

International Expert Meeting on the Development and Implementation of National Codes of Practice for Forest Harvesting – Issues and Options

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FOREST ROAD CONSTRUCTION IN MOUNTAINOUS TERRAIN – NATIONAL CODES, LAND MANAGEMENT AND DEVELOPMENT PLANNING



Mountain logging: British Columbia

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Towards a common understanding

A strategic plan, or forest management plan, guides both the development and the implementation of forestry practices on the ground. The objective is simple, namely to provide for practices that are safe, productive and environmentally sound. Yet its formulation is challenging. Expectations of forest resources management have evolved tremendously in recent years. The result is a demand for greater consultation, and a more integrated approach to planning that includes cultural, ecological, economic and social factors.

This presents a formidable challenge when considering the practical options, from policy level to field operation level, in forest harvesting practices in general and reduced impact logging in particular. International forestry is facing a critical juncture in the sustainable provision of economic, social and environmental services to society. Nowhere is this felt more profoundly than in mountainous regions, where the environmental and economic impact of poor harvesting are so immediately apparent. There is a compelling need to disseminate sustainable practices that address concerns for timber production, forage production and grazing, recreation and tourism, water, fisheries, wildlife and biodiversity and cultural heritage. There is an overriding responsibility to engage the collective expertise of foresters, biologists, ecologists, engineers, logging specialists and social scientists. There is an urgent need to have policy-makers develop and refine national codes of practice with reference to regional and local considerations, and, above all, a coherent framework for decision analysis.

Such national codes of practice must address recommendations that are compiled with reference to best management practices, the basics of sound engineering practice, socio-economic influences, and a critical evaluation of field experience from case studies reported in the literature. The latter consideration is perhaps the most important since, as individuals, as organizations, and as societies, we learn from experience. Appropriate dissemination of good field experience is the benchmark for sound decisions. It follows that the dissemination of field experience from case studies is the cornerstone of capacity

building. It is a basic prerequisite for improved strategic planning, given the nature of current forest practices, the lessons learned and the rapid changes in societal demands.

Forest road access: developing and applying codes of practice

National codes of practice must be written for practitioners, whose responsibilities include that of road access and harvesting on steep ground, to assist with the development of improved professional practices that are consistent with the basic principles of sustainable forest management. In particular, codes must be written to promote the use of recommended practices in the planning, design, construction and maintenance of forest roads in mountainous terrain. Recommended practices are typically drawn from methods and activities that have proven effective in minimising the adverse impacts of forest roads and harvesting. Ideally they should include reference, where appropriate, to companion case studies describing forest operations on steep and potentially unstable ground that are used to illustrate important points.

In general, guidance on forest operations is prepared for one of two reasons. Either it is provided to interpret mandatory codes of practice arising from legislated regulations or, alternatively, it is provided to describe voluntary activities that, if adopted, could reasonably be expected to yield improvements to professional practice. The intent of each provision, whether mandatory or voluntary, is similar and the principal difference lies only in the method of implementation. There are three prerequisites for sustainable forest development: forest operations that are environmentally sound, socially acceptable and economically viable. In promoting the use of recommended practices, the main focus of national codes and associated guides is to refine the practitioner's understanding of potentially adverse impacts and to use that enhanced knowledge in a broader consideration of the socio-economic factors influencing management of the forest resource.

Forest harvesting on steep ground

A critical issue to the advance of environmentally sound forest practices, especially on steep ground, is an appropriate system for the planning, control and evaluation of harvesting operations. A system that is used with diligence, and is appropriate to the terrain in which it is applied, has the potential both to reduce environmental impacts and improve the socio-economic benefits of the forest resource to both the concessionaire and the community. Forest roads are widely recognised as the major source of disturbance in any forest development. The alignment of access roads generates a series of alternating cuts and fills which, in turn, change the natural profile of the slope and hence the potential for instability. The alignment of the road and any skid trails also tends to modify the existent pattern of groundwater drainage on the slope, which also influences the potential for instability. Consequently, the likelihood of soil erosion and landslide activity increases following road construction.

Within the context of harvesting operations, forest road engineering involves “the specification of design standards and the engineering design, field layout, construction and maintenance of the roads and subsidiary structures such as bridges and culverts” (Dykstra and Heinrich, 1996). The responsibility for planning and design should rest with forest engineers who have a clear understanding of, and appreciation for, the interdisciplinary demands placed upon them. Thereafter, the construction and maintenance of forest roads should be supervised by engineers and completed by experienced work crews. Various factors should be considered, which include but are not limited to:

- cultural
- ecological
- economic
- environmental
- safety
- social

In this context, forest roads for which the planning, design, construction and maintenance have been properly undertaken should:

- avoid disturbing areas of significance for historical or archaeological reasons, or religious or community purposes
- account for wildlife and fisheries needs, together with any concerns for flora and fauna;
- provide a cost-effective access for purposes of harvesting and transportation, and for the long-term management of the resource
- protect against unacceptable levels of soil erosion, landslide activity and degradation of natural water flow and water quality
- ensure the safety of forest workers and the general public
- fit with the visual qualities of the landscape, and associated recreation and tourism

A growing expectation that many, if not all, of these various factors are met in current forest practices has provided an impetus to the development of national codes and companion guides.

In this context, the *FAO Guide to Forest Road Engineering in Mountainous Terrain (in review)* is written primarily as a reference for FAO member countries that do not have an appropriate code of forest practices or, in the absence of any code, a series of appropriate voluntary provisions. It was developed by myself and Joachim Lorbach (UN FAO), in consultation with other forest specialists, and is currently in review for publication. The support of the UNFAO Academic Exchange Program is gratefully acknowledged.

Although considerable progress has been made in the development and implementation of environmentally sound harvesting practices in recent years, opportunities still exist for improvement in many aspects of routine operations. The main purpose of the guidance therefore is to promote activities that refine current standards of practice and limit environmental impacts, thereby enhancing the protection and sustainable management of forest resources.

Road construction, of all forest operations, has one of the greatest potentials to impose a lasting environmental impact on the landscape. Yet it is necessary in order to gain access to the timber, both for harvesting and for subsequent silvicultural treatment. Therein lies the challenge. Given the diversity of factors for consideration, the challenge often requires an interdisciplinary approach be adopted in planning. It may also be advisory to seek specialist advice on issues of wildlife and fisheries, geotechnics and hydrotechnics, and conservation and landscape management in particular situations. The role of risk-based decision-making, either quantitative or qualitative, will likely emerge as a useful tool in professional practice.

Variations in practice will exist between different countries and locations; hence it is reasonable to expect that some of the recommendations described in national codes are not universally applicable. Rather, the underlying purpose of such codes and affiliated guidance is to compile a source of information to which practitioners can refer when called upon to make decisions in forest development planning.

Summary remarks

National codes of practice, like a strategic or forest management plan, guide both the development and the implementation of forestry practices on the ground. The objective is to provide for practices that are safe, productive and environmentally sound. In general, guidance on forest operations is prepared for one of two reasons. Either it is provided to interpret mandatory codes of practice arising from legislated regulations or, alternatively, it is provided to describe voluntary activities that, if adopted, could reasonably be expected to yield improvements to professional practice. Codes must embrace an integrated approach to planning that includes cultural, ecological, economic and social factors. Practical options for applying new and appropriate technologies are best communicated through dissemination of case studies. Importantly, they provide a common platform for capacity building among a wide range of stakeholders.

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