Ecosystems Approach to Human Health: A Case of Konda Reddi Tribes and Women’s Health

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ABSTRACT The health of humans, like all living organisms, is dependent on an ecosystem that sustains life. Healthy ecosystems are the sine qua non for healthy organisms. The consequences of ecosystem degradation to human health are numerous. Countries across the world have a strong inclination to continue economic growth, even at the cost of severe environmental damage. The human population is now at all-time high, and associated pressures of human activity have led to increasing degradation of the earth’s ecosystems. Ecosystems approaches strive for outcomes that involve long term economic benefit rather than short-term financial gain. Ecosystem approaches to management involves a holistic, ecological view of natural resources and the environment. They recognize that human activity and production takes place within, and not outside of, ecosystems. This paper attempts to view tribal health from the ecosystems approach with the help of a case study of a Primitive Tribal Group; Konda Reddis in Andhra Pradesh, Southern India. The paper focuses on the tribe’s adaptability to their surrounding physical environment. They have harmonious interdependent relationship. However, a change in ecosystem due to human activities, development and modernization is disturbing this harmonious relationship. As a consequence of deforestation, forest rules and exploitation by the non-tribals their survival is threatened and life is becoming more and more challenging. The emphasis is on the adaptation, livelihoods, well-being and survival strategies of the Konda Reddis in this predominantly tropical rain forest environment. It focuses on the human contexts of deforestation and its repercussions on women’s health. This paper focuses on the ethno-ecological knowledge and on local resource management. The study gives emic perspective, the local perception, and gives the indigenous people a voice.

INTRODUCTION

An environmental determinant of health is, in general, any external agent whether biological, chemical, physical, social or cultural, that can be causally linked to a change in health status. In developing world, the primary environment determinants of health are biological agents in the air, water, and soil that account for most deaths. Four million children die annually from diarrhea diseases acquired from contaminated food or water. Over one million people die from malaria each year. Hundreds of millions of people suffer from debilitating intestinal parasitic infestations. Hundreds of millions of people suffer from respiratory disease caused by biological and chemical agents in the air, both indoors and outdoors. According to WHO (1992) over one billion people are unable to meet their basic needs (i.e., adequate food, clean water and shelter) because they lack the necessary income or land. These are environmental hazards that take a far greater toll on human life and suffering in absolute terms compared to those environmental determinants of concern in the developed world. The health of humans, like all living organisms, is dependent on an ecosystem. An ecological system may be defined as a community of plants and animals interacting with each other and their abiotic, or natural, environment. Typically, ecosystems are differentiated on the basis of dominant vegetation, topography, climate, or some other criteria (Breslow, 2002: 361). In most areas of the world, the human community is an important and often dominant component of the ecosystem. Ecosystems include not only natural areas (e.g., forests, lakes, marine coastal systems) but also human-constructed systems (e.g., urban ecosystems, agro ecosystems, impoundments), that sustains life. Healthy ecosystems are the sine qua non for healthy organisms. The consequences of ecosystem degradation to human health are numerous, and include health risks from unsafe drinking water, polluted air, climatic change, emerging new diseases and the resurgence of old diseases owing to ecological imbalances. Ecosystem degradation increases risk to human health. Ecological imbalances triggered by global climate change and other causes are responsible for increased human health risks (Rapport, 2002: 361). Countries across the world have a strong inclination to continue economic growth, even at the cost of severe environmental damage. The human population is now at all-time high, and associated pressures of human activity have led
to increasing degradation of the earth’s ecosystems.

Ecosystems approaches strive for outcomes that involve long term economic benefit rather than short-term financial gain. The desired outcomes of ecosystems approaches typically include: the protection of natural capital; the long-term protection of ecosystems and ecological processes; the maintenance of biological diversity; the sustainable use and harvesting of resources; and the recognition and protection of the traditional knowledge, customs and practices of indigenous peoples. The ecosystem approach can be viewed as one means to achieve sustainability or sustainable development. Ecosystem approaches to management involves a holistic, ecological view of natural resources and the environment. They recognize that human activity and production takes place within, and not outside of, ecosystems.

This paper attempts to view tribal health from the ecosystems approach with the help of a case study of a Primitive Tribal Group (PTG) in Konda Reddis in Andhra Pradesh, Southern India. The paper focuses on the tribals adaptability to their surrounding physical environment. They have harmonious interdependent relationship, i.e., on one hand these tribal groups are depended and survive on their immediate physical environment and on the other hand protect and conserve it. However, a change in ecosystem due to human activities, development and modernization is disturbing this harmonious relationship. As a consequence of deforestation, forest rules and exploitation by the non-tribals their survival is threatened and life is becoming more and more challenging. Due to the changes in their physical environment, their subsistence economy is affected, the availability of resources is scarce and they have to struggle for bare minimum needs. All these changes are posing a threat to their health, especially to women’s health.

Further, the emphasis of the paper is on the adaptation, livelihoods, well-being and survival strategies of the Konda Reddis in this predominantly tropical rain forest environment. The study adopts an inter-disciplinary perspective blending elements from human ecology, ecological anthropology, medical anthropology, ethnomedicine. Here the focus is on humanistic and social scientific approaches to the ecology/health discourse. The research questions, methods and concepts are oriented more towards the humanities and social sciences than ecology and biomedicine. Broadly the study link ecological aspects related to indigenous people’s livelihood, subsistence pattern and survival strategies. It focuses on the human contexts of deforestation and its repercussions on women’s health. This paper focuses on the ethno-ecological knowledge and on local resource management. How human induced changes in the environment are detrimental to their health and existence. The study gives emic perspective, the local perception, and gives the indigenous people a voice.

ECOSYSTEMS APPROACH TO HEALTH

In classical sociology, social was seen as separated from the natural. Thinkers like Marx, Weber and Durkheim were preoccupied with the development of modern industry and its degrading effects on human beings. Even if they saw nature as a precondition for social life, this dependency was not judged as important for the sociological analysis of society. Nature was defined negatively, as the non-social, being external to society and therefore not an object for sociological research. The dichotomy between the social and the natural- an academic division between a world of social facts and one of natural facts- has been pronounced in the case of sociology, which has caused nature to be almost a blind spot of sociological theory. This makes it understandable why modern sociology has found it hard to develop a systematic appraisal of environmental concerns (Lidskog, 2001: 114). Sociologist’s preoccupation with the study of modern, industrial human societies, where the relationship with the ecosystem is implicit did not catch their attention. The influence of environment is quite obviously indirect and is not visible in a short span. The consequences are slow yet drastic. Sociology’s research interest in the environment is relatively recent. ‘Environmental sociology’ is now accorded a formal status by the ‘American Sociological Association’ which has focused its attention almost exclusively on studies of the environmental movement.

Though, sociologists do implicitly worked within a model of society as being divided into four broad themes: economy, polity, social structure, and culture. This four fold division is an analytical device used by the sociologist,
though society does not divide itself so distinctly. Ramchandra Guha adds a fifth basic category to the scheme, the *ecological infrastructure* of human society, i.e., soil, water, flora, fauna, climate, etc. The ecological infrastructure powerfully conditions the evolution and direction of human economic life, political relations, social structure and ideology. At the same time, human intervention itself reshapes the natural environment in its own image (Guha, 1994:4-5). Social Ecology, a field which is still in the making, is not yet an established sub-discipline of sociology. It rests on the awareness of the interdependence of the biophysical and socio-cultural domains (Burch, 1987). Ecosystems have been recognized as an approach to study human health very recently. Though water, air, climate have been recognized for the causal of diseases, but overall approach of ecosystem is missing.

However, Anthropologists could not escape the importance of ecosystems in their investigation due to the explicit and conspicuous human-nature interaction among the traditional, tribal societies. Anthropologists studying small scale societies have traditionally exhibited a greater interest in ecological questions, relying on intensive fieldwork method amongst peasant and tribal cultures that are dependent on nature. Anthropologists have developed a healthy respect for the ecological sensibilities of the local communities. They have documented in great detail and in variety of regions, the indigenous knowledge systems, conservation mechanisms, and adaptations to the bio-physical world of tribal and peasant societies. For instance, Durkheim and Mauss’s study on totemism as ‘primitive classification’, Levi-Strauss’s work on myth and folklore took close notice of natural world. Radcliffe- Brown and Malinowski wrote monographs which highlighted the embeddedness of social institutions in their ecological surroundings. Frederik Barth is considered to be the pioneer of ecological anthropology. The studies of human-nature interactions by these anthropologists strongly testify to the continuing vitality of ecological traditions in Anthropology. Though, these studies have tended to ignore the environmental change that follows from human social activity. Environmentalists however are studying the environmental changes due to human activities. Social anthropologists in India have paid scant attention to the ecological framework of rural life: their over-riding concern has been with caste, kinship and religion (Guha, 1994: 9,11)

In sum, it may be noted that there is no dearth of research on human health by physiologists, or public health professionals or medical sociologist or medical anthropologists. Further, many studies were conducted on environmental issues and sustainable development though an integration of environment and health or more specifically ecosystems approaches to study human health is largely ignored.

Foller questions the epistemological concerns that have divided and fragmented research on ecological and health issues into different sub-disciplines? By searching for the intellectual roots and the theoretical progress of a shared ecology/health discourse, new patterns and linkages are unfolded and a new synthesis is emerging. It still suffers from the lack of common terminology for potential practitioners to avail themselves of, but new tendencies can be elucidated. He is firmly convinced that in the interface between these research fields’ ecology and health, new challenging research is emerging. It is moving away from the adaptationist school, with its monocausal explanatory models, towards a theoretical context with a more synergistic interaction (Bhasin, 2001).

McElroy and Townsend (1996) try to intertwine ecological, cultural and health approaches. They write in the introduction that medical ecology emphasizes the health implications of interactions between human groups and their physical and biological environments, and that human populations adapt to environmental problems, maintain health and persist overtime. They also state that medical ecology overlaps considerably in method and theory with ecological anthropology. This perspective has taken into consideration when analyzing the ecology/ health discourse. Globally, the ecological perspective on health is gaining voice and weight. Brown and Inhorn (1990) stress the ecological perspective on disease and human behavior, an underdeveloped area of research within medical anthropology. According to Bonet, the leader of a rehabilitation project in the oldest section of Havana, puts it:

“*The Ecohealth approach recognizes that there are inextricable links between humans and their biophysical, social, economic environments that are reflected in an individual’s health*”

Striking a balance between the health of
ecosystems and of the people who live in them calls for a new research framework “ecosystem approach to human health” - Ecohealth for short. Ecohealth activity inherently involves three groups of participants: researchers and other specialists, community members and decision makers. The ecohealth approach is based on three methodological pillars: transdisciplinarity, participation and equity (Lebel, 2003: 9-10). The ecosystem approach gives equal importance to environmental management, economic factors, and community aspirations. Traditional methods focus more on the latter two, to the detriment of the environment. 

Source: Adapted from Hancock, T. 1990. Toward Healthy and Sustainable Communities: Health, Environment and Economy at the Local Level. Paper presented at the 3rd Colloquium on Environmental Health, Quebec, Canada, 22 November 1990.

**Fig. 1. The traditional approach, and the ecosystems approach in understanding health**

**GENDER AND ENVIRONMENT AND WOMEN’S HEALTH**

In India the natural life support systems of land, water and air have been weakening over time as a result of the pressure of population and certain demands made by economic growth. In consequence, the symbiotic relationship between society and nature is disturbed. For instance India lost 3.4 million hectares of forest between 1950 and 1972 and another 9.2 million hectares in the ten-year period between 1972-75 and 1980-82, leaving a total forest cover of only 46.35 million hectares (CSE, 1985: 80). Not only are the forests disappearing, local inhabitants report that the water table has dropped to 120 feet below the surface in the span of one generation. Environmental degradation poses biggest threat to marginal cultures like that of tribals, and occupations like, nomads, fisher folk and artisans, which are heavily dependent on their immediate environment for their survival. But the maximum impact of the destruction of biomass sources is on women. Most of the development programmes are ignorant of women’s needs, and often anti-women, literally designed to increase their work burden. Given the culturally accepted division of labour within the family, the collection of household needs like fuel, fodder and water is left to women. As the environment degrades, and survival needs become increasingly difficult to collect, women have to spend an extraordinary amount of time foraging for fuel, fodder and water in addition to household work, agricultural work and caring for animals. Millions of rural women today sell firewood in the towns and cities. Survey shows that selling firewood is a profession that has grown rapidly in the last 10-15 years with the growth in landlessness and joblessness. Most of these head loaders are women, and mostly tribal women. Selling firewood is back breaking work and brings extremely little money (Aggrawal, 1994).

The experience of Chipko Movement shows that women in Himalayan Ghats, despite their 14-16 hour back-breaking work schedule, are extremely keen to participate in tree planting or afforestation. Once the women are organized and mobilized the evidence is that they work with great keenness and they fight any obstacle that may be created by men. It has been found that when women become involved in afforestation they tend to demand fuel and fodder trees, trees which can meet household needs, whereas men demand trees that can generate cash. The best ally in the demand for an ecologically and socially sound nature is, therefore, womankind (Aggarwal, 1994). Jacobson remarked, Chipko evolved into a full fledged ecological movement and became an outstanding example of female empowerment. The Chipko movement often has been used to point out what women in the Third World can accomplish when they organize and challenge traditional gender-defined patterns of resource use (Jacobson, 1992: 14).

There is little doubt that women in many parts of the developing world bear the brunt of deforestation, since they are the primary fuel wood collectors and depend on the forests for subsistence needs like fodder and food. It has been reported that women’s needs have received no consideration under community-oriented initiatives than under the unilateral programmes of forestry departments. Women remain as
marginalized at the community level as in national politics because of their disadvantaged position defined by patriarchal gender relations, which traditionally exclude women from the arena of political participation, even at the community level (Sarin, 1995: 27). Much of the marginalization of women can be related to traditional gender roles related to forest responsibilities and uses. Men are normally responsible for cutting wood for timber to be used in house construction and for agricultural implements. Such needs occur relatively infrequently for household. In contrast, women normally have responsibility for collecting daily fuel wood, fodder and water. Ecofeminists too opines that women are inherently closer to nature than men. Gender analysis tells us about some important structures that pattern the ways in which women and men relate to their environments. The worst sufferers are women who have traditionally been dealing with the resource. Their workload increased because of greater distance of forests (Shiva, 1989). The United Nations conference on Environment and Development (UNCED) in Rio de Janeiro during 1990, presented a global action plan to institutionalize the role of women in environment and development. The United Nations Fourth World Conference on Women, held in Beijing, China, during September 1995, further highlighted important issues if the gap between men and women is to be narrowed.

In short, it can be said that deforestation and environmental degradation directly affects the health and well being of women in the poor and underdeveloped regions. Their traditional roles of being fuel, food and fodder collectors, force them to trek long distances in harsh and undulating terrain. Gender analysis and integrated approach on some of these issues will give a better understanding of how the local groups manage their resources and what are the consequences of environmental degradation.

DISCUSSION

Profile of the Konda Reddis

The field work was conducted in three Konda Reddi hamlets, namely ‘Yerraguntapaka’, and ‘Tulipsipaka’ in Chintoor Mandal of Kammam district in 1992 and in ‘Upperrilla’ village of West Godavari district in 2003. Primary data was collected through observations, informal interviews, and case studies and also through administering schedules to the key informants like pregnant and lactating women, old men and women and medicine-men. Focus group discussions helped in cross checking the data and further enriching the information with various viewpoints.

The Konda Reddis are an important and one of the largest Primitive Tribal Groups of Andhra Pradesh. Their population was 76,391, with 38,309 males and 38,082 females, total literates 6,629 with 4,128 males and 2,501 female literates. Konda Reddis are predominantly rural in residence with 75, 361 and only 1030 having urban residence (1991 census). The Konda Reddis are known with varied names as Pandava Reddi and Hill Reddis. They are mainly concentrated in the districts of East Godavari, West Godavari, and Khammam of Andhra Pradesh. Based on the geographical settlements, they are divided into three distinct zones—hill settlements, river side settlements, and settlements of lower track. Konda Reddis inhabiting the interior areas have a greater level of dependence on the local natural environment. Their adaptation to the physical environment is seen in the material culture and in particular technology. The tools, implements, containers, food, house type and domesticated animals establish relationship with the natural environment. The man-nature interdependence can be seen as their whole survival and subsistence living is dependent on their surrounding environment. Poverty is rampant. They generally wear very little clothes; even the moderate winters are too severe to protect them from chill. The Konda Reddis are isolated from the outside world due to lack of communication and inadequacy of modern transport and educational facilities. Only few hamlets which are close to the main road have access to the modern transportation and tribal welfare schools for their children.

Forest Ecosystem of Konda Reddis: An Ethnographic Account

The villages are surrounded by undulating terrain, thick forests (deciduous), rivers, streams and hillocks. They are dependant on slash and burn method of cultivation (Podu) with a pre-agricultural level of technology and the hill slopes are usually unfertile. The other important
subsistence activity is hunting and gathering. According to Haeimendorf (1945) they are still at the Neolithic stage with pre-agricultural techniques. By podu cultivation they produce insufficient crops like, corn, maize, redgram and few items of vegetables. ‘Podu’ was a productive and convenient method of cultivation till recently. They were thriving on this subsistence activity. However, it is becoming more harsh and challenging. Earlier with good forests around and with less population, Konda Reddi Groups use to clear a patch on hill slope and cultivated for three years and use to abandon it permanently, a fallow period to rejuvenate, i.e. the land used to regain its fertility and flora. Now due to rules of reserved forest by the government they are given a limited area around their settlements and cannot go beyond certain boundary. Due to population growth, the land is becoming scarce and whatever land available is loosing fertility and is leading to soil erosion. Further, due to low soil fertility, the crop is of low yield which is not sufficient for their subsistence. They have adapted to these kind of environment by cultivating mixed crop of Millets, corn, sorgam, vegetables etc. They grow fruit trees around their houses. Podu cultivation essentially provides the necessary day to day requirements for survival rather than producing surplus. Since the crop is not sufficient for the whole year, they resort to the next important activity of foraging.

Konda Reddis life, whether economic, social, religious and their beliefs and their world view are influenced by their immediate ecosystem. Forest plays a vital role in the survival of these forests dwelling tribe, for forest provide them with food in the form of tubers, roots, leaves, fruits. Other items like skins, hides, horns of wild game and minor forest produce are exploited for commercial purposes. Forests provides them medicinal herbs, folk practitioners use herbal medicines for all most all the diseases. The man-nature interaction is of primary importance in economic activity of the Konda Reddis and it is intertwined with every aspect of their living. However, this agro-forest based economy is subject to vagaries of nature. Forest based economy not only provide food but also materials to build huts and other purposeful articles, fuels for cooking as well as lighting and warmth, fodder for cattle, rope, grass lac, gum, soap-nut, tamarind, etc. Farming is made difficult due to the natural conditions of the region; the luxuriant, valuable and abundant forests promote the natives to exploit the forest resources. They have evolved native methods of approach in extracting the forest products for the survival and continuity of the community. In hot dry summers, agricultural activity is meager. People mostly gather forest produce in this period. Forest is the heart of their traditional life and culture.

Foraging / gathering are an important economic activity. They are mostly done by women and children; it all depends on the seasonal fruits, flowers, leaves and tubers available. Through out the year some or the other resource is available. Nevertheless collection of it is rather a hard and strenuous activity. Women and children start early in the morning and go out in the forest in search of tubers and fruits. Due to scarcity, they are now required to travel more and into the interiors of forests. Here again reserved forests come as an obstacle for them to collect minor forest produce. The cattle’s too find it difficult to get their fodder or grass.

Hunting is another subsistence activity that is invested with certain cultural importance which encourages group activity and participation. It is a kind of entertainment and entirely the activity of men, a symbol of masculinity. During their leisure time as a small group they chase birds and hunt small game. The real hunting group consists of all the youth and elder males of the community. Earlier they carried only cater-pullers, bow-arrows but now they have crude guns too. The game is distributed among all the households, the hunter getting a double share. Decrease of animal species and the consequent imposition of government regulations to conserve the wild life in the region restricted the natives to practice hunting activity to some extent. Though there is decrease in the frequency of hunting activity, the natives take up hunting activity to meet their subsistence. Konda Reddi thus exploits natural resources in a systematic way through hunting, foraging, and cultivating. Konda Reddis have adapted to natural environment through organized activities all round the year.

Figure 2 shows the interdependence of Konda Reddis life on their ecosystems; forest, mountains, rivers and streams and in turn conserve and protect them. Whether, it is their subsistence economy, beliefs both religious and spiritual, health and folk medicinal practice and
social life all are influenced by the ecosystem. Further, for centuries Konda Reddis too with their shared beliefs and practices have been protecting and conserving their immediate environment. They revere and worship forest, streams, rivers, as they are dependant on them for their survival. They strongly believe in spirits and Gods and worship them. There is a direct relationship between the health and their environment. Due to the non-approachability of modern health facilities, they depend on folk medicine. The tribals are loosing the folk medicinal plants and herbs due to deforestation, thereby loosing the valuable traditional knowledge from the folk practitioners, who are not practicing anymore. Further, due to non-availability of forest produce and fertile land for podu cultivation their survival is challenged, leading to malnutrition and under-nutrition. As Konda Reddis life revolves around their ecosystem they are very much aware of its relevance and importance and thereby conserve it.

Interestingly Konda Reddis still have subsistence living, surviving on day to day hard labour. The podu cultivation, hunting and gathering are their basic economic activities which demands lot of labour and their economic activity varies with the changes in the seasons or availability of the resource. In other words, if they do not work they cannot survive. Except for children or handicapped all of them work, including the old people. It was reported that due to harsh living conditions and limited resources, the newly wed couples are asked to setup their own nuclear family and earn their living, thereby environment influencing their social life. It was observed that even old couples had their own separate households. There are no joint families. The simple and primitive technology which they practice results in scarce produce which is sufficient only for a nuclear family to subsist. Under the harsh conditions that are prevalent in their habitat all able bodied persons have to work hard for their survival. Konda Reddis do not have private property. They have adapted themselves to the environment by sharing, protecting and conserving whatever limited resources they find. Their behavior guided by the cultural norms, values and rituals, strongly suggests the amicable and harmonious relationships they maintain to protect their own environment.

Konda Reddis carry the feeling of “our forest, our streams and rivers” which allows them to carefully exploit, only as much as they need. There is no hoarding, no cheating and no greed.

Traditionally, they devised a system of sharing which is governed by their religious beliefs and practices. The ‘first fruit eating ceremony’ or the first harvest festival marks their values which govern their behavior. Till the festival is celebrated, which is fixed by the village head, even if the fruits are ripe and falling, they do not consume. If these kinds of restrictions are not imposed, they believe that there will be a kind of competition, cheating, hording and conflict among their own people. Once the festival is over, all the members get their due share and enjoy the fruits of the nature. They celebrate these festivals with joy, first to thank the Gods for the yield and further to propitiate the Gods and spirits to be kind enough to give more in the coming year. They sacrifice, pig, fowl, etc., for the ceremonies. The procession starts from village, worship gods in their village and then proceed to the forests. They also perform rituals at home in an auspicious corner called “gondi”. The rituals are carried by a person called “goravadu”. Mostly men and children carry out the rituals and women are kept outside these ceremonies for the fear of pollution. In the evening, they have a community feast, where rice and fowl are contributed by the family. Food is cooked by men for the community feast and served to women and children. Later end the festival with a drink of caryota toddy or country liquor with jubilant dance by all men, women and children of all ages. Drinking is quite
rampant and it is believed that it has a significant ceremonial importance as it increases the spirit of festive mood.

Perception about the Environment

Konda Reddi carry both kinds of feelings, of reverence and fear towards the forest. Adavi devata, adavi thalli, are the terms used for forest which means forests are like their gods, mother which takes care of them and provide everything for their survival. For Konda Reddis, forest is also the personification of evil, it is foreboding, uncontrollable and dangerous. People think that it is the habitat of demons, and ghosts who prey on people. Moreover, they carry mixed emotions, of fear, respect, and wonder for mountains. The hills and mountains are considered to be the symbols of power and the nature is considered to be majestic and mysterious, uncontrollable and threatening and yet life giving. They are considered to be abode of gods, places of infinite beauty yet have an element of wilderness, desolation and terror. Mountains also play an important role in the religious life of Konda Reddis.

Streams and Rivers too are revered as they are the source of life. Streams are considered to be village deity and worshipped as their goddess Gangalamma. Land too is perceived as mother, goddess, who ceaselessly blesses them and provide them with grains. It is interesting to know that during the period of pollution caused due to the life cycle occasions such as birth, puberty and death, they cleanse themselves in the stream water which is believed to make them pure. But a menstruating woman is forbidden to enter into the farms, as it is considered to be a sin against the goddess for polluting it. Konda Reddis perform Gangalamma festival to propitiate the goddess of water to have sufficient rains for them to cultivate. Since they are totally at the mercy of the powerful and uncompromising nature, they propitiate the land and water gods with sacrifices and rituals so as to gain their good will. All the religious beliefs, practices and ceremonies are associated with the physical environment. They believe in supernatural powers, deities and benevolent and malevolent spirits which are responsible for ecological happenings. They worship the ancestral spirits on every important life cycle occasions and festivals of the village. The villagers believe that their lives are ordained by certain spirits and deities and are thus engaged in organizing regular offerings toward the supernatural powers they believe in (Bondla, 1994).

Thus, Konda Reddis worship their ecosystem whether it is land where podu is practiced, forest, hill or grass. They even worship the path through which they move into the interior forest. They also perform certain festivals which are associated with the different stages of agricultural activities. It is a kind of expressing gratitude anticipating good harvests in the succeeding harvest seasons. These festivals also indicate the precautions that they take to over come natural calamities and scarcity of products. It can be summed up that their economic, social, religious, spiritual life revolves around their ecosystem and their beliefs and practices help in leading a harmonious life and adapting their life with scarce resources. It is imperative to understand how they preserve and conserve their ecosystem.

Preservation and conservation of Ecosystem

Konda Reddis show exceptional ecological sensibilities. Their whole survival is dependant on the ecosystem around them. They have sound knowledge especially of ecological and ethno-medicine, and view the environment as their only source of survival and livelihood which in different ways influence their lives. Moreover, Konda Reddis strictly observe certain social and cultural norms. These norms regulate and guide natives in the process of exploitation of natural resources and aim at conservation of natural ecosystem. This shows the awareness of the natives to the conservation and maintenance of natural ecosystem. Every household is restricted not to exploit the natural resources such as excess cutting of wood, edible leaves, fruits, etc. beyond the requirement. It is believed that causing wastage may lead to scarcity of forest items. The natives use timber only for making agricultural implements such as plough, handle for certain other tools and for house construction. Interestingly, the Konda Reddis do not specifically cut wood for firewood rather they collect the already slashed and half burnt wood from the fields. They also cut and dry the fallen branches and bark of trees and utilize them as firewood in their home stead. Konda Reddi conserves most of the tubers and roots by leaving
a small piece of tuber or roots in the earth for further germination, so as to collect the same in the forthcoming season. Konda Reddis shows concern about the conservation of fruit bearing trees and water resources at the community level. Jack fruit, tamarind and caryota trees are owned by the community. The community as a whole takes the responsibility to safeguard and take measures to replace it with the same plant species in the case of damaged trees. Thus, due to scarcity the whole community shares the natural resources, maintain harmony and peace and at the same time take responsibility to conserve the resources. Konda Reddis strongly believe that unnecessary and excessive felling of trees and greenery lead to the destruction of natural ecosystem which ultimately may affect their livelihood.

**Gender and Health**

Konda Reddi subsistence economy shows that they are totally dependant on their immediate ecosystem. Any change in their ecosystem is going to affect their lives immensely. Due to their illiteracy and innocence they are largely exploited by the non-tribal people when ever they come in contact. Due to lack of transportation, they are not able to sell their forest produce in the market, instead the people from plains come to their hamlets and barter their forest produce for broken rice or any other edible items. These intermediaries exploit them as they are in need. During the field work, it was observed that Tamarind which cost Rs. 24 a Kg in the market is brought from these tribals for an exchange of two kilograms of broken rice, which may be costing around Rs.10-12. The Konda Reddi women were exchanging tamarind with broken rice which they consume on daily basis. Some times Konda Reddi men do exchange their forest produce at shanties for the bare necessities like, salt, oil, legumes, etc. Even the cooperatives do not give very good price to them.

The younger generations coming in contact with the non-tribals are loosing their cultural values and faith in their belief's systems. It was found that due to the intrusion of outsiders and stringent forest laws, the feeling of possession of forest as “our forest” among the tribals who used to protect and safeguard it as their own, are now loosing interest. Due to poverty, scarcity of forest produce and the difficulty in procuring these resources, the younger generations are misguided and are lured for easy money making. The old men from the tribe reported that the younger men are lured with cash for cutting the trees in the forest. They are paid a sum amount of Rs. 200-300 overnight for cutting trees, which are towed away by the non-tribals later. It was reported that the deforestation is not only by these tribal men, but by the non-tribal and even the forest officials who employ people to cut trees and supply to their seniors in order to appease them. It was reported that there has been a connivance of the forest officials and non tribals in the illegal cutting of trees, which mainly occurs at night. During the field work in the month of May, 2003, the scholar found many trees cut down on the way to Konda Reddis hamlets.

As a consequence of the excessive felling of the trees by vested interests, Konda Reddi women have to walk longer distances in search of minor forest produce and firewood. Given this additional workload, women even in advanced stages of pregnancy are required to work in the podu or walk great distances to collect fuel and minor forest produce. The strain on these women is further added due to the non-availability of forest produce and decrease in the food grain production. Further, the availability of food is reduced, as a result of deforestation and lower fertility of the soil. This has serious implications particularly for the women who are responsible for the provision and distribution of food. Though, there is a division of labour among men and women, it is not balanced. Except for hunting, women perform all the functions which a man does, some of them are exclusively done by women, like, rearing children, collecting forest produce, collecting firewood, cooking, cleaning etc. One can observe women carrying loads of firewood on her head whereas, men walking with a sickle/ knife, as his job is to cut trees not to carry them. Women perform strenuous and routine work which takes toll on her health. Konda Reddi women work in Podu fields and go to forests till the third end of trimester in pregnancy. Apart from the biological function of child bearing, child rearing, cooking food, collecting firewood, household chores, gathering food all consume maximum of her time and attention. When they were asked why they work so hard, they commented:
Men work for themselves; they are lazy and are mostly drunk. We have to work to feed our children and ourselves. There is no other way.

Women and Konda Reddis in general suffer from fever, stomach-ache, cold, cough, jaundice, etc. There are frequent cases of fractures and burns and are prone to accidents while climbing trees or going around in forests. Many women were having either burn marks or marks of injuries on their bodies. Children were found with burned legs of hands as they sleep near the embers during cold winter nights. However, apart from these health problems, women suffer from reproductive tract infections and problems related to child birth and post-delivery infections. Most of the Konda Reddi women deliver the child at home under unhygienic conditions with no assistance and expertise. Sometimes old women and sometimes husband assist her. Women fear child birth and want to control their fertility. Case of Laxmi and Pandamma given in the italics below shows their fear for delivery and maternal death and they wish to have fewer children. Whereas, the older women prefer to have more children, as they are not sure of their survival. Hamlets close to the main land are availing some of the health facilities. Health officials also reported that the tribal who are nearer to the main roads and hospitals are coming forward for health check ups and family planning.

Laxmi, 22 years old has got two children, Pandamma 4 years, Chinna Reddi 1.5 years old. During her first delivery she suffered severe labour pain for hours. For her second delivery too, she suffered labour pain for 2-3 days. Her father, who is a medicine man, vydyuda, gave paste of roots to apply on stomach and to keep a bark called tadu cettu (Grewia tiliae folia) on the head and eat little bark. However, she feels that childbirth is very painful experience and would not like to bear any more children. But on the other hand, an old lady Bajaramma told she had 10 children, out of them only three are surviving and rest all died. She prefers to have more children, as many of them die and she is left with few. Unlike Bajaramma, Laxmi and Bumamma told that they do not want more (having 2 or 3 children respectively) children, as they had difficult deliveries and suffered with labour pains for 2-3 days. They all fear death (maternal death) during delivery.

Maternal mortality is reported to be high but no exact data could be collected. Many of the Konda Reddi men were married twice. Most often levirate marriages, where a man marries her wife’s sister after her death. Children were referred as born to first mother or second mother. It was common to find young women married to middle aged and some times old men. In one of the cases, a village head’s second wife was as young as his son born to the first wife. These marriage practices were the consequences of large maternal deaths during child birth. It was reported that the expectant mothers, to a large extent, were not inoculated against tetanus. Further, crude birth practices, as shown in indent, were carried out, either due to non availability of health care facilities, or lack of transportation. Only those hamlets near to the main road are availing the modern health facilities. The main causes of maternal mortality are considered to be unhygienic and primitive practices of parturition, puerperal infection, anemia, hemorrhage, obstructed labour and sometimes ruptured uterus. Nutritional anemia is an acute problem, for women in India and more so in tribal belt. These tribal women have heavy workload and anemia has a profound effect on their psychological and physical health. Anemia lowers their resistance to fatigue, affects working capacity under conditions of stress and increases susceptibility to other diseases.

On interviewing Bullemma’s husband, he revealed that during his wife’s delivery, she had intensive labour pain (twaraga niladledu) and that the position of the head of the infant was wrong (pindam tirigindi). He showed a small knife and said that he himself turned the pindam by pressing it over the stomach of his wife.

It was reported that they suffer from infectious and water borne diseases. Due to poor environmental sanitation and poor hygiene, they contract communicable diseases. Growing population, scarcity in the forest produce and less fertile podu cultivation leads to unsatisfactory nutritional status (malnutrition and undernourishment). Due to ignorance, inaccessibility and also unsatisfactory modern health care delivery system Konda Reddi women are heavily dependant on ethno-medicine. Traditional healers reported that they have herbal medicines for all kinds of health problems. They can cure simple ailments like cold, cough, stomach ache, fever, headache, etc. and even for a snake bite. The have medicines even for
treating complications during delivery, for treating barrenness and for controlling fertility/contraception. Studies have revealed that Konda Reddis have excellent knowledge about the folk medicines (Raju, 1995). Traditional healers reported that earlier they use to get the herbal plants easily, but now due to large number of felling of trees, they have to travel long distances to search these medicinal plants and trees. Due to non-availability of these medicinal plants, they are loosing interest in this practice and giving up their tradition.

Thus, it can be found that the environmental degradation have detrimental affect on the health status of the Konda Reddis. The relationships are extremely complex and work through long causal chains, which are not immediately apparent. For instance, soil degradation has lead to a scarcity of fuel wood and safe water and thus compels a mother to spend several hours a day away from home, putting the small toddlers in the custody of older siblings. The repercussions can be morbidity, infant mortality, and maternal depletion. In addition to greater maternal fatigue, superimposed on already low calorie-intake may lead to a low weight at birth of progeny and thereby to increased infant mortality.

CONCLUSIONS

The profile of Konda Reddis and their complete dependence on the immediate environment shows their age old adaptation and harmonious life with their ecosystem. It is in recent years that they are now being exposed to outside world and their adaptability is being challenged. Due to the interference of outside non-tribals and forest policies and programmes they are being exploited, alienated and loosing control over their environment and thereby struggling to survive. The loss of forests is posing great problems especially for women who take the responsibility to feed themselves and their family. They are now struggling much more to collect fuel, fodder and forest produce. The repeated podu cultivation is again leading to the loss of quality and quantity of produce. Further, the Konda Reddis are losing command over their resources on account of pressure from the non-tribals. They face displacement by development projects and of the state. The tribal sub-plan and special component plans for the scheduled tribes (within the national Five Year Plan) do provide substantial financial outlays but in the absence of a holistic frame and coordinated implementation, results have been far less than expected. The tribes who live in symbiotic relationship with the nature are the protectors of nature and any change in the ecosystems affects adversely on their living. Their entire life situation is based on the environment.

It is imperative to take cognizance of the tribal situation vis-à-vis their ecosystem. There is an immediate need to recognize and protect the traditional knowledge, customs and practices of indigenous people. Further ethno botanical investigation and scientific enquiry to preserve their knowledge and impede their valuable source of knowledge from vanishing. In order to reduce the burden of women in collecting firewood, focus should be to increase the biomass in nature and conservation of biodiversity. Women should be fully involved in decision-making and in the implementation of sustainable development activities. Priority should be given to gender sensitive, participatory action-oriented research and policy analysis. Measures should be taken to develop and include environmental, social and gender impact analyses as an essential step in the development and monitoring of programmes and policies. Thus, it can be summed up that there is a need for a holistic approach to environment, economy, energy, equity and development.

NOTES

1. This paper was presented at an International Conference “Ecosystems Approaches to Human Health” held at Montreal, Canada from 18th-23rd May, 2003.

2. An ecological system may be defined as a community of plants and animals interacting with each others and their abiotic, or natural, environment. Typically, ecosystems are differentiated on the basis of dominant vegetation, topography, climate, or some other criteria (Brestow, 2002: 361) In most areas of the world, the human community is an important and often dominant component of the ecosystem. Ecosystems include not only natural areas (e.g. forests, lakes, marine, coastal system) but also human - constructed system (e.g. urban ecosystems, agro ecosystems, impoundements).

3. PTG - Primitive tribal groups are tribal communities among the Scheduled Tribes who live in near isolation in inaccessible habitats. They are characterized by a low growth rate of population, pre-agricultural level of technology and extremely low levels of literacy. So far 75 PTGs have been identified.

4. Ethnomedicine deal with the study of indigenous peoples and healing systems, medicinal plants use and classification of diseases, public health.
5. For more details on this approach see chapter 2 “The approaches” by Jean Lebel. This is an IDRC publication showing how an ecosystems approach is used to study human health, a transdisciplinary approach applied in 30 countries and in some 70 projects. The book deals with the issue, case studies and some lessons learnt and recommendations.

REFERENCES


