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TRADITIONAL ECOLOGICAL KNOWLEDGE AND THE ADAPTIVE MANAGEMENT OF WATER

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Abstract

Modern resource management has long regarded the knowledge of traditional and indigenous communities as folklore to be superseded by science. This paper argues, to the contrary, that traditional ecological knowledge is a sophisticated body of understanding, accumulated through long observation and transmitted through culture, that has much to teach the scientific management of water. Drawing on the scholarship that has rehabilitated traditional ecological knowledge as a form of adaptive management, it argues that such knowledge shares with the best modern resource science a recognition that ecosystems are complex, variable, and imperfectly predictable, and that managing them well requires continual learning, feedback, and adjustment rather than fixed optimisation. The paper shows how the traditional water practices of communities embody exactly this adaptive logic, responding to local conditions and to variability in ways that rigid engineered systems cannot, and how the social institutions that carry traditional knowledge are themselves mechanisms of adaptive management. It concludes that the integration of traditional and scientific knowledge, far from being a concession to sentiment, is a route to more resilient water management, and that the loss of traditional knowledge is a loss of adaptive capacity the world can ill afford.

Keywords: *traditional ecological knowledge; adaptive management; resilience; water; indigenous knowledge*

1. Introduction

The knowledge by which traditional communities have managed their environments for generations has usually been dismissed, in the confident centuries of modern science, as superstition or at best as quaint custom, destined to give way before the superior understanding of the expert. This dismissal is now recognised as a serious error. The accumulated environmental knowledge of communities that have lived long in intimate dependence on a particular place, their traditional ecological knowledge, is increasingly seen as a genuine and valuable body of understanding, and one with a surprising kinship to the most advanced thinking

in modern resource management. This paper develops that kinship in the domain of water, arguing that traditional ecological knowledge embodies an adaptive logic from which the scientific management of water has much to learn.

The paper first characterises traditional ecological knowledge and its rehabilitation, then draws the parallel with adaptive management, then shows how traditional water practices embody adaptive management in action, and finally considers the case for integrating traditional and scientific knowledge. The discussion is conceptual, drawing on the scholarship of traditional ecological knowledge and resource management.

2. The rehabilitation of traditional knowledge

Traditional ecological knowledge may be defined as the cumulative body of knowledge, practice, and belief, evolving through adaptive processes and handed down across generations by cultural transmission, concerning the relationship of living beings, including people, with one another and with their environment (Berkes, 1999). So defined, it is not a static inheritance of fixed lore but a living and evolving understanding, continually tested and refined against experience. Its rehabilitation in recent scholarship rests on the recognition that communities long resident in a place accumulate, through generations of close observation, a detailed and reliable knowledge of local ecological processes, of the behaviour of species, the patterns of weather and water, the responses of the land, that often exceeds what outside science has had the time or the local presence to acquire. Far from being folklore to be discarded, this knowledge is data of a kind science cannot easily replicate, gathered over timescales no research project can match (Berkes, 1999).

3. The parallel with adaptive management

The deeper significance of traditional ecological knowledge, however, lies not only in its content but in its method, which bears a striking resemblance to the approach that modern resource science calls adaptive management (Berkes et al., 2000). Adaptive management arose from the recognition that ecosystems are complex, variable, and imperfectly predictable, so that management cannot proceed by calculating an optimal intervention once and for all, but must treat each intervention as an experiment, monitor its results, learn from them, and adjust, in a continual cycle of acting and learning. Traditional ecological knowledge, it turns out, embodies exactly this logic. Having evolved through long trial and error in environments whose variability its holders understood intimately, it encodes rules of thumb and practices that are responsive to feedback and hedged against uncertainty, and the communities that hold it continually test and revise it against the outcomes they observe. Traditional knowledge is, in this sense, adaptive management carried on over generations, and its practitioners are adaptive managers whose experiment has run for centuries (Berkes et al., 2000). The supposed gulf between traditional practice and advanced resource science narrows, on this view, to the point of meeting.

4. Adaptive water management in practice

The traditional water practices of communities illustrate this adaptive logic in action. Across the varied environments of the subcontinent, communities developed water-harvesting and management systems finely adapted to their particular conditions of climate, terrain, and society,

and sustained them over long periods, adjusting them as conditions changed (Agarwal & Narain, 1997). These systems embody the hallmarks of adaptive management. They are matched to local conditions rather than imposed from a standard template, and so they fit the variability of the places they serve. They are hedged against uncertainty by their dispersal across many local sources, so that the failure of one does not mean the failure of all, a resilience that a single large engineered supply lacks. And they are governed by social institutions that monitor their condition, enforce rules of use, and adjust practice as circumstances require, so that the knowledge is not merely held but continually applied and revised. Where a rigid engineered system optimises for predicted conditions and fails when conditions depart from prediction, the traditional system, adaptive by design, bends and persists (Agarwal & Narain, 1997; Berkes et al., 2000).

5. The case for integration

If traditional ecological knowledge is a form of adaptive management with much to teach, then the case for integrating it with scientific water management is strong, and rests on more than sentiment. The two forms of knowledge have complementary strengths: science offers the capacity to measure, to model, and to generalise across places, while traditional knowledge offers the depth of local observation, the responsiveness to local variability, and the embedded social institutions that science often lacks. Integrating them means neither replacing science with tradition nor tradition with science, but combining the generalising power of the one with the local depth and adaptive institutions of the other, to produce water management that is both scientifically informed and locally adapted, both measurable and resilient. The obstacle to such integration is less technical than attitudinal, the lingering disposition to regard traditional knowledge as inferior, and overcoming it requires recognising traditional knowledge as the sophisticated adaptive practice it is (Berkes, 1999; Berkes et al., 2000). The alternative, the continued loss of traditional knowledge as its communities and institutions erode, is a loss of accumulated understanding and of adaptive capacity that, in a world of rising environmental uncertainty, can ill be spared.

6. Conclusion

Traditional ecological knowledge, long dismissed as folklore, is a sophisticated body of understanding whose method, continual learning and adjustment in the face of complexity and variability, mirrors the adaptive management that modern resource science has come to embrace. The traditional water practices of communities embody this adaptive logic, fitting themselves to local conditions, hedging against uncertainty through dispersal, and governing themselves through institutions that learn. The integration of such knowledge with scientific management is therefore not a concession to nostalgia but a path to more resilient water management, combining complementary strengths. To let traditional knowledge die unregarded is to discard a form of adaptive capacity that the uncertainties of the future make more, not less, valuable. The wise course is to learn from it while it can still be learned.

References

Agarwal, A., & Narain, S. (1997). Dying wisdom: Rise, fall and potential of India's traditional water harvesting systems. Centre for Science and Environment.

Berkes, F., Colding, J., & Folke, C. (2000). Rediscovery of traditional ecological knowledge as adaptive management. Ecological Applications, 10(5), 1251-1262.

Berkes, F. (1999). Sacred ecology: Traditional ecological knowledge and resource management. Taylor & Francis.