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The Forest Cover – Water Yield Debate: Implications for land management in Ethiopia

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”Are forests good for water” remains a hotly contested scientific question. Despite both its importance and apparent simplicity, we have difficulty knowing enough about how the water regime reacts to land use change to make water-wise decisions regarding the forest management alternatives facing individuals, communities and governments.

Scientists still argue about how the presence of forest influences the availability of water. There has been a tendency in some circles to focus on trees as thieves of water because they take water from catchments and put it back up into the atmosphere. Research that focuses on small watersheds where a local water budget can be established, however, misses the potential importance of forests on a regional scale with regard to the importance of returning water vapor to the atmosphere so that it can fall as rain again. ..

In the face of global warming and climate change, the preservation and extension of forest cover is likely to play an increasingly important role in the maintenance and improvement of available water supply. But given the complexity of the science, and the scale issues involved when contrasting local management vs. regional and global issues, it is difficult to know how to include water in forest management.

It is therefore not surprising that there can be disparities between national-level water resource management policies and community-level understanding. Even at the local level, upstream/downstream perceptions of land-water management issues and practices can be quite different. Thus, it is often challenging to get community perception integrated into water management, even when there is agreement on the value of local knowledge. The gap between policy and perception is exacerbated by a lack of scientifically based understanding and data-based decision support.

Using the situation in Ethiopia as a starting point, the relation between land cover and water over the past half century has been explored using both traditional methods (runoff records, statistical analysis, and change detection modeling), as well as an exploration of community perception. The main findings were that no major, consistent changes in the flow regime despite ongoing land degradation could be detected. Any hydrological changes there were watershed specific. The study of forest cover change also revealed that while there were some general differences in the timing and extent of deforestation, each watershed had its own land-use story. The community perception showed that the relationship of forest cover change and flow regime is not as simple as deforestation bringing loss (or increase) of dry season flow. According to the elders, forest and flow relationships are watershed specific, even sub-watershed specific. The lack of a clear relationship between forest cover change and flow regime at the temporal dimension could be attributed to scale of watersheds and the likely uncertainty in measurements of flow extremes.