

Challenges for endogenous development and bio-cultural diversity

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Diversity in biology and cultures

The world is going through a critical stage in its evolution. The global spread and application of new technologies influence ways of living and living standards in all corners of the globe. Electronic communication and free trade have contributed to an enormous boost in global flows of capital, products, people, knowledge and ideas and have contributed to important economic, social and cultural developments.

At the same time, a number of human-created crises are threatening the sustainability of global systems. The deteriorating ecological situation, persistent poverty, social, political and religious tensions, the presence and spread of weapons, and the reduction of biological and cultural diversity present a polycrisis for which new answers are urgently needed.

There is increasing doubt in the promise of modern science and technology to solve the global problems. Rather, the global spread of the mechanistic and materialistic worldview, global consumerism, corporate control and generic policies and universal application of a particular dominant science may be seen as possible contributors to the global problems.

Uniformity, control, competition, transfer of universal knowledge, standardization and integration in global economics are popular catchwords for dominant paths for development. Diversity, local management, complementarity, synergy, holism, identity, sense, spirituality and love are catchwords that seem to be contradicting this dominant thinking and at the same time are argued by some to hold solutions for the global polycrisis.

This chapter explores the terms 'endogenous development' and bio-cultural diversity' and presents some of the experiences of the COMPAS programme as a contribution to the search for solutions. Worldviews and sciences are presented as useful tools.

Diversity

'Biodiversity' can be briefly defined as the variability in the totality of living organisms and environments. It includes genes, species and ecosystems of a region. 'Cultural diversity' is the variability in the totality of human and man-made environment. It includes worldviews, beliefs, knowledge, values, norms, morals, language, laws, art and artifacts and institutions of a region. It also refers to the different ways in which people use land, arrange their territory, produce and consume food, build houses, arrange gender relations, use their free time and resolve their conflicts.

The concept of 'bio-cultural diversity' is not just a play of words; the development of diversity in the biological and the human domain cannot be seen as separate, they are intrinsically linked. This was concluded in the declaration of Belem (1998) by the International Society of Ethnobiology and also expressed by UNESCO (2001). Maffi (2001) shows striking correlation between biological diversity and linguistic diversity: 10 out of the top 12 megadiverse countries also figure among the top 25 countries with endemic languages. This link is the result of the coevolution of human groups in and with their ecosystems that is especially occurring when ecosystems (and the livelihood systems they provide for humans) are isolated.

Biodiversity is considered to be of economic and scientific significance and to provide the essential stability and resilience of a biosystem. Similarly, cultural diversity is seen as a source of exchange, innovation and creativity and is considered as necessary for human kind as biodiversity is for nature. According to the UNESCO Declaration on Cultural Diversity (2001), 'Cultural diversity is one of the roots of development, understood not simply in terms of economic growth, but also as a means to achieve a more satisfactory intellectual, emotional, moral and spiritual existence'.

The forces that threaten biological and cultural diversity have the same origin: commercialization and commoditization of nature, deforestation, urbanization, migration, modern agriculture, food and clothing habits, globalization and domination by powerful organizations. Modern scientific and economic systems generally assume universal applicability of theories and technologies and work towards normalization and standardization of approaches for production and commercialization, and massification of consumption of food, clothing and other consumer goods. They tend to use generic policies for management of natural resources, rural, agricultural and urban development, irrespective of the diversities in geographies and cultures. With this background, the initiatives to be taken to limit further reduction of biological and that of cultural diversity cannot be separated.

A major challenge is to formulate concrete proposals for policy, for research and for local or regional initiatives to maintain or enhance biocultural diversity. We do not aim at an exclusively academic or political discussion of the subject; we rather try to build on existing initiatives, scientific insights and policies and to formulate and present suggestions for action for policy-makers, researchers and implementers. Key questions are: what should be done, and what can we do to enhance endogenous development and bio-cultural diversity in the domains of research, education, policy and development initiatives?

Declining diversity and initiatives to counter it

The world is witnessing an alarming reduction of both biological and cultural diversity: Some studies indicate that over the next 30 years some 20 per cent of the world's existing species may be lost, and that this figure may increase to 50 per cent over the coming 100 years (Maffi, 2001). Considering the fact that at present only an estimated 10 per cent of the existing species (estimated to be between 15 and 40 million species) has been discovered and named by sciences, scores of species will go extinct before they are identified studied. Most of the species extinctions from AD 1000 to AD 2000

are due to human activities, in particular destruction of plant and animal habitats. The rate of species loss is greater now than at any time in human history, with extinctions occurring at rates thousands of times higher than background extinction rates (Maffi, 2001). Elevated rates of extinction are being driven by human consumption of organic resources, especially related to tropical forests, loss of habitats, overexploitation, extraction, hunting and fishing, pollution, invasion of alien species and global climate change (IUCN, 2004).

The widespread introduction of exotic species by humans is a potent threat to biodiversity. When exotic species are introduced to ecosystems and establish self-sustaining populations, the endemic species in that ecosystem, which have not evolved to cope with the exotic species, may not survive. The exotic organisms may be either predators, parasites or simply aggressive species that deprive indigenous species of nutrients, water and light. These exotic or invasive species often have features due to their evolutionary background and environment that makes them very competitive, and similarly makes endemic species very defenseless and/or uncompetitive against these exotic species.

The rich diversity of unique species across many parts of the world exist only because they are separated by barriers, particularly mountains, deserts, seas and oceans, from other species of other land masses. These are barriers that could hardly be crossed by natural processes. However, humans now have the power to bring into contact species that have never met in their evolutionary history. If humans continue to combine species from different eco-regions, there is the potential that the world's ecosystems will end up dominated by a very few, aggressive, cosmopolitan 'super-species'. Just like a species with high genetic diversity, an ecosystem with high biodiversity may have a greater chance of adapting to environmental change. In other words, the more species comprising an ecosystem, the more resilient and stable the ecosystem is likely to be.

The meaning and significance of cultural diversity is more complicated, but consensus exists that biological and cultural diversity are intrinsically linked (Posey, 1999; UNESCO, 2001). According to scientific anthropology, humans first emerged in Africa about two to three million years ago. Since then, they have spread throughout the world, successfully adapting to widely differing conditions and to periodic cataclysmic changes in local and global climate and gradually also manipulating the environment to their specific needs. The many separate societies that emerged around the globe differed markedly from each other, and many of these differences persist to this day.

Beyond the obvious cultural differences that exist between peoples, such as language, dress and traditions, there are also significant variations in their shared conception of worldviews, knowledge and morality, in the way societies organize themselves, and in the ways they interact with their environment.

Cultural diversity is tricky to quantify, but a good indication is thought to be a count of the number of languages spoken in a region or in the world as a whole. By this measure, there are signs that we may be going through a period of precipitous decline in the world's linguistic diversity. Research data differ, but it is fair to expect that in 100 years time only about 50 per cent of the 6,000 languages will survive (Maffi, 2001).

Looking at the curricula in schools, colleges and universities in the different parts of the globe, it is obvious that the dominant worldview and universal dualistic science is prominent. If any attention is given at all to traditional and indigenous worldviews and sciences, it is often in a derogative form. Hence education often alienates students from its own roots and obstructs the transfer of culture, from one generation to the other or its adaptation to new situations.

Quantitative data on the decline of traditional communities, traditional worldviews, values and knowledge systems, traditional medicine and food systems, architecture, music and art, to name a few, are not available, but it is fair to assume that the speed of their decline would be similar to the decline biological systems and of language. It may be argued that the diversity of worldviews and ways of knowing may be a fundamental factor in understanding cultural diversity. The diversity in the languages, in food habits and the way of dressing is than seen as a consequence of this ontological and epistemological reality. In this chapter, I explore the role of worldviews, ways of learning and ways of knowing in different cultures as they were documented by the COMPAS network and share experiences in different cultures to document, revitalize and innovate these views and ways of learning and knowing. The possibilities for coevolution of existing diversity are then explored.

Conservation of biocultural diversity in international initiatives

Concern for diminishing cultural diversity has also lead to a number of important initiatives, conventions and declarations. Without the pretension to be complete, the following could be mentioned as specifically relevant.

Universal Declaration of Human Rights

The 1948 Universal Declaration of Human Rights (UDHR) is a significant nonbinding international agreement. It guarantees fundamental freedoms of personal integrity and action and individual political, social, economic and cultural rights. The 'human rights approach' of the UDHR is directed toward nation states. It does not easily provide a basis for claims against multinational companies or individuals who profit from traditional knowledge.

The UDHR supports equal protection for all under the law, thereby implying that intellectual property right (IPR) protection should be available to all peoples, including indigenous peoples. It provides for the right to own collective property and not to be arbitrarily deprived of that property, and guarantees the right to just and favourable remuneration for work, which can be interpreted as work related to traditional knowledge. It also provides for the right to culture and recognition of interest in scientific production, including the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production.

Working Group on Indigenous Populations

In 1982, the UN Economic and Social Council (ECOSOC) created a Working Group on Indigenous Populations (WGIP), which has become the most open international forum for indigenous representatives and advocates of indigenous rights. The WGIP has prepared a Declaration on the Rights of Indigenous Peoples.

Convention 169 of ILO

Convention 169 of the International Labour Organization (ILO) (adopted in 1989) expresses respect for the culture, spirituality, social and economic organization and identity of different indigenous and tribal peoples. It says that indigenous and tribal peoples have the right to determine their own development priorities and to exercise control over their own economic, social and cultural development.

Rio Declaration on Environment and Development

The Rio Declaration on Environment and Development of 1992 establishes the relevance of indigenous peoples and the central importance of their protection in achieving 'sustainable development'. Principle 22 states that indigenous people and their communities, and other local communities, have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Agenda 21

Agenda 21 is the programme of action for sustainable development agreed to at the UN Conference on Environment and Development (UNCED). It emphasizes the conservation and utilization of plant genetic resources *in situ* as a component of programmes to promote sustainable agriculture. It recognizes the importance of indigenous and local communities, their knowledge and culture, and the contribution they can make to protecting biodiversity, and states that they should be rewarded. It is reinforcing indigenous communities' rights to pursue their traditional way of life and land rights, and gives indigenous people an opportunity for greater control over their life and lands 'in accordance with national legislation', plus the possibility of participating 'in the establishment or management of protected areas'.

The FAO International Code of Conduct for Plant Germplasm Collecting and Transfer

The Food and Agriculture Organization's (FAO) International Code of Conduct for Plant Germplasm Collecting and Transfer is part of the FAO's Global System on Plant Genetic Resources, the International Undertaking on Plant Genetic Resources. The code provides a set of general principles that governments may wish to use in developing national regulations or formulating bilateral agreements on the collection of germplasm. Its first objective is to promote the conservation, collection and use of plant genetic resources from their natural habitats or surroundings in ways that respect the environment and local traditions and cultures. It aims to involve farmers, scientists and organizations in conservation programmes in countries where collecting is taking place, to promote the 'sharing of benefits' and increase recognition of the rights and needs of local communities and farmers so that they may be compensated for their contribution to the conservation and development of plant genetic resources and not have their current benefits undermined by resource transfer.

UNESCO Universal Declaration on Cultural Diversity

The UNESCO Universal Declaration on Cultural Diversity, adopted by 185 member states in 2001, represents the first international standard-setting instrument aimed at preserving and promoting cultural diversity and intercultural dialogue. It states that (UNESCO, 2001):

The defense of biocultural diversity is an ethical imperative, inseparable from respect for human dignity and nature; it implies a commitment to human rights, and fundamental freedoms. It asks for protecting traditional knowledge, in particular that of indigenous peoples with regard to environmental protection and the management of natural resources; and fostering synergies between modern science and local knowledge.

Kari-Oca Declaration

The World Conference of Indigenous Peoples on Territory, Environment and Development (1992) endorsed the following declaration:

We, the Indigenous Peoples, walk to the future in the footprints of our ancestors. From the smallest to the largest living being, from the four directions, from the air, the land, and the mountains, the Creator has placed us, the Indigenous Peoples, upon our Mother the Earth. The footprints of our ancestors are permanently etched upon the land of our peoples. We, the Indigenous Peoples, maintain our inherent rights to self-determination. We have always had the right to decide our own forms of government, to use our own laws to raise and educate our children, to our own cultural identity without interference. We continue to maintain our rights as peoples despite centuries of deprivation, assimilation, and genocide. We maintain our inalienable rights to our lands and territories, to all our resources – above and below – and to our waters. We assert our ongoing responsibility to pass these on to the future generations. We cannot be removed from our lands. We, the Indigenous Peoples, are connected by the circle of life to our land and environments.

The declaration includes 109 articles with specific demands related to human rights and international law, lands and territories, biodiversity and conservation, development strategies, culture, science and intellectual property.

The Earth Charter

The Earth Charter is a declaration of fundamental values and principles for building a just, sustainable and peaceful global society in the 21st century. Created by the largest global consultation process ever associated with an international declaration, endorsed by thousands of organizations representing millions of individuals, the Earth Charter seeks to inspire in all peoples a sense of global interdependence and shared responsibility for the well-being of the human family and the larger living world. It is an expression of hope and a call to help create a global partnership at a critical juncture in history. The Earth Charter's inclusive ethical vision recognizes that environmental protection, human rights, equitable human development and peace are interdependent and indivisible. It provides a new framework for thinking about and addressing these issues.

Potsdam Manifesto 2005

Another important initiative is the Potsdam Manifesto 2005 that states that we have to learn to think in a new way. This manifesto is a follow up of the Russell-Einstein declaration of 1955.

This manifesto:

Hopes for and successes in the development of better and... easier life and the consequential far-reaching appropriation of the world disguised the direct victims and the creeping devastation that were already tied to the early phases of such power. Today it is obvious that the one-sided implementation of these successes to the advantage of the European/North American initiators of the new civilisation and oft heir imitators around the world amounts to a cold war against everyone and everything that can be turned into resources to increase this material appropriation or that what seems to hinder this appropriation. Particularly threatening thereby is an accelerated destruction of the bio-ecological diversity of whole complexes of life, to a degree seemingly unique in the history of the earth. But also the diversity of human ways of life and the treasure store of the cultures is similarly being irreversibly reduced, and in this process the spectrum of possible strategies and lifestyles and future developments. This wide variety of crises today confronting us and threatening to exceed our ability to cope are the expression of a mental crisis in the relation between us humans and our living world. They are symptoms of deeper causes that we have thus far neglected to seek and reveal. They are closely connected with the materialistic-mechanistic worldview favored all over the world today and with its prior history.

Initiatives of NGOs and universities

Important initiatives have been taken by local and international NGOs. Mention can be made of IUCN and the International Society for Ethnobiology, with its study on the cultural and spiritual values of biodiversity (Posey 1999), the International Institute for Environment and Development (IIED), Terralingua (Maffi, 2001), the Centre for Development and Environment (CDE) of the University of Bern and University of Geneva, as well as the University of Wageningen (Howard, Roling and van der Ploeg) and University of Yunnan (with Tillmann and Salas as active promoters). In the south many thousands of NGOs, CBOs local groups and individuals take important initiatives in support of cultural and biological diversity. Universities in the south such as University of Cochabamba (UMSS) in Bolivia and UDS in Ghana are pioneering in the domains of endogenous development. In Asia there are thousands of centers for traditional healing, yoga and spiritual development. Presently the idea of static conservation of biodiversity is being replaced by the idea of dynamic conservation, and the notion of innovation in development from within: endogenous development is one approach that is relevant in this context. Also COMPAS is one of the players in this domain.

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 organized 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 globalization. Its focus on the locally available human, physical and biological resources enhances bio-cultural diversity.

COMPAS experiences

COMPAS is an international cooperative programme with some 10 years of action research and learning from local knowledge in different cultural and ecological environments. Revitalizing 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 coevolution of knowledges and sciences. The field activities of the 25 partner organizations include support to local people in their endogenous development processes.

Endogenous development is based mainly, though not exclusively on the locally available resources, local knowledge, culture and leadership. It is open to integrating traditional, as well as outside knowledge and practices. It has mechanisms for local learning and experimenting, building local economies and retention of benefits in the local area. A consortium of 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 or on the social world.

Local and outside knowledge are always interacting, sometimes competing, replacing or confronting each other, sometimes as an intercultural dialogue. The COMPAS partners try to understand these interactions and influence them in such a way that social learning and coevolution can take place. The 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 and 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 their own culture.

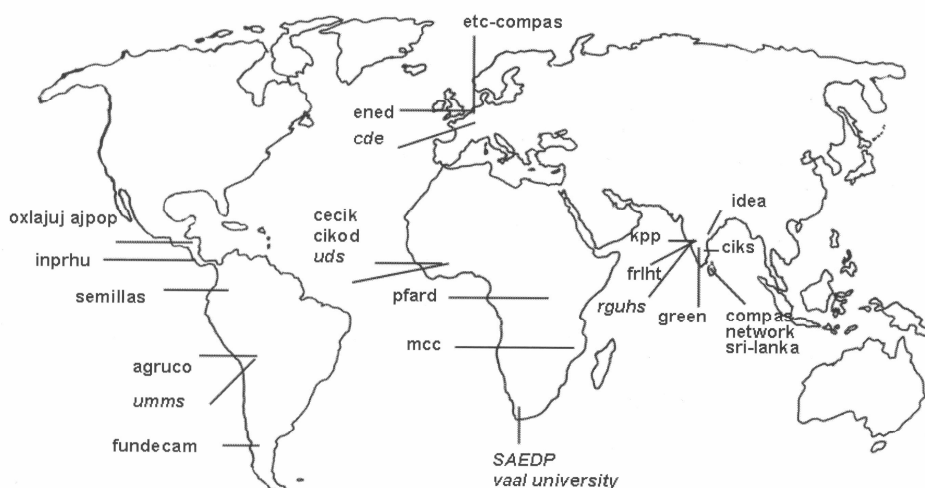


Figure 1 The location of COMPAS partners across the globe

COMPAS partners

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 organizations that have similar focus but that restrict themselves to field work or research or to the technical aspects of indigenous knowledge. COMPAS partners, as a relatively small network, have done field work to understand the role of culture in people's lives and its significance for development; they have been developing operational approaches for endogenous development. It has now reached a point that it actively seeks cooperation with other organizations: funders, scientific organizations, international and local NGOs, scientific institutions and individuals.

Supporting endogenous development does not imply a narrowly defined development approach. It does not romanticize or reject traditions. It takes traditions as a starting point of possible innovations. 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 to enhance local economies and link them to international systems with optimal terms of trade. It supports coexistence and coevolution of a diversity of cultures. Intercultural research, exchange and dialogue 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 organizations 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 systematization of the experiences so far.

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

Objectives based on locally felt needs and values, acknowledging the interests of different social categories;

In situ reconstruction and innovation of local knowledge systems: understanding, testing and improving local practices and enhancing the dynamics of the local knowledge processes;

Maximizing local control of development;

Identifying development niches based on the characteristics of each local situation;

Selective use of external resources;

Retention of the benefits in the local area;

Exchange experiences between different localities and cultures;

Training and capacity building for rural people, development staff and researchers;

Networking and strategic partnerships;

Further understanding the diverse ways 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 worldviews, paradigms and epistemologies in Africa, the Andes, Mesoamerica, India, Sri Lanka and Europe. We are only at the beginning of this process, but it has fascinating preliminary results. In the course of 2005 and 2006 COMPAS carried out case studies and organized regional conferences on the different cultures in the South and in the North, their worldviews and knowledges. Of course, there are many differences within each of the regions and commonalities between regions. In a preliminary way, we have found some general characteristics, summarised here for each region.

Latin America, the Andes

The natural, social and spiritual worlds are expressions of *unidad* (non-duality). Sacred time-space goes beyond the physical or socio-economic domains (*pacha*) to embrace the spiral notion of time, reciprocal relationship between humans, animals and plants, living astrology, and the role of rituals and fiestas.

The Mayas religious worldview, the Maya calendar, had its own system of mathematics (based on the number 20) allowing pyramid architecture, health and agricultural systems built on the calendar, rituals and ecological principles (see Delgado and Escobar 2006, Delgado and Mariscal, 2006; Escobar, 2006)

Africa

Africa has a worldview with a hierarchy between divine beings, spiritual beings, ancestors and natural forces. Natural resources have a scared character and there is a cyclic notion of time. Ancestral spirits have powers and the use of magical powers can be on both 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 has specific values, often leading to different decision making (see Millar et al, 2006).

India and Sri Lanka

The real world and the fundamental principles of organizing 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, animism prevails and the 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) (see Balasubramanian and Devi, 2006).

Europe

Conventional European values stem from the Enlightenment and centre on the measuring and the use of the five senses as knowing. Organizing principles are rational logic, materialism, mechanistic approaches and self-interest of individual or group. In post-modernity, instead there is uncertainty, diversity, chaos and self-regulation, holism, synergy rather than generic principles and universal science or values (such as human rights, democracy, good governance). There is post-normal science and transdisciplinarity (see Haverkort and Reijntjes, 2006).

Knowledges and sciences in plural

On the basis of these regional studies on worldviews and ways of knowing in different cultures, COMPAS has taken a position to consider the different ways of knowing as different sciences. We understand 'knowledge' as the assumptions, concepts and information acquired and processed by people. And 'science' is understood to be the complex of producing, storing, retrieving and utilization of knowledge within a specific theoretical and methodological framework that is accepted by a professional community. Hence science is a social construction of knowledge. It is at best an approximation to truth, and always subject to improvement. Therefore we assume that in different cultures and different professional communities, different sciences exist.

This position has also been taken by the Study Group on Science and Traditional Knowledge of the International Council for Science (2002). This study group concludes that there is growing awareness of the extraordinary diversity of

sciences. Different sciences are far more dissimilar to each other than previously thought, and there is no 'unity of science', nor a 'unique scientific method'. What counts as good practice in one science, may be outdated or even inappropriate in another.

Box 1 Declaration of World Conference on Science

The World Conference on Science was organized by UNESCO in cooperation with the International Council for Science (ICS) in Budapest 1999. The conference accepted a declaration that affirms that scientific knowledge has led to remarkable innovations that have been of great benefit to humankind. But it also notes the challenge to use this knowledge in a responsible manner to address human needs and aspirations. The declaration observes that traditional and local knowledge systems, as dynamic expressions of perceiving and understanding the world, can make, and historically have made, a valuable contribution to science and technology, and that there is a need to preserve, protect, research and promote this cultural heritage and empirical knowledge.

The Science Agenda Framework for Action includes the following guidelines for the relations between modern science and other systems of knowledge:

- Governments are called upon to formulate national policies that allow a wider use of the applications of traditional forms of learning and knowledge, while at the same time ensuring that its commercialization is properly rewarded.
- Enhanced support for activities at the national and international levels on traditional and local knowledge systems should be considered.
- Countries should promote better understanding and use of traditional knowledge systems, instead of focusing only on extracting elements for their perceived utility to the Science and Technology system. Knowledge should flow simultaneously to and from rural communities.
- Governmental and non-governmental organizations should sustain traditional knowledge systems through active support to the societies that are keepers and developers of this knowledge, their ways of life, their languages, their social organization and the environments in which they live, and fully recognize the contribution of women as repositories of a large part of traditional knowledge.
- Governments should support cooperation between holders of traditional knowledge and scientists to explore the relationships between different knowledge systems and to foster interlinkages of mutual benefit.

The appreciation of the diversity of cultures and worldviews offers a wide range of opportunities for exchange and dialogue. Intercultural contacts can lead to domination and control and lead to disappearance of cultures and ways of knowing. But, if the intercultural contacts take place with respect, it can also lead to mutual learning and synergy. Respect does not imply the unconditional acceptance of all differences. It implies the willingness to listen, openness to learn and to be responsive, and the capacity to criticize when necessary (Fay, 1996).

COMPAS wants to provide a platform for intra-, and inter-cultural and intra- and inter-scientific dialogue. Intra-cultural/scientific dialogue takes place between persons that are from a particular culture and share a similar knowledge base, whereas inter-cultural/scientific dialogue takes place between persons with a different cultural and scientific background. These exchanges can contribute to a coevolution of cultures and sciences. In this process, no science is considered *a priori* to be superior

or inferior. Traditional knowledge is not romanticized and western knowledge not rejected because of its dominant position. Each science involved is stimulated to develop and improve its methods and theories based on its own dynamics as well as on interaction with other systems of knowing.

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

- to understand and describe the epistemologies and paradigms of the sciences involved from the internal perspective;
- to determine the strengths, weaknesses and comparative advantage of each science;
- to strengthen and revitalize the marginalized sciences;
- to look for synergy and opportunities for mutual learning as well as for contradictions and exclusions;
- to question, challenge and criticize 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 further attention. Therefore, it is important to continue to systematize and make more explicit the concepts and theories behind indigenous forms of knowledge in order to share and improve on them as part of a possible coevolution of the diversity of sciences.

Risks and code of conduct

Based on the experiences, the partners of COMPAS realize 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 (for example, beliefs and spirituality, power relations).

The partners have therefore 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 avoid mentioning technical details but focus on the methods and strategic issues.

Coevolution 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 marginalize other 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, and institutions of education and research. However, also national and international donors and development agencies should 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 revitalization 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 coevolution 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, that is, local communities, NGOs, universities, and regional and international coordination units.

Rebuilding 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 characterized 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 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 organizations changes radically. Instead of teaching local people 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 scrutinized and modified where necessary.

Intra-community dialogue and decisions about possible interactions with outsiders

An inter-cultural dialogue and a process of coevolution 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 maintain? 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, and on the desirability of the ways, contents and partners of a coevolution.

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 their own knowledge. We could try to understand the cosmovisions, how the different sources of knowledge, like rationality, intuition or inspiration 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, revitalizing 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 chapter be used to make such a description? Can we learn from the community how they have managed to survive/change and coevolve with the dominant/formal system? How do they do it and how shall we as NGOs, universities or other supporting organizations relate to that? 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 (for example, rationality and intuition), proposals can be formulated to revitalize local knowledge. Suggestions can include transformation of existing mechanisms of learning and teaching, recovery of lost knowledge, mobilization 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 chapter 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; specialization and disciplinarity versus holism or 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, on the other hand, need to be explored and where necessary corrected. Non-western scientific traditions can offer a lot to western science.

Exchange of experiences and coevolution

An important step would be to look for opportunities for mutual learning and exchange and for coevolution. 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 criticize when necessary. It needs to avoid the pitfalls of rejecting positive elements of deficient forms of knowledge, as well as avoiding the risk of romanticizing or idealizing 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, mobilization and healing.

Challenging the dominant worldview and epistemology

The participants of the regional conferences on worldviews and sciences organized by COMPAS, agreed that the dominant/mainstream/western worldview is biased in its dualistic and materialist orientation and that this bias contributes to the existing ecological, social and spiritual problems of the globe. Human behaviour leading to these crises has its roots in the dominant values and the way knowledge and technologies are being produced. There is a clear link between the dominant scientific knowledge and the way economic development is governed by the laws of capital (Molenaar, 2006).

As the dominant worldview is at least partly responsible for the polycrisis in the world, it is being challenged from several angles. More and more the conventional, materialistic and science-based approaches to development are being questioned and innovative individuals, citizen groups, scientists and policy-makers are increasingly presenting new ideas on how things can be done.

Sources of inspiration for moving the dominant worldview

To find inspiration and new insights to move the dominant worldviews participants recommend that we:

1. Look at history and reconnect with diverse identities and worldviews prior to wide spreading of materialism and dualism, and study the era prior to the introduction of duality. Germanic and Celtic roots of Europe can be source of insights about the roots of western culture and ontology (Haverkort, 2006).

2. Go beyond the materialist and reductionist views of western science to include insights from quantum physics, holism, uncertainty and chaos theories, transdisciplinarity, inclusive science. Include insights from complementary sciences in health, agriculture, education and others (Nicolescu, 2006, Stijkel, 2006).
3. Build on the wisdom of different social actors: NGOs, social movements, concerned scientists, religious and spiritual leaders, and respect the possible differences and complementarities of gender perspectives. Explore complementarity between science, morality and religions. Strengthen links with artists: visual artists, painters, poets, musicians (Funtowicz and Ravetsm, 1993; Röling, 2006).
4. Learn from non-western cultures, their a-dualistic worldviews, gnoseologies and epistemologies.
5. Learn from the feminine perspective and develop caring and cooperative attitudes. Apusigah (2006) calls this the matri-force; Zajonc (2006) elaborates the epistemology of love and includes that in his teaching for students in quantum mechanics.

New scientific insights from quantum physics, learning theory, transdisciplinarity and ecology are becoming more and more convincing and visible and their influence is growing. Approaches inspired by these new insights emerge in sciences and research, policies and practices in domains such as rural renewal, organic agriculture, sustainable energy, complementary medicine, alternative education and solidarity economics.

Each domain requires different methodological tools. In order to assure that deeper levels of knowing are included in the scientific building, it is suggested to build towards a new western gnoseology (namely, a system of deeper knowing). It was seen that this way of deeper knowing should be based on rationality, intuition, imagination and sensibility. That it assumes that the economy and politics must serve all living beings, the earth and the cosmos. It attaches value to dialogues across ideologies, sciences, religions, economies and policies. It has respect for otherness and diversity, uses rigorous arguments, taking into account all existing information. It suggests openness to accept the unknown, the unexpected and the unforeseeable and tolerance to accept opposite views.

Insights from inter-cultural and inter-science dialogue

Participants presented experiences and views from cultures, where not the duality but the connectivity between living and non-living are the ordering principles of the worldviews. In most of the non-western societies, the human world, the material world and the spiritual world are inseparable. The way this is expressed in the lifeworlds of people is distinct, ranging from ancestor-centric Africa to the South America of Pacha Mama, and the Vedic or Buddhist a-material notion of the reality. But the underlying notion of unity, connectivity and reciprocity is a common element. Traditional knowledge and values have been subject to erosion, some have gone underground, and many have lost their vitality and power. The participants provided important insights in the fundamental difference between western worldviews and knowledge and those of their own cultures.

Ontological differences and power issues may prevent a simple inter-cultural exchange. The southern authors refer to the colonial and neo-colonial situation and the impact it has had and still has on the worldviews, development of the own knowledges and status of traditional knowledge. There is a long way to go to compensate for power differences and to create favourable conditions for revitalization of traditional knowledge and worldviews.

For this, an intra-cultural process of reconciliation with their own tradition has to take place. The increasing awareness of the importance of culture and cultural diversity is leading to an increase in intra and inter-cultural education. The educational systems, systems of governance and management of the local resources increasingly get attention. In these domains, important innovative initiatives are being undertaken in the South.

The voices from the South feel the challenge to revitalize their own knowledge, to make the link with their own culture and to bring about a development path that is not just repeating the western model, but that takes advantage of the strengths of the own values, worldviews and expertise. They do not claim isolationism, but expect benefits from South–South cooperation as well as from North–South exchange. The authors reveal lively initiatives in this direction, such as the regional conferences on worldviews and knowledge in Africa, Latin America and Asia.

The experiences of the regional conference show that new thinking and acting indeed is feasible. Many building blocks are already there in the form of new philosophies, scientific paradigms and research and learning approaches, but also in the form of ancient wisdom embedded in our global cultural heritage. The participants of this conference brought together many examples in crucial domains like quantum physics, transdisciplinary science, social learning, human consciousness, health, agriculture, rural innovation and education. Persons with experience are available and platforms for inter-cultural and inter-science dialogues do exist. However, much is still uncertain or unknown, and priorities and capacities are still far too low to achieve critical mass and momentum. Difficult ethical changes, in sciences, governance and economics, for example, still have to be made. We have to unlearn our bad habits, have to go against the odds, and have to accept or even embrace uncertainty. Experiences in environmental management for example, show that transition is long and difficult and full of unconscious and conscious road blocks. As there is not one way to the future, ready road maps do not exist and there are different visions and interests. Broad processes of social learning and democratic decision-making are needed.

The International Conference on Endogenous Development and Bio-cultural Diversity

The Geneva conference brings together the experience and insights of many experts in the fields of endogenous development and bio-cultural diversity. We shared lessons on the worldviews and sciences presented and discussed in the earlier conferences in Latin America, Africa, Europe and Asia. This conference was a real exercise in inter-

cultural and inter-sciences dialogue and learning. We exchanged our different visions, experiences and ambitions and worked on the objectives of this conference.:

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

We hope that all participants will draw their attention to the future: What needs to be done by policy-makers, by scientists and by NGOs? What can we do ourselves to enhance endogenous development and bio-cultural diversity? Can we as participants commit ourselves to follow up activities?

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