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## **Traditional knowledge system and western science**

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### **Abstract**

Should we allow the non-literate knowledge systems developed through the millennia transmitted through word of mouth, tested through trial and error, to vanish without even trying to verify such knowledge? In this note we plead the case of the other knowledge systems to bring them within the ambit of science.

Int. J. Sustain. Dev. World Ecol., 6: 60-67, (1999).

## **Traditional knowledge and practices of Bhotiya pastoralists of Kumaon Himalaya: the need for value addition**

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### **Summary**

Little is known about traditional knowledge and practices developed by the transhumant society on available plants, animal resources, medicinal herbs and other technologies of high altitude Himalaya, where resources are scarce. Moreover, these traditional specializations of the indigenous people known as 'Bhotiyas' are breaking down because of lack of income generation and value addition. The impact of modernization and development has relegated the traditional systems of medicine, handicraft and cattle breeding further behind. The institutional attitude towards such knowledge systems has also been quite discouraging. This paper tries to document the traditional knowledge of some important herbs in their society, traditional cattle breeding achievements, and the traditional handicrafts, and suggests the immediate need for value addition in these sectors in order to save them from extinction and to add to the income of the people.

**Keywords:** traditional knowledge, practices, medicinal plants, cattle breeding, value addition, high hills, central Himalaya

## **Influences of economy and culture in development among mountain tribes of Indian Central Himalaya**

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### **SUMMARY**

The Indian republic contains a large number of tribal communities with varied cultures. Efforts to develop these communities by the government of India and the provincial governments continue to be important in the post-independence planning era, and perceptible development has occurred in the socioeconomic and demographic areas. However, expected goals have not been achieved and differing socioeconomic and demographic developments are still found in tribal communities, even within the same ecosystem. In this paper, an effort is made to characterize the differential trends of socioeconomic and demographic development among two mountain tribes — the Jaunsaries and the Bhotias — inhabiting the Indian Central Himalayan region. With the exception of altitudinal variation, the Central Himalayan region of India is governed by a set of more or less similar geophysical and environmental conditions. However, discernible differences in socioeconomic and demographic developments are found in these tribal communities, and are affected by the economy and culture of the tribal communities. The findings suggest that economic and cultural advantages and limitations should be appropriately integrated in planning to make development efforts more meaningful and sustainable.

**Keywords:** mountain ecology, tribes, economy, culture, development, planning, Indian Central Himalaya

## Conservation policy-people conflicts: a case study from Nanda Devi Biosphere Reserve ( a World Heritage Site), India

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### Abstract

Perceptions of local people towards conservation policy and related management interventions, nature and magnitude of policy-people conflicts and, possible options for conflict resolution were analysed in the Nanda Devi Biosphere Reserve, a World Heritage Site in Indian Himalaya. People's perceptions were discerned through participatory discussions covering 419 households distributed in 10 villages in the buffer zone. Traditional uncodified rights of local people were substantially reduced through policy interventions set in since 1860s. Local people as well as tourists were excluded from the core zone covering an area of 625 km<sup>2</sup> since 1982. Deterioration of rural economy due to damage to crop and livestock by wildlife and, termination of opportunities of income from wild medicinal plant resources and tourism in the core zone were the key negative impacts of conservation policy felt by more than 90% of respondents. Mean annual economic loss per household was estimated as Rs 1285, Rs 1195 and Rs 156 due to damage caused by wildlife to food crops, fruit trees and beehives, respectively, Rs 1587 due to ban on collection of wild medicinal plants for marketing and Rs 7904 due to ban on tourism in the core zone. Reserve authority granted compensation of livestock killed by wildlife but it was hardly 5% of the market value of killed livestock as assessed by the people. People did not appreciate much the present benefits from the reserve management in the form of wages for carrying out afforestation work, partial compensation of livestock depredation and availability of solar power devices, wool, and spinning devices. Approximately 95% respondents identified empowerment of local people in respect of realising income from timber from dead/diseased trees in community forests, income from medicinal plants in buffer zone and opening of core zone for tourism as potential development options. Improvement in rural economy, the prime concern of local people, has not received as much attention as legal enforcement of protection by the reserve management. There is a need for developing policies and management actions that serve the economic interests of local people together with enhancement of environmental conservation goal.

**Keywords:** Biosphere reserve; Conservation policy, people conflicts; Himalaya

## Seeds of *Adenanthera pavonia* Linn. used as weight-stone for weighing gold in the traditional system: A nature's substitute

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### Abstract

Use of the seeds of *Adenanthera pavonia* as a weight-stone (or weighing gold in the traditional system) is described.

**Keywords:** *Adenanthera pavonia*, Weight-stone, Gold-weighing.

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## Developmental Processes, Changing Lifestyle and Traditional Wisdom: Analyses from Western Himalaya

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### Summary

Traditional knowledge and practices are important in prudent resource use and biodiversity conservation. The implications of modernization and changing lifestyle are discussed in the context of agriculture and resource use, the two sectors in which maximum modernization has occurred. The information was gathered through observations and structured interviews over three years (July 1996 to July 1999) of field work in the western Himalaya. It was observed that forest based subsistence agriculture has given way to the market dependant cash crop cultivation. That apart from loss of genetic diversity, has also resulted in the degradation of forests. The use of wild plants in the day-to-day activities has also declined and dependence on high value market products has increased. Currently, wild plants are used only if no other cheap substitute is available in the market or if the use is economically beneficial to the people. Thus, the knowledge gathered through ages of experience is eroding because of the activities geared for short-term economic benefits which, in long run, may not be sustainable.

**Keywords:** Western Himalaya, traditional knowledge, resource use

## **Indigenous means of communication amongst social dignitaries of Hill Karbis of Assam**

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### **Abstract**

Communication is the lifeline of modern civilization. There exist an indigenous means of communication amongst social dignitaries of the Hill *Karbis*, Assam, India using a symbol called *Lam Kido* - made out of bamboo splits. In this study an attempt has been made to trace the origin of *Kido* and its significance in the social life of the *Karbis*. The study area covers the western part of Karbi Anglong district, where *Lam kido* had its origin and its uses still practiced. *Lam Kido*, often referred as only *Kido*, is the official means of communication between a *Karbi* traditional chief *Lindokpo*, and his subordinate *Habe*, who looks after the customs and traditions of a designated area called *Longri*. Only the *Lindokpos* enjoy the privilege of sanctioning the making of *Kido* which of course is preceded by a discussion in the traditional council. The *Kido* or Royal letter is carried by lower level dignitaries *Borsinot* and *Bormiji*. The content of the letter is coded in the form of knots in the tail part of the letter i.e. *Kido*. The study further revealed that though the message for the *Habe* is verbally passed through the messenger, the message will be considered authentic only if it is accompanied by the *Kido* from the sender, *Lindokpo*.

**Keywords:** *Kido*, *Lindokpo*, *Habe*, *Pinpo*, *Rongbong*, *Longri*, Traditional Communication Method, Bamboo splits, Hill Karbis, Mikirs.

## The Traditional Jewellery of Pabbar Valley

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### Abstract

Passion for jewellery is legendary. It is reflected in the numerous customary occasions where it is not only considered auspicious but mandatory to gift ornaments. The bride's trousseau is incomplete without the ornaments. Jewellery in India has drawn upon the many facets of its people, and has in turn been inspiration and solace to both wearer and beholder. Sculptors and painters transgressed boundaries between the real, the ideal and the imaginary, profusely embellishing their images with ornaments. Rulers used jewels as statements of power and prestige. To the Indian woman, gold holds special significance to her life. It is far more than the ultimate enhancer of beauty, it is that precious thing which stays and grows with her through the different stages in life. It is also her *Stridhan*, her security in the face of adversity, to be encashed in times of need or distress. The Indian woman has always been very creative in her expression of jewellery and design. In keeping with India's rich heritage of diversity, jewellery also takes on regional nuances. It is the ultimate and most-personal expression of region specific culture and art of lifestyles and heritage. It draws inspiration from architecture, dance and even religious customs, Each part of India offers their own traditional ornaments with special significance and these typically traditional ornaments with slight variations remain trendy at all times. The paper describes the traditional jewellery worn by the women of Pabbar valley of Himachal Pradesh, one of the northern states of India.

**Key words:** Traditional Jewellery, Traditional ornaments, Pabbar Valley, Himachal Pradesh.

## Warehouse Techniques in Traditional Knowledge Systems

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### Abstract

Traditional knowledge is the knowledge that has been passed from one generation to the next through the oral or written traditions. Elders, being the most knowledgeable persons are very important in the society. The elders are the people, who have gained the knowledge over their lifetime and are needed to teach the younger generations. The relationship of the indigenous people to the land and its resources is tantamount to their survival. No matter where they live and whatever beliefs they have, they all view land as the basis of their survival. Attempts are being made to document and preserve Oral Traditional Knowledge and Traditional Cultural Expressions. Looking into the quantum of the information, It is difficult to document and retrieve the information. To make this a reality, an urgent need to fabricate a Data Warehouse (DW) on Traditional Knowledge Systems (TKS) has been emphasised.

**Keywords:** Data Warehouse Techniques, Traditional Knowledge Systems

## Woodcarvings from Pabbar Valley

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Received 15 October 2004, revised 22 February 2005

### Abstract

Woodcarving was the favoured medium of artistic expression of the Indian subcontinent. Indian houses and temples were profusely adorned with it and are often inseparable from it. Woodcarving, an indigenous tradition craft finds a mention in the ancient texts such as the *Rig Veda* and *Matsya Purana*. Woodcarving craft was well developed in many states specially, Himachal Pradesh, Uttar Pradesh, Rajasthan, Gujarat, Kerala, Kashmir and Madhya Pradesh. They differed in terms of the kind of wood and the craft tradition. In the early days of kings and *nawabs*, woodcarving was essentially seen as an adjunct to architecture. Palaces, *havelis* and temples were decorated with incredibly carved doors, windows and *jalīs* (lattice work). The present paper describes traditional woodcarving work adorning houses and temples of Pabbar valley of Himachal Pradesh.

**Keywords:** Woodcarving, Traditional Craft, Pabbar Valley, Himachal Pradesh

## Gender in the management of indigenous knowledge: reflections from Indian Central Himalaya

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### Abstract

In the Indian Central Himalaya, indigenous knowledge is an important natural resource that has enormous potential to facilitate the development process in cost effective and sustainable ways. It governs almost all important productive resource sectors and revolves around traditional values of resource use. In this study, covering nineteen settlements and as many as 500 respondents drawn equally from both sexes, an effort was made to understand the indigenous knowledge of both the sexes through documentation of indigenous system of medicine and health-care practices. The study revealed that women are the real custodians of the indigenous knowledge system, as 52% of them have knowledge on thirty practices against that of 26% from males.

**Keywords:** Gender, conservation, Indian Central Himalaya, indigenous knowledge, resource.

## **Indigenous water conservation technology of Sumari village, Uttaranchal**

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### **Abstract**

An indigenous water conservation technology was studied in Sumari village of Pauri district, Uttaranchal. Since, the village had high population and low water quantity, therefore, they had developed an indigenous mechanism in such a way so that the available water could be managed properly for the use of humans and livestock. The indigenous technology developed by villagers is termed as *Nawn* and *Chaunree* systems of water management and conservation. The present paper investigates in detail about the *Nawn* and *Chaunree* systems of water conservation.

**Key words:** Indigenous water conservation technology, Nawn system, Chaunree system, Sumari, Uttaranchal, Himalayas

## **Sustainable mountain development: The Himalayan tragedy\***

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### **Abstract**

Mountain systems in India, including the Himalayan region are characterized by highly complex socio-ecological systems, with rich cultural diversity linked with equally rich species of biological diversity. With a large number of ethnic societies having their own social, economic and cultural attributes placed in a highly heterogeneous mountain environment, any conservation-linked developmental initiative has to be based upon a value system that they understand, appreciate and therefore can participate. While textbook-based 'formal knowledge' has its value in this effort, the rich traditional ecological knowledge (TEK) derived through an experimental process and available with local communities forms a powerful connecting link between ecological and social systems. Converting TEK, often seen as location-specific in broad generalisation that are applicable across socio-ecological systems was the major steps that was under taken by this author to convert research result in to policy formulations and developmental initiatives, as illustrated here. In the ultimate analysis, developmental initiatives that link cultural diversity with biological diversity are seen as the basis for ensuring human security in these socio-ecologically fragile mountain systems.

**Keywords:** Mountain systems, socio-ecological system analysis, sustainable development, traditional societies, traditional ecological knowledge.



## Indigenous beekeeping for sustainable development in Himachal Himalaya

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### Abstract

Indigenous beekeeping is the indigenous techniques of harvesting honey and beeswax from bees, using various indigenous styles of hives and other equipments. India and the neighbouring East Asian region are considered to be the centre of origin and evolution of honey bee species. Himachal Pradesh, owing to its varied agro-climate, has a great variety of bee forage sources that provide the basis for development of beekeeping industry in the state. The potential and success in beekeeping development is dependent on the quality and quantity of bees and bee flora available and the technology used. A survey conducted in seven blocks of district Chamba revealed that there are about 2.45 hives per house and occupancy rate of hive is 53.94 % in the region testifying to the richness of this culture. The Indigenous wall hives are locally called as *Ganari* in Chamba district. The dimensions of wall hive was accordingly, made by leaving a cavity in the wall when the house is under construction. On the inside, it is covered usually with a slate or stone plastered with mud. The size depends upon the availability of hollow tree trunk of *Toon*, *Robinia*, *Bann*, *Kail* trees. Beekeepers of district Chamba prefer the wall hive, however quantity of total honey harvested and ease of harvest is best in log hives. People clean their hives by scrubbing them from inside with scrubbers made of pine needle, *Juniperis* sp. or old raw combs. This helps in attracting the bees to the hives. Economic efficiency of *Apis cerana* (Indigenous beekeeping) is shown to be more economic than *Apis mellifera*. Beekeeping with *Apis cerana* should be encouraged for rural households with low investment capacity.

**Keywords:** Indigenous beekeeping, Chamba, Honey, Beeswax, Sustainable development, Himachal Pradesh, Himalaya

## **Biological geographical indicators of traditional knowledge based products and green technology from Arunachal Pradesh: An initiative for safeguarding IPR of communities**

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### **Abstract**

The paper demonstrates the observations of an initiative taken during 2003-2008 in Arunachal Pradesh about the work on Geographical Indication (GI) with reference to the traditional knowledge and plant based products/practices and green technologies. These studies suggest that there are total 12 GI important products and green technologies which are made/ prepared from the indigenous plants. These products and technologies were recorded from *Adi* and *Monpa* communities of East Siang and West Siang districts of Arunachal Pradesh. Each product/green technology is belonging to community knowledge domain. These GI important practices/products/green technologies were submitted to the Government of India for their inclusion in main GI database and further processing to ensure community collective rights and IPR on the reported products and green technology.

**Keywords:** Geographical indications, Traditional knowledge, Plant biodiversity, Tribal communities, Arunachal Pradesh

## **Social Organization, Continuity and Change: The Case of the Bhutias of Lachen and Lachung of North Sikkim**

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### **Abstract**

All societies are involved in the process of social change. The study of socio-cultural change is the systematic study of variation in social and cultural change. However, in societies there are structures and processes which are more prone to change while there are others that are resilient to change. The structures which do not change are social continuities. The efforts to improve or bring development cannot ignore culture. The very process of socialisation is one in which cultural knowledge is constantly transmitted, acquired, and produced. Cultural beliefs and values shape what occurs within formal education systems. Economic and political changes are often expressed in cultural terms. Meanwhile, culture also works as a force to reshape the environment and therefore influences economic and political systems. Anthropological perspectives on cultural continuity and change can thus make critical contributions to more informed and enlightened policies and practices in the new millennium. The study centres on the two prominent groups of the Bhutias- the Lachenpas and Lachungpas who are settled in two river valleys of Lachen and Lachung of North Sikkim. The Bhutias of Lachen and Lachung practiced marginal agriculture and yak, sheep and goat rearing as a part of their subsistence. Maintenance of such herds was possible only through a skillful organisation of the migratory movements to avail pastures in certain niche or at certain times in the particular environment of the region. High up on the northern borders, marginal agriculture and animal husbandry was not sufficient to sustain the population, so the people of Lachen and Lachung indulged in marginal trading activities with Tibetans across the borders. The barter of timber, wood, dyestuffs and dairy products of that region for Tibetan salt and wool formed the basis of this trade. The people of Lachen and Lachung pursued it as an occupation intimately interwoven with their pastoral activities. Thus, as long as trade was unhampered by political restrictions, it enabled them to remain economically independent. However, with the closing of the Tibetan border in 1962, social life changed for these people. Since the closure of the transborder trade they are facing several problems. The Bhutias have tried to solve these problems with their traditional social organisation. The key aspects of social organisation, transhumant production system, continuity and change among the Bhutias of Lachen and Lachung have been discussed in this study. Units such as the household, the village or *busti*, encampments, and *dzumsha* defined by predominantly local interaction patterns between kinsmen and friends are the most important institutions which anchored these Bhutias to a specific community and territory. This traditional organisation (*dzumsha*) has a formal set up to show an example of social cohesion between the people with range of activities. *Dzumsha*, which has been under operation for over 600 years, controls resources and looks after conservation of resources, pasture management for grazing, conflict resolution, social and community mobilisation, traditions and local governance.

**Keywords:** Environment. Agriculture. Animal Husbandry. Barter. Transhumant Production System

## Life on an Edge among the Changpas of Changthang, Ladakh

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### Abstract

The Buddhist Changpas-pastoral nomads of Changthang, Ladakh form an ethnic entity. Like other nomads in the world, the pastoral nomads of Changthang are a minority, suffering problems of under representation, social, economic and geographic marginalisation. The region is extremely poor in conventional energy sources (fossils, fuel and wood) and has almost no industrially exploitable resources. Natural environmental limitations dictate many aspects of traditional life, especially settlement pattern and economic system. Among the Changpas, the pastoral mode of livelihood is an evident attempt to adapt to a natural environment, which provides no plants as food that can support humans and has no potential for growing food crops. Under such conditions, the only solution is to domesticate large herds of various animals, which can feed off the plants and in return, the animals can sustain humans. Since, the ecological conditions of Changthang are not favourable for crop growing, the Changpas raise large herds of sheep and goats as well as transport animals like yaks and horses. These animals provide the Changpas with meat, milk, varieties of wool, which they use themselves and barter for grains and other utilities. This economic interdependence of nomadic pastoral and settled population has been an important characteristic of the society in this area. The Changpas social behaviour is, in part, a response to constraints and opportunities of the natural environment. Both stability and change are outcomes of response to the immediate needs of daily life. The basic form of social organisation in the area was rural, and social relations among the agriculturalists, nomadic and semi-nomadic groups were based on trade and exchange of essential commodities. The Changpas' subsistence level pastoral economy, traditional social and religio-cultural systems are composite part of cold desert's ecological system. Their way of life shows a capacity to adapt themselves to the rugged cold desert environment. The Changpas possess a high degree of specialised knowledge and a flexible social organisation to make viable the mobile mode of production. Despite the ecological constraints, the Changpas were managing their environment for making a living without outside intervention. Their own societal controls like polyandry and cutting of excess animals, helped in turn by their customary rights and equity in resource allocation has helped them. The Changpas are organised using a patrilineal idiom, all members being patrilineal descendants of the founding ancestor. Rangeland, livestock, manpower and the considerable knowledge of the skills necessary to exploit them effectively are the principle economic resources of the Changpas of Changthang. Resource management in a risky environment illustrates the skills of the Changpas for survival. Traditional practices of Changpas, such as the rotation of grazing areas and use of reserve pastures in case of natural calamities help manage the variability of ecosystem and bail out pastures from a state of permanent degradation. Each animal has its own specific characteristics and adaptation to the environment. Rearing together different animals maximised the use of vegetation in the pasture. Different animals graze on different plants. In recent decades, the Changpas of Changthang have been experiencing changes due to external pressures that have altered political, economic and social landscapes. Traditionally, the Changpas were self-sufficient and livestock were providing them with their food and lodging. In recent decades, continuous massive defense investments and improvement in communications; proliferation of government departments; introduction of development plans; provision for basic amenities, alterations in traditional subsistence economy, its commercialisation and extension of know-how through government departments and non-government organisations and tourism has led to a higher motivation among local people for better standards of living. Increasing administrative and market integration and population growth over the years have weakened socio-homeostasis with no functional substitutes for restoring positive social system. For centuries, pastoralists in Changthang have lived in the context of environmental uncertainty and have developed a diverse range of strategies, institutions and network to minimise this unpredict-ability and risk. Pastoral management strategies, which may have worked previously, may or may not be sufficient now. The three communities of Samad, Korzok and Kharnak responded differently to these changes. Various pressures with an ever-increasing rate of change necessitated the adoption of new strategies for survival.

**Keywords:** Pastoral Nomads. Conventional Energy Sources. Soci-eco-geographic Marginalisation. Social Behaviour. Natural Environment.

## Pastoralists of Himalayas

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### Abstract

Pastoral societies have revived strong and renewed interest among the anthropologist. Pastoralism is a subsistence pattern in which people make their living by domesticating large herds of animals. The pastoral subsistence economy provides an adaptation to such conditions since it promotes the conversion of the low quality plant resources into portable, high quality animal foods. However, the overall low level of energy availability necessitates low population density and high mobility among pastoral population. Within a pastoral society the ecosystem diversity does not only mean the variety of ecological zones or habitats, but, it encompasses cultural diversity and ecological processes related to different pastoral production systems as well. Therefore, biodiversity provides a fundamental base to pastoralism and to the overall economic systems. Sheep and goat pastoralism is a constant feature of traditional mountain societies. It is rare that any pastoral group lives exclusively with the products of their herds. All pastoralists have to look for supplementary forms of economic activity. The pastoral communities of Himalayas make use of resources like high mountain pastures by three different ways by characteristic mobility patterns, socio-economic organisation and property rights. The study deals with three pastoral groups of Himalayas who inhabit Ladakh, Sikkim and Himachal Pradesh. Changpas nomads of Changthang raise herds of sheep and pashmina goats, yaks and horses. Gaddis of Bharmour are agro-pastoralists and raise large flocks of sheep and goats. Bhutias of North Sikkim are agro-pastoralists and raise local cows and ox, yaks, sheep, goats and ponies. These societies use animals as providers of food, fuel, fiber, draught power and transportation. However, nomadic, seminomadic and transhumant pastoralist societies have lifestyles that revolve mainly around their livestock. The transhumant pastoral societies inhabiting the high Himalayan areas exploit the seasonal abundance of grazing areas. As social and ecological conditions change, pastoralists adjust accordingly. Pastoralists play an important role in the ecology of India. Their production of organic manure contributes to the maintenance of soil fertility. Their grazing controls invasive exotic species. Contrary to their reputation, pastoralists have traditional practices for conserving vegetation by rotational grazing. Pastoralists make a significant contribution to India's economy in terms of food security (milk), provision of draft animal power, as well as foreign exchange earnings (meat, fibre e.g. pashmina wool). Since pastoralists do not own land, their produce is generated by dependence on communally and state-owned grazing land. Currently, the trend towards globalization of the market, with pastoral lands increasingly being commercialised and/or turned in to national parks has created problems for the pastoralists. Due to neglect by officials and policy makers, pastoralists face deprivation from their traditional and customary rights to these grazing areas. The political marginalisation of pastoral communities paved the way for forcible eviction from their land and/ or restriction of their movements. In Ladakh, protection of wildlife has proceeded at the expense of the availability of grass biomass for the herds of the pastoralists. Since Independence of India, the pastoralists of Himalayas have faced a series of significant changes from external political and economic changes. These structural alterations have brought adjustments in many aspects of the traditional pastoral system, including migratory cycle, local economy and social organisation. Many of them left their traditional transhumant way of life and settled along valleys. Some have settled in urban areas others stick to the pastoral activities by changing the composition of livestock by increasing number of goats and decreasing number of yaks. State policies regarding forests, agriculture, irrigation, fodder, famine, pastoral rights and migration are some of the mechanisms that contribute to the alteration of pastoral life-style. Development of animal husbandry is a major government goal. All pastoral groups in Himalaya face the similar constraints and stimuli. Natural exigencies-extreme weather conditions, drought, epidemics and predators result in reduction of animals. Likewise, social crisis, such as phases in domestic developmental cycle and work force shortage in herding groups cause concern in the community.

**Keywords:** Ecology. Adaptation. Settlement. Animal Husbandry. Transhumant. Tribal Groups. Gaddis. Changpas. Bhutias. Sikkim. Ladakh. Chamba. Socio-economic Organisation. Property Rights.

## **Traditional Knowledge Research: Recycling Human Waste Among Ladakhis**

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### **Abstract**

A major challenge facing environment and development organization is the waste management. In the present paper, how Ladakhis have been reusing the human waste instead of waste disposal and in doing so are helping their subsistence agriculture has been reported.

**Keywords:** Himalayas. Tribes. Environmental Sustainability. Indigenous Knowledge.

## **Need for Indigenous Knowledge Based Sustainable Planning**

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### **Abstract**

Since the dawn of civilization, both sexes have played a significant role in the evaluation of mankind. In the tribal society of western Himalaya, people have been playing an integrated role in terms of ecosystem functioning. Nonetheless, women have been playing a key role in the upliftment of social, cultural, economic and political values since age-old in the mountainous region. The distinct allocation of activities of men and women has evolved locally for productive and functional usages and it has been inheriting since generations. The status of both sexes is exclusively dependent up on functional attributes of the people concerned. However, the position of women in the study area is, by and large, equal to men; women work 14-16 hours a day and enjoy their life. They never feel bore in harsh and inhospitable geo-climatic conditions but they have molded themselves to contribute optimally through conducive functioning at different subsystem levels. Lack of developmental policies and programmes focusing on cultural domain and centering around agriculture-animal-forest-domestic based interactive subsystems/sectors are endangering the indigenous society of the region. Therefore, developmental approach should be centered on interactive subsystem levels derived from indigenous knowledge oriented packages rather than introduced alien packages.

**Keywords:** Western Himalaya, Tribals, Status of Women, Indigenous Knowledge, Interactive Planning, Ecosystem Sustainability

## **Re-energizing Watermills for Multipurpose Use and Improved Rural Livelihoods- A Case Study from the Western Himalayas**

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### **Abstract**

Abundant rivers, streams, rivulets, and lakes are found in the Indian mountain region; ultimately, they flow down to meet the water needs of the population residing in the plains. Adequate efforts have not been made to harness the water resources that originate in the Himalayan region in order to address the increased need for small-scale energy for local use and sustainable livelihoods among the population living in remote and inaccessible mountain areas. Most of these areas are still without electricity, which plays a vital role in the development of any society. There is a need to ensure that local communities can benefit from energy just like people in the plains: they need to be empowered to tap and make the best use of local water resources, based on traditional knowledge of techniques to do this and improvement of time-tested technologies for better efficiency. This will allow them to produce added value and enhance their livelihood options.

## **Gender Approach to Sustainable Rural Development of Mountains Women's Successes in Agro-enterprises in the Indian Central Himalayan Region**

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### **Abstract**

In the context of mountain development—eg in the Indian Central Himalayan Region (ICHR)—the role of micro-enterprises in poverty eradication and extending employment opportunities with very low capital is self-evident. Micro-enterprises have been well established in promoting equity-based participatory development in rural areas in the ICHR. Women play a vital role through collective entrepreneurship in mountain regions for achieving socioeconomic equity and ecological sustainability. The Rawain Women's Cooperative Federation (RWCF) established in Yamuna valley, Uttarakhand, in the western part of the ICHR, has emerged as a role model of sustainable rural livelihoods. The diversification of agriculture in mountain regions according to the RWCF pattern has played an important role in ensuring participation of women in policy making, community-based interventions, and institutional support. With this experience women have been capable of visualizing and realizing the opportunities offered by globalization.

## **Traditional knowledge and biocultural diversity: learning from tribal communities for sustainable development in northeast India**

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### **Abstract**

This paper presents a synthesis of grassroots activities designed to promote the learning and conservation of traditional knowledge and related biocultural resources among Adi, Monpa and Khasi tribes of northeast India. The results indicate that the participation of knowledge holders in various village level activities can enhance the promotion of traditional practices, learning of knowledge and conservation of related resources. Knowledge holders of varying age groups and social systems have many notable traditional practices that provide promising solutions to current challenges. The promotion of traditional knowledge-based products can also facilitate the conservation of resources and the subsistence survival of people. Strong multi-level networks between all stakeholders are needed to ensure the sustainability of traditional knowledge and conservation of biocultural resources of communities of northeast India.

**Keywords:** traditional knowledge; biocultural diversity; conservation; livelihoods; sustainable development; northeast India



## Pastoralists of Himalayas

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### Abstract

Pastoral societies have revived strong and renewed interest among the anthropologist. Pastoralism is a subsistence pattern in which people make their living by domesticating large herds of animals. The pastoral subsistence economy provides an adaptation to such conditions since it promotes the conversion of the low quality plant resources into portable, high quality animal foods. However, the overall low level of energy availability necessitates low population density and high mobility among pastoral population. Within a pastoral society the ecosystem diversity does not only means the variety of ecological zones or habitats, but, it encompasses cultural diversity and ecological processes related to different pastoral production systems as well. Therefore, biodiversity provides a fundamental base to pastoralism and to the overall economic systems. Sheep and goat pastoralism is a constant feature of traditional mountain societies. It is rare that any pastoral group lives exclusively with the products of their herds. All pastoralists have to look for supplementary forms of economic activity. The pastoral communities of Himalayas make use of resources like high mountain pastures by three different ways by characteristic mobility patterns, socio-economic organisation and property rights. The study deals with three pastoral groups of Himalayas who inhabit Ladakh, Sikkim and Himachal Pradesh. Changpas nomads of Changthang raise herds of sheep and pashmina goats, yaks and horses. Gaddis of Bharmour are agro-pastoralists and raise large flocks of sheep and goats. Bhutias of North Sikkim are agro-pastoralists and raise local cows and ox, yaks, sheep, goats and ponies. These societies use animals as providers of food, fuel, fiber, draught power and transportation. However, nomadic, seminomadic and transhumant pastoralist societies have lifestyles that revolve mainly around their livestock. The transhumant pastoral societies inhabiting the high Himalayan areas exploit the seasonal abundance of grazing areas. As social and ecological conditions change, pastoralists adjust accordingly. Pastoralists play an important role in the ecology of India. Their production of organic manure contributes to the maintenance of soil fertility. Their grazing controls invasive exotic species. Contrary to their reputation, pastoralists have traditional practices for conserving vegetation by rotational grazing. Pastoralists make a significant contribution to India's economy in terms of food security (milk), provision of draft animal power, as well as foreign exchange earnings (meat, fibre e.g. pashmina wool). Since pastoralists do not own land, their produce is generated by dependence on communally and state-owned grazing land. Currently, the trend towards globalization of the market, with pastoral lands increasingly being commercialised and/or turned in to national parks has created problems for the pastoralists. Due to neglect by officials and policy makers, pastoralists face deprivation from their traditional and customary rights to these grazing areas. The political marginalisation of pastoral communities paved the way for forcible eviction from their land and/ or restriction of their movements. In Ladakh, protection of wildlife has proceeded at the expense of the availability of grass biomass for the herds of the pastoralists. Since Independence of India, the pastoralists of Himalayas have faced a series of significant changes from external political and economic changes. These structural alterations have brought adjustments in many aspects of the traditional pastoral system, including migratory cycle, local economy and social organisation. Many of them left their traditional transhumant way of life and settled along valleys. Some have settled in urban areas others stick to the pastoral activities by changing the composition of livestock by increasing number of goats and decreasing number of yaks. State policies regarding forests, agriculture, irrigation, fodder, famine, pastoral rights and migration are some of the mechanisms that contribute to the alteration of pastoral life-style. Development of animal husbandry is a major government goal. All pastoral groups in Himalaya face the similar constraints and stimuli. Natural exigencies-extreme weather conditions, drought, epidemics and predators result in reduction of animals. Likewise, social crisis, such as phases in domestic developmental cycle and work force shortage in herding groups cause concern in the community.

**Keywords:** Ecology. Adaptation. Settlement. Animal Husbandry. Transhumant. Tribal Groups. Gaddis. Changpas. Bhutias. Sikkim. Ladakh. Chamba. Socio-economic Organisation. Property Rights.

## **Women's Contribution to Household Food and Economic Security: A Study in the Garhwal Himalayas, India**

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### **Abstract**

Poverty and household food security are much debated issues in development literature, and women's contributions to food and economic security have received attention for the last 15 years. Collection of natural resources is usually carried out entirely by women in developing countries, particularly in fragile and rugged mountain environments. Our study in the Garhwal Himalaya attempted to monetize this unpaid work by women through a survey conducted by researchers of time use on a recall basis for the last 7 days. The value of women's contributions was then computed by 2 methods: opportunity costs and output method. The results show that women are at the forefront of food and economic security and in some cases are breadwinners.

Policies must address the specific problems of fodder and fuelwood collection in mountains by promoting renewable and nonconventional energy resources such as biogas and solar energy and by involving women in grassroots participation. This will significantly lessen the drudgery of women's work.

**Keywords:** Gender division of labor; time use analysis; monetization; unpaid work; opportunity costs; output method; food and economic security; India.

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## **Situating the Humans Relationship with Nature in the Tangkhul Naga's Lifeworld**

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### **Abstract**

The Tangkhul Nagas are intricately bound to nature in their social, cultural, economic, ethical and religious values. The dynamics of Tangkhul's livelihood activities in many ways reflect the complexities of the human and nature relationship. Interactions between human and nature have undergone significant changes during the last century which leaves unwarranted impact on its natural environment. Today increasing scarcity of natural resources is serious in Tangkhul Naga society. Besides other than population pressures, technological intrusion and developmental activities, the arrival of Christianity in the late 19th century proved ominous to the human and nature relations in the lifeworld of the Tangkhuls. The Colonial British introduced Christianity to the Tangkhul Nagas and used as a preliminary strategy to contain the hostile Tangkhuls from fierce rebellion against British dominions in the region. This paper attempts to present the symbiotic relationship of humans with nature in the antecedent lifeworld of the Tangkhuls while arguing for preserving its traditional knowledge system of nature conservation.

**Keywords:** Tangkhul Naga, Indigenous, Human, Nature, Land, Plant, Animal, Lifeworld, Christianity and Modernisation

## Local and regional institutions and environmental governance in Hindu Kush Himalaya

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### Abstract

This paper examines the role of local and regional institutions in environmental governance in Hindu Kush Himalaya (HKH). These institutions have been playing a significant role in regional environmental governance, particularly through generating and disseminating critical knowledge, mobilizing resources and addressing marginality, and regional environmental fragility. However, local and regional institutions have not yet comprehensively addressed the issues of poverty, livelihood, food security, gender inequality, education and social marginalization that affect the entire process of environmental governance. Community access to and involvement in critical socio-economic sectors such as infrastructure and health and education systems, including their governance processes, did not improve due to a lack of inter-linkages within and between local and regional institutions. This underlines the need for capacity building and the development of partnerships and horizontal and vertical linkages among local, regional and national institutions. These practical advances would facilitate improved access to new knowledge, technology and critical information and encourage the movement of financial resources to local levels.

**Keywords:** Sustainable mountain development, Mountain ecosystems, Community-based environmental, governance Forest panchayat, Community forestry

## Pastoralism in Transition: Livestock Abundance and Herd Composition in Spiti, Trans-Himalaya

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### Abstract

Recent discourse on pastoralism and ecology has focused on increased stocking densities and subsequent consequences on grasslands and productivity. It has been shown that increase in livestock numbers may adversely affect wildlife populations associated with high altitude pastures. In this study, we examine the decadal trend in livestock numbers and composition in five villages in Spiti in the Trans-Himalaya region to determine social-ecological linkages in these agropastoral communities. As opposed to previously reported trends, we find that livestock numbers have essentially halved in the last decade and the reduced holdings also are compositionally different from the original stock. We examine the societal, agricultural and perceived ecological changes associated with the decline in livestock. We conclude that the decline in livestock is associated with large-scale changes in the social, cultural and economic landscape and that this decline may benefit wildlife conservation programmes in the region.

**Keywords:** Pastoralism, Livestock, Wild ungulates, Development, Spiti

## **Tribal institutions and conservation of the bioculturally valuable ‘tasat’ (*Arenga obtusifolia*) tree in the eastern Himalaya**

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### **Abstract**

This study reports on the biocultural dimensions of the tasat (*Arenga obtusifolia* Griff.) tree and its conservation by various informal institutions of the *Adi* tribe of Arunachal Pradesh, India. The study included 240 *Adi* community members (120 men and 120 women) residing in 12 villages of the East Siang and Upper Siang districts of Arunachal Pradesh. The study was conducted using personal interviews and participatory methods. Results indicated that the stem of tasat is used as a traditional food during droughts and in preparing an ethnic beverage. *Tasat* is being conserved by the *Adi* tribe in various habitats. Plant populations of *tasat* were observed relatively higher in Upper Siang than the East Siang district. The study found differences in the status of biocultural knowledge between genders and different age groups. *Kebang* and *reglep* are two indigenous institutions of men and women, respectively, and play leading roles in sustaining *tasat* plants in various habitats. Women of the Upper Siang district still maintain a knowledge network for diffusing biocultural knowledge related to *tasat*, among others, through a barter system. Changing land use patterns in agriculture affects *tasat* conservation. The value addition for *tasat* based products, and rewarding women who conserve *tasat*, can enhance the sustainability of *tasat* based on biocultural knowledge and institutions.

**Keywords:** *Adi* tribe; *Arenga obtusifolia*; conservation; biocultural value; indigenous institutions