Indira Gandhi
National Open University
School of Interdisciplinary and
Transdisciplinary Studies

MSD-013
Socio-Cultural System

Block

3
INDIGENOUS KNOWLEDGE SYSTEMS

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BLOCK 3 INDIGENOUS KNOWLEDGE SYSTEMS

This is the third block "Indigenous Knowledge Systems" of the course on "Socio Cultural System". The block explores the hidden traditional knowledge wealth of India and discusses that this valuable knowledge should be put into use before it gets eroded by the winds of modernization. Unit 1 "Socio-Cultural Belief Systems" pertains to the course of evolution of our present day beliefs and values that we believe in Ideas like Ecophilosophy of the West and Ecocosmology has been explained well to make the learner understand that it is important to examine the rationality of the beliefs and their real impact on sustainability. The unit also encourages the learner to respect not only all forms of nature but the manifestation of environment as well. Unit 2 "Customs and Traditions" explores the rationality of culture and traditions through various examples. In this unit various stories about the tribes and tribal life and their customs and traditions has been mentioned. The clear distinction has been made on the suitability of the old customs and traditions in the present context. In unit 3 "Forests and Natural Resource Management" the importance of forests and need for their conservation has been highlighted. The nature and types of forests along with current forest policies are also given so that the learner is able to relate with real life experiences. Unit 4 is "Cultural dimension of Conservation: Innovation, IKS, IPR and Value addition". In this unit the meaning and scope of indigenous knowledge is described. Many consider indigenous knowledge to a science and many as art. This distinction is also explained in a lucid manner. Importance of indigenous knowledge towards maintaining sustainable societies is the crux of the unit.

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UNIT 1 SOCIO-CULTURAL BELIEF SYSTEMS

Structure

1.0 Introduction

1.1 Objectives

1.2 Nature as Nature or Nature as Human

1.3 Earth and Sky Symbols

1.4 The Eco-philosophy of the West

1.5 Eco-cosmology

1.6 Let Us Sum Up

1.7 Key Words

1.8 References and Suggested Further Readings

1.9 Key to Check Your Progress

1.0 INTRODUCTION

Humans adapt to their surroundings in a creative manner using the neuro-motor skills developed by them in the course of evolution. The characters of the human brain that set them apart from other species is the ability of abstract thinking, to communicate using this capacity for symbolism (that is through language) and living in aggregates by forming long term attachments and symbolic associations, what we call society. The human societies are not genetically formed by information coded in the genes but by the process of conscious association and a long term formation of a system of symbolic meanings that we call culture. In the course of human evolution culture has been the tool of adaptation, enabling humans to spread across the globe and occupy all possible ecological niches, by the use of technology that is only an aspect of culture.

More importantly humans have created their own environment by the process of cognition, so that the environment does not impinge upon them only as a material source of stimulation and resource but as a perceptual source where everything is interpreted before it impinges the senses. According to the philosopher Wittgenstein, human do not just “see” but they “see as”. Thus what may appear to be only a clump of trees may appear to a group as the abode of spirits; an animal may appear to be a god and so on. These perceptions that in an integrated sense we call a belief system, informed action and the behavior that is exhibited by humans and since they are held in a collective manner by a group (the society) and passed on by a collective process we call socialization; an entire society’s collective representations then give rise to collective behavior that regulate the ecosystem relationships of that society with its environment. It is for this reason that study of beliefs and values play a crucial role in the study of sustainability. In this unit we shall examine some of the beliefs held by various societies and see how they affect the ecological relationships and regulate the process of sustainability.

So also every society has philosophies of existence, it is not something that is confined to complex societies. How we perceive the world, the role of human beings, the cognitive dimensions of reality, cosmology and world view are part of the philosophy of every culture. Ecophilosophy is something that has been coined recently more in terms of the western system of dichotomous thinking that differentiates between nature and society in a way that most other societies do not.

1.1 OBJECTIVES

After reading this unit, you will be able to:

- determine the nature and culture dichotomy;
- explain the eco-philosophy of the West; and
- illustrate the concept of Eco-cosmology.

1.2 NATURE AS NATURE OR NATURE AS HUMAN

The nature culture dichotomy is rooted in Western mode of thinking and the Judeo –Christian tradition privileged humans above nature and also brought forth other dichotomies, like woman and man seen as parallel to nature and culture in a way that both nature and woman were seen as appropriately dominated by cultured men. Sherry Ortner (1974), an American feminist anthropologist, equated the universal subordination of women to the universal subordination of nature, a point of view criticized by many other scholars. MacCormack (1980) who pointed out that not only nature was not seen as subordinate in many non-western cultures, the dichotomy itself did not exist in many world-views.

Anthropomorphic representations of nature are a feature of most antique religions such as ancient Indian, Persian, Greek and Egyptian systems of beliefs. Most natural phenomenon was perceived as human like men and women but with superhuman abilities. Thus the forces of thunder, lightning and rain were deified as the king of heavens, Zeus in Greek and Roman mythology; Ahura Mazda the god of heavens in ancient Persian system of beliefs travelled to India and was established as Varuna, the god of heavens along with his partner, Mitra and thus the duo of Mitra-Varuna were the subject of many ancient Vedic verses. The Sun was worshipped as god not only by the Vedic Indians but also by the Egyptians and the Inca and Peru civilizations. These forces of nature like wind and rain, rivers and mountains are invested with human qualities, and believed to behave like humans. Like for example in Hindu mythology, Himalaya is god and Menaka is his wife and their daughter Parvati, is a goddess who wins the supreme god Shiva as her husband. There are myths that tell us that they have sons called Ganesha and Kartikeya. The celestial goddess Ganga, came to the earth in the form of a river to bless human beings, but in her human form she married King Shatanu and had a son who was known as Bhishma. These human attributes of natural things gives humans a sense of identification and they feel morally guilty while ravaging or exploiting them. Like the Gonds of Madhya Pradesh who believe that the earth is their mother and do not wish to use a plough as they say it is like tearing the breast of your mother.

In fact in India most natural phenomenon are deified including mountains and rivers. In her seminal study on the Ganga, Kelly Alley shows how the concepts

of purity and pollution with respect to Ganga have a real effect on the actual state of physical pollution of the river, with most people refusing to believe that the river (Goddess) that washes away every one's sin (Pollution) can herself be ever polluted. In her research in the city of Varanasi, Alley found that even though some (not all) people knew about the hidden drains carrying waste water from the city into the Ganga, right at the place where devotees were taking bath, they still considered the water to be pure. "But even if pilgrims know about the drains, many argue that they have no impact on her purification power, that power is eternal (acyut) and praised by the ritual practices of bathing, meditation and worship" (Alley 2002:101).While the belief in the purity of the Ganga may actually prove an impediment to the river's clean up drive, not all beliefs may have such detrimental effects on the environment. In fact most scholars have in recent studies praised the positive effects that beliefs and norms of folk and pre capitalist societies have on the sustainability of the environment.

Nature has often been viewed in terms of kinship with human beings. Many communities believe in what has been termed as totemism, where the human clans or kinship groups are believed to have been descending from non-human ancestors, in their environment. The people who have a particular animal, plant species or even a natural object like water, for their totemic ancestor, have the duty to protect and conserve the species or object and to treat it with veneration. This has the overall effect of maintaining biodiversity and ecological balance. In fact in many places it was shown that ecological degradation began as soon as people lost their beliefs in the kinship with nature or began to lose faith in the sacredness of nature.

1.3 EARTH AND SKY SYMBOLS

The belief in the sacredness of the earth mostly as a mother figure and the sky, seen likewise as a father figure or male god, is among the most primordial of beliefs that humans developed. The contemporary eco-philosophy of Deep Ecology or nature-centric beliefs has revived the ancient Egyptian concept of Gaia, or mother earth. In India, the Indus Valley civilization has yielded many female figures that typically represent such mother goddess figures that are associated with fertility, of the earth and of humans and animals. From ancient times people were well aware that death and decay is only one stage in the beginnings of new life; this cyclical aspect of nature was well understood even in the most primeval times and usually associated with female power. People celebrated the regenerative power of mother earth across civilizations, in India, Egypt and many tribal societies. In the ancient Vedas, Prithvi, the hot female goddess was cooled and made fertile by the rain sent by the sky god Indra, and produced the green trees and vegetation essential for all life.

As Caldwell (1999) explains, in the non-Aryan ancient traditions of India, preserved in the South, Tamil poetry of the Sangam period, focused on the earth's body in the form of mountains, rocks, trees and water bodies; and five types of landscapes were described with their specific moods. *Marutum* are the fertile plains where people live, and which contains the agricultural fields, the kitchen gardens and houses. The harvested paddy carried on the heads of women is seen as analogous to the body of the goddess Bhagwati. Thus traditionally the paddy sprouts were transplanted only on Tuesdays and Fridays, which are sacred days

of the goddess. She is also considered the deity of the tender coconut palms. Thus the staple food of Kerala is embodied in the form of the major goddess Bhagwati whose dance is performed on the dried paddy fields after the grain has been harvested. Coconut is in fact seen a sign of fertility and considered auspicious all over India to make appropriate ritual offerings. There is an intrinsic association of the staple and most nourishing foods and sacredness. The coconut tree is a guarantee of food and income, while the fruit is eaten, the other parts of the tree, its leaves, trunk etc, are used to make coir, coconut oil, mats, fans and many handicrafts. Thus sacredness is often an indication of the importance a tree or animal has in a culture. And it is this concept of sacredness that also serves to conserve the species and ensures that its good care is taken.

The sacredness of the earth is the key belief that motivates a reverential attitude towards nature and its manifestations. The reverence has two aspects; one is that of awe and fear, which instigates action of avoidance and that of gratitude and love like for a caring mother that motivates acts of nurturing and care. Thus while the former may be the attitude towards a forest that is avoided and circumscribed with taboos, the latter may be the attitude towards agricultural fields that need to be tendered and cared for. The result is the sustainable management of forests and its biodiversity. Similarly agricultural and horticultural fields, being circumscribed with taboos and care prevent many harmful and degrading practices from developing. For example a study done in Orissa reveals that while chemical fertilizers and genetically modified seeds are used in the fields in which the produce is designated for the market, the rice that is offered to the gods and used in rituals and self consumption is still grown by organic methods of cultivation.

For the pastoral as well as coastal people on the other hand the sky and the heavenly bodies are seen with a reverential attitude. In a pastoral community in the upper Himalayas the sheep herders looked upon the Sun as a mother and called it "Aama Nyama" or Mother Sun and the Moon was referred to as father's brother. Unlike what may be thought that illiterate people do not have any idea of the scientific explanations of natural phenomenon, the Bhotiya sheep herders knew about the water cycle, and how the sun caused the waters to evaporate and then come down as rains that were preserved as snow in the mountains. In summer when the snow melted, lush green grass came up and was fed to their animals. They said, "We worship sun because it causes the rain to fall and it gives warmth to our animals to survive. The sun is our life giver and therefore we consider it as our mother". The fishermen and coastal people who venture out into the sea, the heavenly bodies like the moon and stars are of great importance. The sea fearing people of the Melanesian islands could navigate with the help of the heavenly bodies without the help of compasses and they were some of the best navigators of the world. The traditional fishermen likewise can predict tides and the weather better than the weather men.

We shall discuss more about the traditional knowledge systems later. Here it is sufficient for us to emphasize that reverence for nature was not based upon ignorance but rather upon fairly comprehensive knowledge that gave rise to rationality that may have appeared as superstition but which had very positive impact on sustainability.

Check Your Progress 1

Note: a) Use the space provided for your answer

b) Check your answers with the possible answers provided at the end of this unit

1) What is a dualistic philosophy of nature and culture?

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2) How is nature viewed in Hinduism and other ancient religions of the world? How do these beliefs affect practice towards the environment?

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1.4 THE ECO-PHILOSOPHY OF THE WEST

It is widely accepted that the western philosophy makes a distinction between nature and culture, yet as Gisli Palsson points out such was not the case in medieval Europe where people still thought that they were a part of nature and the western world view was more monistic than dualistic as it is now. It was only during the renaissance period, marking the beginning of modernity those extraordinary changes took place that led to the perspectives centered on "discontinuities and distinctions" (Palsson 1996:65). From a spiritual focus, the renaissance artists for example followed a more explorative methodology and began to depict "human activities and their place in nature and history" (ibid). The painting styles that went in for the depiction of three dimensional spaces added a completely different world view and epistemology that triggered a revolution in the manner in which people now approached their relationship to nature, knowledge and learning. By such representations it became possible to acquire nature to see it as something outside of one's self.

As Descartes saw the world, everything that was real could be placed on a time/ space axis as an objective reality and all such reality was capable of being exploited, acquired and manipulated. This was the rational Universe that was not an aspect of subjective experience but of objective knowledge. By painting nature in three dimensions, it was understood that nature was an objective reality with an objective existence (situated within time –space coordinates) and hence graspable and exploitable. Nature in other words was neither sacred, nor were humans a part of nature or inside it as they were capable of grasping it from the outside. Humans, more specifically men were rational and objective while women

were more subjective, less rational and therefore both nature and women (equated with each other) were to be dominated and kept under control by men. Adding this perspective to the colonial experience the term men was understood as 'white' men in particular as the 'native' were irrational and even infantile. Thus any decisions made on how to deal with nature were best made by white men with their objective and scientific knowledge. Thus nature and environment were continuously modified, subjugated and brought under control.

As Palsson points out this domination attitude of nature was of two kinds, what he calls the Orientalist and the Paternalistic. The third approach that is more non-western and pre-modern is the one that advocates a more sharing and reciprocal relationship, namely Communalism. The Orientalist approach is the attitude exhibited by the colonial rulers over the resources of their colonies. It is also expressed in the capitalist which emphasis on maximizing profit at the cost of devastating the environment; it is the attitude of taking without giving, what has also been called as negative reciprocity, where one party to an exchange appropriates disproportionate amounts from the other by virtue of its power. The vocabulary of Orientalism is typically one of domestication, frontiers and expansion-of exploring, conquering, and exploiting the environment for the diverse purposes of production, consumption, sport and display (Palsson : 68). However the world has realized today that this kind of exploitative attitude towards the environment has not paid off as nature is not a passive victim. The massive environmental issues that we are facing today is a result of this philosophy that humans can dominate over nature and that white man's rationality is the most superior. It is because of the realization that too much of exploitation is not sustainable and one is in danger of killing the goose that lays the golden eggs that the Paternalist philosophy developed.

With Protectionism, the attitude that humans are in control still prevailed, the only difference was that now the strategy was not of direct destruction and extraction but of management and judicious exploitation. These may include rights activists who may aggressively put their own views forward. Many of them have an exaggerated and romantic view of the so called 'primitive' or native people who they feel have ideal human –environment relationships. Many scientific approaches modeled on terms such as resource management fall within this approach. Also traditional producers such as peasants who feel that they have a balanced reciprocal relationship with nature are also having an attitude by which they feel that by using their judgment and skills they can make the environment yield what they want. The use of modern technology, introduction of concepts such as efficiency and regulation are all aspects of protective *Paternalism*. This philosophy continues to prioritize humans and ignores other aspects such as inequality, external costs and subjective aspects such as emotions, sentiments and values. It is primarily an economic approach that seeks to maximize the availability of resources to those who can afford them and to see to it that an uninterrupted supply is maintained.

The third type of philosophical approach, *Communalism*, is radically different from the first two that it does not put a priority on humans. It does not seek to look for a balanced reciprocity but rather for an intimate and subjective relationship in which both nature and humans are situated at par in a monistic unity. It is highly influenced by Marxism and the theory of practice. It does not focus itself on the individual but on the community. Many preliterate societies

living close to nature exhibit communalistic philosophies. For example Nurit Bird-David working among the Nayakan of South India has shown how these people who are forest dwellers look upon the forest as their parent, who satisfies all their needs; such that their view of nature is that of a giving nature and they see themselves as children. In such a philosophy, the concept of control, management and exploitation cannot arise. On the other hand it is an affectionate and intimate relationship in which the people feel comfort in nature.

The Bhotiya pastoral communities are afraid of civilization and cities and feel comfortable and secure when they are in the upper reaches of the Himalayas, even in the forests and high altitude pastures. A shepherd grazing his sheep hundreds of miles away from civilization, in the high mountain tops has nothing to fear, he knows how to deal with the forest spirits and deities up on the hills. The shepherds relate their security to the purity of the environment, air and water in the high mountain tops, they feel as they come closer to cities, the air and water gets polluted and their animals get sick. To them the more a region is away from human habitation the purer and more sacred it is.

The western world view has usually the opposite view point and also those who live in cities and urban areas. They fear nature as wild and dangerous and in the early phase of colonization the human –nature relationship was often phrased in terms of conquest, control and clearing. Thus, forests were cleared to make way for agricultural fields and cities; and the two were seen as opposed to each other. Thus both oriental and protectionist philosophies sought to use nature rather than live with it. It was only the communal approach that included nature within its social relationships and had a more interactive approach to nature actually was able to manage a more sustainable relationship. We have seen that the maximum amount of time as homo- sapiens has been spent as hunters- gatherers, a philosophy that we can also call as eco-cosmology, where the deep relationship and bond of humans with the environment is explicitly felt. When humans lost their bonding with nature they became predators, what Ramachadra Guha has called the omnivores, trying to usurp as much as possible of the environment for their own use. At this point instead of a communal sharing of natural resources, various strata and interest groups compete with each other to extract as much as possible for their greed.

Thus industrialization and capitalism along with the development of a value system that placed too much emphasis on materialism and accumulation of material things led to increase in accumulative attitudes and measuring social status and success by pecuniary standards only. All other qualities of humanity are superseded by that of monetary success. It is for this reason that people cannot put a stop to their accumulative behavior and therefore need to exploit nature more and more. The concepts and values of sharing decreases; competitiveness increases. Consumption becomes directed towards status and a consumer driven world view that puts people on a scale of consumption in order to assess their worth for society. It is this world view that has led to a disastrous situation for the world. On the other hand eco-cosmology is a way of living with nature rather than using nature.

1.5 ECO-COSMOLOGY

Eco-cosmology was a term coined by Elizabeth Croll and David Parkin(1992) in their seminal volume, Bush Base Forest farm, one of the first attempts to consolidate non-western philosophies.

The Amazonian forests have held the attention of the world as one of the last remaining rain forests that is fast getting depleted by the onslaught of commercialization and capitalist development. The forest dwellers of the Amazon region have been a focus of study for this reason as well. Here we shall describe the eco cosmology of the Amerindians of the Amazon, studied by Kaj Århem (1996), for whom there is no separation of nature from society. Thus humans are one part of a total world that is regulated by cosmic principles. "As holistic cultural constructs, eco-cosmologies engage and motivate; they mould perception, inform practice and supply meaningful guidelines for living" (Århem: 186).

The Makuna, of the Columbian Amazon all beings are interlocked in exchange relationships of hunters and preys. They are subsistence farmers and hunters and food gatherers where men hunt and women do the gardening. The Makuna, called themselves the 'Water people' and have marriage relationships with the Yiba people who are stipulated to be descendents of the forest. This is a totemic relationship. Together the Water people and the Forest people form a single community speaking the same language and occupy continuous territory. Since they speak the original language of the Water people they are called as a community by the name of Makuna.

Like most other people of their type of subsistence, the Makuna have all their activities such as hunting, gardening and even daily consumption of food accompanied by rituals. There is no separation between the sacred and the ordinary. The Makuna distinguish between the transcendental world of the *he* spirits who are both life givers and predators and the every day, visible and physical world. While the former is unchanging and timeless the latter is moving and visibly transforming. Everything in the material world has its counterpart in the *he* world, and everything that happens in the visible world is made meaningful by the spiritual existence of the *he* world.

The animals and humans are all the same kind of being with the same essence so that one class of being can always transform into another class of being, thus humans can turn into animals and animals into different kinds of animals. Thus the essence of every being can manifest itself into different kinds of energy, all living things share the same vitality that circulates around and manifests itself in various physical forms that have only a superficial difference. All beings are the same essence otherwise. The relationship between all these beings are of predators and prey; either one is a prey for another class of being or is a predator for the same. Thus from the human point of view the entire Universe consists of either human food or eaters of human beings. There is a cosmic web of either eat, or be eaten. The system has two extreme points that all the eaters are prey to none and the plants are only eaten and do not eat anything. The humans occupy a middle position where they are food for some and eat some. The supreme predators include the anaconda, the jaguar and the gods and the *he* spirits.

When an individual of any species is eaten, a new process of reproduction begins as the spirits are sent back to the 'birth house' of the particular species and the

species as a whole is empowered for reproduction. Thus when the *he* spirits eat a human spirit, it is sent back to the birth house and similarly if a human eats an animal; its spirit is sent back to its birth house. Thus individual deaths ensure the continuation of the species. The Makuna philosophy of life explains predation as exchange as death is exchanged for regeneration of life.

The shamans are the human counterparts of the supreme predators, the jaguars, anaconda and spirits; all of these can change forms, transform from one to another. The main role of these 'cosmic hunters' is to move from one life world to another and see that all species are ensured for reproduction. The Makuna believe that the animals, birds and fish are all 'people' who live in houses, have their fields and have intelligence, rationality and agency just like humans. They roam in their particular bird or animal forms yet when they reach their own place they become like people. They recognize kinship between the spirits, animals and humans; the Makuna are Water people the descendants of the water Anaconda and the Yiba are descendents of the mythical forest being, Yiba. In this cosmic world all are equal and share bonds of kinship. They are bound to each other by bonds of exchange just like people who have married into each other's groups. The role of fish and animals is however different, as animals are seen as incarnations of the God while the fish are only byproducts of the creative work of God. Therefore the Makuna consider fish to be more like food than game animals that are seen as active agents like God and men. While other animals have appropriate food, humans can convert any species like animals into food by their shamanistic powers. A shaman is a person with ritual powers and he blesses the animals or plants that are killed so that their spirit goes to the 'birth house' from where the species originate. This is the exchange process involved in hunting that the hunter gets the meat but has to ensure that the spirit of the dead animal/ plant returns to the birth house. In this way humans differ from other species that they are not confined to any specific foods. If the food is not cured by blessings then it is dangerous as it contains its own weapons. Only blessings neutralize such powers inherent in all food. Unblessed food thus causes illness, being the result of failed reciprocity because unblessed spirit does not return to the birth house.

Most non-western societies relate disease to failed morality, like among the Makuna mentioned here it is the failure to reciprocate, to complete the exchange; but in Hinduism often people say disease is caused by bad karma, or many people think it is caused by the wrath of the God. Since many times God is nothing but natural objects, the concept of failed morality is often attached to irresponsible behavior towards natural objects, like polluting water, over killing animals etc. As among the Makuna, all species eaten, are just like humans, so one must kill only if one has to that is for survival. But, in most cases the person who kills must make up by prayers, rituals or blessings to atone for the killing. Thus while humans hunt and kill the animals for food and eat the plants, they also ensure their survival and reproduction through rituals and shamanistic practices.

This in fact is the principle of sustainability at the metaphysical level. One must replace what one takes and there is no essential difference in scale of values between a human and non-human being. All are equally important and like the Makuna, many preliterate people understand this mutual dependency of humans and non-humans in the cosmic order.

Most scholars working with illiterate and traditional people have found their belief systems to be perfectly logical and rational and contributing towards a sustainable relationship with the environment. The Makuna for example do not have a technology for storage of food, and the ideology of reciprocity that they have with the natural beings prevents them from any kind of overexploitation. Only what is required for immediate consumption of the family is to be taken from the environment. If there is a ritual, then that extra food is always shared among several families and the shaman regulates the amount to be used, ensuring that there is no wastage. Makuna eco-cosmology emphasizes man's responsibility towards the environment and the interdependence of nature and society. Human life is geared to a single, fundamental and socially valued goal i.e. to maintain and reproduce the interconnected totality of beings which constitute the living world; 'to maintain the world', as the Makuna say. In fact this cosmonomic responsibility towards the whole end the accompanying shamanistis knowledge= is, according to the Makuna, the hallmark of humanity" (Arhem: 201).

Check Your Progress 2

Note: a) Use the space provided for your answer.

b) Check your answers with the possible answers provided at the end of this unit.

1) What kind of attitudes makes people expiate nature? What social conditions are responsible for such attitudes?

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2) What is Eco-cosmology? Discuss.

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3) What are the ways in which we can develop a more sustainable attitude towards the environment?

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1.6 LET US SUM UP

- Sustainability is a value that is inherent in the cosmologies of many pre-literate and pre-capitalist people.
- The inclusion of the natural world within the moral Universe of social relationships is what is crucial to bringing about a sustainable relationship with the environment.
- Because of the intervention of the western system of rationality and a modernist way of looking at the world, some of us can no longer perhaps go back to the same ways of thinking as of antiquity. But the important thing for future is to examine the rationality of the beliefs and their real impact on sustainability.
- The modern scientific dichotomous way of thinking about nature and society has not paid us good dividends.
- It is relevant for us to respect not only all forms of life but all manifestations of nature like mountains and streams.
- It is the attitude and values that need to be relearned from our own past, the technology is not so important for technology can always be invented.

1.7 KEY WORDS

Totem : An animal/plant/natural object which is considered as the representative emblem of a clan.

Taboo : A social custom of restriction or prohibition based on religious beliefs.

Community : Group of people who have common interests and understandings.

Industrialization : Development of industries on a large scale.

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1.9 KEY TO CHECK YOUR PROGRESS

Check Your Progress 1

1) Your answer must include the following points
   - Nature-culture dichotomy.
   - Celestial bodies into the forms of natural things, beings and phenomenon.
   - Developed in Indeo-Christian era.
2) Your answer must include the following points
   - Naturalistic form of worship representation of Gods and Goddesses.
   - Conserve environment.
   - Control agricultural activities.

Check Your Progress 2

1) Your answer must include the following points
   - Capitalist emphasis on maximization of profit.
   - Negative reciprocity
   - Diverse nature of production and consumption.
   - Fear of nature.
   - Wilderness of nature.
   - Industrialization
2) Your answer must include the following points
   - Nature and human beings are complementary.
   - Holistic view of living encompassing the relationships
3) Your answer must include the following points
   - Respect all forms of species.
   - Appreciate the ecological wisdom.

UNIT 2 CUSTOMS AND TRADITIONS

Structure

2.0 Introduction

2.1 Objectives

2.2 Relevance of Traditional Customs

2.3 Traditional Social Organizations and Sustainability

2.4 Resource Conflicts

2.5 The Coast, The River and The Fishermen

2.6 Let Us Sum Up

2.7 Key Words

2.8 References and Suggested Further Readings

2.9 Key to Check Your Progress

2.0 INTRODUCTION

In the previous unit we have discussed the beliefs and worldview across many societies of the world. As mentioned these beliefs are important as they inform action and practices, what we called as customs. However unlike the popular conception, these customs are neither static nor rigid, most of them are informed by logic and rationality and serve to maintain a healthy human –environment relationship except when commercial and political interests intervene. A major source of conflict has arisen in the modern world when subsistence economies geared to the needs of local people are sought to being uprooted and replaced by exchange economies geared towards making cash profits and that too for mostly outside agencies. Very recently we are seeing the resistance put up by local people against the introduction of multinational companies into areas having a thriving local economy based on locally produced environmental resources. The people of Orissa are resisting the replacement of their well integrated economy based on betel leaf cultivation and prawn culture by the mega steel plant proposed by the Korean multinational POSCO. The agitation against the proposed mega thermal plant at Srikakulam (July 2010) is based on similar lines where a self-sufficient local economy and environmentally critical water bodies are sought to be uprooted to make way for an outside mega thermal plant project.

The rhetoric routinely put up by the power holders, both politicians and economists is that the local people are irrational and they illogically want to cling to their age old customs and do not want to have much desired change. However environmentalists have pointed to the huge environmental costs of such projects and also their adverse effects on the lifestyle and human rights of the local people who inevitably get marginalized and land up either as landless migrants feeding the labour force in the cities or as bottom line poorly paid workers in the same projects.

2.1 OBJECTIVES

After reading this unit, you will be able to:

- comprehend the rationality of customs and traditions;
- recognize the importance of traditional social organisations in the process of sustainability; and
- explain the value of local knowledge and customs in the process of modernisation.

2.2 RELEVANCE OF TRADITIONAL CUSTOMS

One of the seminal works was done by Roy Rappaport (1968), on the role of rituals in maintaining ecosystemic balance among horticultural people in the New Guineas. This study transformed the way rituals were approached as a part of religion and as a way of dealing with the supernatural to do something that regulated food supply and led to a sustainable balance of cultural and environmental variables. This approach known as ecosystem approach introduced the concepts of negative feedback and systems into the study of human environment relationships.

Rappaport used this theory to study the role of rituals among a Maring speaking people, the Tsembaga, living in the interiors of New Guinea, in his classic book, *Pigs For Our Ancestors* (1968). He showed how the ritual sacrifices of pigs in their annual rituals, led to a regulation of relationship between the humans, and the non-humans. "To be more specific, this regulation helps to maintain the biotic communities existing within their territories, redistributes land among people and people over land, and limits the frequency of fighting." (Rappaport 2008:254).

Since the communities are not integrated under any higher political body the rituals help to integrate them and form allies for fighting as well as distributes surplus pig meat to a larger population, each community being assured by the cyclical rotation of these rituals to have a supply of high quality protein when they need it most, that is at the time of warfare; as the pig sacrifice rituals coincide with the feuding. The Tsembaga, at the time of their study were a small population of only about 200 people, with little contact with the outside world. They are thus taken as a typical case of a preliterate community who maintained a close interaction with the natural environment. Rapport has referred to this small group as an ecological population that is "as one of the components of a system of trophic exchanges taking place within a bounded area" (Rappaport 2008: 255). The Tsembaga along with their biotic environment have been considered as an ecosystem. However since the Tsembaga maintain a gene flow by intermarriage with other groups in the vicinity and also engage in exchange of material goods with them, it is considered that these larger aggregate is like a 'population' in the sense that this term is used by geneticists, that is as "an aggregate of inbreeding organisms persisting through an indefinite number of generations and either living or capable of living in isolation from similar aggregates of the same species" (ibid: 256).

The Tsembaga practiced shifting cultivation and grew a variety of tubers and yams, sugar cane, sweet potatoes and large variety of greens. The record kept by

the researcher indicates a daily intake of 2,600 calories by men and 2,200 calories by women both of whom are of short stature and slight built. This indicates a good intake although 99 percent of their intake was of vegetable and Rappaport is of the opinion that the Tsembaga achieve nitrogen balance at a low level or have reduced protein intake. It was found that between 0.15 and 0.19 acres of land was cultivated to feed each person, per year and fallow periods for shifting the plots varied from 8 to 45 years, so that the secondary forests on the fallow fields were about 1000 acres. Along with their cultivation the Tsembaga keep pigs that are reared by the women, and kept in pens in the secondary forests. The pigs are allowed once the secondary forest trees are large enough not to be damaged by their rooting that incidentally also keeps the soil loose and free of excessive vegetation making it easier for them to replant them. The pigs thus act both as scavengers picking up garbage and as cultivating machines.

The people never kill their pigs under normal circumstances but only sacrifice them if someone is ill or kill them ritually at the ancestor worship rituals known as Kaiko, which accompanies the beginning of warfare with a neighbouring group, with whom they may be having marriage relationships. The Kaiko usually signals that the combined human and pig population has become too high to be sustainable. The pigs are fed with sub-standard tubers and household wastes and the amount they eat is almost equal to that of a human, but when their numbers become too large they need to be fed on tubers especially grown for them as waste food is no longer sufficient. Since women produce food and feed the pigs it puts extra burden on them. The increase in size of a pig herd also signals an increase in human population as no pigs would have been sacrificed for a long time, if no one was ill or dying. The pig population is kept low by castrating all juvenile male pigs and the new pigs are born of domestic females and feral males. This keeps the growth rate very low and it takes a long time for the human and pig population to grow large enough to cause such disturbances that a war becomes imminent. If pigs grow in numbers the skirmishes involving pigs straying into growing gardens increases and daily fights take place between neighbours till some of them begin to move out of the territory and women begin to press for a Kaiko.

The Kaiko is a ritual that signals that the peace stones and the Rumbim that was planted at the time of the last truce can now be uprooted and a new cycle of warfare may begin. With the uprooting of the Kaiko that is nothing but a ritual pole with the fighting stones tied to it, the pigs are killed. Almost all adult and juvenile pigs are killed and the meat is eaten by the men who go to war and distributed among the allies who help them in the fighting. Thus by participating in a Kaiko, people acknowledge that they have now become part of that particular group. The fighting is always regulated and few casualties ever take place. The fighters are afraid of the spirits of the dead and limit them to as few as possible. Also the practice of not drinking water but eating pig fat with a lot of salt makes the warriors too thirsty to fight for too long. The main effect of the fight is the killing of surplus pigs and the distribution of the meat to a large population, supplementing them with the protein normally missing from their diet. Also they get it at the time they need it most, that is at the time of bodily stress. Even during peace the pigs are sacrificed at the time of illness that is when the body requires extra nutrition and often this high protein intake may make the ill person better and also help the family members to cope with the stress of looking after someone who is sick.

When there are no more pigs to be sacrificed the fighting is called off as it is dangerous to fight without making offerings to ancestors. There might be a truce or one group that is the loser may go off their territory in which case the victors go into the territory and kill all the remaining pigs and destroy houses and field but they do not occupy the territory for fear of the ancestors of the people who have left. The Rumbim is planted and the fighting stones put up to appease the ancestors and for this some taboos are still in place. These include taboos on dancing (major source of courtship), eating wild marsupials and rodents. The people who had fled join other groups and begin to offer sacrifices with them. Over a period of time when the victors feel that all ancestors would have left, they occupy the new fallow land and plant the Rumbim. One effect of this waiting period is to allow the land to come back to normal fertility. The Rumbim is uprooted only when the next Kaiko cycle begins (One Kaiko cycle usually lasts a year, when pigs are sacrificed and sporadic fighting takes place). Once the Rumbim is planted normal activities like dancing and getting married takes place and food intake resumes that includes widely occurring small animals.

Let us now examine the rationality of sustainability in this entire ritual cycle. Firstly the population of pigs acts as a regulatory mechanism to control the population of humans and serves to redistribute this population in a more sustainable manner, from an area of high congestion to areas of lower congestion. The stress leading to fights begins because of high population density of humans and pigs that is interrelated. It allows the wild species to recover their populations because of the long periods of taboos. It helps form new alliances between groups and also provides supplemental high protein intake in a population normally suffering from protein deficiency. This is only one of the examples of rituals providing ecologically sound rationale to promote sustainability. One may also take the example of concept of sacred groves that have served to preserve many species of plants and also prevent natural disasters like land erosion and storms. Marvin Harris has analyzed the concept of sacred cow in India in light of the economic rationality of not eating an animal that is the back bone of the agricultural economy besides providing food in terms of milk and milk products. According to Harris, if there was no ban on cow slaughter at times of famine people would have eaten too many cows thus being left with no bulls for traction at the end of the famine and also having no animals for manure and other benefits provided by the cow.

No doubt as we have seen in the case of the river Ganga sometimes, traditional customs such as the immersion of idols in the river may lead to pollution. But if we examine this custom a little more closely we find that in the times when these were prevalent or originated, the population was low. In the villages, the Durga Puja used to take place only in one house namely that of the Zamindar. Sometimes there was one Puja among several villages as not all households even of Zamindars had the sanction to perform Puja. Also the idols were always made of clay and biodegradable materials like cane and bamboo. The idols were usually decorated with real jewelry that was taken off before immersion. Thus the load on the river was minimal. But in the urban situation and with increasing population, now hundreds of idols are immersed , also they are painted with toxic chemical paints rather than the natural dyes used earlier and tinsel decorations add to the pollution. Thus a custom that may not have been environmentally toxic can become so in changed circumstances. Therefore there is always need for revision and reinvention of customs.

2.3 TRADITIONAL SOCIAL ORGANIZATIONS AND SUSTAINABILITY

Besides rituals and religion, kinship and especially kinship groups have played key roles in management and sustenance of resources. Shifting cultivators for example hold land by clans and kinship groups where the individuals only have rights of user and not of possession. Thus as large tracts of land lie fallow, they need to be protected collectively and it is not possible for individual households to look after and protect so much land. Individual households are given land according to their needs at the beginning of each cultivation cycle that may be done by a shaman or a priest or a clan elder. It is the same case with pastoral communities where again rights of user to pastures and water bodies are often held by communities based on either kinship or village settlements. Thus while individual households may own their flocks, the access to what may be called 'abstract property' is vested in the collectivity.

The social organization based on some principles of common ownership and access to resources is found among people with a mode of subsistence that has a large resource base and less population density. These apply to resources such as water bodies, forests, grazing land and shifting cultivating land where only a fraction of the land is under cultivation at any time. The collective responsibility allows for greater management and also for the equitable circulation of resources with least possible wastage. Thus in shifting cultivation each household gets land according to its needs. Thus there is no problem of surplus at one unit and less than subsistence at another. For pastoral communities also precious resources like water and grazing grounds are equitably accessible to all with hereditary rights.

Describing access to scarce water resources in the Kalahari, Polly Weissner (1982) has shown how kinship relationships allow for a degree of security to individuals providing them with several options in case one option fails. Thus unlike in agricultural communities where land is usually handed over individual households and follows only one line of descent that is either through father or mother , rights to the n!ore, or a food and water resource locality that can sustain at least one band throughout the year are spread all across the Kalahari inhabited by the Bushmen. In the present day context, in addition to food and water the n!ore gives access to wage labour, opportunities for marketing crafts, schools clinics, etc. (Weissner 1982: 62-63). Each person gets rights to one n!ore from their father and one from their mother. During the course of their lifetime a person gets strong rights in the n!ore they live in and maintain weak rights in one they have inherited but do not live in. The rights to the strong n!ore are passed on to the children. However a person can also live in the n!ore of a spouse and subsequently get a right over it. In case a n!ore is left uninhabited then others can negotiate rights to live in it from those who hold it weakly. Thus a person has many options to access resources that are critical to survival yet there is the provision of equitable distribution inbuilt into the system. Thus the system of flexible distribution avoids overload and at the same time secures adequate resources for everyone.

One of the most remarkable feature of social organizations that makes sustainable and extremely efficient use of the precious resource of water for wet rice cultivation is the Subak of Indonesia described by Clifford Geertz. The Subak is

an organization made only for irrigation and has a complex structure that involves the provision and distribution of water, timing of the cultivation activities and ensuring an efficient use of resources. A Subak consists of all the rice terraces irrigated from a single major water canal that runs down the slope of a volcanic mountain and has its origin in a mud and stone river dam. The Subak functions as a corporate body that has access to the dam and the canal, the tunnels and aquaducts and reservoirs used for running water down from the hills into the fields. The Subak is a spatial domain and all people who use it to irrigate their fields in that bounded area are its members. A large land owner can be the member of more than one Subak and membership is independent of caste, kinship, village membership and class. Thus the Subak is a corporate organization specifically created to manage irrigation, both technologically and socially and also has religious aspects that are integrated into its technological and social dimensions. The main canal coming down from the dam is divided into two canals by bamboo water dividers; and this process is repeated five or six times till the water reaches the fields in large numbers of narrow streams. This multiple divisions by which water is channeled into narrower canals are fixed and allows for very little adjustment. It is actually written down in palm leaf Subak Constitution and is a formal dictate. The ultimate result is that the final openings provide exactly the same amount of water supply.

The productive activities on the individual fields are carried on by individual owners in their own capacity, independently of each other but the timing is coordinated such that every field in a Subak must be planted at the same time. The entire technical task of the Subak is collectively carried out by its members, in work groups that attend to various layers of the Subak and the size of these groups varies accordingly. This entire system has at its apex the Subak chief who is an elected office bearer and who presides over the Subak council which is comprised of all the members each having a single vote irrespective of the size of their holdings. The Subak can take away a man's land if he does not comply with the Subak regulations. The Subak council also arranges for all the Subak rituals and gets priests to perform the rituals that mark every stage of cultivation. However in spite of these regulations and norms, the actual cultivation and marketing is done individually and not all members are of equal economic standing. The regulation of water is done through the elaborate rituals that involve a rice goddess cult. The various ceremonies that have their own temples, priests and rituals nevertheless regulate the cultivation into a systemic rhythm. The overall ritual has nine stages and takes place concurrently at all the levels. These are 1) water opening 2) terrace opening 3) planting 4) purifying the water 5) feeding the gods with holy water and other offerings 6) budding of the rice plants 7) growth of the rice 8) harvesting and 9) storing the rice. Now the first of these ceremonies is staggered in such a way that it is the highest terrace that begins the cycle and the lowest does it at the end, so that while the highest is harvesting and storing its grains, the lowest may be planting. Thus the water comes down step by step and everyone gets it equally.

As Geertz explains it, the water is regulated in such a way that while one is making maximum use of it, the others are at various stages of using water, and the entire water system is not taxed simultaneously. This not only increases the efficiency of production but leads to a highly sustainable system that is able to maintain itself year after year , without reducing productivity and also ensuring a democratic and just distribution of resources.

Thus we find that in many societies of the world, customs and even rituals have played key role in human environment interactions and at times given rise to highly efficient and sustainable systems of environmental regulation and management. Such systems however are usually delicately balanced and may be destroyed if interfered with or if under attack from outside forces. Most of the time such outside forces manifest themselves in the form of laws that are meant only for the power holders and not for the local people. The fine ecological balances that the local communities may have created over generations are usually disrupted and the people lose their subsistence base.

Check Your Progress 1

Note: a) Use the space provided for your answer

b) Check your answers with the possible answers provided at the end of this unit

1) What are customs? Are they static? Explain with examples.

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2) How can a traditional custom contribute to the maintenance of an ecosystem? Elaborate.

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2.4 RESOURCE CONFLICTS

One of the major sources of conflicts has been the takeover of communal lands and resources by the state, most of which had happened during colonial times. The attempts to replace a subsistence economy or a local system of exchange by a market based economy and integration into global economy has also given rise to conflicts. Madhav Gadgil and Ramachandra Guha (1995) have reported how in the Dharwar district of Southern Karnataka, villagers uprooted eucalyptus saplings and replaced them with locally useful plants. The incidence that took place on 14th Nov, 1987, was in protest against the allotment of common village land to a polyfibre unit that wanted to grow commercially useful eucalyptus trees on it. The villagers were protesting peacefully, yet forcefully to indicate that the village commons were not meant for commercial exploitation but for the good of the village people.

In a similar way Chipko activists in Himachal Pradesh uprooted 7000 eucalyptus saplings for a forest nursery in Chamba District and planted locally useful broad leaved trees instead. All over the hills local NGOs and activists are continually resisting the planting of commercial conifers and want to promote the retention of natural forests and broad leaved trees like *banj*. Some of the most controversial projects have been the building of mega dams that submerge large tracts of valuable forest land and biodiversity as well as play havoc with people's social and cultural lives. The world view of land as a landscape of memories and inscribed values such as spiritual, social and personalized sentiments are increasingly being viewed as irreplaceable and impossible to value in terms of money.

The personal costs of development are increasingly being brought to the forefront in the past three decades or so ever since real opposition to the Tehri dam project began and as the Narmada agitation acquired international proportions. Guha and Gadgil (1995) have recorded one of the earliest and less known agitations against building of a dam that took place in the years following World War 1, in the Sahyadri hills in western India. This refers to an ambitious project of the industrial house of Tatas to build a series of dams on the Sahyadri hills. The first dam built near Lonavala just acquired land from peasants without giving them any compensation. The next one was planned near Mulshi, close to Pune, a centre of the Indian freedom Movement. A peasant objected to a trench being dug on his field and a British engineer, brandished a revolver at him. The issue took on nationalist proportions and Senapati Bapat, a young congress leader led an agitation that halted the dam for a year.

The Tatas were then directed to acquire land from the peasants by paying compensation. Here the situation became similar to what was much later faced in Singur in West Bengal. While the upper caste Brahmin landlords were in favour of giving up the land in lieu of monetary compensation, the peasants were reluctant to give up their only source of income. Also like most peasants their attachment too went beyond commercial interests, they considered the land as their way of life. However unlike in Singur, the Tatas were able to push through the deal with the then British government and the compensation went to the landlords and the actual tillers were left high and dry. The only positive outcome was that the Tatas dropped other projects meant for the Sahyadri hills. However interesting issues related to development were raised at this time and have been repeatedly echoed in many projects undertaken later.

The rhetoric that the dam projects were of national interest and was visualized keeping a western model in front wherein requirements of electricity and power were mostly meant for urban and elitist areas. For the Mulshi Peta dam the advantages listed included the saving of large amounts of coal, transportation of coal, the divergence of water for agricultural purposes after its use for generating electricity and generating work for labourers. The rationale has been that people displaced from agriculture will become available as labour on these projects. However, the collapse of the displaced people's entire life style, their rituals and religion and their social organizations were completely overlooked. The displacement rhetoric takes a mechanistic view of humanity depriving it of its cultural and social values and the richness of its lifestyle. Also the environmental costs and effectiveness of the projects are often overlooked as it was done for the Tehri dam project that is an environmental as well as an engineering disaster,

besides hitting at the roots of Hindu religious sentiments by damming the river Ganga.

2.5 THE COAST, THE RIVER AND THE FISHERMEN

While a lot of focus has been centered on forests and mountains the coasts were relatively less studied in terms of environmental impact till the incidents of tsunami and the Gulf oil spill took place. The fishermen, like the peasants, have a lifestyle that revolves around the sea and have rich cultural traditions involving it. The coast is however increasingly under threat, the coastal wetlands and the natural foliage of mangroves and coastal fauna and flora is being destroyed by indiscriminate tourism and urban development that have removed mangroves and built hotels and artificial structures. The industries are releasing effluents that enter the sea through the rivers. The fishing on large rivers has also been affected by changes in the ecosystem. The Gangetic dolphin is now a threatened species and so are the Olive Ridley turtles on the Orissa coast. An imminent threat to the fish reproduction and the lives of the traditional fishermen has been the commercial fishing using trawlers which are destroying the nesting and eggs of the fish and severely damaging their reproduction. The traditional fishermen on the Kerala coast have been agitating against this intrusion into their lives by commercial fishing that is posing a threat to the environment that was so sustainably used by the traditional fisher folk. Fishing trawlers are interested only in maximizing their catch and all over the world commercial fishing is now threatening the survival of popular species of fish like the Tuna.

Studies across the world by scholars have shown that traditional fisheries have their culturally conserved "resource conserving management that are not informed by Western Science" (Knudsen2009: 5). Howsoever sustainable such techniques were, in the post world war period, globally a whole new set of technologies were introduced that include, "monofilament/nylon nets, fishmeal technology and electronic fish finders" (ibid:127). Describing new fishing technologies introduced on coastal Turkey, Knudsen writes, "Around 1960 the first echo sounders were imported and the fishers became less dependent upon weather and light conditions. All these innovations facilitated more continual fishing. The teams started to use special carrier vessels that would take the catch ashore while the main vessel continued fishing operations. When the fishers were allowed to use radiotelephones and coast radio during the later part of the 1970s, communication between the mother vessel and the carriers, between the teams and their contacts ashore was made much easier. In the 1970s the introduction of the power block, the fish pump as well as radar , the adoption around 1980 of the fish sonar, and in the early 1990s the legalization of GPS guided map systems, further increased catch capacity"(ibid).

However all this one sided investment into catching fish had the inevitable result, by 1989, there was a resource crisis, the volume of fish went down dramatically. The vision in Turkey was totally influenced by western models and the state repeatedly attempted to introduce fisher's cooperatives on the lines of western countries. Unlike a grass root level effort, the organization of cooperatives in Turkey was a top down effort initiated by the bureaucracy and modeled totally on the west and were largely oriented towards introducing western technology

into fishing. As Knudsen (2009:195) describes "during one phase cooperatives were also seen as important to bringing the organizational structure in the Turkish fisheries in line with the cooperative structure which prevails in EU in order to ease future Turkish entry into the Union". Since it did not integrate with local customs the cooperatives failed totally to achieve what they were intended to do. Very few actual fishermen were members of any cooperative and were not part of running them. Most claimed that the cooperatives were 'empty' or of no use to the small boat owners and were run by the rich big boat owners.

The small boat owners on the other hand are having their own informal organizations such as having an alarm system to warn them when they are engaged in illegal sea-snail dredging. They do not form organized groups but rather shifting clusters that work on an opportunistic basis. They try to hide their information from others rather than sharing them as resources are limited. For example if they make good catch they try to keep it a secret. Sometimes small boat owners felt that they lacked a leader and could not handle their affairs more systematically. They are more comfortable with vertical rather than horizontal relationships. Trust is invested in local rich patrons and influential local leaders who are seen as 'friends'. Trust does not vest with cooperatives whose leaders are usually seen as corrupt as siphoning away collective resources. Thus if they look for a leader from among them that person is powerless in the hierarchical system, and if he belongs to the elite then they may not be able to trust him. The small boat owners along the Black sea coast studies by Knudsen do not form any one homogenous community and they are more drawn to their other relationships with higher status patrons. In 2005 only about ten percent of fishers were members of any cooperatives. In the general neoliberal political atmosphere of the country, cooperatives were often stigmatized as 'communist'. The official view on failure of cooperatives is stereotypical and based on a negative construction of the fishers as uneducated, '*cahil*'(unsophisticated), irrational and so on. The *mahalle* (association) norms based on Islam, more compatible with the organizing of fishers were perceived as regressive. The rejection of western models by the fishers was seen as their ignorance.

All this indicates an official ignorance of the real customs of the fishermen, and also the official rejection or reluctance to know these customs as the officials were totally driven by the western models. They idealized the techniques and organization of big boat fishing mostly in the corporate sector and ignored the small boat fishers altogether. This is in great contrast to Japan where folk models have been given great importance and led to much more successful development of fishing cooperatives. "While fishery policy had clear parallels in Japan and the Ottoman empire, traditional privileges and rights, unlike development in Turkey, were incorporated in the first Japanese Fishery Law (1901) and sustained in modified form in the second Fishery Law (1949). The laws upheld to a large extent the coastal communities' privileged access to fish in their immediate coastal territories. Fishing cooperatives were allocated substantial responsibility and authority in the management of "fishing rights" (ibid: 208)

Thus we see that the contrast between Japan and Turkey in the same area of fishing is starkly evident. Where local customs have been respected and incorporated, the success story is there for everyone to see. Japan has always set its own goals of modernization based on its own customs. Turkey like many other countries including India has unsuccessfully tried to impose western models

from the top ignoring local customs that have their own story of sustainability. This clearly indicates that successful development needs to follow more folk models. The rhetoric that local people have no sense and are irrational has its echo in many manmade environmental and development disasters. It is also difficult to break long standing practices like family based fishing that continues even today in Turkey and is even achieving a degree of success and proved its resilience in the face of state opposition.

Check Your Progress 2

Note: a) Use the space provided for your answer

b) Check your answers with the possible answers provided at the end of this unit

1) What kind of conflict arises when traditional life ways are sought to be uprooted?

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2) What are the advantages and disadvantage of new fishing techniques?

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2.6 LET US SUM UP

- Every community or people in their long standing relationships with the environment have developed a set of social organizational principles and norms that pass for culture and tradition.
- The success story of sustainable modernization is not to try to erode every strand of such customary structures especially as they have withstood the test of time.
- The end of the twentieth century has seen too many human caused disasters for any country or state to push through such irrational projects of development. Yet we see that it is still happening and also right at our door steps.
- Collective action and conflict has been able to divert or dilute some of them but scholarly attention needs to be given more rigorously to such notions of customs and traditions.

- The top down approach to administration and the attitude of elitist groups in power towards dismissal of all things local as ignorance is what has been wrong with the concept of development as practiced in much of the third world.

- What the West has already rejected, like the building of mega dams is now being incorporated into the developing countries. What is being accepted globally as indigenous knowledge is still being rejected in India as superstition.

- For our future sustainability we need to introspect more on what are the gains of building up from what we already have rather than trying to destroy everything and then beginning again, often when it is too late to do so.

2.7 KEY WORDS

Customs : A custom is any activity which lots of people do, and have been doing it for a long period of time

Traditions : A tradition is a belief or behavior passed down within a group or society with symbolic meaning or special significance with origins in the past

Resource Conflicts : The situation when more than one individuals or groups are competing to use similar set of resources.

2.8 REFERENCES AND SUGGESTED FURTHER READINGS

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2.9 KEY TO CHECK YOUR PROGRESS

Check Your Progress 1

1) Your answer must include the following points
   - Practices based on beliefs and ideas.
   - Dynamic
   - Isembage victuals
2) Your answer must include the following points
   - Beliefs and victuals help in the integration and regulation of the population.
   - Exchange of energy level between human and animals.
   - Koiko helps to keep a sustainable population.
   - Pigs act as a regulatory mechanism in controlling human population.

Check Your Progress 2

1) Your answer must include the following points
   - Peaceful protest in support of village commons.
   - Resistance over the commercial plantation by local people.
   - Displacement
2) Your answer must include the following points
   - Maximum catch.
   - Less dependency on weather and light
   - Reduction in the fish volume.
   - Loss of trust and security.

UNIT 3 FORESTS AND NATURAL RESOURCE MANAGEMENT

Structure

3.0 Introduction

3.1 Objectives

3.2 Nature and Type of Forests

3.3 The Forestry Debate

3.4 Community Forests

3.5 The Pacific Mangroves and Capitalist Encroachment

3.6 Forest Narratives and their Critique

3.7 Conservation and Sustainability

3.8 Let Us Sum Up

3.9 Key Words

3.10 References and Suggested Further Readings

3.11 Key to Check Your Progress

3.0 INTRODUCTION

Forests have been recognized as of extraordinary environmental significance. They maintain essential biodiversity, act as a carbon sink for carbon emission caused by burning of fossil fuels, and provide human groups and a variety of living organisms with an ecological niche, providing a huge repertoire of resources for various human uses. They support several modes of subsistence practiced by humans such as hunting and food gathering, pastoralism and shifting cultivation as well as providing resources for settled agriculturalists.

The urban way of life however has looked upon the forest as an antithesis of itself and high urban civilizations have sometimes equated the forest with danger and negative qualities. It was for this reason that large tracts of virgin forests have been clear felled in the course of human history, to make way for settled and controlled agriculture and urban dwellings. In the first phase of human settlements the forest was looked upon as an enemy rather than as a friend and it was especially true in the period of colonial expansion when terms such as conquest and frontiers were used to designate human clearing of the forests and expansion of man -made environments. Wild animals and naturally growing species, fell victim to such an attitude and today we are facing a world where biodiversity is becoming a precious commodity and species are disappearing at a fast rate along with primary forests.

3.1 OBJECTIVES

After reading this unit, you will be able to:

- describe the nature, types and functions of the forests;

- explain the existing forest policies and the role of the state in conserving forests; and
- identify the causes of encroachment of forests.

3.2 NATURE AND TYPE OF FORESTS

The most precious forest is what is called old growth forests or primary forests, like the Silent Valley on the western coast of India. What official statistics passes off for forested land often includes plantations or commercial forestry like a clump of eucalyptus that has little environmental value. Natural Secondary growth forests that come up on fallow land in shifting cultivation also has its value, as it contains natural biodiversity. Primary forests have evolved a long term ecosystem that shelters numerous forms of life and plays critical role in maintaining biodiversity. Rangarajan (2000) mentions that the extent of forests in the northern parts of India was very vast and even in the seventh century, Hieun-Tsang, mentions vast tracts of forest while travelling India. What is interesting to note is that even at that time there were state rights over the forest and tracts of forest were like conserved forests that protected the elephant, one of the most critical wild animals required by mobility for transport and warfare. *Hasti-vanas* have been mentioned in the Arthasastra, where rulers of the Mauryan Empire had imposed rules for elephant protection, and even the tusks of an animal dying a natural death were to be handed over to the king. Then as now, the forest dwellers were regarded with suspicion and the central state was often antagonistic to them. The fauna that is mentioned in the old texts such as lions, tiger, elephants and rhinos makes it clear that the forest cover must have been very dense, to have contained all these species.

Yet from the early centuries during the spread of the empires, the forest was being constantly brought under the control of humans, and as early as the Mahabharata we have stories about the burning of the forest (Khanadava) by Krishna and Arjuna with the help of Agni (God of fire) to create more urban centers. Historically the Mauryas and the Kushanas in the north and the Chalukyas and the Sangam Cholas in the peninsular India were spreading their agricultural base at the expense of the forest, although some forest creatures like elephants were being protected for state use. The surplus allowed the state to consolidate its power and also engage in widespread trade. However royal antagonism to forests may have been countered by the lower castes and tribes who depended more closely on the forest for their livelihood and who may have had more sentimental attachment to the forest. The rise of Jainism and Buddhism in India must have contributed to the conservation of forest resources, because they forbade the killing of any form of life. As pointed out by Dr. B.R. Ambedkar, the initial followers of Buddhism could have been composed of larger numbers of lower caste people and tribes. Gadgil and Guha (1992: 89) pointed out that the proportion of vegetarians in India is significantly higher in the drier and less productive regions that must have suffered more deforestation earlier than other regions and where animal power is critical to agriculture.

A kind of forest called as Sacred Groves have played a critical role in many parts of India where they have not only preserved biodiversity but also saved water bodies for local use. But misguided notions of scientific forestry have led to their removal by the forest departments themselves in spite of strong local protests.

Gadgil and Guha(1995: 91) have recorded how the forest department was bent upon clear felling a beautifully preserved sacred grove in the village Gani in Western Maharashtra. The desperate people, called upon these scholars for help and with some difficulty they were able to prevent the felling of this grove that was also the source of one of the main water streams supplying water to this region. The forest department could not understand the logic of saving commercially valuable mature timber which in their opinion should have been replaced by new trees.

The ecological value of mature forests is immense but was not recognized till recently and even now the forest departments are more interested in commercial forestry than the rich biodiversity of mature and primary forests. On the Delhi ridge for example the forestry officials have systematically destroyed what was once a primary forest with a huge diversity of flora and fauna with artificial parks and gardens planting cultivated flowers and trees, that has now managed to destroy the habitat of most of the wild animals that once had a home there. The rich undergrowths have been cleared to plant domestic plants of ornamental value like crotons.

The Himalayan region for example has had a rich variety of forests that is found on high altitudess Guha(1989:36) gives the following classification of forests in the Himalayas.

Table 3.1: Distribution of vegetation by altitude in the Himalayas

Altitude(in feet)	**Characteristic Vegetation**
13,000	Vegetation entirely ceases
12,000	Birch and blue Pine
11,000	Fir, spruce, yew, cypress and bush
10,000	Rhododendron and chestnut limit; grassy slopes begin
9,000	Higher level oaks(*tilonj* and *kharsu*)
8,000	*Banj* oak limit
7,000	Blue and Chir pine limit; *Banj* oak and Rhododendron in abundance
6,000	Deodar begins; *Banj* and Rhododendron gives way to pine
5,000	Chir pine in abundance
4,000	*Sal* limit; *haldu* and *tun*

(**Source:** Adopted from S.D. Pant , *Social Economy of the Himalayas*, 1935, London)

According to Guha(ibid) a stable forest cover is achieved by a succession of stages. In the initial stage small plants with light seeds come up on the newly exposed ground, in the transitional stage some changes begin to occur on this ground already covered with some kind of vegetation, in the third or climax stage hygrophilous vegetation appears and forms a thick cover. In the Himalayas it is believed that in pristine times there was a thick cover of mixed forests given the favourable climatic conditions, today the conifers represent stage 2 and the oaks represent stage 3 of forest growth.

In the local economy the broad leaved varieties have more importance as they provide fuels, fodder and manure for local agriculture and for the animals. Thus the villagers preferred a natural forest of thick cover. But since the conifers have more commercial value and can be grown for export, after scientific forestry was introduced, the stage 2 to 3 growth was reversed by human intervention and broad leaved varieties were replaced by conifers. Such reversal of natural succession may have negative environmental effects and this is what happened in Uttarakhand that is now facing excessive deforestation.

3.3 THE FORESTRY DEBATE

The Forest department in India was set up in 1864 and has been a powerful controller of precious biomass reserves of this country. In 1878, the Forestry Act was revised and all rights were vested in the state (as the right of conquest of the colonial state). Thus the notion of reserved forests was introduced where large tracts of forests were closed to local people and exploited commercially for use by the state. The so-called scientific forestry implemented by the colonial administration and adopted by the Indian government has contributed to deforestation of primary forests. Recent news (16th July 2010) has reported the closure of most dams operating in the Himalayan region because of heavy siltation caused by heavy flow of soil from deforested slopes of the Himalayas. The various interest groups in India have had differential voice in the attitude and practice towards forests. The predominant voices in the earlier periods were of the imperial state, followed by the voice of scientific forestry during the colonial and post colonial period when the Indian state too looked upon the forests as a vast source of commercial resources. However new voices have come up more recently especially from the educated elite classes which can be called as pure bio-centric conservationists, who want nature to be preserved as pristine and consider all forms of human residence inside the forests as encroachment. These are the ones most influenced by western ideas of national parks and biosphere reserves. What they forget is that forest dwelling tribes and some peasants and pastoral communities have had century's old relationship with the forest and many of their practices have evolved in ways that serve to preserve the forest and the flora and fauna.

No doubt with deforestation caused by commercial exploitation and also extensive damage to forests caused by mining, dam building and industrialization, some of the practices of the forest dwellers may appear to be threatening the depleted resource. But since the population of these forest dwellers is considerably less than the urban populations whose constant demand for more resources has put the pressures on the forests in the first place, there needs to be a more balanced view on the forest and forest dweller's relationships. The recently introduced Tribal Bill has taken into account some of the issues. Yet the political and economically powerful voices are still stronger on the ground. The voices raised against illegal mining for example are quickly silenced and although the Prime Minister himself has taken up the task of Project Tiger, the tiger habitat is constantly under threat from unscheduled development projects, rampant corruption and political pressure to push through projects that have negative impact on the forests.

3.4 COMMUNITY FORESTS

The rural and tribal people with the least voice had been the most marginalized in forest related debates. Yet collective action on the ground along with dedicated work by some social workers have led to some degree of success in letting people have some say in forest management, in their own vicinity. Orissa being one such state where the concept of Joint Forest Management (JFM) was introduced but it was unacceptable to the village communities because the formal proposal of the state was not in consonance with the people's perception of forest management (Singh 2004). The alternate system evolved on the ground was Community Forest Management (CFM). At present about 8000 villages in Orissa have CFM and some have JFM that is a more formalized system. The procedure adopted in the initial stages to restore a degraded forest cover is by restricting local access to bare necessity and completely cordoning off the forest from outsiders. The villagers evolved systems of fines for local infringement and began patrolling for keeping off outsiders. Although there is a formal system of patrolling called *thengapalli,* as we have seen in the case of the Chipko movement, women who spend a large amount of time in the forest, were efficient enough to patrol the forest and raise an alarm if they saw anything amiss. Thus while patrolling by men many be considered a formal task such regular vigilance by women spending long hours in the forest to collect minor forest produce is part of their daily routine.

However as soon as the forests begin to regenerate, the community has a surplus that may be given on lease through auctions. In such a case the men who form village committees, advised by the patriarchal forest department, lease out forests near the village, thus denying women access to their own forests forcing them to travel long distances for their household requirements. It also adversely affects poor households some of whom depend upon the forest for a livelihood. The role of women in gathering forest produce is primary. It has been estimated that more than 350,000 tonnes of *kendu* leaves are harvested in Orissa by 600,000 women and children (Vasundhara 1998). Yet they are kept out of all policy making and have no rights over the forest. The Non-Timber Forest Produce (NTFP) policies of Orissa are totally dominated by the state that has monopolized all rights over the forests. Although according to JFM, 100 per cent of intermediate products and 50 percent of any major harvest is supposed to go to the Vana Samraksha Samiti(VSS) (Forest Protection Committee) yet in Orissa, the members of the VSS get salaries for collection that are given on the minimum wage rate and not based on value of collection. Thus even in the name of JFM the local people have been reduced to mere wage labour at the bottom of the scale. Singh (2004) suggests the following measures to give more autonomy to the local people especially women

a) Setting up of mechanisms for a minimum support price for NTFP items similar to those for agricultural commodities;

b) Building people's institutions/cooperatives for value addition and marketing.

However on the ground there has been little attempt to actually address the problems of the people who actually depend for their livelihood on the NTFP. The result of such alienation is that people who had the maximum stakes in preserving and caring for the forest are gradually marginalized from it. Since

they draw minimal benefit from it they may take to poaching or illegal means to supplement their income. The cognitive dimension of 'Our forest' is essential to imbibe a sense of responsibility in the local people. Even when NGOs or other agencies are involved the really poor and those who need help the most get left out of the decision making processes as they do not have networking skills and are usually not literate. Even in JFM, many local people have vehemently opposed the leasing out of rights to outsiders for money as the marginal people in the village lose their rights of user over the forests and only an elite section takes all the advantage. Women are especially against leasing out of forest produce rights to outsiders.

A suggestion made by Singh (2004:322) is that of Trusteeship Rights. She suggests that "a village community could manage forests as 'trustee' on behalf of the various stakeholders /users, ensuring that the interests of various users/dependent sections of the people are protected." She invokes age old principles of forest dwellers which have been recognized as rights of users as against rights of possession. The scholars working on hunting food gathering people (discussed in earlier units) have no notion of property but of generalized reciprocity where the people are expected to use resources in an ethical manner based upon their needs and not because of profit making motivations.

Check Your Progress 1

Note: a) Use the space provided for your answer

b) Check your answers with the possible answers provided at the end of this unit

1) Describe the various types of vegetation found on the Himalayas and describe the impact of commercial forestry on the Himalayan ecosystem.

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2) What are the debates regarding forests? Critically discuss.

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3.5 THE PACIFIC MANGROVES AND CAPITALIST ENCROACHMENT

Mangrove forests are extremely important as a repository of biodiversity and also for performing various ecological and economic functions. Escobar (2008: 85) describes the mangroves in the Pacific area, where they play a very important role in the life of the locals. They maintain and reproduce river and ocean life and recycle huge amounts of nutrients and maintain water quality. They also house a large number of fish and fauna like molluscs and fish and crustaceans; they play a crucial role in maintaining biodiversity as they are essential for the early reproductive stage of many species. For example the shrimps lay eggs on the open seas near coastal areas, but the larvae slowly move to the mangroves, where they grow considerably before returning to sea. Mangroves offer protection to coastal areas from storms flooding and also prevent erosion. It is believed that the damage caused by the Tsunami was considerably magnified because of the removal of mangrove forests from the coasts of Indonesia and India. The local people on the Pacific coast get a number of resources from these mangroves, including timber for house building, fish and molluscs to supplement their diet and tannin for dying handicrafts and wood for charcoal production, fruits and medicinal plants. The estuaries that feed the mangroves also provide transportation, thus the influence of these mangroves goes beyond the immediate environment and has far reaching effects. However ever since fish trawlers have become popular from around 1980s they have been damaging the ocean ecosystem. The diminishing returns of naturally occurring shrimp have led to the popularization of aquaculture and the World Bank has been enthusiastically funding such projects all across the world. The immediate fall out of aquaculture is the destruction of mangrove forests. The fish ponds are being created after uprooting mangrove forests and most of contemporary shrimp comes from ponds rather than the sea.

Eucador is one of the world's leading producers of shrimp by farming. However recently there is a ban on shrimp farming and new ponds are created due to mangrove forest destruction.This is causing more and more community opposition. Here we have one more case of local communities in opposition to their resources being used for commercial purposes even though shrimp industry is a highly lucrative industry with the great demand from Europe, Japan and USA. However the alarming destruction of mangrove forests, about 2,600 hectares in Nariño, alone by the mid-1990s has led to large scale protests against their destruction. One solution has been to shift shrimp farming to inland zones of higher elevation. Efforts are also underway to restore mangrove forests although it takes a lot of resources to do that, about $5,250 to $125,000 per hectare (Escobar: 89).

An important dimension of identity of communities has been realized in the eighties and nineties that has led to many movements to preserve or restore traditional forest and land based ways of life to the peasants and to reduce commercialization of all resources. Significant advances in this direction has been achieved in the pacific region as described by Arturo Escobar, who writes, "The idea that 'the territory' was fundamental to the physical and cultural survival of communities, and the argument that these communities have unique ways, rooted in culture, of using the diverse spaces constituted by forest, river, mangrove, hills, and ocean were the two most important conceptual innovations". (2009:

54) The implications of this for all other regions are significant. It puts a question mark on the ethics of displacement and also uprooting from traditional ways of life that is routinely being practiced in Third world countries such as India. The relationship of forests and forest dwellers also becomes far more significant as we understand that for those who live in the forest, it is not just a place to get subsistence but an identity, a way of life and the notion of empty space has been converted to one of landscape.

3.6 FOREST NARRATIVES AND THEIR CRITIQUE

The generally prevalent narratives about forests especially those built up by outsiders is that forests everywhere are getting degraded and the forest dwellers are responsible for degradation. It is this narrative that has led to all kinds of policy formulations that focus upon removing people from forests and creating nature reserves that totally exclude human beings. But some of these narratives have been proven to be wrong as people practicing traditional subsistence had developed a balanced relationship with the environment. One example is that of cattle grazers in the Bharatpur sanctuary, where the removal of cattle grazers led to thick growth of grass that choked the area and prevented the birds from finding a place to land and thus considerably reduced bird presence in the sanctuary.

Let us now take a case study from West Africa reported by James Fairhead and Melissa Leach. Kissidougo, is a region of West Africa that at the first look seems to be a landscape of patchy forests that surround the village settlements and a largely savannah area. The presumption of most scholars who studied that area was that earlier the entire region must have been a dense forest but human settlements and increasing populations gradually destroyed the forest and the people only kept patches of forests near their villages to safeguard the settlements from wind and to have a supply of resources for their own use. The famous French botanist Auguste Chevalier was of the opinion that the present settlers were a savannah people who had displaced the earlier forest dwellers and had converted most of the forested areas into savannah by fire setting and cultivation, converting most of it into secondary forests; retaining the dense forests only near their settlements and waterways. Similar narratives have been constructed for the forest dwellers and shifting cultivators in most part of the world and colonial and post colonial policy makers have usually taken several steps to curb what they considered unsustainable practices.

In West Africa the policy makers put restrictions on upland farming as against swamp farming. Whatever upland areas to be cultivated were to be done through scientific forestry namely agro-forestry and reorganization of tenure and fallow systems. A second set of policies have tried to impose prohibitions and regulations on bush fires (as practiced by shifting cultivators) and thirdly they have tried to create patches of protected forest where old trees typical of the region and commercially valuable are to be preserved and to restore forest cover by tree plantations by cultivating saplings in nurseries (Fairhead and Leach 2008: 106). However a critical examination of actual data has shown that the typical narrative may be sometimes quite wrong. For Kissidougo, there are available aerial photographs over the years that show the state of vegetation in that period. Surprisingly the comparison with later views does not show vegetation loss but

an actual increase in forest cover. Even earlier data from French military occupation during the 1890s to 1910 and oral recall from local people show that there has been no forest degradation from that time onwards. The elders of the villages claim on the contrary that it is the people who planted the forests near their villages and it is their work that has produced secondary forests in the savannah. Rather than a forested area being converted to savannah, the human settlements had forested the savannah and created the dense forests that have been steadily growing over the years. The practices engaged in by the villagers to enrich forested areas have been thatch and fence grass collection and tethering of cattle that reduces flammable grasses, the disposition of household wastes to serve as fertilizers for thicker growth of vegetation, planting forest initiating trees and allowing them to go into the climax stage of forest development. Such practices can be used by any human settlement to increase the forest cover around them, and human populations need not always be detrimental to forest growth. It was also seen that these practices created conditions that upgraded soil conditions to forest supporting rather than savannah. These practices included gardening and cultivation, short term fallow improvement through intensive cattle grazing and seed source protection and distributing forest inducing creepers.

Unlike again what is commonly presupposed that there are organizational or community level practices that lead to sustainability, here it was found that it was the short term production patterns like mostly carried out by individuals and families for themselves or one's own compound that had a cumulative effect by joining in with other such efforts to create a vast and effective spread of sustainable practices. For example the small fires set up in the early and mid dry season prevent larger fires from spreading. There has been no overhead organizational structure to manage resources and it is because of these individual initiatives that the local people have been able to adjust to flexible economic and ecological conditions.

The forest islands have served various purposes historically serving as fortresses when wars were common in the pre-colonial periods. Later they grew coffee on the outskirts of the forests, when it was profitable to do so and later turn to growing fruit trees. Employment opportunities and out migrations have reduced farm sizes but they are managed in a way that sustain the fallow and forest cover and women do farming in ways that is continuously improving soil conditions and encouraging vegetation growth.

The most interesting facts put forward by Fairhead and Leach is that unlike a stereotypical assumption that more population means more deforestation, since in this place it is the people who have converted the savannah to forested land, the more people actually means more forest. Thus it is not necessary that all human initiated work on the environment is harmful and especially by a community that is not using overtly "scientific" technology. The perspective discussed here can be called *landscape-enrichment –through –use*. That is one where a people have been consciously working on their environment to make it more sustainable and ecologically improved. As Fairhead and Leach put it, "The implementation of repressive environmental policies has in effect taxed rural populations for supposedly harmful activities which were, in fact, benign or beneficial". (2008:109). Thus a population can have its own integrated vegetation management practices that can work towards enhancing forest cover and restoring environmental balances and biodiversity. Rather than imposing external policies

that may or may not integrate with local practices, it is better to create an enabling environment in which people can successfully work out their existing practices. This kind of policy will go far towards sustainability than one that blindly imposes an external model that is often based on a faulty narrative. In a densely populated country like India, it is better to look for those practices that the people have that could be effectively used to maintain and enrich the environment. By this the problems of finding more land and jobs for dislocated populations will be less and the pressure on resources would decrease.

3.7 CONSERVATION AND SUSTAINABILITY

The concept of territory and biodiversity has been integrated with that of sustainability and conservation. Increasingly these are integrated with concepts such as local economies, life ways and alternative development. It is now understood that conservation cannot exist outside a framework that includes people and their culture, and traditional ways of integrating biodiversity with livelihoods.

According to Gadgil and Guha (1995:155) the forests perform five functions and these are 1) the maintenance of soil and water 2) conservation of biological and genetic diversity 3) production of biomass for subsistence which includes fuel, fodder, house building materials, medicinal plants, roots, tubers, honey etc.4) production of woody biomass for raw material for paper industry, timber for furniture and 5) production of non-timber biomass such as leaves, cane, fibers, latex, bamboo etc. The first two functions are associated with the ecological conservation of the forest, the fifth fulfills a substance objective and if sufficiently developed also provides the local people with development options while the fourth is primarily a development objective and mostly benefits outsiders although it may provide locals with jobs and some incentives. Those who advocate a purely conservationist approach are more interested in the second function namely conservation of genetic and biological resources and consequently for preserving water bodies and soil. Those who are interested in communities and development of the people are interested in maintaining subsistence base and in providing livelihood through the third and fifth functions while those interested in commercial exploitation are only interested in the fourth aspect.

Now since the forests in India are exclusively the property of the state, it is up to the state run forest departments to cater to the varied demands of the stakeholders and interest groups. Ethically and normatively the Forest department is supposed to take care of the common people and look into the interests of conservation and biodiversity. But in actual terms the powerful lobbying of interests groups such as big business houses wanting to commercially exploit timber or even to do mining is often given preference ; the mega development objectives of the nation is given priority over the needs of marginal and poor locals. The wilderness conservationists and the scientific foresters are two groups with widely differing interests, yet who concur in their opinion that the state should strongly and without interference from local people either empty the forests of all human presence what- so- ever (conservationist) or remove the already existing populations and replace them with modern scientists and people who have “better” knowledge of forestry. The rural people want local and community management of forest resources at least those forests that are in their vicinity. The forest dwellers wish

to be left to them inside the forest and are allowed to pursue forest products for use and exchange. But the industrial lobby has seriously undermined the claims of subsistence users. In fact for the past couple of hundred years, the emphasis is gradually shifting from subsistence use to market profits; from local use to gradually what is now a global market system.

The challenge that India faces according to Gadgil and Guha (1995: 156) is to both maintain its immense biodiversity and to feed its vast population and achieve a respectable rate of industrial growth to compete in the world economy. For the sake of a balanced and sustainable ecology, the biodiversity must be maintained over the genetic, species, ecosystem, landscape and regional levels. Also for conservation there is always a relative value, like medicinal plants over poisonous weeds and butterflies over mosquitoes. Thus there are aesthetic, moral and scientific values of conservation. However the question that may be raised is that is it enough to conserve only selected areas, like nature parks biosphere reserves. There is something called a "transformative value' of nature, that is ultimately whatever we are looking for in conservation includes the human values that value nature. Thus nature conservation is also ultimately a human value.

In India nature reserves cover only 4% of the country's surface and these too are subjected to timber extraction for commerce. The state is blind to local sentiments and lifestyles and following the stereotypical narratives as discussed above, forest dwellers are often pushed out of forests that result in more damage to them. The protective functions such as conservation of sacred groves and sacred flora and fauna practiced by the forest dwellers are no longer operative or recognized. Since they are deprived of their resource base, poverty and loss of income may push them into illegal activities that further stigmatizes them and creates a cycle of exploitation.

As Gadgil and Guha point out such a strategy is one aspect of an overall development strategy that seeks to divert resources to urban and elite areas taking away the subsistence base of marginal people. The ecological imperative is paid lip service by creating reserves that are meant for biodiversity protection yet which are only a fraction of the real biodiversity in the country. The focus on nature reserves diverts attention from real biodiversity conservation as by protecting patches of land. The rest of land is either laid waste ecologically or put under monoculture and commercial farming. It would yield better results if the species rich natures reserves are embedded in a richer and wider matrix of biodiversity that can be maintained at urban parks, roadside plantations, and village commons, and even if they are in various stages of use and degradation, a very large amount of species can still be maintained on them. As we have already discussed nature and human habitation are not necessarily antithetical to each other. Also small and local ecologically rich systems can add up with each other to give a wide coverage and about 40% of land can be covered like this. Such buffer zones will allow dispersal from one reserve to another especially when some of them may get endangered by climate change and global warming.

Thus what is being put forward is that it need not be nature reserve or nothing. Even in and near human habitations a large number species can be preserved and sustained and often with active human participation.

There are several reasons why the state is not a good protector of such biodiversity

1) It may not have the information needed to make appropriate decisions. Since the administration mainly consist of people drawn from elite and urban sections of population who have no direct stake in the environment.

2) There does not exist sufficient motivation for the administration to maintain biodiversity as their life style is not affected by loss of species.

3) The state does not have enough knowledge to maintain biodiversity programs. It is usually the people who have had sustained relationships with nature who have the knowledge, known as Traditional Ecological knowledge to effectively maintain biodiversity.

4) The state is unable to do policing of resources unless helped by the local people.

Thus the best solution is to make the local, territorial groups who directly benefit from the biodiversity to take care of it and to effectively guard it. Such groups can be caste or tribal groups or village clusters, but the important thing is that they should be both dependent on their environment. The community will engage sustainably with their resources if they stand to gain in a long term towards their sustenance. They will also try to increase the value of these resources, like we have discussed in the example from Africa. But essentially the interest of the community will be retained as long as they are able to enjoy the fruits of their labour and keep out the outsiders. Most forest dwellers lost the will to take care of their environment once they saw that their resources were being usurped by outsiders and also they were being marginalized on their own lands.

However even if the rights to community resources are returned to the original owners, under pressure from outside market forces they may be tempted to convert to monoculture and cash cropping, like the men folk in Garhwal who wanted to cut their forests to plant potatoes. Here it may be necessary under present conditions to compensate the community for protecting and enriching the resources. "Such rewards may be untied funds coming to the community to be devoted either to community works such as educational or health facilities, or to be shared among all community members. The rewards could also take the form of building community capacity for maintaining enhanced value of biodiversity within their territory, or for setting up bio-diversity based enterprises, such as chemical prospecting or extraction of active ingredients. Similar rewards may also flow for making available knowledge pertinent to uses of biodiversity, for instance in pest control". (Gadgil and Guha 1995:162)

Check Your Progress 2

Note: a) Use the space provided for your answer

b) Check your answers with the possible answers provided at the end of this unit

1) What contributions do Mangrove forests make to the local people and to the environment?

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2) Is it necessary to remove people in order to conserve nature? Discuss with examples.

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3) Why state is not successful in the protection of Biodiversity?

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3.8 LET US SUM UP

- The best solution for maintaining a good forest cover, biodiversity and an extensive enriched environment cannot be done by imposing policies and technologies from outside.
- The elite urban dwellers far away from forests have been entrusted with making policies and implementing plans with respect to the forest and associated biodiversity.
- For long term sustainable use of resources, the care for these must be entrusted to those who are most closely associated with them economically, ecologically and emotionally.
- Under changing circumstances, if the people are not finding the dependence on natural resources rewarding they may be given various incentives to continue to take care of their environment.
- The real contribution of policy makers is to make this happen. Instead of imposing from outside the policy makers must partner and cooperate with the local communities to take care of their resources and also to enhance the value of these for themselves and for others.
- Nature without people and people without nature are both untenable. Real sustained development will come when both are integrated and work together.

3.9 KEY WORDS

Sacred Groves : Sacred groves are forests of religious importance.

Mangroves : Mangroves are the trees which are salt tolerant and are found in coastal areas.

Joint Forest Management : It is a tool for forest conservation in which the state governments and local communities both are involved.

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3.11 KEY TO CHECK YOUR PROGRESS

Check Your Progress 1

1) Your answer must include the following points
   - Conifers, oaks, pine, fir, spread, sal, rhododendron.
   - Excessive deforestation.
   - Broad leaved varieties replaced by conifers.
   - Negative environmental factor such as heavy siltation, flood, soil erosion.
2) Your answer must include the following points
   - Restrictions on forest tracts

- Recent tribal bill
- Commercial forestry, deforestation and environmental degradation
- Forest and forest dwellers livelihood.

Check Your Progress 2

1) Your answer must include the following points
   - A repository of Biodiversity.
   - Maintenance of water quality.
   - Storehouse of fish & other various fauna
   - Provide food, fuel, shelter
2) Your answer must include the following points
   - The locals and their presence in the regeneration process.
   - Judicious use of scientific technology.
   - Integrated vegetation management practices
3) Your answer must include the following points
   - Lack of information.
   - Lack of motivation.
   - Local knowledge and participation is not appropriately incorporated.

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UNIT 4 CULTURAL DIMENSION OF CONSERVATION: INNOVATION, IKS, IPR AND VALUE ADDITION

Structure

4.0 Introduction

4.1 Objectives

4.2 What is Indigenous Knowledge?

4.3 Is local or Indigenous Knowledge a Science?

4.3.1 Fishing & IEK

4.4 How to Access Indigenous Knowledge (IK) and Local Knowledge (LK)

4.5 Investigations into Local Knowledge

4.6 Intellectual Property Rights (IPR)

4.7 Let Us Sum Up

4.8 Key Words

4.9 References and Suggested Further Readings

4.10 Key to Check Your Progress

4.0 INTRODUCTION

In the earlier unit we have discussed how the State is largely ineffective in implementing successful programs of biodiversity conservation and sustainable ecological projects. The reason lies in the ignorance of people who do not have intimate knowledge of the environment as compared to the people who have spent generations living with environment. Earlier when western science was considered as the only form of knowledge; such indigenous forms of knowledge were relegated to the status of superstition and ignorance. Industrial technology was given pride of place in the process of development and development itself was directed towards replacing or modifying nature to suit industrial and urban growth. However towards the end of the twentieth century, it was becoming apparent that western scientific technology did not have all the answers. A case in point is the inability of British Petroleum to plug the hole in their undersea oilfield that has caused immense ecological damage in the Gulf coast of the USA, even after struggling for three months to do so. Similar ecological disasters including the hole in the ozone layer has led to rethinking about the wisdom vested in non-western people and those without so called 'scientific' knowledge.

Other factors that have led to such reconsiderations have been the loss of political domination of the Euro-American countries to some extent with the rise of China, Japan, Korea and India. Another has been the philosophical revolution of the twentieth century in the form of deconstructionist and post-modern theories that have challenged the very notions of truth and knowledge as propagated by the western age of reason. These in turn have been supported by the transformation in science itself with quantum theory and relativity replacing positivist notions. Let us now examine some definitions of what we understand by Indigenous knowledge and its types.

4.1 OBJECTIVES

After reading this unit you will be able to:

- compare indigenous knowledge and scientific knowledge giving the pros and cons of each type;
- describe the cross cultural perspective of the application of indigenous knowledge; and
- recognize the viability and sustainability as well as capacity for transformation of the local knowledge systems.

4.2 WHAT IS INDIGENOUS KNOWLEDGE?

The term indigenous knowledge is tied to the term indigenous, the meaning of which is not a straight forward answer. In the last few decades, this term has assumed considerable political significance especially as it is linked to various people's movements across the globe. It largely refers to those populations that were early settlers in any place, thus distinguishing them from the Euro-American white populations that colonized many countries. Conceptually it raises images of black people conquered by white, a semantic opposition of conquered and conqueror and from the point of view of the west, it is we Vs. them. It is these kinds of reckonings that led the Indian government to assert that in India there are no indigenous people as all are early settlers and there are no ethnic or conqueror/conquered relationship between the people of India. However the tribal people of India have contested this view asserting that they merit being considered as indigenous as their position in the political and social hierarchy is the same as say Australian Aborigines in Australia or Native Americans in USA. According to B.K. Roy-Burman, an expert on tribal people, the term indigenous now carries notions of dispossession and being dominated and thus the tribes of India also can be called indigenous because of the intellectual, social and economic marginalization they are suffering.

Various scholars have used terms like local knowledge, autochthonous knowledge etc to designate what does not fall within the range of formal, scientific knowledge. Antweiler(2004: 3-5) has summarized some of these terms with respect to the semantic stress or the meaning that they convey. We shall examine only a few of them here.

Indigenous knowledge: "Culturally specific self-contained knowledge, knowledge defined in relation to western (scientific) knowledge; contrast implies many dichotomies (e.g. us /them, west/rest, rationality/magic, universal /particular, tradition/modernity)".

Local Knowledge, Art of locality: "Knowledge and skills related to a specific place, immediate surroundings; implies limited wider relevance"

Autochthonous knowledge: "Of Internal Origin, Culturally integrated"

Sustainable Knowledge: "Environmental Wisdom that provides sustainable solutions"

Community Knowledge: "Shared knowledge in self contained social units"

People's Knowledge and People's Science: "Shared, broadly disseminated knowledge, potential for political resistance (vs. dominating state knowledge)".

There was some reservation about the applications of these forms of knowledge that partly stems from the power hierarchy. As by definition these forms of knowledge are opposed to the state sponsored knowledge, the people in power would be reluctant to acknowledge that their knowledge was not sufficient or efficient as we have seen in the case of scientific forestry.

The second dimension of skepticism was that these knowledge systems were often folk traditions transmitted orally or in the form of learning by experience. The knowledge was quite often, though not always, not capable of being codified and formally transmitted. However, it is now believed that knowledge need not necessarily be codified and ecological knowledge especially is more relevant situationally and contextually. Like the knowledge used for farming shrimps in swamps cannot be sued for catching fish in the high seas. At times such knowledge is implemented through traditional social organizations like the Subak of Indonesia discussed in an earlier chapter that cannot be duplicated elsewhere at least in that form. However it is now contended that at least the basic principles can sometimes be understood and applied in similar situations.

Local knowledge is understood thus as situated knowledge and it may not present itself as a systemic body of knowledge. And although some environmentalists or social workers may project local knowledge an antithesis of industrial knowledge and always seen as good for the environment and just and equitable; it may depend on the situation and the kind of society that we are talking about. If the society under consideration is both just and egalitarian then the knowledge system will be implemented so as to maintain that. However if the society is itself hierarchical, like the caste system or slavery or is changing under impact of other modes of subsistence, then the knowledge need not always support environmental equity or quality. See for example Kelly Alley's (2002) work on pollution of the Ganga caused by traditional modes of using the river in an industrial and transformed circumstance. The rituals that sanctify the river have become commercialized under the new regime and the sacred specialists continue to propagate values (the river is sacred) that are no longer commensurate with reality (the river is polluted). Hess (1997) in her study of sheep management among an Andean community; came to the conclusion that local and knowledge and practice has resulted in sick and unproductive sheep.

Local knowledge can be defined in terms of being "cognitive" that is based on a shared perception of the environment and includes "emotive and corporeal aspects" (Atelier 2004:10). In other words it is based not on an outside or specialist perception (like a scientist) but of the entire community and is integrated with the emotional and organizational aspects of the community. "It is culturally situated and best understood as a 'social product'. It encompasses knowledge in the strict sense of shared information ——" (ibid). Such knowledge as is acquired through one's culture and is a part of inherited legacy is often associated with one's ancestors, one's territory and gives pride in one's identity and self worth. As Siverts (1991:308) puts it, it is a "combination of utilitarian and symbolic practices" For example while the sacred groves are preserved not only because they are the abode of sprits but also because of their ecological significance.

4.3 IS LOCAL OR INDIGENOUS KNOWLEDGE A SCIENCE?

Indigenous knowledge or local knowledge has often been contrasted with science in saying that unlike scientific knowledge that is ever expanding, IK is static. It is also said that it is not structured and has a disuse and fuzzy character. However as Sillitoe (2000:2) explains it, IK has a structure and has a concrete reality as one component of it, while at the same time there is a way of knowing that is through action, or practice. Thus while a fishing community has structured knowledge about making boats, nets, fish life cycles and weather conditions; the exact way in which a fisherman has to deal with the sea may be a situated knowledge based on experience that may not be understood except by the engagement with the environment.

As Knudsen(2009: 80) puts it IK or TEK (Traditional Ecological Knowledge), has one main defining character that it is dissimilar to science; where scientific knowledge is characterized by such terms as generalized, universal, formal and systematic. However the study of Science and Technology (STS) and Sociology of Scientific Knowledge (SSK) are also fields that are being pursued in the last few decades. Increasingly through the works of scholars such as Fleck (1979) it has been shown that all knowledge is sociologically constructed and each body of knowledge including western scientific knowledge is not completely value free and neutral (as it is supposed to be) but a historical and cultural tradition like all other forms of knowledge. This mode of thinking that shows up western scientific knowledge as culturally biased and following social hierarchies has been taken up by feminists scholars like Susan Harding and Donna Harraway. Increasingly the study of western science is moving in a direction that is making it converge with IK, in a way that most scholars are tending to believe that all forms of knowledge is socially constructed and serves social goals.

On the other hand the concept of “ethnoscience” was coined by anthropologists, who tried to show the efficacy of tribal forms of knowledge and the rational basis of that kind of knowledge.

Thus rather than the debate being situated in whether IK is a science or not, in recent times the enquiry has shifted to whether there is anything called a perfect science in the sense of the term used in nineteenth century Europe. The work of Levi-Strauss that focused upon universal categories of the human mind, drawing upon linguistics showed that everywhere people use symbolic categories to understand and decode the environment they are in. It was thus deemed necessary to understand these situated categories of classification in order to implement any policy or development project. However other scholars such as (Palsson 1998) and Latour (1993) have criticized this way of dichotomizing human societies into ‘us’ and ‘them’ pointing out that such divisions increase distance.

One way in which to get over this dichotomy is as suggested to view science itself as being experiential and intuitive as it has been pointed out the greatest discoveries of science have been based more on intuition rather than experimental knowledge, the classic case of the apple falling. Chris Shore(1996) has distinguished between two ways of knowing the world, ‘analytical’ based upon digital codes , that is understanding in terms of opposites and ‘non-analytical’

based upon analog codes, that is in terms of associations. However it is the work of Latour that gives us more insight into how objects and facts are constructed by human beings, in the process of understanding them and how this knowledge then becomes embedded in larger structures that is in society or community as a whole. Latour uses the word collective to refer to the associations of humans and non-humans (an ecosystem of society) or 'actants' and these are represented by spokespersons, that is representatives of the knowledge held by that collective. Knowledge constructs and stabilizes new collectives by bringing in as many 'actants' as possible.; the more the 'actants' brought in the more the facts are hardened or posited as true knowledge.

The difference between local knowledge and science lies in the size of the collective or the number of 'actants' that are brought into the network of that particular knowledge collective. The more people believe that something is a fact or knowledge the more powerful it becomes. Thus knowledge enables us to get familiar with things at a distance and this is what is taught in class rooms. The students learn about things they have no bodily knowledge of yet 'know' through the "mobilization, stabilization and combination of inscriptions" (Knudsen2009: 84). Thus in techno-science the range of inscription is very large and everything can be moved to and fro by the process of inscription. The process of inscription entails the externalization of something into a form that is transportable and becomes more interpersonal than being embedded in personal experience. The ability to tell and write about something is to be able to inscribe it and then transmit it to others even at a longer distance. Thus oral traditions as a form of inscription cannot travel very far but written knowledge can and digitalized inscriptions can travel even faster and reach out to many more people. Thus the differences between knowledge is not in their efficiency or applicability or 'truth' but in their range of externalization, their capacity to travel and to be objectified, that is put in a form that is accessible to others. Thus experiential knowledge, common sense knowledge are intangible , cannot be objectified and hence have been kept out of the scope of 'scientific' knowledge but as we have already seen intuition still plays an important role in science and thus cannot be objectified.

Let us now illustrate our discussion with some case studies of IK and TEK.

4.3.1 Fishing and IEK

When action is carried out in a group that habitually stays together, like in hunting or fishing the knowledge is shared by common experience rather than by inscription. The Black sea traditional fishermen, described by Knudsen, go out in groups in small boats, have knowledge of the ocean bottom based on experience that is not available by any charts. Even sonar display is not of any use unless interpreted by an experienced sea-man. The captains of large ships often take with them a traditional fisher to interpret the sonar signals even though their contributions are not officially recognized. The small boat fishers have knowledge of what are called adas that are perceived as flat fishing banks that is where a particular species of fish may be concentrated. The local fishermen know by experience that whiting and turbot are more frequently to be found on adas than anywhere else. Only local fishers, who may be referred to as a 'community of practitioners' fish in adas have this knowledge. And even though it is not inscribed the fishers share a routine that is set by practice that is not verbalized or written

yet mutually understood. For example Knudsen could not make the fishers explain by a diagram what an ada was. They said it was an area of shallow water, separated from the shores by deep waters, but could not represent it diagrammatically, yet knew all its properties, how it was formed, etc. The fishers could use hand symbolism and couple it with standardized knowledge of fish behavior and change of seasons. The symbols here are plastic and based upon the imagination of the fisher about how the sea bottom looks like, as they do not have any technical view of it. In this way it is the analog model that is in use here. The symbolism is drawn from bodily experience yet uses abstraction and distance. The fishers can verbalize it but cannot convert it into inscription that is highly standardized or capable of being transmitted too far. Thus one has to engage in conversation with a fisher to know about it. The fishers have their indigenous models that they may verbalize as to the origin of fish and humans, that is divine origins, the changes in weather because of coming of winds and how this change of weather affects the flow of fish. These include knowledge about physiology of the fish and other aquatic animals, their capacity to withstand cold, their movements towards warmer seas and so on. Thus much of this knowledge is based on rational interpretations of experience and observations and also basic common sense knowledge that if a fish or animal feels cold it will try to move to a warmer place. Also a fish with scales is different physiologically than a fish without scales. They have understanding of water currents and of the way fish would behave if it is too cold or warm, how it will move etc. Thus the fisher's experience is not entirely a bodily experience as interpretations and symbolisms are involved here.

Thus fishers have their linguistic models when they discuss among themselves about the adas. They have theories and speculations about them too. Thus one need not separate an embodied from a linguistic model. But the real separation is between formal or hard knowledge, thus the fishers were unable to put their knowledge down on paper, by any kind of hard inscription and that is where the real difference lies. Without such inscription the knowledge cannot travel, it remains local. Like when it comes to classification the fishermen cannot do context free classification, that is cannot create abstract universal typologies; what they can do is to classify in terms of behavior, occurrence and appearance. "The operating principles of their taxonomy evolve from their practice and the world presents itself as different things to fishers with different practices" (Knudsen: 95). To the fishermen categorization is more important as these categories set guidelines for actions. Most scholars of the human cognition agree that "objectification, reason, and reflection" (Knudsen 2009: 90) are products of the technology of writing. It is through writing that a thought is separated from its author and becomes universally applicable. Also then it cannot be modified except by due reasoning and by public knowledge. The transition from speech to writing permits a fixation and structure that enables not only transmission but also a way in which author ship can be imputed and fixed. Once a person puts a name on a piece of writing that person becomes an author and gains copyright. In the absence of writing authorship it is difficult to assign although as we have seen in the times of oral traditions, authors would inscribe their name into their speech like Omar Khayyam or Tulsidas.

Check Your Progress 1

Note: a) Use the space provided for your answer

b) Check your answers with the possible answers provided at the end of this unit

1) What do you understand by IK? Discuss.

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2) Discuss Local Knowledge critically.

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4.4 HOW TO ACCESS INDIGENOUS KNOWLEDGE (IK) AND LOCAL KNOWLEDGE (LK)

There has generally been an opinion regarding IK that such knowledge is not accessible to others. In fact it is on this basis that Latour had set this type of knowledge as different from formal scientific knowledge. Andrew Vadya et al (2004) suggested that rather than trying to get at the knowledge, which may not always be possible, we should look into the actions that are triggered by this knowledge and then work in this way.

First step: Examine the actions

Second step: What knowledge these actions are based on in so far as these actions rather than any other are taken.

Third step: Causes of changes in these actions and their knowledge bases.

As it is mostly understood external interest in both actions and knowledge is linked to success in devising programs of economic development and environmental sustainability. Unlike most studies that seek to do holistic studies of cultures in order to find out the embedded knowledge systems Vadya advocates a method by which one is limiting oneself to studying only the causes of outcomes of interest. The interests are confined to environmental changes and the actions of people in dealing with such changes and managing their resources. Rather than carrying out research over a long period of time only to come to the conclusion that there was nothing worth learning by way of environmental management and sustainability, Vadya is of the opinion that let us first look for the good practices then follow them up with research to find out the knowledge

behind these successful practices so that we are able to use them for further sustainability. In other words we are looking towards some practice oriented research here and not simply for the sake of research.

One can use such methods as Rapid Rural Appraisal for short term research to collect data specifically for its particular applicability. Vadya et al(2004: 37) noted certain key features of their approach that involves 1) Identifying at the outset certain environment related or resource related actions as objects of study in terms of their relevance for actions directed towards sustainability 2) Studying only those knowledge that are relevant for the goals of sustainability and development and ignoring others. There is no need to study the entire knowledge system and its cultural relevance 3) It is not necessary to assume that all practices and knowledge systems are embedded in cultural matrixes that must be first understood in totality in order to comprehend knowledge and practices. Thus one can assume that understanding or explanation of anything that people do or know can be based on linking them to other things, not necessarily within the same system and that partial explanations can be useful for certain purposes and that we can use our judgment to choose what we need to study and what we can leave out. In other words these scholars are trying to establish a methodology for studying societies that differs from classical anthropological holistic studies. However if there are knowledge that are so deeply culturally embedded that they are not understood even by the actors then they cannot be studied so easily.

4.5 INVESTIGATIONS INTO LOCAL KNOWLEDGE

Vadya et al (2004 *passim*) carried out investigations into farmer's practice of pest management in Indonesia. Their aim was to observe how farmers used traditional knowledge and also how they responded to inputs of scientific training given to them from outside. The knowledge imparted to the farmers about pest management was about the interactions between pests and their predators, about the differential impact of various pests at different stages of the life cycle and about dangers of overuse of pesticides that kill the pest predators, thereby ultimately causing a resurgence of the pests. The idea was to focus on the practices and its related knowledge base without trying to find out its cultural and social interrelationships. Five villages were studied in which weekly morning long IPM (Integrated Pest Management) sessions were held for approximately 25 farmers, in each village, for ten weeks. Each farmer was paid 1000 Indonesian rupiahs and a snack for attending each session. Specifically the training involved counting the number of pests and predators in a section of the field to decide what amount, if any, of chemical pesticide to use. The authors wanted to observe the application by the farmers of such knowledge and any innovations they were likely to make to them based on their own experience or knowledge. They found that many farmers did learn the procedures of counting and sampling in the school but none were following them in their own fields. The farmers walked through their fields, usually near the edges and looked out for the visible pests, that included passing their hands over the crops to see the pests, but none looked for the predators as they were taught in the school. The interesting observation made was, "there indeed were farmers who could and did learn sampling rules and counting procedures; however they regarded these simply as rules and procedure to be followed in the schools and they saw no good reason to apply them to their own farming activities" (ibid:41). Even if some of them did reduce use of pesticides it was for the reason that they could no longer afford them.

This training was imparted in 1990 and after two years in 1992, returning to the field, the authors found that while most farmers claimed they had learnt all about the pest-predator relationship they were however applying them to their field in ways different from what was taught to them in school. Instead of going for physical sampling and counting they had devised more innovative ways of achieving their ends. One farmer carried a torch into his field at night to attract the moths and by the density of the moths assess their presence in his fields. It was then decided that the team will study the practices of the farmers to assess their relevance for pest management. Some of these practices were found functioning quite well. Like the practice of putting up a crab on the end of a stick in the field to let the rice seed bugs attach to it so that they could then be burnt. Other practices were identical to those recommended by scientists like flooding the rice fields to drown mole crickets, and draining the fields to get rid of nematodes. There were some old practices that did not seem effective like catching a grasshopper in the bush or forest and then carrying it around the rice field and chanting to the rice bugs that this is your father, go with him, your home is not here. It was also found that a certain point the farmers stopped taking action against ridding their fields against pests. To the farmers the failure of insecticide in these cases was because either the pests were magically sent by the goddess Nyai Loro Kidul or the pests would only leave when they were fully satisfied by their feeding on the crops. Other forms of indigenous knowledge that were sometimes evoked were that the brown plant hoppers were sent by the goddess in the place of rats that she used to send in earlier times, that the plant hoppers to some extent could be eliminated by pesticides and that the coming of the plant hoppers was not sudden but preceded by signs such as storms and heavy rain, confirming their supernatural origin.

Thus the invocation of some of the traditional supernatural knowledge by farmers in not taking action under some circumstance, but not all, indicates that there is context dependent variability of action that needs to be accounted for. Sometimes for example the farmers were drawing upon their former knowledge about non-insect predators such as snakes on rodent pests to apply to and augment their learnt knowledge about predator prey relationships. There was also the tendency to stick to traditional methods and use them partially in conjunction with new learnt knowledge. Thus while the farmers became well versed in predator prey relationships they still preferred to use the traditional method of observation by sight and from the edge of the field rather than by counting from within the field, as they were taught.

Again other research has indicated that not all forms of cultural communities and IK use the same type of group behavior. While most people consider IEK to be a shared form of knowledge, Walters (1998) in his research in the Philippines found otherwise. He found that mangrove planting in this region was a private and household affair and different people did not share their knowledge. The people also thought that there was no knowledge involved in mangrove planting and it was just a simple task that anyone could do. However at other times as the study by Waddell (1972) of the practice of planting sweet potatoes on mounds by the Fringe Enga shifting cultivators in New Guinea shows, it appears that very precise scientific knowledge is being used by the people almost unknowingly. The Enga sow their potatoes on large plano-convex mulch mounds, about three meters in diameter and more than half a meter in height. The Enga were themselves not able to tell why they did so except that their forefathers had always done it

that way. Waddell, a geographer, was of the opinion that these mounds were constructed in such a way as to protect the crop of sweet potatoes from frost in the highest altitudes. Waddell took temperatures from unmounded ground and from the top of the mounds and then made measurements that showed that the height of the mounds and the minimum height above ground at which the sweet potatoes were planted, increased with the altitude and correlated with the intensity and frequency of occurrence of frost. This indicated that such precise knowledge could not be just by chance but as a result of long term experience of the Enga with potato planting in that particular environment. However as the practice was reutilized people forgot about the reasons and followed it blindly yet the origin of the practice must have been by the scientific method of trial and error and then arriving at the best solution.

Thus these studies reveal various aspects of indigenous knowledge:

1) It is capable of being partially integrated or fully integrating with learnt knowledge.

2) Sometimes having no practical utility and on other occasions having immense efficiency.

3) IK is not necessarily culturally embedded and as Vadya *et al* have shown, can be studied by itself with only context specific reference to culture and tradition.

4) The study by Waddell also shows that we may look for efficacy of certain practices by using formal methods of analysis rather than always depending upon cultural or cognitive modes of explanation.

4.6 INTELLECTUAL PROPERTY RIGHTS (IPR)

The notion of intellectual property rights refers to the claim that one can make legitimately to any piece of creative work, a discovery or a knowledge that one has prior to anyone else. While it is easier ascribed in the modern times when people are aware of the legalities of ownership it is difficult to introduce such rights among people who may not have any concept of property, where traditionally rights of user rather than rights of possessor were in place. Even knowledge, like in the case of the Enga cited above may be attributed to the ancestors or may not be recognized as knowledge; for example the Philipino thought that planting mangrove forest required no special skill or knowledge. Rights to traditional knowledge was thus often usurped by outsiders and in case where patents are issued for certain herbs or natural products, the local people suddenly found that they were alienated from those resources to which not only did they have access for ages but the use of which they knew from antiquity. Infringements of traditional rights has often resulted in conflict in the modern world and the Indian government for example had to fight court battles to prove that basmati rice and herbal products based on *neem* were a part of Indian traditional ecological knowledge and could not be usurped by outside agents. The Igorots of Philippines have fought for their identity and rights to their own culture and knowledge; they have successfully fought for their rights and gained ground. Even the Churches in these regions have become more sensitive to people's rights and incorporated indigenous cosmologies and practices in their preaching.

The native Americans have also been fighting through their grass roots organizations that are also proposing "innovative sustainable indigenous alternatives" (Gonzales and Nelson 2001: 508) to use indigenous knowledge for production and making the environment enriched in a sustainable way. Knowledge among the Native Americans is guided by their natural law that stresses reciprocity that is one must give something in return for one gets and that one must never take more than what one needs. Such laws are obviously at odds with the larger consumer culture and capitalist economy and also those tribal elders from within their own communities who may like to opt for the western economic-political system for short term gains. Today however many native Americans have laid claims to their Intellectual Property Rights in the form of their IEK and are seeing the return to their own indigenous systems of knowledge and life-ways a way of asserting their inherent sovereignty. Today a new category of World heritage site includes the 'Cultural Landscape' as recognition of the fact that it is difficult to isolate people and their knowledge from their place of living. Knowledge for example cannot often be isolated from supernatural entities and plants and animals. The shamans regularly believe that the knowledge that they possess emanated from supernatural sources, "In this sense, a division of traditional knowledge is not local knowledge, but knowledge of the universal as expressed in the local" (Tucker and Grim 2001:3). Such ideas are not uncommon in many parts of the world among traditional healers. Even in India many such healers do not charge any money for their knowledge believing that if they charge money the supernatural agency will withdraw the knowledge from them. Like for many other people in the world, knowledge may be seen as a gift and one must give in order to justify the acceptance of this gift.

As reported, the shamans of the Mazatecs of Southern Mexico confer with plant spirits in order to heal and a part of being a healer is to be able to understand what the plants tell you. Similarly the Kayapo Indians of Brazil believe that health and well being of humans depends upon plants, animals and forces of nature. Thus it is difficult or impossible to assign IPR to individuals in such traditional knowledge societies and such rights are therefore conferred on the community along with its rights to certain resources and territory. The International Labour Organization (ILO) is the only legally binding international organization to protect the rights of indigenous and tribal people.

Check Your Progress 2

Note: a) Use the space provided for your answer

b) Check your answers with the possible answers provided at the end of this unit

1) What are the methodological understandings of accessing IK?

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2) How is the TK and Scientific Knowledge sustainable?

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3) What do you mean by IPR?

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4.7 LET US SUM UP

- "Ecological ethnicity" refers to those small pockets of humanity and their environment that is not part of the global economic order or are struggling to remain out of it.
- The recent policies of the Indian Government in introducing the Tribal bill look into some of the issues of TEK and there is now a political recognition that local governance and local management of resources are the only way in which some major achievements in sustainability can be achieved.
- The future rests on political and intellectual decentralization where alternative modes of thinking and knowledge is given due consideration and placed at equal footing.
- One cannot also override the philosophical basis of IK and TEK.
- The contribution of an earth centric word views or a holistic approach to human –environment relationship towards a sustainable future for mankind cannot be overlooked.
- Most environmental disasters are a result of environmental racism. It is only globalization that has made people realize but only in a limited way that we all breathe the same air and share the same resources on the same planet.

4.8 KEY WORDS

Indigenous knowledge : It is referred to as the unique, traditional, local knowledge existing within a particular geographical area.

Scientific knowledge : Systematic studied knowledge which is organized by general principles.

Intellectual Property Rights : It is a collective term including the independent intellectual rights which can be used collectively for protecting any kind of inventive work.

4.9 REFERENCES AND SUGGESTED FURTHER READINGS

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4.10 KEY TO CHECK YOUR PROGRESS

Check Your Progress 1

1) Your answer must include the following points
   - Culturally specific self-contained knowledge.
   - Autochthonous knowledge.
   - Oral tradition learned by experience.
   - Emotional and organizational aspects of collectiveness.
2) Your answer must include the following points
   - Rational interpretation of experiences and observations.
   - Case of the Black Sea traditional fisher and their TEK.
   - Ethnoscience.

Check Your Progress 2

1) Your answer must include the following points
   - Examination of actions.
   - Basis of knowledge: Linking knowledge system and other cultural systems.
   - Parameters of changes.
   - RRA (Rapid Rural Appraisal).
2) Your answer must include the following points
   - Learn new ideas, innovative ways.
   - Combine tradition and scientific knowledge.
   - Use of traditional methods.
3) Your answer must include the following points
   - Legitimacy and legalities of ownership.
   - Nature's contribution in the process of production and protection of environment.