

# Headlines Himalaya

Jan 1 – Jan 15 (2020)

No. 585- 586

Editorial Team: Tika Maya Shrestha and Rita Thapa

For the 585-586<sup>th</sup> issues of Headlines Himalaya, we reviewed journal articles from two sources and selected seven happenings from four countries. We selected three happenings from Nepal and four happenings from other Himalayan countries (India, China, and Pakistan). The overall coverage of this issue is agriculture, water, tourism, climate change, and environment.

Headlines Himalaya, a weekly research based information fact file is an attempt to keep our global readers abreast with the happenings in the Himalaya. Please share it with your colleagues and friends. Also, subscription is free. Enjoy!

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- TOURISM AND LOCAL WELFARE: A MULTILEVEL ANALYSIS IN NEPAL'S PROTECTED AREA*
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### **AN ASSESSMENT OF THE POLICIES AND PRACTICES OF SELECTIVE LOGGING AND TIMBER UTILISATION: A CASE STUDY FROM NATURAL FORESTS OF TARAI NEPAL AND QUEENSLAND AUSTRALIA**

Bishnu Hari Poudyal, Tek Maraseni, and Geoff Cockfield

*Land Use Policy* 91 (2020): 104422

Selective Logging (SL) contributes nearly 15 percent of the global timber needs. Considering its role in sustainable timber production, biodiversity conservation and forest carbon enhancement, assessment of SL policies and practices is crucial. This paper assesses the policies and practices of SL in natural production forests of the *Tarai* region of Nepal and Queensland Australia to explore the key differences in such policies and practices and their possible implications in achieving sustainable forest management objectives. The primary methods applied in the study were review and synthesis of key policy documents and qualitative analysis of the information gathered from key informant interviews and stakeholders' workshop. Altogether, 53 respondents from a wide range of stakeholder groups (government organizations-15, non-government organizations/networks-15, private sector including the individual landowners-13, local political leaders-3 and independent forest experts/scientists-7) were consulted. Findings suggest that: (1) frequent and inconsistent changes in policy provisions, lengthy administrative procedures and heavy engagement of state forest agencies in forest product harvesting and sales processes play key roles in sub-optimal forest production in Nepal, whereas lower dependency on forest-products, higher labour costs, lack of species-wise royalty rate and flexibility in selecting optional logs are the key factors for increased wastages of forest products in Queensland; (2) recovery and utilisation of the harvested forest product is better in Nepal but policy and practical considerations on biodiversity and environment are better in Queensland; and (3) Forest harvesting specific codes of practice, occupational health and safety standards, and their compliance mechanism of Queensland could be beneficial for Nepal to minimise operational harvesting risks and to attract professional harvesters that support promoting sustainable use and management of natural forests, as we found this aspect almost neglected in Nepal.

For further reading: <https://doi.org/10.1016/j.landusepol.2019.104422>

### **TOURISM AND LOCAL WELFARE: A MULTILEVEL ANALYSIS IN NEPAL'S PROTECTED AREA**

Marie-Eve Yergeau

*World Development* 127 (2020): 104744

While environmental conservation is sometimes criticized for limiting the sources of income for the poorest populations, tourism in protected areas is often viewed in the literature as a mechanism that helps to increase local welfare and reduce poverty in developing countries. However, there are still few quantitative studies assessing how nature-based tourism is directly linked with welfare. In this article, we examine the relationships between: (1) tourism and the monetary welfare of local populations in Nepal's protected areas and (2) self-reporting being constrained in the use of natural resources, and the welfare of the same population. We develop a two-level hierarchical linear model to take into account the database structure. We estimate that households involved in a self-employed occupation directly linked to tourism are associated with a significantly higher consumption compared with non-involved households. In addition, results suggest that tourism may generate positive externalities on the community's welfare. We conclude that tourism development in Nepal's protected areas should be included in a broader sustainable development agenda.

For further reading: <https://doi.org/10.1016/j.worlddev.2019.104744>

## ANALYSIS OF HOUSEHOLD ACCESS TO DRINKING WATER, SANITATION, AND WASTE DISPOSAL SERVICES IN URBAN AREAS OF NEPAL

Bhagirath Behera, Dil Bahadur Rahut, and Narayan Sethi

*Utilities Policy* 62 (2020): 100996

In recent years, researchers have paid increasing attention to the provision of access to clean and sufficient drinking water, sanitation facilities, and proper waste management in developing countries. This paper examines household access to these services in urban areas of Nepal by studying the comprehensive data of the Nepal Living Standard Survey (NLSS) for the 1995-1996, 2003–2004, and 2010–2011 periods. Multinomial logit models are employed to identify and analyse potentially influential factors. We find that education levels, household wealth, and distance to markets are among the significant determinants of household access to safe and secure drinking water, flush toilets connected to septic tanks, and proper liquid and solid waste disposal. Households located in relatively developed regions, such as the Midwest and Far West, tend to have better access to these services compared to households located in the ecologically sensitive mountainous regions. Education and employment opportunities are also relevant to service access in urban areas of Nepal. Stakeholder involvement and effective governmental intervention are also necessary.

For further reading: <https://doi.org/10.1016/j.jup.2019.100996>

## India-Himalaya

### EXAMINING THE GLACIAL LAKE DYNAMICS IN A WARMING CLIMATE AND GLOF MODELLING IN PARTS OF CHANDRA BASIN, HIMACHAL PRADESH, INDIA

Saurabh Kaushik, Mohammad Rafiq, P.K. Joshi, and Tejpal Singh

*Science of The Total Environment* 714 (2020): 136455

The presented study reports applicability of Lake Detection Algorithm (LDA) for an automated extraction of glacial lakes over a large geographical region and dynamics of Samudra Tapu and Gepang Gath glacial lakes. The areal extent of lake boundary extracted through LDA and areal extent of manually interpreted lake boundary exhibit a remarkable agreement ( $R^2 \sim 0.99$ ). Glacial lake dynamics is assessed in terms of areal and volumetric expansion for two selected glacial lakes from 1979 to 2017, i.e. Samudra Tapu ( $0.95 \text{ km}^2$ ), and Gepang Gath ( $0.67 \text{ km}^2$ ). They show volumetric expansion from  $8.52 \times 10^6 \text{ m}^3$  (1979) to  $80.34 \times 10^6 \text{ m}^3$  (2017) and  $2.04 \times 10^6 \text{ m}^3$  (1979) to  $32.44 \times 10^6 \text{ m}^3$  (2017) respectively. Statistical analysis (Mann-Kendall and Sen's slope) of climate data indicates rise in mean annual temperature ( $0.021 \text{ }^\circ\text{C yr}^{-1}$  1961–2015) and fall in annual precipitation ( $-2.74 \text{ mm yr}^{-1}$ ; 1951–2015) at different confidence intervals. Further Glacial Lake Outburst Flood (GLOF) is modelled using empirical relationship and Simplified Dam Breach Model (SMPDBK). The SMPDBK demonstrates discharge of 3866.52 and  $2100.90 \text{ m}^3 \text{ s}^{-1}$  reaching Chhatru and Sissu village posing threat to life and property. The study also exhibits that glacial shrinkage under the influence of climate change causes expansion of glacial lakes. This expansion is expected to intensify catastrophic GLOF and resultant fatalities and destruction in the downstream region.

For further reading: <https://doi.org/10.1016/j.scitotenv.2019.136455>

## China Himalaya

## **CLASSIFICATION OF INSTREAM ECOLOGICAL WATER DEMAND AND CRUCIAL VALUES IN A SEMI-ARID RIVER BASIN**

Fang Liu, Tianling Qin, Denghua Yan, Yu Wang, Biqiong Dong, Jianwei Wang, Hanjian Nie, Shan He, and Shanshan Liu

*Science of The Total Environment* 712 (2020): 136409

Analyzing the instream environmental flow demand by coupling the hydrological cycle and the hydrodynamic process with aquatic ecological processes at watershed scale remains one of the most important yet most difficult issues. One or two of the above processes have been the focus in the evaluation of intra-annual ecological water demand in recent studies. In this study, a hydrology–hydrodynamic–habitat model was developed and applied to the Huangshui River basin. A new classification method for instream ecological water demand (IEWD), which considered sensitive species was proposed. The suitable level of IEWD and crucial values with different flow frequencies were analysed, including runoff, water level, water surface width and weighted usable areas (WUA). The results of the study indicated that monthly IEWD had an increasing trend during the flood season and a decreasing trend during the non-flood season in three sections at different suitable levels. With the increase of suitable levels, the range of IEWD in three sections also increased. The IEWD and crucial values were the lowest in March with the smallest range and were the highest from July to October because the amount of precipitation during that period accounted for nearly 84.3% of that of the entire year. Furthermore, the lower the flow frequency in three sections, the higher the suitable levels of IEWD, as well as water level and water surface width every month. When the flow frequency of 90% decreased to 75%, the value of IEWD increased by at least 55% during the wet season and doubled during the dry season. The WUA with the lowest or highest flow frequencies were relatively poor, especially reproduction period. The IEWD and crucial values at different suitable levels agreed with the actual situations. Thus, this study provided a new method for implementing river ecosystem restoration and aquatic ecosystem management.

For further reading: <https://doi.org/10.1016/j.scitotenv.2019.136409>

## **SPATIOTEMPORAL CHARACTERISTICS OF HYDROTHERMAL PROCESSES OF THE ACTIVE LAYER ON THE CENTRAL AND NORTHERN QINGHAI–TIBET PLATEAU**

Liming Yuan, Lin Zhao, Ren Li, Guojie Hu, Erji Du, Yongping Qiao, and Lu Ma

*Science of The Total Environment* 712 (2020) : 136392

The spatial and temporal variations of the seasonal freeze–thaw cycles are important in understanding the ecological and hydrological processes and biogeochemical cycle associated with permafrost degradation caused by climate change, although observational data on the soil hydrothermal dynamics within the active layer of the permafrost region at the central and northern Qinghai–Tibet Plateau (QTP) are extremely scarce. In this study, soil temperature and moisture data from 11 observational sites along the Qinghai–Tibet Highway from 2010 to 2014 were used to analyze the freeze-thaw cycles of the active layer. The results revealed that mean annual ground surface temperature (MAGST) and mean annual temperature at the top of permafrost (TTOP) were the factors that are most closely related to the onset dates of soil freezing and thawing. The onset dates of soil freezing from bottom to top did not occur earlier than those from top to bottom. The differences between the onset dates of the two freezing directions and the proportion of bottom-up freezing depth increased with decreasing TTOP. The unfrozen water content of the cooling process was always higher than that of the warming process during the freezing stage. The hysteresis effect of the unfrozen water content can also be observed in the field experiment, and the maximum hysteresis levels occurred at their corresponding soil freezing points. Soil organic matter and soil moisture associated with vegetation cover are essential for water-heat exchanges between atmosphere and

permafrost beneath active layer. We suggest that a better protected plant ecosystem, helps preserving the underlying permafrost on the Qinghai–Tibet Plateau.

For further reading: <https://doi.org/10.1016/j.scitotenv.2019.136392>

## **Pakistan- Himalaya**

### **FARM HOUSEHOLDS' RISK PERCEPTION, ATTITUDE AND ADAPTATION STRATEGIES IN DEALING WITH CLIMATE CHANGE: PROMISE AND PERILS FROM RURAL PAKISTAN**

Imran Khan, Hongdou Lei, Irshad Ali Shah, Imad Ali, Inayat Khan, Ihsan Muhammad, Xuexi Hua, and Tehseen Javed  
*Land Use Policy* 91 (2020): 104395

Pakistan is highly vulnerable to extreme climatic events, such as floods and droughts. This study determines the farmers' risk perception, risk attitude, adaptation measures and various aspects of vulnerability to climate change (e.g. floods, droughts, heavy rainfalls, pests and disease) at farm level in rural Pakistan. The risk perception and attitude of farm households are crucial factors that influence farm productivity, investment and management decisions at this level. A well-designed questionnaire was used to interview 720 farm households from six districts of the Khyber Pakhtunkhwa province. A binary logit model was used to determine the main factors that affect the choice of adaptation strategies of the farm household. The findings revealed that crop diversification, changing crop varieties, altering the crop calendar, varying the fertilizer used, mulching and farm insurance were the main adaptation strategies followed by farm households. The results of the binary logit model revealed that age, education, farm size, household size, credit accessibility, annual income and the perception on the increase in temperature and decrease in rainfall had significant influence on the selection of the adaptation strategies. The findings of this study can provide guidance, policy recommendations and reference for future researchers.

For further reading: <https://doi.org/10.1016/j.landusepol.2019.104395>