

Dialogues within and between different sciences: issues and strategies from endogenous perspective

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Globalisation and localisation of knowledge

The European workshop, 'Moving worldviews, reshaping sciences, policies and actions for endogenous development', addresses an issue that is increasingly receiving attention from scientists, policy makers and practitioners. Until recently, the diversity of worldviews, values and ways of knowing has been given little regard in science and policies. Currently, however, these themes are receiving attention in lively debates on globalisation, cultural diversity and the role of religion.

Compas is an international programme for inter-cultural dialogues in cultural diversity and endogenous development. Through a series of regional conferences, it wants to contribute to this debate by looking at it from an inter-cultural angle. In September 2005, a conference was held in Bolivia, Latin America under the title 'Intra- and inter-scientific dialogue of the original people of the Americas'. In October of the same year, a conference was held in Ghana on African Sciences, and early 2006 a workshop on *Indian sciences* will take place in India. In September 2006 a global inter-scientific conference will be held in Geneva, Switzerland.

These events are part of a more general rethinking of the role and nature of knowledges and sciences in the globalising world. On the one hand, one can observe a continuing proliferation of mainstream or global sciences and technologies. Modernisation, globalisation and proliferation of market-thinking are seen by many as a desirable and unavoidable process. On the other hand, one can observe a renewed interest in local cultures and endogenous development, and an acceptance of the pluralistic nature of worldviews, sciences and knowledges. This renewed interest is a response to the globalisation process that, although contributing to global economic growth, is also criticised for not doing enough to solve problems of poverty, social conflicts, sense giving, for reducing cultural diversity and its negative impact on local economies.

The ongoing process of globalisation involves the entrenchment of modern knowledge and technologies throughout the world. Profit-driven values and corporate interests to a large extent determine the global direction of research and development. Commercial enterprises, universities and international and national research organisations apply this global science in their research and development programmes and apply it in technologies for production of food, medicine and communication systems, in commercialisation and promotion of these products and of the lifestyles that go with them. 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 have reached out to all corners of the globe. Food habits and styles of dressing are changing globally as a response to international marketing.

Although these efforts have led to a definite increase in productivity and to increased health for many, the awareness of the problems associated with this approach is increasing. Environmental pollution and degradation, loss of biological and cultural diversity, international and local conflicts, poor health and persistent poverty in certain regions of the globe are serious problems. Privatisation and liberalisation have kept or put access to health services and 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 areas to live in urban centres. Under the influence of mass media and marketing, a general westernisation of taste and consumption is taking place. These processes strain local economies and influence the social and cultural inheritance of the local communities. The confidence in traditional cosmology, leadership and practices is declining and as a result, the local dynamics, social cohesion and local mechanisms for conflict resolution are being undermined.

Thus, globalisation has triggered local responses, called 'localisation', that emphasise cultural identity, local ownership and local culture. Part of this 'counter development' are the numerous new social movements emerging around the world that are expressing their disagreement with the current mainstream understanding of globalisation. The search for new ways of living gives rise to alternatives, e.g. movements for fair trade, organic agriculture, complementary medicine, production of renewable energies, multi-functional land use and other forms of education. The uneasiness with globalisation and the associated homogenisation also leads to a re-valuation of cultural identity. Ethnicity, religion, language, local values and knowledge are receiving attention and play important roles in the national and international debates.

This is the case in the North, but also in the South. Despite the apparent acceptance of dominant concepts and technologies, a number of traditional or indigenous societies with their own locally based institutions and values have survived and/or are being revitalised. A wealth of local or indigenous knowledge still exists that is based on specific cosmology and traditional leadership. Indigenous knowledge and leadership have their strengths and their weaknesses, and, although often not respected or even noticed by outsiders, they still form the basis for the decisions made by the majority of rural and a large part of the urban people in the world.

Endogenous development, development born from within, builds mainly but not exclusively on local resources, values, knowledge and leadership. As an approach, it is receiving increasing attention as a response to the problems associated with the globalisation process.

This paper is a result of the experiences of *Compas*, an international programme on endogenous development. Studies on local knowledge in different cultures have drawn attention to the global diversity in ways of knowing. A further understanding of the various ways in which people in different cultures see the world, learn, and build up and exchange knowledge is an important challenge. It may contribute to more symmetrical cross-cultural dialogues and acceptance of pluralism of worldviews and ways of knowing.

This paper addresses the following questions

In an inter-cultural perspective:

- What are important differences in worldviews and how do these affect the ways of knowing?
- What is knowledge and what is science?
- What types of relationships can exist between dominant science and the different local knowledges?
- How do we look upon endogenous development and how can it contribute to co-evolution of knowledges?
- What activities could we undertake to enhance co-evolution of different ways of knowing?

Different worldviews

Across the globe, people perceive existence in different ways and these different ontologies, cosmovisions or worldviews lead to different ways of perception, learning, interpretation and knowing. A major divide can be observed between those who believe in the primacy of the material world and those who (also) believe in a non-physical reality.

A representative of materialist thinking is Edward Wilson, a biologist at Cornell University. He claims that all tangible phenomena, from the birth of stars to the workings of social institutions, are based on material processes that are ultimately reducible, however long and tortuous the sequences, to the laws of physics. This thesis is supported by modern (Cartesian) physics, but also by neurologists who interpret behaviour, memory and emotion exclusively as brain functions, and by gene biologists who explain characteristics of living beings by the genome structure only. Evolutionary biology provides the thesis of transition and progress through competition and mutations.

Materialist thinking is dominant in Western cultures. But also there, other visions exist: vitalism is the metaphysical doctrine that living organisms possess a non-physical inner force or energy that gives them the property of life. Vitalists believe that the laws of physics and chemistry alone cannot explain life functions and processes. Vitalism is opposed to mechanistic materialism and its thesis that life emerges from a complex combination of organic matter. Christian de Quincey presents the vitalist vision. He takes the position that, unless energy at its ontologically most fundamental level already came with some form of proto-consciousness, proto-experience or proto-subjectivity, subjectivity, conscious experiences or subjectivity would never emerge or evolve in the universe. Laszlo's theory of the Akasha (or zero point) field provides a theoretical basis for the bridge between consciousness and matter.

These insights are supported by the results of quantum physics and gave rise to the chaos theory. In chaos theory, nature is recognised to be a highly complex, interlocking network of nested systems. Relationships between the parts are dynamic and ever changing because they involve complex networks of feedback and feedforward loops. It becomes difficult or meaningless to identify individual causes, and to predict behaviour of complex systems. No part can control the whole, because

every part contributes to the changes of the whole and therefore of the parts themselves. Instead of controlling, we can only participate. Participation counts: every part, every individual can make a difference.

Chaos and uncertainty are natural. They are a key component of the universe. Chaos may cause uncertainty but it also creates the opportunities that give rise to hope and change. People need to prepare for chaos and accept uncertainty as a natural condition. Teachers, policy makers and development workers cannot control the entire universe, but they can make impacts on the small slice of the universe they reside in, despite all the chaos evident in it.

The existing diversity of life forms can be explained by the evolution theory in which new species and life forms emerge from the process of survival of the fittest. Others claim that nature is not exclusively regulated by competition and substitution. Cooperation, harmony and complementarity do also occur in nature. The German physicist Dürr (2001) draws attention to the fundamental immaterial connectedness of the real world. All matter and also man are an inseparable part of the all embracing immaterial reality that obeys non-deterministic laws. Contrary to the 'dead' material, where the law of entropy leads to increasing disintegration and disorder (paradigm of the dead), the life processes and evolutionary change produce progressively higher organisation: differentiation and integration (paradigm of life). This latter process will only take place with energy inputs and or with deliberate decisions.

According to Dürr, the dominant economic dogma that reduces *homo sapiens* to *homo economicus* stimulates the paradigm of the dead: competition leads to winner takes all and global trends towards uniformity, rather than to a win-win situation that allows continued co-existence and co-evolution. Globalisation, as it is taking place now, reduces cultural diversity, accumulates power and spreads uniformity in behaviour, food habits and energy use. The dominant Western system glorifies aggressiveness, toughness, reckless advancement and an arrogant lack of empathy. It undertakes great efforts to make people fit into a world which is perceived as a great battle field for survival, with everyone fighting the others and all jointly attacking nature. This world is claimed to be true as it is sanctioned by an infallible science, despite all the traditional wisdom to the contrary.

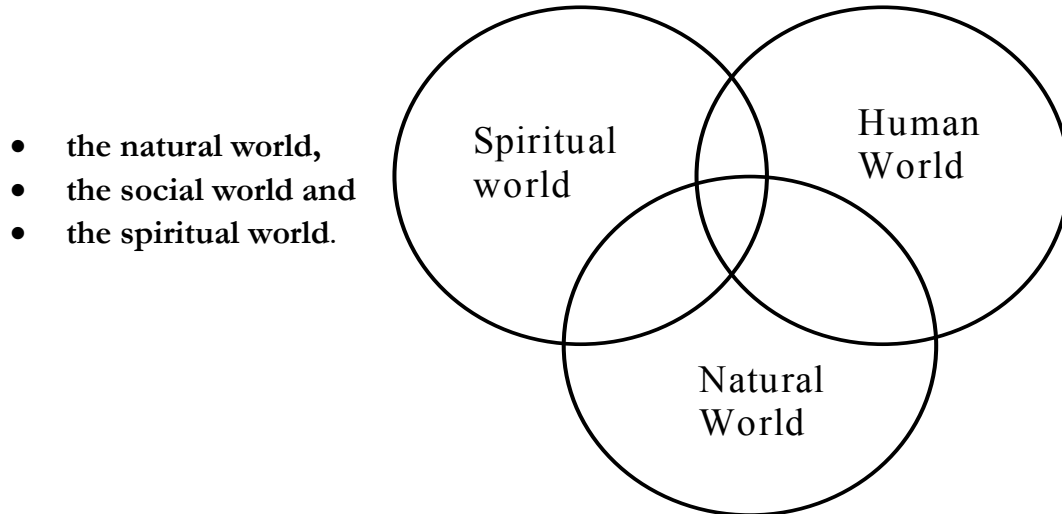
In Dürr's view, people do not need to be taught empathy, fairness, responsibility, generosity, kindness and the play of win-win games from scratch. They just have to be reminded of their ingrained competence in constructive cooperation as a participant in the general process of life. He advocates a development model that increases cultural diversity and respect for differences.

The notions of Laszlo, de Quincey and Dürr are consistent with the worldviews that are predominant in non-Western cultures.

Non-Western cosmovisions

Through their action research in Asia, Africa and Latin America, the Compas partners have learned that local knowledges in most cultures 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 has 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 inter-related and inseparable domains:



Local knowledge in the natural domain includes thematic fields related to 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 translates into values and sense-giving and related practices such as rituals, festivals.

An important feature is that none of these domains exist in isolation. In many traditional ways of knowing a notion of unity exists according to which the natural, social and spiritual worlds are considered to be inseparable and integrated.

Different ways of knowing and plurality of sciences

The conventional way of knowing is based on a separation of observer and the observed world. The resulting knowledge is compiled by observation and application of quantitative methods and is organised in specialised disciplines. It focuses on the material world, has an anthropocentric perspective and has difficulty in relating to the spiritual world. In this view 'science' is an activity where 'true' knowledge can only be acquired by rational reasoning and the application of quantitative methods of observation and investigation.

This position is dominant in the West, but it is being challenged. It is widely held that there are two different sources of knowing: rational reasoning and measuring on the one hand and intuitive learning on the other.

- In the rationalist worldview, a separation is made between object and subject, between people and nature, between mind and matter, between quality and quantity. These notions lead to a scientific approach where natural laws can be discovered by putting nature to the test. Knowledge then is the result of rational, logical or scientific reasoning and observation and measuring of an objective world.

- Knowledge can also be rooted in intuition and connectivity with the greater unity. Sources for these kinds of knowledge include meditation, seeing from a connection with the supernatural world, visions, dreams and trance. Often this type of knowledge can only be accessed by persons with special qualities and positions in society. The knowledge contributes to ethics and sense-giving and may be expressed in rules, myths, metaphors or stories that convey awe or morality. It links mysteries with real life. Their messages can be understood in multiple ways. Ascribing meaning to it requires a process of meditative reflection. In cultures or situations where the worldview is based on a unity of the natural, the social and spiritual worlds, it is not the separation, but the unification, the connectedness between these three domains that plays a role in the way knowledge is gained.

Every form of knowledge – including the one produced by natural and quantitative sciences – is socially constructed. This means that knowledge cannot exist separately from the worldview and the process of its construction.

We take as the definition of science: the body of knowledge and its classification under a theoretical framework. It includes the complex of producing knowledge based on a specific worldview and assumptions, general principles, theories and methodologies about which a specific community has reached consensus. The knowledge acquired and the resulting science is always limited and subject to modification in the light of new data and information.

From this definition, it can be concluded that there are many different co-existing sciences and numerous ways of knowing. Besides the academically established and globally dominant sciences (of an assumed Western origin), there are sciences rooted in other cultures. Plurality of worldviews can lead to a plurality of sciences. The differences in ontological positions and in the sources of knowing determine the degree of compatibility and or complementarity of sciences. A joint learning process or dialogue between different forms of knowing would be impossible or meaningless if the sciences involved contradict each other. If they are strictly based on either materialist or vitalist assumptions or oriented exclusively to rationality or to intuitive ways of knowing and if the partners involved do not accept the relevance or feasibility of the other ways of knowing, dialogues are not useful.

The insight is emerging that we should look at worldviews, sciences and values not as universal, but as expressions of a pluralist reality. In this view, inter-cultural dialogues, mutual learning and co-evolution of the diversity of sciences are important. But then, how can we form rules for understanding and exchange between individual knowledge systems. To what extent can we expect contradiction, synergy or complementarity between different forms of knowledge? How can we make an exchange between for example Maya knowledge, Shona knowledge, Hindu and Buddhist knowledge, European and global knowledge beneficial for the participants?

Two conditions have been mentioned by Klein Goldewijk (2005): acceptance of pluralism and symmetry. Symmetry in power and in the contributions of the criteria for knowing, will avoid a situation arising where a dominant system determines the rules of the game. Local knowledge should not be assessed by the criteria and methods used by global science, or the other way around.

But, as we elaborate in the next section, in the current international scene, acceptance of pluralism and symmetry is far from reality. Acceptance of pluralism of different ways of knowing goes against the claim of universality of (Western) science. The West has a dominant position in the globe: economically, ideologically and scientifically, and this makes a symmetric relationship with non-Western systems very difficult.

For an inter-scientific discussion, it is important to have a formulation of the characteristics of different ways of knowing (in terms of the ontology, sources of the knowledge and epistemology) and a self-assessment of the relative strengths and weaknesses of each knowledges. This could coincide with an assessment of the power relation between the systems involved. In terms of the Peruvian traditional scientist, Jose Illescas: intra-scientific dialogue and revitalisation of indigenous knowledge is a precondition for inter-scientific dialogues.

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 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 inter-relate 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 to be comprehensive, therefore, we have presented some of the possible relations between different forms of knowledge in the table below.

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: shamanism 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-existing in Europe; conventional and bio-dynamic or organic farming; voluntary isolation from certain aspects of international exchange of a country like Bhutan.

Type	Characteristics	Examples
4. Utilitarianism 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 already used by the Ancient Egyptians and Greeks, without their knowing its active ingredient. Local medicinal practices for malaria treatment; adoption of Arab mathematics and Chinese gunpowder by Western scientists
5. 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 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 <i>both</i> systems believe that their knowledge is the one that is dominant.	European knowledge with Cartesian knowledge and Catholicism merged with Andean or Maya beliefs, health practices and rituals.
8. Complementarity	Two different ways of knowing and using 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. Trans-cultural and transdisciplinary synergy	Sciences knowledge that they represent one type of knowledge among others and that knowledge is always culturally embedded and forming part of historic development. Both can benefit from comprehensive interaction.	Sciences acknowledge that knowledge is always culturally embedded and forming part of historic process. All can benefit from comprehensive interaction and possibly integrate in a way that goes beyond any particular culture or discipline.

Table 1 Typology of relations between different forms of knowledge

Issues

The typology leads to six issues to consider when looking for an inter-relation between different forms of knowledge:

- First, due to global interdependence and communication, almost any type of knowledge available today is influenced in some way or another by the dominant way of knowing. This makes it difficult to distinguish ‘pure intra-cultural ways of knowing’. Yet, the papers by Escobar, Balusubramanian and Millar for this Moving Worldviews workshop provide important insights into the way of knowing in Guatemala, the Andes, India and West Africa, and their differences with and relation to the dominant worldviews and values.
- Second, the relative strength and position of a specific science is the result of the use of power. This means that the degree to which a certain way of knowing is spread and accepted may depend more on its power base than on its intrinsic quality. In his paper Molenaar gives important reflections on the mechanisms involved in this process and the dilemmas it offers in international development cooperation.
- Third, the global domination of the rationalist way of knowing and the emphasis of the use of knowledge for unlimited accumulation of material wealth creates important problems at global level. Dürr’s paper elaborates on this aspect. He warns that our problems will lead to catastrophe for us people. He claims that we must do everything to put the playing field back into a state in which all can play their own games in a decentralised way under comparably favourable conditions and can cooperate and communicate in friendship across all borders. Zajonc’s paper provides inspiring examples of university teaching on Eros and insight.
- Fourth, a mutual learning process and dialogue between different types of knowledge involves the revision of power, values and worldviews. This is a way to overcome the suppression and paternalism mentioned in the typology. A synergetic relationship and co-evolution between sciences can only take place if the wars between sciences, mentioned by Röling in his workshop paper, can be turned into peace or start with peace talks.
- Fifth, in the inter-scientific 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 role of rationality and intuition, the values involved and the way meaning is ascribed to things)? How does it relate to the natural, social and spiritual worlds? How is it placed in terms of power and conflicts? On the basis of these, a process of intra-scientific dialogue can be designed that aims at the revitalisation of the form of knowledge.
- Sixth, the idea of integration of (scientific and local) knowledge, by taking the best of both, is not realistic in all circumstances. Sometimes different knowledges have contradictory or mutually exclusive positions. For example, the hegemony between mind and matter may be seen differently; the notion of connectivity and unity may be different from the notion of separation and disciplinarity. Rather than having the idea that the end of inter-scientific dialogues would be one integrated scientific construction, we may have to accept or embrace the fact that a diversity of ways of knowing exists, each unravelling part of the complex reality.

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

Supporting 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 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 building on this knowledge in development programmes is the final goal. Compas is involved in an inter-cultural dialogue aiming at a co-evolution of knowledges and sciences. The field activities of the 25 partner organisations include support to local people in their endogenous development processes. This is development based mainly, though not exclusively on the locally available resources, local knowledge, culture and leadership. Endogenous development is open to integrating 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 nine universities provides scientific support that includes contributions in the formulation of the specific paradigms, epistemologies and the launching of related research and teaching activities. As mentioned above, Compas has learned that, even with the immense diversity in the ways local knowledge is phrased and expressed in different cultures, a common feature is that existence is perceived in terms of three inter-related and inseparable domains: the natural, the human and the spiritual worlds, whereas the conventional way of knowing is based on the separation of observer and the observed world and focuses on the material world.

Local and outside knowledge are always interacting, sometimes competing, replacing or confronting each other, sometimes as an inter-cultural dialogue. The Compas partners try to understand these interactions and influence them in such a way that social learning and co-evolution can take place.

The Compas 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 that exist within the communities, with their technical, social and spiritual dimensions, need to be accepted as the starting point for development, from within the own culture.

Compas functions as an international network that links practical support to people in rural areas with theoretical reflections about development options. The approach of the Compas programme can be described as action-research on endogenous development. It aims 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.

Supporting endogenous development does not imply a narrowly defined development approach, nor does it romanticise or reject traditions. Endogenous development is seen as an approach that is complementary to the ongoing technological and economic global processes. It wants to address local needs and contradictions, use local potentials enhance local economies and link them to international systems with optimal terms of trade. It supports co-existence and co-evolution of a diversity of cultures. Inter-cultural research, exchange and dialogues will be helpful to find the most desired development path in specific contexts, building on experiences accumulated.

Indigenous knowledge and practices may 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 carrying out 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 the 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.

Intra- and inter-scientific dialogues

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, summarised here for each continent.

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 of 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 this often leads to different decision making. (See Millar's paper.)

India and Sri Lanka: The real world and the fundamental principles of organising life systems are different from those in the West. Scientific methods 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. The health system is based on these principles. 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).

Latin America, the Andes: The natural, social and spiritual worlds are expressions of a unity. Sacred time-space goes beyond the physical or socio-economic domains (Pacha Mama). The cyclic notion of time; mutual and reciprocal relationship between humans, animals, plants; living astrology; the role of rituals and fiestas.

The Mayas: The religious worldview, the Maya calendar, own system of mathematics (based on the number 20) allowing pyramid architecture, own health and agricultural systems that build on the calendar, rituals and ecological principles. (See Escobar's paper.)

Europe

Conventional, Enlightenment: Measuring and the use of the five senses is knowing; rational logic; materialism; mechanistic, 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). Post-normal science, transdisciplinarity. (Several papers in this publication, e.g. Baars, Bosman, Kieft, Laszlo, Molenaar, Pereira, Röling and Zürcher touch upon the different scientific paradigms that are complementary, contradictory or transcending conventional science.)

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 interaction with other systems of knowing.

The *objectives* of the intra- and inter-scientific dialogues are:

- To understand, describe and exchange the epistemologies and paradigms of the sciences involved;
- To strengthen and revitalise the marginalised sciences ;
- 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.

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 attention. Therefore, it is important to systematise and make more explicit the concepts and theories behind indigenous forms of knowledge in order to share them as part of a possible co-evolution of the diversity of sciences.

Risks and code of conduct

Based on the experiences, 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;
- 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 aimed at strengthening local ways of knowing, and are written as far as possible in local languages. Publications will avoid mentioning technical details but will focus on the methods and strategic issues.

Co-evolution of different ways of knowing: 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 intra- and inter-cultural relations. The present dominant position of materialist values and global technologies tends to marginalise minority cultures and diminish cultural and biological diversity. Therefore, to achieve 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 intra- and inter-cultural social learning process carried out by multiple actors. The process will include at least the following actors: local people, their intellectual, political and spiritual leaders, local NGOs, government agencies for rural development, education and research, educational institutes and research centres. However, also national and international donors and development agencies can play their role.

Each actor can contribute to the social learning process in their own unique way. Local people can share their local knowledge. NGOs 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 in their curriculum. Universities and research centres can do supportive research on the epistemologies and support the action research programmes. National governments can give policy priority to 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 take place easily. The present systems for research and development have their own interest in the continuation of the status quo. Therefore, a careful strategy of activities at different levels will be important.

Possible activities

Below we present a number of activities that together could contribute to an approach for actors in the Compas programme, i.e. local communities, NGOs, universities and regional and international coordination units.

Re-building relationships

A prime condition for successful cooperation of these actors will be a relationship between actors that is horizontal as far 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. NGOs 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. This may mean procedures of selection and processes of initiation, and 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 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 organisations changes radically: instead of teaching local people on how to resolve their manifold problems, they concentrate on learning from 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. This requires a process of personal preparation where the conventional professional standards, attitudes and skills are scrutinised and modified where necessary.

Intra-community dialogue and decisions about possible interactions with outsiders

An inter-cultural 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 inter-cultural dialogue is desirable and possible, we need to have a view of the community as it is differentiated in social class, 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 do local actors consider to be responsible for strengthening or debilitating endogenous development and the cultures in which they are rooted? Which points are considered 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.

Learning about cosmovision, sources and forms of knowledge within the cultures

This activity consists of trying to understand the way of knowing within the cultures involved in this process. The cosmovision, values, the way people learn, teach and experiment and their logic and knowledge concepts and theories must be made clear and understood in order to be able to have internal reflection on the strong and weak points of the own knowledge. We could try to understand the cosmovisions, how the different sources of knowledge, like rationality, intuition, inspiration etc. are being used and combined and how they lead to the understanding by the holders of local knowledge. Sharing these aspects could then lead to a joint reflection. Specific needs can be identified for strengthening, revitalising or enhancing the way of knowing. Based on these, possible changes required in relation to traditional education, training, research or macro conditions and policy environment can be identified.

Learning 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 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 NGOs, universities or other supporting organisations relate to that, and how do we deal with this when certain value differences between them and us become clear? What are the possibilities and limitations for inter-cultural dialogue?

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), proposals can be formulated to revitalise local knowledge. Suggestions can include transformation of existing mechanisms 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 initially 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.

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 inter-cultural dialogue based on mutual confidence and horizontal relationships can only take place 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 held on issues such as objectivity versus subjectivity; universalism versus relativism; specialisation and disciplinarity versus holism and transdisciplinarity; quantitative method and qualitative methods; neo-positivism and actor perspectives. Hence, it is clear that also within the dominant scientific tower, there are different perspectives and positions. Western

knowledge applied to agriculture or health practices has great impact on the globe. It has led 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 inter-cultural and inter-scientific dialogue, on condition that Western science also accepts 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, need to be explored and where necessary corrected. Non-Western scientific traditions can offer a lot to Western science.

Exchange of experiences and co-evolution

An important 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 dialogue implies 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 of romanticising or idealising any of the forms of knowledge involved. The question whether it is feasible to achieve inter-epistemological cooperation in the sense that it leads towards transcultural synergy has not yet been answered. Possibly this can only be done in a satisfactory way, once the local systems as well as global systems have gone through their own processes of transformation, recovery, mobilisation and healing.

The challenge

This paper is an effort to get to grips with the co-evolution and inter-scientific dialogue in a situation where the starting position of the different actors is not equitable and where the differences in status, power, and resource availability are tremendous. We have to learn a lot if we are to overcome our Western bias. Compas wants to play a stimulating role in creating a platform for the dialogue and therefore we need to be open to other positions and approaches. We are ready to receive constructive criticisms and suggestions for improvement.

Compas' experiences in inter-cultural and inter-scientific dialogues are still rather limited. In this paper we purposely 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, which we have to learn ourselves. What seems to be clear for us might be questionable for others and the other way around.

Our challenge is to accept the uncertainty and through our mutual social learning process try to come closer to answering the questions. We invite professionals and scientists in local organisations, NGOs, universities, government bodies, national and international development agencies to join us in this effort. We look forward to the opportunity to strengthen our ties with organisations based in the South as well as in the North, in initiatives that reshape sciences, policies and actions.

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