

IKI-Projektevaluierungsbericht Nr. P-007

**Waldschutzprogramm „Heart of Borneo“
Anteil Succow-Stiftung
Restoration of Peatswamp Forests in Central Kalimantan**

Durchgeführt durch die unabhängige FZ-Evaluierungseinheit der KfW Entwicklungsbank



2. Evaluierungszyklus 2017-2021 der Internationalen Klimaschutzinitiative (IKI)

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Ex post evaluation – Indonesia

>>> Project of the International Climate Initiative (IKI)

IKI funding area: Funding area 3: Conservation of natural carbon sinks/REDD+ /
Funding area 4: Conserving biological diversity

Project: Securing natural carbon sinks and habitats in the Heart of Borneo (HoB)
(Project number 209810532, BMUB reference 09_II_029_IDN_K)

Implementing agency: WWF Germany and WWF Indonesia



Ex post evaluation report: 2018

		Planned	Actual
Total costs	EUR	870,055	1,005,542
Counterpart contribution*	EUR	0	135,487*
Funding	EUR	870,055	870,055
of which IKI funds	EUR	870,055	870,055

*) Counterpart contribution comprises further funds raised for this project by WWF Indonesia until project end.

Summary: Between August 2009 and March 2013, WWF Germany and WWF Indonesia implemented agroforestry measures in three districts - Kapuas Hulu, Sintang and Melawi - located on the Indonesian part of the island Borneo (Kalimantan). The measures included enrichment planting with rubber, fruit and hard wood trees and were accompanied by education on environment and good agricultural practices for rubber cultivation, by village land use mapping and by very site-specific village development measures. Furthermore, support for district spatial planning was provided. WWF cooperated with forestry and spatial planning authorities and with local communities in the Leboyan Corridor - connecting the National Parks Betung Kerihun and Danau Sentarum - and in the buffer zone of the Bukit Baka Bukit Raya National Park (BBBR).

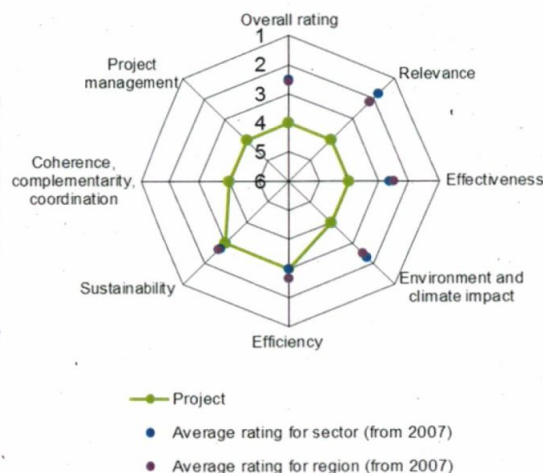
Objectives: The overall climate-relevant objectives (impact) were 1) the protection of forest and peat land ecosystems in Kalimantan and 2) the reduction of greenhouse gas emissions, as well as 3) the conservation of biodiversity. Project objective (outcome) was the reduction of deforestation and forest degradation in and around the national parks Betung Kerihun and BBBR.

Target group: Rural population living in and around the National Parks. The direct target group encompassed 42 households until 2012 and 281 households including WWF's continuation of project measures until 2018. A global benefit was envisaged with regard to reduction of greenhouse gas emissions.

Overall rating: 4

Rationale: The project increased the biological and economic value of small-scale project areas of local communities, but did not achieve additional carbon sequestration. The deforestation trend in the project areas has not developed more positively than in the whole of Borneo. The objective was too ambitious. Furthermore, the measures were not relevant for peatland.

Highlights: The project measures triggered the acquisition of funds for follow-up sustainable village development projects.



Rating according to DAC criteria

Overall rating: 4

Lessons learned

- Enrichment planting with species of economic value in tropical forests can make forests valuable for local villagers. However, additional carbon storage is only created if the biomass development is higher than the natural vegetation growth without a project.
- The socio-economic benefits from natural rubber tapping are highly sensitive to market prices and access to marketing channels.
- This project was proposed together with a peatland protection component, which had higher potentials for climate impacts, but which was rejected. The International Climate Initiative should be aware of potential trade-offs between socio-economic impacts and climate impacts and prioritize funds accordingly.
- Much time and grass-root work is needed to establish community forestry.

General methodological approach of the ex-post evaluation

The ex-post evaluation represents an expert judgement and applies the methodology of a contribution analysis. It attributes outcomes and impacts to the project by plausibility considerations based on the careful analysis of data, facts and impressions. Causes of potentially contradictory information are investigated, trying to eliminate such contradictions, basing conclusions – wherever possible – on several different data sources (triangulation). The analysis is based on assumed interdependencies, described in the impact matrix developed at the project appraisal (PA) and reviewed during the ex post evaluation (EPE). This evaluation report sets out arguments as to why which influencing factors were identified for the identified outcomes and impacts and why the project under evaluation was likely to provide the contribution that it did. An evaluation conception represents the reference frame for the evaluation. This evaluation included a mission to the project executing agency and project areas in Indonesia, from 20.02. to 01.03.2018. Prior to the evaluation mission, the project executing agency received a questionnaire, which informed about the main topics of the evaluation. Semi-structured interviews formed the basis for discussions during the evaluation. In addition, data from multispectral satellite images by Hansen et al. were used for own calculations regarding forest cover losses in the project region and GHG emission analyses by GIZ/FORCLIME were taken into account.

Indonesia at a glance

Area

- Indonesia	- 1.9 million km ²
- Kalimantan (Indonesian Borneo)	- 544,000 km ²
Forest area (% of total area)	
- Indonesia	- 910,100 km ² (50.2 %)
- Kalimantan	- ca. 270,000 km ² (50 %)

Population / population growth	
- Indonesia	- 261.1 million (+1.1 %, 2016)
- Kalimantan	- ca. 14 million (2010)
Gross Domestic Product (GDP) per capita	11,600 current USD (+ 5.2 %, 2016)
Population below the national poverty line	10.9 % (2016)
Human Development Index	0.689 (rank 113 of 188, 2015)
Carbon emissions per capita¹	1.9 t (rank 139 of 216, 2016)

General conditions, classification of project and project measures

Indonesia is one of the largest greenhouse gas emitters worldwide². Land use change and forestry (LUCF) caused 65.5 % of the country's emissions, according to FAOSTAT (2017)³. Large areas of primary tropical rain forest still exist, but are logged for timber extraction or converted to agricultural land use at a fast pace, i.a. for plantations and small-scale agriculture.

The island Borneo is the third-largest island in the world and belongs partly to Malaysia, Brunei and Indonesia; its largest part ("Kalimantan") is Indonesian territory and characterized by large stocks of primary forest, endemic biodiversity of global relevance and at the same time by high forest conversion rates. The "Heart of Borneo" (HoB) holds one of the world's largest transboundary forests (22 million ha). The evaluated project forms part of a larger initiative of the Government of Indonesia (GoI) "Heart of Borneo" (HoB), which was launched in 2007 by Brunei, Malaysia and Indonesia with the commitments of these countries 1) to conserve its biodiversity, 2) to protect Borneo's 14 watersheds, 3) to base economic development on sustainable natural resource management and 4) to strengthen indigenous communities. The initiative also aims at protecting the corridors between national parks, designating areas for carbon sequestration and legal community forests.

The main drivers of deforestation in Western Kalimantan have remained the same as at project start: Satellite data, spatial plans and interview results indicated that forest losses between 2009 and 2015 in Kapuas Hulu and Melawi district occurred primarily in areas of palm oil and forestry concessions, while forest cover loss in the same period in Sintang seemed to have occurred mainly in areas of illegal mining, of small-scale land conversion by local people and in timber concessions.

Maps of the project area

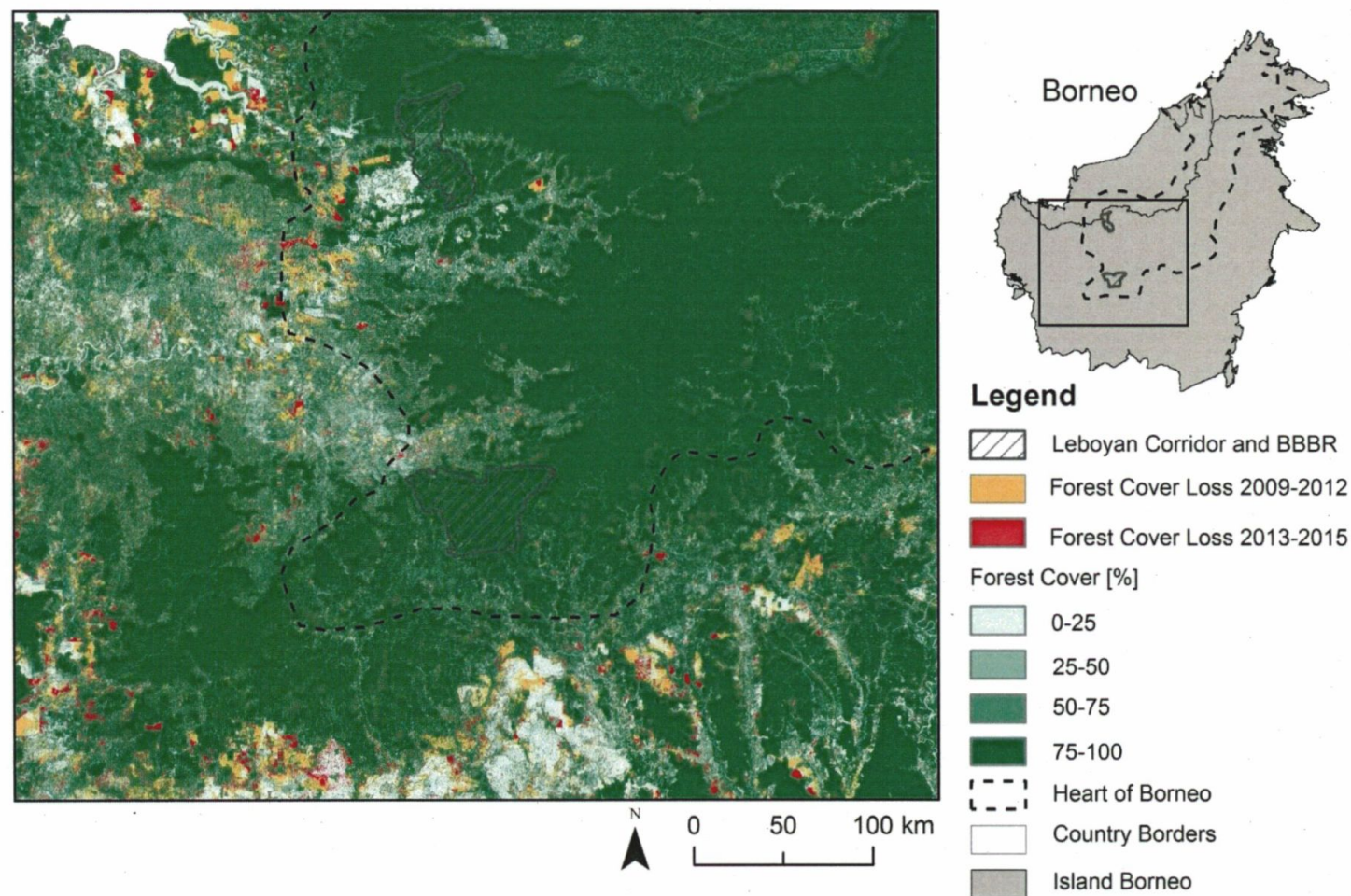
The restoration sites are located in the province West Kalimantan: 1) In the Leboyan Forest Corridor ("Leboyan Corridor" or "Corridor") between the national parks Danau Sentarum and Betihun Kenuang in Kapuas Hulu district and 2) in the buffer zone north of the national park Bukit Baka Bukit Raya in the district of Melawi. The Corridor and the buffer zone do not have the legal status of a national protected area. Their management is the responsibility of local communities, districts and provinces and not of the national government.

¹ <http://www.globalcarbonatlas.org/en/CO2-emissions>

² rank 6, World Resources Institute Climate Indicator Explorer 2014, following China, USA, EU-28, India and Russia

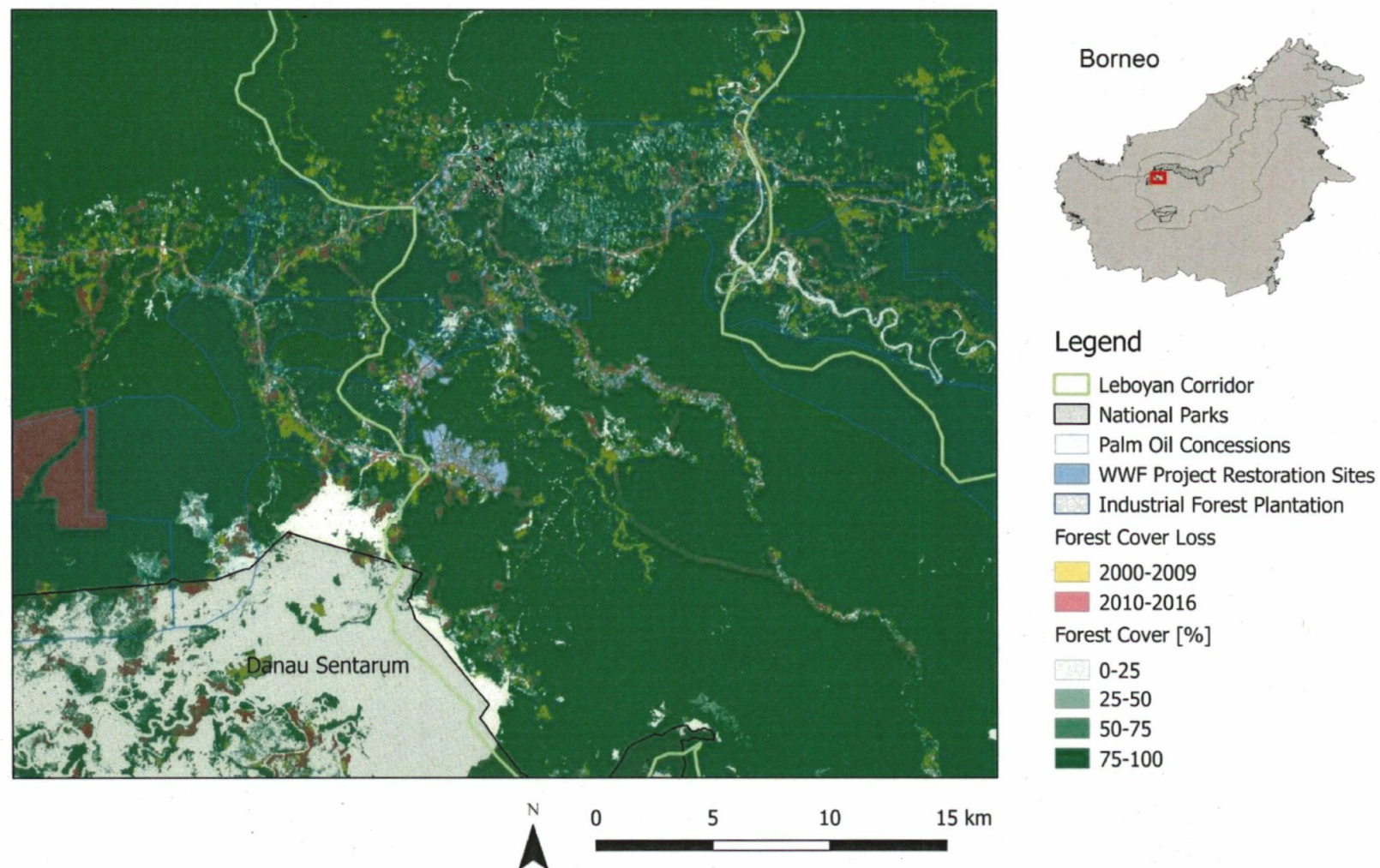
³ Depending on the source, data on GHG emissions of Indonesia and its causes vary substantially. However, LUCF is always the highest contributing sector to the emissions.

Figure 1: Illustration of forest cover in the Heart of Borneo



Internal analysis and preparation. Definition of forest cover in the data used here (Hansen et al., 2013): tree heights over 5m and at least 25 % tree canopy cover, which is measured with a spatial resolution of 30m x 30m.

Figure 2: Illustration of WWF project restoration sites in the Leboyen Corridor



Own compilation on the basis of the sources indicated below Figure 2.

Relevance

The project intervention logic was to achieve conservation commitments of communities for their land and protected areas in their vicinity and to reduce negative impacts of the traditional shifting agriculture systems on forests. This was to be achieved by providing support to communities in the form of 1) valorization of the forests by planting economically valuable trees and 2) conservation education. The implicit project objectives of WWF were i) returns for communities in the buffer zones/Corridor from near-to-nature agroforestry, i.e. enrichment planting with rubber, fruit and hard wood trees and ii) securing Orang Utan habitats by planting those fruit tree species that could serve as Orang Utan foodstuff.

The Leboyan Corridor is considered relevant for migration of many species, for example the Orang Utan, while the buffer zone of the BBR has been under strong pressure by small-scale illegal goldmining land clearing for shifting agriculture. The locations were therefore relevant for forest protection and environmental education of local communities. In retrospective, the high deforestation rates inside Danau Sentarum National Park – which are higher than in Ketung Berihun and BBR - suggest that it may also be highly relevant to make forest protection inside the park more effective and potentially a more cost-effective approach than planting activities outside of protected areas.

The project was in line with the district Kapuas Hulu's plan to become a "Conservation District"⁴ and a "Biosphere Reserve" recognized by UNESCO. Furthermore, the project provides first experiences relevant for the GoI's policy goal to develop 12.7 million ha of "community forestry" (Hutan Kemasyarakatan) until 2020, i.e. forest managed by local communities.

The chosen project measures are considered adequate as pilot measures for development of communal forestry and conservation of ecosystem services (watersheds) and partly for improving the Corridor function of the Leboyan Corridor as a habitat of key species.

The objectives in the project proposal to the German Ministry of Environment (donor) focused on the reversion of deforestation and loss of forest quality, and by these means, on the carbon storage inside and around the national parks Betung Kerihun and Bukit Baka Bukit Raya. Contrary to the proposal, the project approach was not very relevant with regard to peatland protection, as the most important peatlands and peat forests of Kalimantan are located in other provinces (e.g. Central Kalimantan). The project design did not explicitly seek to maximize carbon emission reductions. In addition, the restoration areas were too small to be relevant by themselves for carbon sequestration in the HoB. At evaluation, it appeared that the objectives of WWF Indonesia focused rather on sustainable village development and the provision of Orang Utan foodstuff.

The project approach recognized that long-term forest protection requires patient and trustful grass-root work and education with communities in buffer zones, including cooperation with NGOs and spatial planning authorities. The project design was a state-of-the-art approach to balance the interests of forest resource use and forest conservation. Cooperation of WWF with previously responsible district spatial planning agencies and with local NGOs was well established⁵. Thus, the right actors were chosen; the same activities could not have been implemented with national park authorities, given that they have no mandate to work in buffer zones, although the threat of deforestation and land use change is often higher there than in the parks themselves.

⁴the district's declaration exists since 2004, formal process and its realization in practice is yet to be finalized.

⁵ After a forestry sector reform, responsibility has shifted from districts to provincial spatial agencies. The implementation of the reform is still ongoing.

In a nutshell, the project's relevance was high with regard to local village development and communal forestry. However, the relevance of the small-scale areas for carbon sequestration was low in comparison to the large areas to be conserved. This constitutes a drawback of this project, as it was to contribute principally to the objectives of the International Climate Initiative.

Relevance rating: 4

Effectiveness

The project objective as defined at appraisal and as evaluated was to reduce deforestation and forest degradation in and around the national parks Betung Kerihun and Bukit Baka Bukit Raya. The achievement of the indicators related to the project objective is summarized as follows:

Indicator	status/ goal at appraisal	Ex-post-Evaluation		
			2009-12	2013-16
(1) Average annual forest cover loss in areas with canopy >25 % [%] ⁶	Annual average 2001-2008			
	BBBR National Park 0.03 %	BBBR NP	0.03 %	0.04 %
	BBBR Buffer Zone 0.42 %	BBBR Buffer	0.49 %	0.74 %
	Leboyan Corridor 0.22 %	Leboyan C.	0.21 %	0.15 %
	Danau Sentarum NP 0.22 %	DS NP	1.09 %	0.25 %
	Betung Kerihun NP 0.01 %	BK NP	0.03 %	0.01 %
	Goal: reversion of deforestation trend	Comparison: Borneo	6.06 %	4.34 %
		Deforestation rate decreased only in the Leboyan Corridor, but not to a larger extent than in whole of Borneo		
(2) Area with enrichment planting [ha]	Goal: 1.000 ha until 2012	50 % fulfilled until 2012, 97 % until 3/2018		
	Goal: 40 % rubber, 30 % hard wood, 30 % fruit	<ul style="list-style-type: none"> - 2012: 502 ha (44 % fruit; 5 % hard wood; 51 % rubber) - 2018: 967 ha⁷ <p><i>Inspected sites (random, but not representative sample): 90 % of planted trees were rubber</i></p>		

⁶ Source: Data from multispectral satellite images by Hansen et al. were used for own calculations regarding forest cover losses in the project region, cf. annex.

⁷ Activities between 2013-2018 financed by WWF Germany, WWF Sweden, BONGO, individual US and German donors. WWF plans to meet the target in June 2018; 33 ha remain, the 15.000 seedlings necessary for this purpose were seen at evaluation at the nursery.

(3) Survival rates of seedlings [% in year x]	Indicator amended at EPE	<p>Satisfactory survival rates:</p> <p>10/2017 (Leboyan Corridor)</p> <ul style="list-style-type: none"> - Orang Utan diet 76 % - forest timber 74 % - rubber 80 % <p>2012 (BBBR buffer zone, all species average)</p> <ul style="list-style-type: none"> - Jelundung village: 71 % - Rantau Malam (Remukoi): 68 % <p>Source: WWF monitoring</p>
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1) Own analysis based on data from Hansen et al. (2013)

For the implementation of the **agroforestry measures**, WWF successfully identified households in villages of the indigenous Dayak⁸ population that were willing to spare time and land to plant trees on their former shifting cultivation land (Ladang). Rubber and fruit trees were planted on private land (largest share), hard wood on community land. WWF realized, however, that due to seasonal migration of many villagers to Malaysia, time-intensive agricultural activities of the target group and identification of land with suitable biophysical conditions, it took much longer to identify voluntary participants for the project and to implement the project (9 instead of 3 years). The evaluation mission considers the adaptation of the time plan (500 ha until 2012 instead of 1000 ha) adequate against this background.

Selection criteria of tree species to be planted were based on the demand of the target group (economic and tradition-related considerations) and secondly on the suitability of the fruits for Orang Utan foodstuff. Ecological criteria, e.g. hard woods for improvement of forest quality, were subordinated.

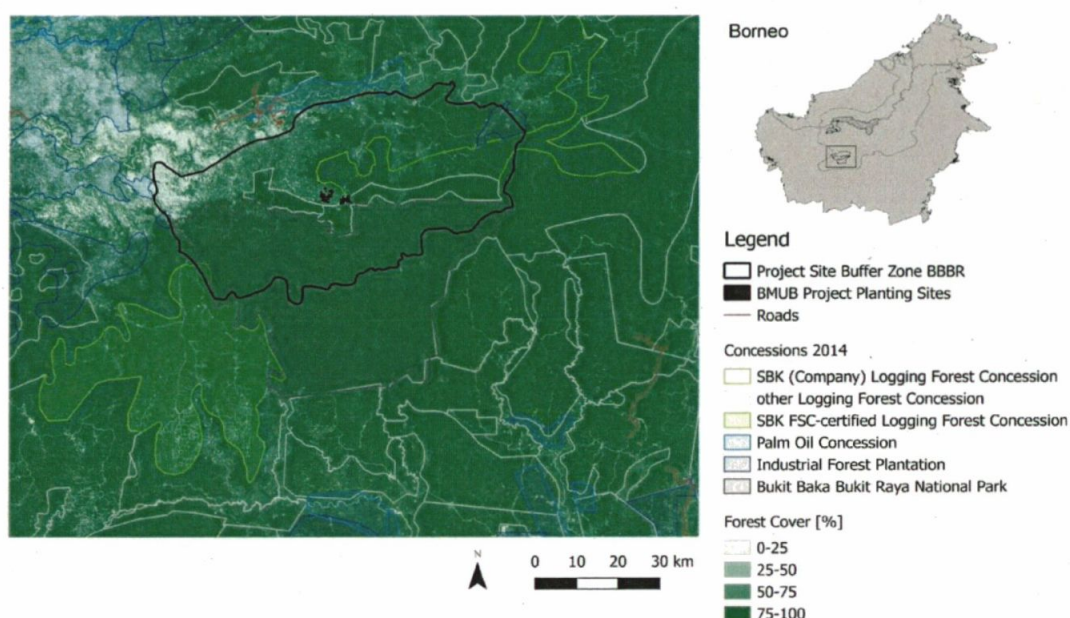
The plantation plots visited in the Leboyan Corridor were mainly established on previous shifting cultivation areas. In the Corridor, hybrid rubber had very low survival rates, mainly due to mainly lack of maintenance (fertilizing, tending, weeding). Hybrid rubber was considered an "improved species" as compared to local species by WWF. Hybrid rubber however is not automatically high-yielding; it is "highly responsive", i.e. high survival rates and yields can only be realized if maintenance is done in the necessary quality and intensity. WWF thus decided not to procure any more hybrid rubber seedlings for the Corridor, but used local seedlings instead. This was adequate, but had one disadvantage: rubber tapping is only possible after a minimum of 7-10 years, fruit trees such as durian even take 35 years until the first harvest. Thus, at the time of the EPE, very few households were already tapping hybrid rubber from the project trees. None of the four inspected nurseries and learning centers that had been financed with BMUB funds was still in use.

An originally **planned cooperation with the timber concession holding company SBK** in the Leboyan Corridor was not implemented in the project, but communication lines between SBK and WWF exist. SBK became certified according to Forest Stewardship Council (FSC) standards for sustainable forest management in 2007. The company conducted an assessment to identify areas with High Conservation Value Forest (HCVF) as required by an FSC "Corrective Action". This assessment was planned to be supported by the project. But due to

⁸ 'Dayak' is the generic term given to indigenous groups in Kalimantan, Indonesian Borneo

project delays, SBK acquired external support by Flora and Fauna International instead. SBK designated 8,6 % of a 170,000 ha concession southwest of the BBBR National Park as protected forest, which is above the minimum of 5 % set by the Indonesian FSC standards. SBK seems to have an adequate management plan in accordance with FSC national requirements. It is strongly recommended that WWF seeks cooperation with another SBK concession, which is not yet certified, but much more relevant for the BBBR NP, as it is located in the buffer zone (cf. Figure 3).

Figure 3: BBBR Buffer Zone and Forest Logging Concessions



Own compilation on the basis of the sources indicated below Figure 2.

WWF reported support to the district of Kapuas Hulu in its **spatial planning**. At EPE, the spatial plan had not yet been approved by Jakarta. Sustainable land use planning and its enforcement are crucial for a future protection of forests. The new spatial plan for Kapuas Hulu, however, was partly revised in favor of APL (*areal penggu-naan lain*, non-forest estate), which would increase the risk of deforestation for the affected planning areas. The below shown maps illustrate that more than 180,000 ha have been transformed into non-forest estate in the planning document. Thus, the Kapuas Hulu spatial plan itself has failed so far to become a milestone of forest protection. It is difficult to assess the effectiveness of the project support to spatial planning, as there is no counterfactual scenario without any support and certainly other powerful lobbies exist that are advising according to their interests. It can be considered a positive development that some palm oil and timber concessions that were located inside the Leboyan Corridor were withdrawn by authorities, given that they were inactive over a longer time period than legally permitted. This was confirmed by several interview partners.

Furthermore, WWF conducted **village land use mapping** with the target group. The mapping was supposed to facilitate land use planning at the village level and to serve as a documentation of customary land use rights. However, the exercise did not seem very relevant to villagers, as only one of five villages still possessed the map.

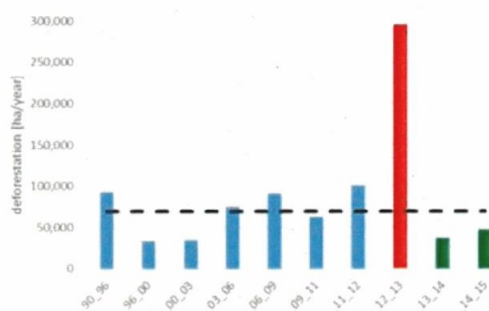
According to WWF reporting, "**collaborative zoning in the buffer zone of BBBR**" was conducted during the project and a management plan for the NP BBBR was elaborated.

Participatory zoning and development of a park and buffer zone management plan are crucial tools to find agreements about traditional land use zones and zones protected from uses between different stakeholders. However, the outputs and outcomes of this activity remain unclear. A buffer zone (management) plan was not available. The BBBR NP management plan was not approved by the Forestry Ministry, according to the Indonesian METT. In addition, villagers did not fully seem to accept the outcomes of this activity. The village of Jelundung still claimed 5.000 ha customary forest at the time of the evaluation, which were not approved officially. This is also due to the fact that a constitutional court decision from 2013 regarding customary forests has not yet been transposed into province and district level regulation, which would be necessary for official recognition. In Melawi district, two villages continue to have conflicts with NP BBBR authority and did not agree to the nature conservation contracts proposed by WWF. It is considered adequate that WWF decided to withdraw from project activities in Melawi district against this background. WWF had originally planned to stay active in the park and buffer zone management activities until 2017. In fact, WWF did not conduct any further activities at BBBR or in its buffer zone after the end of this project. "Collaborative management" had not been continued after the project; the NP staff was not seen in the nearby project villages Jelundung and Remukoi in years.

A major successful project outcome by WWF was **the successful mobilization of additional resources for village and community development** for replication of the project measures and additional investments in community infrastructure (e.g. micro hydropower in Remukoi), e.g. funds from: Millennium Challenge Account (MCA), Bengo (2014-2017), other WWF donors. Especially worth mentioning is the support for a successful application to annual government funds intended for the village budget, particularly for community development.⁹ In addition, the BMUB project (2016-2020) "Green Growth in the Heart of Borneo: Integrating conservation, economic development and well-being of communities across a transboundary landscape" supports with 4.2 million EUR green economy business models in Kapuas Hulu district in Indonesia and Sarawak in Malaysia; according to WWF, this constitutes a continuation of the project approach in other villages.

In addition, WWF successfully established a network and communication lines between communities, NGOs, district authorities and (to a lesser extent) National Park authorities. Especially the local NGO network is very well established and crucial for knowledge exchange with the local civil society and for representation of different communities, including indigenous ones.

Graph 1: Deforestation rates in Kalimantan Barat, 1990-2015



Source: GIZ/FORCLIME (2016). Analysis of Indonesia's emission reduction performance in Kalimantan 2013-2015; rates are moving averages of different time spans

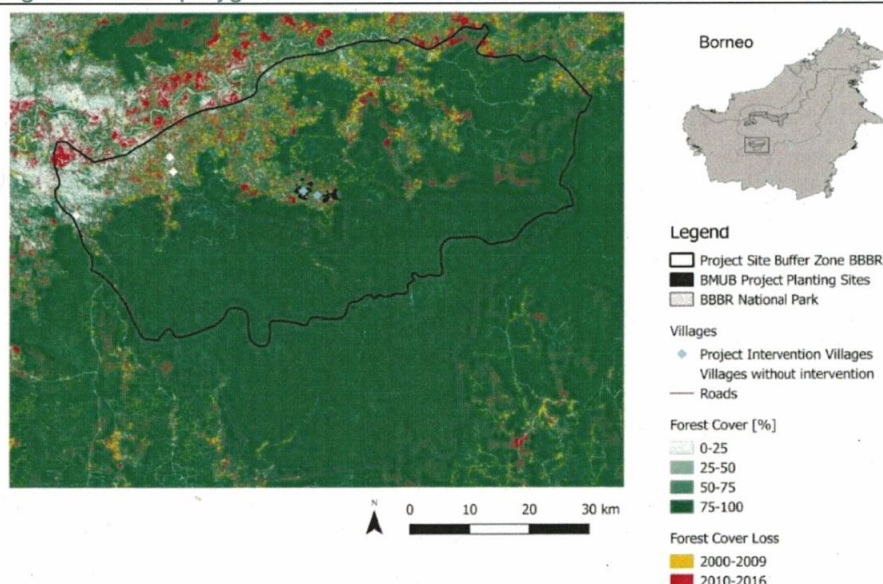
The deforestation trend in West Kalimantan was not reversed, the average annual deforestation between 2008 and 2016 has not decreased. To reverse this trend as aimed for in the project proposal seems a very ambitious target in the face of the small intervention areas and the strong economic drivers of deforestation in Indonesia. The hypothesis of the WWF that planting of rubber trees would reduce land

conversion by villagers cannot be conclusively confirmed; villagers stated that they do not open new land for "Ladang" (shifting) agriculture anymore, but population increases in the project

⁹ Government programme "Satu desa, satu bilion"

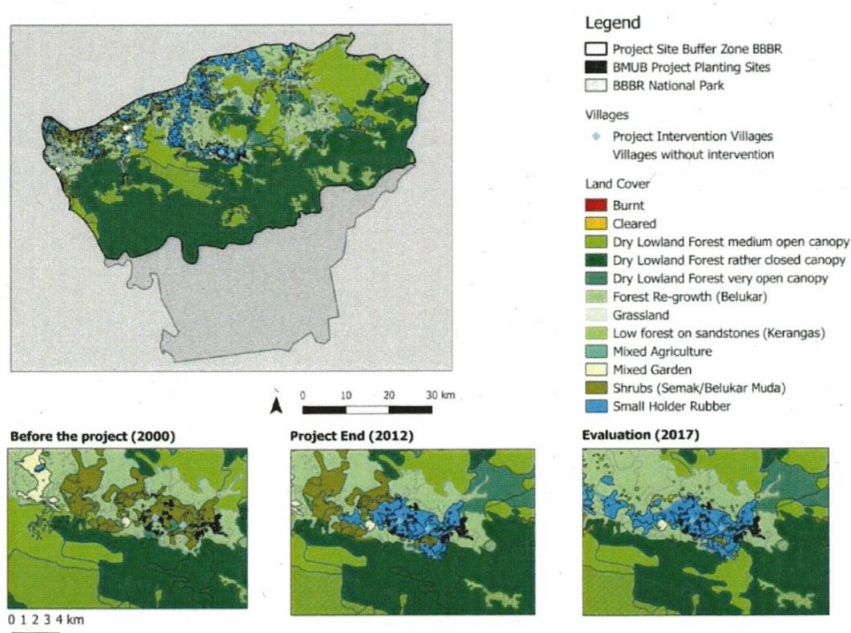
villages – as on national level – and crop yields have not increased substantially. At the same time, market access in the very remote areas in the buffer zone of BBBR is very limited and subsistence farming necessary. Thus, shifting agriculture will remain important for nutrition security there. In addition, gold mining, (palm oil) plantation development i.a. continue to threaten the natural resources. There is no clear decreasing trend of forest fires; 2015 was a year with severe forest fires. Figure 4 indicates that many small areas have been cleared both around villages with project interventions and around villages without project interventions in the buffer zone of BBBR, before and after the project. Figure 5 shows that clearing of small areas, potentially for shifting agriculture, stopped only during project implementation between 2009 and 2012 and occurred again after that.

Figure 4: Small polygons of deforestation in the buffer zone of BBBR National Park



Own compilation on the basis of the sources indicated below Figure 2.

Figure 5: Land use changes in the buffer zone of BBBR National Park, 2000-2017



Own compilation on the basis of the sources indicated below Figure 2.

The agroforestry measures generated important lessons learned about advantages and disadvantages of local and hybrid rubber in the project areas and will likely produce higher yields in coming years, as the trees mature. The project measures involving 281 households were too small in scale to contribute to reversing the deforestation trend in the project areas. Summing up, the outcomes with respect to the project objectives have remained below expectations.

Effectiveness rating: 4

Overarching climate and environmental impacts

The overarching environmental and climate objective were 1) the protection of forest and peat land ecosystems and its biodiversity in Kalimantan and 2) the reduction of greenhouse gas emissions.

Indicator	Status EPE
(1) CO ₂ emission reductions/ carbon storage [t C/Jahr]	Not fulfilled. No additional carbon storage by the project compared to the Business as Usual scenario.
(2) Forest quality is improved in BBBR national park and in the Leboyan Corridor measured against vegetation surveys and monitoring of key species.	Data base insufficient. Intertemporal changes cannot be assessed. Vegetation and species survey only available for one location and one year, 2015.
(3) Income effects associated with the project ²	Partly achieved.

2) Nature conservation projects are characterised by a potential conflict of objectives between protecting resources and alleviating poverty. Regardless of the project objective, this indicator is used for information.

Carbon storage at project level: At the end of the project implementation, a methodology was established to measure carbon impacts. The dynamics of carbon sequestration were estimated by comparing the different forest cover types in 2000, 2009 and in 2017. For the reference scenario without a project intervention (Business as Usual – BAU), the originally planned planting area of 1,000 hectares was used. According to the BAU, the biological value of ecosystems in the project area would continue to slightly decrease, but with a relatively stable level of carbon storage. This stability can be interpreted as a typical feature of land use by shifting cultivation in Kalimantan with a low population density. The reference scenario (BAU) therefore assumes that without a project intervention, no significant changes in the projected development of carbon storage would have occurred in the project area. The monitoring of planted trees in the project was still done at evaluation and records were used by WWF to calculate the mitigation effects of the newly established trees. The development of carbon storage with the project measure "afforestation of 1,000 hectares" (project scenario) was calculated for mixed crops in 2013. At the end of the project, based on actual enrichment planting (smaller area, percentage change in species composition, fewer trees per hectare), it was assumed that after 30 years 23,930 t C would additionally have been stored as compared to the baseline without project intervention. This methodological approach appears misleading, as most trees were planted on former fields that have turned into shrublands, where the natural

vegetation would likely accrue the same biomass (unless it would be converted again), so that no additionality of the carbon storage appears evident. Especially the large block plantation in Ngaung Keruh (Corridor) has undoubtedly positive impacts on watershed protection, biodiversity enrichment and value generation and is a good basis for the development of village forests. Nevertheless, the clearance and maintenance that is necessary to establish hardwoods and fruit trees represents a biomass reduction, which is not necessarily compensated by the increment of the new trees as compared to the BAU case in the next years.

Carbon storage at province and district level: GIZ/KfW FORCLIME documentation compares the latest available data for Kalimantan (2015) with the Forest Reference Emission Level (FREL) approved by the Government of Indonesia. Although there is a decrease in deforestation and degradation for Kalimantan as a whole and West Kalimantan in 2014 and 2015, the project districts Kapuas Hulu and Melawi do not follow this trend (cf. Table 1). The districts have significant increases in deforestation, mainly due to conversion of forest lands into plantation and due to forest fires in 2015. Hence, any potential effect of avoided deforestation and degradation in the project areas would be overcompensated by leakage and external effects in the districts. Although this is not the fault of the project, it has to be stated that avoided emissions for the project districts could not be achieved by the project.

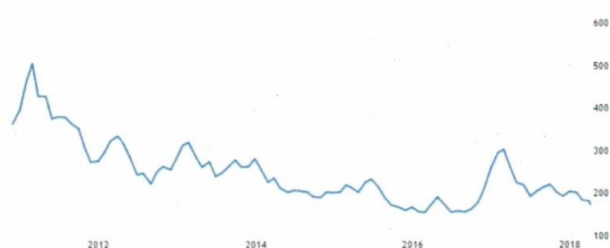
Table 1: Reference Emission levels and actual emissions as per FORCLIME/Gol data, district and province level

Geographical Unit	FREL 1990-2012	Emission 2013		Emission 2014		Emission 2015	
	[MtCO ₂ e]	[MtCO ₂ e]	% of FREL	[MtCO ₂ e]	% of FREL	[MtCO ₂ e]	% of FREL
Kalimantan	134.6	164.1	122	56.5	42	129.9	96
West Kalim.	23.4	97.3	415	12.6	54	19.7	84
Kapuas Hulu	1.919	9.15	477	1.49	78	2.17	113
Melawi	0.432	3.06	709	0.38	87	0.67	154
Sintang	1.533	10.18	664	1.49	97	1.50	98

Source: GIZ 2018 based on Hardiansyah et al (2016) FREL West Kalimantan, UNU Kalbar Press, Pontianak. FREL based on 186 sample plots, including GIZ FORCLIME plots, Allometric developed for tropical forests by Chave et al. 2005 was used, a more conservative methodology than other tested methodologies.

Regarding **socio-economic co-benefits**, it can be stated that 42 households benefitted from the agroforestry measures between 2009 and 2013, increasing to a total of 281 households up to 2018. At evaluation, the rubber trees were considered a physical savings book ("living

Graph 2 : World Rubber Prices 2011-2018 (JPY/kg)



Source: <https://tradingeconomics.com/commodity/rubber>

savings scheme") by the households, in which cash income could be mobilized by tapping rubber upon need. This is typical for smallholder forestry all over the world. Tapping and selling was done by some villagers only when the rubber price was high, typically via middlemen. It was high in 2014 and was low at EPE (cf. Graph 2). In individual cases (two households), rubber incomes from the project allowed to pay for a

university education in times of good prices. In retrospective, the project concentration on rubber instead of a diversification of products constitutes a disadvantage of the project approach due to the negative development of rubber prices since project start.

In addition, valuable lessons were documented in a rubber market research conducted by WWF in 2011 in Kapuas Hulu: It was recommended to decrease the number of intermediaries and the transport duration during the marketing chain in order to improve quality of rubber at the time of processing and to obtain higher margins for producers. In addition, producers should organize themselves in cooperations to achieve economies of scale when purchasing inputs or for their marketing efforts. Cooperatives should partner directly with rubber processing factories. Furthermore, processing e.g. to rubber sheets would improve the suitability of rubber for storage, opening possibilities for strategic storage in accordance with market prices.

Regarding the conservation of Orang Utan habitats, it can be mentioned that in the Leboyan Corridor an increased presence of Orang Utans (nests) is indicated by WWF surveys. However, a causal relationship with the project is not conclusive, as fruit trees planted in the project do not carry fruits, i.e. Orang Utan diet, yet. Potentially, the planted trees provide Orang Utan nest material and restore a Corridor function in combination with older trees.

The environmental impacts were satisfactory and the climate impacts below the expectations. Socio-economic co-benefits were positive, but to a lesser extent than expected due to rubber price decreases.

Overarching climate and environmental impacts rating: 4

Efficiency

Remoteness of the villages Jelundung and Remukoi in Sintang district increased project travel costs as these are only reachable by boat. In addition, according to WWF rubber market studies, a longer duration of storage of rubber significantly decreased rubber quality. Middlemen, however, only rarely travel to these remote villages, transport duration both to Malaysia and to larger markets in the province is time- and cost-consuming. Under mere efficiency considerations, measures could have targeted only the Leboyan Corridor.

Comparing with other projects in the sector, approaches to promote natural rejuvenation of forest and protection of existing carbon sinks is more cost efficient than planting. However, in case of rejuvenation, the focus would be on carbon storage and not on socio-economic activities such as rubber planting. By shifting from hybrid rubber seedlings to local seedlings, the planting activities were managed in an efficient way.

Summing up, the efficiency was satisfactory.

Efficiency rating: 3

Sustainability

The socio-economic impacts in terms of revenues from rubber tapping will increase with increased quantities that can be tapped as the rubber trees mature. Involved villagers have taken responsibility for the project plots. They seemed committed to protect their water resources by avoiding any further shifting cultivation upstream. The ecological services, such as those of watersheds in the project areas, are likely to persist in the future.

Also the support to villages of ethnic Dayak seems a sustainable approach to form alliances between civil society organizations and villages against deforestation or land conversion by plantations. According to Potter (2008)¹⁰, Ethnicity determines the forms of resistance to oil palm. While the protests of transmigrants from the main island Java are often limited to working

¹⁰ Potter(2008). Dayak resistance to oil palm plantations in West Kalimantan, Indonesia. Conference Proceedings, 17th Biennial Conference of the Asian Studies Association of Australia in Melbourne.

conditions, Dayaks have bad experiences with land grabbing and fear the loss of cultural heritage. Evidence exists for successful protection by Dayak smallholders of their land against plantations. NGOs can serve as a platform for Dayak interests.

At the same time, Ladang (shifting agriculture areas) may be further expanded by villagers (potentially by clearing forest) in the face of population growth and nutrition security in the remote areas. Leighton et al. (1998)¹¹ support this for areas with little market access and demand. In addition, the study found that shifting agriculture in West Kalimantan does cause loss of primary forest, but not to the same extent as timber extraction and oil palm plantations. According to a cluster analysis by van Vliet et al (2012) - 57 studies exist for Kalimantan indicating a decrease in the dynamics of shifting agriculture between 2000 and 2010 – the transformation of shifting agriculture to more intensive land uses increased household incomes, but contributed to permanent deforestation, loss of biodiversity and soil erosion. In near-located Malaysia, the main driver of a decrease of shifting agriculture was road development and the availability of infrastructure for logging and mining, which may be an even greater danger to the forest than shifting agriculture.

For West Kalimantan's environmentally sustainable development, the next steps in spatial planning and its implementation will be decisive. If forest areas that have in recent years been converted to non-forest estate in the spatial plan are now in fact deforested for other land uses, the deforestation dynamic will continue and so will the related carbon dioxide emissions. In addition, the new road development plans, which are planned to connect the districts of West Kalimantan until 2025, may bring economic growth, but will also increase the pressure on forest resources. In addition, one of these roads leads directly through the Leboyan Corridor.

Finally, it should be remembered that one of the major objectives of the transboundary Heart of Borneo initiative – to which this project is supposed to contribute – is the protection of the island's watersheds. Against this background, the potential negative environmental impacts of gold mining along the rivers – especially if mercury is used – should be further assessed and tackled by environmental authorities and other stakeholders involved in environmental protection. The evaluators counted during one day on the river between Nanga Pinoh and Jelundung 202 gold mining boats on the river with approx. 2-4 workers each and, in addition, 48 gold mining pumps, where the gold washing itself is done at the river banks.

The difficult Indonesian context for forest protection is not project-specific. Taking this into account, the sustainability of achieved outcomes and impacts can be considered satisfactory, considering that ecological and socio-economic impacts of the planted trees are likely to further increase with time.

Sustainability rating: 3

Coherence, complementarity and coordination

In general, the project is complementary to other German cooperation projects with Indonesia. Some activities are very similar to those of GIZ, e.g. the support for spatial planning at district authorities. However, coordination between the two agencies has potential for improvement, as GIZ and WWF are competitors i.a. for BMUB funds. Furthermore, land use planning at village level was first done by WWF in the visited villages and then by FORCLIME – an unnecessary doubling. Lessons learned seem not to be systematically documented and transferred to other donors. The coordination of all government and donor projects in the Heart of Borneo should be coordinated by the HoB secretariat that is working in Jakarta, to make sure that all projects

¹¹ Leighton et al. (1998) The impact of shifting cultivation on a rainforest landscape in West Kalimantan: spatial and temporal dynamics. *Landscape Ecology* 13: 135–148, 1998.

in the HoB support the main environmental and climate objectives of the HoB initiative. At the time of evaluation, the secretariat got involved by approving new projects, mainly based on their potential to contribute to “green growth”, i.a. through ecotourism, which is not developed at all so far. Not all foreign engagements follow the same development strategy: The Asian Development Bank and Chinese companies are involved in road development in West Kalimantan.

Regarding policy coherence, it must be emphasized that land use changes by plantations for oil palm or timber and their environmental impacts are largely driven by the (international) demand markets. This can be positive, e.g. in cases where timber buyers request certain sustainable practices and their certification, e.g. SBK's Japanese buyers. But it can be negative, e.g. if large buyers seek Indonesian products such as palm oil at cheapest prices and thus at lower environmental standards.

In addition, neither Indonesian nor EU climate policy can be considered very coherent: To reduce dependence on imported oil, Indonesia has set an ambitious target for 30 % palm oil blending in domestic fuels; for its part, the EU uses 45 % of its palm oil imports for biodiesel, and a further 15 % to produce heat and power. Given that at present more palm oil production is likely to mean more deforestation, total greenhouse gas emissions from palm biodiesel might be higher than from fossil fuels (EU 2018).

Both policy coherence and coordination with other donors at project level were below expectations.

Coherence, complementarity and coordination rating: 4

Project management

A high continuity, commitment and motivation were assured by WWF field staff, which allowed to build trust with Dayak villagers. WWF conducted and still conducts many very important activities for village development, environmental education and documentation of species. WWF management structures have potential for improvement with respect to communicating a consistent intervention logic and priority objectives also to those doing field work.

The project duration was three years, nine years were necessary to plant the nearly 1,000 ha that were planned. With regard to the planned small-scale measures in different priority areas with time-consuming local involvement, the planned duration was clearly too short. Project measures were adapted in a meaningful way according to the context circumstances of the project.

Project documentation did not allow an easy attribution of individual activities to certain projects and donors. The project account of WWF Indonesia was audited by an external auditor. According to the management letter, WWF did not use the special account exclusively for the project, but also for other projects.

Project management rating: 4

List of Abbreviations

APL	<i>Areal penggu-naan lain</i> (non-forest estate)
BAU	Business as usual
BBBR	<i>Bukit Baka Bukit Raya</i>
BK	<i>Betung Keritun</i>
BMUB	<i>Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit</i> (German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety)
BMZ	<i>Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung</i> (German Federal Ministry for Economic Cooperation and Development)
CO₂	Carbon dioxide
DS	<i>Danau Sentarum</i>
EPE	<i>Ex post</i> evaluation
EUR	Euro
FAO	Food and Agriculture Organization of the United Nations
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>
Gol	Government of Indonesia
ha	Hectare
HCVF	High Conservation Value Forest
HoB	Heart of Borneo
IKI	<i>Internationale Klimaschutzinitiative</i> (International Climate Initiative)
ICS	Internal Control System
LUCF	Land use change and forestry
MCA	Millennium Challenge Account
NGO	Non-governmental Organisation

NP	National Park
PA	Project appraisal
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SBK	<i>PT Sari Bumi Kusuma</i>
USD	US Dollar
UNESCO	United Nations Educational, Scientific and Cultural Organization
WWF	World Wide Fund for Nature

Notes on the methods used to evaluate project success (project rating)

Projects (and programmes) are evaluated on a six-point scale, the criteria being **relevance, effectiveness, efficiency, overarching developmental impact, coherence, complementarity and coordination rating and project management**. The ratings are also used to arrive at a **final assessment** of a project's overall developmental efficacy. The scale is as follows:

Level 1	Very good result that clearly exceeds expectations
Level 2	Good result, fully in line with expectations and without any significant shortcomings
Level 3	Satisfactory result – project falls short of expectations but the positive results dominate
Level 4	Unsatisfactory result – significantly below expectations, with negative results dominating despite discernible positive results
Level 5	Clearly inadequate result – despite some positive partial results, the negative results clearly dominate
Level 6	The project has no impact or the situation has actually deteriorated

Rating levels 1-3 denote a positive assessment or successful project while rating levels 4-6 denote a negative assessment.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability): The developmental impact of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability): The developmental impact of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected).

Sustainability level 3 (satisfactory sustainability): The developmental impact of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability): The developmental impact of the project is inadequate up to the time of the ex post evaluation and is very unlikely to improve. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The **overall rating** on the six-point scale is compiled from a weighting of all seven individual criteria as appropriate to the project in question. Rating levels 1-3 of the overall rating denote a "successful" project while rating levels 4-6 denote an "unsuccessful" project. It should be noted that a project can generally be considered developmentally "successful" only if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("overarching developmental impact") and the sustainability are rated at least "satisfactory" (level 3).