Biodiversity Offsets

Measurable conservation outcome resulting from actions designed to compensate for significant residual biodiversity loss arising from project development after appropriate prevention and mitigation measures have been taken (BBOB). Offsets can, for example, deliver biodiversity benefits (e.g. reforestation) through a transaction, where offset sellers (e.g. a conservation NGO) sell offsets to developers (e.g. a mining company) who seek to compensate the residual biodiversity loss resulting from a development activity (e.g. mining). The term also encompasses wetland, species, and habitat banking.

Key Words: offsets; mitigation banking; conservation banking; Biobanking; habitat banking; aggregate offsets; polluter pays

How does it work?

Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from development plans or projects after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity (BBOB).

Biodiversity offsets thus require a new development activity (e.g. industry complex, mining activity, railway construction) to provide for "no net loss" or a "net gain" in biodiversity. In other words, biodiversity offsets demand at minimum a like-for-like compensation for residual biodiversity impact through a direct compensation or the acquisition of biodiversity credits in a regulated market. An alternative version of "compensation" involves the definition of an economic value of the biodiversity impact or a set rate fee calculated as a percentage of the development project's value. Think of a developer converting X ha of natural wetland habitat into a housing and harbour complex. The developer will need to pay for the creation or protection of a comparable wetland habitat to compensate for the residual loss of biodiversity after all possible mitigation actions are undertaken. In an area where there are offset credit banks, the sponsors can buy offset credits for the purpose. An offset credit can involve both habitat expansion (creation), habitat restoration measures, and habitat protection when the habitat was previously under threat (additionality). Think of a conservation project by a non-governmental entity that aims to restore X ha of wetland in a formerly drained area as an offset credit. Offsets are different from natural resource damage assessments that arise from unplanned damage to the environment and are based on the cost of remediation.

Biodiversity offsets can be organized as one-off offsets (the offset is specially designed and carried out by the developer or by a subcontractor), in-lieu fees (fee that the developer has to pay to a third party as compensation) and biobanking (the developer can purchase offsets directly from a public or private biobank that holds a repository of pre-certified offset credits). Biodiversity offsets can be voluntary or compulsory by law. A national strategy or policy on biodiversity offsets can help to address issues of validation, market size, and coherence, thus realizing "aggregated offsets" - i.e. measurable conservation outcomes resulting from coordinated actions arising from more than one development project. Aggregating offsets can optimize the net biodiversity benefit by increasing ecosystem connectivity, preventing future habitat fragmentation and creating large contiguous sites.

In the case of biobanking, credits are tradable units of exchange defined by the ecological value associated with changes in a natural habitat. Credits are certified and monitored by a central regulatory authority. Biobanking shares certain features with tradable permit schemes whereby a quantifed objective for biodiversity conservation is set (i.e., no net loss /net gain) along with the possibility of providing developers with flexibility to determine the compensation by participating in a market of offset credits. Most biobanks must include a long-term management plan and a trust fund that guarantees the long-term financing of the management plan.

Offsets are applicable to a wide range of sectors, including: mining (e.g. Strongmine Coal NZ; Akyem Coal Mine Ghana); wind power (e.g. Apennine Wind Farms, Italy); pulp and paper (e.g. Pulp United Pulp Mill, South Africa); hydropower (e.g. Nam Theun 2 Hydropower Project, Laos); oil and gas (e.g. Chad-Cameroon Petroleum Development and Pipeline Project); property development (e.g. Bainbridge Island, United States); and agriculture (e.g. Queensland, Australia).

Stakeholders

- **Regulatory entity**(s): the Government entity(s) mandated by the law to regulate and govern biodiversity offsets.

Summary

Financial Result

Generate Revenue

Deliver Better

Instruments Used

Regulatory

Market Solutions

Sources of Finance

PUBLIC

PRIVATE

NATIONAL

INTERNATIONAL

Related SDG

Functions-which might be allocated to different entities at the national and sub-national levels-could include the overall definition and regulation of the offsets, the generation and accreditation of biodiversity offsets and market oversight powers.

- **Offset buyer** (or project developer): anyone that harms biodiversity with a development project. Government transportation agencies, residential and commercial developers, extractive sector's industries, and utilities are the most common buyers.
- **Offset seller**: wide range of private and public entities with the capacity to create offsets, including environmental consultants, engineers, and lawyers; private mitigation bankers; non-profit organizations and government agencies running biodiversity conservation programmes.
- **Offset providers**: These are the owners or managers of the offset receptor sites-they could be anyone who owns or manages (with the owner's consent) land, including conservation non-governmental organizations (NGOs), local councils, farmers, and estate owners.
- **Affected community**: in areas affected by the project and by the biodiversity offset, the participation of stakeholders should be ensured in decision-making, including in evaluation, selection, design, and implementation and monitoring.

Potential in monetary terms (revenues, realignment, or cost-savings)

The potential in monetary terms is highly dependent on the value of biodiversity assets in the affected region and on regulatory provisions. The US, for example, has one of the most developed markets for biodiversity mitigation and conservation: over 100 mitigation banks generate transactions estimated at US$1.3-2.2 billion a year. The price per acre of wetland can vary from US$24,000 for non-riparian wetland in North Carolina up to US$653,000 per acre for tidal wetland in West Virginia, depending on the availability, price of land and the cost to create an acre of wetland compensation. In conservation banking, the price for an endangered fairy shrimp can reach US$300,000.

When is it feasible?

A compliance–or regulatory-based biodiversity offset scheme, can be created via a standard regulatory route by a national or a sub-national authority. The regulations set the principles, limits and rules for compensation and/or for the establishment of an offset credits' market. Technical regulations on valuation of biodiversity loss and credit can be part of the regulatory provision, but due to the complexity of calculations, valuation is rarely included in regulations. As of 2015, over 50 countries have passed laws or policies that require biodiversity offsets or comparable compensatory mechanisms. Biodiversity offsets may also require amendments in laws governing land management or land use.

Feasibility requirements for establishing compulsory schemes include the political will to impose and enforce legislation, initial investment to set up regulatory bodies, broad-based support from affected communities and the existence of entities able to develop conservation activities that can be awarded offset credits. One of the most basic requirements is the existence of clear land tenure rules, regulations, and enforcement. Without clear private land tenure, offset options are limited to community projects, government management agencies, and other group approaches consistent with existing land tenure regulations.

Biodiversity offset provisions can also be voluntary and included in the environmental safeguards policies of private companies and institutional investors. A number of well-recognized international financial institutions include biodiversity offset requirements in their safeguard policies. The Equator Principles contain a recommendation on biodiversity offsets modelled on the Performance Standard/Requirement 6 of the IFC on biodiversity conservation. The financial institutions that adopted these principles are responsible for about 70 per cent of project finance in developing countries. Moreover, an increasing number of companies make commitments for "no net loss" and "net positive" impacts on biodiversity.

Minimum investment required and running costs

For compulsory schemes, investment by the public sector is limited to the completion of the legislative process (drafting and approval of legislation) and to the creation or delegation of an entity/agency responsible for overseeing the biodiversity offset market. The cost of drafting new legislation and stakeholder consultations can be estimated as in the range of US$50,000-200,000. In the case of voluntary offsetting the costs to the public sector is minimal.

The costs incurred by financial institutions and private companies to prevent biodiversity loss depend on the size and value of the development project, related biodiversity loss and the success of other mitigation measures.

Use in appropriate time and context

Most countries could benefit from biodiversity offset schemes as habitat conversion during development is practically inevitable and unstoppable. Other considerations follow:

- The need for an offset comes when the mitigation of adverse impacts on biodiversity associated with a development project is not sufficient for no net loss to be achieved. Provisions for biodiversity loss are paramount in contexts where earlier mitigation efforts have proved to be insufficient.
- The existence of functional Environmental and Social Impact Assessment (ESIA) legislation that requires developers to follow the mitigation hierarchy (avoid, mitigate, restore, offset) is essential for certain types of biodiversity offset schemes to assure a level playing field, regulatory enforcement, and to avoid using offsets as a right to destroy.
- Within very weak environmental management regimes, biodiversity offsets should be developed only after strengthening the regulations and enforcement of basic environmental safeguards on development.
- Before any offset is considered, the mitigation hierarchy should have been followed to ensure that all reasonable

Related Sector

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efforts have been taken to avoid and reduce harm to biodiversity caused by a development project.
- When adverse impacts to biodiversity may not be capable of being compensated because the affected biodiversity is irreplaceable, there are no available offset sites, or there are no known conservation approaches to achieve the offset, other forms of intervention should be considered.
- There are limits to offset schemes when the expected impact on biodiversity is so large that it cannot be compensated by a sufficient equivalent project or in a socially acceptable way.

What are the main risks and challenges?

Pros

- Governments can closely align environmental impacts with those causing the damage (polluter pays) and engage the private sector, not only in financing conservation, but also in implementing the conservation solutions.
- Governments can allow development in sensitive environments while assuring no net loss of ecosystem services and biodiversity and still gain the economic benefits of development.
- Conservation organizations can secure more and better conservation and obtain funding.
- Biodiversity offsets can establish a compensatory/incentive system to encourage companies to make significant contributions to biodiversity conservation.
- Voluntary offsets are a means to practice corporate social responsibility as well as a tool to manage company risks related to biodiversity (e.g. impact on licence to operate, project delays, access to land, reputational damage, etc.).

Cons

- There is no negative consequence in the concept of a biodiversity offset per se. Nevertheless, the way an offset scheme is designed could be flawed. Biodiversity offsetting should never provide incentives to developers for skipping steps in the mitigation hierarchy and thus indirectly providing incentives for the destruction of ecosystems.
- Because of the strict certification criteria and the opportunistic (private) localization of biobanks, landscape level conservation planning is rarely considered and the per hectare cost of private biobanks tends to be significantly higher than government managed conservation areas.

Risks

- Higher than planned transaction costs associated with the identification and creation of an offset, including variance in compliance and legal costs;
- Accreditation of sufficient offset credits in biobanking;
- Offset suppliers fail to deliver conservation outcomes over time. Permanence of offset can be pursued by purchasing land and/or modifying land rights;
- Overreliance on biodiversity offsets might undermine other mechanisms meant to first avoid and minimize harm to biodiversity. Regulators must ensure that developers adhere to the mitigation hierarchy;
- Valuation. Valuation of biodiversity loss in ecosystem services is a difficult process especially where baseline data and professional ecological estimations are not available;
- Equivalence. Biodiversity offsets will not always be able to deliver equivalent outcomes and additionality must be considered in any offset scheme design;
- Put in place and maintain effective monitoring, reporting and verification, including indicators that measure the extent to which offset activities have been implemented and the influence of project activities on the status of biodiversity;
- Fairly allocating responsibilities and costs between the state and the project developer for guaranteeing the offset long-term sustainability;
- Lack of options for companies willing to buy offsets while integrating biodiversity conservation into their systems/safeguards in developing countries.

How can the design be ameliorated to improve the impact?

The positive impact of biodiversity offsets can be high, particularly in extractive industries' operations in developing countries. The Rio Tinto ilmenite mine in Madagascar, which has been selected by IUCN as a pilot site to quantify the net positive impact on biodiversity, is a good example of how to reach positive gains. The most direct negative biodiversity impact envisaged by Rio Tinto was the loss of littoral forest habitat estimated in 1,665 ha (3.5 per cent of Madagascar's 47,900 ha of littoral forest). In addition to mitigation measures, Rio Tinto is investing in biodiversity offsets at several forest (littoral and non-littoral) sites covering 6,000 ha of forest. If the project proceeds as planned, a net positive impact will be achieved thanks to biodiversity offset provisions.

A biodiversity offset allows economic activities to happen while assuring a no loss or a net benefit for biodiversity. The impact of offset process on the economy is related to the measures undertaken for habitat expansion (creation) and habitat restoration. Preserved ecosystems that result from biodiversity offsetting can produce sustainable economic gains for the communities affected, based on the services that can be directly or indirectly monetized. Eco-tourism is a prominent example.

Taking account of proxies for biodiversity value and permanence in calculating the required areas to be set aside by the offsets are essential to assure a net positive biodiversity impact. For example, if an area that is not under threat (i.e. there is a low risk of biodiversity loss or deforestation) is chosen for offset activity by a mining company, then the area where the compensation activity is to be undertaken should be larger than the size of the area of the mining operation. If the offset is in an area at high risk of biodiversity loss or deforestation its value is higher and the total area could be smaller. A formula based on national legislation (e.g. Australia) and independent assessments can be used to measure the biodiversity value of a specific area set for an offset.

Additional design elements to improve the economic impact include requiring economic valuation of ecosystem services and biodiversity as part of the ESIA and project design, embedding the offset scheme into landscape level conservation and economic development planning, a clear regulatory and certification framework, development of a market based scheme that encourages private sector investment in biobanking, a combination of private and public biobanking development, etc. The establishment of a compensation fund could be economically efficient (as in the State of Rio de Janeiro) in that it allows conservation specialists to design and implement conservation investments rather than the one-off approach where companies with no conservation experience must design, or at least approve of, offsets. The fund approach may also improve the likelihood of sustainable financing.

Participation of local stakeholders in decision-making, including in evaluation, selection, design, and implementation and monitoring of decisions on biodiversity offsets can help to address social and economic concerns. Where possible Restoration projects financed by offset schemes should be connected with unemployment programmes active in the area to reduce local unemployment.

Guidelines and Case Studies

Guidelines

Biodiversity Offset Design Handbook

Biodiversity Offsets: Effective Design and Implementation

Case studies

United States: Compensatory Wetlands Mitigation

Australia: Bio-banking in New South Wales

Madagascar: Rio Tinto QMM

Our work

International Guidebook of Environmental Finance Tools null

Sustainable Development Goals

Environmental finance

Our Perspective

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We should reach a consensus on the fact that macroeconomic policies in low-income economies need to also jettison the conventional wisdom of undue restrictiveness.