Climate and Biodiversity Protection in Indonesia

Activities implemented by GIZ as part of the International Climate Initiative (IKI)

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

of the Federal Republic of Germany

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List of Abbreviations

BAPPENAS	State Ministry of National Development Planning
BMUB	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
BMZ	German Federal Ministry for Economic Cooperation and Development
COP	Conference of the Parties
CBD	Convention on Biological Diversity
DANIDA	Danish International Development Agency
DFAT	Australian Government Department of Foreign Affairs and Trade
DG NREEC	Directorate General of New, Renewable Energy and Energy Conservation
F-gas	Fluorinated gases
FSF	Fast start financing
GHG	Greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
ICRAF	World Agroforestry Centre
INDC	Intended National Determined Contribution
IKI	International Climate Initiative
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt-hour
LiDAR	Laser Imaging, Detection and Ranging
LULC	Land use/land cover data
MONEV	Monitoring and Evaluation
MRV	Monitoring, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Actions
NGO	Non-Governmental Organizations
PLN	*Perusahaan Listrik Negara*, state-owned electricity company
RAC	Refrigeration and Air-Conditioning
RAD-GRK	Local Climate Change Mitigation Action Plan
RAN-GRK	National Climate Change Mitigation Action Plan
RAN-API	National Climate Change Adaptation Action Plan
RE	Renewable Energy
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SOP	Standard Operating Procedures
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change

Foreword

For several years, the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) through the International Climate Initiative (IKI) has been funding projects in the field of climate change and biodiversity in Indonesia.

As a federally owned enterprise, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH supports the German Government in achieving its objectives in the field of international cooperation for sustainable development. GIZ has been working in Indonesia since 1975 on behalf of the German Government. Currently, GIZ implements the German contribution to over 20 projects on behalf of and financed by the German Federal Ministry for Economic Cooperation and Development (BMZ), the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), the German Federal Foreign Office (AA) with co-financing from International Donors such as DFAT (Australia) and DANIDA (Denmark) in the areas of Energy & Climate Change, Inclusive Growth, Good Governance & Global Networks and Migration & Development. GIZ employs around 390 staff in Indonesia, including 310 national personnel and 80 German and international staff.

In the priority area "Energy & Climate Change", GIZ is supporting the Government of Indonesia to develop
a policy framework for sustainable energy use, climate change policy and to assist with its implementation.

This brochure reflects how GIZ, on behalf of BMUB, as part of its International Climate Initiative (IKI), supports national and local Government bodies in concrete implementation to achieve its climate change and biodiversity targets. This covers a broad variety of issues, starting from supporting national climate plans to maintaining local biodiversity, the development of renewable energy and energy efficiency pilot projects to improving a national climate change trust fund.

We thank all related ministries, state-owned entities, private sector stakeholders, and civil society partners for the fruitful and trustful collaboration over the past years and are looking forward to intensifying our commitments towards a sustainable growth of Indonesia.

Peter Palesch
Country Director, GIZ Indonesia/ASEAN and Timor-Leste

Introduction

Background

The fight against the far-reaching effects of climate change is one of the greatest challenges facing mankind today. More frequent natural disasters and extreme weather events, changing water patterns, accelerating species' extinction, rising sea levels, coastal erosion and ocean acidification are just a few of the impacts brought about by unabated global climate change. This, in turn, will further threaten food security and efforts to eradicate poverty, with serious implications for sustainable development.

The effects of climate change are felt in all countries but they are noted to be particularly harsh for developing countries. These countries are particularly vulnerable, given their greater exposure together with inadequate means and limited capacities to adapt to its effects. At the same time, rapidly-growing economies worldwide are increasingly contributing to global emissions. Hence, in international negotiations on climate change, the principle of countries' "common but differentiated responsibilities" has been adopted.

In Copenhagen at the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 15) in 2009, countries agreed to limit greenhouse gas emissions to 450 parts per million (ppm) or 2° Celsius to avoid serious impacts of climate change. However, a globally comprehensive agreement with binding emission-reduction targets to achieve this goal is currently lacking.

Instead, the Kyoto Protocol has entered a second phase and countries have made pledges to reduce emissions in the near term, i.e. by 2020. While the coverage of emissions increased over time, current emission pledges and commitments are insufficient to reduce emissions to a level consistent with the 2°C target. In this context, countries agreed in 2011 at COP 17 in Durban, South Africa, to close the emissions gap before 2020, while at COP 19 in Warsaw, Poland, and at COP 20 in Lima, Peru, they submitted intended nationally determined contributions by the first quarter of 2015 as part of the post-2020 framework. A new climate- change agreement needs to be finalized by the end of 2015 to be effective by 2020. It is expected that this new agreement will pave the way for limiting emissions to below 2°C above pre-industrial levels and be consistent with the latest scientific information as documented in the fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

Germany's Role in International Climate Change Negotiations

The German Government is actively helping to drive the international climate process, as countries worldwide prepare to adopt this new climate change agreement at COP 21 in Paris, France, in December 2015. Domestically, Germany has set an ambitious target to reduce its own greenhouse gas (GHG) emissions by at least 40 percent by 2020 and 80-95 percent by 2050 compared to the baseline year of 1990, while its

Rural landscape, South Sumatra. ©BIOCLIME, Nyimas Wardah

Introduction

Energiewende (energy transition) provides an example for a transformative shift towards a low-carbon economy.

Globally countries prepare to adopt a new climate change agreement by 2015 at COP 21 in Paris to enter into force in 2020.

As a member of the European Union (EU), Germany is also dedicated to meeting ambitious mitigation commitments in an agreement applicable to all parties to stay below 2°C warming. In this context, all EU member states have set themselves the target of achieving 40 percent emission reductions by 2030.

Financing Climate and Biodiversity Protection

Internationally, Germany is scaling up its support for mitigation and adaptation efforts, as well as biodiversity protection, in developing countries. German Chancellor Angela Merkel made a pledge at the Petersberg Climate Dialogue in July 2014 to contribute EUR 750 million to the initial capitalisation of the Green Climate Fund (GCF). One important issue in current climate negotiations is the mobilization of scaled-up climate finance to shift economies towards low-carbon growth. According to the Copenhagen Agreement, countries have agreed to raise USD 100 billion per year by 2020 to finance climate and biodiversity protection in developing countries. A crucial building block to the evolving climate -finance framework will be the GCF; it is expected that a large proportion of the total climate finance will eventually be channelled through the Fund to blend with domestic public and private sources. However, international climate finance alone will not be sufficient to develop an adequate response to climate change. The overall investment needed will be much higher than the USD 100 billion target. Therefore, countries have to set in place a workable regulatory and policy framework to shift investments across their economies towards climate and biodiversity protection in order to leverage private-sector investments.

Germany's Commitment

The EU along with other industrialised countries committed to provide up to USD 30 billion in new and additional funding for the period from 2010 to 2012 as "fast start finance" to developing countries. During this period, Germany provided a total of EUR 1.29 billion for climate change mitigation and adaptation measures and an additional EUR 283 million for biodiversity protection. This reflects Germany's willingness to provide a fair contribution to international climate finance and support to developing countries centres on four key areas:

i. Mitigation of greenhouse gas emissions,
ii. Adaptation to climate change,
iii. Reducing Emissions from Deforestation and Forest Degradation (REDD+),
iv. Conservation of biological diversity

These resources are mostly channelled through bilateral cooperation organised by the German Federal Ministry for Economic Cooperation and Development (BMZ), as well as through specially created bilateral instruments and initiatives such as the Initiative for Climate and Environmental Protection (IKLU).

International Climate Initiative

Since 2008, an increasing amount of climate finance has also been provided by the International Climate Initiative (IKI) belonging to the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). The IKI fulfils financial obligations on biodiversity-related matters resulting from the Convention on Biological Diversity (CBD) Strategic Plan 2011-2020.

Based on a decision taken by the German parliament (Bundestag), the IKI's annual budget totals at least EUR 120 million. During its first few years, the IKI was financed through the auctioning of emission allowances, but it is now primarily funded from the BMUB's budget.

NAMA Facility

Germany has also been among the pioneers in providing finance for the implementation of Nationally Appropriate Mitigation Actions (NAMAs). The BMUB together with the United Kingdom's Department of Energy and Climate Change (DECC) jointly established the NAMA Facility to finance ambitious climate change-mitigation measures. In 2013 and 2014, the NAMA Facility provided total funding of EUR 120 million to developing countries. As the first such mechanism of its kind, the NAMA Facility provides important lessons learned in financing transformative climate change-mitigation measures.

Introduction

Indonesia and Climate Change

As an archipelago, Indonesia is particularly vulnerable to climate-change impacts. The country is predicted to experience shortages in the availability of clean water; increased frequency of extreme weather events; a rise in sea levels and storm surges; threats to food security and agricultural productivity; disruption of coastal livelihoods for millions of people, and an intensification of water- and vector-borne diseases. A deterioration of coral ecosystems and a severe loss of its biodiversity are also expected. It is estimated that by the end of the century, the collective impact of climate change will cost the country between 2.5 and 7 percent of its annual gross domestic product (GDP).

As an emerging economy, Indonesia is recognised as one of the largest contributors to global GHG emissions. These emissions are currently dominated by emissions from deforestation and peat fires. In addition, with the country's current economic growth of 4.7 percent and increasing energy demand of 9 percent, emissions from the transport and energy sectors are expected to double the emissions volume in the near future.

Indonesia acknowledges that climate change is a global problem that requires solutions from both developed and developing countries. In 2009, Indonesia made a strong commitment to combating climate change by announcing that until 2020 it aimed to reduce its emissions by 26 percent compared to "business-as-usual" projections with its own resources, and by up to 41 percent with international support.

In 2011, the government launched a National Climate Change Mitigation Action Plan (RAN-GRK) to reduce GHG emissions. This 10-year plan for 2010 until 2020 provides guidance for national and sub-national governments to implement a variety of activities, both direct and indirect, to reduce greenhouse gas emissions in accordance with national development targets. GHG mitigation measures in Indonesia emphasize five priority sectors: forestry and peat land; agriculture; energy including transportation; industry, and waste management. Since most climate-change action takes place at the local level, all provinces in Indonesia developed local climate change action plans (RAD- GRK) by the end of 2013. Both national and local action plans refer to the vision of the National Long-term Development Plan (*Rencana Pembangunan Jangka Panjang Nasional* - RPJPN 2005-2050). In addition, a National Climate Change Adaptation Plan (RAN-API) formulates the coordinated adaptation to the impact of climate change amongst concerned public and private stakeholders.

Indonesia's National Climate Change Coordination Team (CCNT), which was established in 2012 by a Ministerial Decree from the State Ministry for National Development Planning Agency, coordinates the implementation of each of these action plans. The CCNT is assisted in its tasks by the Secretariats of the RAN/ RAD-GRK. These Secretariats primarily provide technical support to relevant line ministries and sub-national governments in implementing and reviewing climate change measures.

Over the past few years, the Government of Indonesia (GoI) has also established several climate finance bodies to coordinate and harmonise international and national funding for the implementation of the RAN/RAD-GRK and NAMAs. Of particular relevance in this regard is the Indonesia Climate Change Trust Fund (ICCTF), whose main role is to seek funding and channel it towards climate change-related activities. The ICCTF recently underwent a transition to become a nationally-managed trust fund with the state-owned bank, Bank Mandiri, becoming its operational trustee. The BMUB is supporting the ICCTF's organisational development via technical assistance provided by GIZ.

With the new climate change agreement to be adopted in Paris in December 2015, Indonesia has also initiated a process of reviewing the achievements of the RAN-GRK ahead of submitting its Intended National Determined Contributions (INDCs) in 2015, which are expected to outline a new climate change-mitigation framework for the post-2020 period.
This process is supported through a global project funded by IKI.

BMUB Projects in Indonesia

For several years, the BMUB through its IKI-funded projects has supported the GoI to develop a policy framework for climate and biodiversity protection, and to assist with its implementation. The BMUB projects, which are implemented by GIZ, the KfW development bank and other organizations, are primarily concerned with international climate and biodiversity policies, such as the CBD's Strategic Plan or the Aichi Biodiversity Targets. Besides providing policy- level support through capacity building and technical assistance, the projects implemented by GIZ also support the private sector to implement innovative pilot projects that have a high potential for replication. Lessons learned and innovative approaches from the implemented pilot enable public and private decision makers to replicate successful climate and biodiversity protection measures.

Introduction

The bilateral projects that are currently implemented by GIZ in Indonesia on behalf of the BMUB are described in more detail in factsheets on the following pages:

INFIS, Strategic Partnership for Supported NAMAs and Climate Finance

This project assists the ICCTF to develop its institutional arrangements and mechanisms, as well as its procedures and capacities to enhance both direct and indirect access for local public- and private-sector stakeholders, to international climate finance in Indonesia in accordance with good financial governance principles.

Further development of the ICCTF's capacity is needed to support the fund's intention to leverage private sector engagement on climate-change activities, particularly in terms of mitigation.

Promotion of Least-Cost Renewables in Indonesia (LCORE-INDO)

The LCORE-INDO project is implemented in cooperation with the Indonesian Directorate General for New and Renewable Energy and Energy Conservation (DG-NREEC). LCORE-INDO promotes the use of renewable energy in areas where it can be applied in the most cost-efficient manner. LCORE-INDO operates in three main areas: (1) utilising biomass waste in the agricultural industry for power generation, (2) replacing diesel oil through connecting renewable to power grids, and (3) applying new models for off-grid renewables. A strong emphasis lies on developing pilot projects in collaboration with private companies.

Green Chillers

This project provides support to Indonesian industries by creating and implementing a reliable framework to foster energy efficiency in the cooling and air-conditioning sector. With increasing demand for cooling technologies, energy efficiency contributes substantially to the country's climate change-mitigation goals. Inventories are taken and projections of reduction potentials in the industrial and cooling sectors are developed. These feed into advisory services for drawing up NAMAs for using energy-efficient cooling technologies in selected areas of application. Policy makers use the information to promote emission reductions through NAMAs and to create incentives and promotional measures for efficient cooling and air-conditioning technologies.

Green Economy and Locally Appropriate Mitigation Action in Indonesia (GE-LAMA-I)

This project supports the GoI to mitigate climate change in the land-based sector by strengthening selected districts to plan, implement and monitor green-economic developments, including low carbon development. Four Locally Appropriate Mitigation Actions (LAMAs) have been identified as having the potential to be scaled up to the national level (NAMAs). GIZ jointly implements the project with BAPPENAS, in collaboration with the World Agroforestry Centre (ICRAF).

BIOCLIME

This project aims to support the GoI to conserve selected forest ecosystems in South Sumatra province, together with their respective biological diversity and the carbon stored within them. The project compiles baseline data necessary for the effective protection and sustainable management of each of these forest areas by, for example, collecting information on their biological diversity and measuring prevented deforestation and forest degradation.

In addition, the project is developing the central elements of a participatory system for the monitoring, reporting and verification (MRV) of greenhouse gas emissions in accordance with national requirements, which take into account the specific characteristics of the ecosystems. The project's partners are identifying areas that are particularly worthy of protection and will subsequently develop strategies for their protection and sustainable management. By designing the associated planning and decision-making processes in a transparent and participatory manner, the project is building the capacities of local institutions and village communities, enabling them to plan and implement collaborative protection and management strategies. Moreover, it is also helping to develop alternative income opportunities for people living within these protected forest areas.

Factsheet

INFIS Support the operations of Indonesia Climate Change Trust Fund

Title:	Indonesian NAMAs Financing Support
Lead executing agency:	Directorate of Environment, Ministry of National Development Planning/National Development Planning Agency (BAPPENAS)
Overall term and budget:	January 2014 to November 2017; EUR 3.5 million
Keyword:	Climate Finance, Trust Fund, NAMAs

Background

Indonesia is one of the first countries in the world to have established a national climate fund, the Indonesia Climate Change Trust Fund (ICCTF). The ICCTF – launched in 2009 — reflects the increasing need to pool and coordinate funds at the national level for the imple-mentation of the National Climate Change Mitigation Ac- tion Plan (RAN-GRK) and the National Climate Change Mitigation Adaptation Action Plan (RAN-API). In this regard, it is part of the wider landscape of institutions involved in the implementation of climate-change activities.

The first phase of the ICCTF was managed by the United Nations Development Program (UNDP) to prepare for national climate change trusteeship. The focus was on building the ICCTF's organisational foundation and the implementation of six pilot projects (2010-2014). The UNDP ended its function as fund manager at the end of 2014, and the management and operation of the ICCTF was handed over to a nationally managed climate fund institution. The ICCTF still faces institutional and organisational barriers, however, to fulfilling its assigned role. As a newly-established, nationally managed climate fund, the ICCTF's success will also depend on its ability to scale up finance. This will require, among other things, sharpening the fund's profile, clarifying its role in the climate-change landscape, and establishing a regulatory environment that allows climate finance to flow smoothly to designated activities.

Objective

Starting from the recent transition phase, the project aims to support the ICCTF to develop and improve its institutional arrangements and mechanisms, its procedures and capacities to enhance access for local public- and private-sector stakeholders to international climate finance in accordance with principles on good financial governance. With the project's support, the ICCTF will be better able to execute Nationally Appropriate Mitigation Actions (NAMAs), which will in turn contribute to the success of the RAN-GRK.

Main Activities

The project employs a mix of approaches to strengthen the ICCTF to become a nationally managed climate fund that effectively allocates climate finance to public and private actors at the national and sub-national level. The project provides technical assistance with a focus on:

- developing the ICCTF's public finance mechanisms for channelling funds to support the implementation of national and sub-national mitigation plans (RAN/RAD-GRK);
- developing the capacity of the ICCTF's Secretariat and stakeholders to apply financing mechanisms that comply with international standards in terms of financial management and project implementation;
- designing an "ICCTF's Transformation Fund" as an innovative finance mechanism to engage the private sector in climate change mitigation activities; and
- supporting inter-institutional coordination and collaboration with other agencies. As there are

INFIS assists ICCTF to better execute Nationally Appropriate Mitigation Actions (NAMAs). The picture above presents their stakeholders gathered during NAMAs Summit in Jakarta. ©ICCTF

numerous public institutions in Indonesia with financing instruments, and the ICCTF is limited to grant financing, inter-institutional coordination and collaboration with other agencies will be vital for the financing and implementation of mitigation measures.

Results Achieved

In the first phase of the project implementation, the focus was on developing the public financing mechanisms. An effective public financing mechanism that allows the ICCTF to receive funding from international and national resources and disburse it to implement activities at the sub-national level is seen as a prerequisite to setting up the ICCTF. By the end of 2014, the standard operating procedures (SOPs) for accessing national sources and disbursing funds to the sub-national level were finalised. A first strategy to operationalise the transformation has also been finalised. According to the strategy, the ICCTF will foster early-stage investments to mitigate development risks of climate-related investments to incrementally engage the private sector. Green public-private partnerships (PPPs) are being tested as one solution for mobilising private-sector investments. Inter-institutional coordination is also being improved through close coordination with the RAN-GRK Secretariat and other climate-related institutions. The NAMA Investment Summit, held on September 12, 2014, and supported by GIZ, served as an opportunity to present the NAMA pipeline and to propagate climate finance for channelling through the ICCTF. Initial discussions are ongoing with the Secretariat of the Green Climate Fund about the ICCTF's participation in GCF-readiness activities.

Impact

Through technical assistance and capacity development the project will f
igation-policy framework. The ICCTF shall be equipped with efficient, r
trust fund's financial mechanisms are put in place and become operationa
and accounting for mitigation measures and the achievement of Indones
and private finance mechanism developed by this project, including relat
model by other countries, as well as in the context of the appropriate use
Convention on Climate Change (UNFCCC) process.

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Factsheet

LCORE-INDO Introduction of least cost renewable energy solutions

Title:	Promotion of Least Cost Renewables in Indonesia (LCORE-INDO)
Lead executing agency:	Directorate General of New, Renewable Energy and Energy Conservation (NREEC)
Overall term and budget:	March 2012 to February 2016; EUR 3.5 million
Keyword:	Renewable energy, private sector, GHG mitigation

Background

Despite its huge potential in Indonesia, renewable energy (RE) has until now played only a minor role in Indonesia's electricity supply. To date, Indonesia's primary energy supply is heavily dependent on fossil fuels, with oil taking the major share at 45 percent. In addition, energy supplies are heavily subsidised and demand increases annually by 9 percent. The share of RE, which is derived primarily from hydropower, currently stands at 5 percent. The GoI has committed itself to increasing the RE share in the energy mix to 17 percent by 2025 in combination with a reduction in GHGs by 26 percent until 2020.

The project's partner, the Directorate General for New and Renewable Energy and Energy Conservation (DG NREEC), has enacted RE regulations and improved procedures to attract private investors to RE applications. Nevertheless, the RE market is still in its infancy, where a lack of project experience in the private sector results in high risks in developing, financing and operating RE systems.

The project strives to enable private and public stakeholders to close the gap between the growing demand for energy and the lack of private investment in renewable energy.

Main Activities

The project's activities focus on three implementation areas that show the highest potential for accelerated implementation and allow different strategies in learning and innovation:

1. The use of waste from agro-industries for energy generation;
2. The replacement of diesel by solar energy, and
3. The application of innovative business models for off-grid electrification.

These main activities are categorised in five tasks:

1. Studies deliver realistic technical and economic RE and CO_2 saving potential;
2. Pilot projects demonstrate feasibility and business models;
3. Capacity building informs key stakeholders about the business models of pilot projects;
4. Action plans and best-practice guidelines lead public and private stakeholders towards viable market development, and
5. Monitoring and evaluation of RE implementations are established at the DG NREEC.

Objective

The DG NREEC is enabled to develop practical policies and promote programs for the effective support of RE implementations, which will contribute substantially to national climate strategies, including NAMAs.

To achieve its objectives, the project focuses on strengthening the DG NREEC's capacity to analyse and further develop existing guidelines and RE-support programmes. One key measure is the inclusion and support of the private sector in the development of renewable energy pilot projects as best-practice examples for further replication.

LCORE-INDO introduces potential of ice making process using solar PV. The picture above shows ice loading activity in Lombok, Indonesia. ©GIZ

Factsheet LCORE-INDO

Results Achieved

The RE potential in Indonesia has been quantified and implementation strategies identified. For example, the technical potential of electricity generation from the most common agro-industries like palm oil, rice husk and paddy is 43 Terrawatt-hour (TWh) per year which could meet 25% of the nation's electricity demand.

Taking the country's archipelagic conditions with more than 5,000 inhabited islands into account, a technical potential of a 4 Gigawatt (GW) grid-connected photovoltaic (PV) system could be implemented, which would save 2 billion litres of diesel per year, hence saving EUR 1.5 billion per year from the state budget that would otherwise be spent on fuel subsidies.

In cooperation with private project developers, intensive energy audits and pre-feasibility studies for eight different pilot projects have been executed. Technology providers have been identified and economic viability been proven. The most feasible option is the use of biogas from palm oil mill effluent (POME) for on-grid electricity generation. It has also been shown that cogeneration using starch-process waste and empty fruit bunches in the palm oil industry have high fossil fuel-saving potential.

Solar energy pilot projects have been analysed at tourist resorts and at ice-production facilities where solar systems could substantially lower the consumption of diesel oil for back-up power in remote areas with unstable electricity supplies.

The identified pilot projects are at a feasible stage, ready for in-depth investment and due diligence. In total, they have a CO_2 saving potential of more than 200,000 tonnes per year.

LCORE is mapping palm-oil mills in East Kalimantan with regard to their potential for electricity generation and grid-power supply. This is being carried out in cooperation with local governments and another BMUB-funded project, GE-LAMA I, in order to introduce bioenergy supplies into local mitigation action plans.

A wide variety of capacity-building measures have transferred knowledge to professionals from businesses and ministries. After analysing the knowledge gap in Indonesia, two Training of Trainers (ToT) seminars on solar and bioenergy were conducted for Indonesian training institutions, followed by a one-week training on similar topics for over 50 staff from the NREEC and the state-owned electricity company, PLN. The project has also organized visits for NREEC and PLN delegations to state-of-the-art RE power plants and relevant trade shows in Germany, and numerous studies and reports have been published on the project's homepage.

A key factor for the economic viability of private project development is the feed-in tariff. LCORE-INDO has supported the DG NREEC in revising the existing tariff and together, they have jointly developed practical guidelines for bioenergy project developments.

In addition, the project develops monitoring and evaluation procedures to measure the performance of biogas power plants and their contribution to climate-change mitigation. This will serve to establish a fully-fledged MRV system at the DG NREEC and other involved ministries.

Impact

The project enhances regulatory- and economic-framework conditions for the private sector to develop and realise RE projects. As measurable outcomes, pilot projects in bio- and solar energy are implemented and showcase the least-cost approach. They serve as a blueprint and can be replicated from the existing scale-up project pipeline. Relevant ministries and private sector stakeholders have come to understand about technical feasibility and economic-risk mitigation of RE project development.

This is contributing to an increasingly dynamic RE market and to a significantly larger share of RE in the country's electricity supply.

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Factsheet

Green Chillers

Implementation of climate friendly cooling systems

Title:	Development of a NAMA for Energy-Efficient Cooling Systems and Cold Supply in Indonesian Industry and Commerce
Lead executing agency:	Ministry of Environment and Mineral Resources (MEMR)
Overall term and budget:	June 2014 to May 2018; EUR 4.1 million
Keyword:	Energy Efficiency, NAMA, F-gas

Background

In Indonesia, the use of cooling systems – such as refrigeration and air-conditioning (RAC) – increases by an average of 15 percent per year in the industrial, commercial and private sectors combined, where inefficient appliances with outdated technology are commonly used. These are not only energy inefficient, but mostly run on fluorinated gas (F-gas) refrigerants, which adversely affect the climate and damage the ozone layer if leakages occur.

It is estimated that in Indonesia, energy consumption from cooling appliances in commerce and industry could be reduced by 15-30 percent through the implementation of modern technology. Moreover, direct emissions from devices through leaky refrigerants amount to approximately 2-3 million tonnes of CO_2 per year.

Energy consumption and GHG emissions from within the RAC sector are rarely considered at the planning level, although modern technology with low energy consumption and natural, climate– and ozone–neutral refrigerants are readily available.

These green technologies are neglected for several reasons: There is a general lack of technical expertise and knowledge about green cooling; added to which, there are no local manufacturers and little demand for these products. At the same time, however, the adoption and implementation of green-cooling technology offers opportunities to further support energy security, decouple emissions from economic growth and, in so doing, support Indonesia's ambitious emission-reduction targets.

Objective

The project's main objective is to establish a NAMA for industrial and commercial refrigeration and air-conditioning that makes a significant contribution to meeting Indonesia's GHG-reduction targets.

To achieve this, the project assists the GoI to establish appropriate incentive mechanisms for the implementation of efficient RAC technology in selected areas.

The introduction of green cooling technologies in pilot projects in combination with comprehensive capacity building measures will create best-practice samples and influence the entire RAC-sector.

Main Activities

The project is structured into four focus areas:

NAMA strategy development

Sector-specific NAMA initiatives are designed and agreed upon with primary stakeholder groups and embedded in the national NAMA strategy. This includes:

- Developing, modifying and testing methods and instruments to provide coherent information about the inventory, projections and reduction potentials;
- Defining a GHG baseline on the use of refrigeration and air-conditioning according to a "business-as-usual" scenario;
- Designing and establishing a monitoring, reporting and verification (MRV) system, synchronized with

Green Chillers introduces green cooling technologies to industry and residential areas. The picture shows cooling systems used in residential areas. ©GIZ

the government's monitoring and evaluation (MONEV) system;
- Documenting the NAMA approach and agreeing it with relevant interest groups to provide decision makers with suggested interventions.

Establishment of incentive systems

Policy-makers are informed of options to promote emissions reductions through NAMAs and to create incentives and funding for efficient refrigeration and air-conditioning technologies through:

- Regular consultations (quarterly to half-yearly), exchange of experience and training to help boosting the mitigation capacities of the target groups (ministries, public authorities and selected industry associations);
- Designing specific industry standards for at least five typical application, agreed with interest groups;
- Developing and testing policy approaches, promotional instruments and incentive mechanisms for the private sector;
- Developing of a financing strategy and a profitability analysis for the commercial and industrial use of refrigeration and air-conditioning.

Implementation of pilot measures

Exemplary reduction measures - partially in the context of technology cooperation schemes – are implemented to promote the introduction of more efficient technologies. This is achieved by:

- Assessing energy requirement of RAC systems in the industrial sector;
- Carrying out systematic studies of RAC technology - categorised according to at least five typical applications – to feed into decisions on technology scenarios and pilot measures;
- Designing at least five halogen-free technology scenarios for the use of energy-efficient, climate-friendly alternatives in selected typical applications;
- Selecting up to 10 pilot measures to optimise energy efficiency, and guaranteeing the financing of incremental costs;
- Documenting the 10 pilot measures' energy-consumption data for at least one year for comparison with standard systems of lower efficiency.

Capacity building

Training schemes are established that cover the planning, execution and maintenance of innovative cooling systems. An information platform is also established to disseminate information on refrigeration and air-conditioning to support the implementation each NAMA.

These capacity-building measures are achieved by:

- Identifying training needs and developing appropriate training materials;
- Implementing training courses (for 30 auditors, 30 planners and supplementary training for 100 technicians) in close cooperation with manufacturers, industry associations and scientific institutions;
- Exchanging knowledge and expertise, as well as arranging study tips, to ensure that energy efficiency is incorporated into the training plans of Indonesian institutions.

Impact

The adoption of sustainable technology in the RAC sector will have a spill-over effect and possibly lead to sustainable practices and products in other sectors.

Also, the subscription of NAMAs specific to the RAC sector will demonstrate that green cooling can be integrated in national strategies for sustainable development.

Furthermore, the project raises awareness about mitigation potentials in the cooling and refrigeration sector, which will help strengthen the role of green cooling in the international climate-change regime.

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Factsheet

GE-LAMA I

Development assistance for local climate-change action plans

Title:	Green Economy and Locally Appropriate Mitigation Actions in Indonesia (GE-LAMA I)
Lead executing agency:	Directorate of Environment, Ministry of National Development Planning/National Development Planning Agency (BAPPENAS)
Overall term and budget:	January 2014 to November 2017; EUR 4.5 million
Keyword:	Green economy, Low Carbon Development, NAMA

Background

According to the on Indonesia Second National Communication under the United Nations Framework Convention on Climate Change (UNFCCC), Indonesia is the country with the highest land-based emissions. The Government of Indonesia (GoI) issued a decree that greenhouse gas emissions should be reduced by 26% by 2020 out of national budgets and up to 41% with international support. This decree (no. 62/2011) is known as the National Action Plan for Greenhouse Gas Reduction (RAN-GRK). All the 33 provinces have submitted their own sub-national climate change action plan (RAD-GRK) to contribute to the national action plan. They have to include land-use planning for low-emissions development that is aligned with the national economic growth target. The national plan lists about 50 main mitigation actions; 19 of these actions are under the land-based sector, which amounts to 672 million tCO2-emission reduction or 88% of the total target.

The implementation of these action plans is strongly linked to the Indonesian policy on for Nationally Appro- priate Mitigation Actions (NAMAs) and its local derivate, called Locally Appropriate Mitigation Actions (LAMAs). The GE-LAMA I project goal is to enhance the capacities for the development and implementation of four NAMAs. These aim at "green growth" initiatives to reduce emissions from agriculture, forestry, and other land uses as well as socio-economic growth promotion.

Objective

The project assists the Government of Indonesia to meet its GHG emission reduction targets through the development of a simple methodology and tools for planning low emissions development at district levels, with a view to balance economic growth and climate-change mitigation (dubbed as "green growth" strategy).

The project has a focus on East-Kalimantan Province (Kutai Timur, Berau, and Paser) and Central Java Province (Purbalingga, Banjarnegara, and Banyumas).

There are three main outputs on GE-LAMA I:

1. Green economy initiatives along multi-government levels are developed and implemented including policy coordination and stakeholder dialogue.
2. A planning and negotiation methodology for low-emissions development is elaborated and tested.
3. Capacity building is in place to implement land based sector NAMAs in line with national and local climate change action plans.

Brief description of main activities

In the implementation of the project, GIZ collaborates with the World Agroforestry Centre (ICRAF). It has been addressing climate change and livelihoods in Indonesia, other tropical countries and globally for more than 20 years. ICRAF will be in the lead of specific project objectives. GE-LAMA I also collaborates with the Danish International Development Agency (DANIDA).

GE-LAMA I assists the Government of Indonesia to achieve their GHG emission reduction targets. The picture shows palm oil company and local government of East Kalimantan discussed on potential cooperation. ©GIZ

Factsheet GE-LAMA I

The project main work packages refer to its corresponding output.

1. Green economic initiatives along multi-government levels are developed and implemented including policy coordination and stakeholder dialogue.
2. Tools, syntheses and comparative studies of land-use planning for low-emissions development strategies that include multiple environmental services.
3. Capacity strengthening and support for the development and implementation of RAN/RAD-GRK and integration with 'green' economy at the national level, in two provinces and three districts each and technical and information support to three associated provinces.

Results achieved

In the first phase of the project implementation, potential districts representing variations in sources of historic land based emissions, future threat, potential mitigation and green growth potential were selected. Further, the project improved the coordination among multilevel governments for implementation of national and local climate change action plans through Working Groups at district level. So far there are two potential LAMAs that have been explored for the selected area; first is the Increasing Rural Electrification by Generating Power from POME Biogas and the second is the potential of degraded land utilisation (sugar palm, rubber, fruits and cocoa).

GE-LAMA I collaborates with the BMUB funded project LCORE-INDO in mapping of palm oil mills in East Kalimantan in order to evaluate the electricity generation potential from process waste. This contributes to the local climate change action plan.

Impact

The project will assist the Government of Indonesia to meet its GHG emission reduction targets through the development of a simple methodology and tools for planning low emissions development across the nation. The landscape approach that integrates trees, forests and best practice agriculture has a high mitigation potential while at the same time it contributes to adaptation and reducing vulnerability to climate change impacts. In regard to economic aspects, the project will assist in analysing and dealing with the trade-offs at local levels and prioritising low emission development. Through links to BAPPENAS and related ministries, the locally achieved impacts and experiences will be integrated into national programs and policies.

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Factsheet

BIOCLIME Conservation of forest biodiversity in South Sumatra

Title:	Biodiversity and Climate Change Project (BIOCLIME)
Lead executing agency:	Ministry of Forestry
Overall term and budget:	October 2013 – November 2016, EUR 3.8 million
Keyword:	Biodiversity, carbon sequestration, high-value forest ecosystems, climate change

Background

Indonesia has the third largest forest area world-wide, belongs to the global biodiversity hotspots and has the largest peat swamp areas in the world. Progressing deforestation and forest degradation have caused a rapid loss of biodiversity. In particular in Sumatra and Kalimantan the remaining forest eco-systems and their biodiversity are endangered. This affects increasingly peat swamp forest areas which dispose of a unique flora and fauna, while there are also important carbon sinks. The loss in biodiversity affects the adaptation capacity of ecosystems to changing climatic conditions. It jeopardizes the livelihood of the rural population who utilizes raw material and food from forests inside and outside of protected areas. At the same time, deforestation contributes significantly to Indonesia's CO_2 emissions. Existing surveys are by far not sufficient to identify high conservation value areas and to develop protection concepts. Current approaches are not supported by local population, since they are not sufficiently involved in the decision making. The Government of Indonesia is determined to stop uncontrolled deforestation and forest degradation.

With the Biodiversity and Climate Change Project (BIOCLIME), Germany supports Indonesia's efforts to reduce greenhouse gas emissions from the forestry sector. It aims to conserve forest biodiversity, to maintain carbon storage capacities, and to implement sustainable forest management for the benefit of the people. Germany's immediate contribution will focus on supporting the Province of South Sumatra to develop and implement a conservation and management concept to lower emissions from its forests, contributing to both biodiversity conservation and Indonesia's GHG emission reduction goals.

Objective

The project contributes to achieve the so called "Aichi biodiversity targets" of the Convention on Biological Diversity (CBD) in Indonesia. Additionally it also aims at meeting Indonesia's climate change mitigation and adaptation targets under the Framework Convention on Climate Change (UNFCCC).

The project has a focus on four districts in South Sumatra, and aims at preserving the biodiversity and carbon sequestration capacity of high-value forest ecosystems in these areas.

Brief description of main activities

To achieve this goal, BIOCLIME has designed five working packages:

1. Providing baseline data for the protection and sustainable management of areas of high biodiversity, as well as for the measurement of avoided deforestation and forest degradation;
2. Designing planning and decision making processes for the selection and management of protected areas in a transparent and participatory manner;
3. Strengthening the capacities of local government institutions and rural communities for the implementation of participatory protection and management concepts;
4. Developing and implementing a participatory system for measuring, reporting and verifying that considers the specific characteristics of the aforementioned ecosystems as contribution for a national MRV-System;

BIOCLIME assists the Government of Indonesia to meet Indonesia's climate change mitigation and adaptation targets. The picture above presents rain forest used as carbon storage. ©GIZ

5. Identifying and developing alternative sources of income for the rural population living in and around protected areas.

Results achieved

A socio-economic survey has been conducted in 20 villages, located in different areas. This survey mapped the living conditions of villages with high conservation value. The report provides data to identify and develop alternative sources of income.

Secondly, in order to analyse geographic land-use information, a multi-purpose monitoring system is required. One part of this system is to inventory and monitor the biodiversity of selected forest ecosystems. Thus, a set of bio-indicators for the assessment of the quality of forest ecosystems in South Sumatra and for the determination of parameters for the measurement of forest degradation is necessary. The design of the indicator set is available by end 2014.

Another section is the necessity to generate:

- Information on actual land-use and the dynamics of land -use changes during the past decades. For South Sumatra, this data is already available from a previous assessment in cooperation with the World Agroforestry Centre (ICRAF). The results of the assessment are analysed by end 2014.
- Current information on forest types and the forest status, in particular in terms of aboveground bio-mass, carbon stock and biodiversity, derived from a combination of remote sensing and field techniques.
- Information of the historic fire regime in the study area will be derived from historic satellite imagery. Fire is considered one of the key drivers shaping the landscape and influencing land cover change, biodiversity and carbon stocks.

For knowledge transfer, the project initiates 'cadres' on district level. Cadres are acting together as network agents with focus on bridging activities between different institutions namely 'Government agencies, NGOs, Universities and Research Centres, Private Sector, and Local Communities'. A Training Need Assessment has identified the competences which should be developed to improve the performance of human resources and institutions.

Currently, BIOCLIME supports the development of a Spatial Data Network based on the Indonesian "One Map Policy". The national based spatial data network is aligned on provincial level in order to establish a reliable geo-referenced data system. This will improve land use planning and decision making on district level. This data collection activity is based on baseline spatial data including land use/land cover data (LULC), high resolution images, LIDAR surveys, aerial photos and terrestrial inventories.

Impact

A participatory planning system is established, understood and used by all stakeholders in the four districts in South Sumatra. Furthermore, best practices on natural resource management are expected to be adopted on provincial and national level.

A biodiversity "Indicator Set and Parameters" is used in a multipurpose monitoring system that takes spatial planning, conservation, habitat connectivity and sustainable management of forest ecosystems into account. It contributes to a REDD+ and biodiversity monitoring on district, province and national level.

Strengthening the capacities of all stakeholders is one of the paramount activities to foster the implementation of a participatory protection and management concept. In order to transfer the knowledge onto national level, the project works with the Forestry Training Centre in Bogor.

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Back Cover Photo: Fresh fruit bunches from palm oil plantation in Belitung (©GIZ)

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