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Capacity Building for Effective Work at the Interface of Forest Science and Forest Policy

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Linking scientific knowledge with political decision-making has never been an easy task. This is also the case in the forestry sector, especially with its wide array of stakeholders at local, national, and global levels. Considerable constraints appear to exist in translating innovative ideas generated through science into practical application for policy-making and on-the-ground forest management. Over the past few years, the International Union of Forest Research Organizations (IUFRO) therefore has addressed the issue of the science–policy interface through in-depth study by a special task force, and by providing training on the subject for the forest science community in developing countries. This paper reports on the results and ongoing activities of these IUFRO initiatives, including a best practices guide on how to work effectively at the interface of forest science and forest policy and a training program that has been implemented in Africa, Asia, and Latin America over the past few years. As an example of successful training in science–policy interfacing, we present results of a workshop focused on mountain forestry development. This workshop was organized for scientists from developing countries in Africa and Asia in conjunction with the International Conference on "Mountain Forests in a Changing World" held in Vienna, Austria, in April 2008. Experiences gained in implementing the training on science–policy interfacing for scientists from developing countries show that interaction between the science community and decision-makers is very limited. Although in some developing countries there are established formal processes for reporting research results to the government at higher levels, greater efforts in terms of resources and awareness creation are required for more effective integration of scientific knowledge into policy-making. The science–policy guidelines and training presented in this paper are an essential step toward this end.

Keywords: *Science–policy interfacing; forest science; research communication; developing countries; capacity building.*

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The interface between forest science and forest policy

Science has always been a source of information for decision-making in policy and management. In recent years, however, interactions between the science community and policy-makers have developed new qualities, particularly in addressing global environmental issues such as loss of biological diversity, combating desertification, deforestation, and forest degradation, and climate change. Science is contributing to these debates in different ways through permanent scientific advisory committees, such as the Intergovernmental Panel on Climate Change (Parry et al 2007), or groups of scientists formed on a temporary basis to compile expert reports, such as the Millennium Ecosystem Assessment (MEA 2005). The global debate on forests within the framework of the United Nations Forum on Forests (UNFF) is supported by—amongst others—forest science through the Global Forest Expert Panels (GFEP), which synthesize the latest scientific knowledge on issues that are of high relevance to ongoing policy debates and negotiations (IUFRO 2009). Besides scientific reports, these panels also produce so-called policy briefs, which are summaries written in a language that can be understood by policy-makers. Similar work on science–policy interfacing is being carried out at the national and local levels (eg in the framework of national forest programs, poverty reduction strategies, or other multistakeholder processes).

Despite these efforts, linking substantive knowledge with political decision-making remains a difficult task (Pregernig 2008). Barriers and gaps between science and policy exist: decision-makers frequently complain that they do not obtain the information they need, and scientists take the view that "we produce valuable information that is not used." From this assessment, it is obvious that the problem is largely related to work at the interface between science and policy. According to Guldin et al (2004), an interface can be described as a boundary between two systems. Usually, these systems are quite different in terms of objectives, purpose, information needs, and the ways they operate. Research is

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defined as a detailed study of a subject, especially in order to discover (new) information or reach a (new) understanding (Cambridge Dictionaries Online 2003), while policy-making is recognized as a social (political) process consisting of varying analytical and problem-solving elements.

Forest research predominantly belongs to applied science, and therefore the extent of available problem-oriented scientific knowledge is quite large. However, considerable constraints appear to exist in translating innovative ideas created through science into practical application for forest policy-making and on-the-ground forest management (Pregernig 2000). Different factors are responsible for this and include the multitude of stakeholders involved, varying conditions of forests on the ground, which make generalizations extremely difficult, and the strong impact of other sectors on forest policy, such as agriculture, energy, infrastructure development, and nature conservation.

In recognition of the constraints associated with science–policy interfacing in forestry, the International Union of Forest Research Organizations (IUFRO) has undertaken various initiatives over the past years aimed at improving science–policy interactions through further study, research, and capacity building.

IUFRO task force and best practices guide on science–policy interfacing

In 2000, IUFRO established a task force on the science–policy interface composed of experts from all regions of the world. The goal of the task force was to analyze the constraints of interactions between the forest science community and forest stakeholders, particularly policy-makers in need of forest-related scientific knowledge and expertise. To this end, the task force organized several international meetings to present and discuss case studies and examples of science–policy interactions in forestry from around the globe. Based on these studies, the task force compiled a best practices guide for effective work at the science–policy interface (Guldin et al 2005).

The best practices guidelines attempt to highlight the major aspects of science–policy interfacing and recommend useful actions that could help forest scientists to become more effective in informing (influencing) forest policy. These aspects are presented in the guidelines according to the following 4 categories and are briefly outlined in the following sections:

- Focus research on questions that are relevant to policy issues;
- Conduct research in a communicative and collaborative manner;
- Understand, serve, and engage in policy processes; and
- Create organizational capacity and culture that enable and encourage work at the science–policy interface.

Research relevance

Most of the themes addressed by policy-makers are broad socioeconomic and environmental issues and thus cannot simply be answered by a single specialized research field. In order to have an impact on policy, it is therefore important for scientists to be aware of the major issues that are high on the agenda of policy-makers at a particular point in time. If, for example, climate change is the top issue at the policy level, scientists need to provide information on the role that forests can play in adapting to and/or mitigating changing climatic conditions. Usually, the type of scientific information needed by policy levels is a blend of several specializations, including biological, social, and economic research. If research is directed toward policy-relevant problems, or if specific research from one or more scientific disciplines is placed into the context of policy-relevant problems, this creates interest in and support for research.

Communication and collaboration

Section 2 of the *Best Practices Guide* (Guldin et al 2005) explains the roles that communication and collaboration play in work at the science–policy interface. It is commonly accepted that research results that are not properly communicated are of no value to society. Scientists are confronted with the task of informing a skeptical world about new scientific findings and innovation in order to create a better natural environment and society. Thus, the science community—besides generating new knowledge—also has the obligation to ensure proper communication (ie a type of communication of research results that can be understood by the intended audience). In forest applications, this involves communication products tailored to the needs of various forest stakeholders such as policy-makers, forest managers, rural communities, and the general public.

Experience also shows that communication with stakeholders from time to time, in single events, is not very effective. Instead, the science community needs to establish long-term partnerships with policy-makers and other stakeholders using a series of events (eg seminars, workshops, individual discussions) to convey relevant scientific information. Such long-term partnerships, for example, have partly been put into practice in national forest programs or initiated within the framework of the United Nations Forum on Forests. Frequently, informal channels of communication are very effective and may initiate discussions among stakeholders that lead to more formal ways of addressing a particular issue. Feedback from clients is another benefit of frequent communication, since it is essential to keep abreast with current thinking, and it may provide starting points for new research undertakings. Awareness of present and future emerging issues among policy-makers is equally important in the communication between science and policy.

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Policy processes

Policy-making is in most countries based on interactions and debate among policy-makers and stakeholders through political processes. In order to be effective in informing and influencing such policy processes, the science community needs to understand these processes, serve them to the degree possible, and—if opportunities arise—engage in them.

An understanding of the difference between scientific methods and policy processes is a first step in effectively contributing to policy decisions. More recently, many countries have tried to make policy processes more transparent. This provides a good opportunity for the science community to better understand such processes and plan for active engagement. Similarly, at the international level, important policy processes take place, such as through the UNFF, CBD, and United Nations Framework Convention on Climate Change (UNFCCC). These processes offer a wide range of opportunities for the provision of scientific input.

The next step toward more effective science–policy interactions is to serve policy processes. This can best be done by the forest science community by producing synthesized information that helps policy-makers to better understand the issues and become open for innovative solutions. For example, IUFRO, in its new initiative on GFEP, carries out independent scientific assessments on forest-related issues of high concern to UNFF and other global policy processes and produces reports that reflect the state-of-the-art understanding of the subject matter. In this context, it is important to note that the topics are selected based on intensive consultation with policy-makers. The current work of the GFEP has its focus on "adaptation of forests and forest management to climate change." This theme was identified in 2007 by the UNFF as a key issue to be dealt with in its next session in 2009.

Engaging in policy processes would be the most direct involvement of scientists in policy-making. In pursuing this, the science community should be aware of the boundaries between informing and advocating, and they should ensure that they do not become advocates for particular positions. Neutrality and independence are essential in order to be accepted as a reliable source of information and to effectively build relationships among stakeholders. Overall, to serve and engage in policy processes will require the science community to mobilize additional resources for capacity development and implementation of science–policy interactions. This is a particularly difficult task for the science community in developing countries.

Organizational capacity and culture

At the institutional level, the science community can encourage effective science–policy interactions by investing in capacity building to deliver and communicate research results and science messages. Such capacities include: (1) approaches to designing and implementing research projects that integrate stakeholders into the research process; (2) abilities to prepare policy briefs using language that can be understood by decision-makers; and (3) interpersonal skills for exchange between scientists and communicators in jointly preparing products using various dissemination channels (eg television, radio, press releases, etc.). Another element in effective science–policy interactions is establishment or enhancement of mechanisms that allow for continuous science input into policy as well as feedback from policy-makers and practitioners. More specifically, such mechanisms include national forest programs, permanent advisory committees to ministries and industry, and official reporting frameworks for regular updates on the latest scientific findings. In addition, research institutions, besides creating incentive structures that provide adequate rewards to scientists for effectively informing policy, should also establish communication sections staffed with trained personnel. However, in developing countries, forest research is largely underfunded, thus making it difficult to invest in this type of extension service.

Training in science–policy interfacing

Based on the work of the IUFRO Task Force on Science–Policy Interface, IUFRO's Special Program for Developing Countries (IUFRO-SPDC) developed a training module titled "Working Effectively at the Interface of Forest Science and Forest Policy." This training is part of IUFRO-SPDC's capacity-building program, which also includes courses on preparing and writing research proposals, research communication, and information management. Overall, IUFRO-SPDC's mandate within IUFRO's global network of 650 institutions of forest research and higher learning is to assist the forest science community in economically disadvantaged countries through training, travel grants to attend scientific meetings and conferences, and coordination of networking initiatives aimed at promoting research cooperation within and between regions. Over the past 4 years, several science–policy interfacing training events have been held for scientists from developing countries at various locations in Africa, Asia, and Latin America. The training has been aimed at providing concepts and methods to forest researchers that focus on how to plan, conduct, and organize research activities so that results can more quickly and easily be transformed into usable information for problem-solving and policy-making. Although not all research specifically focuses on policy-relevant questions, best practices in transforming research results into usable information can increase the impact

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of science on forest policy and improve the practice of forestry, thereby creating more value for society from forest and tree-related research.

The training workshops have a duration of 2–3 days and each one includes lectures on the nature of science–policy interfacing and problems associated with this type of activity; best practices for work at the science–policy interface; presentations of case studies to provide insights into successes and failures of science–policy interactions; and hands-on exercises to evaluate the tools and methods discussed in the context of specific research projects that are being implemented in the participants' country or region. Although all workshops followed this basic program, there were significant differences between the workshops in terms of thematic focus, resource persons, and case studies presented. The content of each workshop was tailored to the regional context and research environment of the participants. Table 1 presents the major workshops organized over the past 4 years along with the specific thematic focus selected for each workshop.

Training workshop on science–policy interfacing for mountain forestry development

In early 2008, a training event was held as a preconference training workshop in conjunction with the International Conference on "Mountain Forests in a Changing World." The training workshop took place at the University of Natural Resources and Applied Life Sciences (BOKU), Vienna, Austria, from 31 March to 1 April 2008, and it was organized by IUFRO-SPDC in partnership with the Institute of Forest Ecology at the same university.

A financial support package provided by several donors, including the Austrian Ministry for Science and Research (BM.W__f[a]), the Austrian Ministry for Agriculture, Forestry, Environment and Water Management, Austrian Academic Exchange Service (OEAD), University of Natural Resources and Applied Life Sciences (BOKU), Raiffeisen Zentralbank Österreich AG, and the Österreichische Bundesforste AG, made it possible to invite scientists from mountainous countries in Africa (ie Cameroon and Ethiopia) and Asia (ie Armenia, Bangladesh, Bhutan, India, Indonesia, Iran, and Nepal) to attend both the training workshop and the conference.

International policy processes

Following the opening of the training workshop, which included an introduction of participants and short presentation of objectives and daily program, the subject of science–policy interactions at the international level formed the focus of the first session. Global policy processes such as CBD, UNFCCC, and the forest regime under the UNFF were presented and discussed, including the ongoing IUFRO initiative on the Global Forest Expert Panels (GFEP).

In the interactive session that followed the presentations, the challenges to and opportunities for science input into international forest-related processes were discussed. As revealed already in other workshops, the participants thus far had had none or only very limited opportunities to provide these processes with scientific information. Only few had ever talked to the delegates representing their country in the respective negotiations. It appears that more often than not, a direct link does not exist between the forest science community and government officers representing a country in international policy processes. Under the UNFF, the so-called Multi-Stakeholder Dialogue (MSD) provides a mechanism that allows various groups, including the forest science community, to submit views and positions on specific topics for the international debate. However, experience has shown that mobilization of adequate state-of-the-art scientific information at the regional level is constrained by lack of funds (eg for organization of regional preparatory meetings) and insufficient time available for scientists to work on their contributions.

Best practices in science–policy interfacing at the national level

The second session was dedicated to the best practices in science–policy interfacing briefly presented already. In the discussions, participants had the opportunity to comment on various aspects of the recommended best practices and share experiences from their own work. The best practices session was further enriched by 2 presentations, one by the Forest Stewardship Council's (FSC) Regional Director for Africa on "The policy context of forest certification with special reference to Africa" (Figure 1) and another one by the Communication Officer of the Austrian Federal Research and Training Centre for Forests, Natural Hazards and Landscape on "Communicating scientific knowledge: Experiences from Austria." Communication of forest research results is considered a key area within science–policy interfacing. Experiences in communicating forest research were therefore presented using the newly established "forestknowledge.net" initiative as an example.

In Central Europe, the users of forest knowledge and those holding the expertise are not well connected. There are only few knowledge centers (ie research institutions), but the audience, composed of forest managers, administrators, and local and national policy-makers, is rather diverse in terms of educational background and location. Therefore, regionally valid expert knowledge is needed to assist in addressing complex forestry problems in their ecological and socioeconomic dimensions. In order to address this fragmentation, 4 leading forest research institutions in Austria, southern Germany, and Switzerland have established an internet-based

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TABLE 1 IUFRO-SPDC science–policy interfacing workshops, conducted between 2005–2008.

Location	Date	Audience	Thematic focus
Brisbane, Australia	Aug 2005	Africa, Asia, Latin America	International policy-making
La Serena, Chile	Oct 2006	Latin America	Science–policy interfacing in Latin America
Maliau Basin, Malaysia	Jun 2007	South and Southeast Asia	Science–policy interfacing in the context of tropical forest management in Asia
Quito, Ecuador	Aug 2007	Latin America	Forest and environmental legislation in Latin America
Nairobi, Kenya	Dec 2007	Sub-Saharan Africa	Science–policy interfacing in Africa
Vienna, Austria	Mar 2008	Africa and Asia	Mountain forestry development
Umea, Sweden	Aug 2008	Africa, Asia, Latin America	Adaptation of forests to climate change
Accra, Ghana	Oct 2008	Sub-Saharan Africa	Traditional forest knowledge

information resources center called forestknowledge.net (LWF et al 2009). The aim of this website is to enhance communication between the forest science community and practitioners, facilitate knowledge transfer, and further raise public awareness of the importance of forests and forest research. The content of the website is compiled by specialists working in the respective scientific field based on issues that are considered to be high priorities at a given point in time. Communication specialists are also involved in drafting texts, because the information must be tailored to the needs of the respective audience. The information provided is easily accessible through the Internet, easy to understand, multilingual, so that each practitioner can read the content in his/her own language, based on scientific findings, and created by expert institutions that are working at the interface between science, forest monitoring, and knowledge transfer.

Application of science–policy interfacing tools within the research process

On the second day of the workshop, the participants were asked to evaluate their own research work based on the best practices guide for science–policy interfacing. The aim of this exercise was to enhance participants' awareness of possible areas of application for available science–policy interfacing tools and to critically analyze the chances that their own research would make a difference at policy and management levels.

In order to provide additional social science perspectives on science–policy interfacing, the group sessions were preceded by a lecture from a social scientist from BOKU University titled "From knowledge transfer to knowledge transaction: Theoretical and empirical insights" (Pregernig 2008). The session explained the nature of science–policy interactions using examples from a microlevel perspective (ie use of scientific knowledge by Austrian forest stakeholders) to macrolevel perspective using large-scale environmental assessments of entire regions in North America. Most of the content of this session was also used to compile an introductory presentation about the basics of science–policy interfacing presented in other training workshops. For the group work, the participants were asked to evaluate specific research projects against the best practices guidelines and discuss the project's research process based on the following guiding questions:

- Which of the elements in the best practices guide have been implemented?
- Have these practices helped to make the project more useful for policy-making? If yes, how?
- Should additional elements given in the best practices guide be included into the project? If yes, which ones?

The groups, composed of 5–7 participants, each analyzed several research projects and compiled model projects for presentation. As an example, the project on the "application of mycorrhizal technology in hill farming systems in the Chittagong Hills of Bangladesh" is presented here to illustrate the nature of the group work assigned in the workshop.

The objective of this research project is to develop mycorrhizal technologies that assist farmers in the hill areas of Eastern Bangladesh to improve productivity of their farming systems using tree species and agricultural crops. It is expected that application of the new mycorrhizal technologies will increase the diversity of mycorrhizal fungi on shifting cultivation sites, leading to better plant growth and survival as well as healthier tree and crop plantations. In the evaluation of the research process against the best practices guide, the group arrived at the following results:

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FIGURE 1 A teaching session during the SPDC course at the conference on "Mountain Forests in a Changing World." Dr Demel Teketay (Forest Stewardship Council) contributed to the training workshop with a lecture on the policy context of forest certification in Africa. (Photo by Michael Kleine)



- The research is of high relevance to policy with a focus on needs of the target group (ie subsistence farmers).
- Apart from developing and testing the new technologies in smaller pilot plots, intensive communication with stakeholders has thus far not been done. This is a serious shortcoming because the wider application of mycorrhizal technologies requires demonstration of its feasibility on a larger scale as precondition for acceptance by farmers.
- With regard to informing local and national policy, the research project has not yet been involved in this type of activity. In the medium term, it is envisaged that policies on subsidies need to be put in place so that farmers are able to apply these technologies.
- Overall, this research project is an important contribution to sustainable land management. However, further efforts are needed to integrate the results into the day-to-day farming systems in the hill areas of Bangladesh and also inform policy-makers about the benefits that can be derived from its large-scale application. It is expected that further research is needed on operational procedures, economics, and impact of the new technologies on ecological and economic sustainability parameters.

Before closing the workshop, the major results generated by the various working groups were discussed, and each group identified science–policy interfacing practices that could be implemented in their research projects in order to enhance science–policy interactions.

Conclusion

The type of training workshop on science–policy interfacing described here has met with great interest, not only from the forest science community in developing countries, but also by donors of international development. This allowed IUFRO-SPDC and its partners to offer several training events over the past few years. The main lessons learned from these training workshops include:

- Very few forest scientists in developing countries have thus far had the opportunity to regularly interact with policy-makers. Only occasionally have presentations and discussions been held aiming at informing decision-makers about available scientific knowledge and results obtained from recent studies.
- Most of the research projects—if relevant for policy-making—do not include a science–policy interface component with defined activities and budgets.
- There are examples from Africa (ie Ghana and Kenya) where formal systems of reporting and communication with forest authorities at the provincial and national levels have been established. These mechanisms mainly address technical issues related to forest management.

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- Far too few local and national initiatives are aimed at scientific synthesis of complex natural resources issues. Such an approach would allow individual scientists to present their research results in a broader context, making it attractive for policy and management levels. However, incentives for scientists to work on such synthesis papers or presentations hardly exist because they are considered to be a lower priority for advancing academic careers.

All in all, the type of training presented here has raised the awareness of forest scientists in developing countries about the importance of science–policy interactions and the role that each scientist can play in informing decision-making. The science–policy interfacing guidelines and related training discussed here are essential components for more effective integration of science in policy-making and practice for the benefits of forests and people.

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