



Property Tax Incentives for the Forestry Sector to Support Climate Change Mitigation in Indonesia

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ABSTRACT

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The current property tax on the forestry sector in Indonesia imposes a heavy burden on taxpayers which reduces the competitiveness of forest products and encourages deforestation amidst Indonesia's efforts to achieve net-zero emission targets. Forestry taxes should be able to balance business profitability and natural resource conservation through the strengthening of ecosystem services provided by forests. This study aims to provide alternative policy and improvements of the administration of property tax policy to support the carbon sequestration function of Indonesia's tropical rainforests and forestry industry. This research is a qualitative study that employs focus group discussions, in-depth interviews, and content analysis to collect data. The data analysis technique employed were successive approximation, illustrative method, and ideal types. Writers identified several policy and administration problems such as uncertain and complex land valuation, high tax rates, insignificant tax deductions, open interpretation of land classification, and numerous user charges. Alternative policies proposed are property tax incentives which consist of tax rate reduction and adjustment of deductions. The provision of tax incentives is expected to encourage reforestation efforts and reduce deforestation, therefore supporting the carbon sequestration of Indonesia's tropical rainforests in the context of climate change mitigation.

1. INTRODUCTION

1.1 Strategic role of Indonesia's tropical forest

Indonesia is home to the world's third-largest tropical rainforest, covering 98 million hectares [1]. Indonesia's tropical rainforests play a strategic role, providing a wide range of services including resource services, biospheric services, amenities services, social services, and ecological services. These forest resources must be sustainability managed and utilized to meet social, economic, ecological, cultural, and spiritual needs [2]. However, the utilization of forest resources in Indonesia has yet to be carried out in line with sustainability principles. Indonesia's forest area continues to decline compared to its recovery rate due to deforestation and land conversion. Indonesia ranks third in terms of deforestation rate. It is estimated that the country has lost more than 9.478 million hectares or 10.1% of its forest cover between 2002 and 2020 [1]. The tree cover area has decreased by 31.2 million hectares from 2001 to 2023 [3].

1.2 Current situation of tax/fiscal policy on forestry in Indonesia

Fiscal policy in the forestry sector can be designed as an instrument to support forest conservation goals. Conversely, inappropriate fiscal policies can encourage the overexploitation of forest resources [4]. As part of fiscal

policy, taxes on the forestry sector are levied to generate government revenue. State revenues from the forestry sector in Indonesia include Non-Tax State Revenues (PNBP) such as Forest Utilization Business Permit Fees, Forest Resource Provisions, and Reforestation Funds, as well as taxes such as Income Tax, Value Added Tax, and Property Tax/Land and Building Tax [5].

Currently, fiscal instruments applied to the forestry sector in Indonesia drive deforestation [4]. In addition, excessive levies have led to high transaction costs, reducing the competitiveness of forestry businesses. This is evident in the declining competitiveness index for Indonesian wooden furniture products, which fell from 3.14 in 2006 to 2.65 in 2015. The decline in competitiveness is partly attributed to taxes imposed on the forestry sector. Furthermore, businesses have to bear illegal levies unrelated to their operations, which can amount to up to 22% [6]. Ideally, taxation on the forestry sector should stimulate business activities, be simple, easy to understand, and ensure efficient tax collection, thereby reducing the cost of taxation [7].

Land and Building Tax is a property tax imposed on various property sectors, including the forestry sector in Indonesia. This tax poses a burden on forestry businesses because it must be paid annually, regardless of the taxpayer's profit or loss. Taxpayers who are unable to pay the tax might be forced to sell their land to cover the outstanding tax liability [8]. One of the challenges in collecting Land and Building Tax is determining an accurate land valuation [9]. Valuing forest land

presents a unique complexity, with questions arising over whether to base the valuation on profitability or to use a separate valuation method [10]. Another challenge is determining the market value as the basis for taxation. Market value is considered irrelevant for forest land, which is often located far from settlements and lacks comparable market values. Additionally, taxpayers often complain about the annual increase in Land and Building Tax. Taxpayers and Tax Authorities frequently disagree on the definition of taxable objects. These differences lead to tax disputes, resulting in relatively high compliance costs [11].

Taxation in the forestry sector should consider both the profitability of businesses and the goal of preserving natural resource values [12]. In this regard, the tax system should support ecological sustainability [7]. Initially, neutral forest taxation can be designed to be distortive to influence forest management and achieve specific objectives [13]. Taxes on the forestry sector typically do not function as Pigouvian taxes, which require polluters to pay. However, if designed appropriately, tax policies can change the incentive structure for economic actors [14]. Therefore, tax instruments that can reduce costs for businesses while supporting forest sustainability and preserving forest ecosystem services are needed. One incentive that can be provided is a reduction in property taxes for businesses that can maintain and manage high conservation areas within their land [15].

1.3 Property tax incentives for sustainable forest management

Property tax incentives help to reduce deforestation and promote the provision of various forest ecosystem services, such as forest integration and sustainability, access to open spaces and views, soil and wetland conservation, wood and fiber production, fish and wildlife protection and supply, recreational land use, and resource conservation [16, 17]. However, there is another forest's ecosystem services that need to be optimized called carbon sequestration. Forests contribute to climate change mitigation by acting as carbon sinks. If there are no economic or tax instruments in place, forest landowners do not receive the climate benefits of carbon sequestration. Therefore, tax instruments are needed to encourage carbon sequestration as its intervention will provide climate benefits [13].

Indonesia has committed to reducing greenhouse gas emissions by 31.89% with business-as-usual and 43.2% with international support. Forestry and Other Land Uses (FOLU) is the sector with the largest contribution to greenhouse gas emissions reduction efforts, accounting for 60% of the target. In countermeasure 1, efforts to reduce greenhouse gas emissions with its capabilities, 17.4% of the 31.89% target is achieved through the FOLU sector, while in countermeasure 2, efforts to reduce greenhouse gas emissions with international support, 25.4% of the 43.2% target is achieved through the FOLU sector [18].

The high costs faced by forest entrepreneurs and the disincentives for forest conservation created by fiscal instruments are problems that the government needs to address, given the urgency of forests in supporting the sustainability on earth. Therefore, a reformulation of property tax policy is necessary to support the profitability of entrepreneurs while preserving the value of natural resources [12]. We identified two problems related to property tax on forestry. First, the property tax policy problem of high tax

burden that leads to deforestation. One policy alternative that can be considered is a Land and Building Tax incentive to reduce costs for businesses, thus supporting forest sustainability and preserving forest ecosystem services [15]. Second, the property tax administration problems of high compliance costs due to uncertainty and inefficiency of tax collection. This study aims to propose alternative property tax policy and administration improvement on forestry in Indonesia in supporting the forestry industry, state revenue productivity, and climate benefit of carbon sequestration.

2. LITERATURE REVIEW

2.1 Property tax principle

Property tax is a levy imposed on the ownership or other legal interest in land and buildings. The imposition of property tax is justified by four reasons it has an immobile tax base; it reflects the public's claim on private property value; it has an inelastic tax base; and it is based on the ability-to-pay principle [19]. Property tax policy must meet the principles of equity, efficiency, accountability, stability and predictability, and ease of administration. Equity shows when the taxes are fair if their burden is distributed by some measure of the taxpayer's ability to pay taxes. Efficiency shows how costs from tax burden should be minimized so it does not distort the decision of taxpayers in doing business or investment. Accountability shows how taxes should be designed so that are clear and accountable both to taxpayers and policymakers. Stability and predictability represent how tax amounts should be stable and predictable over time. Ease of administration indicates the time and resources allocated to tax compliance should be minimized [20].

2.2 Property tax policy

Property tax revenue is determined by tax base and tax rate. Tax base then determined by taxable wealth and number of tax objects which reflects the value and the quantity respectively. Property tax law shall define which property is taxable and exempted. The law shall also regulate if there is any deduction, credit, or deferral. After being identified, tax base then will proceed to valuation to determine the Gross Property Tax Base (GTB). Ideally, GTB would become the property tax base. However, observed practice shows GTB is often reduced by administrative actions, such as exemptions and deductions, which would form Net Property Tax Base (NTB) [20].

The property tax base is generally determined using the market value method, which sets the tax base based on the average of fair market transactions of related properties. Philosophically, the use of the market value approach is based on the principle of substitution. A potential buyer of a property will not pay more than the cost required to acquire a similar property in the same property market [19]. In addition to market price, other property tax bases according to Youngman include [19]:

Capital value and annual value: The tax base is determined based on the assessed value to acquire or obtain the right of ownership of a property, such as the rental price or the selling price of the property.

Income-based valuation: The tax base is determined by the income generated from a property over a specific period multiplied by a capitalization rate.

Area-based taxation: The tax base is derived from a region-based valuation. This method assesses property based on its location. The more strategic the property's location, the higher its value. Conversely, if a property is located in a non-strategic area, its value can be lower.

Acquisition value: The tax base is determined by the acquisition cost incurred to acquire the property. The advantage of using this method is its predictability, allowing the property-buying taxpayer to calculate future tax liabilities accurately.

Other tax bases: The determination of the tax base through methods other than the five mentioned above, as stipulated by the tax authorities.

The amount of tax rate is related to the amount of tax liability. There are two types of tax rates which are flat rates and progressive rates. The advantages of a flat tax rate include uniformity, simplicity, transparency, and predictability of revenue. However, due to reliance on property tax as a source of revenue, multiple tax rates may be employed. It may raise additional revenue but at the same time may be complicated [20].

2.3 Property tax administration

Good tax policy requires good tax administration. The realization of tax revenue and tax policy objectives depends on the quality of tax administration [20]. Tax administration is the institution that administers tax policy. They do the tax policy implementation and tax law enforcement as mandated by law [21]. Kelly [22] identifies seven property tax administration functions which is (1) tax base identification to determine the property tax base (2) tax base valuation to determine how the tax burden will be distributed among the taxpayers (3) tax liability assessment to determine how much tax will be levied (4) tax collection to collect the tax receivable from taxpayers (5) tax enforcement to determine how much revenue will be collected through enforcement (6) tax appeals resolution to ensure that the tax is equitably administered (7) taxpayer service to provide service to the taxpayer.

2.4 Taxes on forestry

The concept of forest taxation was first formulated to determine the value of forest land to facilitate fair and efficient taxation for landowners. Taxes can be an instrument to control timber production or to provide facilities to the state. The varied ecosystem benefits of forests make the public goods implications of forests very broad, further highlighting forest damage as a wide-range negative externality. Tax policies combined with other specific instruments can be applied to achieve certain objectives. In general, taxes are collected to meet government revenue, so the tax treatment of forestry should be neutral. However, if it is to be used to influence forest management, then taxation must be distortive [13]. In other words, this goal requires tax instruments that are designed to promote sustainable forest management.

Tax policies should also be oriented towards increasing the valuation of natural resources by limiting overproduction that is not utilized and does not add value to the products. Tax collection must not only consider the profitability of businesses but also be used to encourage businesses to improve their performance in preserving the value of natural resources or to decide to exit the forestry sector if they cannot adapt to government regulations [23]. Taxation of the forestry

sector should be able to stimulate business activities, be simple, easy to understand, and ensure efficiency in tax collection [7].

Forests contribute to climate change mitigation by acting as carbon sinks and sources of wood, replacing fossil fuels and electricity production emissions. If no economic instruments are applied, forest landowners may not receive the climate benefits of carbon sequestration. Subsidies and taxes are needed to encourage carbon sequestration. The interventions generated by subsidies and taxes on wood production should be equal to the marginal climate benefits received. Forest tax instruments are similar to Pigouvian taxes aimed at climate mitigation [13].

2.5 Property tax incentives for the forestry sector

Property tax incentives for the forestry sector have been implemented in several states in the United States under the name of Private Forest Property Tax Programs (PFPTP) as part of efforts to conserve forest ecosystem services. Incentives are provided in the form of exemptions, flat taxes, or modified rate assessments. The ecosystem services aimed to be achieved through these tax incentives include forest sustainability, scenic and open space values, soil and wetland conservation, timber and fiber production, wildlife and fisheries protection, water supply and protection, as well as recreation and heritage conservation [24]. PFPTP is expected to help reduce the conversion and sale of forest land by landowners, although the impact of PFPTP on active forest management efforts is still limited [25]. Similar incentives are also provided in Slovakia, where property tax reductions benefit landowners and entrepreneurs. Property tax incentives in the forestry sector have the potential to be highly effective in conserving forest ecosystem services [26].

Forests provide the ecosystem service of carbon sequestration [2]. Subsidy and tax instruments are needed to encourage carbon sequestration [13]. One ecosystem service that has not been discussed in detail regarding the impact of property tax incentives in the forestry sector is carbon sequestration. Tax incentives have a positive impact on investment, forest product production, and the expansion of forest areas, thus promoting carbon sequestration efforts [27, 28].

3. METHOD

This study employed a qualitative approach to explore the issues surrounding property tax policy and administration on forestry in Indonesia. It aimed to understand challenges in compliance and collection, and to reformulate an alternative property tax policy that balances support for the forestry industry, state revenue, and carbon sequestration for climate change mitigation. The research began with a literature review on the forestry industry and property tax policies, followed by data collection from relevant stakeholders. The collected data was analyzed using qualitative methods and compiled into a research report.

3.1 Data collection

The qualitative data collection technique employed to obtain the primary data consists of in-depth interviews and Focus Group Discussions (FGD). The primary collection data

was conducted from December 2022 to March 2023. The researcher used judgmental/purposive sampling that engaged experts to obtain more informative insights into the issue [29]. The selection of key informants considered the background, actors, events, and processes related to property tax administration and forestry industry in Indonesia. In-depth interviews aimed to elicit views and opinions from the participants [29]. Firstly, the writers conducted in-depth interviews engaging the Association of Indonesia Forest Concession Holders (APHI) to gain the observed practice and implementation of the compliance of Land and Building Tax on the forestry sector dealt with by the forestry industry/enterprise. Writers then arranged an FGD to obtain a holistic view of the implementation of Land and Building Tax on the forestry sector. FGD is informally interviewed in a discussion setting to gain insight from various participants on a specific issue that in the end creates an agreement and mutual understanding around the issue [30]. The FGD engaged several stakeholders around the issue of Land and Building Tax on the forestry sector which were Fiscal Policy Agency of Ministry of Finance (BKF), Directorate General of Tax of Ministry of Finance (DG Tax), Directorate General of Sustainable Forestry Management of Ministry of Environment and Forestry (DG Forest), and forestry industry (APHI). Lastly, the researcher conducted a second In-depth interview engaging the Directorate General of Tax officers to explore the issue on tax collection and enforcement of Land and Building Tax on the forestry sector. The researcher also conducted content analysis on relevant documents related to property tax, forestry industry, and sustainable forestry management. The documents analyzed were largely the prevailing Land and Building Tax regulation and forestry industry regulation in Indonesia such as laws issued by the House of Representatives (UU), Government Regulation (PP), Regulation of the Ministry of Finance (PMK), Regulation of the Ministry of Environment and Forestry (PERMEN LHK), and Regulation of Director General of Tax (PER). Researchers also gathered literature discussing the property tax on forestry in other countries with similar geographic situations as Indonesia such as Malaysia, Thailand, Vietnam, and Brazil.

3.2 Data analysis

Collected primary data from in-depth interviews and focus group discussions along with secondary data from desk research were all coded using three steps of data coding which consists of open coding, axial coding, and selective coding [30]. The codes were then processed for further steps of qualitative data analysis (Figure 1). The researcher employed

qualitative data analysis techniques such as successive approximation and illustrative methods. Successive approximation is an analysis technique which involves the iteration between the empirical data and abstract concepts and theories [30]. The writers employed this technique to gain a holistic view on the implementation of property tax on forestry policy and administration in Indonesia. The analysis continued by employing the illustrative methods to reformulate the property tax incentive policy and property tax administration that align with the objective of supporting the forestry industry, state revenue productivity, and forest conservation. The illustrative method is an analysis technique that treats theoretical concepts as empty boxes to be filled with specific empirical examples and descriptions [30]. The writers used the concepts of property tax policy, and property tax administration in employing illustrative method. Ideal types technique was also employed in order to ensure the reformulation of property tax incentives on forestry in line with the principle of tax policy. Ideal types technique compares the social reality (data) to the pure standards of theoretical abstracts [30].

4. RESULT

4.1 Overview of land and building tax on forestry sector regulation in Indonesia

Property Tax on the forestry sector in Indonesia is called Land and Building Tax on the Forestry Sector (*Pajak Bumi dan Bangunan atas Sektor Perhutanan*). The taxpayer is an individual or entity that has the right, benefits from, owns, and/or legal controls of land and buildings in forest areas. The object of the Land and Building Tax on the forestry sector includes land and/or buildings located in forest areas as stipulated in the Forestry Business License.

Land in the forestry sector is classified into productive areas, not yet productive areas, unproductive areas, supporting buffer areas, emplacement areas, and protection and conservation areas. The determination of the value for each type of area has different assessments. The Tax Base for Land and Building Tax on the forestry sector is the Taxable Value. The calculation of the Tax Base begins by determining the Tax Object Value of land and buildings in forest areas. Then, the amount of Tax Object Value will be reduced by the Non-Taxable Object Value of Rp 12,000,000, resulting in the Taxable Object Value. Taxable Value amounts to 40% of Taxable Object Value. The Land and Building Tax rate for the forestry sector is imposed at 0.5%. The tax calculation is shown in Table 1.

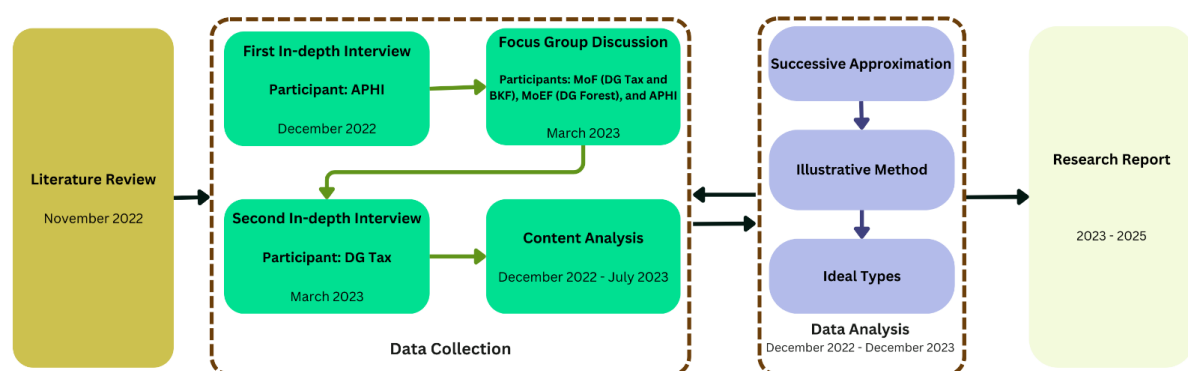


Figure 1. The steps and timeframe of the research

Table 1. Calculation of land and building tax on forestry sector

Tax Calculation Component		Formula
Tax Object Value – Land	a	AAA
Tax Object Value - Buildings	b	BBB
		+
Tax Object Value of Land and Buildings (Gross Property Tax Base)	c= a + b	CCC
Non-Taxable Object Value (Deduction)	d=12,000,000	DDD
		-
Taxable Object Value (Net Property Tax Base)	e = c - d	EEE
Taxable Value (Tax Base)	f = 40% × e	FFF
Land and Building Tax Payable (Tax Amount)	g = 0.5% × f	GGG

Land and Building Tax on Forestry Sector is a tax collected by the Central Government through the Director General of Taxes of the Ministry of Finance. The amount of tax payable is determined through an official assessment system. The process of determining the tax due begins with the submission of a Tax Object Notification Letter to the Director General of Taxes. Subsequently, the Director General of Taxes will issue a Land and Building Tax Return to the taxpayer based on the available data. Value determination is regulated in the Regulation of the Ministry of Finance of the Republic of Indonesia number 186/PMK.03/2019 (Table 2).

However, taxpayers have the right to file an objection towards the Director General of Taxes. If the taxpayer is not satisfied with the result of the objection, then the taxpayer may file an appeal to the tax court. For decisions made by the tax court, the taxpayer has the right to file a judicial review with the Supreme Court.

Table 2. Determination of Tax Object Value for calculating Land and Building Tax on Forestry Sector

Area	Definition	Tax Object Value Determination
Land in the Forestry Sector		
Productive Forest Areas	-Felling block areas in a natural forest and/or harvesting block areas in a natural forest	Replacement Selling Value = Capitalization Rate × Net Forest Product Revenue
	-Areas that have been planted within the plantation forest	-Land, determined by comparing prices with similar properties -Land development (plantation), determined by calculating the plant investment cost
Yet to Productive Forest Areas	-Areas of felling blocks and/or areas of harvesting blocks within a natural forest -Replanted area within a plantation forest	Price comparison with similar properties
Unproductive Forest Areas	-Areas of felling blocks and/or areas of harvesting blocks within a natural forest -Replanted area within a plantation forest	Determined by the Stipulation of the Director General of Taxes
	-Areas that have undergone engineering processes and are used to support and secure forestry activities, including log ponds or log yards, harvest collection points, roads, canals, ditches, and embankments	Adjustment to the land Tax Object Value per square meter for not yet productive forest areas
Buffer Forest Areas	-Areas that are used for buildings and their supporting facilities	Price comparison with similar properties
Forest Emplacement Areas	-Areas that have the function and purpose of protection and conservation, including rivers, areas that provide protection for downstream areas, local protected areas, natural reserves and cultural heritage areas, and buffer zones	Determined by the Stipulation of the Director General of Taxes
	-Areas designated as High Conservation Value Forests	
Buildings in the Forestry Sector		
Buildings	-Permanent man-made structures anchored to the ground within forest areas	New Acquisition Value = New Construction Cost - Depreciation

5. DISCUSSION

Writers have identified problems which are divided into two main categories, Property Tax policy problems and Property Tax administration problems, shown in Figure 2. Property tax policy discusses the design of the property tax base and the property tax rate that affects the amount of tax liability [20]. Writers identified five policy problems in property tax policy on forestry sectors. They are the complexity of land valuation, insignificant tax deduction amount in the form of Non-Taxable Object Value, high tax rate, lack of incentive for the forestry sector, and high burden of transaction costs due to numerous user charges (PNBP) on the same levy base. Property tax administration focus on functions in policy implementation such as identification, valuation, liability assessment, collection, enforcement, appeals resolution, and service [22]. Writers have identified three property tax administration

problems. They are uncertainty of land valuation, open interpretation on land classification, high compliance cost due to objection and appeal, and lack of technology information utilization. Writers then proposed alternatives to address the policy and administration problems. Policy problems are mainly addressed by granting tax incentives while administration problems are mainly addressed by the simplification of land valuation.

5.1 Property tax incentives for forestry: Lowering costs and promoting climate change mitigation through carbon sequestration

Market Value is the most employed method in forest land valuation for property tax purposes. It is used for determining the valuation of productive forest areas, not yet productive areas, buffer areas, and emplacement areas. The market value

method is considered less relevant to use in forest areas because the market value is for areas with limited infrastructure and far from settlements, highways, and other public facilities. Thus, the land value in forest areas is relatively too high. In addition, the market value class, which is determined based on administrative divisions, also cannot

accommodate the arrangements for forest areas located in different regencies with different assessment bases. This causes a significant value difference in one adjacent forest area. The difference makes the calculation of Tax Object Value of Land and Buildings (TOVLB), which served as Gross Property Tax Base, more complicated.

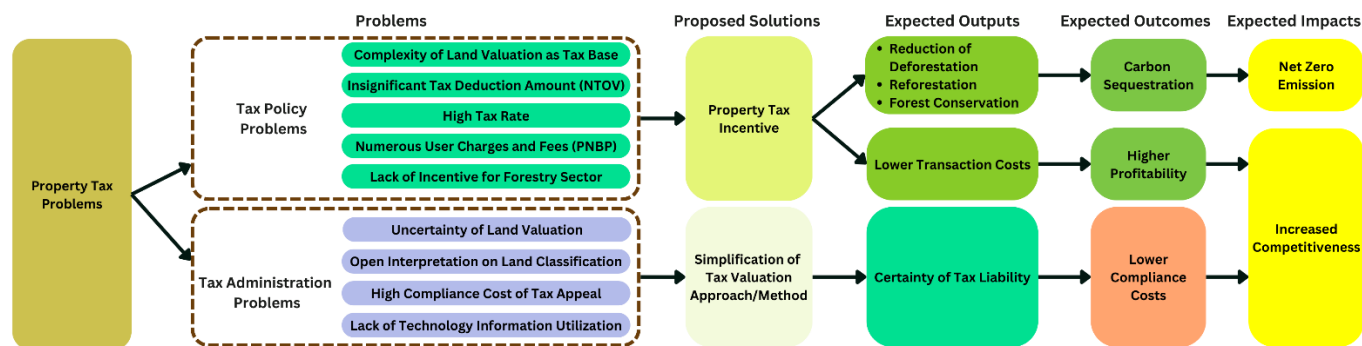


Figure 2. Mapping of property tax on forestry sector problems, proposed alternatives, expected outputs, expected outcomes, and expected impacts

Tax Object Value of Land and Buildings then will be deducted by the amount of Non-Taxable Object Value (NTOV), which serves as Property Tax deduction. Currently, Non-Taxable Object Value is set at Rp12,000,000. However, the amount of this NTOV is pretty low. There is no adjustment of NTOV over time while the tax base, market value of forest land, continues to grow. This mismatch makes the NTOV amount very insignificant to property tax calculation.

The effective rate of Land and Building Tax on forestry sector in Indonesia is 2%. Additionally, there are no specific incentives provided to forestry businesses regarding Land and Building Tax payments. The government provides incentives in a form of tax reduction for the taxpayers that incur a loss from their business activities. Comparison with other countries that have similar tropical rainforest resources to Indonesia shows lower effective tax rates and various other incentives for forestry businesses (Table 3).

Although different from taxes, Non-Tax State Revenues increase operational costs and burdens for the forestry industry, potentially reducing efficiency and competitiveness. These Non-Tax State Revenues include (1) forestry business permit fees, (2) forest resource provisions, (3) reforestation fund, (4) funds from the sale of standing timber, (5) penalties for violations, (6) fees for forest product transportation documents, and (7) fees for forest product export legal assurance documents.

The outdated regulation and unequal property valuation may result a little willingness to comply as there is no equity reflected from the tax amount. Therefore, the policymakers should re-examine policies related to tax base and rates [20]. The writers proposed property tax incentive in a form of effective tax reduction from 2% to 1.5%. Effective property

tax rate is set by the percentage of taxable value (tax base) and the tax rate itself.

Therefore, we can adjust these two for getting the targeted effective tax rate. There are two ways to accomplish this which are setting the taxable value from 40% to 30% or lower the tax rate from 0.5% to 0.3%. However, we have to consider the legal space of the prevailing property tax regulation in choosing the appropriate effective tax reduction option. The Law No. 12 of 1985 (Property Tax Law) set the range of the percentage of taxable value of 20% to 100% from the Taxable Object Value (Net Property Tax Base). The percentage of 40% later was regulated in the Government Regulation No. 46 of 2000. On the other side, the Property Tax Law set the tax rate at 0.5%. There is no room for the Government to change the tax rate unless revise the Law itself through the House of Representatives (highest legislative authorities). Therefore, the appropriate way to grant the effective tax reduction is to revise the Government Regulation, which is easier than revising the Law, and change the percentage of taxable value to 30%.

The incentive also includes the adjustment of Non-Taxable Object Value as the Property Tax Deduction. The amount of Non-Taxable Object Value is insignificant as there is no adjustment from time to time. There is no adjustment since 1985, the time when the Property Tax Law was passed. We suggest the amount of Rp150,000,000 following the inflation rate from 1985 to current date of 2024. It is also easier to revised the regulation on Non-Taxable Object Value as it was regulated under The Regulation of Ministry of Finance (PMK).

Table 3. Property tax policies for the forestry sector in developing countries

Country	Effective Property Tax Rate	Property Tax Incentives for the Forestry Sector	Source
Malaysia		Tax Allowance of 10% on expenditures for road and building construction	[31]
Thailand	0,01% - 0,1%	Tax deduction up to 90% on the tax due for individuals to prevent the conversion of agricultural land	[32]
Vietnam	4%	Tax exemption on income from forestry-related business activities	[33]
Brazil	0,03% - 20%	Tax deduction/allowance for small landholders	[34]
Indonesia	2%	Tax allowance only for taxpayers who have incurred losses	

Forestry Land and Building Tax incentives are expected to provide relief in conducting forest plantation investments, further expanding forest coverage, and increasing forest ecosystem services in carbon sequestration [28]. Incentives are needed so that entrepreneurs can carry out reforestation and selective logging, thereby supporting efforts to conserve forest ecosystems [18]. The imposition of Land and Building Tax that adds a burden to forestry businesses can push entrepreneurs to conduct illegal logging to pay the Land and Building Tax or sell their forest land, thus leading to land-use change [8, 35]. Additionally, Land and Building Tax is one of the components of the high transaction costs borne by forestry entrepreneurs in Indonesia, thereby reducing the competitiveness of forest products [6]. Forestry Land and Building Tax incentives are expected to provide relief in conducting forest plantation investments, further expanding forest coverage, and increasing forest ecosystem services in carbon sequestration [28]. Incentives are needed so that entrepreneurs can carry out reforestation and selective logging, thereby supporting efforts to conserve forest ecosystems [18]. Incentives in the form of reduced Forestry Land and Building Tax rates are expected to reduce the burden on forestry entrepreneurs, which consists of transaction cost, monitoring cost, enforcement cost, opportunity cost, and political cost. The costs incurred from providing tax incentives are relatively lower compared to other forest restoration efforts such as land-use regulations, compensatory mitigation, mitigation banking, in-lieu mitigation fees, fee-simple purchases, easements, and cooperative-collective actions [36]. However, the impact of the property tax incentive on forest industry productivity and carbon sequestration needs to be assessed further.

5.2 Strengthening the efficiency of property tax collection by improving certainty and simplicity of land valuation in the forestry sector

Unlike Income Tax or Value-Added Tax, property tax is an official assessed tax. Therefore, the tax liability is calculated by the Tax authorities using the information provided by the Taxpayers. However, open interpretation still occurs between the Taxpayers and Tax authority. Issues on property tax can lead to tax disputes, which may lead to a high cost of taxation known as compliance costs that consists of fiscal costs, time costs, and psychological costs [11]. This increases production costs for taxpayers and reduces the competitiveness of forestry products.

Value determination is regulated in Regulation of Ministry of Finance of Republic of Indonesia number 186/PMK.03/2019. Valuation for property tax base purpose is determined through one of two processes namely assessment and stipulation. The assessment process employs several methods as explained in the Table 4. Most used valuation/approach method in determining the land value is market value.

However, the market value method is considered less relevant to use in forest areas. The market value used is the market value of nearest area which more developed than the forest areas with limited infrastructure and far from settlements, highways, and other public facilities. Therefore, the land value of forest areas is relatively too high. In addition, the market value class is determined based on administrative divisions that it is actually also cannot accommodate the arrangements for a forest area located in multiple regions. This

causes a significant value difference in one adjacent forest area. Accountability also becomes one issue related to the market-based valuation as there is no accountability for the data used. This raises uncertainty for the taxpayer in estimating the tax amount and managing the tax risks within their business.

Table 4. Methods for determining the Tax Object Value for Land and Building Tax in the forestry sector

No.	Tax Object Value Components	Value Determination Method
Tax Object Value – Land		
1	Productive Areas	Market Value/Cost/Revenue
2	Not Yet Productive Areas	Market Value
3	Unproductive Areas	Stipulation of the Director General of Taxes
4	Buffer Areas	Market Value
5	Emplacement Areas	Market Value
6	Protection and Conservation Areas	Stipulation of the Director General of Taxes
Tax Object Value – Building		
1	Building	Cost

Another problem in the implementation of the property tax on forestry is the open interpretation between Tax Authority and Taxpayers in determining which land is classified as productive areas; not yet productive areas; unproductive areas; emplacement areas; conservation areas; settlements; separate forest areas; and buffer areas. Differences in the determination of each of these areas have implications for the total tax burden borne by taxpayers in a fiscal year. In line with the concept of certainty, taxes need to have a certain object to avoid problems arising in tax collection. The regulations of property tax on forestry need to be adjusted in line with the business processes of the forestry industry and the current forest management policies.

The use of information technology for property tax is very limited. Tax Authorities have the tax payment record but it is not presented in a geographic information system that is able to describe areas, points, and roads showing the reference for tax payments [37]. Comprehensive technology such as Geographic Information System (GIS) is not commonly found.

The first proposed alternative is to redefine the classification of each type of forest land. There is a difficulty in distinguishing not yet productive areas and unproductive areas. Therefore, the classification of those areas may be merged as one area. The merge of forest area will provide simplicity and predictability in property tax calculation.

The second proposed alternative is to use the stipulation in land valuation, rather than the current market-based valuation, similar to the valuation method of unproductive areas and protection and conservation areas (see Table 5). This stipulation-based approach should be expanded to all other areas within forest regions in Indonesia. The advantage of this alternative is providing the certainty of Tax Object Value of Land and Building Tax on Forestry (Gross Property Tax Base). However, the existing regulations still predominantly use assessment-based valuation, not stipulation. Therefore, the revision of the law is needed, which requires a long period of time and relatively high political costs. Nevertheless, this opportunity is still open considering that the Directorate General of Taxes has also used discretion to use stipulation as regulated in Director General of Taxes Decision (KEP)

Number KEP-185/PJ/2020. The valuation of unproductive area is stipulated at the fixed amount based on island while the

valuation of protective and conservative area is stipulated at the fixed amount for all region as shown in Table 6.

Table 5. Proposed changes in valuation methods for Land and Building Tax calculation in the forestry sector

No.	Area	Current Provision on Land Assessment	Proposed Provision on Land Assessment in Short Term	Proposed Provision on Land Assessment in Long Term
1	Productive Areas	Income, Cost, and Market Value	Income	Stipulation of the Director General of Taxes
2	Not Yet Productive Areas	Market Value	Merge to Unproductive Area	Merge to Unproductive Area
3	Unproductive Areas	Stipulation of the Director General of Taxes	Stipulation of the Director General of Taxes	Stipulation of the Director General of Taxes
4	Buffer Areas	Market Value	Stipulation of the Director General of Taxes	Stipulation of the Director General of Taxes
5	Emplacement Areas	Market Value	Stipulation of the Director General of Taxes	Stipulation of the Director General of Taxes
6	Protective and Conservative Areas	Stipulation of the Director General of Taxes	Stipulation of the Director General of Taxes	Stipulation of the Director General of Taxes

Table 6. The tax object value of unproductive area and protective and conservative area for Land and Building Tax calculation in the forestry sector

No.	Region	Value (Rp/m ²)
Unproductive Area		
1	Sumatera	803
2	Java	2,950
3	Bali and Nusa Tenggara	1,029
4	Kalimantan	290
5	Sulawesi	357
6	Maluku and Papua	342
Protective and Conservation Area		
1	All Regions	58

Fairness in property tax collection can be improved through increased certainty, stability, and practicality by reducing tax avoidance, ensuring consistent interpretation and application of tax regulations, making the tax burden more predictable from year to year, providing clear information for taxpayers, and reducing the number of disputes and appeals, leading to a more efficient tax system [20]. Assessment through the stipulation of the Director General of Taxes increases certainty by providing stability and predictability for the basis of imposing Forestry Land and Building Tax for both taxpayers and the tax authorities. Assessment through stipulation also provides certainty in the interpretation and application of tax regulations, thus reducing differences of opinion between taxpayers and tax authorities and reducing the number of disputes that can lead to high costs of taxation, including direct costs, time costs, and psychological costs for taxpayers, and collection costs for tax authorities.

Simplifying assessment using a fixed value is also expected to reduce costs and expand coverage [38]. The determination of Tax Object Value in productive areas remains based on assessment-valuation, with discretion given to the appraisal officers. Assessments may be conducted on an area or regional basis to prevent excessive disparities between forest areas in adjacent regions. The determination of these areas can refer to island-based regions or on a provincial basis, which is relatively narrower than an island. If adjustments are needed, then adjustments should be made with limited and very significant indicators such as the distance to nearest road or port or the strategic position of the forest area. Other indicators that can be considered are those that are in line with the characteristics of the forest area, namely land cover or the physical surface of a forest land covered by trees.

Third proposed alternative is the use of area-based

valuation. The tax base of land and buildings is determined according to a fixed amount that has been differentiated for each region, rather than assessment-based valuation. This method excels in terms of efficient land use in urban areas due to the improvements and additions to buildings that do not affect the amount of tax. In addition, from the administrative simplicity standpoint, this method is also superior because it does not require the registration of property prices one by one. However, this method has a drawback regarding the difficulty in assessing the selling price in an area, especially if there are various types of buildings in one area. In relation to the imposition of area-based property tax, Bell and Bowman [39] state that this method can be used if the data and costs required to determine the selling value of land and buildings in market value-based property taxation are not available. This method also has advantage in terms of public understanding as they do not need to think about the value of land and buildings when they want to sell or buy. A property tax system that uses an area-based valuation tends to meet the principle of fairness, especially when there is property market development. Considering simplicity, cost efficiency, and the support for sustainable forest management, this area-based approach can still be considered as a good alternative.

The fourth alternative proposed in this paper is to utilize the Geographic Information System to improve the accuracy of land valuation for property tax purposes. The use of information technology has the potential to conduct effective and transparent property tax valuation assessments [38]. Various studies have shown that the use of a Geographic Information System (GIS) can be very helpful in assessments, especially in areas without market prices such as forest areas. The use of GIS maps in determining the value of an area has been widely used in various countries. Countries that have

used GIS maps in land or property assessment are Australia and the United States. Developing countries that have used GIS maps in property assessment are Kenya and Rwanda. Several variables can be used for land valuation that are quite accurate and objective, which can be included as variables in GIS maps. An additional benefit for the government is the establishment of a database of forested areas, which will make it easier to set the Tax Object Value in the future and update it periodically.

6. CONCLUSIONS

This research identified the tax policy problems and tax administration problems in the implementation of property tax on forestry that leads to high transaction costs and deforestation of tropical forests in Indonesia. The property tax policy problems found are the complexity of land valuation, insignificant tax deduction amount in the form of Non-Taxable Object Value, high tax rate, lack of incentive for the forestry sector, and high burden of transaction costs due to numerous user charges and fees (PNBP). The property tax administration problems found are uncertainty of land valuation, open interpretation of land classification, high compliance cost due to objection and appeal, and lack of technology information utilization.

Writers proposed recommendations as an alternative to address property tax policy and administration problems. The first suggestion is providing tax incentives which consist of an effective tax reduction of 1.5% and increasing the tax deduction (Non-Taxable Object Value) amount to Rp150,000,000. The second suggestion is to improve the administration by simplification of valuation which consists of redefinition of forest areas, use of stipulation to determine the land value, use of area-based valuation, and utilization of a geographic information system. It is expected that the provision of the incentive is expected to encourage forest conservation to maximize the carbon sequestration function of tropical forests in Indonesia. This effort helps to achieve net zero emissions as part of climate change mitigation in Indonesia. The incentives and administration reform are expected to reduce the transactional costs for the forestry industry which helps them to be more competitive.

The qualitative approach employed in this research only captured the problem in the policy implementation which was then analyzed for reformulating the appropriate alternative policy. However, the expected output, outcome, and impact of the property tax incentive and administrative reform must be investigated. Future research may conduct a quantitative assessment of the impact of property tax incentives on economic productivity, business competitiveness, and environmental benefits, especially carbon sequestration.

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