

# Financial solutions for biodiversity in contributing to the economic development in Indonesia

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**Abstract.** Having strategic position makes Indonesia rich in biodiversity. However, there is a gap in funding this biodiversity; whereas, the existence of this biodiversity can be optimized by the government to enhance the economic development in Indonesia. This study aims to analyze potential financial solutions to fill the gap and increase the biodiversity funding in Indonesia. This research did a literature study from various sources such as BIOFIN countries, UNDP, and IBSAP of Indonesia; and conducted an assessment based on the results, sources, financial impact categories, and likelihood of success categories. The results show that out of 156 financial solutions studied, 32 of them have high financial impacts and are most likely successful to be implemented in Indonesia, and 8 of them are very potential to be implemented; those are state budget, corporate social responsibility (CSR), nature swap debts, taxes and fees in the tourism sector, payment for ecosystem services, ecological fiscal transfers (EFT), zakat, infaq, shadaqah, and waqf (ZISWAF), and green sukuk.

## 1 Introduction

A country needs to develop their economy to improve their community welfare. On the other hand, the economic development may affect the ecological conservation. Economic development that does not pay attention to ecological aspects will threaten the existence of biological diversity; whereas biodiversity can support the economic development itself. Countries that are rich in biodiversity have great potencies in utilizing it as capital in development. The biodiversity can be formed as raw materials for food, medicine, cosmetics, or other industries; as well as biotechnology development for the processing industry, and the tourism sector. Developed countries have utilized and managed biodiversity a lot in the forms of biotechnology and raw materials for various industries; while developing countries that are rich in biodiversity have not developed much biotechnology or optimized the use of biodiversity in various industries. This is due to limited technology and funding for the development and management of the biodiversity.

In developing countries, funding for biodiversity has not been optimal. This problem is because the government budget is more widely used to improve education and health,

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reduce poverty, and build infrastructures. While the budget allocated by the government for biodiversity is still small – including Indonesia.

Indonesia is an archipelago and is one of the largest maritime countries in the world which is very rich in biodiversity. This high biodiversity is marked by various types of species that exist, ranging from marine biota, invertebrate and vertebrate fauna groups, as well as spore flora and spermatophytes [1]. Meanwhile, funding for the management and preservation of biodiversity is still limited. According to data from the 2015-2020 IBSAP, the number of government budget allocations for the development and management of biodiversity is approximately 0.38% of the average total of state budget. In addition, based on the strategic plans of the Ministry of Environment and Forestry (KLHK) in 2015-2019, the Ministry of Maritime Affairs and Fisheries (KKP) 2015-2019, and the Peat Restoration Agency (BRG) 2016-2020, the total funding needs for programs related to biodiversity is approximately IDR. 89.99 trillion.

The large funding needs for biodiversity management in Indonesia makes researches on financial solutions for biodiversity necessary to fill the existing funding gap; considering the main sources of biodiversity funding in KLHK, KKP, and BRG come from a limited number of APBN. Current state budget expenditures are more focused on infrastructure development, poverty reduction and jobs creation. In addition, funding for biodiversity from donor agencies and the community is still not optimal; so that explorations and researches on new financial solutions or optimization of existing financial solutions are needed to fill the biodiversity funding gap in Indonesia. This research is expected to be a reference in implementing potential financial solutions to improve biodiversity management in order to support sustainable economic development.

2 Literaturew review

2.1 Financial solutions for biodiversity

Financial solutions to conserve biodiversity can be in the forms of instruments, tools, strategies and mechanisms related to generating revenue, avoiding future expenditures, delivering better conservation, and realigning expenditures to be more efficient [2]. **Table 1** shows the lists of 156 financial solutions from various sources; those are case study papers and reports on PIR, BER, and BFP of Bhutan, Sri Lanka, Indonesia, India, Thailand, Vietnam, Georgia, Kyrgyzstan, Kazakhstan, Fiji, Malaysia, Philippines, Mongolia, Rwanda, Botswana, Zambia, South Africa, Uganda, Seychelles, Mozambique, Cuba, Costa Rica, Belize, Peru, Colombia, Ecuador, Guatemala, Mexico, Brazil and Chile. This list of financial solutions was also reviewed by the BIOFIN and IBSAP Indonesia catalog.

**Table 1.** List of financial solutions from biofin countries and latin american country.

156 List of Financial Solutions
Airport departure fees that fund protected areas ; Conservation Concession Cost ; Biodiversity business incubator ; Biodiversity Conservation in Kyrgyzstan (Small Grant Financing) ; Biodiversity offsets; Biodiversity offsets (The Biodiversity Banking and Offsets Scheme) ; Bio-prospecting (Biodiversity utilization payment)-Gain ; Blue bonds; Carbon credit payment; Carbon Funds ; Carbon Markets ; Carbon offset scheme ; Cat Bond Funds ; Certification/Eco-Labels ; Charge systems ; Charges for scarce road space and water resources ; Climate change finance ; Climate Credit Mechanisms ; Commemorative License Plates (Fees from License) ; Conservation extension services ; Conservation Finance Incentives ; Conservation funds ; Conservation notes ; Corporate Funding ; Corporate Social Responsibility Spending ; Corporate Social Responsibility Tax ; Crowd-funding ; Village funds ; Debt for nature swap (Commercial Debt-for-Nature Swaps) ; Debt for Adaptation Swap ; Debt-financed endowments (endowment fund) ; Developer fees / water infrastructure ; Diaspora Investment ; Disaster relief funds ; Dive Fees, Mabini & Tingloy ; Donor funded projects ; Ecological Fiscal Transfers ; Economic Valuation of Ecosystems ; Emissions taxes ; Enhanced Land or Marine Stewardship ; Enterprise Challenge Funds ; Environment Trust Fund (ETF) ; Environment, biodiversity and climate change in Kyrgyzstan-fishing licenses ; Environment, biodiversity and climate

change in Kyrgyzstan-Logging Fees ; Environmental Fund ; Environmental Taxes ; Equity financing for sustainable tourism project ; Exchange-Traded Catastrophe Options ; Finance Alliance for Sustainable Trade ; Financial incentives ; Fines and levies ; Fines and Penalties ; Fisheries landing fee ; Fisheries quotas (catch limits) ; Forest bonds ; Forestry Concession Fees ; Forestry Stumpage Fees ; Fuel Taxes ; Fundraising through public revenue-raising effort ; Funds generated by the Nagoya Protocol on ABS ; Global Environment facility (GEF) Trust Fund ; Gorilla Visit Fee, Rwanda ; Government allocation funds ; Grant ; Green bonds ; Green Sukuk ; Green Tax ; Green/carbon tax ; Impact Investment ; Incentives for Public Budget Execution ; Incentives-Market Based Instrument ; Indices ; Law on Natural Resource Use Fee ; Legal mechanism for economic incentives to sustain use of biodiversity ; Loans ; Local government tax or fees charged of hotel ; Local service tax ; Lotteries/Lottery Winnings ; Malaypaya Funds (Earmarked Funds related to environment) – Royalties ; Malua Bio-bank ; Marine Parks Trust Fund (conservation charges) ; Market for green products through natural resource trade and value chains ; Micro-credit/Microfinance ; Mining Taxes, Fees and Royalties from Mining ; Mooring Fees ; Motor Vehicles User's Charge (MVUC) (Earmarked Funds unrelated to environment) ; Namibian Nature Reserve, Namibia ; National Conservation Trust Fund for Natural Resources ; National Water Fund ; Non-Tax Revenues ; Non-Timber Forest Product harvesting licenses and fees ; Oblast budgets ; Official Development Assistance (ODA)-Funds from ODA ; Oil royalty-based financing ; Sailing Taxes, Belize ; Pasture Fee ; Payment for ecosystem services (PES) ; Payment for watershed protection, Costa Rica ; Payment from Hydropower, Filipina ; Hydroelectric Revenues, Costa Rica ; People's Survival Fund (Earmarked Funds) ; Photo Safaris Polar Bear, Manitoba ; Polluters payment scheme ; Portfolio (investment fund) ; Profit directly from conserving biodiversity, e.g. eco-tourism companies ; Project Finance ; Project Finance for Permanence (PFP) ; Promotion of Sustainable Tourism ; Property taxes ; Public debt and finance from a renegotiated petroleum agreement ; Public guarantees-World Bank Guarantees ; Public Sector Investment Program (PSIP) ; REDD+ (Reduced Emissions from Deforestation and forest Degradation) ; Reduction of subsidies ; Remittances (Diaspora Financing) ; Renewable energy finance windows ; Resource rents and royalties ; Revenue from Telecom Operators ; Revenue, benefit sharing and access to resources ; Revolving Fund ; Root Capital ; Securitization ; Set limits on trade of natural resources ; Sinking Fund ; Social and Development Impact Bonds ; Sovereign Wealth Funds ; State budget ; Subsidies for organic agriculture ; Taman National Trust Fund/ PA Financing Project ; Tax incentives ; Taxes and fees in the tourism sector ; Taxes and subsidies ; Taxes on negative climate changes activities in Kyrgyz Republic ; Taxes on Pesticides and Chemical Fertilizers ; Taxes on Renewable Natural Capital (water; timber) ; Taxes on Renewable Natural Capital-Forest Taxation ; Taxes on Tobacco ; Taxes, Fees and Royalties in the Forestry Sector ; Tender Commission ; Tourism, real estate and commercial concessions ; Tourist departure tax ; Traditional Thai Medicine Fund ; Travel philanthropy fund ; User charge in public facilities ; User Fees ; Venture Capital & Private Equity ; Voluntary Standards (finance) ; Wastewater fees ; Water abstraction charges ; Water Conservation Grant ; Water conservation loan ; Water markets ; Water quality markets ; Water tariffs ; Weather Derivatives ; Zakat, Infaq, Shadaqah dan Waqf (Ziswaf)

Sources: UNDP Catalog, Case Study Papers and Reports of 29 BIOFIN countries, IBSAP, PIR and BER Indonesia, and UNEP Finance Initiative (2007) (data processed)

### 3 Research methodology

This study is a qualitative research through literature study aiming to find out financial solutions that have been used in several developing countries and developed countries to further analyze whether the financial solutions have already existed or have not existed in Indonesia; so that they can be developed and used for biodiversity funding. Literature studies were carried out to 29 BIOFIN countries (Biodiversity Finance Initiative), Latin American countries, UNDP catalog, Biodiversity and Ecosystem Services Network (BESNet), Indonesia Biodiversity Strategy and Action Plan (IBSAP) 2015-2019, Policy and Institutional Review (PIR) and Biodiversity Expenditure Review (BER) BIOFIN Indonesia.

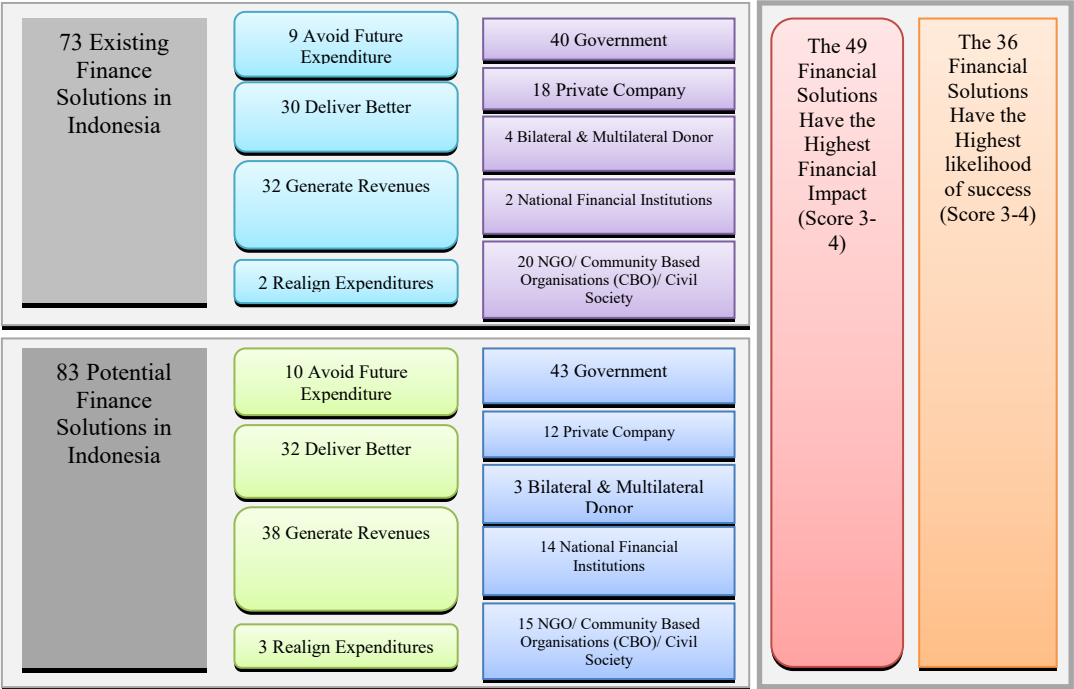
This research through several research processes: (1) review and analyze documents from BIOFIN countries and other sources; (2) create the list of financial solutions from the results of review and analysis of documents, (3) analyze and assess the list of financial solutions that have been created, using BIOFIN data tools was conducted through 4 categories: the results obtained from the implementation of the financial solutions (avoid future expenditure, deliver better, generate revenue, and realign expenditures), the source categories from which the financial solutions originated (government, private category, bilateral & multilateral donors, national financial institutions, NGOs, CBOs, and civil society), financial impacts (score 0-4), and possibilities of success to be implemented (score 0-4); (4) choose the 8 financial solutions from analysis results that have a high impact and are likely to be implemented; (5) analyze in depth the 8 financial solutions, the risks that

might be caused, the positive and negative impacts that they cause, and the potential of these financial solutions for use in biodiversity financing in Indonesia.

4 Results and discussion

4.1 Mapping results and financial solutions analysis

The mapping and analysis of both existing and potential-to-be-implemented financial solutions for biodiversity in Indonesia were done by grouping them into the results and source categories; as well as assessing the financial impacts generated and the success to be implemented.



\*There are financial solutions that include one or some sources

Fig. 1. Financial solutions mapping for biodiversity funding in Indonesia.

From the analysis conducted, out of the listed 156 financial solutions through various sources, there are 73 financial solutions that have been applied for biodiversity in Indonesia; while 83 financial solutions have not been used as biodiversity funding, as shown in Figure 1. Of the 156 financial solutions available, 49 of them have high scores between 3-4 which means that these financial solutions can generate, increase, store or attract various sources of financing by 15% or more of the current funding needs. These 49 financial solutions may be potential to be mobilized in a timely manner and in accordance with needs. There are 36 financial solutions that are highly possible to be implemented successfully (score 3-4). These 36 financial solutions are large enough in getting political and social supports: there are underlying regulations, support from the government and law, support from the community and other parties, and have fewer challenges to implement the financial solutions. There are 32 financial solutions that have the highest scores in both categories (highest financial impacts and highest possibility of success).

## **4.2 Financial solutions for biodiversity funding in Indonesia**

Of the 32 financial solutions that have high financial impacts and have high possibility to be successfully implemented, eight potential financial solutions are analyzed; either because of existing regulations or due to several conditions that support the implementation of the financial solutions. Those eight financial solutions are described as follows:

### **1) State Budget**

Central government spending from the National Budget for the environment was only 0.9% in 2015 and 1% in 2017. Through the state budget, the government can increase the budget, create and implement an economical, efficient and effective budget, or rearrange the budget that supports the biodiversity funding and make it one of the priorities.

### **2) Corporate Social Responsibility Spending**

CSR is a private funding that is potential to be increased in protecting and maintaining biodiversity as well as improving and developing conservation areas as so far biodiversity funding mostly comes from the government and donor agencies; whereas the CSR funds from the companies are quite large. Funding from CSR has a low risk, because CSR does not require any refund. In addition, there are regulations in Indonesia that support a company's obligation to carry out CSR.

### **3) Debt for Nature Swap (Commercial Debt-for-Nature Swaps)**

Debt-for-Nature Swap is a donor agreement to reduce or cancel government debts of developing countries in return for a government's commitment to protect nature through investment in conservation projects [3]. The implementation of debt for nature swap may be good since it can reduce the country's debt and also can increase the protection of biodiversity. On the other hand, the implementation of debt for nature swap has several shortcomings and constraints such as it only results a small debt reduction for developing countries; negotiations can take a long time and may result in high transaction costs.

### **4) Taxes and Fees in the Tourism Sector**

Taxes and fees from tourism sectors can be in the forms of protected area entry fees, diving fees, airport and ship passenger fees, hotel tax, recreational fishing license fees, endangered animal visit fees, user fees, rare species fees, photo safaris of animals, etc. These fees can generate income that can be used to manage the biodiversity conservation and maintain the areas. For example, entrance fees from a conservation area can be directly distributed and used for conservation funds including protection and development of conservation areas.

### **5) Payment for Ecosystem Services (PES)**

PES initiatives in Indonesia include various types of environmental services such as tourism (natural landscape beauty), biodiversity, watershed protection, and others. The application of PES has several advantages; PES is flexible and can easily adapt to local conditions, the funding sources and access of PES is easy even in areas with many poor people – it can be used to provide training and technical assistance to communities around conservation areas, and can increase participation and transparency from the community and conservation area management institutions.

### **6) Ecological Fiscal Transfers (EFT)**

Ecological Fiscal Transfer is the redistribution of tax revenue from national and regional governments to local jurisdictions for ecological purposes by creating a conservation index which is a part of the fiscal allocation formula in order to reward investment in conservation and to encourage the expansion of protected areas [4]. Ecological fiscal

transfers in Indonesia according to Joko (2016) can be applied in the forms of among others: the General Allocation Fund (GAF), Special Allocation Funds (SAF), Revenue Sharing Funds (RSF), Regional Incentive Funds (RIF), and Village Fund (VF). Constraints to the implementation of EFT in Indonesia are the immature readiness of regions and the need for regulation in the forms of Presidential Regulation, PP, or PMK in order to implement EFT for biodiversity funding.

#### 7) Zakat, Infaq, Sadaqah and Waqf (Ziswaf)

Zakat is Islamic financial instrument or “a compulsory levy imposed on the Muslims so as to take surplus money or wealth from the comparatively well-to-do members of the Muslim Society and give it to the destitute and needy” [5]. Zakat, infaq, and shadaqah can be used to empower communities around the conservation areas to build their small enterprises that support the biodiversity conservation and ecotourism areas. Waqf is the locking up of an owned asset from disposition in which the allotment of its benefits is for a specific purpose. The ownership of a waqf asset cannot be disposed or be transferred [6]; and the benefits are to be used for a specific purpose which is mainly charitable in nature. Waqf can be used for the infrastructure development needs in conservation or agricultural and fisheries sectors.

#### 8) Green Sukuk

Green Sukuk is an investment instrument representing an ownership of tangible assets, projects, usufruct, and renewable energy services, or other environmental assets in accordance with the sharia principal and compliance [7,8]. In the biodiversity context, green sukuk can be used to fund the infrastructure of terrestrial and marine conservation areas. Challenges in the issuance of green sukuk in Indonesia are that green sukuk may have a higher risk profile since many environmental or biodiversity projects involve new technology; it is difficult to convince investors that sukuk funds will be used for projects with economic value which meet the credible and acceptable green standards [9].

## 5 Conclusions

Based on the results of the study, there are 156 financial solutions for biodiversity funding; 73 of which have already existed and implemented in Indonesia and 83 others are potential financial solutions to be applied as biodiversity funding in Indonesia. In addition, 32 financial solutions have high financial impacts and are likely to be successfully implemented in Indonesia; 8 of which are very potential to be implemented: state budget, corporate social responsibility (CSR), debt for nature swaps, taxes and fees in the tourism sector, payment for ecosystem services, ecological fiscal transfers (EFT), zakat, infaq, shadaqah, and waqf (ZISWAF), and green sukuk. The limitation of this study is that the assessment is based on the judgment of the researchers by looking at the conditions and existing implementation from various secondary sources; it has not exploited expert judgments or utilized questionnaire.

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