



**SUMMARY OF ASB OPEN SCIENCE MEETING
ON TROPICAL FORESTS AND WATER:
8 DECEMBER 2004**

The Alternatives to Slash-and-Burn Consortium's (ASB) Open Science Meeting on Tropical Forests and Water took place on 8 December 2004 on the campus of the Center for International Forestry Research (CIFOR) in Bogor, Indonesia. Organized by ASB's global coordination office, the World Agroforestry Centre (ICRAF), the meeting was attended by over 100 representatives from governments, intergovernmental organizations, non-governmental organizations and academic institutions.

Focusing on linkages between forestry and water, the meeting presented ASB research on tropical forests and water supply, deforestation and local watershed hazards, hydrological effects of reforestation, watershed conflict management, and other topics. It also engaged policymakers and global experts in discussions on local implications of this new understanding of forest/water relationships. Participants at this one-day meeting heard 7 presentations addressing a range of forestry and water issues in two plenary sessions. A panel discussion between policymakers and researchers on relevant forest and water issues also convened in the afternoon.

A BRIEF HISTORY OF THE ASB

Recommendations agreed to at the 1992 Rio Earth Summit (Agenda 21's Chapter 11 on Combating Deforestation) provided the impetus for the creation of the ASB, which has operated as a systemwide programme of the Consultative Group on International Agricultural Research (CGIAR) since 1994. ASB works on two interlinked global problems: the environmental effects of forest destruction and persistent rural poverty in the tropics. ASB is a consortium of international and national research centers, as well as more than 50 independent

centers, non-governmental organizations, and universities. The International Centre for Research in Agroforestry (ICRAF) is ASB's convening center and hosts its global coordination office in Nairobi, Kenya. ASB is governed by a global steering group of 11 representatives from key institutions, and is chaired by ICRAF's Director of Research.

Recently, ASB contributed to a study about hydrology-biodiversity-forest relationships, which found that many policies are based on an inadequate understanding of the relationship between forests and hydrology. The World Bank - Netherlands project on forests and biodiversity was a comprehensive assessment of hydrology in tropical forest basins, using a nested suite of hydrological simulation models to understand the nature,

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magnitude, and geography of hydrology-biodiversity-forest relationships. This study's results highlight the gap between the popular and scientific conceptions of forest and water links – and provide the scientific evidence necessary to inform policies that address the impacts of deforestation and land cover change on key hydrological processes.

REPORT OF THE MEETING

Ir. A. Ngaloken Ginting, Senior Researcher of Forest Research and Development Center, Ministry of Forestry, Indonesia opened the morning session and welcomed participants to the meeting. In his opening remarks, Thomas Tomich, Global Coordinator of ASB, ICRAF, thanked the Indonesian Government and CIFOR for hosting the meeting. He referred to three different editorials from the 8 December 2004 *Jakarta Post* that dealt with the forest and water issue and demonstrated the importance and timeliness of the meeting.

Yetti Rusli, Senior Advisor to the Minister on Forestry Development, Ministry of Forestry, Indonesia, delivered opening remarks on behalf of Hadi Pasaribu, Director General, Forestry Research and Development Agency, Ministry of Forestry, Indonesia. She highlighted the Ministry's priority programs to improve forest resource rehabilitation and conservation, which are being carried out together with other programs that are related to the sustainable supply of water, including: combating illegal logging, revitalizing the forestry industry, and empowering local communities. Recognizing the close relationship between local communities and forests, she stressed the need for active participation by local communities in forest management. She also encouraged participants at the meeting to share information and experience as well as practical knowledge regarding the management of tropical forests.

Following these opening statements, participants heard four presentations on the issue of forests and water during the morning. The afternoon session consisted of three more presentations, chaired by Kurniatun Hairiah, University of Brawijaya, Indonesia, and a panel discussion.

FUTURE WATER DEMAND AND REGIONAL SUPPLY/ DEMAND SCENARIOS

Daniel Murdiyarto, CIFOR, gave a presentation that focused on key challenges, a water simulation model, a scenario description and results, climate change, and the role of forests. He summarized key challenges for global water supply as follows: rapid growth in domestic and industrial water demand,

increasing costs of water development, wasteful use of existing water supplies, groundwater over-drafting and degradation of irrigated cropland, threats to ecosystems, declining water quality, subsidies, distorted incentives, poor cost recovery, low rainfed crop yields, climate change, and land-use change.

He described the water simulation model as a tool to assess the impact of alternative water policies and investment on water supply and demand, and food production, demand and prices. It simulates effective water for irrigation and rainfed production based on climate parameters, infrastructure, and policy inputs. Noting the close relationship between climate change and water, he indicated that the world's population under water stress is increasing. In terms of the role of forests, he said that reforestation/afforestation increases evapotranspiration and improves soil infiltration capacity.

In conclusion, he highlighted that increasing competition for water severely limits irrigation and constrains food production. He also underscored that fundamental changes in water management and policy can produce a sustainable future for water and food, including: selective investments to expand irrigation; increased investment in domestic water supply; and water price incentives and water trading. He finally noted that the impact of land use and climate change on water yield is site specific.

LINKS BETWEEN RAINFORESTS AND WATER SUPPLY: STRANGE BUT TRUE?

Thomas Tomich, ASB Global Coordinator, ICRAF, told participants that policymakers do not have the information they need about links between forests and water supply and researchers are not heading in the right direction to supply information that policymakers can use. Reasons for such gaps between policymakers' needs and research results include, in particular: the effects of weather, terrain and geology are much bigger than those of land cover change; lumping together distinct issues under "watershed management" causes confusion; it is misleading to extrapolate from small scales to larger scales; there are almost no experimental data for scales over 100 sq km; and there are big gaps in the evidence precisely at the larger scales where policy makers are most concerned. On the bright side, he said that powerful new tools and datasets do exist that can help fill the gaps. These new cost-effective tools allow us to apply established hydrological knowledge consistently at policy relevant scales, to perform tests with real data, and to consider the whole landscape, forests along with agriculture land. They

help us to tease out the weaker effects of deforestation and land cover change from the strong effects of climate change, terrain and geology.

He highlighted a number of relationships relating to water and forests issues with upland, lowland and deforested areas:

1. the biggest watershed problems are in the lowlands, not the uplands; 2. we cannot assume deforestation reduces rainfall; 3. deforestation increases total water supply; 4. reforestation does not cause rivers to flow again; 5. upland deforestation increases risks of lowland flooding; 6. upland deforestation is a small factor in the biggest lowland floods; 7. farmers can monitor watershed functions; and, 8. agroforestry and tree crop systems can substitute for almost all the hydrological functions of natural forests.

BRIDGING BETWEEN LOCAL, POLICY AND MODELLERS' PERCEPTIONS OF TREES, FORESTS AND WATERSHED FUNCTIONS

Meine van Noordwijk, South East Asia Regional Coordinator, ICRAF, highlighted ten steps in bridging knowledge, perspectives and actions. They include: characterization and diagnosis of problems and issues; landscape appraisal; understanding the flow of water; ASB-matrix characterization of land use options from a private/social economic perspective and local/global economic and social impacts; characterization of the landscape mosaic on a segregate – integrate spectrum; tradeoffs between relative agronomic function and relative environmental function; the landscape mosaic in the context of existing regulation and incentives at the community scale; patterns and land use practices from a multi-stakeholder (including gender and equity) perspective; clearing misunderstandings between local, policy and scientific knowledge; and negotiated agreements and monitoring compliance.

HYDROLOGICAL EFFECTS OF REFORESTATION

Albert van Dijk, Land and Water Programme of the Commonwealth Scientific and Industrial Research Organization, Australia, gave a presentation that focused on reforestation and natural disasters, water resources and soil loss and river sediment. With regard to reforestation and natural disasters, he noted that for many natural disasters the damage is decreasing because human beings are now better prepared, but the frequency is increasing because we are facing a bigger problem with forests and water. He argued that flooding tends to be caused by a lot of rain and deforestation can worsen flash floods, while land cover has little or no effect on large scale flooding. He also

argued that landslides tend to be caused by a lot of rain and land use can affect shallow landslides but has little or no effect on deep landslides. In terms of drought, he said large forest areas may affect rainfall patterns and (de)forestation can change cloud formation, and thereby they have an effect on drought.

On reforestation and water resources, he said forestation always uses more water than shorter vegetation types, and therefore reduces streamflow. In terms of boosting low flow, he said reforestation does in some cases boost low flows but it requires offsetting greater forest water use by increased rain infiltration into soil and the right type of groundwater system. On reforestation and soil loss and river sediment, he said that, in general, trees don't prevent soil loss, but surface cover does. He further argued that forestation probably reduces river sediment if it increases soil protection.

In summary, he noted that reforestation is different from simply the reverse of deforestation, it has benefits but also some drawbacks and may not always live up to people's expectations. He stressed that the following questions need to be asked before undertaking reforestation projects: why is reforestation needed; what will be planted and how will the soil and forests be managed; and where will the planting occur and how will local climate, geology, soil, terrain and catchment type affect the outcome?

DOES DEFORESTATION AFFECT RIVER FLOWS ACROSS THE MEKONG BASIN?

Jeff Richey, University of Washington, Seattle, USA, focused on a case study in the Mekong Basin area to evaluate the "issue" of Mekong flows by examining what controls water flows across the Mekong Basin: geology, climate, land cover (change) and engineering.

He said the objective of the study is two-fold. The first objective is to evaluate the "issue" of Mekong flows, including measured "truth," modeling as an analytical tool, details of the discharge regime (1979 -2001), climate influences, engineering and land cover change. The second objective is to remind us that the integrated approach used is "more" than "just" hydrology modeling. He said it is imminently transportable to other regions, the sheer act of building such an analysis promotes interdisciplinary cooperation, and there are very useful stakeholder/policy applications. The study also tries to answer the following questions: how does land use intensification affect watershed functions in large-scale drainage basins (high flow, low flow); would switching land cover back to forest

change flow regimes; how does total water yield depend on the distribution of rainfall and portioning between hydrologic processes, under historical and current conditions; how are the temporal dynamics of high and low flows of rivers influenced by spatial scale; and how are “far field effects” on people living downstream linked to changes in total and seasonal water yield?

He said that to “deconvolve” the signal, suitable tools are needed, for example geospatially-explicit process-based models that are exciting new tools, as representation of space and dynamics, from tectonics to a local rainstorm. He also described: the vegetation classes, surface climatology, Mekong discharge, “Diagnostic” landscape/hydrology processes, regional climate proxies, the effect of dams on flow, irrigation, and various land cover scenarios. In summarizing, he said that as “farfield” affects water yield even in a very “big” basin, whether or not upstream changes are detectable depends quantitatively on the relative magnitude in a dynamic balance: transition forest to agriculture; irrigation; dams; and climate.

***EMPOWERMENT THROUGH MEASUREMENT:
LOCAL MONITORING, SCIENCE, AND CONFLICT
MANAGEMENT IN THAILAND***

David Thomas, ICRAF, Thailand, presented a case study from North Thailand, focusing on land use change in the region. Due to government policies in forest land zoning, watershed classification, narcotics and national security, and stopping shifting cultivation, land use in 2000 in the region changed to a mixture of grasslands, pine reforestation, intensive commercial vegetables, temperate/sub-tropical fruit trees, etc. He outlined the incentives and pressure for land use change, including: population growth and migration; agricultural expansion, commercialization and capitalization; infrastructure and public services; urbanization, industrialization and tourism; forest policy and administration; and environmentalism. He presented two examples to illustrate the importance of combining science and local knowledge to strengthen local institutions and multi-level understanding and communications: one is mapping community defined land use categories and boundaries, and the other is community-based monitoring of watershed services. He discussed mapping village views of land use zones by using science-based tools to improve communication and facilitate negotiations for land use security. He also discussed community-based monitoring of watershed services from agroforestry landscapes by using science-based tools to improve and facilitate negotiations on using and maintaining watershed services,

including: community monitoring of rainfall, temperature and relative humidity; community monitoring of water quality using biological indicators; community monitoring of stream flow, sediment and soil erosion; drawing on local and scientific knowledge to identify additional biological indicators of environmental quality; assessing community monitoring data and problems; village views on community monitoring data collection; and key factors affecting quality of community monitoring.

***SUMBER JAYA (LAMPUNG, INDONESIA): FROM
CONFLICT TO SUSTAINABLE LAND USE***

Fahmudin Agus, Centre of Soil and Agro-Climate Research, Bogor, Indonesia, gave a presentation that focused on: land use systems; land use scenarios; negotiation as a prerequisite for sustainable land use; and research findings on coffee based farming systems. Based on a case study in the Sumber Jaya area, a negotiation support system for sustainable land use was developed, involving different stakeholders and performance indicators. His research findings indicate run off and soil loss, ratio of erosion to runoff, and variation in soil loss. He described several selected conservation techniques and outlined farmers’ perception of these techniques in terms of their functions and effectiveness.

In conclusion, he highlighted: erosion and runoff are significantly reduced as coffee and other tree canopies, soil cover and litter layer develop; conservation intervention, in addition to coffee, is necessary for selected sites with low soil permeability/low porosity; a multistrata coffee system is the closest to forest in providing environmental services and can also provide reasonable livelihoods for people living on the forest margin such as Sumberjaya; and facilitation of the bottom-up development of multistrata and other conservation options, thereby accelerating the restoration of forest functions, seems to be the wisest way forward.

PANEL DISCUSSION

Mohamed Bakarr, Director of Strategic Initiatives, ICRAF, chaired a panel discussion by policymakers and researchers on three topics during the afternoon. The three topics were: “Kebun Lindung” or “Protective Gardens” and existing regulatory frameworks; national reforestation programs; and payment for environmental services or focus on tenurial security. Under each topic, participants were presented with two different “views” and the Chair requested them to express their preferred view and to provide argumentation for that preference.

‘KEBUN LINDUNG’ OR ‘PROTECTIVE GARDENS’ AND THE EXISTING REGULATORY FRAMEWORK:

Chair Bakarr introduced the two views considered under this topic: 1. ‘Protective gardens’ can fulfill all the watershed functions that the public expects from ‘protection forest’, while allowing farmers to make a living; and 2. Maintaining substantial areas with forest without human interference is essential for watershed functions.

A majority of participants supported view 1. One participant argued that protection secures economy, food and humanity. Another participant stated that it is important to maintain a balance between nature’s function and a farmer's need to make a living and protection is the balanced way to achieve that goal. Several other participants said that protection is the key for maintaining watershed functions

Other participants favored view 2. Several foresters stated that they believed that planting trees will not stop soil erosion or flooding, and the better idea to maintain watershed functions is to encourage farmers to do nothing to let forests conserve biodiversity and absorb carbon dioxide. One participant quoted the failure of a conservation district project in Indonesia as proof that “protection” will not work. He said both production and protection are right approaches, but one alone would not be sufficient to solve the problem. Chair Bakarr noted that watershed functions can be achieved through a combination of protecting the Gardens and maintaining substantial areas with forests.

NATIONAL REFORESTATION PROGRAMS SUCH AS GNRHL IN INDONESIA: Chair Bakarr introduced the two views considered under this topic: 1. National reforestation programs for critical watersheds are necessary to reverse the current negative trends; they require good planning and control; and 2. Support for local initiatives of farmers planting the trees they want on the places they like with a clear prospect of future direct benefits is more effective.

Some participants supported view 1, noting that there are not many local initiatives with farmers planting trees, as claimed in view 2. One participant stressed that national reforestation programmes should not be bottom-up approaches.

Most participants registered support for view 2. Some claimed that national plantation requires a big budget and such budget money should go to local initiatives that will have a greater impact. They believed that forest management will fail without taking into account local knowledge, and that top-down approaches are not a wise approach. One speaker said

that planting trees is not just for reforestation, but also for maintaining land functions, therefore governmental investments and other incentives are necessary for local initiatives. Another said it is easier to plant trees than look after them afterwards and local communities should be given the chance to decide what to do.

One participant indicated that both views are problematic. View 1 lacks the involvement of local communities and newly planted trees will die, while View 2 lacks the assurance that trees will be planted in critical watershed areas. Chair Bakarr suggested that the views be combined, calling for support for local initiatives and governmental investment and incentives for national reforestation programs for critical watersheds and areas where farmers do not like planting trees.

PAYMENTS FOR ENVIRONMENTAL SERVICES OR FOCUS ON TENURIAL SECURITY? Chair Bakarr introduced the two views considered under this topic: 1. Direct payment for watershed protection is a cost effective alternative to a regulation-based approach; and 2. What upland poor need primarily is security of tenure, watershed functions are likely to follow from there.

In support of view 1, one participant underscored the need to “bribe” and compensate because a regulation-based approach is not working. Another participant said it is necessary for government to provide credit so that people can have access to funds to protect the land and maintain the land’s functions. Some participants criticized view 2 for being too ownership-oriented, which they said might lead to land abuse based on an owners’ wishes, with others cautioning about uncertainties such as the compatibility of land use with environmental services and compliance with regulations. One participant said it is just and fair for people who render environmental services to get paid.

In support of view 2, one participant said it is necessary to fix problems from the past by recognizing local communities’ land tenure. Another participant argued that tenure security is a requirement for those who rely on natural resources and take the responsibility to manage natural resources.

Several participants indicated that collective action is needed, with one participant emphasizing that tenure security should come first and be followed by direct payments and compensation. Other participants expressed concern over the lack of evaluation for payment and compensation as well as lack of assurance that money will go to those who render the environmental services.

CLOSING OF THE MEETING

Thomas Tomich thanked all participants for attending the meeting and the chairs for chairing different sessions of the meeting. He informed participants that all presentations made at the meeting had been posted on CGIAR's website at:

<http://www.asb.cgiar.org/water>. He closed the meeting at 5:30 pm.

UPCOMING MEETINGS

INTERNATIONAL CONFERENCE ON WATER FOR FOOD AND ECOSYSTEMS: This conference will take place from 31 January to 5 February 2005 in Hague, the Netherlands. It is organized by FAO and the Government of the Netherlands, and will provide a high-level platform to help governments identify management practices, share practical lessons learned and determine the enabling environment for harmonizing food production and ecosystem management with a view to implementing internationally-agreed commitments. For more information contact: Mathieu Pinkers, Dutch Ministry of Agriculture, Nature and Food Quality; e-mail: m.j.h.p.pinkers@minlnv.nl; Internet: <http://www.fao.org/ag/wfe2005/>

SECOND SESSION OF THE UNITED NATIONS CONFERENCE FOR THE NEGOTIATION OF A SUCCESSOR AGREEMENT TO THE INTERNATIONAL TROPICAL TIMBER AGREEMENT, 1994: The second session of the United Nations Conference for the Negotiation of a Successor Agreement to the International Tropical Timber Agreement, 1994 will be held from 14-18 February 2005, in Geneva, Switzerland. For more information contact: Alexei Mojarov, UNCTAD Secretariat; tel: +41-22-917-5809; fax: +41-22-917-0051; e-mail: alexei.mojarov@unctad.org; Internet: <http://r0.unctad.org/commodities/>

17TH COMMONWEALTH FORESTRY CONFERENCE: This conference, which will take place from 28 February to 5 March 2005 in Colombo, Sri Lanka, will convene under the theme of "Forestry's Contribution to Poverty Reduction." For more information contact: Libby Jones, Secretary, Standing Committee on Commonwealth Forestry, Forestry Commission, ; tel: +44-131-314-6137; fax: +44-131-316-4344; e-mail: libby.jones@forestry.gsi.gov.uk

GLOBAL FORUM ON THE REVIEW OF WOMEN'S PROGRESS ON FORESTRY MANAGEMENT SINCE BEIJING 1995: TOWARDS A COMMON AGENDA: This Forum will convene from 28 February to 4 March 2005 in

Kampala, Uganda. It will examine the advances made and challenges met by women in implementing sustainable forest management. The Forum is co-organized by the Uganda Women's Tree Planting Movement, the Uganda Land Alliance, and the Ministry of Water, Land and Environment, Government of Uganda. For more information contact: Ruth Mubiru, Uganda Women's Tree Planting Movement; e-mail: ruthmubiru@yahoo.com; Internet: <http://www.un.org/esa/forests/gov-unff.html>

GLOBAL INITIATIVE ON FOREST LANDSCAPE RESTORATION: This meeting will take place from 4-8 April 2005 in Petropolis, Brazil. Organized by the Global Partnership on Forest Landscape Restoration, this workshop aims to increase understanding of good practices and opportunities to optimize delivery of the benefits from forest landscape restoration activities. For more information contact: Carole Saint-Laurent, Coordinator, Global Partnership on Forest Landscape Restoration, IUC; tel: +1-416-763-3437; e-mail: CarSaintL@bellnet.ca; Internet: <http://www.unep-wcmc.org/forest/restoration/globalpartnership/>

THIRTEENTH SESSION OF THE COMMISSION ON SUSTAINABLE DEVELOPMENT: The thirteenth session of the CSD will convene from 11-22 April 2005 in New York, US. CSD-13 will be a "Policy Year" to decide on measures to speed up implementation and mobilize action to overcome these obstacles and constraints for the thematic clusters of water, sanitation and human settlements. For more information contact: UN Division for Sustainable Development; tel: +1-212-963-2803; fax: +1-212-963-4260; e-mail: dsd@un.org; Internet: <http://www.un.org/esa/sustdev>

UNFF-5: The fifth session of the UN Forum on Forests is scheduled to convene from 16-27 May 2005 in New York, US. This meeting will represent the conclusion of the UNFF's five year mandate; delegates will discuss the future of the UNFF, among other things. For more information contact: Elisabeth Barsk-Rundquist, UNFF Secretariat; tel: +1-212-963-3262; fax: +1-917-367-3186; e-mail: barsk-rundquist@un.org; Internet: <http://www.un.org/esa/forests>

XXII IUFRO WORLD CONGRESS: This Congress of the International Union of Forest Research Organizations (IUFRO) will convene from 8-13 August 2005 in Brisbane, Australia, and will focus on "Forests in the Balance: Linking Tradition and Technology." For more information contact: Congress Manager, PO Box 164, Fortitude Valley QLD 4006, Australia; tel: +61-0-7-3854-1611; fax: +61-0-3854-1507; e-mail: iufro2005@ozaccomm.com.au; Internet: <http://www.iufro2005.com>