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THE HIMALAYAN DILEMMA RECONSIDERED: UNCERTAINTY AND THE GEOGRAPHY OF MOUNTAIN ENVIRONMENTS

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Abstract

For much of the later twentieth century a powerful narrative held that the mountains of the Himalaya were caught in a spiral of environmental ruin, in which growing highland populations stripped the forests, triggering erosion in the hills and catastrophic flooding in the plains below. This paper revisits that narrative and the influential reassessment that challenged it. It argues that the crisis narrative, however compelling, rested on weak evidence and a mistaken model of mountain processes, and that the reassessment known as the Himalayan dilemma replaced it with a more honest picture, one marked by deep uncertainty, enormous natural variability, and a complex and often weak link between highland land use and lowland disaster. The paper draws out the lessons of this episode for the geography of mountain environments and for the management of their water. It argues that mountain systems are characterised by a variability and an uncertainty that defeat simple cause-and-effect stories, that confident crisis narratives can do real harm by misdirecting policy and blaming mountain communities unjustly, and that humility before uncertainty is the beginning of wisdom in mountain environmental management.

Keywords: *Himalaya; environmental degradation; uncertainty; mountain geography; crisis narrative*

1. Introduction

A story about the Himalaya took hold in the second half of the twentieth century and acquired, for a time, the status of established fact. In this story, the rising population of the mountains was destroying the forests of the hills for fuel and farmland; the loss of forest cover was unleashing erosion on the steep slopes; and the eroded soil, washing down the rivers, was raising their beds and causing the devastating floods that periodically drowned the plains of the Ganges and Brahmaputra. The story was dramatic, intuitive, and politically potent, for it identified a culprit, the mountain farmer, and a remedy, the restraint of highland land use. This paper revisits that narrative and the scholarly reassessment that overturned it, and draws out what the episode teaches about the geography of mountain environments.

The paper first sets out the crisis narrative, then describes the reassessment that challenged it, then examines the role of uncertainty and variability in mountain systems, and finally considers the lessons for mountain environmental management. The treatment is conceptual and historical, engaging a landmark debate in mountain geography.

2. The crisis narrative

The crisis narrative drew its force from an apparently seamless chain of cause and effect running from the mountains to the plains. More people in the hills meant more demand for fuelwood, fodder, and cultivable land, which meant the clearing of forests on slopes ill suited to cultivation; deforested slopes, lacking the binding and sheltering effect of trees, shed their soil in the monsoon rains; and the sediment and the accelerated runoff travelled down the great rivers to silt their channels and swell their floods, visiting disaster on the densely populated lowlands. Each link seemed plausible, the whole told a coherent story, and the narrative was widely adopted as the basis for policy, which accordingly sought to protect highland forests and to restrain the land use of mountain communities held responsible for the lowland catastrophe. The narrative's appeal lay precisely in its simplicity and its assignment of blame.

3. The reassessment

The influential reassessment of this narrative, advanced under the name of the Himalayan dilemma, subjected each of its links to scrutiny and found them wanting (Ives & Messerli, 1989). The evidence that highland population growth was driving wholesale deforestation proved thin and in places contradicted by the record; the assumption that mountain farmers were careless destroyers of their environment ignored the sophisticated terracing and land management many practised; and, most importantly, the supposed causal chain from highland land use to lowland flooding dissolved under examination. The sediment carried by the great Himalayan rivers, it emerged, is overwhelmingly the product of natural geological processes, the erosion of young, tectonically active, rapidly rising mountains by monsoon rains and earthquakes, on a scale that dwarfs anything human land use could add or subtract. The floods of the plains, likewise, are driven primarily by the sheer magnitude and variability of monsoon rainfall over vast catchments, against which the state of the forests on distant hillsides can have little effect. The reassessment thus replaced the confident crisis narrative with a far more uncertain and humbling picture, in which the dominant forces are natural, enormous, and variable, and the human contribution is modest and hard to discern (Ives & Messerli, 1989).

4. Uncertainty and variability

What the reassessment revealed above all was the depth of uncertainty surrounding mountain environmental processes and the enormous natural variability against which any human signal must be detected. The Himalaya are among the most geologically active and physically dynamic environments on earth, where landslides, earthquakes, and extreme monsoon events move sediment and water on scales that are naturally vast and highly variable from place to place and year to year. Against this background of large and noisy natural variation, the effect of human land use is both small and difficult to isolate, and confident claims about it, in either direction, outrun the evidence. This same variability characterises the water that the mountains supply, for

the snow and ice that store it and the monsoon that renews it are themselves variable and imperfectly understood, so that the mountain water system shares the uncertainty of the mountain environment as a whole (Barnett et al., 2005). The lesson is not that human action in the mountains has no consequences, but that those consequences are embedded in, and often dwarfed by, a natural variability so large that simple cause-and-effect stories are almost always too simple.

5. Lessons for mountain management

The episode of the Himalayan dilemma carries lessons that extend well beyond the particular narrative it corrected. The first is that confident crisis narratives, however compelling and however well intentioned, can do real harm when they outrun the evidence, for they misdirect policy toward false remedies and, in this case, unjustly blamed mountain communities for a lowland disaster they did not cause, burdening them with restrictions founded on a mistaken model. The second is that mountain environments, by their nature, resist the simple causal stories that policy craves, because their defining features, steep gradients, geological activity, extreme and variable climate, generate a natural variability that confounds attempts to trace clean lines from cause to effect. The third, which bears directly on water, is that the management of mountain water must proceed under deep uncertainty, respecting the variability of the snow, ice, and monsoon on which it depends, and favouring approaches that are robust to a wide range of outcomes over those optimised for a confidently predicted one (Barnett et al., 2005; Ives & Messerli, 1989). Humility before uncertainty, rather than confidence in a tidy narrative, is the appropriate posture; and that humility is itself consistent with the inherited caution of mountain communities, whose dispersed and locally adapted water practices hedged against a variability they understood well (Agarwal & Narain, 1997).

6. Conclusion

The crisis narrative that once held the Himalaya in thrall, in which highland population growth deforested the hills and drowned the plains, proved on examination to be a story too simple for the environment it described. The reassessment known as the Himalayan dilemma replaced it with a picture dominated by natural forces of enormous scale and variability, in which the human signal is small and the uncertainty deep. The episode teaches that mountain environments defeat tidy causal stories, that confident crisis narratives can misdirect policy and unjustly assign blame, and that the management of mountain environments and their water must proceed with humility before an uncertainty that will not be wished away. In the mountains, more than most places, the honest acknowledgement of what is not known is the foundation of wise action.

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