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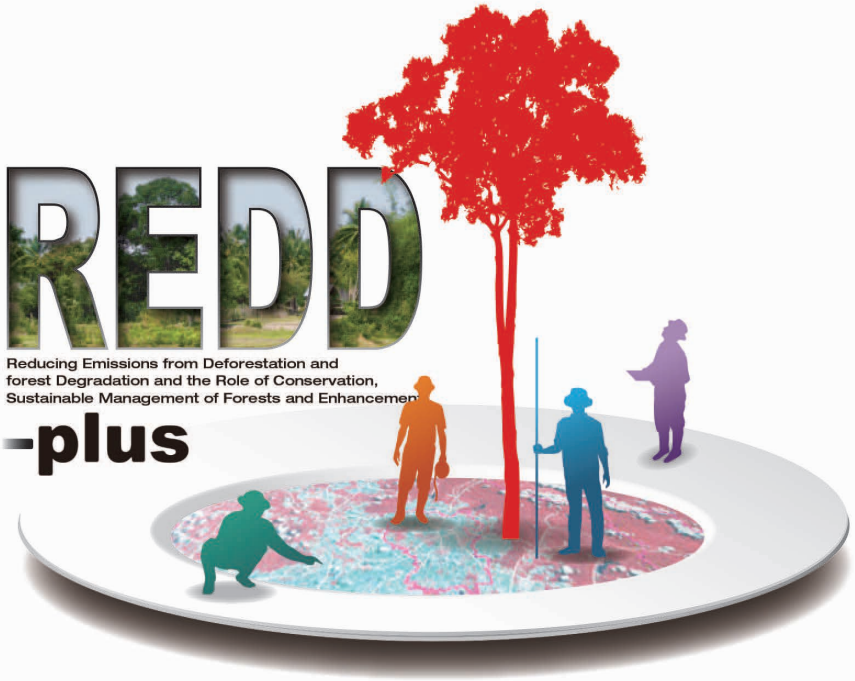

COOKBOOK

ANNEX

Vol. 6
Environmental Safeguards

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Research achievement of the 4th mid-term plan 12 (Forest Management Technology-11)

Preface

The basic concept of REDD-plus is to provide economic incentives such as funding and credits to developing countries for REDD activities (reducing emissions from deforestation and forest degradation) and "plus" activities (reducing CO_2 emissions and CO_2 levels in the atmosphere by carbon sequestration). Thus, to estimate changes in the amount of carbon stored in forests, monitoring using a scientific approach is essential. Additionally, the international community has agreed on promoting and supporting "safeguards" to prevent possible adverse impacts on the environment and society resulting from REDD-plus activities.

The REDD Research and Development Center published an easy-to-understand technical manual "REDD-plus Cookbook" in 2012. This manual provides basic knowledge and techniques required for REDD-plus with the main focus on forest carbon monitoring methods. REDD-plus Cookbook is intended for policy makers working on the introduction of REDD-plus and practitioners and experts working for the planning of REDD-plus activities. Items of necessary knowledge and techniques required for REDD-plus are compiled in units called "recipe." As for the REDD-plus safeguards, additional study materials published by the REDD+ Safeguards Research Consortium in 2016 are also available. "Guidebook for REDD+ safeguards" (in Japanese) covers the background, basic concepts, and steps required to address and respect REDD-plus safeguards, and "REDD+ Safeguard Approaches 2014" provides practical examples from forest conservation projects around the world. Although these materials are useful to understand the basic knowledge required for REDD-plus, detailed instructions useful for on-site activities were not necessarily covered. Thus, we decided to elaborate on hands-on knowledge on "social" and "environmental" aspects of safeguards as part of a series of technical manuals called the "REDD-plus Cookbook Annex." In this particular annex, fundamental concepts to address and respect safeguards are explained. This manual is intended to be used as a textbook for capacity building, and we recommend that it be read in conjunction with the Cookbook, the "Guidebook for REDD+ Safeguards", and the "REDD+ Safeguards Approaches 2014."

We hope this manual will contribute to the promotion of REDD-plus worldwide.

March, 2018

The REDD Research and Development Center
Forestry and Forest Products Research Institute
Forest Research and Management Organization

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1 Outline

1.1 Purpose of Cookbook Annex Vol. 6

The REDD-plus Cookbook compiled in 2012 by the Forestry and Forest Products Research Institute is an easy-to-understand technical manual on basic knowledge and techniques required for REDD-plus. This REDD-plus Cookbook Annex Vol. 6 explains REDD-plus safeguards by focusing on environmental aspects, such as biodiversity and ecosystem services, which are roughly outlined in the Cookbook. It also covers necessary considerations when developing and implementing REDD-plus, taking differences in national circumstances into consideration. Although (prospective) project proponents of REDD-plus are the primary target readers of this manual, we hope that students and NGOs interested in biodiversity conservation in the tropics will find it useful as well.

1.2 Recipes covered by REDD-plus Cookbook

This annex complements the explanations on safeguards outlined in REDD-plus Cookbook. Recipes covered by REDD-plus Cookbook are shown in **[ ]** for reference. Detailed information on safeguards is provided in “Guidebook for REDD+ Safeguards” (Forestry Agency of Japan 2016; in Japanese; http://www.maff.go.jp/j/kokusai/kokkyo/yosan/pdf/sg_guide.pdf), which this annex will also complement.

1.3 What are REDD-plus safeguards?

The basic concept of safeguards was first proposed at the Declaration on Human Environment adopted by the United Nations (UN) Conference on the Human Environment held in Stockholm, Sweden, in 1972 and then developed as the bases for investment in the World Bank and other organizations since the 1980s (Davis et al. 2013). The fundamental principles are to “conserve the effects of measures” and to “do no harm,” but safeguards also include expectations to further contribute to various social and environmental aspects of REDD-plus. REDD-plus safeguards are often classified into two categories: social safeguards and environmental safeguards. The Cookbook provides four categories: forest governance, social, environmental (including related social aspects), and climate ***[See Recipe-P03, page 38-39]***.

<Key points of REDD-plus safeguards>

- Safeguards are requirements to be met when implementing REDD-plus activities to prevent negative social and environmental impacts and reduce any risks that can undermine climate change mitigation measures.
- Under the UN Framework Convention on Climate Change (UNFCCC), countries are required to promote and support the safeguards throughout the implementation of REDD-plus activities and provide a summary of information. National circumstances should be

considered when determining the specific contents of the information, criteria, and indicators for identifying the achievements.

- Information on effective approaches and methods of setting objectives for safeguards is expected to be updated based on analyses of REDD-plus activities in the near future.

1.4 REDD-plus safeguards under the Cancun Agreement

The 16th Session of the Conference of the Parties (COP16) of UNFCCC held in Cancun, Mexico, in 2010 was an important turning point for REDD-plus. The seven items of REDD-plus safeguards that should be taken into consideration when implementing REDD-plus (see below) were identified in the so-called the Cancun Agreement. Since then, these safeguards have been perceived as the fundamental requirements when implementing REDD-plus at the national level **[*See Recipe-P03, page 38-39*]**.

The seven safeguards identified in the Cancun Agreement (Cancun Safeguards) (1/CP.16, Paragraph 2 of Appendix I) are as follows:

(a) That actions complement or are consistent with the objectives of national forest programmes and relevant international conventions and agreements;
(b) Transparent and effective national forest governance structures, taking into account national legislation and sovereignty;
(c) Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances, and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples [UNDRIP];
(d) The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision[1];
(e) That actions are consistent with the conservation of natural forests and biological diversity, ensuring that the actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits[2];
(f) Actions to address the risks of reversals;
(g) Actions to reduce displacement of emissions.

1 Activities for reducing emissions from deforestation and forest degradation, as well as conservation, sustainable management of forests, and enhancement of forest carbon stocks.

2 "Taking into account the need for sustainable livelihoods of indigenous peoples and local communities and their interdependence on forests in most countries, reflected in the United Nations Declaration on the Rights of Indigenous Peoples, as well as the International Mother Earth Day." (1/CP.16, Footnote of Paragraph 2(e), Appendix I)

2 Components of environmental safeguards

The primary objective of REDD-plus is to reduce emissions through forest conservation and sustainable forest management in developing countries. However, since the concept was first proposed at UNFCCC, REDD-plus has also been expected to promote the conservation of biodiversity-rich tropical forests. This expectation is represented by item (e) of the Cancun Agreement, which is also called environmental safeguards. The statement requests countries to respect and address the conservation of biodiversity and ecosystem services when implementing REDD-plus activities. Note that countries are requested to enhance not only environmental benefits but also social benefits, as represented by the term "social and environmental benefits" (See 2.4 for enhancement of benefits). Furthermore, the footnote of item (e) states that sustainable livelihood of indigenous peoples and members of local communities should be considered in the context of environmental safeguards (See REDD-plus Cookbook ANNEX Vol. 3 (Furukawa et al. 2017) for instructions on social safeguards). This particular manual focuses on item (e) of the Cancun Agreement (Table 1) ***[See Recipe-P03, page 39-40]***.

Table 1. Categorization of Safeguards in the Cookbook and the focus of this annex

Cancun Safeguards Item	Category
(a)	Forest governance
(b)	
(c)	Social safeguards
(d)	
(e)	Environmental and social safeguards
(f)	Climate change
(g)	

* This annex covers the green item only.

Safeguard items related to social and climate (c, d, f, and g) ask parties to avoid negative impacts and reduce risks, whereas item (e) further encourages to enhance positive impacts. The wording of item (e) is complicated reflecting the process of international negotiations, but the key components are 1) conservation of biodiversity, 2) special consideration for natural forests, 3) conservation of ecosystem services, and 4) enhancement of social and environmental benefits. Although multiple pathways exist to enhance social benefits comprehensively, this manual will focus on social benefits achieved through conservation and enhancement of ecosystem services given the close link with biodiversity.

2.1 Conservation of biodiversity

The Convention on Biological Diversity (CBD) defines biodiversity as the variability among living organisms from all sources, including diversity within species, between species and of ecosystems (CBD Article 2). Biodiversity is critical for sustaining the functioning of ecosystems and bringing various benefits to human society. However, biodiversity is currently at stake due to increasing pressures from human activities.

REDD-plus targets forests in developing countries, particularly in the tropics, where biodiversity is exceptionally rich. However, tropical biodiversity has been rapidly declining due to habitat loss, forest degradation, and excessive hunting and harvesting of biological resources (Bradshaw et al. 2009). Therefore, REDD-plus is expected not to impair the value of biodiversity but to further promote its conservation. The CBD invites countries to consider the following points when implementing REDD-plus (Annex to Decision XI/19).

Adverse impacts on biodiversity to be avoided (excerpted from Article 4, Annex to Decision XI/19):

- The conversion of natural forests to plantations and other land uses of low biodiversity value and low resilience;
- Displacement of deforestation and forest degradation to areas of lower carbon value and high biodiversity value;
- Increased pressure on non-forest ecosystems with high biodiversity value;
- Afforestation in areas of high biodiversity value.

Approaches to enhance biodiversity conservation and ecosystem services (excerpted from Article 17(d), Annex to Decision XI/19):

- Converting only land of low biodiversity value or ecosystems largely composed of non-native species, and preferably degraded ecosystems;
- Prioritizing, whenever feasible, local and acclimated native tree species when selecting species for planting;
- Avoiding [the use of] invasive alien species;
- Strategically locating afforestation activities within the landscape to enhance connectivity and increase the provision of ecosystem services within forest areas.

Conservation of biodiversity is strengthened when it is planned based on multifaceted and spatially broad information, such as the location of important habitats, ecosystems with conservation priority, and landscape configuration and connectivity. Such information is usually incorporated and reflected in regional or local biodiversity conservation programs, and item

(e) of Cancun Safeguards notes the importance of REDD-plus actions to be “consistent” with them. When consistency is not ensured, the effectiveness of both REDD-plus and biodiversity conservation measures might be weakened or impaired. Specific programs of interest are the National and/or Regional Biodiversity Strategy and Action Plans (NBSAPs/RBSAPs) formulated under the initiation of the CBD. Other international agreements and programs, such as the World Heritage Convention, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Ramsar Convention, and UNESCO’s Man and the Biosphere (MAB) Programme might also have regulations, programs or guidance relevant to REDD-plus activities. National and subnational programs and regulations related to land protection and land use should also be checked. Conservation activities led by local stakeholders, such as NGOs, indigenous peoples, and members of local communities, should also be considered.

2.2. Special consideration to natural forests

Reflecting the high level of interest by the international community, the term “natural forest” appears three times in safeguard item (e). Natural forest is defined as “A forest composed of indigenous trees and not classified as forest plantation,” so it is clearly distinguished from forest plantation, i.e., “A forest established by planting or/and seeding in the process of afforestation or reforestation” (FAO 2000). Monocultural plantation may be high in carbon absorption over a short period. However, biodiversity is generally significantly lower in forest plantations than in natural forests (Gibson et al. 2011). During the initial negotiations in UNFCCC, one concern was that if REDD-plus focused only on forest carbon, conversion of natural forests to fast-growing forest plantations might be accelerated to increase the short-term gain in carbon stocks. Furthermore, if the qualitative change in forests is ignored, conversion of natural forests to profitable forest plantations might be overlooked. Therefore, safeguard item (e) emphasizes to protect and conserve natural forests without converting them to plantations.

Natural forests include primary forests that have no clear visible indications of human activities and secondary forests that have naturally regenerated after disturbance (FAO 2000). Intact forests that are almost unaffected by human activities are increasingly becoming rare worldwide (Potapov et al. 2017). Such forests are homes of species that are unable to survive in secondary forests or forests that have experienced selective cutting (Barlow et al. 2007; Gibson et al. 2011). Therefore, REDD-plus has a large potential to promote biodiversity conservation by preferentially protecting and conserving natural forests with almost no human activities.

2.3 Conservation of ecosystem services

Ecosystem services are the benefits supplied to human societies by ecosystems. Ecosystem services are supported by biodiversity, and they are generally grouped into provisioning

services, regulating services, cultural services, and supporting services, which all help improve human well-being in various ways (Fig. 1; MA 2005).

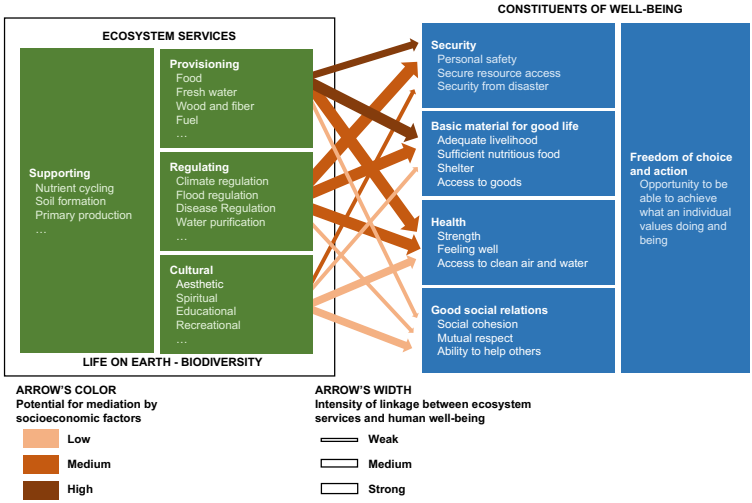

Fig. 1 Links between ecosystem services and human well-being (MA 2005)

Synergy (relations in which the enhancement of a service also improves the state of other services) or trade-off (relations in which the enhancement of a service in exchange impairs other services) might occur between ecosystem services or between ecosystem services and biodiversity. In particular, different types of trade-offs that are mutually not exclusive exist: spatial trade-offs (i.e., benefits here and costs there), temporal trade-offs (i.e., benefits now and costs later), and beneficiary trade-offs (i.e., some win and others lose) (TEEB 2010).

Forests provide various ecosystem services to human society, and REDD-plus focuses on its climate regulation service (CO_2 absorption and storage). For example, if REDD-plus actions prioritize the conservation of forests high in carbon stock, biodiversity, and watershed protection function (i.e., synergistic relationship), various ecosystem services can be conserved simultaneously. Meanwhile, if REDD-plus activities restrict the use of forest (i.e., provisioning services), there might be a trade-off between the beneficiaries of emissions reductions distributed worldwide and the local communities whose livelihood depends on forest resources. To address this trade-off, the local communities might deserve livelihood support or compensation for having restricted their rights so that any cost burdens are mitigated.

2.4 Enhancement of social and environmental benefits

Benefits are something useful and valuable to individuals and societies, and they are not limited to products or services that can be priced. Ecosystem services are benefits people obtain from ecosystems (MA 2005), and the benefits people enjoy also affect their well-being (Fig. 1). When assessing benefits, the cost required to obtain benefits should be taken into consideration (TEEB 2010).

REDD-plus is a financial mechanism for "carbon benefits" by reducing carbon emissions. As mentioned earlier, forests are closely related to "social and environmental benefits" including but not limited to ecosystem services. REDD-plus is expected to enhance these "social and environmental benefits" (also called "non-carbon benefits" or "co-benefits") along with carbon benefits. The definition of social and environmental benefits lacks consensus, but they likely include benefits derived from the conservation of biodiversity, natural forests, and ecosystem services, and positive social impacts to stakeholders including indigenous peoples and members of local communities. Thus, social benefits are closely related to respecting and addressing items (c) and (d) of Cancun safeguards (i.e., respect for the knowledge and rights of indigenous peoples and members of local communities, as well as full and effective participation of stakeholders), which are commonly known as social safeguards. Respecting the tenure rights of forest-dependent local communities and their participation in the decision-making process of forest management would lead to an improvement and increased security of their livelihoods. (See REDD-plus Cookbook ANNEX Vol. 3 Social safeguards (Furukawa et al. 2017) for details).

The social and environmental benefits that REDD-plus can provide are diverse, and various ways are used to strengthen them. When we perceive human well-being as a form of comprehensive benefit, REDD-plus has great potential to bring benefits to people through three non-exclusive approaches: "opportunities" including jobs, payments, and education; "security," which encompasses ecosystem services and the rights to landownership and resource use, and "empowerment" related to participation in decision making (Fig. 2; Lawlor et al. 2013).

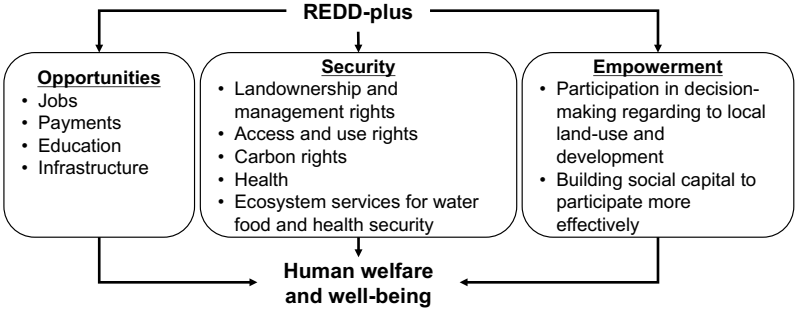

Fig. 2 Three approaches to improve human well-being through REDD-plus (Lawlor et al. 2013)

3. Addressing environmental safeguards

To respect and address environmental safeguards when implementing REDD-plus activities, one must 1) identify conservation targets found in areas that REDD-plus activities may affect, 2) assess potential impacts of REDD-plus, especially negative impacts that should be avoided, and 3) consider whether appropriate conservation and/or enhancement measures are planned and implemented.

3.1 Identifying conservation targets

To address environmental safeguards in REDD-plus, elements that are important for conserving biodiversity and ecosystem services should be identified[3] in the target areas where REDD-plus activities are carried out, and in other areas that might be indirectly affected by REDD-plus activities (e.g., displacement of emissions[4]). Among the components of environmental safeguards, natural forests can be specifically defined, but elements of biodiversity and ecosystem services may vary depending on the sites. Given the difficulty for individual project proponents to measure the variability within species (i.e., genetic diversity), assessing biodiversity from or above the species level to the ecosystem/landscape scale is feasible in the context of REDD-plus.

3.1.1 Identifying important species

The conservation priority of a species should be judged based on multiple factors such as its extinction risk, level of endemism, cultural value, and resource value (See section 3.1.3 for values as culture and resources). Species inhabiting both forests and non-forest ecosystems should be considered if there is a possibility of being affected by REDD-plus activities. Species to be considered will most likely be limited to plants, vertebrates, and insects due to limited information on identification keys, distribution, and general ecology of most species in other taxa. For taxonomic groups that are difficult to identify to species (especially for plants and insects), higher taxon, such as genus or family can be used based on the information available.

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3 Social and Environmental Principles and Criteria (SEPC), REDD+ Social and Environmental Standards (REDD+ SES), Climate Community and Biodiversity Standards (CCBS), and Strategic Environmental and Social Assessment (SESA), which are the four major REDD-plus safeguard guidelines used worldwide, encourage the identification of areas to be preferentially conserved for biodiversity and ecosystem services (Ehara et al. 2013).

4 Increase in emissions as a result of emission activities being displaced from areas targeted by REDD-plus to areas that are not.

The National and/or Regional Biodiversity Strategy and Action Plans (NBSAPs/RBSAPs) and related local conservation programs often provide lists of the important species that should be conserved. By referring to them, project proponents might be able to identify species of conservation targets that may live in or near the project site. Other useful sources of information include the IUCN Red List of Threatened Species[5], which lists the world's endangered species and their distributions for some taxa. More detailed information might be available if a national or regional Red Data Book or Red List of endangered species is compiled. In particular, effective conservation measures can be planned if information on population size or location of breeding site of important species is available.

When identifying the target species, one should check whether the species is regulated in the Appendix to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) or protected by the laws in the host country. Many species with economical and cultural values, especially those regulated under the CITES, are overexpolited by illegal hunting and harvesting. Therefore, information of species distributions must be handled with the utmost care (Box 1).

Box 1: Handling of information on endangered species

Scientific information on the ecology of endangered and/or rare species is useful for developing effective conservation measures or for operating ecotourism in an ecologically appropriate manner. However, disclosing the information on species location or habitat description to the public requires care: poachers or illegal harvesters might show up and wipe out the local population, or nature enthusiasts might accelerate habitat destruction (Lindenmayer and Scheele 2017). Species that are most targeted are those hunted or collected for high economic or cultural values, such as high-value timber species, orchids, animals with ivories or horns, or those consumed as rare delicacy, traditional medicine, or as pets and specimens. International crime networks are believed to be involved in some of these transactions. Appendix to CITES or the laws of the host country often provide lists of species that need to be handled with utmost care. However, such regulations might lag behind the local situation, so project proponents should pay attention to any emerging threats through various information channels including interviews with the locals. The search results of the name of the species on the internet would probably be a good indicator of whether the species is highly prized and threatened by enthusiasts (Auliya et al. 2016). Project proponents should avoild the careless disclosure of location information of species at risk, even though such data are intended to contribute to the conservation of biodiversity in the host country.

5 IUCN (International Union for Conservation of Nature and Natural Resources) Red List of Threatened Species: http://www.iucnredlist.org/

3.1.2 Identifying important ecosystems and/or landscapes

An ecosystem includes not only organisms but also their surrounding physical environment as a system. It is composed of hierarchical components such as genes, species, populations, and communities. At a broader spatial scale, multiple ecosystems form a landscape. For a comprehensive biodiversity conservation and the sustainability of ecosystem functioning including provisioning of ecosystem services, there is growing recognition of the importance of ecosystem-based management (UNEP 2009). Thus, REDD-plus is expected to recognize important ecosystems and landscapes for biodiversity conservation (For the viewpoint from ecosystem services, see section 3.1.3).

Natural forest is the most emphasized ecosystem to conserve under REDD-plus. The distribution and area of natural forests need to be monitored while being distinguished from planted forests to demonstrate that no conversion has occurred. Natural forests with pristine features and minimal human impacts are particularly high in conservation value, and REDD-plus can enhance biodiversity conservation by protecting such natural forests. Forests with little human disturbance are characterized by few pioneer species and many shade-tolerant species, and data from ground-based carbon monitoring might be useful to identify the location and characteristics of such forests (Imai et al. 2014). Non-forest ecosystems with little human activities distributed within the range affected by REDD-plus activities should also be identified as well.

Ecosystems and landscapes that provide feeding grounds and habitat for important species are also candidates of conservation targets. Protecting forests that have lost species of conservation interest due to poaching and other illegal activities is a failure of ecosystem conservation and is called “empty forest syndrome” (Redford 1992). Conservation success cannot be achieved unless both species and ecosystem conservation are taken into consideration. Thus, whether species of conservation importance are found in the target area and in which ecosystems, and where their distributions overlap, should be determined. Breeding grounds are areas that require special consideration.

Protected areas are important conservation targets whose conservation values have been identified through pre-existing conservation schemes. In addition to protected areas (e.g., national parks and wildlife reserves) designated by the host country, those that are registered under international conservation networks such as the World Heritage Convention, the Ramsar Convention and the UNESCO’s MAB, and areas protected by local stakeholders should also be identified. If such protected areas have conservation plans, useful information on the species and areas of conservation importance, areas restricted to human activities, and locally adapted conservation measures might be available.

Areas of conservation interest can also be identified through landscape-level analyses. For

example, intact forests that are not fragmented by anthropogenic land use such as roads and built-up areas are becoming increasingly rare worldwide (Potapov et al. 2017). Landscape-level analyses are also useful for identifying contiguous ecosystems that play a critical role in local biodiversity conservation and areas that improve the connectivity of ecosystems.

3.1.3 Identifying important ecosystem services

Among the four categories of ecosystem services, provisioning, regulating, and cultural services are subject to conservation as they are directly related to human well-being, whereas supporting services are necessarily not because they are the basic functions of ecosystems that support other services (Fig. 1). When identifying ecosystem services of conservation interest, opinions from stakeholders including indigenous peoples and members of local communities should be considered through interviews and consultations to enhance social and environmental benefits.

Important provisioning services can be identified by interviewing local peoples who use, consume, and/or sell resources obtained from the surrounding landscape. The type of resources they collect, the location of collection including prohibited areas, and the characteristics of people who use them are important information that can be obtained through household interviews (Miah et al. 2012; Kimura et al. 2014; Ehara et al. 2015). However, what people consider to be valuable in the forest areas is often difficult to recognize and measure (Sheil and Wunder 2002; Kaimowitz and Sheil 2007). Thus, one should understand the socioeconomic background and surrounding environment of vulnerable groups in the community, particularly those sensitive to changes in the surrounding environment, and the services they depend on (especially food, fuel, medicine, and materials) (Schoneveld et al. 2011; Mandondo et al. 2013; Ehara et al. 2016). From the perspective of social safeguards, understanding the relationship between stakeholders' rights related to land and forest use and each provisioning services is crucial, with special attention to the rights of indigenous peoples and members of local communities.

Regulating services are difficult to measure directly, and the beneficiaries, who tend to be distributed in relatively wide areas, are often hard to identify. Thus, the critical areas for the conservation of regulating services should be identified using knowledge derived from scientific literature. For example, vegetation in the riparian zone and on steep slopes is a candidate of conservation targets for the general functions of soil and water conservation and preventing landslides.

Field-based interviews to local stakeholders should be conducted to identify conservation targets of cultural services due to their large regional variation. Specifically, the forests used or protected by indigenous peoples and local communities over generations, such as grave

forests, spiritual forests, shrine and temple forests, and sites prohibiting human entry should be included. In addition to these forests and sites, scenic spots designated by host countries and landscapes attracting people for sightseeing will also be targets of conservation.

In the previous sections, key approaches to identifying conservation targets of biodiversity, ecosystem, and ecosystem services from the perspective of REDD-plus environmental safeguards have been explained. In early REDD-plus projects, a framework known as High Conservation Value (HCV) was utilized to identify conservation targets, in which both biodiversity and community objectives were incorporated (Box 2).

Box 2: Framework for High Conservation Value (HCV)

Forestry-related voluntary certification schemes, such as the Climate, Community and Biodiversity Standards (CCBS) and the Forest Stewardship Council (FSC), use a framework known as High Conservation Value (HCV) to identify the conservation targets (CCBA 2013; Forest Stewardship Council 2015). HCVs consist of six categories: HCV1–HCV3 (biodiversity components), and HCV4–HCV6 (elements of ecosystem services important for local communities) (Table 2; Brown et al. 2013). In particular, HCV identifies the areas with high conservation value as the target to conserve. In addition, when identifying HCV4–HCV6, opinions of indigenous peoples and members of local communities are required to be taken into account.

Table 2 Elements and contents of High Conservation Value (HCV)

	Category		Notes and examples
Biodiversity	HCV1	Species diversity	Areas with high concentrations of biological diversity: protected areas, habitats of rare, endangered and/or endemic species, including temporal importance (e.g., breeding areas, feeding grounds, and migration routes)
	HCV2	Landscape-level ecosystems and habitats	Intact forest landscapes and large landscape-level natural ecosystems and mosaics that contain viable populations of the great majority of a species
	HCV3	Rare, threatened, or endangered ecosystems	–
Local communities	HCV4	Ecosystem services	Basic ecosystem services including protection of water catchments and control of erosion of vulnerable soils and slopes
	HCV5	Community needs	Sites and resources fundamental for satisfying the basic necessities of indigenous peoples and local communities (for livelihoods, health, nutrition, water, etc.)
	HCV6	Cultural values	Sites, resources, habitats and landscapes of cultural, archaeological or historical significance, and/or those that are critical for the traditional cultural identity of indigenous peoples and local communities

3.2 Avoiding negative impacts

The basic concept of REDD-plus safeguards is to avoid negative impacts that might be caused by REDD-plus activities. After identifying the conservation targets, potential impacts of REDD-plus activities should be analyzed at the planning stage. If possible negative impacts are identified, improvement measures, such as changing the plan or adding compensatory measures, should be adopted. Some project proponents may regard safeguards as “burdens” of REDD-plus activities, but one must remember that any negative impact to the environment or the community might lead to the failure of the entire project. Therefore, safeguards should be addressed and respected from the initial stage of project development.

When a REDD-plus project aims to reduce deforestation, measures to control the expansion of land-use associated with forest conversion (to farmland or residential land) are usually implemented. This type of REDD-plus activity usually leads to the conservation of forest biodiversity and ecosystem services. However, such positive effects might be limited unless the conservation of natural forests is ensured. In addition, when managing the displacement of emissions, one must ensure that non-forest ecosystems (or low-carbon forests) with high value of biodiversity and ecosystem services are not converted to other land-use.

In a REDD-plus project aimed at reducing forest degradation, the reduction in forest carbon stocks is often prevented by restricting forest use. As with deforestation measures, reducing forest degradation is considered to act positively for the conservation of forest biodiversity and ecosystem services. However, if the use of provisioning services, such as timber, fuel, and other forest resources, is prohibited, local people using them might be adversely affected by the project. Therefore, compensation and/or support for livelihood equivalent to the loss caused by the implementation of the REDD-plus project is needed for those affected. The use of provisioning services is closely related to the rights to land and forest use. Special attention should be paid to the customary rights of indigenous peoples and members of local communities, which are not always recognized in the host country’s legal system and not reflected in local resource management programs. (See Furukawa et al. (2017) for further reading on respecting the knowledge and rights of indigenous peoples and local communities).

Afforestation and reforestation activities are not necessarily the focus of REDD-plus in general, but related activities (e.g., small-scale tree planting, assisted natural regeneration, and restoration) have been implemented in early projects to enhance carbon stocks, restore forest ecosystems and biological corridors, and/or introduce useful tree species for livelihood support. When implementing such activities related to tree planting, converting

natural forests into tree plantations is not allowed in REDD-plus. Alien species might be selected for planting due to established reforestation technology and low adoption costs, but the use of highly invasive species that might threaten natural ecosystems, disturb water balance, or alter natural fire regimes should be avoided. In particular, voluntary certifications strongly recommend the use of native species for biodiversity conservation; if alien species are used, one should demonstrate that the benefits are larger than the negative ecological impacts (CCBA 2013).

Other types of activities might also be conducted in a REDD-plus project, and careful consideration is required as their possible negative impacts will vary depending on the circumstances. Some international safeguard standards ask to demonstrate that the use and disposal of chemicals (e.g., fertilizer, herbicide, and insecticide) and materials used for the activities are appropriate (CCBA 2013). If, for example, forest patrolling by local communities is planned for the conservation of forest carbon and biodiversity, the community would be negatively affected if appropriate expenses of patrolling including labor cost are not paid (which applies to all community-based participatory activities). Diverse measures can be adopted to address negative impacts under REDD-plus environmental safeguards, and they should be considered in close relationship with social safeguards, especially for matters involving indigenous peoples and members of local communities.

3.3 Enhancing positive impacts

Unlike other items of the Cancun safeguards, environmental safeguards encourage the enhancement of social and environmental benefits. Avoiding negative impacts while enhancing positive impacts in REDD-plus may seem demanding. However, REDD-plus has the potential to achieve both carbon and non-carbon benefits simultaneously. The enhancement of social and environmental benefits might also be an integral element for the success of a project to receive support from local stakeholders and strengthen project legitimacy. Furthermore, projects are increasingly evaluated or even rated based on whether it can deliver net positive impacts, in which the with-project scenario is compared against the business-as-usual or without-project scenario (Box 3).

To promote additional benefits of REDD-plus, threats to the identified conservation targets must first be understood, and measures in conjunction with REDD-plus activities should be planned. For example, agriculture, logging, and hunting were considered threats to biodiversity in early forest carbon projects (Panfil and Harvey 2016). Among these threats, agriculture and logging are drivers of deforestation and forest degradation, respectively (Hosonuma et al. 2012). Thus, carbon benefits and biodiversity conservation might be achieved simultaneously in REDD-plus projects targeting these drivers. Many projects have claimed to contribute to biodiversity conservation by conserving species habitats through REDD-plus (Panfil and Harvey 2016). Likewise, conservation of forest-related ecosystem services is one of the benefits that REDD-plus can achieve relatively easily.

Additional benefits might be greatly promoted with minimal modification of the planned REDD-plus activities. For example, if patrolling of illegal cutting is planned as a countermeasure of forest degradation, watching out for poaching and other illegal forest use would also enhance the conservation of rare animals and plants while conserving forest carbon. Adding livelihood support for local communities through ecotourism development to such patrolling activities might be one potential option to further enhance social benefits. Furthermore, if small-scale tree planting (e.g., distributing seedlings of garden trees and boundary trees along the edge of croplands or rangelands) to reduce forest degradation is planned, considering the needs of local communities (such as fuel, food, medicine, and materials) when selecting tree species would enhance social benefits of project activities. Environmental benefits can also be promoted by preferentially using native species, choosing trees that provide food to other animals, and planting in areas that increase habitat connectivity (Thompson et al. 2014).

Box 3: Net positive impacts and additionality

Enhanced positive impacts in some elements can be offset by negative impacts in others caused by the project if the negative impacts are left unaddressed. Therefore, some international safeguard standards require not only avoiding negative impacts of the project activities but also demonstrating that the activities deliver net positive impacts[6].

Voluntary certification schemes such as the CCBS expect convincing explanation of how the project will bring the impacts on the environment and society (CCBA 2013). This task is achieved by comparing the with-project scenario against the business-as-usual (BAU) or the without-project scenario and demonstrating that the net positive impact would not have been gained without the project (which is known as "additionality") (CCBA 2013) (Fig. 3).

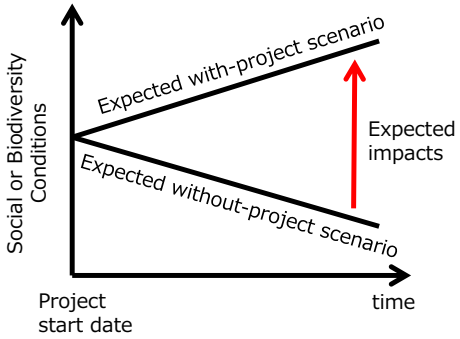

Fig. 3 Concept of net positive impacts achieved through the project's additionality (Richards and Panfil 2011)

The idea of assessing net positive social impacts of a REDD-plus project by comparing with the BAU scenario shown in Fig. 3 is close to the concept of time-series evaluation that has developed in evaluation research (e.g., see Rossi et al. 1999). However, Caplow et al. (2011) reported that robust evaluations using counterfactual scenarios are rare in avoided deforestation projects prior to the introduction of REDD-plus. In addition, constructing BAU scenarios is a challenge for REDD-plus projects because the data collection for scenario analysis is often conducted after project initiation (Pasgaard 2013).

6 Among REDD-plus safeguard standards and tools available worldwide, some of them (e.g., CCBS) require applying methods to demonstrate a net positive effect, and some do not (Ehara et al. 2013).

4. Monitoring of environmental safeguards

In general, the objectives of monitoring are to assess whether the activities are producing the intended effects as originally planned and to update and improve the next actions based on the results. Monitoring is a crucial process for the adaptive management of REDD-plus projects and environmental safeguards. To conduct effective monitoring of environmental safeguards, project proponents should understand what information is needed for implementing safeguards throughout the project. In addition, project proponents must report how safeguards have been respected and addressed and disclose the monitoring results regardless of which financial scheme of REDD-plus they use. Monitoring of natural forests is already a requirement in many REDD-plus frameworks.

Monitoring should be effective and efficient given the often limited project finance. Effectiveness can be achieved by analyzing how the project will bring impact and achieve the targeted effects. In particular, safeguard monitoring should check whether project activities are bringing positive rather than negative impacts to the identified conservation targets as planned. Before project implementation, potential negative impacts of the project on the identified conservation targets should be analyzed and the project design should be modified and improved in advance to avoid negative impacts. Additionally, project activities are expected to be modified or added accordingly to bring positive effects on the identified targets of biodiversity, ecosystem services, and local communities. In both cases, the relationship among the “targets” affected by the “impacts” (effects) of the “activity” should be clarified during the project development phase, and these three components are good candidates of monitoring indicators of environmental safeguards (Fig. 4).

The relationship between project activities and conservation targets can be further analyzed in detail in a framework called “Theory of change” (Fig. 5; Richards and Panfil 2011). Under this framework, the planned activities bring initial “outputs,” which then become tangible “outcomes,” such as, changes in people’s behavior. Finally, the targeted final objectives of the activities (“impacts”) are achieved. Effective monitoring can be achieved by setting relevant indicators for each step. This framework of analyzing the impacts of a project in a step-wise manner is also useful for planning effective project activities.

Among the conservation targets, those that may be negatively affected should be monitored. Even if the plan had been improved to avoid negative impacts, the target that could have been negatively affected in the original plan needs to be monitored to assess whether the improvement measures are functioning. If unexpected negative impacts become apparent on targets that were not intended to be monitored, improvement measures

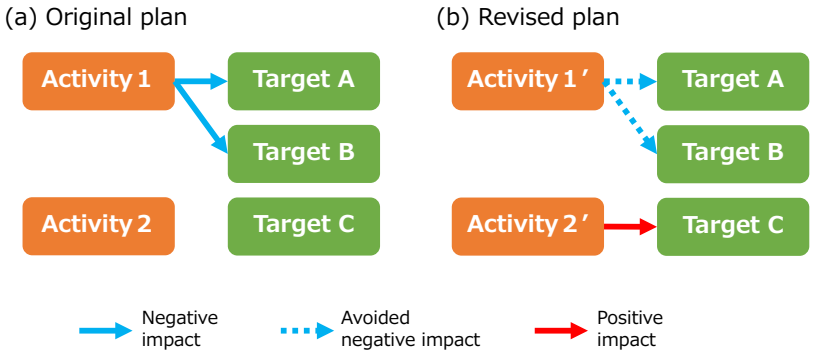

Fig. 4 Relationship between the targets affected by project activities

In this hypothetical example, Activity 1 was found to have negative impacts on Targets A and B, but Activity 2 had no negative or positive impacts on any of the targets in the original plan (a). To avoid negative impacts and bring positive effects, Activity 1 was modified to Activity 1' so that the negative impacts on Targets A and B were avoided, and Activity 2 was modified to Activity 2' to enhance positive impacts on Target C. In this case, one should monitor whether Targets A and B were not negatively affected by Activity 1', and whether Activity 2' brought expected positive impacts on C.

Measures against illegal logging + Measures against illegal hunting		Reduce pressure on forest resources + Support for alternative livelihoods
• Forest patrol • Removal of illegal hunting traps	Activity	• Lectures and training courses • Provision of farming tools and materials
• # of arrested illegal users • # of removed traps	Output	• # of trainees attending • # of households using new tools/materials
• Rate of recidivism of illegal users • Amount of illegal bushmeat on the market	Outcome	• # of households adopting alternative livelihood activities • Increase in income by alternative livelihoods
• Decline of illegal logging/hunting • Increase in wildlife population	Impact	• Decrease in poverty rate • Decreased pressure on forest resources

Fig. 5 Concept of "Theory of change" and examples of monitoring indicators

Countermeasures against poaching implemented along with illegal logging measures (left); livelihood support implemented as part of measures to reduce pressure from forest use (right).

should be taken immediately and monitoring should be added. Project proponents should remember that evaluation of positive and negative impacts is often performed more strictly under voluntary certification schemes (Box 3). When extracting monitoring indicators based on the concept of "Theory of change" for negative project impacts, focus should be given to

the “impact” as the aim is to monitor “no negative impact”.

Efficient data collection is indispensable for sustained monitoring. Determining the monitoring indicators for project activities and their outputs should be relatively easy. Considering whether data collection can be carried out as part of the project activities is also important. For example, monitoring cost may be reduced by recording the number of observed wild animals, including traces of feces and footprints, during forest patrolling. Utilizing data collected for carbon monitoring is another way to reduce cost. For example, changes in the distributions and areas of natural forests and other natural ecosystems can be assessed using remote sensing data that was obtained to monitor forest carbon stocks and drivers of deforestation and forest degradation. In addition, data from ground-based carbon monitoring can be used to analyze the distribution and characteristics of forests with low human impacts and their qualitative change (Imai et al. 2014).

Meanwhile, collected data might have limited use without ensuring the reliability of data. When monitoring temporal changes in a conservation target, use of the data that are periodically recorded via a comparable method at the same observation point is recommended. Monitoring should be conducted using an appropriate survey method and time (e.g., season and day/night) depending on the target, and advice must be sought from experts when necessary. When local communities or non-experts participate in monitoring, appropriate training for necessary monitoring skills should be provided to all participants.

To improve project activities through monitoring, project governance structure including the responsibility of data collection and analysis and the decision-making process for adaptive management should be defined. Monitoring results also need to be reported and disclosed in accordance with the guidance of the financial scheme of REDD-plus the project uses. Monitoring results should be disclosed to the local communities using local languages and appropriate means. Project proponents should also keep in mind that participation of local stakeholders can be enhanced by sharing monitoring data and jointly planning the monitoring design, especially with indigenous peoples and local communities (See Furukawa et.al (2017) for details on participation).

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Notes

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