

Headlines Himalaya

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Editorial Team: Rashmi Tachamo and Sabita Nepal

For the 575th issue of Headlines Himalaya, we reviewed journal articles from five sources and selected eight happenings from four countries. We selected five happenings from Nepal and three happenings from other Himalayan countries (India, China and Pakistan). The overall coverage of this issue is disaster, hydrology, pollution, 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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INDOOR AIR POLLUTION EXPOSURE EFFECTS ON LUNG AND CARDIOVASCULAR HEALTH IN THE HIGH HIMALAYAS, NEPAL: AN OBSERVATIONAL STUDY

Lorenza Pratali, Angela Marinoni, Annalisa Cogo, Kristian Ujka, Stefania Gilardoni, Eva Bernardi, Paolo Bonasoni, Rosa Maria Bruno, Luca Bastiani, Elisa Vuillermoz, Paolo Sdringola, and Sandro Fuzzi

European Journal of Internal Medicine 61 (2019): 81-87

Exposure to indoor biomass fuel smoke is associated with increased morbidity and mortality. The aim of this study is to evaluate the association between exposure to indoor biomass burning and early pulmonary and cardiovascular damage. The indoor levels of particulate matter (PM) [PM₁₀, PM_{2.5}] and black carbon (BC) were monitored in 32 houses in a Himalayan village. Seventy-eight subjects were submitted to spirometry and cardiovascular evaluation [carotid to femoral pulse wave velocity (PWV) and echocardiography]. Peak indoor BC concentration up to 100 µg m⁻³ and PM₁₀ - PM_{2.5} up to 1945–592 µg m⁻³ were measured. We found a non-reversible bronchial obstruction in 18% of subjects ≥40 yr; mean forced expiratory flow between 25% and 75% of the forced vital capacity (FEF_{25–75}) <80% in 54% of subjects, suggestive of early respiratory impairment, significantly and inversely related to age. Average BC was correlated with right ventricular-right atrium gradient (R = 0.449, p = .002), total peripheral resistances (TPR) (R = 0.313, p = .029) and PWV (R = 0.589, p < .0001) especially in subjects >30 yr. In multiple variable analysis, BC remained an independent predictor of PWV (β = 0.556, p = .001), and TPR (β = 0.366; p = .018). Indoor pollution exposure is associated to early pulmonary and cardiovascular damages, more evident for longer duration and higher intensity exposure.

For more details: <https://doi.org/10.1016/j.ejim.2018.10.023>

THE ROLE OF HYDROPOWER IN VISIONS OF WATER RESOURCES DEVELOPMENT FOR RIVERS OF WESTERN NEPAL

Emily L. Pakhtigian, Marc Jeuland, Luna Bharati, and Vishnu Prasad Pandey

International Journal of Water Resources Development 17 (2019): 1-28

Water resources can play significant roles in development pathways for water-endowed, low-income countries like Nepal. This article describes three visions for water resource development in the Karnali and Mahakali Basins of Western Nepal: state-led development, demand-driven development and preservation of ecosystem integrity. The analysis calls attention to water use trade-offs, including those resulting from national priorities such as infrastructure-based hydropower and irrigation, from local drinking water demand, and from environmental conservation concerns. While these visions of water resources development do diverge, common trends appear, including acknowledgment of water management's role in expanding energy access and increasing agricultural productivity.

For more details: <https://doi.org/10.1080/07900627.2019.1600474>

BASIN-SCALE HYDROLOGY AND SEDIMENT DYNAMICS OF THE KOSHI RIVER IN THE HIMALAYAN FORELAND

Rajiv Sinha, Alok Gupta, Kanchan Mishra, Shivam Tripathi, Santosh Nepal, S.M. Wahid, and Somil Swarnkar

Journal of Hydrology 570 (2019): 156-166

Hydrological and sediment transport characteristics for the Kosi basin, which covers parts of Nepal and India, were analysed to understand the spatiotemporal variability of the hydrology and sediment dynamics of the Kosi basin and its implications for flood hazard and sediment dynamics. The study revealed that ~56% of the discharge at

Chatara (where all major tributaries of the Kosi meet) is contributed from the western part of the basin even though this constitutes only 34% of the total basin area. In contrast, the central and eastern parts of the basin constitute 57% and 8% of the basin area but contribute ~38% and ~16% of the discharge at Chatara, respectively. The contribution of sediment load at Chatara from the different tributaries of the Kosi River also shows a similar pattern. Of a total of ~100 million tonnes of the annual sediment load at Chatara, ~56% is transported from four tributaries: the Indrawati, Bhote Kosi, Tama Kosi (all draining from the west), and Tamor. The remaining ~44% is transported by other tributaries upstream of Chatara, the most important being the Arun, Dudh Kosi, and Sun Kosi. Sediment budgeting in this study, based on annual sediment load data, suggested that ~20 million tonnes of sediments are deposited between Chatara and Birpur annually. This study also found that ~53 million tonnes of sediments are being accommodated between Birpur and Baltara annually. Sediment dynamics in the Kosi basin emerges as the most important river management issue, and this is closely linked to channel instability and frequent flooding in the alluvial plains.

For more details: <https://doi.org/10.1016/j.jhydrol.2018.12.051>

ESTIMATING THE PROBABILITY OF EARTHQUAKE OCCURRENCE AND RETURN PERIOD USING GENERALIZED LINEAR MODELS

Noora Shrestha

Journal of Geoscience and Environment Protection 7 (2019): 11-14

In this paper, the frequency of an earthquake occurrence and magnitude relationship has been modelled with generalized linear models for the set of earthquake data of Nepal. A goodness of fit of a statistical model is applied for generalized linear models and considering the model selection information criterion, Akaike information criterion and Bayesian information criterion, generalized Poisson regression model has been selected as a suitable model for the study. The objective of this study is to determine the parameters (a and b values), estimate the probability of an earthquake occurrence and its return period using a Poisson regression model and compared with the Gutenberg-Richter model. The study suggests that the probabilities of earthquake occurrences and return periods estimated by both the models are relatively close to each other. The return periods from the generalized Poisson regression model are comparatively smaller than the Gutenberg-Richter model.

For more details: <https://doi.org/10.4236/gep.2019.79002>

ASSESSMENT OF LANDSLIDE SUSCEPTIBILITY ALONG THE ARANIKO HIGHWAY IN POIQU/BHOTE KOSHI/SUN KOSHI WATERSHED, NEPAL HIMALAYA

Nirdesh Nepal, Jiangang Chen, Huayong Chen, Xi'an Wang, Til Prasad, Pangali Sharma

Progress in Disaster Science 3 (2019): 100037

Landslide susceptibility assessment along the Araniko highway was done using the relationship between the landslide causative factor and presence/absence of landslide using linear discriminant analysis, and divided into Low, Medium, High, and Very High susceptibility zone. The spatial analysis of landslide distribution with its conditioning factors depicts 40°-60° of the slope, South-east and South direction of aspect, 0-5 km North from MCT, 10-20 km of distance from the epicentre, where barren land and forest area are found most susceptible to a landslide. This research can help undertake the proper mitigation and adaptation measures for the landslide risk along the Araniko highway.

For more details: <https://doi.org/10.1016/j.pdisas.2019.100037>

CONCRETING THE FRONTIER: MODERNITY AND ITS ENTANGLEMENTS IN SIKKIM, INDIA

Duncan McDuie-Ra, and Mona Chettri

Political Geography 76 (2020): 102089

Sikkim is a geopolitically sensitive frontier state in India sharing borders with Bhutan, China and Nepal. As distinctions between urban and rural dissolve across the Himalaya, concrete narrates the transformation of these landscapes and the assemblages that hold them together. Using Cloke and Jones's (2001) notion of 'dwelling' we explore Sikkim's concrete manifested in tourism, hydropower and housing to make four arguments. First, concrete is central to the way development is conceived and enacted in Sikkim and offers a critical reading of the ways landscape is imagined, reproduced and politicised. Second, concrete foregrounds the ways peoples' aspirations are materialised in the built environment of a 'remote', yet geopolitically significant territory. Third, concrete is an integral component of Sikkim's political culture, part of the assemblage of incongruent elements that undergird the state's dependency. Finally, concrete has further entangled Sikkim within India, producing a loyal border state out of a recently independent polity.

For more details: <https://doi.org/10.1016/j.polgeo.2019.102089>

China Himalaya

PREDICTING TOURISTS' HEALTH RISK PREVENTATIVE BEHAVIOUR AND TRAVELLING SATISFACTION IN TIBET: COMBINING THE THEORY OF PLANNED BEHAVIOUR AND HEALTH BELIEF MODEL

Xingyu Huang, Shanshan Dai, and Honggang Xu

Tourism Management Perspectives 33 (2020): 100589

Both the theory of planned behaviour (TPB) and the health belief model (HBM) are important theories to analyse health-related behaviours; however, few studies have combined these theories to explore health risk issues in the tourism context. This paper explores the relationships underlying travelers' health beliefs, attitudes, self-efficacy, preventative behaviours, and travelling satisfaction during trips to high-altitude destinations. Tibet in China was chosen as the case and the data are analysed by Mplus 7.4 with the WLSMV estimator. The results show that perceived susceptibility and perceived benefit can be regarded as important antecedent beliefs in attitudes toward preventative behaviours; health beliefs and self-efficacy positively influence preventative behaviours; and there are significant indirect relationships from health beliefs to preventative behaviour. Moreover, risk preventative behaviour is found to be a positive determinant of travelling satisfaction during a trip. Findings also revealed that TPB can be supported and extended by combining constructs of HBM.

For more details: <https://doi.org/10.1016/j.tmp.2019.100589>

Pakistan- Himalaya

IDENTIFYING GENDER VULNERABILITIES IN CONTEXT OF CLIMATE CHANGE IN INDUS BASIN

Saqib Shakeel Abbasi, Muhammad Zubair Anwar, Nusrat Habib, Qaisar Khan, and Kanwal Waqar

Environmental Development 31 (2019): 34-42

Changes in temperature and hydro-meteorological patterns in Indus basin due to climate change are believed to be impacting farming communities in different ways. From a gender perspective however, impacts of change vary

from place to place, household to household and for individual members of the household due to a multiplicity of factors including expectation of individual members of a household to take additional responsibilities in difficult times. As an unavoidable coping strategy, the affected communities in upper Indus basin are compelled to send male members away from home in search of alternate sources of livelihoods. This compels women to take additional responsibilities at farm, household and community levels which ultimately increase the vulnerabilities of local women. However, scenario is different in mid-stream, where women have an additional workload to manage water requirements for household and livestock. While in downstream of the basin, women are culturally and socially dependent on men which increase their vulnerability many folds. Therefore, differentiated analysis of climate change impacts, based on gender roles and responsibilities, is crucial in climate change research. This paper presents gendered vulnerabilities at different scales in up, mid and downstream of the basin.

For more details: <https://doi.org/10.1016/j.envdev.2018.12.005>