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Mountain Forest Policy in Austria: A Historical Policy Analysis on Regulating a Natural Resource

GERHARD WEISS

*Institute of Forest Sector Policy and Economics
Universität für Bodenkultur Wien
Gregor-Mendel-Strasse 33
A-1180 Wien*

ABSTRACT

Employing a policy analysis framework, this paper inquires into the role institutions played in regulating mountain forests in different political-institutional eras in Austria. Theories from political sciences and environmental history are used for a critical re-analysis of forest historical literature.

The analysis finds that the Austrian forest policy is better explained by the historical importance of fuel wood and timber production (pre-industrial time and early industrialisation) than by the goal of securing the multiple values of mountain forests for the public. Since the mid-nineteenth century the forest administration has been aware of those values, but the formulation and implementation of forest regulations rather serves the interests of powerful groups. This is the case for the sustained yield doctrine which promotes economic development, and likewise for the regulation of protective forests in the interest of railways. The installation of a strong forest authority in the mountainous provinces was justified by the protective effects of mountain forests (in politics as well as in the scientific literature). However, it seems that the small forest owners were simply unable to organise effectively against supervision.

Forest uses have been governed by local commons, by absolutist regimes and by the market economy, together with State regulations. The changes in forest regulation over time show that institutional settings shape the perception of problems and the conception of solutions. However, institutional transitions do not take place overnight: different institutional concepts may coexist at the same time and institutions may adapt to problem situations.

KEY WORDS

Forest history, institutions, public policy, Austria

1. THE POLICY OF MOUNTAIN FORESTS – FOR WHOSE SAKE?

1.1. Questions

The Austrian Forest Act of 1975, which is applied to all public and private forests, states four ‘positive effects’ of forests for society which have to be protected: timber production, natural hazards protection, welfare in terms of positive impacts on the environment, and effects for recreational uses. Forest management in Austria is strongly regulated, especially in the mountain regions. The Empire’s Forest Act was established in 1852, and ever since then, the Forest Acts have provided that forests must not be cleared for any other uses but forestry. Large clear cuts are prohibited. Additionally, in the mountainous provinces of Austria every tree to be felled has to be marked by the forest authority. It seems that forest supervision is primarily oriented at the maintenance of the protective effects of the forests.¹ Over the last decade public expenditures for measures to restore protective forests have increased rapidly. These subsidies are paid to private forest owners to maintain stable forest conditions. Most forest owners in the mountain regions of Austria are small farm forest holders, community forest properties or forest co-operatives. However, are all these measures necessary for maintaining the forest? If not managed, would the forests break down and torrents and avalanches destroy the land?

Foresters strive for intensive forest management and they justify this with the protective functions of forests against rock-fall, erosion, avalanches etc. If you ask the foresters, they say that the strict regulation of forest management and the well-staffed forest authorities in the mountainous provinces are necessary for the protection of the mountain forests. In their opinion, the forest laws are wise regulations and were established for this single purpose. Even forestry scientists argue that the Empire’s Forest Act of 1852 was enacted to ensure the protective functions of the forest. Eckhart and Mayer give the following reason for that: the Empire’s Forest Act followed one year after flood catastrophes in Austria.² But were these truly the motivations for the forest laws? When did people/science/governments discover the protective effects of the forest? When, why and how were they regulated? Who benefited from these regulations and in what way? In other words: who were the main actors of protective forest policy and what were their interests? Whose interests succeeded in the regulation of forest management? And what role did institutions play in regulating forest management?

1.2. Hypotheses

There are other interpretations than foresters’ of the development of forest laws. While foresters argue that the purpose of the forest laws has been the protection and sustainable management of forests, some historians claim that the forest laws first of all served the interests of the sovereign.³ While foresters consider state

regulations necessary for preventing the depletion and the destruction of forests, some authors assume that the market would be able to control the wood production just as well,⁴ or that people depending on the forests would be able to regulate the use of the forests themselves – without the intervention of a central state.⁵

Following a critical-theory approach to land use allocation, the distribution of land and land use reflects the distribution of power within society.⁶ The definition of policy goals and the choice of policy instruments can be regarded as a reflection of power structures within a society.⁷ Where a strong lobby of land owners exists, they may be capable of allocating large funds for subsidies.⁸ Institutionalism suggests that the existence of a powerful bureaucracy itself is an explanatory factor for the existence of political programmes, because these programmes are to the advantage of the implementing institutions.⁹ Foresters belong to a professional community sharing a common mode of thought that has developed in the past.¹⁰ It is obvious that the forest authority plays a prominent role in forest policy, and the agencies of administration are important factors in both the development and the implementation of policies.¹¹

Existing policies are often justified by their historical background with phrases like: ‘Even then people already realised the importance of forest regulation...’ This study tries to contribute (critically) to the debate on how natural resources can be managed in a sustainable way. The following analysis is intended primarily to clarify the role of institutions in regulating forest management. The term ‘institutions’ is used in this context for ‘systems of rules that structure the courses of actions that a set of actors may choose’.¹² This concept includes formal legal rules as well as social norms. The institution of property, for example, is not only constituted by the legal system but is also socially constructed.¹³

1.3. Theoretical Framework

A theoretical framework often applied to contemporary forest policy is used here for historical forest policy analysis. Political science analyses how political actors pursue their goals. Public and private actors are active in a policy field. The distribution of power within the policy-making system determines which competing interests will be successful in the policy-making process. Policy network analysis researches the relationship between political actors. ‘Policy networks’ are interacting participants in the policy-making process. The underlying model is that state and society are not clearly separated but interacting. It does not accept the idea that society only reacts to state decisions.¹⁴ For achieving its goals, the state is to a certain extent dependent on voluntary co-operation with large organisations. The participants possess resources that are valuable for others and therefore they are relatively autonomous even if they are part of a hierarchical organisation.¹⁵

This policy research framework allows us to combine hypotheses based on various theoretical approaches which explain the formation of policy networks, the interaction of participants and the actions of policy networks at each stage.¹⁶ Instead of a hierarchy-oriented model of policy instruments, horizontal co-ordination and societal self-organisation are used as analytical models for policy research.¹⁷ Important theories derive from implementation research,¹⁸ bureaucracy studies,¹⁹ and institutional research.²⁰

In the confrontation of 'economic' and 'sociological' theories, action-theoretic and institutionalist paradigms are conventionally treated as mutually exclusive.²¹ In this case, however, they are integrated. If we restrict ourselves to single theories, other sources of empirical variation are ignored. This is an inadmissible negligence which is unacceptable in empirical policy research. Such integrated concepts have been presented e.g. by Fritz Scharpf and collaborators under the title of 'actor-centred institutionalism',²² or Elinor Ostrom and collaborators, who employ a framework of 'institutional analysis and development'.²³ In addition to these integrative approaches of rational-choice and structuralist paradigms, other authors emphasise ideas and beliefs as further important factors in policy-making.²⁴ Summarising, the following three important theoretical approaches are used for explanation: a rational-choice approach, a value-system approach, and an institutional approach.²⁵

The *rational-choice approach* explains the behaviour of actors on the basis of a rational utility oriented exchange of resources.²⁶ These material or immaterial resources are exchanged in bargaining processes among the participants of the policy network. The influence of an actor depends on the extent to which resources that are of crucial importance for others are under his control.

The *value-system approach* explains the extent to which actions are determined by the prevailing principles of problem-solving, which reflect the general consensus about a common value system. The stability of a policy network is also defined by common problem perceptions based on shared 'belief systems'.²⁷ They are ideological guidelines and convictions which change only slowly over time. 'Symbolic values' may strengthen or weaken the perceptions of problems according to their contents.²⁸

The *institutional approach* explains bargaining processes among participants with the help of an institutional framework, e.g. existing organisational structures, legal regulations etc. Institutional structures do not determine the actions of participants but restrict them in certain ways, while they may also open new options for potential action.²⁹ What actions are actually taken depends on cost-benefit calculations, strategic considerations and the prevailing value systems of the participants.

Methodologically the present study is restricted to a critical re-analysis and re-evaluation of existing literature on forest history. The renunciation of primary

data collection can be justified by the fact that extensive material on the forest history of Austria has already been gathered by forest historians. These authors have often been passionate collectors of historical data, but not professional historians. Therefore a lot of data is available, but only a few theoretical analyses have been carried out. In particular, analyses from a social science perspective are almost non-existent. A number of very good analyses from environmental historians, including social science and interdisciplinary approaches, do exist for other parts of Europe.³⁰ However, these do not refer to Austria. For mountain forest history no comprehensive study has been carried out to date. Therefore, my analysis gathers knowledge and facts about historical forest policy in the mountain regions of Austria and reviews it in the light of political and sociological theories.³¹

Looking at forest history in Austria, three main political eras can be distinguished:

1. *The era of the commons*
Prehistoric times before sovereignties were established (until fourteenth century)
2. *The era of the sovereignties*
The Middle Ages to early modern times (fifteenth to eighteenth century)
3. *The era of the constitutional state*
Modern times (since the nineteenth century)

This distinction of eras is based on the change of political institutions, which are found to be crucial in the conception of forest management regulations. The transition from one era to the next does not take place overnight. For the era of the commons few sources exist. Therefore statements can only be made very circumspectly. The time of the Industrial Revolution is easier to study and is well covered in the historical literature.

The different systems of government in these eras constitute different institutional settings for pursuing group interests, such as the interest in the protective effects of forests. The transition periods between these eras are of specific interest, because institutions do not change easily. How do institutions change? And in what way do these changes influence policy fields?

2. THE HISTORY OF MOUNTAIN FOREST POLICY: INSTITUTIONAL CHANGES OVER THREE ERAS

2.1. *The Era of the Commons*

From the neolithic period (c. 4,000 B.C.) onwards, settlers started to clear woodlands for agricultural use in Austria. Settlement in alpine areas started

gradually only a short time before the Middle Ages. In the Middle Ages, alpine forests were managed as common property and regulated by the local communities.³² The settlers developed land for farming. Natural forests were converted into farmland where possible or were managed in an agro-forestry way for the grazing of pigs, sheep, goats or cattle, and for the production of fuelwood and timber. Distinct management systems were developed according to the varying local ecological conditions and to the farmers' needs. Foresters tend to think that the people in general overused the forests. No detailed data exist on early forest management; however, *a priori* there is no reason to assume these uses as non-sustainable forms of land management.³³ Land-use systems existed for generations,³⁴ and Patzelt assesses these early uses as an optimum utilisation of the given resources according to the needs of the time.³⁵ Locally, though, the extraction of biomass from forests (e.g. leaf and needle-litter collection) led to degradation of the sites. Certain forest areas with a particularly high importance for the community benefited from a special protected status: the 'forest ban' (*Waldbann*). Such 'ban forests' (*Bannwälder*) were for example forests on steep slopes which protected settlements against natural hazards such as avalanches or rock-fall.³⁶

There are no direct sources about the commons' regulation. The earliest documents date back to the period of sovereignties. The old community regulations have been registered as *custumals* (*Weistümer*). Yet, the interests of the sovereign had an impact on the contents of these village laws. There are records from the Tyrol, that – according to sovereign doctrines (e.g. dating back to 1330, 1375) – already state that all commons belong to the sovereign (e.g. for the community of Pfunds, 1303³⁷). In other records communities insist on their free will and right to 'ban', i.e. regulate their forests (Steinach, Leiblfling, Silz, 16th and 17th century³⁸). These *custumals* show that the communities of the Middle Ages had already instruments for forest management regulation. They also show that protection against natural hazards was one concern of the people among many other purposes of forest utilisation.³⁹ There are also many indications of forest depletion, but it seems that depletion only occurred at times when the rights of use in the forests became unclear.⁴⁰ As Hardin writes in his famous article with the title 'The Tragedy of the Commons', non-regulated resources run the risk of being destroyed.⁴¹ Misleadingly, Hardin refers to commons, while his analysis describes what today are called open-access resources. What remains unmentioned in his studies is the fact that commons were subject to strict regulations by the community.⁴² Employing such regulations, common-pool resources can be managed, and depletion and degradation thus avoided. It is only when the clarity of regulation breaks down that problems arise – as was the case with the evolving struggle between local communities and the sovereign (or landlords, resp.). In the Tyrol the conflict between the communities and the state about the property rights in the former forest commons lasted for 500 years, until

1847.⁴³ Another property struggle concerned forests that had been used by farmers near their homes ('home-forests', *Heimwälder*, e.g. in southern Tyrol⁴⁴). The conflict here was acted out between the state and the provincial administration (the treasury and the district authority). Eventually the forests were defined as private (*Waldpurifikationspatent* of 1847). Understandably, before that decision, the owners tried to sell all timber from the forest, because they could not be sure whether they would keep their use rights in the forests.

In the historical literature no consensus can be found about the origin of the forest commons in the Alps. Because of the lack of sources it is hard to tell whether they were established by the locals themselves or by landlords. What is of interest here is the relation of the institutional bodies, their interests and their success, once both – the communities and sovereign – were there. The sources speak clearly about the conflicts of interest between locals and the sovereignty and about the behaviour of the actors. Over the centuries there were disagreements between the monarch, the sovereign, the landlords, and the local population about the definition of territorial rights (rights that were originally granted by the monarch, *Regalien*).⁴⁵ The sovereigns appropriated the power to regulate the commons, and later on they tried to acquire all rights of use as well. In the power struggle between the communities and the sovereign the latter tried to define his rights as ownership. The institution of property according to the Roman law was not known in the old German law, which was based on a concept of rights of use instead.⁴⁶

2.2. *The Era of Sovereignty*

When territorial sovereignty evolved (from the fourteenth/fifteenth century on), the sovereigns claimed all forests as their own and enfeoffed aristocrats with the land. With the argument of 'timber shortage' (*Holznot*), the sovereigns enacted forest laws and employed forest staff to preserve the forests from over-use. Many official documents from that time mention severe or imminent timber shortage. 'By the generosity of the sovereign' the laws should prevent 'timber famine'.⁴⁷

Scholars have interpreted this as a real threat, and described the situation as an ecological or an energy problem.⁴⁸ Their studies presume that the forest laws were aimed at preventing forest destruction and providing a steady supply of wood for all people. But a closer look at the reports of 'timber shortages' shows that, independently of economic developments and political measures, the 'laments of timber shortage' (*Holznotklagen*) stayed the same over decades, while the forest conditions did not change dramatically.⁴⁹ It is reported that, indeed, different factors made society feel that wood and timber was a limited resource, e.g., the growing population, and emerging industries. However, the shortage was not dealt with as an ecological nor an absolute shortage of supply. Although locally forests were degraded or depleted it is doubtful whether there

was an ecological crisis that would have affected people severely. What is important here is the question of whether the political institutions perceived an ecological crisis. Schenk holds that the forest laws were not primarily motivated by goals of resource management. For politics there was no ecological crisis.⁵⁰ The concern of the sovereign was not the 'household of nature' but the household of man.⁵¹

Furthermore, there was no crisis of supply in absolute terms.⁵² However, there was a problem of transport: in pre-industrial time a limiting factor for development was the transport of fuel to the industries.⁵³ In some cases, not even the transport problem was relevant, as Grewe reports for the Palatine forest in the nineteenth century.⁵⁴ Although the people there suffered from extreme poverty, the timber was stockpiled in the State forest to achieve high prices. There was no ecological nor economic crisis, but the State created a social crisis. The arguments and the actions of the governments prove that they were not concerned about a problem of absolute shortage but about a problem of distribution. No real market for wood products existed at that time: the use of wood was controlled by regulations, and politics decided who had to suffer. The 'shortage' was defined politically. The governments, which argued there was a 'wood famine', threatening the people and the nation, did not act to help the people in need. On the contrary, the sovereign's interests were not so much in supplying the common people with fuel wood and food, as in hunting grounds and supporting the salt and ore mines.⁵⁵

The sovereigns had clear interests: they intended to strengthen their regimes. A national state has to rely on three pillars in order to be efficient: army, police and income.⁵⁶ At first, the sovereign had none of these things. It shows that the sovereign's most important actions in forest policy were motivated by fiscal considerations: industries like saltworks and mines and the related trades constituted the most important source of income for the sovereign because he could levy lucrative tariffs and taxes only on these industrial goods. Accordingly, his policy was to secure control of wood resources for these industries and to keep fuel prices low. Different industries were provided with wood according to a hierarchy that depended on the national importance of their production within the mercantilistic dogma.⁵⁷ Trade in and exports of wood were restricted in many central European regions. All timber beyond the most urgent needs of local communities was reserved for the mines, and prices were regulated at a very low level. In regions where larger forest areas were the property of the sovereign and when the ideas of market economy had gained ground, he tended to pursue a high-price policy because timber production itself meant income for him.⁵⁸ Depending on ownership, relevant industries and administrative structures, policies differed locally, regionally and between States. The different policies had this in common: at times when the limitation of wood resources became apparent official policy did not restrict, but rather increased, the consumption of wood of those industries that were beneficial to the sovereign.

Additionally to fiscal interests, mere interest in stabilising his power motivated the absolutist ruler to enact laws and to establish a forest administration.⁵⁹ In particular, the enforcement of hunting rights, which were completely reserved to the aristocracy, was a symbol of the sovereign's absolute power and the subjection of the ordinary man. Even in times of real famine, violations of the hunting law were prosecuted with draconian punishments; for shooting deer offenders were usually executed.⁶⁰

In the early ages of manufacturing development, forest resources were considered unlimited. All forest land in the reach of the works was utilised. Trees were felled in huge clear-cuts and transported on rivers for distances of hundreds of kilometres. Formerly unlimited timber resources became a rare and therefore valuable good. The earliest order of the Tyrolean sovereign concerning forest management (1385) protects forests 'which can be transported to the salt-works'.⁶¹ Forest staff had to enforce industrial demands against the demands of the people.⁶² For example, the forest order of 1521 for the community of Taufers, Tyrol, reserved the rights of use for the benefit of the silver mine in Schwaz, except for the most urgent needs of the people. Only due to the complaints of the people, certain forest stands which protected against avalanches and land-slides were preserved from felling.⁶³ Communities had to defend their rights of use and the preservation of protective forests against the sovereign's interests.⁶⁴

Instead of protecting forest resources, the sovereign supported their utilisation. At first, forests were crucial for providing fuel wood for the salt and mining industries and later on for providing timber. The conflicts between the interests of the sovereign, the landlords and the industries on one side and the interests of the local people on the other were not only in quantitative terms, but also concerned the qualitative methods and goals of forest management.⁶⁵

This was especially the case when mineral coal was discovered. Conflicting interests in forest use were not relieved by the availability of mineral coal. One popular interpretation of why 'modern' forest management became practicable in Europe is that mineral coal substituted wood in heating. But if the pressure on forest resources had really been relieved by the availability of coal, the state would not have had great interest in implementing strict forest laws. No lobbies are known that would at that time have demanded preservation of forests as environmental groups do today. All examples prove that strong interests in forest utilisation always got their way.⁶⁶ And if no interests existed, why enforce laws to drive people and their cattle out of the forest? Governments even campaigned to promote the use of mineral coal instead of fuel wood: it seems that enough wood was available, but people were reluctant to accept the new, 'dirty' fuel.⁶⁷

But who was interested in 'relieving' the forests? The explanation may be found in the growing importance of timber. Timber was a crucial material in civil engineering and construction and was therefore extremely important in the further economic development of the countries.⁶⁸ 'Classical' industry-oriented forest management, which is basically still the model of today's forest manage-

ment, is oriented at timber production. The Austrian Empire's Forest Act of 1852 mainly strives towards ensuring this goal. The production of high-quality timber is not compatible with agricultural forest uses. Traditional farm-related forest management was oriented at sustaining a farm and included grazing and needle-litter collection. These practices, however, led to a reduced quality of the timber produced. The foresters developed forest management systems to ensure the efficient production of high-quality timber.⁶⁹ Although Austrian forest policy has never been very successful in driving out farm uses from the forest, this goal must be seen as an important reason for the further commitment of the sovereigns to forest regulation.⁷⁰ Once established, the forest organisation itself was interested in state supervision. At that time, timber prices were already high, which supported this development.⁷¹ In this light the successful implementation of 'classical' forest management becomes understandable, but it also shifts the focus of the 'wise regulation' in the interest of the public to the support of powerful group interests.

2.3. The Era of the Constitutional State

After the revolution of 1848, the aristocrats' privileges and the serfdom of farmers under the landlords were abolished. Private farm and forest ownership with full civil and property rights was established. Hunting became also a right associated with land ownership. The constitutional state's role in forest management was restricted to the administration of the forest law. The Empire's Forest Act of 1852 aimed at the preservation of all forest land and obliged all forest owners to manage their forests according to the principles of 'sustainable forestry', that is – in the understanding of that time – sustained yield in timber. The major concern of the forest law was still the production of timber, although according to the liberal spirit of the time the private owners benefited from timber production.

In his analysis of the Empire's Forest Act, Feichter describes two main groups of actors: the public administration, striving for strong supervision of forest management, and the private forest owners, rejecting this attempt. While the administration argues for the 'public good' – among many other benefits including the protection against natural hazards – the forest owners used liberal arguments. In 1848 the content of the law was still strongly influenced by liberal forces, but after suppression of the revolution in 1849 the new Act was launched as a compromise between both ideological positions.⁷² The main content of the Empire's Forest Act is the prescription of sustained yield forestry.⁷³

And what about the protective effects of the forest? The Empire's Forest Act includes a regulation of 'ban forests', which concerns forests that protect against natural hazards. This regulation bears the same name as the old ban forests of the commons, but the specific regulation is adapted to the new legal system.⁷⁴

Similar to former 'forest ban' regulations it means the prescription of distinct forest management which is different from regular management. In the modern regulation after the revolution of 1848, a restriction of ownership rights in the 'public interest' may only be defined by official procedures, and includes compensation for the forest owner. The regulation is still valid today in the formulation of the Forest Act dating from 1975. The regulation is necessary because the forest owner and the beneficiary of the protective effects might possibly not come to an agreement in free market conditions.⁷⁵ It allocates the costs of the management of protective forests to the parties involved. Forest owners are obliged to maintain their forests (polluter-pays principle), and costs of additional forest management measures are to be borne by the benefiting property owners (beneficiary-pays principle). The regulation guarantees the protection of the benefiting party at the lowest level of costs, but it also relies on the ability of everybody to look after his or her safety interests. The beneficiaries of the protective effects of the forests at that time were often railways, which increasingly gained significance for the economy and the military at that time. This regulation benefiting the railways still complies with liberal principles and does not extend forest supervision very much.

The forest laws, especially the stricter amendments to the laws enacted in the mountainous provinces, are often explained by the special role forests play in protecting against natural hazards. However, no indications can be found that these were the motivation for the enforcement of Austrian forest laws in the nineteenth century.⁷⁶ In the mid-nineteenth century, foresters developed an understanding of the relationship between rain, forest cover, and floods.⁷⁷ Yet, while flood catastrophes were invoked to argue the case for expansion of state supervision and an increase in forest staff, no efficient policy measures were taken.⁷⁸ As no further consequences in forest management regulations were taken, the argument seems to be only of symbolic character.

A good explanation for the extensive forest supervision in the Tyrol may be the specific ownership structure in this mountainous province. In the mountains, farmers had been free, i.e. not in the serfdom of landlords. This had the effect that, in most cases, the right of ownership was eventually granted to the farmers, the communities, or to farmers' co-operatives. The forest authorities strove for increased influence and justified this with the particular importance of the communal forests 'for the public'.⁷⁹ The reason for their success, however, is that communities were not able to organise their interests effectively for opposing supervision.⁸⁰ Although foresters knew the limits of the protective effects of the mountain forests in fighting floods, they exaggerated the role of the forests. If the forests were appropriately managed, they promised the prevention of any more floods.⁸¹ Contrary to traditional forest historians who do not critically analyse the role of the administration in forest policy-making, Pfister alone has drawn a similar conclusion for Switzerland. Using similar exaggerated arguments, the well-organised foresters in Switzerland succeeded with their claim for a federal

forest law. With the enactment of the Forest Police Act they achieved institutionalisation.⁸²

The evaluation of this programme shows discouraging results today.⁸³ The regulations are applied only to a small proportion of protective forests. Many protective forests are damaged by game browsing and have to be restored with public funding. One reason for this is considered to be the way the legal system conceptualises forests: wood production, natural hazards protection, and game management all concern one ecosystem but are represented by different agencies. As this analysis shows, the problem is not so much a simple lack of co-ordination, but the orientation of the administrative agencies at their particular clienteles. Even in the province of Salzburg, where – at district level – only one executive body controls both the forest law and the hunting law, no satisfactory policy co-ordination is achieved.⁸⁴

3. CONCLUSIONS

The above analysis supports the basic hypotheses stated at the beginning and allows for their formulation in more detail. The historical literature gives evidence that the argument which states that forest regulation and supervision in Austria were necessary and introduced primarily for saving the protective functions of forests, can be regarded a 'foresters' myth'. The existence of forest laws is better explained by the historical importance of fuel-wood and timber production (pre-industrial time and early industrialisation). The foresters' myth can be understood as an instrument for legitimating public institutions. Foresters do have a value system that includes the importance of forests for protecting against natural hazards, but the formulation and implementation of forest policy is better explained by the interests of powerful groups. This is true for the sustained yield doctrine (production of construction timber for economic development) and equally for the regulation of ban forests in the interest of railways.

The interests and values of foresters determine their actions as well as their perception of existing regulations. The professional interest of foresters is an intensification of forest management. Public administration is interested in budget maximisation. Today, foresters are still committed to the industry-oriented forestry model which developed during the industrial revolution. The foresters' value system is still based on the prominent role of timber production.⁸⁵ Additional 'forest functions' are rather symbolically defined in the forest law in order to achieve legitimacy.⁸⁶ Interests in forest uses that are not under the jurisdiction of the forest administration (e.g. agricultural uses and hunting) are what foresters contemptuously call 'by-uses'. The interests of influential actors within the policy-making system shape what is officially regarded a 'good forest'. Institutional settings considerably influence effective interests and in this respect also the development of values.

The accounts of protective forest policy in different eras show that societies may use different concepts in regulating forest uses. The regulation of forest management may basically be organised in a common-property regime, by state regulation or the market system. Each basic system, however, has deficiencies with regard to different problems and has to be adjusted accordingly. In practice, the basic institutional framework allows only certain ways of problem-solving since particular regulations have to be consistent with the framework. But this is not valid without qualification: The problem solving capacity of different approaches might differ, and the ruling systems are not as coherent as one might assume.

Different institutional settings mean different perceptions of problems and different concepts of problem-solving.

The institutional structure may fit the natural problem in different respects. Collective ownership may be more adequate than private ownership for regulating multiple interests in forest resources.⁸⁷ The regulation of protective functions may be more efficient at community level than at state level.⁸⁸ In the system of private property, the beneficiary of the protective effects of a forest is not the owner: the institutions of private property and the market fail in this case due to external effects and monopoly situations. Market failure results in the necessity for state regulation. Public administration, on the other hand, is organised in particular economic sectors and territorial districts. The deer, living innocently in their ecosystem, may nevertheless cause damage in a different district and in a different 'sector'. Public administration of natural resources is not organised according to ecological conditions.

Problems in co-ordination are driven by interest conflicts. Interest groups benefit from the imperfect co-ordination and reinforce the separation of the sector policies. If interests in an effective regulation of the forest resource are strong enough, however, the system may adjust to the problem situation and find new ways of regulation.

There is no 'pure' coherency within the institutional framework.

Problems arise in transition periods: As institutions do not change from one day to the other, there are periods when regulations are not clear and therefore not effective. This can lead to the depletion of natural resources.

Different institutional concepts may exist at the same time. Relics of the time of the commons can still be found today: In the mountain regions, where many forest commons have been converted into collective property, the 'public good attributes' of forests are still perceived by the people.⁸⁹ Many uses of the forest are still seen as public rights there. In contrast to the legal definition of ban forests

in the Empire's Forest Act, people think of ban forests as quasi-common property. While according to the Forest Act forest owners can claim compensation, the consideration of natural hazards in forest management is believed to be a moral obligation.

On a general level it can be summarised that institutional settings shape the perception of problems and the conception of solutions. Political-institutional systems have different problem solving approaches, thus being appropriate for regulating different problem situations (e.g., private ownership for timber production, common ownership for multipurpose forest management), but they are capable of adapting to various problem situations (e.g. State regulation of protective forests in a market economy). Transformations from one political-institutional system to another do not take place overnight and different concepts may overlap for centuries (e.g., the conception of ban forests in the Tyrol).

NOTES

¹ In German the rather unspecific term *Schutzwald* (protection forest) is used for both forests *protecting* against natural hazards etc., and forests to be *protected* against improper use. Although the Austrian Forest Act defines protection forests as forests benefiting from a specific protected status, in colloquial usage the meaning is usually associated with forests protecting against natural hazards (protective forest) (Pregernig and Weiss 1998; Weiss 1998).

² Eckhart and Mayer 1983.

³ Radkau 1986; Allmann 1989; Schäfer 1991; Selter 1993.

⁴ Sieferle 1982; Radkau 1986.

⁵ Ostrom 1990.

⁶ Soja 1989.

⁷ Ottitsch and Weiss 1998.

⁸ Glück 1976.

⁹ Krott 1990.

¹⁰ Glück 1983.

¹¹ Krott 1990.

¹² Scharpf 1997: 38.

¹³ Steinberg 1995.

¹⁴ Mayntz 1993: 41.

¹⁵ Scharpf 1993: 67.

¹⁶ Héritier et al. 1994: 8.

¹⁷ Mayntz and Schneider 1995: 92; Windhoff-Héritier 1993.

¹⁸ Pressmann and Wildavsky 1973.

¹⁹ Downs 1967; Peters 1984.

²⁰ Scharpf 1997; Ostrom 1990.

²¹ Scharpf 1997: 36.

²² Mayntz and Scharpf 1995, Scharpf 1997.

²³ Ostrom 1990; Ostrom, Gardner and Walker 1994.

- ²⁴ Majone 1991; Sabatier 1986; Braun 1998.
- ²⁵ Héritier et al. 1994: 7f.
- ²⁶ Wolff and Neuburger 1995.
- ²⁷ Sabatier 1993; Döhler 1990: 31.
- ²⁸ Edelmann 1976.
- ²⁹ Scharpf and Brockmann 1983: 14.
- ³⁰ E.g., Sieferle, 1982; Radkau, 1986; Pfister, 1995.
- ³¹ General literature on forest history from different perspectives: Rubner 1967; Sieferle 1982; Radkau 1986; Allmann 1989; Schäfer 1991; Selter 1993; Schenk 1996. For the Austrian case see Wopfner 1906; Oberrauch 1952; Johann 1968; Koller 1954; 1975; Hafner 1979; Killian 1994.
- ³² Wobst 1971; Sieferle 1982.
- ³³ Sieferle 1982; Bätzing 1991: 25ff.
- ³⁴ Ostrom 1990.
- ³⁵ For the example of the Ötz-Valley (Tyrol, Austria) see Patzelt 1996.
- ³⁶ Schmiderer and Weiss 1999.
- ³⁷ C.f. Oberrauch 1952: 22.
- ³⁸ C.f. Oberrauch 1952: 21–22.
- ³⁹ Sablonier 1995: 592.
- ⁴⁰ Sieferle 1982: 102f; for the canton of Bern, Switzerland see Pfister 1995: 320.
- ⁴¹ Hardin 1968.
- ⁴² Feeny et al. 1990; Ostrom 1990, 1998; McKean 1998: 30.
- ⁴³ Oberrauch 1952: 21.
- ⁴⁴ Oberrauch 1952: 251–252.
- ⁴⁵ E.g., in Styria in the sixteenth century (Killian 1994: 269–270); in the Tyrol over centuries (Oberrauch 1952: 14, 22). Milestones are: Investiturstreit 1158, Goldene Bulle 1356, the forging of the Privilegium Maius 1358/59 (Wopfner 1906: 27).
- ⁴⁶ Literature on the history of the commons and on the German and Roman law has to be read very critically, because the discussion of these is very value-laden. The interpretation of the very rare available data depends very much on the ideology of the author (see Bauer 1925: 4; Wobst 1971: 22ff and 32ff; Sieferle 1982: 100ff).
- ⁴⁷ E.g., the Tyrol: 1385, 1420, 1443, 1541, etc. (Oberrauch 1952).
- ⁴⁸ See Sieferle 1982; Radkau 1986; Selter 1993: 207f.
- ⁴⁹ Allmann 1989: 43; Radkau 1986: 28ff. For the Austrian case see: Hafner 1979: 89ff – Styria; Johann 1968: 168 etc. – Carinthia.
- ⁵⁰ Schenk 1996: 215.
- ⁵¹ Pfister 1995.
- ⁵² Radkau 1986: 7.
- ⁵³ Sieferle 1982: 78ff.
- ⁵⁴ Grewe 1999.
- ⁵⁵ Killian 1994. For the Tyrol: Wopfner 1906: 32; Oberrauch 1952: 66. For Carinthia: Johann 1968: 196, 238.
- ⁵⁶ Matzner 1982.
- ⁵⁷ Schäfer 1991.
- ⁵⁸ Wopfner 1906: 32; Oberrauch 1952: 107; Schäfer 1991. Many authors emphasise the importance of fiscal interests for the sovereign's forest policy: Rubner 1967: 89; Radkau 1986: 31; Selter 1993: 218; Schenk 1996.

⁵⁹ Sieferle 1982: 98; Allmann 1989: 100; Selter 1993: 368. For the Tyrol: Wopfner 1906: 32.

⁶⁰ Allmann 1989: 84ff.

⁶¹ Two orders for the same purpose followed in 1420 and 1443. The first mandate concerning hunting in the Tyrol, which prohibits subjects shooting deer, was decreed in 1414.

⁶² E.g., Oberrauch 1952: 67.

⁶³ Wopfner 1906: 158–163.

⁶⁴ There were riots against the sovereign's intervention in the common land (Wopfner 1906: 108–111).

⁶⁵ Allmann 1989: 122; Schäfer 1991; Pfister 1995: 334.

⁶⁶ Killian 1994.

⁶⁷ Sieferle 1982: 217ff.

⁶⁸ Sieferle 1982: 85; Radkau 1986: 10; Schäfer 1991; Pfister 1995: 313–316.

⁶⁹ Mitscherlich 1963: 15; Sieferle 1982: 217ff.

⁷⁰ The further development of forest regulations after the Industrial Revolution unfortunately is not well studied. The theses stated here are based on theoretical considerations and numerous indications, but no thorough study.

⁷¹ Radkau 1986: 10, 31; Pfister 1995: 319–322.

⁷² Feichter 1996: 43.

⁷³ Weiss 2000a: 80.

⁷⁴ In Switzerland the old term 'ban forest' was to be included in the Forest Police Act of 1876, but was then replaced by the term 'protective forest' (Tromp 1975: 204; Schuler 1992: 109).

⁷⁵ This is a situation of a bilateral monopoly. According to game theory a compromise between the effective costs for the forest owner and the value for the beneficiary could be expected if no regulation existed. The rights of use of the forest for 'protection' are transferred to the owner of the property below a forested slope.

⁷⁶ It is true that severe floods occurred in 1848 and 1851 just before the enactment of the Empire's Forest Act, but the only reactions known are the announcement of prizes for land reclamation projects (Preisaufforstungen) and the investigation of the causes of the floods (Killian 1990: 67ff, 80ff).

⁷⁷ Before that time people believed that the mountain springs were connected with the sea or with huge water-filled caverns in the mountains (Killian 1990: 35–37). It was believed that floods were God's punishments for sins (Pfister 1994: 3). The new interpretations spread with the triumphant advance of the new scientific worldview.

⁷⁸ Killian 1990: 67ff., 116ff., 142ff.

⁷⁹ Oberrauch 1952: 275ff.

⁸⁰ Oberrauch 1952: 278ff; Killian 1990: 134ff, 142ff. In provinces with dominating private property (landlords and noblemen) the owners rejected a strong forest authority successfully (e.g. in Lower Austria, Styria, Killian 1990: 131f).

⁸¹ See Killian 1990: 125ff.

⁸² Pfister 1995: 323; 1998.

⁸³ Weiss 1998, Weiss 2000c.

⁸⁴ Weiss 1999: 292.

⁸⁵ Glück 1995; Duerr and Duerr 1975; Kennedy and Thomas 1995, 1996.

⁸⁶ Weiss 2000b. The normative concept of the 'forest functions' (*Waldfunktionenlehre*) was developed 1935 – 1955 by the Swiss professor for forest policy Victor Dieterich and was soon incorporated in many European forest laws (Glück 1983: 293ff).

⁸⁷ McKean 1998.

⁸⁸ Häflinger and Rieder 1996.

⁸⁹ Schmiderer and Weiss 1999: 280.

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