into policy action takes time. It remains to be seen to what extent agencies can reinvent themselves and move from mere executors of blue prints into a mode of asking questions, looking for answers and solutions, distinguishing between symptoms and causes. Replacing the generic 'forest' concept by a set of quantifiable indicators of watershed functions will help, but this will require public support. The pool of trained people and the tool box with tested and relatively cheap methods to assess, for instance, water quality and erosion is expanding. Collaborative research between national and international institutes improves the prospects of correctly assessing the local context and opening doors to policymakers.

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BASIN MANAGEMENT IN NORTHERN THAILAND: EMERGING LESSONS

By David Thomas

In the discussion on deforestation, reforestation and forest conversion in the tropics water always plays a prominent role. By contrast, the European water framework directive gives guidance on how the quality of surface water should be managed, without explicit reference to forests or trees. In northern Thailand similar ideas are now emerging, after many decades of a forest-biased public debate.

The EU Water Framework Directive has the following key aims:

- water management based on river basins
- expanding the scope of water protection to all waters, surface waters and groundwater

- getting citizens involved more closely
- achieving “good status” for all waters by a set deadline
- “combined approach” of emission limit values and quality standards
- getting the prices right
- streamlining legislation

The directive specifies a single system of water management: River basin management. This was seen as the best model, rather than according to administrative or political boundaries. Initiatives in Maas, Schelde and Rhine river basins served as positive examples of this approach.

Lessons for river basin organizations

A review of the major lessons for river basin organization (RBO) that can be learned from international experience lead to the following conclusions:

Absence of a “blueprint” for RBOs

Scope of Integrated Water Resource Management

There is a growing amount of evidence that RBOs with relatively wide mandates are better able to attract and hold interest of major stakeholders, who feel they are involved with work that is relevant to their needs, especially in basins where there are multiple major problems.

Subsidiarity and decentralization

Subsidiarity is based on the key proposition that, especially in complex management systems, decisions are best made at the most local level where they are possible and viable. A corollary is that where local decisions are not possible or viable, they should be raised to the next higher level in the hierarchy, where the same principles are then applied. When decisions are made at their most appropriate levels, this favors efficiency, equity and accountability.

Stakeholder representation and roles

RBOs employing integrated water resource management principles clearly function best when the full range of stakeholders is represented and actively participating.

Information

Virtually all studies and assessments of experience agree on the need for high quality and openly accessible information. In some societies, this can be provided from a substantial range of sources with which the RBO can develop an alliance or collaboration. In many others, however, information and data are scarce and often of dubious quality, gaps are wide, expertise is low or highly concentrated in particular agencies or stakeholder groups, and public information access is not a cultural norm.

Coalitions and alliances

Increasingly, RBOs face a situation where they are expected to respond to broader mandates, but in a more decentralized manner. Experience confirms that, under the right conditions, this can increase stakeholder participation, accountability, efficiency and equity. But those ‘right conditions’ include needs for more capacity, tools, information, and other resources at local levels of distributed systems where such things are often scarce.

Application in the Ping river basin: confusion and uncertainty

In reviewing the current status of the application of these concepts in the Ping river basin we noticed an overall state of confusion and uncertainty felt by most

stakeholders – including government agencies – about the directions of the Ping River basin program and the status of the various committees, working groups, networks and initiatives that have been formed and are under development. This is resulting in a general feeling of tension that is usually somewhere on a continuum that runs from apprehension to frustration, that appears at all levels from the Ping River Basin to local communities. Stakeholders at different levels asked "Why is there a need for this project?" This is usually followed by, "Why doesn't the government just provide some of the funds they have promised for several years, and let us get started with activities we have already planned?"

Especially in the Upper Ping, there is now considerable confusion about the apparent continuing expansion of the mandate of river basin and sub-basin organizations and planning. The first round of committees and planning seemed to be focused quite directly on water resources. Then the second round of planning seemed to shift much of the focus to forest conservation, land use, agricultural chemicals and trash. Now this new project wants to add public health and poverty *cum* livelihood issues. Most local communities appear to have few problems about seeing how these issues are important, linked, and affect their lives, but they feel a need to get some clarity and definition so that they can do what is required and get on with their activities and their lives without spending so much time planning and re-planning. For government agencies, concern is even stronger because of the lingering questions about who is or will be the "owner" or "patron" of this program (and its budgets), and how are they supposed to act vis-à-vis other agencies.

And at a more specific level, there is also quite considerable confusion about the roles and status of the various existing levels of committees and working groups, as well as the plans they have already developed. A number of people have stepped forward to assume leadership roles, and some are beginning to wonder if they have been wasting their time, or if people at higher levels are for some reason not pleased with their performance. Perhaps even worse, some are wondering if the continuing lack of action in receiving support for the plans and projects they have worked to help articulate and develop will damage their credibility and social standing within their communities.

Problem identification by government officials naturally tends to be viewed through the lens of the mandate of their agency, whereas much local problem identification has been broader but unsystematic and often occurs too late to consider preventative measures. Empirical data-based analysis has generally been extremely rare, and unquestioned popularized general theories backed by emotional arguments are still featured prominently at most public discussions. Various interpretations of 'Forest' play a prominent role in these discussions. Issues often tend to be viewed as simply good or bad, rather than as involving situations where there are trade-offs that must be made between the benefits and costs accruing to different groups. Assessments of such trade-offs, however, would also often require information, data, and analytical tools that are frequently not available to or accessible by local leaders and communities.

That being said, more quiet progress toward more dispassionate and reasoned analysis is being made in various sub-

basins. Local leadership, sometimes assisted by staff from government agencies or academic or civil society institutions, often features prominently in these cases.

The type of progress we have seen in some sub-basins also demonstrates local progress toward development of a "negotiation mindset" that will be required to effectively develop and implement solutions to many, if not most problems. There are usually costs and benefits associated with all potential solutions to a problem, and their distribution is frequently not even or balanced across the range of stakeholders involved. Thus, in order to achieve sufficient participation, this distribution of costs and benefits needs to be negotiated among concerned stakeholders. A negotiation mindset shifts emphasis from a focus on 'winning' or 'losing' to seeking an outcome wherein concerned stakeholders (at all levels) incur various costs and benefits that are mutually perceived as equitably distributed, as they jointly seek a 'best possible' outcome.

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For more information on the European water framework directive, please visit: http://www.europa.eu.int/comm/environment/water/water-framework/index_en.html

MODELLING TROPICAL FOREST WATERSHEDS: SETTING REALISTIC GOALS

By Nick A Chappell

Some rainforest watersheds in the tropics are natural buffers for water resources and ecology; others provide forest products, which sustain local livelihoods. The movement of waters containing chemicals and sediments needs to be known to underpin sound forest management practices; and watershed modelling is a key element in this learning process (Chappell *et al*., 2004b). We do, however, need to be realistic about what we can learn from these modelling results.

Forest hydrologists typically address one of four objectives when they model tropical rainforest watersheds. First, modelling can be used to test the consistency of existing theory and explore individual hydrological mechanisms in a systems context, addressing issues generic to the global hydrological community. These issues include how hydrological behaviour changes with watershed size, or how hydraulic characteristics can be measured over field-scales. Secondly, modelling can also show the relative importance of particular controls on hydrological behaviour within a particular setting; for example, the difference between watersheds with different rainfall regimes (e.g., cyclonic vs. non-cyclonic) or subsurface storage (e.g., aquifer vs. non-aquifer geology); these results can be used to help define simple conceptual models of watershed behaviour. Thirdly, models can be used to illustrate the impacts on hydrology of changes in land cover and/or rainfall regime.