

# **SCIENCE-POLICY INTERACTIONS: MAKING SCIENCE WORK FOR FOREST LANDSCAPE RESTORATION**

by

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The IUFRO-SPDC Pre-Congress Training Workshop on “Science-Policy Interactions: Making Science Work for Forest Landscape Restoration” was held at the Beijing Forestry University, Beijing, from October 21 to 23, 2016, as part of the IUFRO Regional Congress for Asia and Oceania. Twenty eight participants from 11 countries took part in the event which was led by Dr Michael Kleine, Dr John Stanturf and Dr Promode Kant from IUFRO.

## **What is the Science-Policy Interface?**

In his introduction to the training program, Michael Kleine stated that making substantive knowledge the underlying basis of authoritative political decision making has long been the ideal of governance but has remained a chronically difficult task with sporadic success at best. Knowledge seekers are fundamentally driven by curiosity, not so much by the relevance of the knowledge generated to the larger society. Policy makers, however, are interested in social implications of the existing and advancing frontiers of knowledge. Their time horizons can also be vastly different with science, characterized by continuity, moving forward at its own pace determined often by the findings of peers working in isolation elsewhere. But the circumstances of policy makers drive them towards paying more attention to the immediate concerns and their agendas could change rapidly as more demanding urgent situations arise.

In this context, one problem faced world over is that the incentive structures in academia are not partial towards practice oriented projects. The number and quality of publications, and their appreciation by peers, incentivizes core researchers far more than monetary rewards ever could and scientists tend to turn practice-oriented assessment into small disciplinary bits that can be easily published in reputed journals of that discipline. But this very success can make their output incomprehensible to those charged with the responsibilities of meeting the needs of the society on more immediate basis. Decision makers say they receive little information of practical value even as scientists justifiably claim voluminous production of knowledge that remains unutilized for lack of understanding on the part of the potential users of that knowledge.

This potential user of knowledge, or the policy maker, need not only be at the highest level of governance. She could be at the community level, district level, provincial and national level and even the global level. What is needed is to decide to whom the information generated could be useful for and then act accordingly.

Michael Kleine cautioned that scientific information is often utilized to legitimize or sustain predetermined positions. It is selective use of information to justify actions taken for political reasons. Scientific validation of such actions acts as a source of authority and hence brings legitimacy to actions which would otherwise be questioned by political opposition to the ruling dispensation. This can also be used as a justification for unpopular policies, often called ‘greenwash’ to refer to search for environmental justification for governmental actions that may appear harsh to certain sections of the population. Scientific data support can also become a useful mechanism in the hands

of unscrupulous policy makers for delaying or avoiding actions that should be taken in the interest of good governance.

Policy makers should not expect researchers to provide them the data they want to justify their actions. Scientific data collection is a non-negotiable process and lack of bias in research is of critical importance. It cannot be allowed to be controlled by either private companies or even the governments.

Various ways of interaction between scientists and policy makers are possible and many are already in vogue. In recent years new modes of interactions are developing the more promising of which is the model by the UNFCCC where IPCC and SBSTA provide the scientific background and scientific methodologies respectively for guiding the UNFCCC objectives. Similar institutions have also developed around other environmental treaties like the CBD and the UNCCD.

Two ideal types of interaction are possible

1. Knowledge transfer model: This is simple transmission of available scientific results to policy makers and amounts to researchers 'speaking truth to power'. It involves spatial separation between the place of knowledge production and its place of use.
2. Network model of knowledge diffusion: scientific know-how diffuses into society on its way to practical utilization along different routes. These routes evolve over time and involve long term interactions between scientists, policy makers, interest groups, and concerned citizens. Scientists gaining insights into social processes acts as a foundation for such diffusive processes.

It was further explained that important public issues usually go through a distinct public attention cycle involving the following steps:

- Pre-problem state
- Alarmed discovery, euphoric public enthusiasm for immediate mitigating action
- Belated realization of the economic and social costs for making significant progress in mitigating the problem
- Gradual decline of intense public interest
- Post-problem stage

Scientific inputs can come both too early and too late to have an efficient connect with this attention cycle. When scientific assessments arrive before advocates in the issue domain have adequate interest in the information then these inputs may lie in cold shelves for years and thus demotivate the connected researchers. The following approach would be helpful in dealing with such situations including

- (i) Focusing research on questions that are relevant to policy issues
- (ii) Conducting research in a communicative and collaborative manner
- (iii) Understanding, serving, and engaging in policy processes
- (iv) Creating organizational capacity and culture that enables and encourages work at the science-policy interface

Over the past many years IUFRO –SPDC has been taking initiatives in science policy interfacing, mainly through training workshops by providing concepts and methods to researchers on how to plan, conduct, and organize research activities, so that results can more quickly and easily be transformed into usable packages.

## **Forest Landscape Restoration and its Role in current Global Policy Processes**

John Stanturf of the USFS explained the relevance of the Bonn Challenge and the New York Declaration on Forests that, between them, aim at cutting natural forest loss to half by 2020 with no net loss by 2030 and restoration of additional 200 Mha by 2030. For the continent of Africa there is a regional goal of 100 Mha and similar large scale restoration in Latin America is also being stressed. Large scale opportunities for FLR exists in Siberia where wide scale restoration is possible without disturbing people owing to very low population densities. In populated areas the real opportunities lie in mosaic reforestation with a mix of forestry, afforestation, agroforestry. Most developed countries have past experiences of undertaking similar steps. In USA it was called re-vegetation during the recession years and Japan invested heavily in reforestation during post-War reconstruction period. Reforestation is also attractive to political economies of most countries through providing employment to rural populations on a sustained basis.

John Stanturf spoke extensively about the possible scale of contribution of FLR to climate change mitigation and adaptation across the continents and felt that perhaps the best model in this regard might be the network model of making policies making strategic use of knowledge. The audience has to be kept in mind where the language, the idiom, and the time and pace of communication also become important in communicating the necessity, the usefulness, and the optimism required to motivate people into walking into new patterns of behaviours and activities.

Further, John Stanturf introduced the Stoplight tools developed by IUFRO-WRI and the concepts of incremental, anticipatory and transformational approaches to adaptation to changing climate. Incremental is a no-regret approach, with no or low opportunity costs. It does not destabilize the existing systems because it puts little pressure on them on account of new challenges. Anticipatory approach uses the same techniques but is more future oriented whereas the transformational approach to adaptation is far more proactive that may involve intervention ecology and require the introduction and management of novel and emergent ecosystems in ways in which the human society has had no experience till date.

## **Forest Landscape Restoration in the South Asian Context**

Promode Kant of the Institute of Green Economy, Gurgaon, India, and formerly of the Indian Forest Service, spoke on the utilization of rapidly evolving knowledge for effective policy implementation in the context of forest landscape restoration in Nepal, India and Sri Lanka. He said that organized large scale forest restoration in Asia began soon after World War 2 but since forests were low priority and large funding was available only when aligned with national priorities like power generation or mountain road protection. It is for this reason that most early organized large scale attempts in India were around watersheds of large hydroelectric dams – Bhakra Nangal Dam in Punjab in early 1950s, in Nilgiri hills in Tamil Nadu, Western Ghats in peninsular India. Soil conservation and landslide control on hills were also the reason for similar efforts in Murree Hills in Pakistan, Chittagong in Bangladesh, middle hill forests in Nepal and in Bhutan.

By the second half of twentieth century this neglect of forests was becoming inconsistent with the rapidly evolving knowledge about the true role of forests in the life of human society, that forest ecosystem services were the very source of some of the most crucial requirements of human life was becoming increasingly clear as ecological sciences progressed. But deep poverty in most of the

world held back the political leadership from acknowledging it. It was the Stockholm Conference on Human Environment that forced change in this situation by laying down a set of basic principles for management of the earth's environment. While all Principles are important the following three have direct and immediate relevance to the forest landscape restoration that has come to occupy an important position in collective global and intergovernmental efforts today. These are:

Principle 2 - The natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate.

Principle 3 - The capacity of the earth to produce vital renewable resources must be maintained, and wherever practicable restored or improved.

Principle 12 - Resources should be made available to preserve and improve the environment, taking into account the circumstances and particular requirements of developing countries and any costs which may emanate- from their incorporating environmental safeguards into their development planning and the need for making available to them, upon their request, additional international technical and financial assistance for this purpose

It is the resources under the Overseas Development Assistance from SIDA that brought first major restoration efforts to India by way of social forestry. Social Forestry changed the way forestry was seen from a purely governmental effort on government land to the role of community in creating, maintaining and reaping benefits. Initial successes brought multilateral assistance thru WB, ADB and more bilateral assistance from JICA, DFID, USAID, GIZ, DANIDA, etc. followed. External assistance improved monitoring hugely which slowly got transferred to national programs too and large scale training abroad opened the forestry professionals to new possibilities.

The Government led Biomass Cookstove Initiatives in India is another large scale activity with major long term influence on forest landscape restoration even though it was not one of the primary objectives of the program. A pilot project for Community Sized Biomass Cookstoves shows reduction in fuel consumption by 20 - 45 %, emissions reduction of 45 - 86 % and cooking time reduction of 17 - 43 %. Environmental benefits are reduced smoke, fly ash, suspended particulate matter and dust, besides slight reduction in SO<sub>x</sub>, NO<sub>x</sub> and Non Methane Volatile Organic Compounds (NMVOCs). Social benefits include high levels of reduction in health damaging indoor air pollution and prevention of lung diseases, improving working conditions for women, and moderate levels of new short-term jobs and income generation. Perhaps even more important, it improves quality of life for women and girls through reduced drudgery, less time spent in collection of fuel wood and less time needed for cooking. The program has the potential of a much higher level of achievement with adequate investment in R&D.

The community forestry program in Nepal, started with the objective to incentivizing communities to use neighbourhood forests sustainably through good community governance of natural resources, accountability and transparency, and enhancing equity across genders and ethnic groups, has also shown commendable results. It has reportedly led to enhanced forest productivity and regeneration, and improved biodiversity conservation. The program, which formally began in 1978 in middle hills of Nepal, has evolved continuously and spread across the country since then and the target area to be restored has grown continuously and is currently placed at 1.2 million ha.

A major limitation of this program is that the current technologies and processes for important forest management activities like fire and disease control, and increasing access to forests, have prohibitively high transaction costs when taken up at small scales. It would need both scientific

advancements to reduce costs, and improved management practices by community organizations empowered and able to enforce regulations to enhance the effectiveness of these measures.

Promode Kant also spoke about a mangrove rehabilitation project over about 500 ha in Western, North Western and Eastern parts of Sri Lanka with the participation of local fishing communities and civil society organizations and funding from multilateral organizations like the UNDP, FAO and the European Union. A IUCN study into the program found that the program had a limited success due to inadequate understanding of the local hydrology including the seasonal changes of water levels, incorrect choice of species due to poor understanding of biomechanics of mangroves, inadequate post planting care, little or no protection from grazing and submergence, inadequate mobilization of support among the neighbouring communities and lack of technical expertise among the NGO personnel engaged in the project.

In conclusion, Promode Kant felt that the FLR is not new but the scale of ambition is getting expanded rapidly as ecological knowledge streams grow fast and percolates exponentially from scientists to populace. The quantity and quality of investments in new technologies is often critical for the success of these FLR efforts. It is often forgotten that the communities must perceive significant benefits for getting involved in the FLR processes and it would be futile to expect them to have a deep connect with restoration only for emotional or aesthetic reasons, particularly in the poorer parts of the world. He also said that good quality monitoring is necessary to ensure corrupt practices are contained and that to scale up access to funding in order to bring dramatic scaling up of efforts would require a range of innovative approaches in view of the tough competition for the scarce resources.

## **Working Groups**

### **Developing Information Packages to promote FLR at various Levels of Decision-making**

On the second day four working groups were formed with participants choosing subjects of their choice for deliberations and making policy recommendations on it. Very detailed and lively discussions followed for several hours spread over the second and the last day of the workshop at the end of which the groups made detailed policy recommendations which are summarised as below:

One of the working group deliberated on the 'Hill slopes Farming in Andes Mountain of Peru' and identified the core problems as soil erosion, low soil fertility due to annual cropping pattern, changes in soil structure and texture, reduced biodiversity, indiscriminate use of fertilizers and insecticides, lowered agricultural productivity and incomes, abandonment of terraced cultivation and unavailability of labour due to migration of people to cities. The Group recommended that

- Agroforestry system should be implemented in the agricultural lands and terraces should be improved.
- Abandoned cultivated land is causing more environmental degradation. Therefore should be afforested on priority basis.
- This will help generate employment and with improved biodiversity tourism will also get a boost.
- Incentives for the farmers and benefit sharing mechanism should be included in the policy.
- Resilience to fire and grazing programmes should be launched and also included in the policy.



Participants at work during the group assignment

Two working groups deliberated on the forest landscape restoration on dry lands and the increased vulnerability of these lands to fires and droughts. Dry-land ecosystems cover 41.3% of the earth and are characterized by lack of water. These include cultivated lands, scrublands, grasslands, savannas, semi-deserts and true deserts. The lack of water places the biggest constraint on the production of crops, forage, wood, and other ecosystem services. The livelihoods of millions of people depend highly on dry-land biodiversity to ensure their food security and their well-being. Mining activities, forest fire, over grazing, illegal logging and soil erosion are the main causes of land degradation. Conversion of forest land into agriculture is the main cause of deforestation, also in drylands. In order to promote the forest landscape restoration, the following measure should be undertaken:

- Afforestation of suitable floral species should be the main program for landscape restoration. Intensive care is needed in early stages to reduce mortality by droughts.
- Landuse policy should be enacted by Government for proper utilization of land.
- Mining sites should be managed by constructing retaining walls and pay attention on regeneration promotion program around mining sites.
- Trenches should be constructed at plantation/reforestation sites to conserve the soil moisture.
- Prevailing forest laws and bylaws should be enforced actively to prevent deforestation and firing.
- Awareness raising program should be conducted to regulate the over-grazing and forest fire.
- Alternative energy measures should be provided to local people to minimize the over-exploitation of fuel wood from forests.

- Community participation by supporting incentives and capacity building.

These groups recommended discussions among line agencies (stakeholders) at local/district level and high importance to monitoring and evaluation and then reporting to concerned organizations. They asked for cross fertilization of ideas through exposure visits and publications.

One group worked on the degradation of mangroves in the region. Mangrove degradations are caused both by natural and human activities. Natural activities include Tsunami, cyclones, high tidal waves and consequent erosion. These are often compounded by aqua-cultural activities, illegal settlements, tourism, firewood collection from mangroves and charcoal making. Sometimes shipping activities and industrial waste dumping can also cause severe damage to mangroves. The Group felt that restoration or rehabilitation may be recommended through planting activities when a system has been altered to such an extent that it cannot self-correct or self-renew. Under such conditions the chances of normal recovery of ecosystem functioning becomes remote without direct and focussed human interventions. An understanding of the cause of mangrove loss is essential before planting programmes are taken up. Plantation should be opted only after finding out that the natural process is inadequate.

### **Closing of Workshop**

The training workshop was brought to a closure with presentation of certificates to the participants and a farewell speech by Michael Kleine in which he expressed the hope that the training program would help participants guide policy makers in their respective countries with greater purposiveness and ease and hasten the speed of forest landscape restoration across the world.

Finally, on behalf of IUFRO, Michael Kleine thanked the trainers for preparing and leading the workshop. Special thanks were extended to the Beijing Forest University for hosting the workshop at the BFJ premises in Beijing as well as to APFNet, the main partner for bringing the group of forest professionals from 11 countries in Asia and Oceania to attend this workshop.