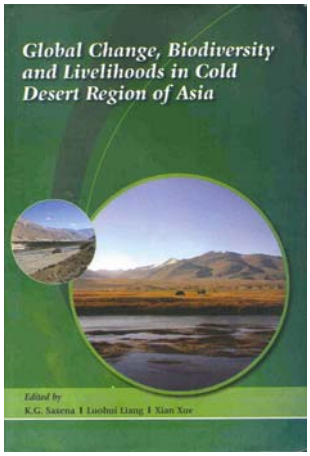

Global Change, Biodiversity and Livelihoods in Cold Desert Region of Asia. K. G. Saxena, Luohui Liang and Xian Xue (eds). Bishen Singh Mahendra Pal Singh, New Connaught Place, Dehra Dun 248 001. 2011. 322 pp. Price not mentioned.

The three keywords in the title of the book, global change, biodiversity and livelihoods, are sufficient to excite a reader. Global change is already happening and will negatively impact on the full range of human and economic development. Biodiversity is important, at a global level for humanity as a whole, at a regional level for ecotourism and other benefits, and at a local level for producing ecosystem services for the well-being of the resident human community[1]. Biodiversity thus plays a significant role in providing goods and services as well as regulating and modulating ecosystem properties, but it is being degraded, and this loss is undermining the value of human economic activities. The poor are more heavily dependent on ecosystem services and therefore most severely affected by deteriorating environmental conditions and factors limiting resource access. Livelihood comprises the capabilities, assets and activities required for a means of living[2] and the idea of livelihoods is fundamental to poverty reduction approaches[3]. Global change will affect the viability of livelihoods unless effective measures are taken to protect and diversify them through adaptation and other strategies. Therefore, a book dealing with these aspects, and particularly for cold deserts, is welcome.

Cold deserts, found in the Antarctic, Greenland, Asia and the Nearctic realm, are characterized by very cold winters and short, moderately warm summers. The precipitation is generally in the form of snow. The largest area of cold desert in the world is located in the Asian continent which includes Gobi desert (northern China and southern Mangolia), Iranian desert (Iran and parts of Afghanistan and Pakistan), Takla Makan desert (western China), Turkestan desert (part of the Middle East and Southwestern Russia) and trans-Himalayan desert (parts of Afghanistan, Pakistan, India and China). Ladakh region of Jammu and Kashmir and Lahaul-Spiti region of Himachal Pradesh account for more than 90% area of the Indian cold desert, the remaining 10% area falls in the states of Uttarakhand and Sikkim. Depending on latitude, longitude, elevation and orographic conditions, there is enormous variation in thermal and moisture regimes in the Indian cold desert region. Snowfall occurs in winter (October–March) and rainfall (100–350 mm yr^{-1}) in summer months (July–August). In summer, the day-time temperatures may reach 35°C and in winter, night-time temperatures may reach –40°C. The region experiences permafrost and fast blowing winds (40–60 km h^{-1} during summer). The steep slopes, poor soil texture, harsh climatic conditions and inability of farmers to adopt modern farming technologies make the region one of the most food-insecure areas of the world. The indigenous livelihood systems are still centred around pastoral/agropastoral subsistence economy. The conventional indicators of socio-economic development (e.g., per capita income, road density/accessibility, education level and adoption of modern technologies) mark the cold desert as one of the poorest regions.

The book under review is a collection of papers presented at an international workshop organized jointly by the United Nations University, Tokyo; Jawaharlal Nehru University, New Delhi; Zoological Survey of India–High Altitude Research Station, Solan; and the Cold and Arid Regions Environmental and Engineering Research Institute of Chinese Academy of Sciences, China. The book claims to provide the state of knowledge on global environmental changes, livelihoods and environmental conservation in the Asian cold desert region especially covering cold desert areas in China, Mangolia, Nepal, India and Tajakistan. The chapters are organized into four sections: Section I (11 chapters) deals with climate, soil and biodiversity of the region, and related scientific and policy issues; Section II (12 chapters) deals with the factors that drive the changes in land uses and implications of these changes to sustainable livelihoods and conservation; Section III (7 chapters) highlights the options available for environmental conservation/restoration and improvement of local livelihoods, and Section IV (one chapter) synthesizes the information contained in sections I–III.

In cold deserts, economic activities are sensitive to even minor changes in environmental conditions warranting a thorough understanding of impacts of climate change. Chapter 1 deals with the tree-ring chronologies emphasizing long-term variability in the regional climate. Inter-annual variability of the tropical circulations and associated rainfall has been usually explained by the combined phenomena of El-Niño and Southern Oscillation (ENSO). Chapter 2 illustrates a significant effect of ENSO on wintertime precipitation over the western Himalayan region. The extreme climatic and physiographic features create hostile conditions for the development of soil profile and dense vegetal cover. The coarse texture and poor water retention lead to poor physical characteristics and the varied topography causes marked heterogeneity in the soils of the cold desert region of Himachal Pradesh (chapter 3).

Cold desert region of India has only 0.4% legally protected area. Nonetheless, the region supports a large number of rare, endemic and endangered species. Chapter 4 presents a summary of the floristic and ethno-botanic surveys carried out in the Lahaul valley part of the proposed Cold Desert Biosphere Reserve of India. The valley contains a total of 489 economically important species belonging to 81 families and 247 genera. Of these species, 353 have medicinal value, 121 human food value, 199 fodder value, 77 fuel value, 56 timber value and 52 have religious value. An overview of biological resources and their role in local health care systems in the Ladakh region which harbours 647 species of vascular plants including 286 medicinal plant species, is provided in chapter 5. Despite its harsh climate, low vegetation cover and high density of domestic livestock, the rangelands of eastern Ladakh harbour a diverse assemblage of wild fauna, including several highly threatened and charismatic species. Chapter 6 provides a brief

discussion on the ecological significance of threatened plant communities grazed by both livestock and wild herbivores, and implications of changing land-use practices on the natural vegetation.

The rich fauna of the cold desert region of India has been considered in chapters 7–10. Chapter 11 concludes that the mammalian fauna of Tajikistan Pamir region is species-poor, and suggests that the main threats to large mammals in Pamir are poaching, overgrazing, intensive harvesting and poor economy of local people.

The agro-ecosystems of the Indian cold desert region have been dealt with in chapters 12 (Spiti catchment), 13 (Lahaul valley) and 14 (Niti valley). These studies indicate that: (i) traditional agricultural systems are repositories of huge agro-biodiversity, (ii) replacement of traditional staple food and fodder crops by cash crop has significant socio-economic and ecological implications, and (iii) socio-cultural transformation coupled with development policy interventions have provided new means of livelihoods. Changes taking place in nomadic lifestyles of Changpas in Changthang, Ladakh and the consequences of migration and economic development programmes are described in chapter 15. Traditional grazing systems of Spiti valley and the traditional agricultural production system of villages located in Nanda Devi Biosphere Reserve are analysed in chapters 16 and 17. Indigenous knowledge about environment and natural resources and impacts of policy-driven changes in a village in Deqin County, Yunnan, China are dealt with in chapter 18. Enforcement of state policies over the past 50 years coupled with changes in traditional resource management systems have caused deterioration of environmental quality and increase in the frequency of natural disasters. The impacts of global processes, viz. international trade, migration, tourism, climate change and global environmental awareness, on primary production in Annapurna conservation area, Manang valley, Nepal are considered in chapter 19. Chapter 20 suggests that global warming is the primary factor leading to desertification in the Maduo County region of Northeastern Qinghai-Tibetan plateau. Ecological health in the Himalayan cold desert region is reported to be the single biggest contributor, followed by per capita resource availability and human development status, to the adaptive capacity (chapter 21). How an international railroad acts as a barrier in the long distance migration of Mongolian gazelles of Gobi steppe region is highlighted in chapter 22. Land degradation strongly impacts livelihood of the local people, besides affecting biodiversity and ecosystem health in the Pamir-Alai Mountains of Central Asia (chapter 23).

The productivity and profitability of cash crops, which have replaced the traditional crops, are low because of poor nutrient and crop management practices (chapter 24). Seabuckthorn (*Hippophae rhamnoides* L.) and apricot (*Prunus armeniaca* L.) are found important for sustainable livelihood and socio-economic development in Ladakh (chapters 25 and 26 respectively). Chapter 27 stresses the importance of low cost agro-technologies in the improvement of the livelihood of local people. The improvement of livestock husbandry and pasture use system, introduction of new animal husbandry systems, coupling of Alpine livestock system with crop systems and improving herdsmen's education level can sustainably protect the cold desert ecosystems in China (chapter 28). Establishment of high-yielding forage crops can promote restoration of desertified land in Inner Mongolia (chapter 29). Micro-hydroelectricity units can provide the people of Ladakh access to electricity (chapter 30).

The chapters collectively highlight the factors responsible for environmental degradation in the cold desert region and suggest measures for promoting environmental conservation and sustainable livelihoods. However, out of 30 chapters, 26 represent trans-Himalayan deserts and only 4 are concerned with other cold deserts of Asia. Gobi desert, which is the third largest cold desert of the world, is almost neglected and only chapter 22 has a reference to it. Nevertheless, the book is useful for researchers and policy makers dealing with the cold desert region.

Old flat top tree of Himalayan cedar growing near Tindi on rocky slope with very thin soil cover.

1. Capistrano, D., Samper, C., Lee, M. J. and Raudsepp-Hearne, C. (eds), *Ecosystems and Human Well-Being*, Millennium Ecosystem Assessment and Island Press, Washington, DC, 2005, vol. 4.
2. Carney, D. (ed.), *Sustainable Rural Livelihoods*, DFID, London, 1998.
3. International Institute for Sustainable Development, International Union for Conservation of Nature and Natural Resources and Stockholm Environment Institute. The International Institute for Sustainable Development, Canada, 2003 (http://www.iisd.org).

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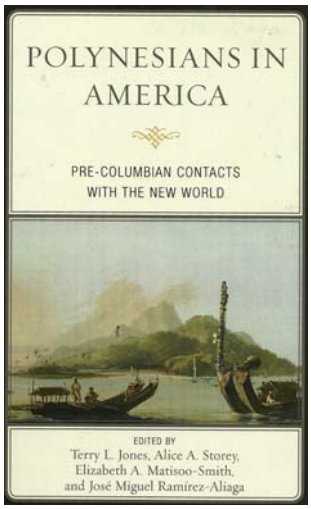

Polynesians in America. Pre-Columbian Contacts with the New World. Terry L. Jones, Alice A. Storey, Elizabeth A. Matisoo-Smith and José Miguel Ramírez-Aliaga (eds). AltaMira Press, A Division of Rowman and Littlefield Publishers, Inc., Lanham, MD, USA. 2011. 359 pp. Price not mentioned.

Pre-Columbian trans-Pacific interaction and diffusion had all but become an ignored topic in mainstream archaeology and anthropology in North America and Europe from the 1960s. This followed the emergence of the concept of techno-

Livelihood and natural resources is Asian cold desert: A case study from selected villages in Central Himalaya, India. In: K. G. Saxena, L. Liang & X. Xue (Eds.), Global change, biodiversity and livelihoods in cold desert region of Asia (pp. 161â€“176). Dehradun: Bishen Singh Mahendra Pal Singh.Google Scholar.Â Cite this chapter as: Nautiyal S., Schaldach R. (2016) Research Approach to Analyze Climate Change Impacts in Rural Regions of India and to Explore Potential Adaptation Strategies for Biodiversity Conservation and Livelihood Development. In: Nautiyal S., Schaldach R., Raju K., Kaechele H., Pritchard B., Rao K. (eds) Climate Change Challenge (3C) and Social-Economic-Ecological Interface-Building. Request PDF | On Feb 1, 2012, Shonil Bhagwat and others published Global Change, Biodiversity and Livelihoods in Cold Desert Region of Asia | Find, read and cite all the research you need on ResearchGate.Â Region: Topics: South Asia, Himalaya, Europe Natural Resource Management (energy, agriculture, fisheries) Climate change and Environmental issues Social differentiation; ethnicity, power and poverty Rural Development. Some Concluded Projects.Â In Saxena K.G., Liang L., Xue X. (eds): Global Change, Biodiversity and Livelihoods in Cold Desert Regions of Asia.United Nations University, Tokya. 2009: (with Ram Chaudhary and Ole Vetaas) Farming flelxibility and food security under climatic uncertainty: Manang, Nepal Himalaya. Area.