



## Article

# Analysis of Financial Support for Forestry in the Czech Republic from the Perspective of Forest Bioeconomy

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**Abstract:** The bioeconomy, as a new phenomenon using renewable resources, significantly affects the forestry sector in many countries. Individual countries have implemented forest policies by financially supporting forestry in different ways and for different reasons. The nature and targeting of this support vary from country to country. In a simplified way, it is possible to divide them into two categories: production support and environmental protection support (e.g., to ensure sustainable development). The aim of this article is to analyse the substantive focus of forestry subsidies from national sources in the Czech Republic and, subsequently, compare them with the Czech focus of a forest bioeconomy (FBE). The objective of this analysis is to analyse the financial support provided by the Ministry of Agriculture of the Czech Republic (MoA) between 2018 and 2021. As the Czech Republic's FBE is not clearly defined, it was analysed and described with the help of the relevant national strategic and political documents. Subsequently, the obtained results were compared with each other to see if the financial subsidies were in line with the Czech FBE. The focus of the subsidies in the years under review is influenced by the situation in Czech forestry, which has faced a severe bark beetle outbreak, causing the financial sources provided to forest owners to increase significantly due to the bark beetle outbreak, which has affected the whole forest sector. The results show that some types of support are provided in accordance with FBE, while others are not. The general conclusions are that the financial support for forestry does not fully represent the Czech FBE.

**Keywords:** bioeconomy; financial subsidies; forestry sector; environmental protection; forest production; forest policy; Czech Republic; sustainable forest management



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## 1. Introduction

The forestry sector, as part of the economy, represents the actors connected with forestry and the relationships between them [1]. This includes the provision of all forest products and services (wood and non-wood), activities related to rural development (e.g., recreation and tourism), their support systems, the foresters, the forest industry, institutions dealing specifically with forestry issues (consultants, educational providers, etc.), institutions shaping the forestry policy agenda, and the diverse relationships existing between firms and a wide range of social actors [1–3].

Financial support to the forestry sector remains a resonating topic not only in the context of European Union (EU) member states [4] but also in other countries. Although there is no common forest policy at the EU level, there is an agreement on the financial support to forestry contained in the funds of the Common Agricultural Policy. It defines the barriers to specific financial support by individual states to their entrepreneurs, not only in agriculture but also in forestry. The concept of the forest policy itself in the EU is not unified but fragmented and not well institutionalised, manifesting in conflicting objectives regarding forests and forest ecosystem services [5]. Despite this, there are a lot of interrelations and dependencies between local, regional, national, and supranational levels. In addition to forest-focused policies developed by forest authorities at different

levels (e.g., European Forest Action Plan), forest-related policies covering issues such as biodiversity, climate change, and trade are playing an increasing role (e.g., EU Nature Directives, EU Biodiversity Strategy, EU Water Policy, and EU Strategy on adaptation to Climate Change) [6].

The policies contain a number of instruments that can be used to enforce changes in the whole society from many perspectives. Political instruments aimed at influencing the behaviour of subjects (individuals, companies) are different. According to Vedung [7], these instruments can be divided according to their strength into four groups: regulatory (e.g., legislative acts), expenditure (e.g., subsidies), fiscal, and informational. The subject of our research is one of the economic instruments—a subsidy. According to Henstra [8], a subsidy is “a conditional contribution to the financial costs of mitigation or adaptation measures provided to individual citizens and businesses”. An effectively implemented subsidy policy can bring several benefits, such as standardisation of the economic behaviour of market entities, improvement in social benefits, and achievement of goals set by the government. Additionally, government subsidies for companies can increase the competitiveness of products and benefit consumers [9].

The two major ways companies benefit from government subsidies are through direct payment from the government, such as grants and tax concessions, or through the market, such as a domestic government taxing foreign-made products [10]. Since there are no taxations between the EU countries, the second option is very limited within the EU market, but it is valid for non-EU markets. In practice, a government may offer multiple subsidies at the same time, such as taxes on foreign-made products, while also providing grants to the same industries to create new products. According to Chen et al. [10], a grant subsidy may also take a variety of forms. First, a subsidy may be a function of the total innovation investment made (innovation effort subsidy). Alternatively, a subsidy may be a function of the total amount produced (per-unit production subsidy).

In theory, subsidies can influence the production and management processes through four mechanisms: (i) by changing the relative price of the products; (ii) by directly affecting revenues that impact investment and labour decisions; (iii) by changing risk perceptions due to the subsidy insurance effect; and (iv) by fostering the company’s growth or exiting the industry [11,12]. A special example related to forestry is an environmental subsidy. According to Engel [13], this is a payment aimed at inducing an increase in beneficial activities for the environment.

There are many reasons why countries use forestry subsidies. Most countries implement agricultural and forestry subsidies to encourage forestry production [14] or to encourage environmental protection, both of which should serve the sustainable development of forestry. When discussing these two options, we can also add another—support bioeconomy. This concept has gained great importance in recent years thanks to the effort to find the optimal relationship between the sustainable use of natural resources and economic profit. In some cases, the financial support of a bioeconomy can be considered a part of both the support of forest production and environmental protection. Huang et al. [15] theoretically proved the effectiveness of a government subsidy as an intervention method in environmental protection. Beyond that, government subsidies are also a good way to encourage green innovation and, thereby, improve the quality of the environment. It is evident that a well-designed subsidy provided by a government is an effective intervention in sustainable development and environmental protection [16].

Worldwide support for sustainable forestry, closer to natural forestry and landscape restoration, also determines trends in the targeting of national subsidies to support silviculture measures, payments for ecosystem services, etc. [17,18]. In some countries with a high deforestation rate, an example can be the approach of the government providing financial support to cover the costs of establishing a forest, followed by annual payments to compensate farmers for lost income from the afforestation of agricultural land (the case in Ireland) [19]. In addition to the above types of subsidies, it is also necessary to mention financial support that aims to increase the production of wood mass from European

forests [20]. Special attention should be paid to economic incentives in tropical regions as frequent illegal logging stemming from corruption and the insufficient effort of the political representation to promote the principles of sustainable development of forested areas causes a negative worldwide knock-on effect. Economic incentives are also used in these areas (e.g., Ghana) to promote low-impact logging [21].

In addition to explaining the various reasons for subsidies, it is also necessary to take the character of the entities in the forestry sector into consideration for which the subsidies are intended. Numerous studies have shown that private forest owners in Europe are mostly multi-objective, recreationists, investors, farmers, or indifferent [22]. The fact that private forest owners are a heterogeneous group also influences government strategy in designing the subsidy system. More information about the behaviour of private forest owners and their affinity to subsidies is described by Quiroga et al. [23] and Sotirov et al. [24].

In order to properly implement forest policies at the state level and properly implement financial support from the state level to forestry, it is necessary to have support in political documents, such as strategies and laws. Political documents related to the use of natural resources tend to be significantly influenced by the bioeconomy concept in many countries. From the forestry subsidies point of view, it is perceived as a combination of supporting forestry production and environmental protection. European countries have approached the bioeconomy concept to varying degrees. Many authors have dealt with its definition [25–28]. The generally accepted definition within the EU is: “Bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms, and the derived biomass, including organic waste), their functions and principles. It includes and interlinks: land and marine ecosystems and the services they provide; all primary production sectors that use and produce biological resources (agriculture, forestry, fisheries, and aquaculture); and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy, and services” [29].

According to Wolfslehner et al. [30], the idea of a bioeconomy is perceived as an umbrella concept covering many approaches. There is also a consensus that it is a comprehensive approach to solving the current challenges, whether ecological, energy, or related to food security, which is also how different countries approach it. The EU, as a whole, already took a clear approach with regard to the bioeconomy concept in 2012, when the EU Bioeconomy Strategy was adopted. Since then, it has been an official part of EU policy [31]. Subsequently, in 2018, the European Commission presented an updated Bioeconomy Strategy that reflected the development in this area. Individual EU member states have approached this concept in different ways; some have adopted their own strategy (e.g., Finland, Italy, Germany), while others have not yet (e.g., Slovakia, Croatia, Belgium). The latter states have the topic of bioeconomy mentioned in several documents of different strategic importance.

A subset of the bioeconomy is the forest bioeconomy (FBE), namely the concept of the bioeconomy related to forest management, which has played, according to Pölzl et al. [32], a smaller role than it deserves thus far. According to Wolfslehner et al. [30], the development of the bioeconomy increases the importance of forests and the demand for forest products and services. Therefore, it also increases the economic opportunities of this sector. Among them, it is possible to include wood products usable in the construction industry, furniture industry, textile industry, chemical industry, bioenergy, etc. As society’s interest in finding solutions to the climate and environmental crises has grown, so has the importance of the FBE and the demand for forest ecosystem services, such as support for biodiversity, recreational functions, tourism, carbon sequestration, water management functions, and support of the positive effects of forests on human health.

The Czech Republic (CZ) is one of the states that have not adopted a separate bioeconomy strategy but have instead adopted several documents that only touch on this topic and approach. These are: Strategic Framework of the Czech Republic 2030; The Czech Republic’s Innovation Strategy for 2019–2030; Research and Innovation Strategy for the Smart Specialisation of the Czech Republic; and, Strategy of the Department of the Ministry of

Agriculture of the Czech Republic with Outlook up to 2030. Due to the unclear definition of the Czech FBE and the fact that the CZ supports the bioeconomy concept, the question arises as to whether the principles of a forest bioeconomy are subsequently included in national subsidies directed at forestry with a focus on financial contributions for forest management.

The research questions of this article are:

RQ1: What is the nature of forestry subsidies from national sources in the CZ?

RQ2: Is it possible to consider support provided by national subsidies as support for the forestry bioeconomy in the CZ?

Structure of financial resources from national public sources for forestry in the Czech Republic:

CZ is one of the countries with a high forest cover. Currently, forest lands cover more than 2.6 million hectares, representing 34% of the total land area of the state [33]. The area of forests has steadily increased since the second half of the 20th century. The ownership structure of Czech forests is very diverse. The decisive share is owned by the state (56%), while municipalities and municipal forests own 17.19%, legal entities own 3.41%, church forests and forests of religious societies have a 5.32% share, forest cooperatives own 1.19%, and natural persons own 19.12% [33]. CZ is a state where forestry is one of the traditional industries providing renewable wood raw materials and a number of ecosystem services, such as recreation, forest berry, and mushroom collection. [34]. The forestry sector is now dealing with the consequences of the bark beetle *Ips typographus* outbreak from 2016–2020, the extent of which was also massive due to the ongoing drought. Due to the bark beetle attacks and the dry seasons, the share of salvage logging in the forests also significantly increased [35].

Currently, CZ has a relatively robust financial support scheme for forest owners. In simple terms, it can be described as financial support from two sources: (1) European funds within the Rural Development Programme 2014–2020; and (2) national sources based on the Forestry Act No. 289/1995 Coll., on forests and on the amendment and addition of certain laws. The fact that the possibility of financial support is mentioned directly in the Forestry Act is unique in the context of the Czech Republic. In other component laws (such as the Water Act, the Air Protection Act, and the Waste Act), subsidies are not directly mentioned; here, support is primarily provided in the form of fee reductions (e.g., for air pollution and waste water discharge) in the case of new investments related to environmental protection. The possibility of support for forest management is stated in Section 46 of the Forest Act. It states that the state, mostly through the Ministry of Agriculture (MoA), supports forest management by providing services and financial contributions (e.g., subsidy)—points 2 and 3 in Table 1. Other ministries provide support for forest management only to a limited extent—the Ministry of the Environment (MoE) in national parks only and the Ministry of Defence (MoD), historically, only for land in military districts. Beyond the framework of the Forestry Act, individual regions can also provide support, but this is only marginally and unsystematically implemented. Last but not least, the Forestry Act provides for the possibility of supporting forest management in the form of compensation for cases of damage listed in the Act or costs incurred for obligations and activities carried out in the public interest.

For an overview, in Table 1, we present a complete overview of the forestry financing structure in CZ from national sources, which is presented annually to the MoA as part of the Report on the State of Forests and Forestry.

In the past, the structure of forest management financing in the Czech Republic was examined by Lojda [36], Špičková [37], Špičková and Jarský [38], Šišák [39,40], Jarský [41,42], Kaliszewski [43], etc. In addition, for example, Kotecký [44] was engaged in research on the substantive focus of subsidies in the forestry sector.

**Table 1.** Overview of financing forest management in the Czech Republic from national sources [33].

Type of Financial Support	Specific Type of Financial Support	Support Implementer	Financial Support Provider
(1) State financial obligations under the Forestry Act (mandatory expenditure)	Improvement and strengthening of wood species	MoA	MoA
	Activities of a professional forest manager		
	Costs for processing forest management plans		
	Improvement and damming of streams in forests		
(2) Services with which the state supports forest management	Aerial liming and fertilisation, including monitoring	Private companies	MoA
	Aerial firefighting and fire brigade	Aviation service of the Police of the Czech Republic, private companies	MoA
	Monitoring and forecasting the occurrence and development of harmful agents	Private companies	MoA
	Consultancy	Forestry and Game Management Research Institute	MoA
	Other services	Other	MoA
(3) Financial contributions	Financial contributions for forest management and selected hunting activities provided from the state budget (for more, see App. 1)	MoA, MoE	MoA, MoE
	Financial contributions to forest management provided from the regional budget	Individual regions of the Czech Republic	Individual regions of the Czech Republic
	Financial contribution to mitigate the effects of the bark beetle outbreak in forests	MoA	MoA
(4) Subsidy for protection and reproduction of the gene pool of forest trees	Gene base support	MoA, MoE	MoA, MoE
	Support of plant parents, ortets, and clones	MoA, MoE	
	Support for seed sets and clone mixes	MoA, MoE	
	Support for the activities of the National Bank of seeds and explants of forest trees	Forestry and Game Management Research Institute	
(5) Support from the Agricultural and Forestry Support and Guarantee Fund ("Podpůrný a garanční rolnický a lesnický fond, a.s.", PGRLF)	Interest support (reduction of interest burden) of investment loans	PGRLF	PGRLF
	Direct provision of preferential Forestry Investment loans		
(6) Partial refund excise duty on diesel fuel consumed during forest management		Customs Administration of the Czech Republic	Customs Administration of the Czech Republic



## 2. Materials and Methods

Several methodological approaches have been used in this study. In the first phase, an overview of the structure of forestry financing from national sources was presented (Table 1).

Subsequently, one of the above-mentioned types of financial support was selected for this analysis as the subject of the research on which the authors demonstrate the support of the bioeconomy. The authors chose Financial contributions from the government level (MoA) to forest management (third row in Table 1). There are several reasons for this choice. These are contributions (i) the objective of which the state can flexibly change with regards to the development of forestry in CZ, such as a bark beetle outbreak, (ii) for which the financial amount of the contribution can be adjusted from year to year, (iii) the financial amount is significant compared to other support.

The provision of these contributions is enabled by the above-mentioned forest law, but the practical implementation, such as their financial amount, takes place through a government regulation, which is a more operative tool than the law. The Government of CZ annually prepares binding rules for the provision of these financial contributions. A detailed breakdown of forestry financial contributions provided at the MoA level is given in Appendix A (Table A1).

For the purposes of this article, data were used on the financial contributions to forest management provided by the MoA. Based on their substantive analysis, the trends in the changes of the contributions were evaluated, and it was determined whether these were contributions for production support or environmental protection support. Subsequently, it was assessed whether the given support is paid in accordance with the concept of the forest bioeconomy in the Czech Republic (CZ FBE). Based on the analysis of the comprehensive data on projects supported by national sources, the amount of support for the FBE was evaluated.

### 2.1. Nature of Financial Contributions Provided for Forest Management

The support was examined for the period of 2018–2021. For each year, we focused on separate applications from forest owners for individual types of support according to government regulations. This dataset contained a total of 288,790 records for the above years (see Table 2 for more details). The data were officially obtained from the MoA. It should be mentioned that the entire system of these contributions is based on the current valid above-mentioned government regulation. The supported activities may, therefore, vary from year to year.

In CZ, grant applications are collected through regional governments, and the funds are subsequently paid out by the state through the MoA. Within three months of the completion of the forestry work, individual applicants submit their applications for financial resources to the relevant departments of the regions in which the forest land is located. Each owner (or user) can submit multiple applications. Subsequently, employees of the relevant region carry out an administrative evaluation of the application and forward information about the approved amount to the MoA, which will make the actual payment of the funds.

In Table 2, in Titles III and IV, there are no realised projects. The reasons for this are as follows:

- The number of applications for a financial contribution to increase the proportion of improvement and strengthening trees is actually not zero; however, contributions are provided by the MoE for national parks and their protective zones. According to the MoA, this is a negligible number of applications from a few owners of non-state forests within national parks. These applications are administered by the MoE without adequate software support. Annual support is up to 200,000 EUR, so the data are not considered in the research.
- The number of applications to support the association of forest owners and to support management in the joint forests of owners of small areas has been zero for a long time; there is no interest in it in the field.

**Table 2.** Number of analysed projects for financial contributions to forest management according to Government Regulation No. 30/2014 Coll. in the individual years.

TITLE	Financial Contribution	Number of Projects Per Year			
		2018	2019	2020	2021
TITLE I	Financial contribution to ecological and nature-friendly technologies in forest management (Section 3)	2492	34,115	48,945	3429
TITLE II	Financial contribution for restoration, securing, and management of forest stands up to 40 years of age (Section 4)	9565	54,376	70,832	15,666
TITLE III	Financial contribution to increase the share of improvement and strengthening of trees (Section 12)	0	0	0	0
TITLE IV	Financial contribution to support the association of forest owners and to support management in joint forests of owners of small areas (Section 34)	0	0	0	0
TITLE V	Financial contribution to forest protection (Section 35b)	0	4529	16,109	715
-	Bark beetle contribution (Section 35b)	0	5665	9944	12,408
-	TOTAL NUMBER OF PROJECTS	12,057	98,685	145,830	32,218

Therefore, these types of contributions were no longer considered; they are only listed for a complete overview.

Part of the analysis of the contributions is also the change in the number of rates of different categories by the state in individual years.

## 2.2. FBE Perspective in the Czech Republic

Due to the absence of a separate bioeconomy strategy in CZ, it was necessary to perform a qualitative content analysis of the official documents related to the FBE topic. These national strategies and documents are essential in terms of assessing the focus of CZ FBE and, therefore, can be considered sources of data for assessing the understanding of CZ FBE:

- Concept of the bioeconomy in the Czech Republic from the perspective of the Ministry of Agriculture for 2019–2024 [45];
- Concept of the state forestry policy until 2035 [46];
- Strategy of the Department of the Ministry of Agriculture of the Czech Republic with Outlook up to 2030 (SMoA) [47];
- Strategic framework of the circular economy of the Czech Republic 2040 [48];
- Concept of the Ministry of Agriculture regarding the economic policy of the Forests of the Czech Republic, State Enterprise [49];
- Bioeconomy in strategic documents of the Czech Republic [50].

A qualitative content analysis was performed on the above-mentioned documents, in which we identified and searched for latent concepts and topics related to the forest bioeconomy [51]. All the assessed documents were analysed in Czech, which is always the official version of the document. The essence of the analysis was the search for keywords based on the words “forest”, “wood”, and “climate” (in Czech, “les”, “dřevo”, and “klima”).

In the case of the occurrence of these formulations, the text was subjected to a detailed assessment from the point of view of the exact meaning. The result of this analysis is an overview of the basic features of CZ FBE.

### 2.3. Analysis of the Financial Contributions to Forest Management from the FBE Perspective

For the analysis of financial support to forestry from national sources from the point of view of the bioeconomy, both outputs from the above steps were used. We compared the substantive focus of the individual categories of financial contributions with the characteristics of CZ FBE.

The output of this analysis was an assessment of whether and possibly which concrete support within the framework of financial contributions can be perceived as support for CZ FBE. We then compared the identified contributions in accordance with FBE and in compliance with the financial scope provided, both in the individual years and in total.

## 3. Results

### 3.1. Financial Contributions to Forest Management According to Government Regulation No. 30/2014 Coll

A detailed overview of the financial contributions to forest management from national sources is given in Appendix A. In order to specify all the information, it should be mentioned that, in Titles II and III, the support is directed to wood species for improvement and reinforcement. These are wood species that are more resistant to harmful factors, such as wind, snow, and rain, than other wood species, such as the oak, beech, and lime, and basic target and preparatory wood species, which are trees that in the first phase reforest clearings and prepare space for subsequent target trees, such as birch and aspen. In the case of seedlings, the categories are also distinguished according to their size and origin.

Due to the situation in forestry at the time of the devastating bark beetle outbreak, the MoA came to the opinion in 2017 that support for forest owners should be adjusted to reflect the fundamental influence of the bark beetle on the forest land in CZ. From the point of view of forest owners, the biggest problems were obvious from 2017 [52], and it was during this period that applications for the bark contribution were submitted. Due to the rules of public support, it was necessary to obtain notification of this special support from the European Commission. Approval of the Framework programme for solving risks and crises in agriculture—compensation for damage caused by pests of forest trees was granted in 2019 [53].

A financial contribution to mitigate the effects of the bark beetle outbreak in forests was provided from the budget of the MoA to all forest owners except national parks and their protective zones and military forests. The amount of the contribution is given by multiplying the volume of coniferous wood from random harvesting and the rate, which represents the difference between the average market price of the coniferous wood from random harvesting in the given period and the price that was necessary for the same period, to secure funds for financing the forest restoration, subsequent care of the forest, and professional forest management. The volume of coniferous wood from random harvesting must be proven by documents on the logging, transport, or sale of wood [54]. Each year, the application approval was governed by the MoA methodology. It represents principles establishing the conditions for the provision of a financial contribution for the mitigation of bark beetle outbreaks in state/non-state forests for a given year. This special contribution was terminated on 15 October 2021 in view of the development of the outbreak [55].

The financial rates of all contributions were subject to changes in the monitored period; in total, there were three amendments to the relevant government regulation. In the case



of the bark beetle contribution, there were different financial amounts for three different application rounds. Table 3 reflects the changes in the amount of the contributions for the individual categories that are relevant to our investigation.

**Table 3.** Changes in the amount of the contributions according to the relevant government regulations in the period under review (in EUR).

TITLE	Category	Identification of the Contribution	Amount of Contribution (EUR)			
			Unit of Measure	1 July 2016 to 31 October 2018	1 November 2018 to 30 June 2020	1 July 2020 to 31 December 2021
TITLE I	Financial contribution to ecological and nature-friendly technologies in forest management (Section 3)	D.a	EUR/m <sup>3</sup>	3.23	3.23	3.23
		D.b	EUR/m <sup>3</sup>	1.62	3.23	3.23
		D.c	EUR/m <sup>3</sup>	1.21	1.21	1.21
		D.d	EUR/ha	485.04	727.57	727.57
		D.e	EUR/m <sup>3</sup>	1.21	1.21	1.21
TITLE II	Financial contribution for the restoration, securing, and management of forest stands up to 40 years of age (Section 4)	B.a.1	EUR/ha	485.04	727.57	1010.51
		B.a.2	EUR/ha	404.20	606.31	606.31
		B.b.1	EUR/seedling	0.36	0.49	0.49
		B.b.2	EUR/seedling	0.24	0.24	0.24
		B.d.1	EUR/ha	1374.29	1374.29	1374.29
		B.d.2	EUR/ha	808.41	808.41	808.41
		B.d.3	EUR/ha	485.04	485.04	485.04
		B.e	EUR/ha	404.20	404.20	404.20
TITLE V	Financial contribution to forest protection (Section 35b)	I.a.1	EUR/m <sup>3</sup>	irrelevant	6.06	6.06
		I.b.1	EUR/m <sup>3</sup>		2.02	4.04
		I.c.1	EUR/m <sup>3</sup>		4.04	12.13
		I.d.1	EUR/ha		1050.93	1050.93
		I.e.1	EUR/m <sup>3</sup>		irrelevant	3.03
-	-	-	-	receiving applications 2019	receiving applications 2020	receiving applications 2021
-	Bark beetle contribution (Section 35b)—non-state forests	-	EUR/m <sup>3</sup>	12.53	12.13	5.86
-	Bark beetle contribution (Section 35b)—state forests	-	EUR/m <sup>3</sup>	12.53	7.48	3.64

At the beginning of the examined period, some contributions were monitored in a more detailed category, e.g., Title II contributions by forest category. This division was not considered for the purposes of this publication.

Table 3 shows a gradual increase in a majority of the eight total types of contributions according to Titles I, II, and V. This is a smaller part in terms of the absolute number of contributions; in terms of the number of applications, it is more significant. The highest increase can be seen in Title II (e.g., B.a.1 and B.b.1). This increase reflected the MoA

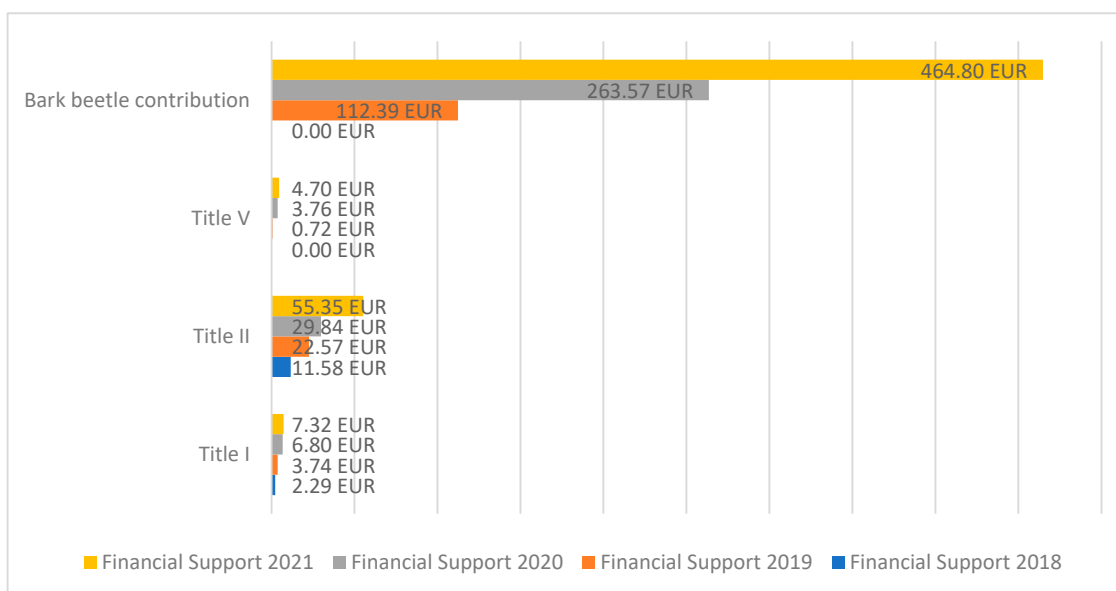
pressure to restore forests after the outbreak, as well as the increasing costs in general. In contrast, the amount of the bark beetle contribution gradually decreased and was even additionally reduced in the second and third rounds due to a lack of funds and greater interest on the part of forest owners.

### 3.2. Financial Analysis of the Examined National Subsidies in 2018–2021

In the next step, we performed a financial evaluation of the individual set of measures (according to the Titles) in the individual years. Finances were paid in CZK, but for comparability, the amounts were converted to EUR. For the calculation, the exchange rate as of 30 June 2022, according to the Czech National Bank (CNB), was chosen, which was 1 EUR = 24.74 CZK [56].

Beyond the scope of the financial volume, we categorised the paid contributions into those that we perceived as supporting the (forest) production (P) and environmental protection (EP) (column 3).

Figure 1 shows the total amount of financial contributions for forest management according to individual categories in the years under review.



**Figure 1.** Total amount of selected contributions for forest management in 2018–2021 (in millions of EUR).

Table 4 and Figure 1 show that the MoA allocated the largest amount of funds to support the owners after the bark beetle outbreak, i.e., to the bark beetle contribution and subsequently to the contributions for the restoration and securing of forest stands (Title II). Contributions under Title V have only been provided since 2019. The overall annual increase in appropriations for the contributions from the level of the MoA has significantly grown year-on-year, even if we do not consider the special bark beetle contribution.

Table 5 summarises the distribution of the contributions in the years according to the purpose, i.e., whether it is a contribution to support the production or environmental protection. It follows from the table that if the most financially significant bark beetle contribution were not included, a larger share would be provided for contributions leading to environmental protection. However, the bark beetle contribution to forest owners was set from the level of the MoA as compensation for the loss of revenue from forestry. For this reason, the authors of the article understand it as a contribution to support production or as finance to support lost profit. Due to this perception of the rate of the bark beetle contribution, the balance between production support and environmental protection has changed in favour of support for forest production.

**Table 4.** Financial analysis of the researched contributions from national sources in 2018–2021.

TITLE	Category	Contribution Identification Including Information about the Type of Support (Production P vs. Environmental Protection EP)	Amount Granted (EUR)			
			2018	2019	2020	2021
TITLE I	Financial contribution to ecological and nature-friendly technologies in forest management (Section 3)	D.a-P	350,600	256,376	406,229	532,612
		D.b-P	1,216,621	1,755,603	2,587,597	2,066,942
		D.c-P	457,220	837,180	1,491,239	1,876,147
		D.d-EP	254,357	881,850	2,302,832	2,816,600
		D.e-P	9439	13,109	16,084	24,526
		-	2,288,238	3,744,118	6,803,982	7,316,827
TITLE II	Financial contribution for the restoration, securing, and management of forest stands up to 40 years of age (Section 4)	B.a.1-EP	158,117	403,469	392,372	1,609,217
		B.a.2-EP	51,811	310,315	311,853	801,985
		B.b.1-EP	6,888,831	16,343,999	22,780,146	30,565,142
		B.b.2-P	1,044,966	1,324,249	1,694,885	3,140,629
		B.d.1-EP	1,289,879	2,000,471	2,055,987	3,286,107
		B.d.2-P	570,363	505,356	473,280	1,402,793
		B.d.3-P	4075	8823	7886	5,432,549
		B.e-P	46,579	73,085	57,143	-
		B.f-P	1,522,191	1,598,048	2,066,700	3,393,358
		-	11,576,813	22,567,814	29,840,252	55,354,277
TITLE V	Financial contribution to forest protection (Section 35b)	I.a.1-P	-	241,533	1,226,174	455,838
		I.b.1-P	-	375,303	2,174,782	2,880,606
		I.c.1-P	-	78,869	340,096	1,202,164
		I.d.1-P	-	27,976	22,301	109,864
		I.e.1-P	-	-	-	53,270
		-	-	723,680	3,763,352	4,701,743
-	Bark beetle contribution (Section 35b)	P	-	112,392,818	263,571,641	464,797,247
-	TOTAL	-	13,865,051	139,428,431	303,979,227	532,170,093

**Table 5.** Financial support of the contributions from national sources in 2018–2021 according to the purpose (production or environmental protection).

	Financial Support According to the Production and Environmental Protection (EUR)			
	2018	2019	2020	2021
Financial contribution as the support of forest production	5,222,056	119,488,327	276,136,036	487,368,545
Financial contribution as the support of environmental protection	8,642,995	19,940,103	27,843,191	39,079,050

### 3.3. FBE from the Perspective of the Czech Republic

As described in the Methodology and Methods section, several official strategies and documents were identified with potential links to FBE. The Strategy of the Department of the Ministry of Agriculture of the Czech Republic with an Outlook up to 2030 (SMoA) is the most fundamental from the point of view of the bioeconomy [57]. This strategy contains 17 strategic objectives, two of which are focused on forestry: sustainable management of forests with continuous improvement of their condition and the competitiveness of the value chain based on forest management. The concept of a bioeconomy states: “A key priority for the development of the bioeconomy is to ensure the sustainable management

of natural resources, sustainable agriculture, forestry, water management and aquaculture, sustainable food and animal food production, and strengthening the role of primary producers and their integration into the bioeconomy value chain, as well as on the forestry side, the involvement of the entire value chain of the downstream industries”.

The concept of CZ FBE is reflected in the document Concept of bioeconomy in the Czech Republic from the perspective of the department of the Ministry of Agriculture for 2019–2024 [45]. This concept is the base document for the creation of a future bioeconomy strategy, which should be created by 2025. This is the main document that defines the principles of sustainable development, mainly emphasising its concept as a complex and dynamic system of six interdependent areas: People and society; Economic model; Resilient ecosystems; Municipalities and regions; Global development; and Good governance. The information presented in the concept, therefore, directly refers to the departments, areas, and strategies that are understood as key in CZ.

In December 2021, the document Strategic Framework of the Circular Economy of the Czech Republic 2040 was approved [48]. This is a long-term strategic umbrella document for strengthening the principles of the circular economy in CZ and emphasises the circular economy as a priority for the country, which, from this point of view, also focuses more significantly on the FBE. “It is important to support the achievement of the highest possible degree of wood use as a renewable raw material for the development of the bioeconomy. It is necessary to increase the primary processing capacity of wood, including other related fields in CZ, and to include wood in the strategic commodities of the country and to create strategic materials in the higher application of the wood mass, wood research, and the bioeconomy fields”.

Based on the procedure indicated in the methodology, we present a perspective of the CZ FBE (Table 6). Only typical forestry activities which have the possibility to be reflected in the activities supported by national MoA sources were intentionally included in the overview. If we were to apply a broader view of FBE, we could also list goals such as support for the wood processing capacity, support for the creation of wooden products, inter-sectoral cooperation, and support for tourism.

**Table 6.** Basic features of CZ FBE.

wood as a major and strategic renewable resource
support of bioenergy and its promotion
support of non-production (ecosystem) functions of the forest
closer to nature forestry, even in commercial forests
increasing the stability and vitality of forest ecosystems
reducing greenhouse gas emissions
creating functional value chains
use of biotechnology in forestry
expand the forest land area
certification support (PEFC, FSC)
creation of strategic materials in the higher utilisation of wood mass, wood research, and bioeconomy fields
support of fast-growing crops
supporting the emergence of new opportunities and new business models based on the valuation of ecosystem services
increasing biodiversity in forest ecosystems, their integrity, and ecological stability
strengthen the importance of forests and forest management for rural economic development
strengthening the importance of education, research, and innovation in forestry
economic viability and competitiveness of sustainable forest management
support the cooperation of forest owners
reducing the impacts of the expected global climate change and extreme weather events

### 3.4. Analysis of the Financial Contributions to Forest Management from the CZ FBE Perspective

In the next step, we compared the supported activities from national sources aggregated according to the superordinate term for the group of measures, i.e., according to the Titles of the government regulation, and compared them with the established results of the CZ FBE concept. The results are presented in Table 7.

**Table 7.** Cross-section of the CZ FBE and support from national sources.

	Financial Contribution to Ecological and Nature-Friendly Technologies in Forest Management (Section 3)	Financial Contribution for Restoration, Securing, and Management of Forest Stands Up to 40 Years of Age (Section 4)	Financial Contribution for Forest Protection (Section 35b)	Bark Beetle Contribution (Section 35b)
wood as a major and strategic renewable resource				
support of bioenergy and its promotion				
support of non-production (ecosystem) functions of the forest				
closer to nature forestry, even in commercial forests	X	X		
increasing the stability and vitality of forest ecosystems	X	X		
reducing greenhouse gas emissions	X	X		
creating functional value chains				
use of biotechnology in forestry				
expand the area of forest land		X		
certification support (PEFC, FSC)				
creation of strategic materials in the higher utilisation of wood mass, wood research, and bioeconomy fields				
support of fast-growing crops				
supporting the emergence of new opportunities and new business models based on the valuation of ecosystem services				



Table 7. Cont.

	Financial Contribution to Ecological and Nature-Friendly Technologies in Forest Management (Section 3)	Financial Contribution for Restoration, Securing, and Management of Forest Stands Up to 40 Years of Age (Section 4)	Financial Contribution for Forest Protection (Section 35b)	Bark Beetle Contribution (Section 35b)
increasing biodiversity in forest ecosystems, their integrity, and ecological stability	X	X		
strengthen the importance of forests and forest management for rural economic development	X			
strengthening the importance of education, research, and innovation in forestry				
economic viability and competitiveness of sustainable forest management	X	X		
support the cooperation of forest owners				
reducing impacts of expected global climate change and extreme weather events		X		

If X is indicated in the table, it means that it is possible to find a feature describing the CZ FBE based on the supported activities from national sources. If a blank space is indicated, it means that the given CZ FBE parameter was not found in the supported categories from the national sources.

It follows from the above table that at least some parameters characterising the CZ FBE can be found in the measures collectively supported in Titles I and II. A greater number of positively evaluated cross-sections does not mean a greater connection with the FBE. For two measures, such as the Financial contribution to forest protection and Bark beetle contribution, no match with any CZ FBE parameter was identified. This fact in itself does not mean that these activities are implemented out of compliance with the forestry development strategy in CZ; however, based on the above analysis, they cannot be included in the CZ FBE support.

It follows from the above table that not all the researched forest management contributions provided in 2018–2021 from national sources can be understood as FBE support from the perspective of CZ. In this sense, the financial contribution to forest protection is a contribution to decontamination (according to certain criteria); that is, it at least partially reimburses the applicants for the costs incurred in order for more trees not to be damaged. The result of the bark beetle contribution is quite interesting. By its nature, this is rather a type of compensation for lost profit than a contribution that would support the development of forestry in the context of the FBE.

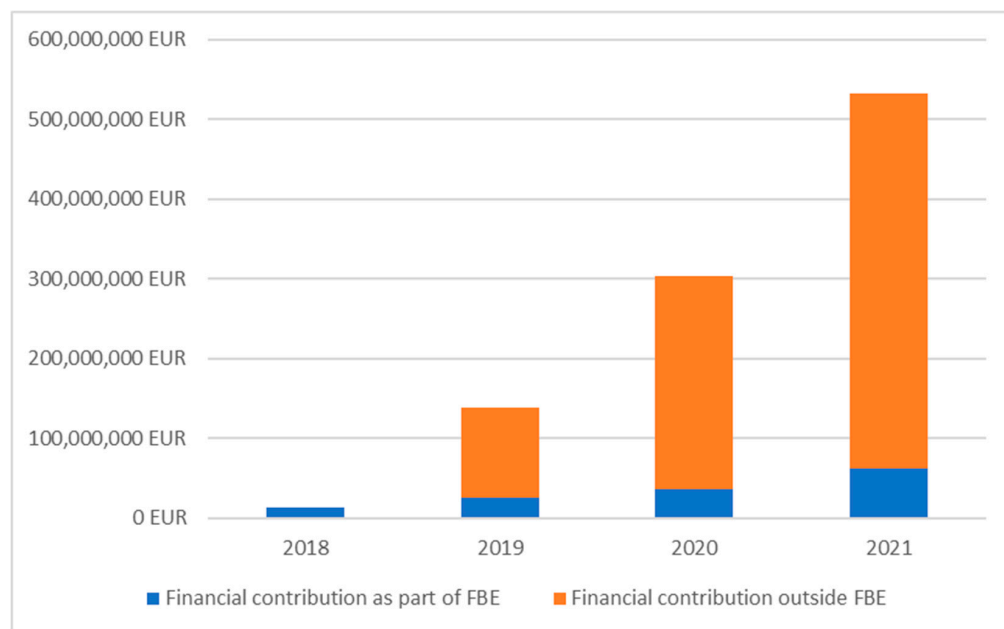
Based on the comparison of the results in Tables 4 and 7, it is clear that the financial support provided under Titles I and II can be included within the FBE support, while the support under Title V and the bark beetle contribution cannot. If we also consider the results shown in Table 5, it is clear that the purpose of the support from the point of view

of production or environmental protection is not directly related to FBE support. However, it is true that we perceive all the contributions supporting environmental protection as also supporting the FBE. However, it is possible to assign other contributions supporting forest production to the FBE category.

Table 8 and Figure 2 show, for the individual years, a view of the contributions provided by the MoA from the Czech perspective of the FBE. In 2018, when no financial contributions outside CZ FBE were funded, it is possible to understand that all contributions provided were part of the FBE. This is due to the fact that the two categories identified as not covered by the FBE support, such as the bark beetle contribution and forest protection contribution, have not yet been provided. Due to the bark beetle outbreak and the need for the subsequent restoration, there was a significant increase in the following years in both contributions under Title II and when the bark beetle contribution payments began. Given that it was several times higher, it is possible to observe a significantly higher provision of funds outside the FBE framework.

**Table 8.** Financial support of the researched contributions according to CZ FBE 2018–2022.

	Amount Granted (EUR)				
	2018	2019	2020	2021	TOTAL
Financial contribution as part of CZ FBE	13,865,051	26,311,933	36,644,234	62,671,104	139,492,321
Financial contribution outside CZ FBE	0	113,116,498	267,334,993	469,498,990	849,950,480



**Figure 2.** Financial contributions from the FBE perspective 2018–2022.

From the forest management point of view, it is certainly positive to see a significant increase in the financial resources provided. However, this increase was preceded by unprecedented damage to forests in CZ caused by the bark beetle.

#### 4. Discussion

An important factor influencing the presented results is the definition of national subsidies for forestry in CZ. For the purpose of this analysis, contributions to forest management

from the level of the MoA to forest owners were considered; these are the most significant in terms of the volume of funds provided, which can be influenced by the MoA level with regard to development in forestry, and in terms of a nationwide geographical impact. If we wanted to include all forestry subsidies of the MoA, it would be necessary to include financial support for mandatory expenses, services, and subsidies for the protection and reproduction of the gene pool of forest trees, which are announced in accordance with the National Programme for the Protection and Reproduction of the Gene Pool of Forest Trees, investment loans for forestry companies from the Agricultural and Forestry Support and Guarantee Fund (PGRLF, a.s.), etc. (see Table 1 for details) [58–60].

Financial contributions from regions to forest owners were also excluded from the analysis. The main reason is the geographical fragmentation, as each region lists programmes according to its preferences. Simultaneously, it should be mentioned that these are very small financial amounts. According to the Report on the State of the Forest and Forest Management (2020), the contributions by all CZ regions were only around 4.357 thousand EUR [33].

The above-mentioned results show that the MoA provides subsidies that change the relative price of the product in the case of Title I and Title II, while Title V and the bark beetle contribution can be considered as subsidies directly affecting the revenues that impact investment and labour decisions [11,12]. The results could be influenced by the level of detail in the assessment of the individual supported activities. For example, under Title III, one of the supported subjects is “erection of new fences”. This activity, in itself, would not be considered an activity reflecting the character of CZ FBE. However, in the context of the entire category “Financial contribution for increasing the share of improvement and strengthening trees”, this entire category can be perceived in accordance with the CZ FBE.

An important factor influencing the financial resources flowing into forestry is also the motivation of forest owners to submit applications. From the above results, it is clear that there are areas to support foresters after the bark beetle attacks or to restore forest stands, which are of interest on the part of forest owners. On the contrary, there is essentially no interest in the area of support for the association of forest owners and support management in joint forests of owners of small areas. There are two reasons for this: In general, forest owners have been dealing with the consequences of bark beetle attacks in recent years and, therefore, use the support related to this. The second reason is that, for historical reasons, forest owners in CZ are not very receptive to associations [61,62]; moreover, a similar instrument for forestry associations is also provided from EU resources (co-financed by the MoA), and the conditions for obtaining it are friendlier for the owners. Even in these conditions, however, this is a small use of these subsidies [63].

The results are also influenced by the current situation in forestry or in the practical implementation of the forestry subsidy policy by the MoA. Between 2018 and 2021, the subsidy programme supported activities related to the clearance of damage after the bark beetle outbreak. Moreover, in 2021, the Forest of the Czech Republic, state enterprise, managing almost 50% of Czech forests, could use funds from this programme for the first time. This support has already ended, and simultaneously, a programme to support the adaptation of forests to climate change was launched in 2022 [64]. It is intended for owners who prepare forests for the effects of climate change, manage in a manner closer to nature, support the natural renewal of forests, increase species diversity, and take care of the forest soil. The programme is intended for private and state forest owners until 2026. It includes the following measures:

- Requirement of smaller clear-cuts from intentional clearance logging
- Requirement for more species-varied restoration of forest cover
- Requirement to leave wood to rot
- Requirement to use the potential of natural regeneration
- Requirement for a less damaging method of gathering wood

It is already clear from the focus of this programme that it is in line with the concept of the CZ FBE. Compared to the special bark beetle contribution, which, according to

our research, was not assessed as a contribution in accordance with the CZ FBE, the new programme certainly reflects the identified characteristics.

Given that the programme was launched in 2022, there are not any numerical data on the support provided. It is clear, however, that, from 2022, this contribution will increase the financial support to the CZ FBE. In a few years, it will, therefore, be appropriate to continue this analysis and find out how the amount of support has changed over the years.

An analytical approach to the analysis of strategic documents defining the area of CZ FBE can also be a limiting factor. Due to the absence of a unified bioeconomy strategy in CZ, bioeconomy-related documents were analysed [65]. These are official policy documents in which the topic of FBE appears explicitly or implicitly. The obtained information was then supplemented, where necessary, with results from current scientific publications investigating and evaluating the situation in CZ [66]. Among the other documents included in the analysis could be the National Recovery Plan approved and adopted in September 2021 [67]. This is a document that also mentions areas related to forestry in Pillar 2—Physical Infrastructure and Green Transition. In its conception, however, it is based on previously adopted and analysed research strategies of CZ, which deal with forestry in greater detail. For this reason, this Plan was not included in the input documents.

This analysis could be supplemented by guided interviews with stakeholders [68,69]. However, even this procedure would show inaccuracies in the case of CZ, as documents related to the bioeconomy are currently guaranteed by more than one ministry (MoA and MoE).

The presented results now reflect the current Czech perspective of FBE. As can already be described by many authors, views on the (forest) bioeconomy are different between countries [70], and the subsequent impact is also different at the regional level [71,72]. The FBE definition reflects specifics related to the nature of the forestry sector in a given country. For example, if the supported subject were viewed through Finland's FBE, it would be possible to consider the special bark beetle contribution as an FBE due to the inclusion of the logging activity [73,74]. It is also possible to mention another view, that of Italy, which places greater emphasis on the recreational use of forestry and non-wood forest production like mushrooms and berries [75,76].

The impact of the subsidy itself (or its percentage amount from the total cost of the investment) on the subsequent output quality and efficiency is difficult to determine, and it was not the aim of this research. There are various perspectives and opinions on the effectiveness of subsidies. Traditional economic theory and political analysis assume that subsidies in agriculture and forestry distort the market, reduce productivity, and are not effective. However, theoretical and empirical studies have shown that this is not always the case. Financial subsidies can increase productivity in the forestry sector in the event of market imperfections [77]. However, the results of subsidies by empirical studies on subsidised forest management have often come to contrasting conclusions. Some authors have found that governmental subsidies had an adverse effect on the economic performance of the forestry sector [78], and others have found that subsidies had a positive influence on the efficiency of forest products [79]. Some authors describe situations when subsidies are not effective [80,81] and what to do to increase their effectiveness [82–85]. The authors van Valkengoed and van der Werff [80] chose two different outside-forestry types of subsidies leading to the support of adaptation to climate change and examined whether these subsidies also attract subjects who are considering support or, in the second case, with early and late majority adopters. The resulting findings can be interpreted in such a way that the types of support they examined attracted only innovators or entities that would have taken the measure even without the subsidy. In such a case, it is possible to perceive the given subsidies as ineffective.

According to Engel [13], environmental subsidies closely linked to forestry suffer from several sources of inefficiency. These can include lack of additionality, i.e., paying for activities that would have been undertaken anyway, leakages, i.e., moving environmentally damaging activities elsewhere in space and creating perverse incentives, e.g., activities to obtain higher subsidies later. In general, it is quite complicated to evaluate support from the

point of view of eco-efficiency. A number of authors have tried to do this, for example, in the field of agricultural subsidies [86]. However, as Jollands [87] points out, there is always a need to describe what (ecological) economists mean by efficiency clearly. Especially with financial contributions aimed at environmental protection, the most important thing is not to ensure economic efficiency but to ensure the effectiveness of the measures. That is, ensuring that such measures are implemented at all. The situation is different for support related to the bark beetle outbreak. In the CZ, this support is classified as a financial contribution (i.e., subsidies), but, in reality, it is compensation for economic losses to the forest owners. Such an approach can be considered a disruption of the market environment. The compensations were determined as an additional payment to the realised prices for the sale of wood. Thanks to the bark beetle disaster, there was an enormous amount of wood on the market, and its price fell sharply. In such a situation, non-state forest owners were able to unite and use their political power [88,89] to enforce this form of compensation.

With the aim of providing the overall situation in Central Europe, it is possible to discuss the situation in the surrounding countries. The situation in the field of forestry subsidies is different in these countries. A very specific situation is found in Poland, where more than 80% of forests are owned by the state [90]; therefore, financial support for forestry is very much adapted to this situation. The situation in Slovakia is similar to that in the Czech Republic. The local government creates support programmes to motivate forest owners to improve silvicultural measures and use closer-to-nature forest management with the aim of increasing the area's forest cover [18]. Due to a similar position as in the CZ, Slovakia also uses national resources and resources from the EU. Austria is another neighbouring country that has a different but similar system to the CZ. In 2020, the Austrian Federal Government established the Forest Fund, which provides support focused on ten measures supporting the sector [91]. The measures of the forest fund are aimed at the development of climate-friendly forests, the support of biodiversity in the forest, and the increased use of wood as an active contribution to climate protection. As part of the forest fund, forest owners are compensated for the loss of value caused by the bark beetle calamity. In order to limit the further infestation of Austrian forests by bark beetles, forest restoration, maintenance measures, construction of wet and dry warehouses for damaged wood, and mechanical debarking are financed as forest protection measures. Most of the measures are similar, but beyond the scope of the CZ, support is provided in Austria to prevent forest fires. For a detailed assessment of compliance with their concept of FBE, an analysis of the strategic documents of these states would be necessary.

The limit of the current concept is the unclear definition of the FBE from the CZ level. Given that the CZ should adopt its own bioeconomy concept by 2025, it can be assumed that the concept of the FBE will be explicitly specified in it. Then it will be appropriate to carry out a similar analysis again and check whether the declared pillars of the FBE are also sufficiently supported by the finances. It is also appropriate to compare the given findings across other states with a similar situation in forestry as in the CZ (Slovakia, Austria, etc.). Simultaneously, it is recommended to use previous similar outputs [18,92] and to further investigate this topic, for example, from the impact evaluation point of view.

## 5. Conclusions

Based on an analysis of contributions provided by the MoA to forestry from national sources, the amount of funds going to forest owners in the individual years of 2018–2021 was identified. Simultaneously, official documents of CZ supplemented with relevant scientific publications were analysed, and thus, the characteristics of the CZ FBE were defined. These results were then compared with each other. This analysis revealed that:

- RA1 (research answer): Contributions to forest management from national sources are provided in CZ, mainly on the basis of the Forestry Act. From their focus and the absolute financial amount in the examined years (2018–2021), it is clear that the main stakeholder (MoA) responded to the current state of forestry in CZ by: (i) creating a special contribution for a limited period to support the management of the bark



beetle outbreak and (ii) significantly increasing the total funds provided for these contributions.

There has been an increase in the contribution volumes year-on-year due to (i) increasing rates, (ii) the fact that, in 2021, the Forest of the Czech Republic, a state enterprise, could also benefit from the bark beetle contribution, and (iii) increasing the volume of work related to the bark beetle outbreak and subsequent forest restoration. By its nature, if it were not for the bark beetle contribution, it would, for the most part, be perceived as support for environmental protection. However, with the payment of the bark beetle contribution (which is perceived as production support), the amount of money supporting production significantly increased.

- RA2: Some of the contributions provided can be seen as support for FBE from the perspective of the Czech Republic. These are primarily operations supporting closer to nature forestry and measures supporting the vitality of forest stands. On the other hand, contributions that tend to minimise the loss/compensate costs (financial contribution for forest protection, bark beetle contribution) cannot be considered as support for the CZ FBE. From the data in the individual years, it is possible to see an increasing amount of funds representing the CZ FBE only if we do not consider the special bark beetle contribution (see Table 7).

It follows from the above that, despite the lack of a unified bioeconomy strategy in CZ, it is possible to identify the parameters of the CZ FBE, and these are subsequently, at least to some extent, reflected in the financial support of forestry from national sources. However, this identified support does not correlate with the standard concept of the purpose of the subsidy—for production or environmental protection.

Key lessons learned: It follows from the above-mentioned research findings that, at least in the case of CZ, not all the implemented forest policy instruments are in accordance with the concept of the CZ FBE in official policy documents. Thus, not all specific financial subsidies provided reflect the concept of FBE.

Implications to theory and practice: The theoretical definition of the CZ FBE will be specified as soon as a separate CZ bioeconomy strategy is adopted. Then it will be possible to correct our theoretical findings. The practical application of our findings consists of the awareness of stakeholders at the level of state administration, such as the MoA, that it would be appropriate to connect individual concepts to concrete measures taken within the framework of forestry policy.

Limitations of our research: the limits of our research are based on the inconsistent concept of the CZ FBE. Another limit is the variable focus of financial contributions and their overall allocation with regard to the development of forestry in the CZ and in the state budget. Frequent changes may reflect the current developments and needs among forest owners and, therefore, may not reflect the long-term strategic concept of the FBE.

Where possible, future research should consider not only the newly developing focus of support (see the new adaptation support programme) with the coming concept of FBE but also view the competitiveness of the CZ FBE in comparison with other countries [93]. Another and significantly more extensive possibility of grasping the topic of the FBE from the point of view of national financial sources in forestry is an analysis from the point of view of the FBE of all national financial sources from forestry—see the financial means according to Table 1.

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## Appendix A

Financial contributions to forest management according to Government Regulation No. 30/2014 Coll. (In addition to the contributions listed in the table, in some of the examined years, contributions were paid, which have now ceased to exist or merged with the contemporary ones. These are, for example, contributions provided in the past for measures to restore forests damaged by emissions and forest damage due to anthropogenic influences. They are now included in Title II).

**Table A1.** Forestry financial contributions according to Government Regulation No. 30/2014 Coll. (This overview does not include articles focused on hunting as they are not relevant to this article).

TITLE	Category Title	Contribution Identification	Contribution
TITLE I	Financial contribution to ecological and nature-friendly technologies in forest management (Section 3)	D.a	Gathering wood by cable logging in forests
		D.b	Gathering wood by horse in forests
		D.c	Gathering wood mechanically in forests
		D.d	Chipping or crushing of brash
		D.e	Gathering wood with a forest crawler in forests
TITLE II	Financial contribution for restoration, securing, and management of forest stands up to 40 years of age (Section 4)	B.a.1	Natural renewal—meliorating and strengthening trees
		B.a.2	Natural renewal—basic target and preparatory wood species
		B.a.3	Artificial regeneration seeding—meliorating and strengthening trees
		B.a.4	Artificial regeneration seeding—basic target and preparatory trees

Table A1. Cont.

TITLE	Category Title	Contribution Identification	Contribution
TITLE II	Financial contribution for restoration, securing, and management of forest stands up to 40 years of age (Section 4)	B.b.1	Artificial restoration by first planting—meliorating and strengthening trees—seedlings, saplings
		B.b.2	Artificial restoration by first planting—basic target and preparatory trees—seedlings, saplings
		B.b.3	Artificial restoration by first planting—meliorating and strengthening trees—semi-saplings
		B.b.4	Artificial renewal by first planting—meliorating and strengthening trees—saplings
		B.b.5	Artificial regeneration by planting the first—basic target and preparatory trees—semi-saplings
		B.b.6	Artificial restoration by first planting—basic target and preparatory trees—saplings
		B.d.1	Securing forest stands—meliorating and strengthening trees
		B.d.2	Ensuring forest stands—basic target and preparatory trees
		B.d.3	Follow-up care of planting—improvement and strengthening, basic target, and basic preparatory trees
		B.e	Transformations, reconstruction
		B.f	Managing forest stands
		B.o	Fences
		B.P	Mechanical soil preparation
TITLE III	Financial contribution for increasing the share of improvement and strengthening trees (Section 12)	B.q	Placing brush in piles or mounds
		B.g.1	Natural and artificial regeneration seeding—meliorating and strengthening trees
		B.h.1	Artificial restoration by first planting—meliorating and strengthening trees—seedlings and saplings
		B.h.2	Artificial regeneration by first planting—meliorating and strengthening woody species—semi-saplings

Table A1. Cont.

TITLE	Category Title	Contribution Identification	Contribution
TITLE III	Financial contribution for increasing the share of improvement and strengthening trees (Section 12)	B.h.3	Artificial restoration by first planting—meliorating and strengthening woody species—saplings
		B.j.1	Securing forest stands—improvement and strengthening trees
		B.k.1	Transformations, reconstruction
		B.l.1	Managing forest stands
		B.m.1	Fences
		B.n.2	Individual protection of seedlings against game
		B.r.1	Placing brush in piles or mounds
TITLE IV	Financial contribution to support the association of forest owners and to support management in the associated forests of owners of small areas (Section 34)	C.a.1	Owners—150–500 ha
		C.b.1	Owners—501–1000 ha
		C.c.1	Owners—over 1000 ha
TITLE V	Financial contribution for forest protection (Section 35b)	I.a.1	Decontamination with an insecticidal net
		I.b.1	Decontamination by insecticide spraying
		I.c.1	Decontamination by debarking
		I.d.1	Chipping of conifers
		I.e.1	Decontamination with a combination of insecticide spray and non-woven fabric
		I.f.1	Decontamination with Ethanedinitrile (EDN)
		I.g.1	Installation of pheromone vaporiser traps
-	Bark beetle contribution (Section 46)	-	Bark beetle contribution

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