

Indigenous Knowledge for Community Based Development

Pushpa Joseph teaches at the department of Christian Studies, University of Madras. She is a feminist theologian with a specialisation in Indian feminist hermeneutical methodologies. Her research interests are in the area of women's issues in society and religion, bioethics, HIV/AIDS. She is the author of *Feminist Hermeneutics: A Contextual Reconstruction* (Darjeeling, 2010) and other books like *Indian Religions* (Chennai, 2003) and *The Old Testament* (Chennai, 2004) which she edited and authored as text books for the University of Madras. She has co-edited *Re-imagining Marriage and Family in Asia: Asian Christian Women's Perspectives* (SIRD, Malaysia, 2008) and is presently working on a volume entitled *Feminist Readings: Essays on Contemporary Issues*.

Abstract

Indigenous knowledge is the unique, traditional, local knowledge existing within and developed around the specific conditions of men and women indigenous to a particular geographic area. Community-based development is considered to be an innovative institutional response for meeting the seemingly conflicting goals of poverty reduction and biodiversity education. A significant element of community based development is drawing on the traditional ecological knowledge. Such knowledge held by local people is viable in the management of local resources. This paper argues that indigenous knowledge, which is survival-oriented, contributes to community based development as a significant foundation for sustainable living. With a focus on local knowledge, relying on tribal forms, it articulates the holistic foundations of indigenous knowledge, which is based on a worldview of interconnectedness thus creating open systems. It stipulates the personal and practical characteristics of indigenous agricultural knowledge vis-a-vis scientific dominant knowledge systems and highlights how such open systems contribute to community based development thus ensuring poverty reduction and biodiversity preservation.

Keywords: Indigenous knowledge, Community development, Sustainable living, Biodiversity

"Indigenous knowledge is the social capital of the poor, their main asset to invest in the struggle for survival to produce food, to provide for shelter or to achieve control of their own lives."¹

Indigenous knowledge is the local knowledge that is unique to a given culture or society. It is the basis for agriculture, health care, food preparation, education, environmental conservation, and a host of other activities. Indigenous knowledge is also known as local knowledge, folk knowledge, people's knowledge, traditional wisdom or traditional science. This knowledge is passed from generation to generation, usually by word of mouth and cultural rituals, and has been foundational for the wide range of activities that sustain a society and its environment in many parts of the world for many centuries.

1 World Bank Website: <http://www.worldbank.org/afr/ik/basichtm>

Knowledge about the environment has been central to human survival throughout history. Survival was virtually impossible in hunting and gathering societies without a good knowledge about forest and wildlife - plant and animal species, their growth environments and habitats, growth cycles, behaviour of animals, specific characteristics of plant and animal species and their uses. In the same way, farming societies depended upon a keen understanding of the local natural environment and ecological processes leading to the regeneration of environmental resources, e.g. soil fertility and water. By interacting with their immediate environment over centuries, local people have gained an enormous volume of knowledge about their environment. Their knowledge involves not only environmental resources available within the locality but also how to manage these resources in a sustainable manner.²

The main argument of this paper is that indigenous knowledge is survival based. Indigenous people have a wide knowledge of the ecosystems in which they live and of ways of using natural resources sustainably.³ It can also help people learn how to live in harmony with nature and the environment in a sustainable fashion. However, colonial educational systems replaced the practical everyday life aspects of indigenous knowledge and ways of learning with Western and modern notions of abstract knowledge and academic ways of learning. Today, there is a grave risk that much of the indigenous knowledge is being lost and, along with it, valuable knowledge about ways of living sustainably both ecologically and socially.⁴

The Holistic Foundations of Indigenous Knowledge

All indigenous knowledge related to life is based on the four fold understanding of the environment as seen in the figure given below. The interrelated ethos embedded in their worldview is well illustrated in the following diagrams.⁵

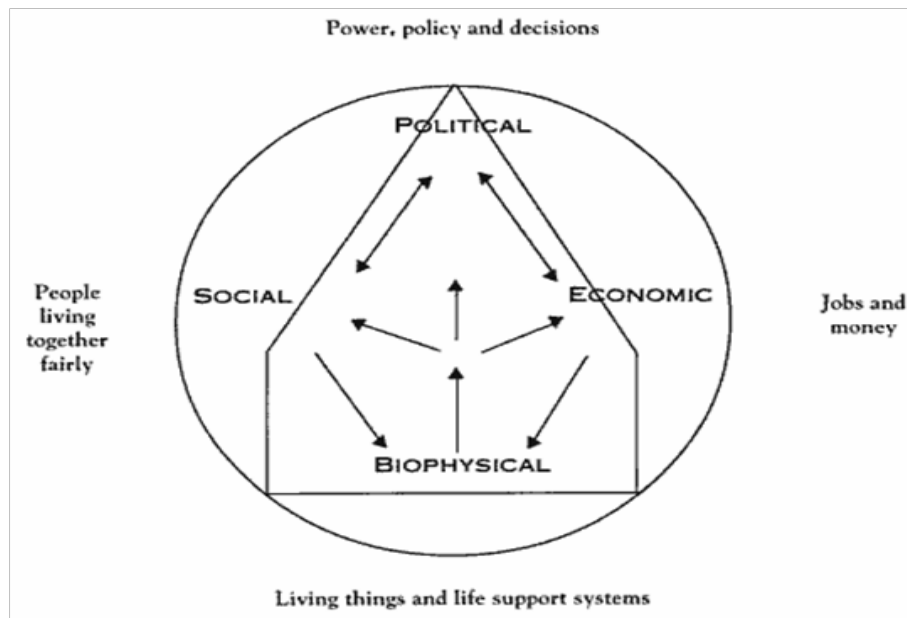
2 See the essays in Roy Ellen, Peter Parkes and Alan Bicker, *Indigenous Environmental Knowledge and its Transformations: Critical Anthropological Perspectives*, Amsterdam, Overseas Publishers Association, 2000. The contributors focus on a series of interrelated issues in their interrogation of indigenous knowledge and its specific applications within the localised contexts of particular Asian societies and regional cultures. Also see the essays in Balasinorwala, T., A. Kothari, and M. Goyal (compilers), *Participatory Conservation: Paradigm Shifts in International Policy*, Pune, IUCN/TILCEPA/Kalpavriksh, 2004.

3 For an excellent exposition from the Indonesian context see, Tania Murray Lee, "Locating Indigenous Environmental Knowledge in Indonesia," in Roy Ellen et.al., *Indigenous Environmental Knowledge and its Transformations: Critical Anthropological Perspectives*, Amsterdam, OPA, 2000, pp. 121-150.

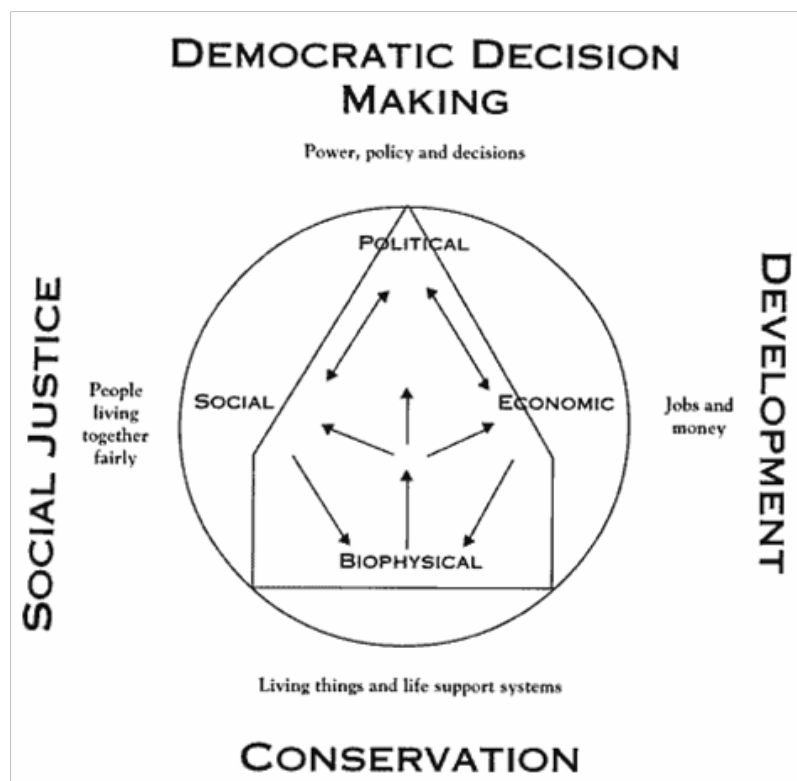
4 See the study of Nandini Sundar, "The Construction and Deconstruction of 'Indigenous Knowledge' in India's Joint Forest Management Programme," in Roy Ellen et.al., *Indigenous Environmental Knowledge and its Transformations: Critical Anthropological Perspectives*, Amsterdam, OPA, 2000, pp.79- 100.

5 For illustrations see, Berkes F., *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*, London: Taylor & Francis, 1998. The book explores a diversity of relationships that different groups have developed with their environment, using extensive case studies from research conducted with the Cree Indians of James Bay in the eastern sub arctic of North America. The book deals with concepts, practices and issues related to sacred ecology. It discusses the emergence of the traditional ecological and management systems; how it actually works and the potential of traditional ecological knowledge.

Four Systems of the Coastal and Marine Environment⁶



The Values Underlying Sustainable Environment⁷



6 Source: R. O'Donoghue, *Natal Parks Board*, South Africa

7 Source: R. O'Donoghue, *Natal Parks Board*, South Africa

The Value Based and Open Knowledge Systems

The tribals in general and of India in particular have great regard for the forest. This is manifested in their perceptions of their forest and environment, especially their prevailing concept of natural resource conservation which gives them a sense of caring and stewardship over their forest resources. This involves responsible and moderate use of forests, so that they will continue to be sustaining for future generations. Greed has no place among the rural folk which in practice means that when they harvest crops, they use only the mature stems, and leave the young shoots for harvesting in a few years' time.⁸

They also greatly respect and protect the trees, and they take whatever they need from the environment and leave the rest for the rest of the species. They have a great fear of tree-fellers who cut the trees indiscriminately in their jungle because they are afraid that the disturbance will decrease their food supply.⁹ The forest seems to be everything to them. They feel an affinity with it and are thankful for its supply of staple food, building materials, medicines and raw materials for their handicraft. The forest is their world and they live in harmony with it and so guard it zealously.¹⁰

Through their day-to-day activities of agriculture and hunting, they utilise and extract forest resources to produce food and manufacture materials for their consumption and tools for their survival activities, respectively. They have been practising this way of life through many generations, using a complex and highly adaptive system, such as cultivation of hill and swamp rice. To cultivate their staple food, rice, they used different agricultural techniques, both shifting and permanent, depending on the different types of paddy.

In short, it has been their harmonising and systematic methodologies of using their environments (particularly land and forests) that have enabled them to practice similar economic activities through many generations to produce food and manufacture materials, not only for themselves but also to sell the surplus to non-agricultural people in the country.¹¹

8 See Sushil Saigal, *Does Community Based Conservation Make Economic Sense? Lessons from India*, Pune, Kalpavriksh, 2000. This book assesses the economic (material, financial) and other benefits that communities and society in general receive from community based management of natural resources. Examples from various parts of India illustrate the point that conservation does not have to be inimical to people's livelihoods and economic development but in fact can greatly complement human welfare and economic well-being.

9 See for instance, Rajasekaran, B. and M. B. Whiteford, "Rice-Crop Production in South India: The Role of Indigenous Knowledge in Designing Food Security Policies" in *Food Policy*, 18, (1992) 3, 237-247.

10 Neema Pathak and Vivek Gour Broome, *Tribal Self Rule and Natural Resource Management: Community Based Conservation at Mendha Lekha*, Maharashtra, India, Pune, Kalpavriksh, 2001. The story is of the Mendha Lekha village in the Gadchiroli district of Maharashtra is one of struggle and transformation of a once-suppressed Gond tribal community into a well-informed and empowered one. This book describes the process of attaining self-rule and taking control of the surrounding forests, which has resulted in an enhancement of social and ecological security. It explores the reasons for the success of this community initiative, constraints it faces, future directions to take and major lessons that it holds for a decentralised conservation system in the country.

11 See for similar arguments from other perspectives, Agarwal Anil, *Dying Wisdom: State of India's Environment:*

Indigenous Knowledge related to Agriculture

The agricultural knowledge of the tribals is practical, detailed and personal. In a biodiversity hotspot like Chattisgarh, for example, the knowledge of the tribals, both men and women, include a detailed distinction between many varieties of the main crops or sub crops, be it wheat, rice or millet. They distinguish the varieties on the basis of smell and taste, as well as the adaptability to a specific terrain, even specific fields.

In the infields, mixed cultivation of several crops is guided by a detailed view on what crops should go together and which definitely not. Rotation in the outfields follows a distinct pattern (beans, millet, tubers). The start of the cycle, the end of the fallow period, is indicated by specific grasses appearing in the fields. The end of the cycle is shown by the emergence of specific weeds between the millet and tubers. The start of the cultivation season is arrived at by both counting moons, watching the exact spot of the sunset and waiting for the migration of specific birds. During the cultivation season, the farmers are guided by a detailed knowledge of manure, both for the millet fields as well as for the tubers.

For them, this knowledge is practical. As subsistence farmers they are survival oriented, aiming at an optimisation of the chances for survival, not at a maximisation of the harvest. They do so by spreading risks; sowing several vegetable varieties, millet and other tubers, with their main crop of rice they are sure that though certainly some crops will not yield a harvest, some will. For the millet and other tubers, which are best adapted to dry conditions, they choose several varieties with differing drought resistance so that some will yield. Agriculture is to do with survival, not profit, a tendency which does not make them rich, but has the great advantage of keeping them alive, as it has done throughout their existence.

Knowledge: Factual and Detailed

Most tribal agricultural communities have a crystallized view of the general characteristics and exigencies of each of their crops: what amount of rain is needed, the dangers they run from crop diseases and parasites, the amount of manure needed, the way in which one crop combines with others, etc. They also know what plants should appear before the starting of cultivation in general, and where to expect those grasses on that particular field. They know the slight depressions in the dunes where they can bury a pot to catch some rain for drinking when they are out in the fields for days. When tending their vegetable gardens, they know at what stage of growth what

A Citizen's Report, Pune, CSE, 1997. A comprehensive book on the traditional water harvesting systems of India, it explores the rise, fall and potential of this system in the different ecological zones of the country spanning from the Trans-Himalayan region to the Islands. It documents water harvesting systems from prehistoric times, through evidences from archaeological excavations and references in ancient texts. It studies how the village-based water management systems of the historical times were manipulated for state supremacy during the Raj. In conclusion it highlights the present day water crises and the efforts by several NGOs to revive the water harvesting systems of the past.

type of manure is to be used (some groups distinguish between at least eight different types of fertilizers), and they know when the tubers and other vegetables are mature by judging the state of the flowers.

Knowledge is Personal

A farmer has this very specific knowledge about his own fields, and the fields he uses. When the fields change hands, the former user is expected to transfer this knowledge towards the best use of the field to its new 'owner'. As the fields fall into well-definable categories, this personal knowledge consists of some details per field, on top of the general knowledge pertaining to that particular terrain. The above mentioned qualities make for a very open system of local knowledge and differ in many ways from the dominant views of knowledge.

Indigenous Knowledge vis-à-vis Dominant Knowledge of Nature

It is obvious that the indigenous knowledge about the natural world contrasts with that of the Western scientific knowledge in a number of ways. The two differ in their social goals: survival of a people versus the luxury of gaining knowledge for the sake of knowledge, and for power over nature and other people. They differ in their intellectual goals too: while one prefers to co-exist with the mystery of nature, the other strives to unravel that mystery by explaining it away.¹² The two worldviews differ in their association with human action: while the one is intimately and subjectively interrelated, the other is formally and objectively de-contextualised. While the tribal worldview stresses on holistic perspectives with their gentle, accommodating, intuitive, and spiritual wisdom, the western science opts for its reductionist, mechanistic, and analytical explanations. They even differ in their basic concepts of time: circular for indigenous, linear for modern scientists.

On the one hand, the culture of science is guided by the fact that the physical universe is knowable through rational and empirical means, albeit the western rationality and culture-laden observations; while on the other hand, the local knowledge of nature celebrates the fact that the physical universe is mysterious, but can be survived if one uses rational empirical means, albeit the indigenous rationality and culture-laden observations. Indigenous knowledge moreover is not static, but evolves dynamically with new observations, new insights, and new spiritual messages.

Using Traditional Knowledge to Live Sustainably¹³

The norms, values, beliefs, expectations, and conventional actions of tribal people contrast dramatically with the subculture of science. Indigenous knowledge of nature

12 Mauro, Francesco and Hardison, P. D., "Traditional Knowledge of Indigenous and Local Communities: International Debate and Policy Initiatives", *Ecological Applications*, Vol. 10, (October, 2000), No. 5, 1263-1269.

13 J. Burger, *The Gaia Atlas of First Peoples: A Future for the Indigenous World*, Ringwood, Penguin, 1990, pp. 20-62.

tends to be thematic, survival-oriented, holistic, empirical, rational, contextualized, specific, communal, ideological, spiritual, non-elitist, cooperative, coexistent, and peaceful. Endemic to tribal culture is environmental responsibility, a quality that leads to sustainable science in terms of tribal cultures.

Relationship to the Land

For the indigenous people, the land is the source of life, a gift from the creator that nourishes, supports and teaches. Although the customs and culture of the indigenous people differ much, all consider the Earth like a parent and revere it accordingly. For many, "Mother Earth" is the centre of the universe, the core of their culture, the origin of their identity as a people. For them, the earth connects them with their past (as the home of the ancestors), with the present (as provider of their material needs), and with the future (as the legacy they hold in trust for their children and grandchildren). In this way, indigenoussness carries with it a sense of belonging to a place.

At the heart of this deep bond is a perception, an innate awareness and wisdom that all of life's mountains, rivers, skies, animals, plants, insects, rocks, and people are inseparably interconnected. They believe that the material and the spiritual worlds are woven together in one complex web, all living things imbued with a sacred meaning. This living sense of connectedness that grounds indigenous peoples to the soil has all but disappeared among city dwellers, the cause of much of modern alienation and despair.

For the indigenous people, the idea that the land can be owned, that it can belong to someone even when left unused, uncared for, or uninhabited is foreign and alien. In the modern world, land is in the hands of private individuals, corporate investors, or the state and can be sold at the will of the owner. For the indigenous peoples land is held collectively for the community (though competition between communities, and with outsiders, for rights of use, has sometimes led to conflict). According to the indigenous law, humankind can never be more than a trustee of the land, with a collective responsibility to preserve it.

The predominant rational worldview is that nature must be studied, dissected, and mastered and progress measured by the ability to extract secrets and wealth from the earth. But the indigenous people do not consider land as merely an economic resource. Their ancestral lands are literally their source of life, and their distinct ways of life are developed and defined in relationship to the environment around them. This difference in their perception of land itself has often led to misunderstandings. Many have assumed that indigenous people have no sense of territory because they do not necessarily physically demarcate their land. However, indigenous people know the extent of their land, and they know how the land, water, and other resources need to be shared. They understand only too well that to harm the land is to destroy ourselves, since we are part of the same universe.

Nature's Pharmacy

In many parts of the world, indigenous societies classify soils, weather, plant and animal species and recognise their special characteristics. Indigenous people have names for plants and insects that have not yet been identified by the world's botanists and entomologists. The *Hanunoo* people of the Philippines, for example, distinguish 1600 plant species in their forest, 400 more than scientists working in the same area. Of the estimated 250,000 to 500,000 plant species in the world, more than 85 percent are in environments that are the traditional homes of indigenous people. Nearly 75 percent of 121 plant-derived prescription drugs used worldwide were discovered following leads from indigenous medicine. Globally, indigenous peoples use 3,000 different species of plant to treat and control fertility alone. The *Kallaywayas*, wandering healers of Bolivia, make use of 600 medicinal herbs; traditional healers in Southeast Asia may employ as many as 6,500 plants for drugs. The use of plants and drugs is so much that almost all of the trees and plants have a place in the traditional medicinal lore. Some scientists now believe that indigenous knowledge may help them to discover important new cures for diseases such as AIDS and cancer. Of late, many in the developed countries too realise the potential of indigenous medicine.

Medicinal Plants in India

Indigenous people believe in holistic healing and work on the body and mind together to help cure illness. It is interesting to note that the vast knowledge about medicinal plants is now beginning to be acknowledged by the rest of the world. Further, the world also recognises the role played by indigenous people in preserving this genetic heritage. The tribal peoples of the northeast use plant drugs to cure different types of fever, bronchitis, blood and skin diseases, eye infections, spleen ulcers, diabetes, high blood pressure etc. This traditional knowledge is passed on to the next generation by the 'vaidyas', who are the Indian herbal medicine doctors. In the Northeast, in a single area of 277 sq km, around 210 types of medicinal plants have been found. There are people who believe that traditional health practices can provide up to half the local primary health needs. It is beyond doubt that if properly studied and recorded, this traditional knowledge could revolutionise the world of health and medicine.¹⁴

Traditional Knowledge and Resource Management

It is true that the modern industrial world is facing an ecological crisis. Yet few would admit that they could learn from the indigenous people and their way of life. Instead their economies and the way of life are often called 'primitive', and their technology dismissed as 'Stone Age'. Nonetheless, it is also true that these traditional ways of life have proved highly durable. Hunting and fishing have allowed the Inuit to survive in the Arctic; nomadic pastoralism provides a livelihood for people in the arid Sahelian

14 S.N. Chaudhary and R.P. Singh, *Tribes of Pachmarhi Biosphere Reserve and Their Indigenous Knowledge*, Delhi, Pratibha Prakashan, 2006, pp. 5-10.

region of Africa; shifting cultivation has sustained hundreds of distinct cultures in the Amazon and the forests of Southeast Asia. Non-indigenous people have not been able to survive in these extreme conditions without destroying the balance of the ecosystem.¹⁵

The key to the success of the indigenous people is the element of sustainability. Indigenous people today use the resources available without depleting them. They use their intimate knowledge of plants, soil, animals, climate, and seasons, not to exploit nature but to co-exist alongside it. This involves careful management, control of population, the use of small quantities but a wide diversity of plants and animals, small surpluses, and minimum wastage. Plants provide food, medicines, pesticides, poisons, building materials; animals provide meat, clothes, string, implements, oil etc.

The indigenous knowledge of nature has ensured the survival of many people in fragile habitats. All flora and fauna have a place in an ordered universe made up of humankind, nature, and spirits. And indigenous cultures help to protect the natural world from destruction through religion and rituals. Animals are commonly held in respect and their numbers maintained, often through careful management. Those following the Bishnoi religion in India, for example, have survived many droughts because they will not kill any animal or a tree. They breed cattle selectively, monitor the feeding of their camels, and live on milk, yogurt, and a few cultivated crops. Many among the indigenous people have a detailed understanding of animal behaviour. Those living in tropical forests, for example, recognize that where two different ecological zones meet, the hunting is more productive. Many even grow crops or trees to attract certain animals and increase their numbers.

Knowledge and Sustainable Cultivation

Shifting cultivation (sometimes called "slash and burn"), is a sustainable economic system that will not harm the environment. It is the most commonly practised system among indigenous people of Asia and lowland Latin America, and provides them with a high degree of economic independence and cultural integrity. Given sufficient land and low density of population, it is a highly successful way of using the forest. The economy of the *Karen* people of Thailand, who practice shifting cultivation, is based almost exclusively on subsistence dry rice production. An area is cleared of trees, bushes are burned, rice planted and later harvested. Each year a new site is chosen and the cycle takes seven years to return to the site first cleared. The system permits regeneration of the forest and the thin tropical soil, and does not expose the steep slopes to heavy rains, which would eventually wash away the soil in a fixed-field system. Money has virtually no place in the *Karen* community. If a village has enough food it is considered prosperous. When villagers say "we have enough rice", it means not simply that they will survive, but that they have everything they need. If,

¹⁵ Paul Chandler, "The Indigenous Knowledge of Ecological Processes among Peasants in Fujian, China", *Agriculture and Human Values*, 8, (1991), 1/2, 59-66.

however, shifting cultivation is unable to provide for the entire needs of a village, the people grow chilli or bamboo shoots, or they may collect and sell honey or other forest produce. And they nearly use all the income raised to buy rice.¹⁶

Indigenous Knowledge and Social Relationships

For many indigenous people, social cohesion has been the key to their survival. Food gathering and hunting depend on mutual support and cooperation, and disharmony within a part of the group is dangerous to the whole. In many cultures, men and women have developed complementary, if not equal roles; political decisions are arrived at through consensus, and other social arrangements that benefit the entire community have often been incorporated into the indigenous cultural traditions.

Marriage, for example, is an integral part of the social, political, economic, and spiritual systems of many indigenous societies. For example, in some parts of Northeast India, the groom must pay a high dowry but, in return, the wife becomes a member of the husband's clan under the direct authority of the household. Marriage can also ensure political stability for the community (by regulating exchange between groups), and continuing harmony with the spirit world. For essentially religious reasons, marriage may be prohibited between a man and woman of the same kin group, while in other societies it can only take place within the same kin group. The notion of marriage as a relationship founded only on the bond of romantic love is rarely, if ever, seen in traditional societies. The nuclear family, too, is a rare concept. A complex interweaving of lineage, clan, and family connections means that most individuals are related to each other, a tradition that fosters the sense of belonging to the group, and of the need to share.

Conclusion

This article has highlighted the survival orientation of indigenous knowledge by suitable references to aboriginal systems of knowledge as manifested in the knowledge repositories of indigenous groups from India, and other Asian groups of people. The survival centeredness of indigenous knowledge and the pre-suppositions and worldviews on which it is based contribute to the process of sustainable living and development, a factor that we as a world community can no longer ignore.

16 Maryam Niamir, "Indigenous Systems of Natural Resource Management among Pastoralists of Arid and Semi-Arid Africa", in D.M. Warren, David Brokensha, and L. Jan Slikkerveer (eds.), *Indigenous Knowledge Systems: The Cultural Dimension of Development*, London, Kegan Paul International, 1992, pp. 28-45. Also see Radcliffe, Edward B, Gregoire Ouedraogo, Sonia E. Patten, David W. Ragsdale, and Peter P. Strzok, "Neem in Niger: A New Context for a System of Indigenous Knowledge," in D.M. Warren, David Brokensha, and L. Jan Slikkerveer (eds.), *Indigenous Knowledge Systems: The Cultural Dimension of Development*, London, Kegan Paul International, 1992, pp. 48-56.