

## HISTORY OF FORESTRY: INSTITUTIONS AND CULTURE

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### Summary

The chapter expands on the general history of forestry to consider its institutional and cultural aspects from the mid-nineteenth century to early in the twenty-first century. They are described in six layers of forestry that have accumulated over time and that operate at different scales and with different institutions and cultures. Drawing on older European practices, the foundation layer formalized forestry as a discipline from the 1830s. It focused on the management of individual forests and the principles of silviculture and sustained yield. It was implemented by state forestry departments, organized on hierarchical, authoritarian and militaristic lines. There were several variants. The International Union of Forest Research Organisations (IUFRO), the British Empire Forestry Conferences and World Forestry Conferences formed the first international institutional linkages.

Development forestry arose from the 1950s to counter the problems of underdevelopment mainly through strategies of industrialization. The Food and Agriculture Organization of the United Nations (FAO) became the main international forestry organization, and government aid agencies in developed countries became involved in the forestry sector. Policies and projects focused on establishing industrial plantations and building infrastructure to access remote forests. Social forestry arose in the 1970s in response to the perceived failures of development forestry to address the problems of poverty and fuelwood supply at the village level. Multiple-use forestry arose in the developed world in response to environmental critiques of foundation forestry. Both social forestry and multiple-use forestry required public participation in

forest management decisions and represented a challenge to the previous structures and institutions. Large areas of intensively managed industrial plantations were established from the 1970s, primarily by national and international corporations. Global forestry is the term used to describe the proliferation of international institutions and networks that have arisen since the 1980s to address forestry problems.

## **1. Introduction**

This chapter expands on the general overview of the History of Forestry (see History of forestry) that is provided separately. Both chapters consider the history of modern forestry as it originated in Europe from the eighteenth century and developed scientifically during the nineteenth and twentieth centuries. This chapter concentrates on the cultural and institutional aspects of forestry from the mid-nineteenth century and on their international and global expansion into early in the twenty-first century.

Modern forestry is defined as the art and science of managing forested land. It deals with the many uses and values of the forests over extensive areas and long periods of time. Wood is the primary commodity that can be produced from most forests. Its production has to be balanced against the production of other commodities, external effects, the maintenance of forest ecosystems and other values. Access to forest resources is frequently contested between different users and social groups, and is generally subject to state legislation and regulation. State involvement in allocating and managing forest resources has varied according to the type of tenure under which the forests are held, and has significantly increased over time. State actions and institutions are particularly important in the forest sector because governments claim to own and administer 77% of the world's forests. They manage much of this land directly through forest and conservation agencies. However, local and indigenous communities also own 7%, have 4% officially reserved for them and manage large areas without formal recognition. They apply many forms of common property regimes, and since the 1970s have been encouraged to adopt modern forestry practices by national and international, government and non-government organizations. Individual landowners and companies own the remaining 12% of the world's forests. Although they operate under the private property regime, they are subject to considerable state regulation and oversight, particularly in Europe.

There is a world of difference between the institutions and culture of modern forestry discussed in this chapter, and the outcomes for the forests and people affected. Although the ideas and principles of forestry have generally found their way into the declared policies of governments, the salient position of the state means that implementation is subject to economic and other priorities, political pressures from agriculture, timber companies, environmental and other groups. Many national governments have come under increasing pressure from international government and Non-Governmental Organisations (NGOs) in what is described as 'global forestry' in the final section of this chapter.

Forestry comprises the management of both natural forests and plantations. The difference between them is not always distinct, as natural forests are commonly restocked by planting the same or sometimes introduced species. The silvicultural

principles and operational techniques, such as road construction or logging apply to each form of forestry, and they share the management principle of formal long-term planning. The planning horizon for natural forests typically covers many decades, whereas that for fast-growing plantations is typically shorter. The ecological complexity and biodiversity of natural forests is far greater than that in plantations which, with few exceptions, are monocultures. There are several forms of forestry for natural forests and for plantations, and many variants of each according to ecosystem type and society.

<b>Layer</b>	<b>Start</b>	<b>Scale</b>	<b>Institutions</b>	<b>Culture</b>
Foundation	1830s	Individual forest	State forest departments	Systematic management for wood production
Development forestry	1950s	Regional forests and plantations	International aid agencies, national companies	IndustrialisationIndustrial rialization for economic development
Social forestry	1970s	Village	International aid agencies, community organizations, state forest departments	Supply of fuel wood and other local needs, poverty reduction, gender equity
Multiple-use forestry	1970s	Regional forests	State forest and conservation agencies	Production-conservation balance
Intensive industrial plantations	1970s	Extensive plantations	National and multi-national companies	Silvi-business
Global forestry	1980s	All	International and national, government agencies and NGOs	Counter deforestation and loss of biodiversity, governance

Table 1. Simplified scheme of forestry scale, institutions and culture

Forestry was regarded as a single academic and vocational discipline that included managing natural forests, establishing plantations and caring for forests that protected other areas from the risks of avalanches, floods and other hazards. The recognition of further forms of forestry since the 1970s has made the concept of forestry as a single discipline increasingly problematic. Rather than see the history of forestry as a linear progression, it is seen in this chapter as an accumulation of six layers that operate in different scales and with different institutions and cultures. Each layer is characterized by its scope, organizational form and culture. A simplified scheme is shown in Table 1. The layers depicted are broad generalizations or stereotypes that contain several variants

and exceptions. The starting period shown for each layer indicates when it became prominent, although there were earlier examples in most cases.

## **2. Foundation of Modern Forestry**

The foundation of modern forestry as a scientifically-based discipline was part of the overall development of industrial capitalism and the rise of modern science. It can be dated to the acceptance of forestry as a subject to be taught in universities and university-level colleges in Germany, Slovakia, France, Switzerland, Austria and Italy during the first half of the nineteenth century. At that time, European governments were seeking to avert fears of wood shortages for their cities. For this, they needed to restore and improve the productivity of many forests, and gain better access to remote or mountainous forests and expand their timber industries. Although the rich engineering history of the water, rail and road transport systems that were developed to gain access is outside the scope of this chapter, it can be noted that the trend to exploit ever-further and more difficult forest terrain has continued to the present.

European countries already had a medieval tradition of forest legislation and administration, but this needed to be up-dated to reflect modern needs. Some countries, such as France, had extensive forests that the state managed directly, but in all countries, there were large, privately-owned forest estates, community owned forests and individually-owned forests in the agricultural landscapes. Forest legislation was gradually extended to give some degree of control over forests outside the state forests. Distinct forest departments were set up within the state bureaucracies to administer the new legislation. For example, the French forestry service was established in 1824 as an entity within the Ministry of Agriculture, and made responsible for forests and water in the mountains. It was an hierarchical, stratified and uniformed service that could be mobilized as a unit of the French army in times of war. As they had been since medieval times, the foresters continued to be responsible for game and controlling hunting. The authoritarian, quasi-militaristic culture of the French forest service and its range of responsibilities were common across European forest services.

The quantitative science of forestry was developed in the universities and in state forest research stations. In 1892 nine stations established the first international forestry organization, the International Union of Forest Research Organisations (IUFRO). By 1930 it had members from thirty-two countries, of which only seven (Canada, India, Indonesia, Japan, Mexico, South Africa and USA) were outside Europe. Investigating the relationship of forests to water and climate was an important research area, but most work was in silviculture (finding the best species and provenance to plant, nursery techniques, experimenting with the spacing and thinning of stands of trees) (see *Silviculture around the World*). Silvicultural research led to principles about the best way to grow, and the best time to harvest each crop of trees.

The quantitative resource dimension of forestry was first developed to map the forests, find the area of the different types, and assess the number, sizes and timber contents of the trees. This was followed by measurements of their growth so that the yield of timber that might be possible from the whole forest in the future could be estimated. Although there were ancient methods available to ensure a steady flow of wood over a long period

by cutting an equal area each year, they applied most readily to stands cut for coppice on short rotations, typically of 7-10 years (see Ancient forestry practices). More complex calculations were needed to find how some production could be sustained while restoring the productive capacity of European forests that had been cut in an unregulated manner for centuries. It became possible to find, at least in theory, how the yield of the forest might be sustained perpetually. The possibility became enshrined in modern forestry as the principle of sustained yield. The calculations were adapted for forests, such those in the Pacific Northwest of North America, that were being cut for the first time.

The epistemology of modern forestry was formed on the principles of silviculture and sustained yield with water, game, engineering and other matters appended. It contained a confusion because the principles of silviculture that applied to each stand, and the principle of sustained yield that applied to a forest as a whole, could only be resolved in the theoretical case of the 'normal forest' to which very few, if any, real forests ever approximated. The normative practice of forestry was to prepare long-term (10-20 years) 'working' or 'management' plans that sought find the best compromise between silviculture and sustained yield in terms of the quantities of wood that could be grown and harvested. Compromises also had to be made for state forests between the quantities different industries demanded and what the forests could supply in the long-term. The plans needed to be legitimized by state processes or on the authority of professionally-trained foresters, but were always liable to be upset by natural catastrophes or be over-ruled politically.

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### **Biographical Sketch**

Dr **John Dargavel** is an honorary Visiting Fellow in the Fenner School for Environment and Society at the Australian National University where he is actively engaged in forest history research. He has degrees in forestry from the Universities of Edinburgh and Melbourne. His doctorate from the Australian National University analyzed the historical development of the Tasmanian wood industries. He worked as a forester in government and industry for over twenty years, before moving to the Australian National University in 1978. He has researched and taught in the areas of forest economics, politics and history. He is the immediate past President of the Australian Forest History Society. He is the author of more than 70 published papers covering forest management, industrial and labor history, trade, forest and environmental politics, and cultural aspects of landscape and remembrance. He has edited 10 books of conference proceedings on forest policy and history. His book on Australian forest history, *Fashioning Australia's Forests* (Oxford University Press) was published in 1995 and a biography, *The Zealous Conservator: a life of Charles Lane Poole* (University of Western Australia Press) in 2008.