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Stakeholder analysis for coppice forestry in Bulgaria

I. Velichkov, T. Zlatanov, G. Hinkov

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Abstract. The study analyzes the state of coppice forestry in Bulgaria during last 18 years. Stakeholders and their interests and preferences in coppice forests are explored and assessed. Forests restitution process in Bulgaria started in 1997 and has not been finished yet. Nevertheless, significant further changes of the current ownership distribution are not expected. By the end of 2007, the state was the biggest coppice forest owner/stakeholder in Bulgaria with 71.3% of all coppice forests being state property. The other two important stakeholders are the municipalities (14.0%) and private owners (12.0%). Currently, forest owners' number in Bulgaria exceeds 1 million, the average holding area being smaller than 1 ha. Only 150 individual plots are larger than 50 ha. The majority of private owners aim at taking maximum and immediate profit from their recently restituted forest properties. In most cases that reflects in clearcuts. Coppice forests management has been one of the problematic issues of Bulgarian forestry for decades. Despite of forest authorities significant efforts, the area of coppice forests in Bulgaria (1.78 million ha in 2007) remained unchanged for a period of 50 years. The official forest policy is still aimed at conversion of coppice forests into seed ones through different silvicultural methods. That policy is applied to almost all coppice forests regardless of their ownership
Keywords: coppice forestry, stakeholdes analysis, Bulgaria

Authors. IvayloVelichkov (ivo_velichkov@abv.bg), Tzvetan Zlatanov, Georgi Hinkov - Forest Research Institute, 1756 Sofia, blvd. "St. Kliment Ohridski" 132, Bulgaria

Introduction

Since 1990 a significant number of changes have occurred in Bulgaria and have affected Bulgarian forests and their management. The most important changes were related with: alteration of the political and forestry systems, new forestry and environmental legislation, forest property restitution, international agreements and conventions on forests, biological diversity and renewable energy sources etc. signed and ratified by Bulgaria.

By the end of 2007 the forests in Bulgaria covered more than 1/3 of the country's area, almost half of them being coppice forests (48%). The significant forest territory has been attracting more and more interested parties. Consequently, the number of forest stakeholders has been increasing steadily in recent years. Thus, the pressure over all forests (including coppice ones) has been increasing, depending on a great variety of old and new players in the forestry field. Coppice forests are especially vulnerable to that pressure due to their easier accessibility and the expanding usage of firewood since 1990.

In the sense of the abovementioned considerations, the aim of the current study is to analyze the state of coppice forestry in changed economic and social conditions in

Bulgaria for the last 18 years and to define the key stakeholders and their interests by applying stakeholder analysis

Materials and methods

The available data on national level related to all coppice forestsiay was used to conduct stakeholder analysis. State Forest Agency (SFA) annual reports, scientific publications and expert evaluations were the main data sources. Stakeholder analysis was the basic method of the current survey. It can be defined as a methodology for gaining understanding of a system, and for assessing the impact of changes to that system, by means of identifying the key stakeholders and assessing their respective interests (Grimble 1998). Stakeholder analysis is particularly relevant to the analysis of natural resource management where issues are characterized by: cross-cutting systems and stakeholder interests, multiple uses and users of the resource, multiple objectives, untraded products and services, etc. In Bulgarian coppice forestry the above mentioned issues match exactly with the present situation.

Results

State of coppice forestry in Bulgary

Evolution of coppice area

Transformation of coppice forests into high-stemmed ones through various silvicultural methods has been the main objective of their management since the 60s of the last century. Despite the significant efforts at national level, the total coppice forests area remained relatively unchanged during the period 1960-2005: from 1.69 million ha in 1960 to 1.75 million ha in 2005 (Figure 1). The lack of success however, did not lead to a change of the management objective (transformation of coppice forests into high-stemmed ones) for the majority of these forests. Currently, only small part of coppices has been set aside for coppice management. The situation was different just a year ago when the coppice forests used to be divided into three groups:

(i) Coppice forests for transformation into seed ones. That forest type was officially introduced in 1956, by the Council of Ministers Decree. In 1960 the area of coppice forests set for transformation was 0.58 million ha (Figure 2). Stands dominated by *Fagus silvatica* L., *Quercus petraea* Liebl., *Q. frainetto* Ten., *Carpinus betulus* L. and *Quercus cerris* L., on good sites, in good health condition and with relatively high productivity were included in

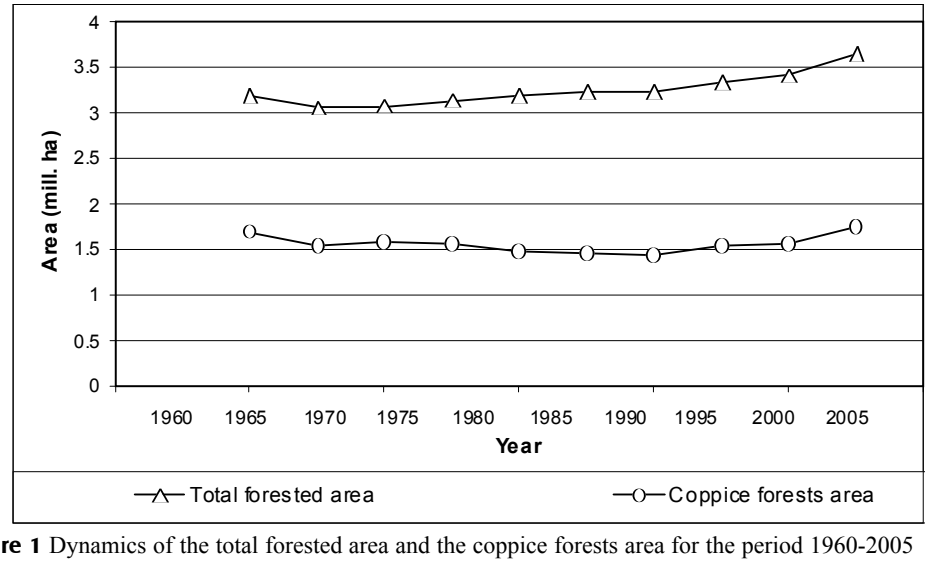

Figure 1 Dynamics of the total forested area and the coppice forests area for the period 1960-2005

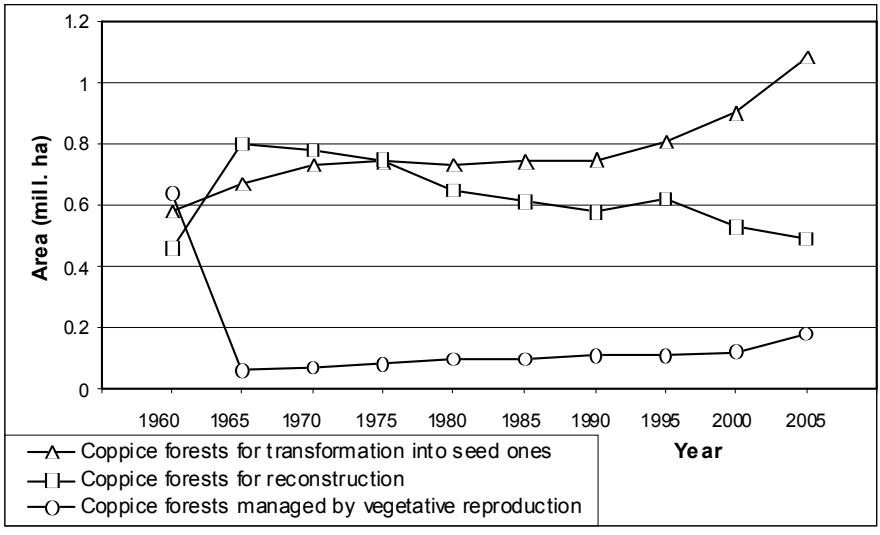

Figure 2 Dynamics of the coppice forests area by management types for the period 1960-2005

this forest type. Transformation by means of natural regeneration was set as the main approach of their management. It was estimated that the transformation would be achieved in relatively short periods (several decades). Despite the initial expectations, the area of coppice forests for transformation into seed ones gradually increased from 0.67 million ha in 1965 up to 1.08 million ha in 2005. That was due to: (1) transfer of areas from coppice forests for reconstruction type; (2) including new forests into the forest fund, since 1990 (from agricultural fund); (3) conversion of high-stemmed forests into low-stemmed ones due to unsuccessful seed regeneration; and (4) low efficiency of transformation activities. For a short period (the 80`s and 90`s of the last century) the best quality stands were designated for production of saw-timber by management at higher rotations - 80-100 years. At present the rotation period of the coppice forests for transformation into seed ones is 40-80 years.

(ii) Coppice forests for reconstruction. These forests were differentiated as a forest type by forest-inventory instruction from 1955. In this case, the purpose was transformation of low-productive coppice stands into more productive ones through clearcutting and substitution of the main tree species. The least productive tree and shrub communities on poor and degraded sites, mainly in the lowest vegetation zone, were set aside for reconstruction. The following tree species predominated in the stands: *Carpinus orientalis, Quercus frainetto, Q. pubescens* Willd. and *Q. cerris*. At the end of 2007 forests for reconstruction were officially abolished as a forest type after 50 years of broad practical implementation with doubtful success. They were mainly transferred into the other coppice forest types: coppice forests for transformation and forests for coppice management. The area of the forests for reconstruction was largest in 1965 (0.8 million ha) (Figure 2). It had been gradually decreasing since then and toward the end of 2006 it was 0.48 million ha. Totally, 0.71 million ha were planted after reconstruction activities during that period. However, in most cases, these afforestations were unsuccessful. Despite cleaning activities, planted seedlings were suppressed by the coppice/sacker shoots of the local tree and shrub vegetation. The reconstruction of coppice and low-productive forests in Bulgaria lost its significance for forestry sector more than 15 years ago. According to data of SFA during the period 2000-2006, 11 370 ha were clearcut in the state forest fund designed for reconstruction. Only 8730 ha, however, were reforested and 2640 ha were left for coppice regeneration. Over the period 1980-2006, roundwood production

from reconstructions has decreased its share from 21.1% to 2.4% of the total roundwood production in the country.

(iii) Coppice forests managed by vegetative reproduction. The area of forests intended for coppice management was significantly influenced by the differentiation of the other two coppice forests types. Towards 1965 it was diminished to 0.06 million ha and was mainly composed (98%) by *Robinia pseudoacacia* L. (Figure 2). Since 1965, the area of this forest type had been increasing: from 0.06 million ha in 1965 up to 0.18 million ha in 2005. This process was relatively regular in the course of the years mainly due to new afforestations with *Robinia pseudoacacia*, followed by coppice management of these forests at rotations from 10 to 20 years. Ignoring the coppice management for the last fifty years has proved to be unsound. It could be considered as a possible alternative of the other management types providing market conditions, needs of local population and state of coppices are regarded.

Ownership

Forests restitution process in Bulgary started in 1997 and has not been finished yet. Nevertheless, significant further changes of the current ownership distribution are slightly possible. State is the biggest forest owner in Bulgaria by the end of 2007 with 75.5% (3.01 million ha) of all forests belonging to it (SFA, 2008). Close to that value is the percentage of the State owned coppice forests: 71.3% (1.41 million ha). The other two important coppice forest owners are the municipalities (14.0% or 0.55 million ha) and the private owners (12.0% or 0.41 million ha). Almost 1% (0.02 million ha) of coppice forests belong to private juridical bodies (0.6%) and religious institutions (0.3%) (Figure 3).

Forest owners' number in Bulgaria exceeded 1 million by the end of 2007. The average holding area was smaller than 1 ha and only 150 individual private forest plots had an area greater than 50 ha.

Significant differences could be established between the forest ownership distribution in 2007 and more than 60 years before. The share of forests owned or managed by municipalities has shrunk from 55.3% in 1940-41 to 11.7% in 2007 while the share of state forests increased from 26.6% to 75.5%. The share of private forests was 18.1% in 1940-41 and diminished to 10.7% in 2007.

Roundwood production

The absolute values of total roundwood pro-

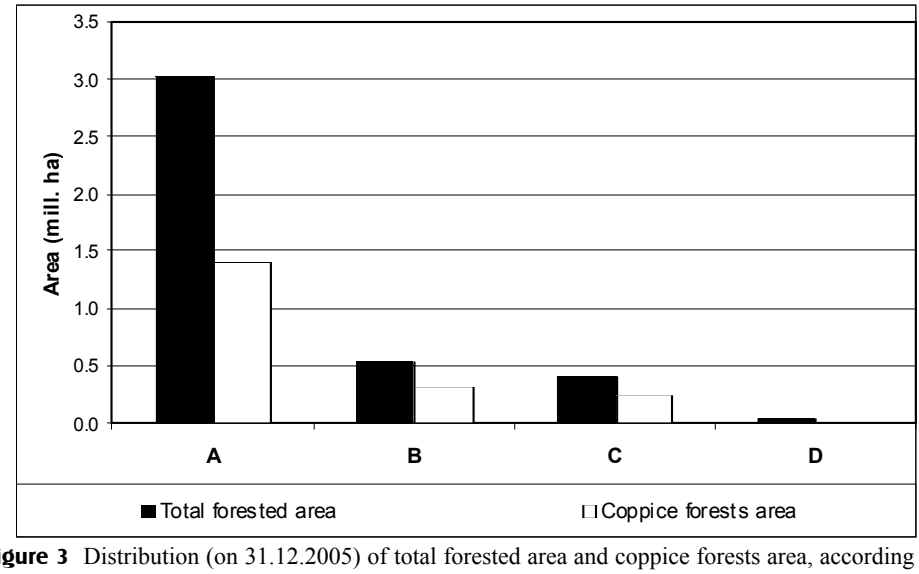

Figure 3 Distribution (on 31.12.2005) of total forested area and coppice forests area, according to the types of ownership: (A) State owned forests; (B) Private forests; (C) Municipality forests; and (D) Religious institutions' forests and private juridical bodies' forests.

duction from Bulgarian coppices for the last years (2004-2007) were: 2.2 to 2.4 million m^3 (1.8 to 2.0 million m^3 of firewood and 0.36 to 0.4 million m^3 of industrial wood). The total annual hardwood firewood production in the country during these years was relatively constant: 2.7-2.9 million m^3. Over longer period (1995-2007) the average share of roundwood production from coppice forests in Bulgaria was 38% compared to the country's total roundwood production (SFA annual reports). During that time, 59% of the total firewood production in the country and 68% of the hardwood firewood production was provided by coppice forests.

The percentage of annually harvested roundwood by the local population on its own and for private use only is 25% from the total roundwood production in Bulgary. It is approximately a constant of 0.9 million m^3 per year and represents a special kind of state social policy in the forestry sector. More than 90% of that volume is firewood harvested manually from coppices in a primitive way. Three quarters of annually harvested roundwood production is subject to industrial harvesting.

The utilization of non-state forests in Bulgaria began as early as the process of restitution started and went through a rapid development. Over the period 2000-2007 roundwood production from non-state coppice forests had been steadily increasing - from 0.1 million m^3 to 1.0 million m^3. In 2007, 41% from all coppice roundwood production was harvested in non-state forests.

The prevailing part of all coppice forests roundwood production was preferably used as firewood (83%) while the rest (17%) was used as saw logs and pulp wood. Except the main and traditional usage of coppice wood as heat source, other very important fields of usage were in wood processing industry and in charcoal production. In year 2007, 0.7 million m^3 were used in the wood processing industry and approximately 0.1-0.2 million m^3 of coppice wood was used for charcoal production.

Stakeholders in coppice forestry in Bulgaria

According to the ownership distribution, the primary stakeholder in coppice forests in Bulgaria is the State. Its interests in all forests (including coppice ones) are represented by the SFA and the Ministry of Environment and Water (MEW) and their central, regional and local enterprises. The MEW manages a very small part of coppice forests (1%, located only in protected areas). The SFA manages 70.3% of all coppice forests (by the end of 2007) and definitely it is the most important stakeholder which holds the monopoly over forests. It also forms the entire forest policy according to which all forests are managed regardless of their ownership.

Other two primary stakeholders in coppice forests according to their ownership are municipalities and private forest owners. Some municipalities already initiated organizing their own forest services. In this field they are experiencing the same problems as the SFA system - lack of qualified foresters and forest workers, old and amortized machinery, insufficient investments in modern technologies and forest road construction and maintenance. In regard to the property fragmentation the municipalities do not have the same obstructions as the private forest owners as far as their plots are much larger and compact.

Currently private forests in Bulgaria are fragmented in a very high degree which makes their proper management practically impossible. Another serious problem of the private owners is their insignificant cooperation so far. There are a few very good examples of successful forest owners' cooperation which occurred in Rodopi mountain in 1930`s and was reestablished after 1997. The forest cooperatives there show satisfying financial and economic results which are not only due to the valuable coniferous forests growing in the Rodopes but to the right form of their organization and functioning as well.

Since the State and the local municipalities are the major coppice forests owners, inhabitants of rural areas in the lower mountain belt (500-1000 m a.s.l.) where the major part of these forests is situated and even citizens of big cities are amongst the main secondary stakeholders in the Bulgarian coppice forestry concerning firewood consumption. By 2002 two million households were consuming firewood

as energy source (Kostov 2002). Firewood has turned to be one of the most important and the cheapest heat energy source in the country since 1990. The percentage of households using firewood as heat source increased during the period 1997-2005 and reached up to 40% in its end. As a consequence firewood consumption tripled. The latter brought increased firewood production from non-state forests.

Coppice forests roundwood production is also very important for the Bulgarian wood processing industry. A short preview of the wood processing history in Bulgaria shows that until 1960`s roundwood production from coppice forests was basically used for firewood, charcoal, carved beams, mine poles and other handmade wooden products. The rapid development of the wood processing industry afterwards have brought to more thorough and differentiated usage of all roundwood, including coppice one.

According to Grigorov (2007) Bulgaria was characterized by well developed and structured wood processing industry until 1989 prior to the changes in the social sphere and the economy of the country. These changes led to conversion of the large state plants into numerous small- and middle-sized private factories. The process of conversion started in 1991 and was completed in 2000.

Since 2000 Bulgarian forest sector roundwood production came up to a steady increase which contributed to stabilization and growth of all kind of woodbased production: pulp, paper and paperboard, particle board, fibreboard and OSB (oriented strand board). Foreign investment in several large Bulgarian pulp, paper and woodbased panel factories after 1995 increased manufacturing capacity of wood processing industry. An investigation of the State Forest Agency (SFA) carried out in 2006 revealed that Bulgarian wood processing industry demand for roundwood exceeds country roundwood production almost twice (Trichkov & Velichkova 2006). The non-coincidence between supply and demand is expected to lead to prices growth in the next years.

The wood processing and furniture producing enterprises in Bulgaria which could be considered as important secondary stakeholders in coppice forestry exceeded 4000 in 1998. Their total staff numbered 37 373 people, 18 725 of them working in the wood processing industry and 18 648 in the wooden furniture sector (Grigorov 2007). The small- and middle-sized enterprises counted more than 90% from the total number with the majority of workers and employees being busy there.

According to the National Strategy for Sustainable Development of Forestry sector in Bulgaria 2006-2015, 35 thousand people worked in the wood processing industry by the end of 2005. At the same time 14 thousand people were busy in the forestry sector, which represented 0.4% from the total number of employees in the country. The share of the forestry sector and wood processing industry from the national gross domestic product (GDP) averaged 0.4% and 2.2% respectively in the last several years.

Currently, there are several large-sized factories in Bulgaria with average annual consumption of broadleaved industrial pulpwood exceeding 50 thousand m^3. In year 2005 the total consumption of industrial hardwood by these factories amounted to 0.65-0.7 million m^3 (Trichkov & Velichkova 2006). That volume was provided in the main by coppice forests and occasionally by other deciduous forest types. These large-sized factories have been permanently increasing their production capacity and, thus, the demand for pulpwood has been steadily growing. However the speed of that growth is not fast enough to ensure the consumption of the whole potential coppice wood production.

Kostov (2002) estimated that the annual harvest from coppices could be increased to 12-13 million m^3 for a period of 5 years or to 6-7 million m^3 for a period of 10 years so that normal age class distribution of Bulgarian coppice forests is achieved. The average annual coppice roundwood production after that would be 2.3 million m^3. This scenario is practically impossible to achieve due to the inability of Bulgarian and neighbor countries markets to utilize such amount of low value wood. On the other hand Bulgaria has not still developed a functioning industry for energy production from renewable sources such as wood, wooden residua etc which is also a serious obstacle.

The nature and wildlife protection non-governmental organizations (NGO) could be considered as secondary coppice forestry stake-

holders with growing role in forest policy and direct impact on forest management in Bulgaria. Their number is around 200 by 2008 but the most powerful and influential ones are not more than 15. The international financing of different ecological projects fulfilled by these organizations proved to be of great importance for the Bulgarian nature and helped them to build substantial human and financial capacity. The efforts to keep public conscience awake are crucial for preserving some of the last wilderness areas in the country. The policy proclaimed by the NGOs is based on the entire nature conservation platform which excludes any form of forests management. Consequently, most of the conflicts between NGOs and the SFA or MEW about coppice forests management usually occur on that basis.

"Union of hunters and anglers in Bulgaria" is the biggest NGO directly influenced by the Bulgarian forests management politics. By the end of 2005, it represented the interests of 110 230 members with a total hunting area of 8.4 million ha. The union holds the hunting rights over 85% of the forested area while the remaining 15% are managed by the SFA and its local enterprises (37 State hunting areas). Some private hunting areas established recently are a new practice for the country. So far they are associated with fencing and limited access to whole forest regions which is negatively accepted by the society. The game populations' impact and the lack of silvicultural treatment in the fenced territories are expected to additionally worsen the forest condition there.

No data was found to differentiate between high stemmed and coppice forests included in NATURA 2000 network of protected areas established in Bulgaria. It could be estimated that approximately 0.7-0.8 million ha of coppice forests habitats (or 40-45% of all coppice forests) are part of that network. Therefore the role of MEW as a stakeholder in coppice forestry will increase as far as its structures will control the management of these protected areas.

Discussions

Coppice forests management has been one of the problematic issues of the Bulgarian forestry for decades. This is supported by the fact that despite the permanent efforts of forest authorities, the area of coppice forests in Bulgary (1.78 million ha in 2007, SFA) remained unchanged for a period of 50 years. The official forest policy is still aimed at conversion of coppice forests into seed ones through different silvicultural methods. In some parts of the country (predominantly in North-Eastern Bulgary) these methods are successfully applied but on small areas. It is obviously that the most appropriate approach and method has not been achieved yet.

The role of the State is to secure the provision of social and environmental services of all forest resources on a sustainable basis. The interests of the other forests owners, however, differ from those of the State. The majority of small-sized forest property owners are seeking maximum advantage from their recently restituted estates in shortest time. Usually that results in clearcuttings of small-sized private forests especially of coppices. Bulgarian Forest Law allows forest enterprises with area smaller than 2.0 ha to be managed avoiding the existing management plan prescriptions. In such cases stands are cared for according to their current condition and the conceptions of the managing forester.

At present the age structure of coppice forests is unfavorable, most stands having achieved and even exceeded their reproduction maturity. Clearcuts and other types of felling recently performed in many non-state coppice enterprises contributed part of these old stands to be regenerated by seeds. At least they were rejuvenated and their sprout/sucker producing ability was preserved at places where no seed regeneration was achieved.

The obtained results concerning the state of coppice forests and the stakeholders distinguished in coppice forestry in Bulgaria presume future conflicts rise. As a main reason for conflict of interests occurrence could be considered the dual role of the state as a monopolistic forest owner and a forest manager represented by the SFA and its enterprises. At one and the same time non-state forest owners are controlled by and have to compete with the SFA enterprises on the forestry products mar-

ket. This situation will be kept unchanged as long as an independent state institution is created to control on fair base both state and non-state forest management activities. Prices policy will remain more or less state priority due to the state monopoly over all forests. In that case large wood processing companies operating at national level will depend almost entirely on state forest policy. Even though non-governmental organizations representing large companies, municipalities and forest cooperatives have been established recently they still do not have the potential and influence needed to thoroughly protect the rights of their members. Small private owners are in the most unfavorable position in terms of their forest property as far as they are not grouped in any kind of organization and usually live in cities away from their property. It is a typical situation a private forest enterprise to belong to more than 10 inheritors of a single former forest owner (by the time of forest nationalization in 1948). Conflicts caused by lack of forest management knowledge and mutual understanding among co-owners are a frequent phenomenon.

Conclusions

It can be assumed that despite the Bulgarian coppice forests have preserved their important historical role as firewood and industrial wood source. They also have a considerable potential as a renewable energy source in future. The SFA, which represents the state interests, and the local population are definitely the most important primary and secondary key stakeholders respectively. It is these stakeholders that are supposed to mainly influence the development of coppice forests in next decades.

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