The Impacts of Harmful Subsidies on Biodiversity and Ecosystems in Thailand

July 2024

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Well-intended subsidies and investments aimed at socio-economic development can have unintended negative impacts on the environment, particularly biodiversity and ecosystems. The study of the Impacts of Subsidies on Biodiversity and Ecosystems in Thailand draws on the methodology from the BIOFIN Workbook 2018 and the step-by-step guide to repurpose subsidies harmful to biodiversity and improve their impacts on people and nature (2024).

The study of the 'Impacts of Subsidies on Biodiversity and Ecosystems in Thailand' relied on the contributions of many people and organisations, many of whom are acknowledged in this study. The BIOFIN technical experts of UNDP Thailand conducted this study with a strong determination to improve the positive impacts of subsidies on people and nature. Kitichate Sridith, PhD, and Sara Bumrungsri, PhD from the Faculty of Science of the Prince of Songkla University of Thailand led the research work from July 2023 to July 2024. A series of consultation sessions among the national BIOFIN team were conducted with technical inputs from Ladawan Kumpa, Piyathip Eawpanich, Pattama Domrongphol, Kanittha Tambunlertchai, Sornsawan Phongphao, and Niran Nirannoot. Natthida Jitsiri liaised with the Prince of Songkla University for close collaboration on this policy paper. Anawach Saithong, Field Coordinating Assistant based in Phetchaburi facilitated the mission with key documents provided.

We are indebted to the information of the many government agencies for the documents they have shared. We would like to extend a special thanks to the former Minister of Tourism and Sport, Weerasak Kowsurat, who is the Senator of Thailand and has shared the policy advocacy process on repurposing harmful subsidies. We would like to express our sincere appreciation to Klaomard Yipintsoi, the Director of the Office of Mrigadayavan Palace Foundation under Her Royal Highness Princess Bejaratana. We appreciated the support of Thai PBS News which featured the case study of the Mrigadayavan Palace. The picture on the cover page was taken by Chittiwat Pornprasert to highlight the amazing freshwater swamp at Songkhla Lake in Thailand.

The valuable inputs of the Office of Natural Resources and Environmental Policy and Planning (ONEP) under the Ministry of Natural Resources and Environment of Thailand are meaningful for BIOFIN in redesigning the harmful subsidies, policies, and investments going forward.

This publication was made possible in Thailand with the generous support of the Governments of Germany and the United Kingdom.









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Harmful subsidies receiving government support are categorized into regular subsidies for various projects impacting biodiversity by government agencies and subsidies derived from policies or laws impacting overall biodiversity and ecosystems.

Research on harmful subsidies affecting biodiversity and ecosystems in Thailand focuses on two main issues: the government's land tax policy harming local biodiversity and subsidies for projects that lack nature-based solutions.

For the government's policy on acquiring dangerous biodiversity-endangering subsidies, the land tax policy has been the most damaging to local biodiversity nationwide. The land tax policy aims to collect a 0.3 per cent tax on land appraisal value per year and increase by another 0.3 per cent every three years, reaching 3 per cent in vacant or underutilized areas. This land tax, devised by the Fiscal Policy Office of the Ministry of Finance of Thailand and collected by Local Administrative Organizations, focuses solely on tax revenue, lacking an understanding of natural ecosystems and biodiversity conservation. Land without proper utilization is subject to this progressive tax rate, affecting areas with natural regeneration processes that help conserve local biodiversity. Landowners are forced to "destroy" natural vegetation to cultivate specific crops listed by the ministry rather than being assessed as underutilized land to avoid the high tax rates, resulting in unintentional and widespread harm to biodiversity. This land tax policy inadvertently endangers national biodiversity by fundamentally altering natural ecosystems. Thus, there is a need to reassess the land tax assessment and have clear guidelines, working in collaboration with biologists to consider natural ecosystems when granting tax exemptions to individuals. This situation underscores the need for more careful planning and consideration in policy-making.

The second point concerns the financial support from the government budget for the construction of various projects that pose a threat to the natural environment, directly impacting erosion and loss of biodiversity. The key impacted areas are river systems, wetlands, and coastal regions, affected by multiple state-led construction projects. The lack of public and government understanding and access to biodiversity information in Thailand's ecosystems results in insufficient awareness of the biodiversity in natural systems, leading to destruction by construction projects. Moreover, most of Thailand's public and government officials lack understanding and access to information about the biodiversity in each ecosystem. This results in a lack of awareness about the biological diversity

in the natural ecosystem before various construction projects are carried out, leading to their destruction. Therefore, construction projects must consider the highest impact on biodiversity. Conducting Environmental Impact Assessments (EHIA) can help prevent impacts on biodiversity if done thoroughly and truthfully, affecting the project evaluation process, especially concerning natural ecosystems such as rivers, wetlands, and coastal ecosystems directly affecting communities.

During the research study, a review of the budget expenditures for various projects between 2021 and 2023 totalled 219,788.6 million baht. Approximately 295.5 million baht was allocated for constructing coastal rigid structures. The government approved a budget of 10 million baht for demolition in 2022.

The major problem with government funding for biodiversity is the lack of knowledge about ecological systems and biodiversity among government officials at both the central and local levels. It is crucial to provide officials with education on natural ecosystems and biodiversity to minimize the risks to biodiversity and enable the government to avoid or reduce future expenses that would be required for the restoration and maintenance of biodiversity and ecosystems. This will also help allocate budgets to care for biodiversity permanently in the future.

Photo credit : Chittiwat Pornprasert, Kitichate Sridith



Chapter Introduction: Biodiversity; Harmful Subsidies and 1 People's Perspective

What is **Biodiversity**?

According to the United Nations Convention on Biological Diversity (CBD), biodiversity means the variability among living organisms from all sources, including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.

Photo credit : Chittiwat Pornprasert, Kitichate Sridith



The agreements concerning biodiversity and the stakeholders' perspective towards biodiversity.

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inance Initia<u>tive</u>

"Biological resources" include genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity. (https://www.cbd.int/). When considering the descriptions of biodiversity and biological resources, the core thing most mentioned in the convention is the benefits people will get from biodiversity. Though conservation means were mentioned in the convention, the core ideas of biodiversity that originated from evolution in the form of natural habitats had not been elaborated. Concerning the Goals of the Kunming-Montreal Global Biodiversity Framework (KMGBF), it has four long-term goals in 2050 related to the 2050 Vision for biodiversity. These Goals are as follows: Goal A-Protect and Restore, Goal B - Prosper with Nature, Goal C - Share Benefits Fairly, and Goal D - Invest and Collaborate.

The issues of subsidies and perspective on biodiversity.

The issues of subsidies and perspective on biodiversity. Goal A of the Kunming-Montreal Global Biodiversity Framework stated integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050. This is somewhat promising. On the other hand, Goal B stated that biodiversity is sustainably used and managed and nature's contributions to people, including ecosystem functions and services, are valued, maintained, and enhanced, with those currently in decline being restored, supporting the achievement of sustainable development for the benefit of present and future generations by 2050. Goal B is focused on using biodiversity, which is the biggest issue mentioned in the convention. For Goal C and Goal D of the convention, they mentioned on how to share all the resources (stress on the genetic resources) among all stakeholders fairly and the implementation, including financial resources, capacity-building, technical and scientific cooperation, and access to and transfer of technology to implement the Kunming-Montreal Global Biodiversity Framework fully are secured and equitably accessible to all Parties. Thus, the basic knowledge is needed to fulfil Goal A, especially in the high-biodiversity areas, such as biodiversity hot spot areas, mostly in the areas where the sub-national government in Thailand pay less attention to the basic researches in Ecology/ Field Biology, which is the fundamental of biodiversity. Mostly, the sub-national governments in such areas of high biodiversity pay more attention to Goal C: Share Benefits Fairly, as the focus point is on the benefit generated from biological resources and not the idea of

being part of biodiversity as an ecosystem. Considering the financial issues in Goal D, the KMGBF Framework is on the relocation of the financial issue of the developing countries' parties for the adequate means of implementation, including financial resources, capacity-building, technical and scientific cooperation, and access to and transfer of technology to implement the Kunming-Montreal Global Biodiversity Framework fully are secured and equitably accessible to all Parties, especially developing country Parties and progressively closing the biodiversity finance gap of \$700 billion per year, and aligning financial flows with the Kunming-Montreal Global Biodiversity Framework and the 2050 Vision for biodiversity. Nevertheless, the financial alignment may become subsidies that harm biodiversity when applied without real knowledge of ecology/biodiversity. Therefore, filling the financial gap according to Goal D of the Kunming-Montreal Global Biodiversity Framework may even widen the ecosystem gap of knowledge and, on the other hand, harm biodiversity. Besides, many activities and practices counted as subsidies can harm biodiversity in a given area more. In the carbon credit market, for example, the areas with low carbon credits could have more biodiversity than the areas with high carbon credits as the low and high carbon credits cannot indicate the value of the areas concerning such environmental issues as it depends on many factors, some of which are the habitat's carrying capacity (Hixon, 2008) as well as the ecological neutral theory (Chave, 2004).

The present report attempts to propose some of the Thai government's selected practices in terms of subsidies that could harm the country's biodiversity and natural ecosystems.

Introduction: Biodiversity; Harmful Subsidies and People's Perspect



The identified subsidies and incentives for biodiversity and ecosystems in Thailand

Chapter

The policies/laws, subsidies, and incentives

of any government could significantly impact its ecosystem and biodiversity as the policies could lead to laws that will harm and destroy the biodiversity of the given areas when issued with no concern for basic knowledge of biodiversity and the ecosystem. Thai governments had issued various projects that had been subsidized and given incentives to continue for many years in the landscape. There is no doubt that it will impact biodiversity in the natural habitats all over the country. Moreover, some recently issued policies that have already led to laws have changed the land/ seascape and depleted the natural biodiversity in the natural habitats. Thus, the three prioritized subsidies are identified as follows:





The construction projects in the natural ecosystems have significant impacts on the river/riverine ecosystems, i.e. the never-finished concrete dykes along the streams and rivers all over the country; the check-dams in almost all the access streams and rivers all over the country. The terrestrial-coastal ecosystems, i.e., the sea wall and other constructions all over the seashores both on the Thai Gulf and Andaman Sea sides. The most fragile forest ecosystems of the mountain peak, i.e., viewpoint towers in various mountain peaks, have destroyed the local biodiversity, especially the local flora. There are various conservation projects to protect biodiversity and ecosystems. On the contrary, such projects have made the diversity and genetic variations of the organisms even less, i.e., reforestation programs; and animals released to nature.

The policy, without reasonable consideration from experts, could harm biodiversity lots; however, the policy would lead to laws, and once it becomes law, it could cause significant disaster for the biodiversity and the ecosystem, i.e. the new land tax act which issued in 2019 had forced the land owners all over Thailand to get rid of the natural vegetation in their pieces of land; the carbon credits policies of the Thai government do encourage the government as well as private company sections to grow plants in natural habitats all over the country that has reduced the natural wild land with biodiversity. The selected project from each category will be discussed concerning the impacts on the biodiversity and ecosystem in the present study. The study aims not to blame but to warn the concerned authorities in conducting such projects. When it causes biodiversity loss and ecosystem degradation, it is nearly impossible to reconstruct both the biodiversity and the natural ecosystem.



The project also aims to re-design the harmful subsidies to be biodiversity-positive, which will then align with functional agencies.

🔄 Methodology

Overall, the methodology can be summarized in Figure 1.

Figure 1

methodology for biodiversity harmful subsidies assessment

identify	re-design three	align re-design
biodiversity- impact	most impact	options with
subsidies	subsidies	stakeholders

1 Identifying subsidies.

In this study, subsidy is defined as "a government action that confers an advantage on consumers or producers, to supplement their income or reduce their costs." In this study, both subsidies that have a positive or negative impact on biodiversity will be listed. Similar to other expenditure reviews following the BIOFIN methodology, there are four key steps as shown in Figure 1.

In the first step, rapid mapping of biodiversity-relevant subsidies and finance actors are identified. These subsidies are both from the government budget and the non-government budget. Subsidies include tax breaks, tax credits, grants, underpricing, subsidized tariffs, COVID-19 recovery program, etc. Based on BIOFIN Workbook 2018 on Step 3.4D: Supportive and harmful subsidies, this study will answer three main questions as follows: 1) What are the most prominent subsidies that have an impact on biodiversity (both positive and negative)? 2) If considered harmful to biodiversity, which aspects are harmful and why? and 3) Who are the primary, secondary, or other beneficiaries? When relevant biodiversity impact subsidy is listed, the study will identify at least 3 of the most significant biodiversity impact subsidies for in-depth assessment considering financial/economic and biodiversity impacts following desk review and consultative processes.

2 Validation

A series of validation meetings in Thailand with key stakeholders including representatives of relevant civil society groups, business associations, local communities, governments, etc. will be conducted. As a result, a final national inventory of subsidies for key sectors that are likely to harm biodiversity and ecosystems will be developed. Further, the redesign action for the 3 major subsidies will be proposed.

3 Re-design.

The study will develop criteria and indicators for the assessment of prioritized subsidies focusing on financial/economic and biodiversity impacts including political and economic consequences. We will have an in-depth review of the 3 prioritized harmful subsidies, with detailed information on the objectives, size, structure, and impact of the subsidies. The policy recommendation for redesigning the 3 major subsidies will be submitted.

Alignment.

The study will point out redesign options aligned with national priority within the sector with different scenarios that will be compared to the business-as-usual scenario for selected subsidies, including potential for avoided costs, perceived effectiveness, and other climate/biodiversity impacts. Redesign options can consist of either eliminating, reducing, or greening the selected subsidy or redirecting savings to support nature-based solutions. We will conduct an Initial Impact Assessment analysis that identifies which part of the environment, economy, and society will be affected directly and indirectly by different redesign options over time. We will design support programs that ease the path of transition away from harmful practices and possible targeted compensation or exemption to low-income groups, certain groups of vulnerable people, and other households affected by the proposed change. We then develop a feasible redesign Action Plan including objectives, indicators, intended effects, inevitable effects, strategy to overcome side effects, and advocacy strategy.

hapter The selected harmful subsidies of the Thai government and the problem identification

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The harmful subsidies have been selected and prioritized into three groups according to Thailand's fragile and endangered ecosystems as follows.

The three most biodiversity harmful subsidies categories:



The harmful subsidies to the river systems and wetlands.



The harmful subsidies from any construction project on the beach/ coastal dune along the coastal areas.



The harmful subsidies from land tax law to the remnant of the biodiversity and the natural ecosystems in private properties all over Thailand.

() The authorities responsible for each biodiversity harmful subsidy

Category 1 The harmful subsidies to the river systems and wetlands

The Royal Irrigation Department

Mission

According to the Ministerial Regulation Organizing the Royal Irrigation Department, Ministry of Agriculture and Cooperatives B.E. 2554, the mission of the Royal Irrigation Department includes:

• Implementation of activities aimed at achieving, collecting, storing, controlling, distributing, draining, or allocating water for agricultural, energy, household consumption, or industrial purposes under irrigation laws, ditch and dike laws, and other related laws.

• Implementation of activities related to the prevention of damages from water, the safety of dams and appurtenant structures, the safety of navigation in commanded areas, and other related activities that may not be specified in the annual plan.

- Implement land consolidation for agriculture under the Agricultural Land Consolidation Act.
- Implement other activities designated by laws or properly assigned by the Cabinet or Minister.

Rationale: The Duties and responsibilities of the Royal Irrigation Department are related to the river system biodiversity, which falls into category 1 in this aspect. The subsidies to the construction harm the river system biodiversity, which is the most fragile ecosystem in the tropics.

2 Department of Public Works and Town & Country Planning

Mission

• Supporting, formulating, supervising, and developing services on urban planning and public works to meet technical standards that are responsive to social, economic, and environmental needs for sustainable development.

- Enabling public-private participation in planning for urban, local, and community development.
- Developing, improving, and promoting good governance and efficiency of enforcement of laws concerning land use, urban planning, and public works for the benefit and happiness of the people

Rationale: The missions of the Department of Public Works and Town and Country Planning concern all public constructions in the country. The constructions in natural habitats, though for conservation and protection purposes, are harmful to the biodiversity in all categories listed in this aspect, either river systems biodiversity or terrestrial coastal ecosystems, e.g., coastal dunes, and beaches.

3 Department of Water Resources

Mission

• The Department of Water Resources (DWR) is the government agency under the Ministry of Natural Resources and Environment according to the Ministerial Regulation on the Administrative Organization of the Department of Water Resources, Ministry of Natural Resources and Environment B.E 2545 (2002) and B.E 2551 (2008). The missions of DWR concern suggestions on formulating policy and plans as well as measures relating







to water resources, management, development, conservation, and rehabilitation, including surveillance, cooperation, follow-up, evaluation, and problem-solving regarding the water resources, academic development, standardization, and technology transfer at overall and river basin levels to manage the water resources with integrity sustainably.

• Additionally, the issuance of Order No. 46/2560 on 25 October 2018 and Order No. 2/2561 on 22 January 2019 by the Head of the National Council for Peace and Order (NCPO) to establish the Office of National Water Resources (ONWR) to be the core agency which is responsible for the water resources management planning and cascading policy of the country. By transferring the missions and manpower from the Department of Water Resources in terms of policy recommendations and water resources work plans in an overall picture of Thailand, formulation of action plans to manage the water resources, water resources management in the cross river basin, cooperation among foreign countries and international organizations in terms of water resources management, monitoring and evaluation as well as performing duty as the secretariat of the National Water Resources Committee for the Office of the National Water Resources. Water Resources Act B.E. 2561 (2018) prescribes the responsibilities of the Department of Water Resources under Chapter I: Water Resources, Chapter IV: Water Allocation and Water Use, Chapter VI: Conservation and Development of Public Water Resources and Chapter VIII: Civil Liability in the Case of Damage to Public Water Resources.

Rationale: Subsidies given to get water resources by various means could be harmful to biodiversity, such as reservoir construction and water drilling, which could disturb the natural habitats and change the physical Environment, leading to biodiversity loss. Most of the water resources used came from the river or groundwater sources. Drilling groundwater could directly impact the river system as more than 80% of the water in the river channel was discharged from the groundwater of the basin where the river/stream runs over. Moreover, the groundwater system along the coast is mainly in the coastal dune; therefore, extracting groundwater without considering the water table in the dune system could significantly impact the dune ecosystem, which is the primary ecosystem along the coast in Thailand. Hence, the subsidies to fulfil the missions of the Department of Water Resources could be harmful to biodiversity in both Category 1: the river system, and Category 2: the coastal ecosystem.

Category 2 The harmful subsidies from any project of the construction on the beach/ coastal dune along the coastal areas

Marine Department



Mission of the Marine Department:

- Dredging and maintenance of the river system
- Sea wall construction along the coast (beach sites)

Rationale: Dredging and maintaining the river system may interfere with the river and riverine ecosystem (category 1 river systems), and the sea wall constructions along the coastline can harm both terrestrial and marine ecosystems, especially the beach and dune ecosystems (Category 2 the coastal ecosystem).

Category 3 The harmful subsidies from land tax law to the remnant of the biodiversity and the natural ecosystems in private properties all over Thailand.



The Fiscal Policy Office

Tax policy in Thailand

Tax Structure

In Thailand, tax revenue is the primary source of the government's income, accounting for 87-90% of total revenue collection, whereas the remaining 10-13% is generated from non-tax revenue sources. The structure of tax revenue is changing. Even though indirect tax remains the principal source, its share in the overall picture has been in gradual decline as a result of less customs duty collection under Thailand's obligation to various Free Trade Agreements (FTAs).

Tax collection in Thailand is divided into 2 levels: by the central government and by local administrative organizations. Central government tax is collected by the Revenue Department, Excise Department, and Customs Department, key agencies under the Ministry of Finance. The Revenue Department is tasked with the collection of personal income tax, corporate income tax, specific business tax, and stamp duties. The Excise Department collects excise tax, and the Customs Department collects import and export duties.

Tax collected by local administrative organizations (consisting of Provincial Administrative Organization, Tambon (sub-district) Administrative Organization, Municipality, Bangkok Metropolitan Administration, and the City of Pattaya) includes two types of local tax, sign tax, slaughterhouse duty, swallow nest harvest duty, tobacco-based local tax, oil-based local tax and local tax from hotels.

Rationale:

The land tax policy is one of Thailand's most harmful subsidies to biodiversity. This Tax is collected by local administrative organizations (consisting of the Provincial Administrative Organization, Tambon (sub-district) Administrative Organization, and Municipality harm the biodiversity as the private landowners, to avoid paying high tax, they have depleted the natural vegetation patches left in their properties and grows the plant species listed by selected authorities, some of those are even alien species. Such natural vegetation patches play essential roles as "refugia" (a location that supports an isolated or relict population of a once more widespread species) and as stepping stones of species distributions when the continual habitats are fragmented.

Results from discussions with the Marine Department, the Department of Public Works and Town & Country Planning, the Royal Irrigation Department, and the Department of Water Resources

1. For the construction projects in the river systems, besides the water shortage and flood problems, the authorities concerned have no mission regarding biodiversity conservation. Examples of their missions are as follows:

• The Marine Department: All missions of the Marine Department are concerned only with aquatic transportation. They have no missions on preservation of local biodiversity.

• The Department of Public Works and Town & Country Planning: All the missions focus on constructions only. Due to local administration authorities' requests, this Department will allocate the regular budget through fiscal year budgeting planning. It has no concerns with local biodiversity preservation.

• The Royal Irrigation Department: The missions focus on managing water sources according to government policies only and have no missions on local biodiversity protection.

Notes:

departments, e.g., the Royal Irrigation Department, have an environmental expert officer; however, the consideration of such an environment is only a specific point of construction and not at all the ecosystem and biodiversity in general

• The Department of Water Resources: The mission is to arrange water resources for local areas besides the Royal Irrigation Department. This department is responsible to wetlands management all over Thailand. However, there are no personnel or officials in the department who are keen on wetlands and biodiversity preservation. The main concern is wetlands protection with enough water resources for local usage only.

2. Besides rigid constructions, all authorities have conducted their projects according to the designated budget proposed by the local administration organizations. Most of all, construction projects have continual budget commitments at the national level.

3. The Office of Natural Resources and Environmental Policy and Planning (ONEP) of Thailand is an authority that appoints EIA (Environmental Impacts Assessments) and IEE (Initial Environmental Examination) committee. There appeared to be an effort to improve the EIA and IEE process so that the departments that conducted all the construction projects should consider their impacts on biodiversity loss.

4. No ecologists or field biologists or biodiversity experts designated or participated in construction project development and decisions.

5. For all invited authorities selected for discussion in this study, all participants have heard about 'biodiversity' issue. However, there appeared to be no concerns about their practices as biodiversity protection.

Discussion

• The authorities selected for the discussions in this study revealed that their agencies provided direct subsidies to local government units; however, all agencies mentioned that it is not their mission to protect biodiversity loss.

• The local administration authorities, according to the Decentralization Act 2542 AD, play essential roles in the designs of each harmful subsidy to biodiversity, especially the utilization of local budget on construction projects.

• No ecologists/ field biologists keen on biodiversity issues participates in issuing harmful subsidies to biodiversity in practice.

Results from discussion with the Fiscal Policy Office

1. The Fiscal Policy Office under the Ministry of Finance had designed the land tax policy (see Annex).

2. The Local administration organization had been working according to the Local Maintenance Tax issued in the year 1965; however, it did not reflect the real land tax value due to the opinion of the Ministry of Finance. Hence, the present Land Tax Act is applied instead.

3. The Land Tax was designed to generate income for the local administrative organization.
4. Economic and social inequality has not been considered by the Fiscal Policy Office as the core factor of the government towards the design of land tax collection. This implies that the land tax is not to compensate the income between the one holding the different amounts of land properties.

5. During the discussion, the Fiscal Policy Office realized that, without intention to harm nature, the design of Land Tax has a great impact on the loss of natural habitats and biodiversity. The FPO agreed to find a solution to address the problem, and, at least, try to minimize the problems. The authority had suggested that the Land Tax Act put a clause that the Memorandum of Understanding (MOU) between the private landowners, the local administrative organization, and the academic authorities could be explored so that the land can be conserved for biodiversity preservation and the exemption of land tax is applicable.

Discussion

Abandoned lands were defined according to the Ministerial Regulations (2019) as 'Abandoned land property or building without appropriate utilization' (see Annex). However, such regulations were set without knowledge and realization of biodiversity loss. In addition, the Land Tax then could be avoided by land utilizations such as planting specific trees according to the approved list (see Annex). The list of 53 trees were identified through the lens of agriculture-based expertise without considering the natural biodiversity in the land.

The local administration authorities in charge of land tax collection see no importance of biodiversity conservation in abandoned land compared to the income from it. The reason for not paying attention to local biodiversity might be the absolute lack of knowledge of the value of biodiversity, which concerns all living in nature. Furthermore, the landowners, who have no other choice but to avoid paying higher land tax, continue to deplete the existing natural ecosystem by introducing some 53 plant species listed by the law (agricultural/forestry base) on their lands. Thus, the Land Tax is the special case for Thailand to take immediate actions on redesigning or repurposing its harmful to the natural ecosystem and biodiversity.

The representatives of Fiscal Policy Office suggested that the definition of the ecosystem and natural biodiversity and green area for the land tax exemption should be reviewed and introduced to all agencies for protecting the natural biodiversity/ecosystem and, at the same time, making the land tax collection also possible.

Results from discussion with Office of Natural Resources and Environmental Policy and Planning

Mr. Jiravat Ratisoontorn, Deputy Secretary-General of ONEP chaired the meeting and provided insightful information.

• **Coastal and river ecosystems are important areas for biodiversity conservation.** The discussion focused on projects initiated by local administration organizations that harm biodiversity and ecosystems. The largest coastal dune in Thailand called "Bang Berd" in Prachuap Khirikhan-Chumpon provinces was highlighted. ONEP realized that this area is being threatened by a new construction project on top of the dune. However, there has no criteria and the boundary to define a coastal dune as Protected Areas.

Biodiversity protection as a "key driver" of ONEP

ONEP is now pushing to issue a Biodiversity Act according to the ratification of the Kunming-Montreal Global Biodiversity Framework. However, ONEP shall consider the co-benefit of all stakeholders to biodiversity as a central axis of practice and ideas in biodiversity protection.

• Enforcement of EIA application

ONEP reposed in enforcing all EIA to be applied for any construction projects in Thailand. ONEP agreed to revisit the regulations applied by some projects which required no EIA application.

Overviews (as per researchers)

ONEP could prevent biodiversity loss from harmful subsidies by introducing law through various concerned Acts. Local Administration Organizations get benefits and impacts from government subsidies. However, the lack of knowledge and resource persons has led to ignorance regarding biodiversity loss. Deploying personnels who are keen in the field biology/ecology would help support the local governments to do no harm to nature.



Results from discussion with the Senator of Thailand

Mr. Weerasak Kowsurat, the Senator, agreed to meet with BIOFIN at Parliament. He provided insightful information regarding the policy advocacy as follows:

The constitutional law level.

The Senator suggested that the first and most practiced way for amending the Land Tax Act is to review the constitutional law.

• The Act level.

The Act concerning biodiversity (which is not yet endorsed) shall be advocated for policy endorsement like other environmental acts, e.g., the Clean Air Act. Most importantly, the Act should promote the scientific principle.

Overviews and suggestions by Senator

Biodiversity is a local resource; most people do not realize this due to their lack of knowledge. Though the protection could be done at local level by communities, the government agencies sometimes complicated the issues towards biodiversity protection.

The senator kindly suggested that a policy change to minimize harmful effects on biodiversity from government subsidies should be composed of a short, interesting headline with graphics, comprehensive keywords, and a few pages, not more than 4. It had to be prepared as proposed to the Budget Committee beforehand.

The biodiversity policy might depend on the National Policy Committee, both the Land Property Policy committee and the Marine/Coast Policy Committee, which have the Prime Minister as a chairperson. Moreover, they are above the Ministry level of Both the Ministry of Finance and the Ministry of the Interior.





• The considerations of biodiversity of all authorities discussed in the present reports focus only on fair benefits to all stakeholders and not on biodiversity/ecosystem protection.

• The former and present policies of the Thai government are to use the biodiversity fairly for every stakeholder and not to protect the biodiversity.

• Such policies have led to the organization's attitudes to exploiting the biodiversity resources without considering biodiversity loss.

• There are nearly no resource persons in biodiversity, e.g. field biologists/ecologists in such organizations or a procedure of biodiversity experts consulting beforehand even though such organizations have provided harmful subsidies to biodiversity in Thailand.

• Policy change is indispensable in changing the attitude of organizations to consider biodiversity as a core value of all living things and not only a resource for utilization at the most benefit for every stakeholder.

• More research on different ecosystem complexes in Thailand is needed, not only the species list and details of organisms found in various ecosystems as done by former research works. It is to make the public understand how vital biodiversity is to all living things.

• Harmful subsidies to biodiversity are not understood by the authorities who provided or requested the harmful subsidies, as their core value of biodiversity is the utilization, not the relationships, in terms of ecology and organic evolution on Earth, which has impacts on all living.

• More field biologists/ ecologists or rigid consultancy procedures with true experts in biodiversity would be critical in such organizations to protect biodiversity loss in Thailand.

Chapter 4 The Re-design action plan



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UN DP



Problems identified and the redesign.

The harmful subsidies to biodiversity were identified in two categories: (a) The policy and (b) the construction projects in the fragile Ecosystem.

${\sf A}$ The policy

For the former, land tax collection aims to reach 0.3 % per year of land appraisal price with an increment of 0.3% every three years up to a maximum of 3% in terms of financial cost. The tax would be collected by local administrative organization officers who will never be concerned with the ecosystem and biodiversity. As unmanaged private land properties are also natural habitats, biological succession could occur naturally. They may also contain valuable species of organisms as in protected public areas. The landlords would then deplete all vegetation and ecosystems to avoid paying taxes. They may be put on the plantation according to the agricultural-forestry expert list, which can harm biodiversity since the ecosystem will be changed accordingly from such plantations. Therefore, the criteria for abandoned land in the land tax law must be redesigned/ or put in more explanation descriptions to avoid harming the valuable biodiversity in unmanaged private land properties all over the country.

${\bf B}$ $\,$ The construction projects in the fragile ecosystems

For the latter, the subsidies that concern river systems and wetlands projects were identified from both the budget of the Department of Public Work and Town and Country Planning and the Royal Irrigation Department from 2021 – 2023 (See Table 1). These are examples of vast amounts of budget in terms of subsidies that will significantly impact the wetlands/ river ecosystem, harming biodiversity (See Annex 1). The construction of any structure in the natural ecosystem will significantly harm the area's biodiversity. The point is that nobody properly knows how diverse biodiversity is in each habitat. Since no one could build biodiversity as it is the natural selection process. Therefore, all the disturbances to the natural habitat must be of great concern. EIA study may not be the best way to be concerned about the biodiversity of a given habitat, but it is better than nothing. The redesign is proposed in any construction project in natural and incredibly fragile habitats like wetlands/ river systems/ coastal areas, which impact society and the ecosystem as it is concerned with the freshwater resources available in the ecosystem.



Table 1 Subsidies concern river systems and wetlands from 2021 to 2023

Budget Year	Agencies	Amount (Thai Baht)
2564	Department of Public Work and Town and Country Planning Royal Irrigation Department	9,599 × 10 ⁶ 55,567 × 10 ⁶
2565	Department of Public Work and Town and Country Planning Royal Irrigation Department	14,757 × 10 ⁶ 56,368 × 10 ⁶
2566	Department of Public Work and Town and Country Planning Royal Irrigation Department	15,000 × 10 ⁶ 59,063 × 10 ⁶

One of the common problems in all subsidies is that harm to biodiversity is caused by the lack of knowledge of ecology/biodiversity of the practitioners/officers of the organisations concerned. The redesign, then, includes the long-term action plan of essential ecology/biodiversity education at all levels of the practitioners'/government officers' concerns. (see Table 2).

The action plan

The action plan includes both short-term plans to minimize the harm to biodiversity of the government subsidies, which have already been undertaken and are going to be undertaken, and the long-term action plan to prevent the misunderstanding of ecosystem/biodiversity in the future.

Plans
Action
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and
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2 Recommendation
2
Table

Action plans	Short-term action plan The definition of land tax exemption	for ecosystem and natural biodiversity	is established.	Proposed definition: Abandoned	land must have alien plant	species in more than 50%	of the area.	Rationale: The term abandoned	land is used in the land tax law:	when the tand has been abandoned, the ecological	succession process will occur	naturally. The crucial point is that	the successional ecosystem should be composed of native species.	The land tax collection should be	applied to the abandoned land	according to this re-described	"abandoned" land.	I one-term Action Dlan	Essential education on biodiversity/	ecosystems must be applied to	all land tax-issuing and practicing	authorities.		
Re-design	Land tax exemption for eco- system and natural biodiversity	must be achieved.		To avoid harm to biodiversity,	abaindoned tand must be re-described for tex collection																			
Old assignments	No biological expertise has been included in the law-issuing process,	though it has a significant negative	impact on biodiversity.	0.3% of land appraisal price in the	first three years and an increment of	0.3% every three years till the	maximum of 3%	The land tax law: The abandoned	lands were defined according to	Ministerial regulations: Abandoned	land property or building without	appropriate utilization, year 2019 (see	Annex 3 in report IV). However, such	regulations were set without knowl-	edge and realization of biodiversity.	In addition, the Land tax could be	avoided by land utilizations such as	planting trees according to the list	provided (see	Annex 2 in Report IV). The list had	been achieved with agriculture-based	expertise without considering the	land's natural biodiversity.	
Government sectors in-charged	The Fiscal Policy Office, Ministry of Finance																							
Biodiversity harmful targets	The natural habitats all over	Thailand are	private properties.																					
Subsidies					Ĵ	A	xei	; p	ue	וך	กิว	ilo	bd		×1									

Action plans	Short-term Action Plan - Ecologists or field biologists as biodiversity experts in all project assignments that will be undertaken in natural ecosystems and decisions both from local administration organisations and government authorities, as well as ONEP - All projects undertaken in natural ecosystems along the coast need EIA	Long-term Action Plan Essential education on biodiversity / ecosystems must be applied to all practicing authorities. Ecological studies must be arranged in the University programs for all who are going to deal with Ecosystem/ natural habitats in the future.
Re-design	Authorities have conducted their projects according to department duties or those proposed by the local administration A field biologist/ecologist's opinion is indispensable in project management in natural habitats and policymaking	
Old assignments	Requested budget constructions were assigned according to the local authorities requested And the EIA is not compulsory for some given projects. Administration and project management were achieved without knowledge of biodiversity/ ecology.	
Government sectors in-charged	Marine Department Department of public works and Town & country planning	
Biodiversity harmful targets	Coastal areas	
Subsidies	SnoitourtenoD	

Action plans	Short-term Action Plan Ecologists or field biologists as biodiversity experts in all project assignments that will be undertaken in natural ecosystems and decisions both from local administration organisations and government authorities, as well as ONEP - All projects undertaken in natural ecosystems along the river sides, as well as all types of wetlands, need EIA Long-term Action Plan	Essential education on biodiversity/ ecosystems must be applied to all practicing authorities. Ecological studies must be arranged in the University program for all who are going to deal with Ecosystem/ natural habitats in the future.
Re-design		
Old assignments	Requested budget constructions were assigned according to the authorities' policy and to the local authorities requested. The EIA is not compulsory for some given projects.	
Government sectors in-charged	The Royal Irrigation Department Department of public works and Town & country planning Department of Water Resources	
Biodiversity harmful targets	Wetlands and River systems	
Subsidies	Constructions	







Case 1: Mrigadayavan Palace, Cha-am district, Phetchaburi Province

King Rama VI founded Mrigadayavan Palace in May 1924 as a recreational summer place for the Monarch. This is the only wooden palace left by the sea for all of Thailand. It was registered as a national archaeological site on 27th October 1981. However, the palace and its announced territory have been changed for various purposes under various organisations. Currently, the Palace is well-kept and managed by The Mrigadayavan Palace Foundation

Problems identified at Mrigadayavan Palace concerning harmful subsidies to biodiversity.

The location of the Mrigadayavan Palace, with perpendicular length to the shore 300 meters, can be located at https://maps.app.goo.gl/6kxyugW9NRF9PgMh6. The construction of groins, breakwater, seawalls, and jetties was started from 2006 to 2017 by the Marine Department of the Ministry of Transport. The total budget of THB 295.5 million, identified as harmful subsidies, was allocated from fiscal year 2006 to 2017. Two significant problems concerning harmful subsidies to biodiversity at Mrigadayavan Palace are identified.



1. The constructions along the coast, both in the sea and on the shoreline, to prevent coastal erosion at Mrigadayavan Palace.

• Groins

The government subsidies, as permanent structures along the shoreline in Thailand, had been achieved in the past to claim that they could prevent coastal erosion. These subsidies are harmful to biodiversity, both terrestrial and aquatic.

At the Mrigadayavan Palace shoreline in Phetchaburi province, almost all types of coastal constructions have been constructed to prevent coastal erosion. Groins are shore perpendicular structures that maintain up-drift beaches or restrict longshore sediment transport. By design, these structures are meant to capture sand transported by the longshore current; this depletes the sand supply to the beach area immediately down-drift of the structure. In response, down-drift property managers often install groins on adjacent properties to counteract the increased erosion, leading to a cascading effect of groin installation.

How Harm to Biodiversity

Groins had changed the beach shape and stopped the seasonal longshore drift. This has changed the habitats of marine organisms, which has had a more significant impact on marine and terrestrial organisms, such as sea birds and coastal animals, through the food web. Moreover, the beach had been interrupted, and more beach erosion occurred behind the groin, which had a chain reaction along the length of the beach until the estuary, if any. Then, Groins always needs to stop such reactions from one another. These more harmful subsidies to biodiversity would continue without an end through the length of the coastline in Thailand.

Breakwater & Seawalls

A breakwater is a structure built offshore to protect a coast from the effects of waves. It is typically made of rock or concrete and is designed to reduce the force of waves before they reach the shore.

A seawall is a wall built along the shoreline to protect against erosion and flooding. It is typically made of concrete or stone and is designed to hold back water and protect the land behind it.

How Harm to Biodiversity

Like Groins, breakwaters and seawalls had changed the beach shape and stopped the seasonal longshore drift. This has changed the habitats of marine organisms, which has had a more significant impact on marine and terrestrial organisms.



Jetties

A Jetty is a long, narrow structure that protects a coastline from the currents and tides. Jetties are usually made of wood, earth, stone, or concrete. They stretch from the shore into the water. Jetties can also connect the land with deep water farther from shore to dock ships and unload cargo. This type of jetty is called a pier.

Two Jetties were constructed at the mouth of Klong Bang Kra Noi and Klong Bang Kra Yai, which Mrigadayavan palace is in between, despite no severe coastal erosion being reported from the areas except for the once-big storm surge from Tropical Storm LINDA in 1997. This is just an occasional event and not a regular one. The only erosion that might happen is due to the regular longshore drift, a phenomenon on the East coast of Peninsular Thailand that brings sand back and forth along the shoreline according to the seasonal wind.

• The chain effect erosion caused by the jetties and groins, seawalls, and breakwaters.

The long, natural shore drift phenomenon was blocked when such constructions were built along the shoreline. Then severe erosion would occur behind the construction that protrudes into the sea, and sand deposition would occur on the side facing the longshore drift's current (see Figures 2-4). It has created a non-stopped chain erosion effect throughout the shore where Jetties, groins, breakwaters, and seawalls are built. Figures 3 - 4 show that severe erosion has continually occurred after building such contractions along the shoreline in Mrigadayavan Palace.

How Harm to Biodiversity

An explanation for constructing two jetties is to fix the mouth of the two waterways (troughs) called Klong Bang Kra Noi and Klong Bang Kra Yai, which are not rivers but troughs in the dune. This would let the seawater flow inland to "enrich" the Rhizophora plantation of the Environmental Park nearby. However, the seawater contaminated the valuable dune freshwater and harmed the dune organism / vegetation ecosystem.



Figure 3

Beach erosion episodes from non-beach erosion from July 2005, when there were no shoreline constructions, to January 2015, with many shoreline constructions.


Mrigadayavan shoreline in April 2019 (compared to non-beach erosion in Fig 3 – July 2005)



The jetties to bring the saltwater inland and the *Rhizophora* spp.

• The Mangrove plantation on coastal dune areas and jetties building.

The Jetties bring seawater to contaminate the water table. This significantly impacts the ecosystem as freshwater is essential to any organism, as 80% of the cells are composed of freshwater. Moreover, it contaminated the soil profile for a given period.

• Plantations in the wrong place: Harmful subsidies to biodiversity.

Many works on mangrove plants' salinity tolerance, especially in the genus Rhizophora spp., have been achieved. There are controversial discussions about whether mangrove plants are obligate or facultative halophytes. Some work has supported that they need certain nutrients in salt water but could stand fresh water for a certain period, such as Wang et al. (2011). However, most of the research suggested that mangrove plants are facultative halophytes. It means they could stand in freshwater and saltwater for a specific salinity limit if it is not too harmful to the maintaining mechanism of the water potential in their cells. Krauss and Ball (2013) argued that current evidence suggests that survival is not dependent upon a physiological requirement for salt, as proposed by Wang et al. (2011).

On the other hand, mangroves can survive and tolerate fresh water. However, there is a continuum of salt tolerance within mangroves ranging from salt-sensitive species to those requiring higher salt levels for optimal growth and reproduction. In any case, it is to be noted that most researchers had almost agreed that the tissue water potential became more hostile with the increase in salinity and that stomatal conductance decreased in all plants. (Khan and Aziz, 2001; Kodikara, Jayatissa, Huxham, Dahdouh-Guebas and Koedam, 2018; Biber 2006).

Figure 4

The confusion of facultative vs obligate property of mangrove plants has broadened such harmful subsidies to the biodiversity of the Dune at Mrigadayavan Palace. The misunderstanding of obligate VS facultative halophytes of the Rhizophora planted near Mrigadayavan Palace is the reason for jetties building at the stream-like dune troughs of Klong Bang Kra Noi and Kling Bang Kra Yai at Mrigadayavan Palace.

In general, the Jetties are another type of shore perpendicular structure placed adjacent to tidal inlets and harbours to control inlet migration and minimise sediment deposition within the inlet. Like groins, jetties may significantly destabilise the coastal system and disrupt natural sediment regimes. However, in the case of Mrigadayavan, the jetties were built to control the open mouth of the dune troughs to bring "sea water" to maintain the tidal condition and the mangrove plant survival at the introduced plantation (Figure. 5). The seawater then contaminated the dune's groundwater table system and nearly destroyed the ground freshwater table of the dune where the palace was.

• Mangrove could survive in freshwater: an evidence reference at Songkhla Lake in Southern Thailand.

In Thailand, specific research has yet to focus on freshwater mangrove species. However, populations of mangrove elements (*Rhizophora apiculate* Blume, *Lumnitzera racemosa* Willd., *Excoecaria agallocha* L. were discovered surviving the freshwater conditions in some regions of Songkhla Lake with some freshwater swamp species such as *Nymphaea nuchal* Burm. f., *Elaeocharis spiralis* (Rottb.) Roem. & Schult. in Songkhla and Phattalung provinces, in Peninsular Thailand. (Figure. 6) (sensu author- 2024 submitted unpublished article).

The high salinity of the seawater will lead to low growth/dead conditions, as seen in the Mangrove plantation next to Mrigadayavan Palace, Phetchaburi province. (Figure.5) compared to *Rhizophora apiculata* Blume of the same area, which is situated on the edge of the plantation where there is more fresh water (from the watering management of the palace staff- unintentional). (Figure. 7)

Figure 5

Dead *Rhizophora apiculate* Blume in the mangrove plantation might be due to many factors, e.g., high salinity of the managed more inflowing seawater/ self-thinning of the too-high density of plants.



Rhizophora apiculata Blume (arrows) of the same area situated on the edge of the plantation where there is more fresh water (from the watering management of the palace staff-unintentional – compared with dead ones in Fig.4).



Mangrove element (*Rhizophora apiculata* Blume, *Lumnitzera racemosa* Willd. In freshwater conditions, notice the blue water lily Nymphaea nouchali Burm. f.- (arrow) in the same site.



• The problem-solving to minimize harm to biodiversity at Mrigadayavan Palace

Removal of groins and sea walls

The sea walls and groins have destroyed the beach ecosystem and diversity as they were the cause of chain erosion on the beach from one place to another once it was built. The construction that caused beach erosion and prevented the coastal dune formation must be removed to re-wild the beach ecosystem. The groins and sea walls have been removed one by one with concerns (Figure 8). The subsequent effect has been monitored.

Removing the groins along the beach in front of Mrigadayavan Palace (January 2024).





The subsequence of groin and sea wall removal

When the barrier of dune formation – sea walls and the sand deposition – groins were removed, the development of coastal dunes could continue naturally. The forming of the berms/embryo dunes is detected where all the barriers were removed (Figure 9.).

Berms /embryo dunes (arrow) were formed by wind naturally when sea walls (barriers) were removed.



Moreover, the native coastal grassland elements have returned naturally, e.g., Ipomoea pes-caprae (L.) R. Br.; *Spinifex littoreus* (Burm.f.) Merr.; *Canavalia rosea* (Sw.) DC.; *Vitex trifolia* L. subsp. *littoralis* steenis (Figure. 10). These coastal grassland plants are essential in dune formation as they can stand the salt spray and help in the sand deposition of the dune. In natural conditions, dunes will get bigger and always move inland. It will allow more plant species and make the biodiversity of the dune more complex as time goes on. In addition, this coast is a foraging habitat of migratory birds such as plover. Hundreds of them were seen on this beach. This bird build nest and lays eggs on this sandy beach, after their offspring grow up, they return to sites, thousands of kilometers far from this beach. Some species of plover such as the Malaysian Plover which is near-threatened species has been recorded in this beach. This undisturbed coast is thus vital to egg laying and survival of these birds (Figure.11).

Figure 10

Figure 9

Ipomoea pes-caprae (L.) R. Br and *Canavalia rosea* (Sw.) DC. It is naturally established on the newly formed beach after removing the groin and sea wall



Egg of plover on undisturbed beach of the Mrigadayavan Palace (February 2024)





Figure 11

Discussions and recommendations

To conserve natural biodiversity, the fundamental knowledge of the ecosystem is critical. The habitat's species composition also changed when the area's physical factors changed. Government subsidies in each area could harm biodiversity and the habitats when applied with no concern for ecology knowledge. The misunderstanding of natural phenomena such as seasonal longshore drift/once-in-a-while storm surge events could be confused with coastal erosion, as seen in the case of Mrigadayavan Palace in Phetchaburi province (see Figures 2-4). Government subsidies can harm biodiversity when construction was made without fundamental ecosystem knowledge and destroy the area's biodiversity. In an example of Mrigadayavan Palace, the Thai government spent around 295.5 million on baths to prevent coastal erosion that may have never occurred. On the other hand, these subsidies had caused chain erosion along the shore due to the direction of the longshore drift and harmed the biodiversity/ ecosystem along the way they were built. This chain erosion will result in never-ending construction need to be made. Thus, long term losses of biodiversity as well as money can be expected.

Conserving nature is not building it but protecting the natural habitats. In this case study at Mrigadayavan Palace, the Jetties that have broad the salt water from the sea to the land area and contaminated the ground freshwater of the dune where Mrigadayavan Palace is situated to maintain the *Rhizophora* plantation are also harmful subsidies to the biodiversity of a natural coastal dune. They destroy the valuable freshwater system of the dune and the biodiversity network of the whole ecosystem. When the ecosystem changes its balance, biodiversity loss could be subsequent. This is also applied to those freshwater habitats, which were rarely studied.

Fundamental knowledge concerning ecology and biodiversity would be critical in decision-making for any requested subsidies from locals or any organization. Any nature conservation projects could cause harm to biodiversity when it is conducted without basic knowledge of Ecology/ Biology. Finally, to protect/ conserve Nature/biodiversity is not to build it but to protect the natural habitats and not change the physical factors through subsidies.

Case 2: The impact of Land and Building Tax Act B.E. (2019) 2562

Since the Land and Building Tax law was enforced in 2020, patches of vegetation have been erased from private properties all over Thailand to avoid tax collection by substation with plant species of the suggested list in the laws' appendix. The foresters-agriculture experts suggested a list of plant species without concern for any natural biodiversity in such private properties.

Proposed functions of the natural vegetation patches left as fragments in the private properties.

1. The natural patches of vegetation in various private properties play an essential role in conserving local biodiversity and genetics (Figure 12). The past's continual range of natural vegetation may be converted into agricultural areas and other land uses, such as community settlements, government offices, etc. However, the leftover patches of vegetation still maintain the original biodiversity that existed before the land uses (Figure 12 B1).



A Diagram showing the natural vegetation in a given area: more biodiversity.



B Diagram showing impacts of the Land Tax Law 2019: No original biodiversity is left in the area; only the suggested plants by foresters-agriculture experts were planted to avoid the high land tax-paying rate.



C Diagram showing impacts of the Land Tax Law 2019: No original biodiversity is left in the area; only the suggested plants by foresters-agriculture experts were planted to avoid the high land tax-paying rate.

2. Steppingstones of gene transfers of native species. In most cases of the vegetation in Thailand outside protected areas, remnant patches of the former natural vegetation are essential as sources of genetic variation in maintaining populations of the organism. (see Fig 13).

Figure 13

Diagram showing the possibility of the remnant patches of leftover vegetation in private properties as steppingstones for 'gene transfers' of the organism to maintain the genetic diversity in the separated populations (arrows). A., B., C.: remnant patches of the original vegetation.



The enforcement of the land tax law 2019 in 2022 has forced landowners to pay more taxes to the so-called, according to the law, "deserted place" when leaving without doing anything on the land. They, then, the plants, according to the list of plant species suggested by Forester and agricultural experts, should avoid paying a high progression rate of the land tax (Figure 12 B2.). This destroyed all the remnant patches of the local original vegetation left in the private properties all over Thailand. The biodiversity loss cannot be estimated in the recent two years (2022-2024). It might be more than all the biodiversity loss in the former time together.

Case 3: Koh Ko Khao Island, Takua Pa district, Pang-nga province.

Koh Ko Khao is a coastal sand bar island situated on the west coast of Peninsular Thailand in Pang-nga province. As a coastal island sand bar, the area contains various rare habitats of mysterious tropical dunes that have never been studied, containing valuable coastal dune biodiversity that cannot be estimated. Unfortunately, most areas belong to private owners under the Land and Building Tax Act B.E. 2562 (2019); therefore, most of the original natural vegetation is depleted to avoid paying the progressive land tax rate. This causes non-calculated biodiversity loss. Such activity not only harms the biodiversity of the areas but destroys every native species. In this case, the Land and Building Tax Act B.E. 2562 (2019) does not harm but depletes all local biodiversity in the area.

Rare coastal bog vegetation on the coastal dune at Koh Khao, Pang-nga, composed of various native rare plant species, e.g., bog orchids, *Nepenthes* spp; *Drosera* spp. and bog ferns, etc.

Rare and probably unknown *Nepenthes* sp., an insectivorous plant in the coastal bog on Koh Ko Khao, nearly vanished by enforcing Land and Building Tax Act B.E. 2562 (2019).



Figure 16

The vegetation in the private owner property on Koh Ko Khao was depleted to plant the suggested species. No survivors could be detected. Note: The same area as shown in Figure 13.



The climax community on the dune at Koh Ko Khao, Takua Pa, Pang-nga, has a high biodiversity of plants.



Figure 17

The climax community on the dune at Koh Ko khao, Takua pa, Pang-nga, with a high biodiversity of plants, was destroyed to plant *Acacia mangium* to avoid the progressive land tax rate.



Case 4: The Songkhla Lake Basin

The Songkhla Lake Basin is the area between Pattalung and the Sating-Phra peninsular. It is a lagoon system composed of coastal dunes that run North-South along the Thai Gulf in Nakorn Si Thammarat, Pattalung, and Songkhla provinces. The landform comprises dunes and slacks, with dune springs discharged in the rainy season. This has made the basin full of terrestrial and aquatic ecosystems, from dunes, swamps, and fresh-water lakes. It is unique and rare, especially in mainland Southeast Asia. As humans settled the basin in prehistoric times, most of the areas were claimed by private owners. The surveys of biodiversity and habitats around the basin resulted in shocking phenomena. As per the Land Tax Law mentioned, most areas have been cleared for some land use. It is a shame that some rare and unknown ecosystems like "freshwater" mangroves, coastal bogs and floodplains are being destroyed to replace with

the plantations of the plants suggested by the recommendation list in the law. (Figures 19,20,21) The original vegetation was removed in selected areas, and the landform and its physical factors were changed completely. The area was ploughed up and overexposed the soil to the air. The soil property will forever change when oxidation occurs and never returns to its former stage. The soil will become acid-sulfate forever. This not only harms biodiversity but also erases all local biodiversity forever. (Figure 22). In terrestrial areas on the coastal dune of the basin, the natural vegetation was replaced by the plantations of the fast-growing species Casuarina equisetifolia. Such plant species, when growing together, form a large area of the plantation and produce an allelopathic agent to inhibit the growth of the native species, therefore destroying the biodiversity of the dune vegetation. (Figures 23,24,25)

Figure 19

A rare "freshwater mangrove" in the Songkhla Lake basin area during the flood season: Notice the actual mangrove elements, e.g., *Rhizophora apiculata and Lumnitzera racemose* occurred with freshwater elements, e.g., *Eleocharis acutangula, Nymphaea nuchal.*

The rare "freshwater" mangrove in the Songkhla Lake Basin area was replaced by an oil palm plantation per the Land Tax Law 2019.



Figure 20

Songkhla Lake Basin: The same area of one private property has the original freshwater swamp vegetation on the left side, the change of landform, and its physical factors on the right side as per the Land Tax Law 2019. Notice that all local biodiversity was erased from the land. – Singhanakorn district, Songkhla Lake Basin area, Songkhla. (photo credit: Chittiwat Pornprasert, May 2024).



The soil in the former natural vegetation patch on private property was ploughed and overexposed to the air, changing its physical property to acid sulfate, and erasing the local biodiversity forever (land usage as per Land Tax Law 2019. – Singhanakorn district, Songkhla Lake Basin area, Songkhla.



Figure 23

Schematic profile of the proposed vegetation on the coastal dune on Sating-Phra Peninsula, Songkhla Lake Basin.



Coastal woodland remnant patch of the Sating-Phra Peninsula left on private property in Singhanakorn district, Songkhla Lake Basin area, Songkhla. (Photo taken in 2012).



Coastal scrub vegetation in claimed private property at Singhanakorn district, Songkhla province, comparing photos taken in May 2012 in Figure and May 2022 in Figure: after enforcing the Land Tax Law 2019. Not only is it a harmful subsidy to local biodiversity, but it also causes all local biodiversity losses.



Case 5: Concrete levee constructions along Phetchaburi River

Phetchaburi River is unique and different from other rivers. It has its upper course in the Tenasserim Range; however, there is no distinct middle course; the river goes straight to the ancient dune of Phetchaburi, next to the Tenasserim Range. No flood plain is recognized through the length of the river. The river is maintained not only by the run-off water from the source at the upper course but mainly by the groundwater along the way the river runs. The groundwater through the river's length at the lower course discharged from the dune with sand is an adequate aquifer. Therefore, unlike conventional rivers, the water in the river channel of Phetchaburi River is, most of the time, clear and has less sediments. The riverbed is sandy as the river is a part of the trough system of the ancient Phetchaburi dune (see Figure 28). The dune discharged water when saturated as the dune spring in the river channel. The current of Phetchaburi River depends on the pressure created by the saturated discharged dune spring. It flows northward due to the pressure discharged water from the dune creates and the longshore drifting in ancient times when the river was next to the shoreline. According to such facts, the river's current cannot be so fast and intense that it creates enormous erosion. Moreover, the riverine vegetation along its banks protected erosion when it occurred and served as a natural buffer, controlling the water in the river channel and the groundwater at an appropriate level. Floods and severe erosion may happen only during special events like typhoon/depression, which seldom happens. (Figures 26-27).



CXCXC

Schematic profile diagram of X-section of the Phetchaburi River, Phetchaburi, Thailand, showing the water relationship in the river channel and the groundwater table.



Figure 27

The Phetchaburi River is clear and has less sediment and a high diversity of riverine vegetation.



Clear and no sediment water of Phetchaburi River, photo taken from Wat Tha Chai Siri Pier, Phetchaburi. – Notice the sand riverbed.



Building a concrete structure like a levee along the banks of Phetchaburi's River is insane, as it destroys the natural buffer of the riverine vegetation between the terrestrial and aquatic habitat. It harms and destroys all high biodiversity in the riverine, which affects not only the terrestrial ecosystem along the river but also the aquatic ecosystem in the river. Concrete and cement change the chemical properties of the water in river channels, causing aquatic biodiversity loss. The construction disturbed half of the river channel with debris, stones, and earth broad from other places (Figures 29-31). Dredging the riverbed caused severe erosion at the banks; it depleted the aquatic biodiversity and the terrestrial one on both riverbanks. So do the levee constructions on both banks; the consequences are not only do they cause riverine biodiversity loss, but they will also make the flood even more severe when it happens.

Almost all the levee construction projects along various rivers in Thailand by this report's previously mentioned government sectors are considered harmful subsidies for biodiversity as they harm biodiversity and cause biodiversity loss in the famous and rare riverine vegetation in no time.



Debris of the levee construction in Phetchaburi River at Wat Koh, Phetchaburi.



Before the famous Wat Koh pier, where well-known King Chulalongkorn paid a famous Royal visit in 1904 at this pier from Phetchaburi River, the levee construction destroyed the riverine, biodiversity, the ancient landscape, and archaeological value.



Figure 31

Dredging and concrete levee constructions at Wat Koh Temple, Phetchaburi province and along the river disturbed the riverbed and river channel and caused biodiversity loss in the Phetchaburi River ecosystem.









Almost all subsidies in terms of the government budget for constructions in fragile natural ecosystems or the subsidies acquired from policies such as the land tax have caused harm to Thailand's biodiversity on a large scale. The consequences of such harm will continue and even cause more problems for biodiversity, as seen in fragile ecosystems like wetlands and river systems, one of the highest biodiversity habitats. On the other hand, the land tax has caused immediate harm faster than any other subsidies; as for the former subsidies, biodiversity harm will slowly happen until the habitats/ ecosystems are entirely depleted. For the latter, the land tax payer will avoid the high paying rate by immediately destroying all the remnant patches of habitats/ecosystems that contained biodiversity in his land and changing to the plantation of the proposed list of plant species, many of which are alien. This has happened all over Thailand in no time. Such natural habitats, though in the private lands, naturally contain a genetic stock of native organisms. Such land performs as a steppingstone of gene flow among separated populations to maintain diversity among those organisms.More subsidies could be considered. However, the selected ones in this study have priority as they dealt with the most fragile habitats, which might have been disappearing from Thailand soon. Thus, the biodiversity in such habitats will disappear forever. Furthermore, biodiversity cannot be considered in terms of high-low as the high biodiversity habitats do not mean that such habitats are more important than the lower biodiversity ones if they naturally occur from natural selection. Each habitat houses different proportions of organisms according to unique physical factors that vary from place to place.

To minimize the non-avoiding harm to natural biodiversity/ecosystems from such subsidies, the recommendations are as follows:

Considering the policies that concern all the habitats, such as landforms and ecosystems, in this study, "The Land and Building Tax 2022". Biodiversity experts should also consider all the policies and processes related to such aspects since most problems concerning biodiversity harm subsidies have been initiated from this policy-making point. So far in Thailand, no biodiversity experts have been involved in the policymaking on the policy that causes biodiversity harm subsidies. This should be taken seriously as biodiversity experts could give the correct opinions on the status of biodiversity in any given area to prevent biodiversity harm from such policy-making subsidies. This is considered the priority in avoiding harm to natural biodiversity/ ecosystems.

Note:

Biodiversity experts must hold a high University degree (MSc or PhD) in "Fundamental" Biology, Botany, Zoology, or Ecology and have experience working in the field (Field Biology). They should not be in any related applied Biological Science, Environmental Science, Agricultural Science, or some other related field of management applied Biology. This is to avoid conflicts of interest.

Z The subsidies for all approved construction projects in natural ecosystems cause significant harm to Thailand's biodiversity. The approvals of construction projects in high biodiversity ecosystems outside "**protected areas**" have never been considered in any construction project approval process. The biodiversity and habitats lost after construction should be considered thoroughly compared with the benefits of such construction. The environmental impact assessment (EIA) process must be applied carefully to every construction project, with the final comment of the biodiversity experts.

Each governmental department working in the natural ecosystem/habitat must have a field biologist position/and a biodiversity harm-detecting section for primary screening and advice in any construction projects and monitoring all approved and ongoing construction projects that might cause biodiversity harm. When biodiversity loss happens, nothing can compensate for it, as it is a non-recovery process, and the habitats and their physical factors will change permanently from such construction projects. Only timely biodiversity harm recognition would help minimize the upcoming disaster caused by biodiversity loss in the ecosystem. Only biologists/ecologists could estimate biodiversity harm from the subsidies timely. Therefore, having a biologist position in such government departments/offices will be essential for minimizing the harm caused by government subsidies to biodiversity.

Note:

Field biologists in this context must primarily hold a bachelor's degree in biology, botany, zoology, or ecology and have experience in field research and NOT other related fields. Biologists ARE NOT environmental scientists, agriculturalists, fisheries experts, or other related applied biological fields.

The Memorandum of Understanding between the landowner and the local government units regarding exemption of land tax collection for biodiversity conservation. Biology staff of local universities should be included in the Provincial Land Assessment Committee (Ministry of Interior and Ministry of Finance). Some rules should be applied, such as this land tax exemption should not be applied to land cover with more than 50% of alien species (list of alien species refer to https://www.doa.go.th)

Nature-based Solution: suggestion for practice

Nature-based Solutions (NbS): meaning and application

Various organizations have used the term Nature-based Solutions to accredit their activities in the natural ecosystem when they apply problem-solving in places after harmful subsidies to local biodiversity from their practices. Alternatively, they often claim that the subsidies, which eventually harm biodiversity, were applied with NbS concerns.

The meaning of Nature-based Solutions as per "Nature-Based Solutions Initiative" is as follows:

- 1 NbS are not a substitute for the rapid phase-out of fossil fuels and must not delay urgent action to decarbonize our economies.
- 2 Nbs involves the protection, restoration, or management of a wide range of natural and semi-natural ecosystems, the sustainable management of aquatic systems and working lands, or the creation of novel ecosystems in and around cities or across the broader landscape.
- 3 NbS are designed, implemented, managed, and monitored by or in partnership with Indigenous peoples and local communities through a process that fully respects and champions local rights and knowledge and generates local benefits.
- A NbS supports or enhances biodiversity, that is, the diversity of life from the gene level to the ecosystem level.

However, when considering biodiversity, NbS should be careful when referring to it. Sometimes, referring directly to the suggestion of the Nature-Based Solutions Initiative could confuse and mislead practitioners. To maintain natural biodiversity, it is suggested here that NbS strictly focuses on the natural process and non-human induction. To revive or maintain natural biodiversity, the evolutionary process must go on freely without the management of humans. Otherwise, NbS itself would not support or enhance biodiversity, that is, the diversity of life from the gene level to the ecosystem level, as proposed in category 4 of the Nature-Based Solutions Initiative, since the manipulation by humans will have significant impacts on the genetics

of natural populations. The example of NbS, as per reporters, can be seen from the case study in this report at Mrigadayavan Palace, Cha-am, Phetchaburi. NbS should result in maintaining/reviving the original biodiversity of the areas. Most importantly, NbS practices must be evaluated by ecologists/ biologists with strictly educational/research backgrounds in the ecology of such habitats, not other environmentalists who are not involved in such ecological backgrounds or amateur naturalist/nature lover volunteers or corporate social responsibility (CSR) persons as done by various government offices when harmful subsidies to biodiversity are detected at the moment.

Nevertheless, most NbS practices in Thailand are doubtful due to the lack of evaluation by professional field biologists/ecologists.



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Annex 1: The survey of government projects and policies/laws impacting Thailand's biodiversity and ecosystem have been listed below.

Fiscal year	Ministry	Agency	Remark	Project title
2021	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along the riverbank
2021	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along Yuam riverbanks for 600 m at Moo 1 Ban Mae suad, Sob Muel District, Mae Hong Son province
2021	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along Klong Oom banks with landscape improvement at Wat Kwan Mueng Moo 8 Bangkrang, Mueng Nonthsaburi distrct, Nonthaburi province
2021	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along the riverbank
2021	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along Yuam riverbanks for 600 m at Moo 1 Ban Mae suad, Sob Muel District, Mae Hong Son province
2021	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along Klong Oom banks with landscape improvement at Wat Kwan Mueng Moo 8 Bangkrang, Mueng Nonthaburi distrct, Nonthaburi province
2021	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction with landscape improvement at Wat Chin Wararam (Face 3), Mueng Bangkayaeng, Mueng Pathum Thani distrct, Pathumthani province
2021	Interior	Department of Public Works and Town & Country Planning	R	Nconstruction with landscape improvement at Wat Bang Tuei Nog, Mueng Bang Tuei Nog, Sam Kog district, Pathum Thani province
2021	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction with landscape improvement at Wat Bang Luang (Face 2), Bang Luang, Mueng Pathumthani distrct, Pathum Thani province
2021	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction with landscape improvement at Wat Sakae, Sam Kog district, Pathum Thani province 150 m
2021	Interior	Rajaburi and adjacent	U	Town ecosystem development project
2021	Natural resources and Environment	Department of Marine and coastal resources	С	Marine and coastal resource status assessment for fiscal year 2564
2021	Natural resources and Environment	Department of Marine and coastal resources	С	Marine and coastal resource status assessment for fiscal year 2564

Remark: C = Coastal ecosystem; F = Forest ecosystems; G = General conservation projects; R = River systems; W = Wetlands

Fiscal year	Ministry	Agency	Remark	Project title
2021	Natural resources and Environment	Department of Marine and coastal resources	W	Sea waste management for 2564 fiscal year
2021	Natural resources and Environment	Department of Marine and coastal resources	С	Regional collaboration project for marine and coastal natural resources for 2564 fiscal year
2021	Natural resources and Environment	Department of Marine and coastal resources	С	All sections coral and sea grass restoration project for 2564 fiscal year
2021	Natural resources and Environment	Department of Marine and coastal resources	W	Promotion of High efficiency natural resources management in public participation encouragement; aquatic animal populations restoration and sea waste management
2021	Natural resources and Environment	Department of Marine and coastal resources	С	Integration of coastal erosion protection in 23 coastal provinces
2021	Natural resources and Environment	Department of Marine and coastal resources	С	Efficiency promotion project for mangrove conservation and protection for sustainable growth of green economic society
2021	Natural resources and Environment	Department of Marine and coastal	С	Mangrove protection works
2021	Natural resources and Environment	Department of Marine and coastal resources	С	Standard environmental effects setting for the coastal constructions with EIA exemption
2021	Natural resources and Environment	Department of Marine and coastal resources	С	Management and administration for promoting marine and natural resources management and conservation
2021	Natural resources and Environment	Department of Marine and coastal resources	С	Marine natural resources conservation and restorations project for appropriate uses (artificial coral and seagrass safeguarding and restoring activities)
2021	Natural resources and Environment	Administration office, Botanic gardens section	G	Rare and endangered plants conservation areas development project
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	G	Biodiversity management activities
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Forest and wildlife management activities

Fiscal year	Ministry	Agency	Remark	Project title
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	G	Medicinal herbs surveys and database accumulations activities
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Forest fire management for 2564 fiscal year
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Natural resource and environment management: participation in forest fire and smog problem solving project
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Wildlife conservation and protection activities
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Forest fire protection and smog prevention integration project of Chiangrai
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Natural resource base conservation project/ degraded forest restorations for 2564 fiscal year
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Protected forest restoration (river basin) face 1 (watershed forest restoration) for 2564 fiscal year
2021	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Sustainable forest resource and environment management (watershed forest protection and restoration Northern part eastern part central part North-eastern part and southern part) for 2564 fiscal year
2021	Natural resources and Environment	Administration office, Office of Natural resource and environment Mae Hong Son	F	Protection and suppression of deforestation provincial project (Mae Hong Son)
2021	Natural resources and Environment	Administration office, Office of Natural resource and environment Roi Ed	F	2564 Protection and suppression of deforestation provincial project (Roi Ed) for 2564 fiscal year
2021	Natural resources and Environment	Office Of Natural Resources and Environmental Policy and Planning	G	Landscape environment; natural environment and art environment sustainable management project: art environment conservation planning areas by type

Fiscal year	Ministry	Agency	Remark	Project title
2021	Natural resources and Environment	Office Of Natural Resources and Environmental Policy and Planning	G	Areas management for sustainable environment protection
2021	Natural resources and Environment	Office Of Natural Resources and Environmental Policy and	G	Smart EIA project
2021	Natural resources and Environment	Office Of Natural Resources and Environmental Policy and Planning	G	EIA process efficiency promotion
2021	Natural resources and Environment	Office of the Ministry of the ministry of Natural resources and Environment	F	Forest restoration (river basin) project face 1
2021	Natural resources and Environment	Office of the Ministry of the ministry of Natural re- sources and Environment	F	Integration activities of "Nan forest lovers" community
2021	Natural resources and Environment	Office of the Ministry of the ministry of Natural resources and Environment	W	Wild elephant protection and conservation
2021	Natural resources and Environment	Office of the Ministry of the ministry of Natural resources and Environment	F	Reforestation project with public participation
2021	Transport	Marine Department	R	Lower Songkhla Lake channel dredging contract for development and restoration (km. 2-4)
2021	Transport	Marine Department	R	Surveys and dredging contract for river maintenances of Ping Wang Yom Nan rivers for 200 km.
2022	Natural resources and Environment	Department of water resource	R	Expenses in system development of follow-up and assessment of water resource by ecosystem (Ecosystem Based Adaptation: EbA)
2022	Natural resources and Environment	Department of Marine and coastal resources	W	Sea waste management for 2564 fiscal year
2022	Transport	Marine Department	R	Dredging and maintenance project of the river Yom channel km 529+900 - km 530+950. km 532+650 - km 533+750, km 535+350 - km 536+700 Denchai to Nong muang kai districts, Prae province

Fiscal year	Ministry	Agency	Remark	Project title
2022	Education	Office of the Basic Education Commission, Supanburi secondary school office	G	Quick Win Research in the issue of natural resource and environment conservation for the 2564 fiscal year
2022	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Siamese rosewood and valuable wood protection activities
2022	Natural resources and Environment	Administration office, Office of Natural resource and environment Prachaup Kiri Khan	F	Resource restoration activities support project reforestation wildlife protection
2022	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along Chao Praya river banks at Wat Patumthong Moo 1 Ban Patum, Samkog district, Patumthani province
2022	Natural resources and Environment	Department of Forestry	F	Forest protection and green areas development and accumulation
2022	Natural resources and Environment	Department of Forestry	F	Systematically fare management of the forest lands project
2022	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Degraded protected forest restoration for 2565 fiscal year
2022	Transport	Marine Department	R	Dredging and maintenance project of the river Shee channel km 195 - km 200. Panomprai districts, Roi Ed province to Muang Yasothon district, Yasothon province
2022	Transport	Marine Department	R	Surveys and dredging contract for river maintenances at Shee river for 200 km. Bureau for channel development and maintenance 8
2022	Transport	Marine Department	R	Surveys and dredging contract for river maintenances at Mool river for 200 km. Bureau for channel development and maintenace 8
2022	Transport	Marine Department	R	Details design and study for dredging and restoring river Jang, Lampang province
2022	Interior	Department of Local Administration Promotion	W	Subsidy for waste management of local administrative organization
2022	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Watershed forest restoration areas for 2565 fiscal year

Fiscal year	Ministry	Agency	Remark	Project title
2022	Transport	Department of land transport	G	Pollution and VOCs releasing control (Land transport Bureau, Mabtapud area, Rayong
2022	Natural resources and Environment	Department of water resource	F	Protected forest restoration (Basin) phrase 1
2022	Natural resources and Environment	Department of Forestry	R	Weir releasing at Klong Rung, Ban Buyaibai Ban Kogsawang Moo 4 Tatum, Sri Mahabodhi, Prachinburi province
2022	Natural resources and Environment	Department of Forestry	F	Forest protection and green areas development and accumulation
2022	Natural resources and Environment	Office of the Ministry of the ministry of Natural resources and Environment	W	Waste and harmful waste management controlling project of the provincial areas
2022	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along Chao Praya River at Wat Samlae Moo 2 Ban Krachang Mueng Prathum Thani district, Prathum Thani province
2022	Natural resources and Environment	National parks Wildlife and Plant Conservation	F	Forest fire management for 2565 fiscal year
2022	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Promotion activities for the Forest fire problems solving for 2565 fiscal year
2022	Interior	Department of Local Ad- ministration Promotion	W	Subsidy for waste management of local adminis- trative organization
2022	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Watershed forest restoration areas for 2565 fiscal year
2022	Transport	Department of land transport	G	Pollution and VOCs releasing control (Land transport Bureau, Mabtapud area, Rayong
2022	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Protected forest restoration (Basin) phase 1
2022	Natural resources and Environment	Department of water resource	R	Weir releasing at Klong Rung, Ban Buyaibai Ban Kogsawang Moo 4 Tatum, Sri Mahabodhi, Prachinburi province
2022	Natural resources and Environment	Department of Forestry	F	Forest protection and green areas development and accumulation

Fiscal year	Ministry	Agency	Remark	Project title
2022	Natural resources and Environment	Office of the Ministry of the ministry of Natural resources and Environment	W	Waste and harmful waste management controlling project of the provincial areas
2022	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along Chao Praya River at Wat Samlae Moo 2 Ban Krachang Mueng Prathum Thani district, Prathum Thani province
2022	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Forest fire management for 2565 fiscal year
2022	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Promotion activities for the Forest fire problems solving for 2565 fiscal year
2022	Natural resources and Environment	Administration office, Office of Natural resource, and environment Trang	F	Provincial prevention and suppression project of deforestation Trang province
2022	Natural resources and Environment	Administration office, aviation section	F	2565 Natural resources and environment prevention and suppression project by aircraft and terrestrial integration for 2565 fiscal year
2022	Natural resources and Environment	Department of Environmental Quality Promotion (DEQP)	W	National public participation in discipline construction for sustainable waste and environment management
2022	Natural resources and Environment	Administration office, Office of Natural resource, and environ- ment Uttaradit	F	Provincial prevention and suppression project of deforestation Uttaradit province
2022	Natural resources and Environment	Administration office, Office of Natural resource, and environment Yasothon	F	Tree planting and maintenance project
2022	Interior	Department of Public Works and Town & Country Planning	R	Concrete dyke construction along Chao Praya riverbanks with landscape improvement at Wat Bang Chak to Wat Indraram Pak Kred district, Nonthaburi province
2022	Interior	Department of Public Works and Town & Country Planning	R	Flood preventing concrete dyke construction project with concrete pavement and pier for river traveling at Phra Nung Klao hospital, Nonthaburi province
2022	Natural resources and Environment	Administration office, Of- fice of Natural resource, and environment Phuket	F	Provincial deforestation prevention and suppression project

Fiscal year	Ministry	Agency	Remark	Project title
2022	Natural resources and Environment	Department of Environmental Quality Promotion (DEQP)	F	Natural resources and environment conscience building project
2022	Natural resources and Environment	Pollution Control Department	W	Garbage and harmful waste pollution prevention and problems solving project
2022	Natural resources and Environment	Pollution Control Department	W	Harmful substance pollution prevention and problems solving project
2022	Natural resources and Environment	Administration office, Office of Natural resource, and environment Roi Ed	W	Provincial Solid and harmful waste removal plan follow-up and controlling collaboration project.
2022	Natural resources and Environment	Pollution Control Department	W	Law examining and enforcing to the water pollution sources project
2022	Natural resources and Environment	Department of Marine and coastal resources	С	Coastal erosion prevention by slowing down the wave energy by bamboo sticks
2022	Natural resources and Environment	Administration office, Office of Natural resource, and environment Chainat	F	Provincial prevention and suppression project of deforestation
2022	Natural resources and Environment	Administration office, Botanic gardens section	F	Rare and endangered plants conservation areas development project
2022	Natural resources and Environment	Administration office, Office of Natural resource, and environment	F	Protection and suppression of deforestation provincial project (Roi Ed) for 2564 fiscal year
2022	Education	Office of the Basic Education Commission, Loei area 2 primary school Bureau	W	Government office solid waste management
2022	Natural resources and Environment	Administration office, Office of Natural resource, and environment Pattani	W	Provincial Solid and harmful waste removal plan follow-up and controlling collaboration project in Pattani province for 2565 fiscal year
2022	Natural resources and Environment	Department of Marine and coastal resources	F	Mangrove resources management
2022	Natural resources and Environment	Administration office, Office of Natural resource, and environment Surat Thani	W	Provincial Solid and harmful waste removal plan follow-up and controlling collaboration project in Surat Thani province for 2565 fiscal year
Fiscal year	Ministry	Agency	Remark	Project title
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2022	Natural resources and Environment	Administration office, Office of Natural resource, and environment Surat Thani	F	Provincial prevention and suppression project of deforestation
2022	Education	Office of the Basic Education Commission, Tak area 1 primary school	G	Tree planting for life and air pollution decreasing
2022	Education	Office of the Basic Education Commission, Prae area 1 primary school Bureau	G	Ecological-Industrial development and pollution and environmental management through environmental study activities for environmentally friendly life
2023	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	G	Patrol system reforming project according to quality patrol standard for 2566 fiscal year
2023	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Minimizing greenhouse gas release in forestry section project by motivating and public participating process face 2
2023	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Stability of natural resources base maintenance project elephant tasks trading control
2023	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Forest resources conservation promotion project under man and biosphere project
2023	Natural resources and Environment	Department of Marine and coastal resources	F	Mangrove planting promotion for commercial purpose in privately-owned properties
2023	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Forest fire controlling activities for 2566 f iscal year
2023	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Natural resource base conservation project, forest fire problems solving efficiency promotion activities for 2566 fiscal year
2023	Natural resources and Environment	Department of Marine and coastal resources	F	Development of monitoring system on changes of mangrove areas
2023	Natural resources and Environment	Department of Forestry	F	Forest protection and the green areas increasing promotion
2023	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Natural resource base conservation project/ degraded protected forest restorations
2023	Natural resources and Environment	Department of Marine and coastal resources	F	Mangrove carbon credits management

Fiscal year	Ministry	Agency	Remark	Project title
2023	Natural resources and Environment	Department of water resource	R	Expenses in carry-on major plan of 20 years water management/ section 4 conservation and restoration river systems and inland natural water sources
2023	Natural resources and Environment	Department of water resource	R	Expenses in carry-on major plan of 20 years water management/ section 5 conservation and restoration degraded water shed forest and prevention of soil erosion
2023	Natural resources and Environment	Department of water resource	R	Project/operation: expenses in studying status and biodiversity surveys of wetlands for conservation and development (face 1)
2023	Natural resources and Environment	Department of Marine and coastal resources	С	Project Sea water quality monitoring with sustainable risk prevention system
2023	Natural resources and Environment	Department of National parks Wildlife and Plant Conservation	F	Protected forest restoration (Basin) face 1
2023	Natural resources and Environment	Department of Marine and coastal resources	С	Coast management and systematic coastal erosion prevention
2023	Industry	Department of industrial works	G	(Green Industry) Establishments promotion and development to green industry
2023	Natural resources and Environment	Administration office, Botanic gardens section	F	Rare and endangered plants conservation areas development project
2023	Higher Educa- tion, Science, Research. and Innovation)	National science museum	G	Natural history archive collections conservation and biodiversity national center
2021	Agriculture and Cooperatives	Royal Irrigation Department	R	Water management project on water sources and irrigation development, fiscal year 2564
2022	Agriculture and Cooperatives	Royal Irrigation Department	R	Water management project on water sources and irrigation development, fiscal year 2565
2023	Agriculture and Cooperatives	Royal Irrigation Department	R	Water management project on water sources and irrigation development, fiscal year 2566

Annex 2: Relevant legal framework of land tax in Thailand

Royal Gazette dated 19 January 2023 of the Ministry of Finance of Thailand, Page 23, Reference 139, Edition 14 - Criteria of privately-owned land for transferring of privately use to the public.

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เล่ม	୭୩๙	ตอนพิเศษ	ଭଝ	٩	ราชกิจจานุเบกษา	୭๙	มกราคม	<u> කිරීම</u>

ประกาศกระทรวงการคลัง

เรื่อง หลักเกณฑ์การพิจารณาทรัพย์สินของเอกชน เฉพาะส่วนที่ได้ยินยอมให้ทางราชการจัดให้ใช้เพื่อสาธารณประโยชน์

Royal Gazette, dated 12 March 2019, Page 21, Reference 136, Edition 30 - Land Tax Act of Thailand

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เล่ม	໑ຓຉ	ตอนที่	៣០	ก	ราชกิจจานุเบกษา	ଡାଡ	มีนาคม	ම්ද්රම



พระราชบัญญัติ ภาษีที่ดินและสิ่งปลูกสร้าง พ.ศ. ๒๕๖๒

สมเด็จพระเจ้าอยู่หัวมหาวชิราลงกรณ บดินทรเทพยวรางกูร

ให้ไว้ ณ วันที่ ๙ มีนาคม พ.ศ. ๒๕๖๒ เป็นปีที่ ๔ ในรัชกาลปัจจุบัน Royal Gazette, dated 10 March 2022, Page 28, Reference 140, Edition 55- Criteria for agricultural uses (issue 2)

หน้า ๒๘ เล่ม ๑๔๐ ตอนพิเศษ ๕๕ ง ราชกิจจานุเบกษา ๑๐ มีนาคม ๒๕๖๖

ประกาศกระทรวงการคลังและกระทรวงมหาดไทย

เรื่อง หลักเกณฑ์การใช้ประโยชน์ในการประกอบเกษตรกรรม (ฉบับที่ ๒)

ตามที่กระทรวงการคลังและกระทรวงมหาดไทยได้มีประกาศกระทรวงการคลังและกระทรวงมหาดไทย เรื่อง หลักเกณฑ์การใช้ประโยชน์ในการประกอบเกษตรกรรม ลงวันที่ ๓๐ มกราคม พ.ศ. ๒๕๖๓ กำหนดหลักเกณฑ์การใช้ประโยชน์ในการประกอบเกษตรกรรม สำหรับการจัดเก็บภาษีที่ดินและสิ่งปลูกสร้าง ตามพระราชบัญญัติภาษีที่ดินและสิ่งปลูกสร้าง พ.ศ. ๒๕๖๒ โดยกำหนดการใช้ประโยชน์ในการ ประกอบเกษตรกรรมที่มีชนิดพืช ชนิดสัตว์ หรือลักษณะการใช้ประโยชน์ในที่ดินหรือสิ่งปลูกสร้าง ตามที่ปรากฏในบัญชีแนบท้ายประกาศ ให้มีอัตราขั้นต่ำของการประกอบการเกษตรต่อไร่ อัตราพื้นที่ คอกหรือโรงเรือน อัตราการใช้ที่ดินหรือมีลักษณะการใช้ประโยชน์ตามที่ระบุไว้ในบัญชีแนบท้าย นั้น

เพื่อให้อัตราขั้นต่ำของการประกอบการเกษตรต่อไร่มีความสอดคล้องกับข้อเท็จจริงในการ ประกอบเกษตรกรรมมากยิ่งขึ้น ฉะนั้น อาศัยอำนาจตามความในมาตรา ๖ วรรคหนึ่ง และมาตรา ๓๗ วรรคสอง แห่งพระราชบัญญัติภาษีที่ดินและสิ่งปลูกสร้าง พ.ศ. ๒๕๖๒ รัฐมนตรีว่าการกระทรวงการคลัง และรัฐมนตรีว่าการกระทรวงมหาดไทย จึงมีประกาศ ดังต่อไปนี้

ข้อ ๑ ให้ยกเลิกบัญชีแนบท้าย ก ของประกาศกระทรวงการคลังและกระทรวงมหาดไทย

เรื่อง หลักเกณฑ์การใช้ประโยชน์ในการประกอบเกษตรกรรม ลงวันที่ ๓๐ มกราคม พ.ศ. ๒๕๖๓ และให้ใช้บัญชีแนบท้าย ก ตามประกาศฉบับนี้แทน

ข้อ ๒ ประกาศฉบับนี้ให้ใช้บังคับตั้งแต่วันประกาศในราชกิจจานุเบกษาเป็นต้นไป

ประกาศ ณ วันที่ ๓๑ มกราคม พ.ศ. ๒๕๖๖

พลเอก อนุพงษ์ เผ่าจินดา รัฐมนตรีว่าการกระทรวงมหาดไทย

อาคม เติมพิทยาไพสิฐ รัฐมนตรีว่าการกระทรวงการคลัง List of Plant species suggested to be planted in "Banchi Naeb Tai Ko" of the Royal Gazette, dated 10 March 2022, Page 28, Reference 140, Edition 55- Criteria for agricultural uses (issue 2) in English

Plants	The least suggested number of individual plant/Rai
1.Banana "Kluai Hom" (<i>Musa</i> sp.)	200
2.Banana "Kluai Kai" (<i>Musa</i> sp.)	200
3.Banana "Kluai Nam Wa" (<i>Musa</i> sp.)	200
4.Sour Satol (Sandoricum koetjape (Burm.f.) Merr.)	25
Satol cultivar 'Tap-tim" (Sandoricum koetjape (Burm.f.) Merr.)	
Satol cultivar 'Pui-fai' (Sandoricum koetjape (Burm.f.) Merr.)	25
5.Coffee (<i>Coffea</i> sp.)*	170
Robusta coffee (Coffea canephora Pierre ex A. Froehner; synonym-C. robusta L. Linden)*	170
Arabica Coffee (Coffea Arabica L.)*	400
6. Clove (Syzygium aromaticum (L.) Merr. & Perry)*	20
7. Siam Cardamom (Kravan) (Amomum krervanh Pierre.)*	200
8. Cacao (Theobroma cacao L.)*	150-170
9. Jack fruit tree (Artocarpus heterophyllum Lam.)*	25
10. Rambutan (Nephelium lappaceum L.)*	20
11. Champadak (Artocarpus integer (Thunb.) Merr.)*	25
12. Nutmeg (Myristica fragrans Houtt.)*	25
13. Jambos (Syzygium jambos (L.) Alston)*	45
14. Durian (Durio zibethinus L.)*	20
15. Peach (Prunus persica (L.) Batsch)*	45
16. Swamp apple (Noi-na) (Anona glabra L.)*	170
17. Cotton tree (Bombax ceiba L.)*	25
18. Japanese apricot (Boui) (Prunus mume (Siebold) Siebold & Zucc.)*	45
19. Oil palm (<i>Elaeis guineensis</i> L .)*	22
20. Guava (Psidium guajava L.)*	45
21.Ziziphus (Ziziphus muaritana L .)*	80
22. Passion fruit (<i>Passiflora laurifolia</i> L.)*	400
23. Black Pepper (Piper nigrum L.)*	400
24. Betal pepper (Piper betle L.)*	100
25. Mango (Mangifera indica L.)	20
26. Young coconut fruit tree (Cocos mucifera L.)	20
27. Coconut tree (Cocos mucifera L.)	20
28. Cashew (Anarcadium Occidentale L.)	45
29. Papaya tree (Carica papaya L.)*	
"Yog-rong" planted (planted on a man-made mound)	100
No mound	175

30. Lime tree (Citrus xaurantifolia (Christm.) Swingle *	50
31. Plum mango (Bouea macrophylla Groffith)	25
32. Sour Tamarind tree (Tamarindus indica L.)*	25
33. Sweet Tamarind tree (Tamarindus indica L.)*	25
34. Magosteen (Gacinia mangostana L.)*	16
35. Para-rubber tree (Hevea brazilliensis Muell.Arg)*	80
36. Litchi (Litchi chinensis Sonn.)*	20
37. Longan (Dimocarpus longan Lour.)*	20
38. Sapodilla plum tree (Manilkara zapota (L.) P.Royen.)*	45
39. Langsat (Lansium parasiticum (Osbeck) K.C. D]Sahni & Bennet)	45
40. Long-gong(Lansium parasiticum (Osbeck) K.C. D]Sahni & Bennet)	45
41. Pomelo (Citrus maxima (Burm.f.) Merr.)	45
42. Som Kliang (orange) (Citrus sinensis (L.) Osbeck)*	45
43. Som traa (orange) (Citrus sinensis (L.) Osbeck)*	45
44. Mandarin orange, tangerine (Citrus reticulata Blanco)*	45
45. Som Chuk (orange) (Citrus reticulata Blanco)*	45
46. Chinese pear (Pyrus pyrifolia (Burm.f.) Nakai)*	45
47. Stinky bean tree (Parkia specios a Hassk.)*	25
48. Shoot-eating Bamboo (Pai Tong) Dendrocalamus asper (Schultes f.) Backer ex Heyne. *	25
49. Betel nut pal (Areca catechu L.)*	100-170
50. Mulberry (Morus alba L.) *	35
51. Grape (Vitis vinifera L.)*	35
52. Dragon fruit vine (Hylocercus undatus (Haw) Brit. & Rose.)*	35
53. Apple tree (Malus domestica Borkh.)*	35
54. Avocado tree (Persea americana Mill.)*	35
55.Date tree (Phoenix dactylifera L.)*	35
56. Eucalyptus tree (Eucalyptus spp.)*	35
57. woody trees	30

* Exotic plant species in Thailand (as per reporters).

Notice

- 1. In case the planted species is not on this list, the suggested no./rai should be calculated according to the closest compared species to the list
- 2. If the planted species cannot be compared to this list, the consideration depends on the agricultural procedure of each local area.

Royal Gazette, dated 25 December 2019, Page 7, Reference 136, Edition 141

Ministerial regulations: Abandoned land property or building without appropriate utilization in 2019.

					หน้า ๗			
เล่ม	໑ຓ៦	ตอนที่	ଭଝ୍ର	ก	ราชกิจจานุเบกษา	්ම	<mark>ธันวาค</mark> ม	ම්ද්රීම
	กฏกระทรวง กำหนดที่ดินหรือสิ่งปลูกสร้างที่ทิ้งไว้ว่างเปล่าหรือไม่ได้ทำประโยชน์ตามควรแก่สภาพ							
					พ.ศ. මඳ්ටම			
ภาษี ดังต่	อาเ ที่ดินแ <i>ล</i> อไปนี้	ศัยอำนาจ เะสิ่งปลูก	งตามคว าสร้าง	ามในมา พ.ศ. ๒	ตรา ๖ วรรคหนึ่ง และมาตรา ๑๕๖๒ รัฐมนตรีว่าการกระทรว	๓๗ วรรคสี่ วงมหาดไทยอ	แห่งพระรา อกกฎกระ	ชบัญญัติ ทรวงไว้
	ข้อ (๑)	๑ ลั ที่ดินท์	ักษณะที่ 1้โดยสภ	ดินหรือส์ าพสาม	ริ่งปลูกสร้างที่ทิ้งไว้ว่างเปล่าให้เป็ ารถทำประโยชน์ได้ แต่ไม่มีกา	็นไปตามหลักเ รทำประโยชน์	กณฑ์ ดังต เในที่ดินนั้น	่อไปนี้ เตลอดปี
ที่ผ่า	นมา <mark>เ</mark> ว้	นแต่การ	ที่ไม่สาม	ารถทำป	ระโยชน์นั้นเนื่องจากมีเหตุธรรมร	ชาติหรือเหตุพ้	นวิสัย	
	(ര)	สิ่งปลู	กสร้างที่	โดยสภา	พสามารถทำประโยชน์ได้ แต่ถู	กทิ้งร้างและไม	ม่มีการทำป	ระโยชน์
ในสิ่	งปลูกสร้	างนั้นตล	อดปีที่ผ่า	านมา				

ข้อ ๒ ลักษณะที่ดินหรือสิ่งปลูกสร้างที่ไม่ได้ทำประโยชน์ตามควรแก่สภาพให้เป็นไป ตามหลักเกณฑ์ ดังต่อไปนี้

(๑) ที่ดินที่โดยสภาพสามารถทำประโยชน์ในการประกอบเกษตรกรรม แต่มีการทำประโยชน์ ไม่เป็นไปตามหลักเกณฑ์ที่รัฐมนตรีว่าการกระทรวงการคลังและรัฐมนตรีว่าการกระทรวงมหาดไทย ประกาศกำหนดตามมาตรา ๓๗ วรรคสอง ตลอดปีที่ผ่านมา

(๒) สิ่งปลูกสร้างที่ก่อสร้างหรือปรับปรุงเสร็จแล้วและโดยสภาพสามารถทำประโยชน์ ในการประกอบเกษตรกรรมหรือเป็นที่อยู่อาศัยหรือทำประโยชน์อื่นที่ไม่ใช่การทำประโยชน์ ในการประกอบเกษตรกรรมหรือเป็นที่อยู่อาศัย แต่ไม่มีการใช้ประโยชน์ตลอดปีที่ผ่านมา

ข้อ ๓ ความในข้อ ๑ และข้อ ๒ มิให้ใช้บังคับกับที่ดินหรือสิ่งปลูกสร้าง ดังต่อไปนี้

(๑) ที่ดินที่อยู่ระหว่างเตรียมการเพื่อทำประโยชน์ หรือสิ่งปลูกสร้างที่อยู่ระหว่างการก่อสร้าง

(๒) ที่ดินหรือสิ่งปลูกสร้างที่ถูกรอนสิทธิในการทำประโยช[ั]นโดยกฎห[ุ]้มาย หรือโดยคำสั่ง หรือคำพิพากษาของศาล

(๓) ที่ดินหรือสิ่งปลูกสร้างที่อยู่ระหว่างการพิจารณาคดีของศาลเกี่ยวกับกรรมสิทธิ์หรือ สิทธิครอบครอง

					หน้า ๘			
เล่ม	໑ຓ៦	ตอนที่	ଭଝ୍ର	ก	ราชกิจจานุเบกษา	୭୯	ธันวาคม	මඳ්ටම

ข้อ ๔ ในการพิจารณาว่าที่ดินหรือสิ่งปลูกสร้างใดเป็นที่ดินหรือสิ่งปลูกสร้างที่ทิ้งไว้ว่างเปล่า หรือที่ไม่ได้ทำประโยชน์ตามควรแก่สภาพ ให้คำนึงถึงสิ่งแวดล้อม สภาพภูมิประเทศ สภาพดิน ความลาดชันของพื้นดิน และการทำประโยชน์ของที่ดินหรือสิ่งปลูกสร้าง ในบริเวณใกล้เคียง

> ให้ไว้ ณ วันที่ ๒๐ ธันวาคม พ.ศ. ๒๕๖๒ พลเอก อนุพงษ์ เผ่าจินดา รัฐมนตรีว่าการกระทรวงมหาดไทย

					หน้า ๙			
เล่ม	ດຕາວ	ตอนที่	ଭଙ୍ଭ	ึก	ราชกิจจานุเบกษา	୭୯	ธันวาคม	මඳ්ටම

<u>หมายเหตุ</u> :- เหตุผลในการประกาศใช้กฎกระทรวงฉบับนี้ คือ โดยที่มาตรา ๓๗ วรรคสี่ แห่งพระราชบัญญัติ ภาษีที่ดินและสิ่งปลูกสร้าง พ.ศ. ๒๕๖๒ บัญญัติให้ที่ดินหรือสิ่งปลูกสร้างที่ทิ้งไว้ว่างเปล่าหรือไม่ได้ทำประโยชน์ ตามควรแก่สภาพให้เป็นไปตามหลักเกณฑ์ที่กำหนดในกฎกระทรวง สมควรกำหนดหลักเกณฑ์ของที่ดินหรือ สิ่งปลูกสร้างที่ทิ้งไว้ว่างเปล่าหรือไม่ได้ทำประโยชน์ตามควรแก่สภาพ เพื่อให้เกิดความชัดเจนแก่ผู้มีหน้าที่ เสียภาษี จึงจำเป็นต้องออกกฎกระทรวงนี้ Annex 3: The minutes of the meeting of the National Policy and Plan Committee for Marine and Coastal Resources under the Department of Marine and Coastal Resources, Ministry of Natural Resources and Environment of Thailand dated 27 September 2021, chaired by the Prime Minister of Thailand

รายงานการประชุม	
คณะกรรมการนโยบายและแผนการบริหารจัดการทรัพยากรทางทะเลแล ครั้งที่ ๒/๒๕๖๔	าะชายฝั่งแห่งชาติ
วันจันทร์ที่ ๒๗ กันยายน พ.ศ. ๒๕๖๔ เวลา ๑๐.๐๐ น ผ่านสื่ออิเล็กทรอนิกส์ (Zoom Cloud Metting) ร่วมกับห้องประชุม ๓๐๑ ทำเนียบรัฐบาล	
I CEILE VĂ CULĂ KĂLĂ DI VĂ PLĂ DI VĂRĂ ÎN	
กรรมการผู้มาประชุม	
ด. พลเอก ประวิตร วงษ์สุวรรณ	ประธานกรรมการ
รองบายกรัฐมนตรี	
๒. นายวราวุธ ศิลปอาซา	รถงประชานกรรมการ
รัฐมนตรีว่าการกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม	
 ณายจตุพร บุรุษพัฒน์ 	กรรมการ
ปลัดกระทรวงทรัพยากรธรรมซาติและสิ่งแวดล้อม	
๔. พลเรือเอก สมประสงค์ นิลสมัย	กรรมการ
รองปลัดกระทรวงกลาโหม	
(แทน ปลัดกระทรวงกลาโหม)	
 พลเรือโท ประชาชาติ ศิริสวัสดิ์ 	กรรมการ

เรื่องที่ ๔.๑๓ แนวทางการแก้ไขปัญหาในพื้นที่พระราชนิเวศน์มฤคทายวันฯ

อธิบดีกรมทรัพยากรทางทะเลและชายฝั่ง กรรมการและเลขานุการ กล่าวว่า ขออนุญาตให้ รองอธิบดีกรมทรัพยากรทางทะเลและชายฝั่ง (นางสาวพรศรี สุทธนารักษ์) เป็นผู้นำเสนอในเรื่องที่ ๔.๑๓ แนวทางการแก้ไขปัญหาในพื้นที่พระราชนิเวศน์มฤคทายวันฯ

รองอธิบดีกรมทรัพยากรทางทะเลและชายฝั่ง (นางสาวพรศรี สุทธนารักษ์) รายงานสรุป ต่อที่ประชุมว่า ในคราวประชุมคณะรัฐมนตรีอย่างเป็นทางการนอกสถานที่เมื่อวันที่ ๖ มีนาคม ๒๕๖๑ ณ จังหวัดเพชรบุรี คณะรัฐมนตรีได้มีข้อสั่งการให้กรมทรัพยากรทางทะเลและซายฝั่งแต่งตั้ง "คณะอนุกรรมการเพื่อ แก้ไขปัญหาในพื้นที่พระราชนิเวศน์มฤคทายวันา" เพื่อแก้ไขปัญหาการกัดเขาะชายฝั่งทะเลและปัญหาน้ำเค็ม เข้าพื้นที่ และเมื่อวันที่ ๗ กรกฎาคม ๒๕๖๓ นายวราวุธ ศิลปอาชา รัฐมนตรีว่าการกระทรวงทรัพยากรธรรมชาติ และสิ่งแวดล้อม พร้อมด้วยนายจตุพร บุรุษพัฒน์ ปลัดกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม ลงพื้นที่ ตรวจราชการบริเวณพระราชนิเวศน์มฤคทายวันฯ และสั่งการให้กรมทรัพยากรทางทะเลและชายฝั่ง .ร่งดำเนินการ จัดทำแนวทางการแก้ไขปัญหาในพื้นที่พระราชนิเวศน์มฤคทายวันฯ ให้เป็นไปอย่างถูกต้อง โดยให้ทีมนักวิชาการ ศึกษาวิจัยรูปแบบการปรับภูมิทัศน์ เพื่อไม่ให้เกิดผลกระทบต่อสภาพแวดล้อม ระบบนิเวศธรรมชาติ ไม่บิดเบือน ข้อเท็จจริงทางประวัติศาสตร์และต้องไม่เกิดผลกระทบต่อพื้นที่ข้างเคียง

กรมทรัพยากรทางทะเลและชายฝั่ง ได้จ้างที่ปรึกษาจัดทำแนวทางการพื้นฟูระบบนิเวศชายหาด ในพื้นที่พระราชนิเวศน์มฤคทายวันฯ ให้สอดคล้องกับสภาพตามธรรมชาติ ทั้งนี้ คณะอนุกรรมการเพื่อแก้ไข ปัญหาในพื้นที่พระราชนิเวศน์มฤคทายวันฯ ได้มีมติเห็นชอบผลการศึกษาเพื่อจัดทำแนวทางการพื้นฟูระบบ นิเวศชายหาดในพื้นที่พระราชนิเวศน์มฤคทายวันฯ ได้มีมติเห็นชอบผลการศึกษาเพื่อจัดทำแนวทางการพื้นฟูระบบ แนวทางการรื้อรอดักทรายจำนวน ๓ ตัว คือ ตัวที่ ๓ ตัวที่ ๔ และตัวที่ ๕ ซึ่งอยู่บริเวณด้านหน้าพื้นที่พระราช นิเวศน์มฤคทายวันฯ ร่วมกับการใช้มาตรการเสริมอื่น ๆ ที่จำเป็น และ ๒) เห็นชอบแนวทางการจัดการ การแพร่กระจายความเค็มของน้ำใต้ดินสำหรับพื้นที่พระราชนิเวศน์มฤคทายวันฯ โดยการเติมน้ำจีดลงสู่ชั้นน้ำ ใต้ดินผ่านบ่อวง จำนวน ๒ บ่อ (บ่อเดิม ๒ บ่อและสร้างใหม่ ๓ บ่อ) ปิดประตูระบายน้ำในคลอง สูบน้ำเค็มออก จากคลองและเติมน้ำจึดเข้าไปทดแทนน้ำเค็มที่สูบออก และเนื่องจากมีประเด็นข้อกฎหมายที่เกี่ยวข้องที่สำคัญ คือโครงสร้างที่ก่อสร้างด้วยงบประมาณของกรมเจ้าท่า มีทะเบียนควบคุม จึงถือว่าโครงสร้างฯ ดังกล่าวเป็น ทรัพย์สินในความดูแลของกรมเจ้าท่า และเจ้าท่ายังมิได้ส่งมอบให้กรมธนารักษ์เพราะไม่อยู่ในเกณฑ์ที่กรมธนารักษ์ จะรับขึ้นทะเบียนได้ ดังนั้น โครงสร้างฯ ดังกล่าว จึงถือเป็น "พัสดุ" ในความครอบครองของกรมเจ้าท่า ตามพระราชบัญญัติการจัดซื้อจัดจ้างและการบริหารพัสดุภาครัฐ พ.ศ. ๒๕๖๐ ฉะนั้น การดำเนินการเพื่อรื้อ ถอนโครงสร้างฯ ดังกล่าวอดกจากพื้นที่พระราชนิเวศน์มฤคทายวันฯ จึงเป็นอำนาจหน้าที่ของกรมเจ้าท่า

ข้อสังเกตของที่ประชุม

นายศศิน เฉลิมลาภ ผู้ทรงคุณวุฒิ กล่าวว่า ขอชื่นชมในการทำงานของกรมทรัพยากรทางทะเล และชายฝั่งที่สามารถทำการศึกษาครั้งนี้ได้สำเร็จ เพราะถือเป็นการศึกษาครั้งแรกของประเทศไทยที่จะนำไปสู่ การพื้นฟูสภาพชายหาดได้ในพื้นที่อื่น ๆ อีกมาก และขอเสนอให้กรมทรัพยากรทางทะเลและชายฝั่งใช้การศึกษา ในครั้งนี้เป็นแนวทางในการประกาศ มาตรา ๒๑ ในการแก้ไขปัญหาการกัดเขาะชายฝั่ง ในกรณีการรื้อถอน โครงสร้างที่ทำให้เกิดการเสียสมดุลทราย ซึ่งเป็นโครงสร้างที่ได้ดำเนินการมาตั้งแต่ในอดีต เช่น กรณีของการกัดเขาะ ชายฝั่งบริเวณพระราชนิเวศน์มฤคทายวัน ที่ดำเนินการก่อสร้างเพื่อป้องกันการกัดเขาะชายฝั่งจากพายุลินดา ซึ่งเป็นตัวการที่ทำให้เกิดการกัดเขาะเพียงชั่วคราว แต่ได้มีการก่อสร้างเชื่อนป้องกันการกัดเขาะชายฝั่งจำนวนมาก ตลอดแนวชายฝั่ง ซึ่งจะเป็นการพื้นฟูสภาพชายหาดให้เป็นธรรมชาติในอนาคต

นายธงชัย ...

นายธงชัย พงษ์วิชัย ที่ปรึกษาด้านเศรษฐกิจการขนส่งทางน้ำ ผู้แทนปลัดกระทรวงคมนาคม กล่าวว่า ตามที่ฝ่ายเลขานุการ ๆ ได้นำเสนอว่าให้มีการรื้อรอดักทรายจำนวน ๓ ตัว คือ ตัวที่ ๓ ๔ และ ๕ ซึ่งอยู่ บริเวณด้านหน้าพื้นที่พระราชนิเวศน์มฤคทายวันๆ ร่วมกับการใช้มาตรการเสริมอื่น ๆ ที่จำเป็น ซึ่งไม่ตรงกับผล การศึกษาที่อยู่ในเล่มบทสรุปผู้บริหารในหน้าที่ ๔๓ ตามตารางที่ ๘ ได้สรุปการประเมินผลกระทบจากการรื้อ ย้ายโครงสร้างรอดักทรายด้านหน้าพระราชนิเวศน์มฤคทายวัน ซึ่งการรื้อกรณี ๒ – ๔ คือ การรื้อรอดักทราย ตำแหน่งที่ ๓ ๔ ๕ พบว่า มีคะแนนได้ ๕ คะแนน และจัดอยู่ในอันดับที่ ๘ ซึ่งหมายถึงมีผลกระทบต่อการกัดเซาะ ชายฝั่งมาก และในหน้าที่ ๔๔ – ๕๑ ไม่มีผลการวิเคราะห์การเปลี่ยนแปลงชายฝั่งในอนาคต กรณีการใช้ แนวทางรื้อย้ายรอดักทรายบางส่วน เพื่อพื้นฟูและปรับปรุงสภาพชายหาดให้สอดคล้องกับระบบนิเวศ ทางกายภาพตั้งเดิมของพระราชนิเวศน์มฤคทายวันๆ ซึ่งจะเห็นได้ว่า ในรายงานสรุปผู้บริหารกับความเห็น ของคณะอนุกรรมการๆ ที่เสนอขึ้นมานั้นไม่สอดคล้องกัน

อธิบดีกรมทรัพยากรทางทะเลและชายฝั่ง กรรมการและเลขานุการ กล่าวว่า ขออนุญาตให้ นายกิตติพจน์ เพิ่มพูล ที่ปรึกษาโครงการจัดทำแนวทางการพื้นฟูระบบนิเวศชายหาดในพื้นที่พระราชนิเวศน์ มฤคทายวันฯ เป็นผู้ขึ้แจงในรายละเอียด

นายกิดดิพจน์ เพิ่มพูล ที่ปรึกษาโครงการจัดทำแนวทางการพื้นฟูระบบนิเวศชายหาดในพื้นที่ พระราชนิเวศน์มฤคทายวันฯ ขึ้แจงว่า การทำรายงานมี ๒ ส่วน คือ ๑) รายงานฉบับสมบูรณ์ และ ๒) รายงาน บทสรุปผู้บริหาร โดยในรายงานฉบับสมบูรณ์ จะรายงานผลกระทบต่อการเปลี่ยนแปลงซายฝั่งทั้งหมด ๑๔ กรณี โดยนำ ๕ อันดับแรกที่มีผลกระทบต่อการเปลี่ยนแปลงชายฝั่งน้อยที่สุดมาใส่ในรายงานสรุปผู้บริหาร ซึ่งการนำเสนอของฝ่ายเลขานุการฯ ในวันนี้ เป็นผลจากการพิจารณาของคณะอนุกรรมการเพื่อแก้ไขปัญหา ในพื้นที่พระราชนิเวศน์มฤคทายวันฯ โดยพิจารณาผลการศึกษาทั้ง ๑๔ กรณี ซึ่งคณะอนุกรรมการฯ เห็นว่า ใน ๕ อันดับแรกที่ได้เสนอไปในรายงานสรุปผู้บริหารนั้น รูปแบบของชายหาดอาจจะยังไม่กลับไปคล้ายคลึงกับ ประวัติศาสตร์ จึงได้พิจารณาในกรณีอื่น ๆ เพิ่มเติม จึงพิจารณาเอากรณีที่อยู่ในรายงานฉบับสมบูรณ์ขึ้นมา ซึ่งเป็นกรณีที่คิดว่ามีความเหมาะสมทั้งในเรื่องของอัตราการกัดเซาะและความสอดคล้องกับทางประวัติศาสตร์ คือ การรื้อรอดักทรายในตัวที่ ๓ ๔ ๕ เพราะฉะนั้น อาจจะต้องเพิ่มข้อมูลในส่วนของเล่มรายงานสรุปผู้บริหาร ให้ครบถ้วนต่อไป

นายธงชัย พงษ์วิชัย ที่ปรึกษาด้านเศรษฐกิจการขนส่งทางน้ำ ผู้แทนปลัดกระทรวงคมนาคม กล่าวว่า ขอให้ทางฝ่ายเลขานุการฯ ปรับปรุงแก้ไขรายงานสรุปผู้บริหารซึ่งเป็นเอกสารแนบในการประชุมครั้งนี้ ให้ครบถ้วนและสมบูรณ์ยิ่งขึ้น

<u>ข้อสั่งการประธาน</u>

เห็นชอบ ให้กระทรวงทรัพยากรธรรมชาติและสิ่งแวคล้อม รับความเห็นของผู้ทรงคุณวุฒิและ ผู้แทนกระทรวงคมนาคมไปพิจารณาดำเนินการ และให้กรมเจ้าท่าและมูลนิธิพระราชนิเวศน์มฤคทายวันฯ พิจารณาดำเนินการในส่วนที่เกี่ยวข้องค่อไป

<u>มติที่ประชุม</u>

๑) รับทราบผลการศึกษาโครงการจ้างที่ปรึกษาศึกษาเพื่อจัดทำแนวทางการฟื้นฟูระบบนิเวศ ชายหาดในพื้นที่พระราชนิเวศน์มฤคทายวันฯ ให้สอดคล้องกับสภาพตามธรรมชาติ

๒) เห็นชอบแนวทางการฟื้นฟูระบบนิเวศชายหาดในฟื้นที่พระราชนิเวศน์มฤคทายวันฯ ให้ สอดคล้องกับสภาพตามธรรมชาติ โดยรื้อรอดักทรายจำนวน ๓ ตัว คือ ตัวที่ ๓ ตัวที่ ๔ และตัวที่ ๕ ซึ่งอยู่บริเวณ ด้วนหน้าพื้นที่พระราชนิเวศน์มฤคทายวันฯ ร่วมกับการใช้มาตรการเสริมอื่น ๆ ที่จำเป็น

๓) เห็นชอบ ...

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 ๓) เห็นชอบแนวทางการจัดการการแพร่กระจายความเค็มของน้ำใต้ดินสำหรับพื้นที่พระราช นิเวศน์มฤคทายวันฯ โดยการเติมน้ำจืดลงสู่ชั้นน้ำใต้ดินผ่านป่อวง จำนวน ๖ บ่อ ปิดประตูระบายน้ำในคลอง สูบน้ำเค็มออกจากคลองและเติมน้ำจืดเข้าไปทดแทนน้ำเค็มที่สูบออก

๔) มอบหมายให้กรมเจ้าท่ารับผิดชอบน้ำแนวทางการฟื้นฟูระบบนิเวศชายหาดในพื้นที่พระราช นิเวศน์มฤกทายวันฯ ให้สอดคล้องกับสภาพตามธรรมชาติ ไปพิจารณาในการรื้อรอดักทรายจำนวน ๓ ตัว ที่อยู่ บริเวณด้านหน้าพื้นที่พระราชนิเวศน์มฤคทายวันฯ ไปดำเนินการให้ถูกต้องตามระเบียบและกฎหมายต่อไป

๕) มอบหมายให้มูลนิธิพระราชนิเวศน์มฤคทายวันฯ รับผิดชอบนำแนวทางการจัดการการแพร่ภระจาย ความเค็มของน้ำใต้ดินลำหรับพื้นที่พระราชนิเวศน์มฤคทายวันฯ ไปดำเนินการ โดยประสานการดำเนินงานกับ ลำนักงานชลประทานที่ ๑๔ ให้ถูกต้องตามระเบียบและกฎหมายต่อไป

๖) รับรองมติที่ประชุม

เรื่องที่ ๔.๑๔ การแต่งตั้งคณะอนุกรรมการขับเคลื่อนการดำเนินงานทศวรรษแห่งสหประชาชาติว่าด้วย วิทยาศาสตร์ทางมหาสมุทรเพื่อการพัฒนาที่ยั่งยืน ปี ค.ศ. ๒๐๒๑ – ๒๐๓๐

อธิบดีกรมทรัพยากรทางทะเลและชายฝั่ง กรรมการและเลขานุการ กล่าวว่า ขออนุญาตให้ รองอธิบดีกรมทรัพยากรทางทะเลและชายฝั่ง (นางสาวพรศรี สุทธนารักษ์) เป็นผู้นำเสนอในเรื่องที่ ๔.๑๔ การแต่งตั้งคณะอนุกรรมการขับเคลื่อนการดำเนินงานทศวรรษแห่งสหประชาชาติว่าด้วยวิทยาศาสตร์ทาง มหาสมุทรเพื่อการพัฒนาที่ยั่งยืน ปี ค.ศ. ๒๐๒๑ – ๒๐๓๐

รองอธิบดีกรมทรัพยากรทางทะเลและชายฝั่ง (นางสาวพรศรี สุทธนารักษ์) รายงานสรุป ต่อที่ประชุมว่า ในคราวประชุมคณะกรรมการฯ ครั้งที่ ๑./๒๕๖๕ เมื่อวันที่ ๕ เมษายน ๒๕๖๕ ที่ประชุมมีมติ เห็นชอบการเสนอขอรับเป็นเจ้าภาพสำนักงานประสานความร่วมมือทศวรรษแห่งสหประชาชาติว่าด้วยวิทยาศาสตร์ มหาสมุทร (Decade Coordination Office : DCO) ซึ่งคณะรัฐมนตรีได้ลงมติเห็นชอบเมื่อวันที่ ๒๙ เมษายน ๒๕๖๔ ให้กรมทรัพยากรทางทะเลและชายฝั่ง เสนอชื่อประเทศไทยเป็นเจ้าภาพสำนักงานดังกล่าวขณะนี้อยู่ในขั้นตอน การพิจารณาของคณะอนุกรรมาธิการระหว่างรัฐบาลว่าด้วยสมุทรศาสตร์ภาคพื้นแปซิฟิกตะวันตก (Intergovernmental Oceanographic Commission : IOC) ดังนั้น เพื่อให้การขับเคลื่อนการดำเนินการตาม แผนปฏิบัติการฯ ดังกล่าว บรรลุตามวัตถุประสงค์ พร้อมทั้งถ่ายทอดไปสู่การใช้ในการกำหนดนโยบายการบริหาร จัดการ และการใช้ประโยชน์มหาสมุทรที่ยั่งยืน ได้อย่างมีประสิทธิภาพยิ่งขึ้น จึงเห็นควรแต่งตั้งคณะอนุกรรมการ ขับเคลื่อนการดำเนินงานทศวรรษแห่งสหประชาชาติว่าด้วยวิทยาศาสตร์ทางมหาสมุทรเพื่อการพัฒนาที่ยั่งยืน ปี ค.ศ. ๒๐๒๑ – ๒๐๓๐ โดยมีองค์ประกอบทั้งสิ้น จำนวน ๒๓ ท่าน โดยมีอธิบดีกรมทรัพยากรทางทะเลและ ชายฝั่ง เป็นประธาน มีอำนาจหน้าที่ในการพิจารณาให้ข้อเสนอแนะ ข้อคิดเห็น และให้คำปรึกษาเกี่ยวกับการ ดำเนินงาน เพื่อสนับสนุนการตำเนินงานของคณะกรรมการนโยบายและแผนการบริหารจัดการทรัพยากรทาง ทะเลและชายฝั่งแห่งชาติ

ข้อสังเกตของที่ประชุม

นางสาววนาลี โล่ห์เพชร รองอธิบดีกรมองค์การระหว่างประเทศ ผู้แทนปลัดกระทรวงการต่างประเทศ กล่าวว่า การแต่งตั้งคณะอนุกรรมการดังกล่าวมีความสอดคล้องกับการดำเนินงานของไทยกับสำนักงาน เลขาธิการคณะอนุกรรมาธิการระหว่างรัฐบาลว่าด้วยสมุทรศาสตร์ภาคพื้นแปซิฟักตะวันตก (IOC WESTPAC) และมีความสอดคล้องต่อแผนการดำเนินงานตามงานทศวรรษแห่งสหประชาชาติว่าด้วยวิทยาศาสตร์ทาง มหาสมุทรเพื่อการพัฒนาที่ยั่งยืน ปี ค.ศ. ๒๐๒๑ – ๒๐๓๐ ซึ่งเป็นการดำเนินการโดยสมัครใจ ดังนั้นจะทำให้ ประเทศไทยมีบทบาท และในเรื่องเป้าหมายแห่งการพัฒนาที่ยั่งยืนนั้นเน้นหลักการ multi stekholder approach โดยการดำเนินงาน ...

Annex 4: Summary of the government project and policy that impact biodiversity and the ecosystems in Thailand.

Table 1 Projects concerning river systems and wetlands of the Department of Public Work and Town and Country Planning

Heading	Description
Existing subsidy	Concrete dyke constructions along the rivers and streams all over the country
Responsible stakeholder/ organization/agency	Department of Public Work and Town and Country Planning
Sector	Ministry of Interior
Drivers	Reduce or stop riverbank erosion, which potentially damage settlement and temples
Direct or indirect	It is a direct subsidy
Financial cost	2021 (9,599 x10 ⁶ Baht, 54 Project), 2022 (14,757 x10 ⁶ Baht), 2023 (15,000 x10 ⁶ Baht)
Description - intended objective and beneficiaries	-to reduce the natural erosion caused by river/stream
Benefits (social, environmental, economic)	Decreasing the damage of riverine areas from erosion for the inhabitants and landlords
Biodiversity benefits	None
Biodiversity-harmful impacts	Destroying riverine as well as the river ecosystem
Is this potentially a "perverse" subsidy?	More/less
Describe related legislation	-
Additional notes	-
Links to related studies, including economic valuation	-

Table 2 Projects concerning river systems and wetlands of the Royal Irrigation Department

Heading	Description
Existing subsidy	Waterway/wetlands dredging and check dam constructions
Responsible stakeholder/ organization/agency	Royal Irrigation Department
Sector	Ministry of Agriculture
Drivers	Drought is increasing because of climate change. Water bodies and irrigation systems are essential for water management, flooding prevention, and drought mitigation.
Direct or indirect	It is a direct subsidy.
Financial cost	2021 (55,567 × 10 ⁶ Baht, 61 projects), 2022 (56,368 × 10 ⁶ Baht) 2023 (59,063, × 10 ⁶ Baht)
Description - intended objective and beneficiaries	To have enough water for agriculture
Benefits (social, environmental, economic)	Human centre benefits
Biodiversity benefits	None
Biodiversity-harmful impacts	Great impacts to the biodiversity of streams and wetlands
Is this potentially a "perverse" subsidy?	More/less
Describe related legislation	-
Additional notes	-
Links to related studies, including economic valuation	-

Table 3 Projects concerning river systems and wetlands of the Royal Irrigation Department

Heading	Description
Existing subsidy	Marine channel dredging and sea wall construction
Responsible stakeholder/ organization/agency	Marine Department
Sector	Ministry of Transport
Drivers	Marine channel dredging and sea wall constructions, as well as sand translocation over the dredged marine channel to decrease coastal erosion
Direct or indirect	It is a direct subsidy.
Financial cost	2021 (2,099 x 10 ⁶ Baht, 33 projects), 2022 (3450.5 x 10 ⁶ Baht, 45 projects), 2023 (4933.6 x 10 ⁶ Baht, 45 projects)
Description - intended objective and beneficiaries	To decrease and prevent coastal erosion
Benefits (social, environmental, economic)	-none
Biodiversity benefits	-
Biodiversity-harmful impacts	Significant impact on coastal biodiversity, both marine and terrestrial
Is this potentially a "perverse" subsidy?	More/less
Describe related legislation	-
Additional notes	Whether coastal erosion took place or just seasonal longshore drift is still suspicious.
Links to related studies, including economic valuation	

Table 4 The subsidy in terms of policy/ law that harms the biodiversity and ecosystem

Heading	Description
Existing subsidy	Land tax for the abandoned land areas
Responsible stakeholder/ organization/agency	Ministry of Finance and Ministry of Interior
Drivers	To encourage the use of the abandoned land of the landlords and to distribute the land ownership.
Direct or indirect	It is a direct subsidy.
Financial cost	0.3% per year of land appraisal price with increment of 0.3% every three years up to 3% maximum
Description - intended objective and beneficiaries	To make more income for the government from tax and to encour- age the use of the abandoned land of the private owners.
Benefits (social, environmental, economic)	It is a great benefit to the government but a disaster for the ecosys- tem
Biodiversity benefits	None
Biodiversity-harmful impacts	Significant adverse impact on the biodiversity of the country
Is this potentially a "perverse" subsidy?	Yes
Describe related legislation	-
Additional notes	the remnant patches of ecosystem are destroying as well as their biodiversity
Links to related studies, including economic valuation	-