

FRP Meeting 20 December 2000

Water catchments – Issues and options for socio-economic research.

Workshop summary

1. Introduction

Two workshops were held by FRP to help define its plans for funding research on water catchment issues especially in tropical montane cloud forest (TMCF) areas. One (18th December) focused on hydrological issues and research locations, a second (20th December) on socio-economic issues for research. In each meeting discussion was based on a draft report of issues and options for research.

Discussions in the socio-economic issues workshop of 20th December reviewed the outcomes of the hydrological issues workshop, and focused on current knowledge gaps and areas for further work, as well as how this proposed research cluster would fit in with other ongoing work. The focus on cloud forests and dry season flows was particularly debated, as reflected in the 'key issues' summary. Discussion in the workshop has contributed to additions and changes to the draft pre-workshop report, which is attached. The workshop also highlighted some concerns about the research focus, which are addressed in question-and-answer format, also attached.

2. DFID's overall interest in catchment work.

DFID noted their various interest and possible funding areas for water catchment work.

- DFID(central) – Policy research, possibly contracted out to IIED, in several countries.
- DFID country programmes (in RSA, India, Indonesia and Grenada) have expressed interest in supporting development of water markets. The proposed DFID-supported research by IIED will include documentation of local experiences and observational studies in these countries.
- DFID (central) - possible support to the large-scale IFAD+ proposal for work on markets for environmental services in Asia.
- FRP – 'science' research on hydrology, with experimental socio-economic work probably in the sites of hydrological work. The need to at least share approaches with other socio-economic work (i.e. DFID/IIED) is strongly recognised.

3. Lessons and gaps in work done to date

Participants agreed in principle with the draft report, adding some information on other current work or proposals for work in this field. Also noted was the importance of comparing stakeholders, in terms of

- differing cultural/economic/social approaches to valuation of similar resources, and
- understanding of, and willingness and ability to pay for water services or land-use change.

4. Considering populations

It was agreed that it would be critical at an early stage in any work to characterise the different stakeholders in terms of their nature, influence, weaknesses, and institutional, technical and financial capacities. This would aid analysis of who bears costs and benefits of alternative land/forest management and options for distribution

of benefits. Similar needs were recognised in the hydrological issues workshop. Participants identified some further types of water users to add to the list in the draft report.

Discussion in this meeting noted some further key issues about locating research, from a socio-economic point of view - where work *should* be done (for clearest technical results) is not always the same as where work *could* be done. To really get results from efforts to investigate new ways of developing water markets and equitably sharing the benefits, it is critical to apply the results of the combined hydrological and socio-economic research in locations where there is 'policy ripeness', i.e. where lasting outputs are politically feasible. Along with characterising stakeholders it will be important to look at the state of institutions and policy development.

5. Key research issues

Valuation: It was not felt that existing valuation mechanisms should be reworked and improved, rather that existing methods should be compared for use in different situations. This would contribute to a decision support system, with simple indicator-based guidelines for when to use which tools, which could be used without extended donor support.

A key issue here was to draw out some of the non-monetary benefits from the body of cash-based work done to date. Emphasis should be less on the valuation itself and more on *how* stakeholders define their commodities and values - the criteria used by each type of stakeholder, and the processes of dialogue and negotiation. Just as payment schemes may be flawed if based on false *information* (hydrological data), they will also be flawed if based on false or biased stakeholder *values* (socio-economic realities).

Key areas of research might then be:

- Which methods work under which conditions (policy, stakeholder and usage, economy) and for whom?
- What processes and criteria are important in stakeholders' definition of commodities and negotiation of their values?
- Is it more efficient/cheaper to change upstream catchment management or to implement downstream water protection measures?
- Comparison of currently available methods and options is key, rather than developing new methods.

Linking upstream and downstream costs and benefits: It was agreed that there is a need to turn current anecdotal experience about enabling and brokering processes into lessons to share, particularly about what works where and why. Key elements include looking at what ensures equity, and what triggers co-operative behaviour and acceptance of compromises. Key to this was seen to be in providing information to change behaviour:

- How and why do people make land-use/water-use decisions?
- Can information be collected to provide facts to use in brokerage/negotiation and in decision support systems?
- What information do different stakeholders need in order to be able to negotiate equitably and to change their behaviour?
- Can provision of better information about hydrology/land-use links and markets actually change behaviour?
- Can information provided by hydrological research be useful in other sites?

Institutional issues were also recognised as critical constraints, and enabling processes need to be analysed:

- What conditions trigger acceptance of information and behavioural change?
- What are the conditions of successful brokerage? What makes a brokering process work and what makes it equitable?
- What geographic scale and what size of stakeholder group is optimal for successful brokerage? Does this differ with different brokerage mechanisms?
- How to identify policy 'ripeness' for interventions to be successful?
- Can water payment/compensation mechanisms be linked into wider policy and institutional frameworks in the long term?
- What will be the long-term implication of interventions? How to ensure that they will be positive in the long term?
- At least basic stakeholder analysis is key to mapping and characterising the stakeholders in terms of their nature, influence and weaknesses.
- Willingness, ability and capacity to implement and participate in interventions are key considerations.

Decision support systems: It was emphasised that these need not be complicated, but could be simple checklists for use by different stakeholders. It would be important for these to be available for use in the hydrological research sites.

6. Clarification points.

Several workshop participants queried the focus of the proposed research cluster. There was concern that this was a narrow focus, driven mainly by the timeframe and feasibility of getting results, and the need for a broader context to be incorporated was observed. The attached question-and-answer document addresses these concerns.

It was agreed that erosion and sedimentation may appear to be as important as dry season base flows in some areas, but that erosion and sedimentation fluxes are typically due to unpredictable large-scale storm events. As such events may or may not happen within the time frame of this RNRRS research, which demands strongly specified outcomes within relatively short time periods, dry season base flows are the research focus. It was appreciated that changes in water *quality* may be attributable to changes in forest cover over larger catchments than changes in water *quantity*. As most widespread interest is in water quantities, and in the scale of catchments where dilution of effects is not a confounding factor, the FRP-supported research will focus on dry season base flows in small- and medium-sized catchments.

7. FRPs approach and next steps

FRPs hydrological work WILL:

- include multi-disciplinary teams to ensure socio-economic issues are included.
- look at the applicability of results beyond the TMCF as soon as possible.
- include an early and rigorous problem analysis.
- build on and use existing studies and networks to optimise information sharing.

Next steps include:

- Seeking confirmation from DFID/RLD that the arguments laid out in the question-and-answer document are acceptable.

- Requesting the DFID Lead adviser for FRP to stimulate indications of interest and commitment from at least the four countries already mentioned (Grenada, India, Indonesia, RSA).
- Improving the information available on possible research locations then ensure rationalisation of location selections.
- Commissioning at least the main hydrological research consortium, nominally under an IUCN umbrella with leadership from the Free University of Amsterdam.
- Devising the protocol for the hydrological studies in elevational transects that should extend the data coverage to non-TMCF vegetation types and locations away from the primary research site(s), and agreeing protocol with other stakeholders.
- Devising and agreeing the approaches and protocols for characterising the vegetation types, land uses and populations of upstream land and forest managers and downstream users and consumers of water services.
- Starting further baseline socio-economic work (in addition to DFID's work) at the same time as hydrological research at those locations. This could include:
 - at least basic 'stakeholder analysis'
 - developing lessons about enabling and negotiating processes.
 - monitoring land-use changes and their driving forces.
- Ensuring that there is (and budgeting for) a conscious steering effort between the proposed and ongoing activities.

Water catchments

Issues and options for DFID's Forest Research Programme research.

Summary of key issues.

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As part of planning towards a new research cluster on management of water catchments, the Forest Research Programme (FRP) held two workshop meetings (18 and 20 December 2000, at the Department for International Development (DFID)) to discuss the issues and options for research. One workshop focused on hydrological issues, the second on socio-economic issues. Discussion in the workshops was based on reports drafted beforehand. Both the updated pre-workshop reports and workshop summaries are attached/annexed, providing details of proposed research and next steps.

In addition, the workshops raised several questions amongst DFID staff about the overall research focus. This document addresses those concerns.

Key questions from workshops.

1. Why is further hydrological research necessary?

Until recently, hydrological research has treated water catchments as 'black boxes', making results catchment-specific and not replicable to other sites. Many 'myths' and unproven assumptions about cause and effect linkages regarding land-use and water have been promoted and remain (Calder, 1999), and have misguided land-use decisions in many places (as noted in the recent UN Food and Agriculture Organisation (FAO) email consultation on catchment management issues). To provide the opportunity to improve such decision-making, it is critical to produce unambiguous and defensible information.

Whilst decision-making may be improved by inclusive negotiations, without equitable access to reliable, factual information, imbalances in negotiating power cannot be expected to be addressed.

In addition, new developments in hydrological research allow a process approach, from which models can be derived, calibrated and applied in other areas.

2. Why focus research in tropical montane cloud forest (TMCF) watersheds, when the number of people dependent on TMCF is low, relative to other forest/vegetation types?

Whilst other forest and vegetation types may be perceived to be more directly critical to a greater number of people's livelihoods than TMCF, the water production value of TMCF should not be underestimated. TMCF captures 5-100% more water than the total rainfall, through interception of cloud moisture. This means that any removals of TMCF or lower montane buffer forests can have significant and attributable effects on both base level and dry season water flows downstream. New hydrological research approaches are expected to be able to produce definitive, quantitative relationships

between TMCF cover changes and dry season flows in five years or less. This is not necessarily the case for other forest types, where the cause-effect relationships may be less clearly quantifiable.

Headwater catchments including significant TMCF may produce so much more water than downstream areas that they influence overall basin streamflow. This means that enormous downstream populations are dependent on the TMCF, as well as those who live in or near it. For example, the Honduran capital, Tegucigalpa, relies on one mountain area (*La Tigra*) dominated by TMCF for around 40% of its water supplies. Other capital cities reliant on TMCF for their water and hydro-power include Quito and Dar es Salaam, with a total population in the three cities of well over four and a half million (P.Bubb, pers.comm).

TMCF is not insignificant as a forest type. There are at least 605 areas in 44 countries (WCMC, 1997), and mountains where they are located support one-tenth of the world's population (Grabherr, 2000). However, it is being deforested at a greater rate than other types of forest (Bruijnzeel & Hamilton, 2000). In degraded mountain areas, islands of remaining TMCF are critical refuges for biodiversity, which provides resources of scarce forest products. TMCF is valuable as a source of a range of livelihood services to poor local people, including non-timber forest products and cultural values.

The biodiversity value of TMCF is very high - for example, TMCF covering just 3.2% of the South American continent harbours 63% of its endemic species. TMCF is increasingly the focus of conservation efforts, attracting support from the World Bank's Global Environment Facility for the maintenance of globally threatened species and habitats. It is important that such efforts be fully informed by reliable information on both hydrological and socio-economic impacts of potential land-use change.

3. *Why focus the hydrological research only on dry season flows?*

As noted above, removals of TMCF or lower montane buffer forests can have significant and attributable effects on both base level and dry season water flows downstream. New hydrological research approaches are expected to be able to produce definitive, quantitative relationships between TMCF cover changes and dry season flows in five years or less. Such definitive attribution may not yet be possible for other aspects of water service provision (such as erosion or sedimentation).

The additional water captured by TMCF is highly critical to local and regional livelihoods as it contributes to maintaining dry season river flows. In areas with a marked dry season without rainfall, the water stripped from clouds is the only addition to the watershed during the dry season. This is a critical function for both domestic and industrial water-use, irrigation, hydro-electric power supplies, river transport etc..

4. *When and how might the research from TMCF be extendable to other forest/vegetation types and other regions?*

New developments in hydrological research allow a process approach, from which models can be derived and calibrated for use in other areas. Proposed hydrological research involves using these new developments and approaching the issue in an integrated manner, rather than looking only at one forest type then 'extending' results to others. It includes study of hydrological processes in various forest types along the elevational gradient, e.g. in lower montane forests below the cloud base as well as in the TMCF. The intention of such transect studies is to track the changes in reliability of quantified vegetational-hydrological relationships from TMCF to other

forest types, where the relationships are more difficult to display unambiguously. The wider the coverage of transects, the more feasible will be the extension of results to whole small- and medium-sized catchments.

Whilst it will not be possible to further extend results within the timeframe of this cluster of projects (up to 5 years), it is anticipated that this definitive, reliable set of results will provide critical lessons for use with other, more spatially extensive forest types and water service issues.

It may also be possible to link efforts in DFID country programmes/regions outwith TMCF areas into this research cluster. For example, India holds potential for similar studies of impacts of forests on low base flows and groundwater recharge in dry areas. This is different from current developments in South Africa, where the effect on water flows of removing extensive plantations of invasive exotics is being studied.

5. *Why focus hydrological research in sites where good hydrological research can happen, when these are not areas of socio-economic (political and populational) need?*

To be able to produce definitive, quantitative relationships between forest cover changes and dry season flows, research needs to be carried out in areas where there is already good baseline and longitudinal series of data on which to build. Attempting to carry out this research in data-poor areas will not produce as reliable results. This does not preclude socio-economic work from being done in these and/or non-cloud forest areas.

6. *Will the hydrological studies interface/link with the socio-economic work?*

Studies in this cluster will be carried out by multi-disciplinary teams, including socio-economists. A key starting point will be to establish a standardised approach to characterising stakeholders in different catchments. The workshops agreed that standardisation would be valuable to the FRP-supported studies and to other DFID-funded research and development projects in upper catchments, such as that recently commissioned from the International Institute for Environment and Development (IIED) in several (not necessarily cloud-forest) areas/countries. This characterisation of stakeholders will then be used by FRP and other DFID- (and other donor-) funded work on water services and catchment land-use. Sharing experiences through action learning as work progresses will ensure that approaches in different research projects are compatible for ease of promotion of results in broad recommendation domains away from the specific research areas.

7. *What is the likelihood that research will lead to development of a decision support system (DSS) that will actually break down the 'myths' of land-use effects on water, and influence land-user behaviour?*

It is difficult to assure a change in the behaviour of land-users, or policy-makers. However, it is clear that the various types of water catchment stakeholders hold diverse views about the short-term and long-term values of forest goods and services. As long as these diverse views are not mutually understood or converted to a common currency of information, and the real hydrological links between land-use and water are ambiguous, the likelihood of promoting sustainable and equitable changes in attitude and policy remains poor. Providing reliable information to all stakeholders is a first step to ensuring good negotiation.

This is where the close links into other ongoing efforts to develop and establish appropriate markets is key. The hydrological work will feed into the DSS developments. Communication between hydrological and socio-economic researchers is essential to take efficiently the science into social and political reality and market negotiations.

The basis of the DSS is critical - in terms of the way in which it emerges from and feeds into negotiation processes and how it targets information to stakeholders. The DSS will be focused on producing tools that are accessible and appropriate to the various types of land-users and policy-makers. As noted in the attached pre-workshop report, this will require research into different stakeholder perceptions about land, forest and water management choices. Acceptance and adoption of the advice and information in the various DSSs will be encouraged by participation of stakeholders in developing the DSSs.

8. Given the strength of power politics in negotiations about water services markets and pricing, can the information provided by the research really make a difference?

Whilst decision-making may be improved by inclusive negotiations, without equitable access to reliable, factual information and without mutual understanding of social and cultural positions and beliefs, imbalances in negotiating power cannot be expected to be addressed. For livelihoods of forest-dependent poor people to be improved, they must have widespread access to reliable and unbiased information in order to be able to negotiate equitably with 'competing' stakeholders (i.e. other land and water users, such as hydropower and water companies, large-scale farmers).

Providing research information to disprove assumptions which currently disfavour the poor will be a first step. Feeding that information into the negotiation processes in a targeted way to the less powerful stakeholders, and supporting the negotiating process with a range of DSSs, will begin to address power imbalances.

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List of participants (status 15 Dec 2000) for the 2 workshops on

18th December:

1. Dr Bergkamp, Ger (IUCN, Gland, Switzerland)
2. Dr Brown, Don (ITAD, for DFID Engineering Knowledge and Research Programme)
3. Dr Bruijnzeel, Sampurno (Free University of Amsterdam)
4. Dr Bubb, Philip (UNEP-WCMC, Cambridge)
5. Prof Calder, Ian (CLUWRR, Newcastle Univ.)
6. Ms Porras, Ina (IIED, London)
7. Dr Price, Martin (Perth College)
8. Dr Roberts, John (CEH/Institute of Hydrology, Wallingford)
9. Ms Steward, Helen (for Mott MacDonald, Cambridge)
10. Mr Topping, C. (same as Helen Steward)
11. Mr Toyne, Paul (WWF UK)

12. John Palmer (FRP)
 13. Duncan Macqueen (FRP)
 14. Ms Kirsti Thornber (LTSI, Penicuik).
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20th December:

1. Arnold, Mike (for FRP Programme Advisory Committee/PAC)
2. Bishop, Josh (IIED)
3. Bubb, Philip (WCMC)
4. Landell-Mills, Natasha (IIED)
5. Mayers, James (IIED)
6. Porras, Ina (IIED)
7. Richards, Michael (Overseas Development Institute/ODI, London)
8. Smart, Malcolm (DFID)
9. Toyne, Paul (WWF)
10. Vermeulen, Sonja (IIED)

11. John Palmer
 12. Duncan Macqueen
 13. Kirsti Thornber
 14. Stefanie Halfmann
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