for us might be questionable for others and the other way around.

Nevertheless we think it is important to formulate clear statements on the conditions, strategies and contents of an interscientific dialogue that instead of being competitive, are facilitating the joint learning process. They should contemplate the diversity of worldviews and values. On this basis possibilities and dimensions of a cross cultural cooperation can be explored an applied. How exactly the cooperation between sciences is leading to integration is not possible to anticipate. What seems to be important is helping to create conditions, means and moments where different forms of knowledge can meet outside of hierarchical conditions, based on usual power differences, mutual understanding, respect and confidence.

Combining interscientific dialogues with a real involvement in endogenous development is seen as an advantage because it allows to launch this process in close cooperation and contact with local people avoiding too much intermediaries which always are embracing biases of interpretations. It also permits to assure that local people can benefit directly form intercultural dialogue and that the same is oriented towards the needs of people engaged in creating new ways for bringing further social dynamics based on the principles of co-evolution between humans and the nature to which they are related.

Our challenge is to accept the uncertainty and through our mutual social learning process try to come closer to answering the open questions.

We invite professionals and scientists in local organisations, NGO's, universities, government bodies, national and international development agencies to join us in this effort. It is worth it.

References:

- Armstrong K, 2000. The battle for God. A. Knopf, New York.
- Arze A. and Long N, 2000. Anthropology, Development and Modernities. Exploring discourses, counter-tendencies and violence, Routledge.
- Balusubramanian A.V. 2004. Traditional and modern sciences and technologies in India: trading new paradigms for old Conference paper.
- Bebbinton, 1999. Capitals and capabilities: a framework for analysing peasant viability, rural livelihoods and poverty. *World Development* Vol 27 no 12.
- Blaikie P. and Brown K, et al., 1997. "Knowledge in action: Local knowledge as a development resource and barriers to its incorporation in natural resource research and development." *Agriculture Systems* 55(2): 217-237.
- Delgado F, 2004. Andean knowledge systems: Pacha Mama as basis for endogenous development in the Andes Conference paper.
- Fukuyama F, 1992. The end of History and the last man. Penguin books London.
- Haverkort B., Hooft, K van 't and Hiemstra. W., 2002. Ancient roots new shoots, endogenous development in practice. Zed books, London.
- Harding S, 1994. Is Science Multicultural? Challenges, Resources, Opportunites, Uncertainties. Configurations. By The Johns Hopkins University Press and the Society for Literature and Sciences.
- Huntington S, 2002. The clash of civilisations and the remaking of world order. The free press, London.
- Millar D, 1996. Footprints in the mud: re-constructing the diversities in rural people's learning processes.
- Millar D, 2004. Interfacing two knowledge systems: Local Knowledge and Science in Africa. Conference paper
- Mouton, J. How to succeed in your masters and doctoral studies. A South Africa guide and research book. Van Schaik Publisher. Pretoria.
- Polanyi M,1983. The tacit dimension. Gloucester, Mass., Smith.
- Rist S, 2002. Si estamos de buen corazón, siempre hay producción - Caminos en la revalorización de formas de producción y de vida tradicional y su importancia para el desarrollo sostenible. La Paz, Ediciones PLURAL - AGRUCO - CDE.
- Rist S. and U. Wiesmann, 2003. Mythos, Lebensalltag und Wissenschaft im Berggebiet - eine Einführung. Welt der Alpen - Gebirge der Welt, Ressourcen, Akteure, Perspektiven. F. Janneret, Wastl-Walter, D., Wiesmann, U., Schwyn, M. Bern, Paul Haupt: 159-169.
- Rist S, Steps towards a post-materialist science: Lessons Learnt from Endogenous Development in Europe, Conference paper.

- Smith L.T, 1999. Decolonising methodologies; research and indigenous peoples. Zed books, London 1999.