

**LAND USE AND LAND COVER CHANGE: A SPATIO-TEMPORAL STUDY OF THE ALAKNANDA VALLEY, GARHWAL HIMALAYAS, INDIA**

SUSHMITA SAHA<sup>1</sup> AND KEITH S. RICHARDS<sup>2</sup>

*Department of Geography<sup>1</sup>, University of Cambridge, Downing Place, CB2 3EN, UK*

*E-mail: <sup>1</sup>ss303@cam.ac.uk; <sup>2</sup>ksr10@cam.ac.uk*

**ABSTRACT**

Land use patterns, with regard to both their space and time variations, are a function of societal characteristics, and qualify as one of the major consequences of human intervention in the landscape. More often than not, the way in which environmental resources are exploited in a given region depends on the nature of the land use. Through the transformation of the environment effected by different, changing, land use practices, and the associated direct and indirect manipulation of water flow, the environment loses its stability and this sets in motion a flow of positive and negative feedbacks between human actions and environmental responses. While positive impacts consist largely of the production of crops, it is the destabilising negative responses (negative externalities), in the form of accelerated erosion, deforestation and pollution that compromises the sustainability of the relationship between humans and the environment. The Himalayan zone is one of the most sensitive regions in terms of its natural environment, stability and soil erosion. This paper explores the extent to which post-independence land use and land cover changes have influenced environmental degradation in one of the most environmentally sensitive sections of the Garhwal Himalayas in India, the Alaknanda Valley. This valley is distinguished by active tectonism, unplanned development and a continuous growth and in-migration of population. Satellite images from the last four decades have been assimilated together with ground-truth and other environmental data to create land use and land cover classifications, and to establish the relation of land use patterns to environmental degradation in the region. At the same time, the paper probes into the debate on the "Himalayan Dilemma" (Ives and Messerli, 1989), and attempts to establish relationships between natural processes and human impacts on the contemporary rates of environmental change in the Alaknanda Valley.