

MOFCOM-UNDP
***Trilateral cooperation on Renewable Energy
in Sri Lanka***

FINAL PROJECT DOCUMENT, 4 March 2019

Sector: Renewable Energy

South-South Cooperation Location: China – Ethiopia – Sri Lanka

China Executing Agency: United Nations Development Program China

Implementing Partners: Sri Lanka Sustainable Energy Authority/China Ministry of Science and Technology /China Agricultural University

Project Duration: 3 Years

Project Budget: 2.000.000 USD

United Nations Development Programme

Partner Countries: China and Sri Lanka

South-South & Triangular Cooperation Project Document

Project Title: Biogas and Solar Trilateral Cooperation - Transitioning to Sustainable Energy Uses in the Agro-Industry in Sri Lanka - China – Ethiopia. Sri Lanka

UNDAF/CPD Outcomes:

China UNDAF Outcome 3: China expands and improves the effectiveness of its development cooperation with other developing countries through TSSC framework

Sri Lanka UNDAF Outcome 4: Policies, programs and capacities to ensure environmental sustainability, address climate change, mitigation and adaptation and reduce disaster risks in place at national, sub national and community levels

Expected Output(s):

China UNDAF: Output 3. The effectiveness of China's engagement in international cooperation is enhanced for the mutual benefit of China and the world.

Sri Lanka UNDAF Output 4.3: Technologies and approaches used by government and private sector towards Climate Change Mitigation (CCM) improved

Implementing Partners:

Sri Lanka Sustainable Energy Authority

China Agricultural University

Ministry of Science and Technology, Administrative Center for China's Agenda 21

Brief Description

The Project supports Sri Lanka GHG emission reduction national targets through trial and demonstration of the potential of biogas and solar in the agro-industry sector. The Project is implemented under a South-South Cooperation framework and as such presents itself as a learning platform for both China and Sri Lanka to engage and cooperate at the international level in renewable energy technology (RET) transfer for GHG emission reduction.

Project interventions include:

- Developing Sri Lanka's Provincial Council capacities in assessing carbon footprint in different agriculture activities and monitoring RET potential for GHG savings;
- Sharing Chinese knowledge and experience in biogas and solar for agro-industries in Sri Lanka;
- Determining suitable business models through South-South knowledge and experience sharing platforms.

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| Total resources required | 2,000,000 USD |
| Total allocated resources: | <u>2,000,000 USD</u> |
| • Funding from Ministry of Commerce of the People's Republic of China: | <u>1,000,000 USD</u> |
| • Funding from Sri Lanka Sustainable Energy Authority and UNDP: | <u>1,000,000 USD</u> |

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| | |
|--|-----------------------------|
| Programme Period (In respective participating countries): | <u>May 2019 to May 2022</u> |
| Atlas Award ID: | _____ |
| Start date: | <u>May 2019</u> |
| End Date: | <u>May 2022</u> |
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| Management Arrangements (In respective participating countries) | _____ |

Agreed by (national government of respective partner countries): _____

Agreed by (implementing Partners in respective partner countries): _____

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Agreed by China MOFCOM



1 April, 2019

Agreed by China Executing Agency: UNDP China

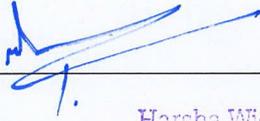


Agreed by Sri Lanka Executing Agency: UNDP Sri Lanka



24 April 2019

Agreed by Sri Lanka Sustainable Energy Authority:



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Contents

| | |
|---|----|
| List of Abbreviations..... | 1 |
| I. Situation Analysis | 2 |
| Sri Lanka Energy-Development Nexus | 3 |
| Energy Efficiency and Renewables for Sustainable Development..... | 3 |
| Ongoing UNDP-GEF Project..... | 4 |
| Potential GHG Emission Reduction and Energy Savings in Agro-industry Sector | 5 |
| Solar and Biogas Energy in China Agriculture Sector | 6 |
| Trilateral South-South Cooperation between China, UNDP, and Sri Lanka: Innovation and Opportunities | 6 |
| II. Strategy | 7 |
| Theory of Change | 7 |
| Rationale and Approach..... | 7 |
| Implementing Partners | 9 |
| Outcomes, Outputs and Activity Overview..... | 10 |
| UNDP Roles and Functions..... | 15 |
| III. Joint Results and Resources Framework..... | 17 |
| IV. Multi-Year Work Plan | 23 |
| V. Management Arrangements | 27 |
| Project Board..... | 28 |
| Project Coordinator | 30 |
| Coordinating Office | 30 |
| National South-South Task Force | 30 |
| Project Management..... | 31 |
| VI. Monitoring Framework and Evaluation | 34 |
| VII. Legal Context..... | 35 |
| VIII. ANNEXES..... | 36 |
| Risk Analysis | 36 |
| Other Partner Organizations | 39 |
| List of Stakeholders consulted during the project formulation mission..... | 40 |
| TORs Trilateral South-South Cooperation Project Coordinator | 42 |

List of Abbreviations

| | |
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| ACCA21 | Administrative Centre for China's Agenda 21 |
| AWP | Annual Work Plan |
| CAU | China Agricultural University |
| CD | Capacity Development |
| CCS | Climate Change Secretariat |
| CCSSC | China's Climate South-South Cooperation |
| CCM | Climate Change Mitigation |
| CEB | Ceylon Electricity Board |
| CPAP | Country Programme Action Plan |
| CSO | Community Service Organization |
| EE | Energy Efficiency |
| EnMAP | National Energy Management Plan |
| ESCOs | Energy Service Companies |
| EPC | Engineering, Procurement and Construction |
| ESPs | Energy Service Providers |
| FSPs | Financial Service Providers |
| GEF | Global Environment Facility |
| GHG | Greenhouse Gas |
| GoC | Government of China |
| GoSL | Government of Sri Lanka |
| HEM | High Efficiency Motor |
| LECO | Lanka Electricity Company |
| M&E | Monitoring and Evaluation |
| MFIs | Microfinance Institutions |
| MOA | Ministry of Agriculture China |
| MOPRE | Ministry of Power and Renewable Energy Sri Lanka |
| MOST | Ministry of Science and Technology Sri Lanka |
| MRV | Monitoring, Reporting and Verification |
| NSC | National Steering Committee |
| SMEs | Small and Medium Enterprises |
| NAMA | National Appropriated Mitigation Action |
| PFIs | Public Financial Institutions |
| PMU | Project Management Unit |
| PSC | Project Steering Committee |
| PV | Photovoltaic |
| RETs | Renewable Energy Technologies |
| RRF | Results and Resources Framework |
| SFM | Sustainable finance Mechanism |
| SHS | Solar Home System |
| SLSEA | Sri Lanka Sustainable Energy Agency |
| TA | Technical Assistance |
| TSCC | Trilateral South-South Cooperation |
| UNDAF | United Nations Development Assistance Framework |
| UNDP | United Nations Development Program |

I. Situation Analysis

South-South Cooperation is a broad framework for collaboration among countries of the South within the political, economic, social, cultural, environmental, and technical domains. South-South Cooperation involves two or more developing countries, multi-lateral organizations or partners, and can take place on a bilateral, regional, sub-regional or interregional basis. This project is designed as a south-south cooperation project to be implemented through a trilateral cooperation modality.

UNDP emphasizes the importance of South-South Cooperation in its Strategic Plan as a welcomed contribution to global development and traditional aid flows. Trilateral South-South Cooperation is a unique approach in which three parties cooperate to implement innovative solutions. Projects are designed as dynamic platforms for exchange and partnership between developing countries. The underlying principle is that each country benefits from transfer of specific technical capacities, knowledge exchange and policy development.

UNDP's role in Trilateral South-South Cooperation projects is to coordinate the exchange of knowledge and experience. UNDP also acts as a convener of international cooperation best practices in project formulation (i.e. integrating beneficiary country needs and development priorities, project partners' ownership) and implementation (i.e. following standard project management and reporting procedures, ensuring quality capacity development activities, and partners' equality in cooperation modalities).

Trilateral South-South Cooperation have similar focus areas, including:

- Sharing knowledge and experience;
- Addressing country development challenges by leveraging Chinese experience and technical know-how;
- Increasing cooperation opportunities;
- A demand driven process.

In March 2018, China undertook initial steps towards the establishment of the China International Development Cooperation Administration (CIDCA). CIDCA will be responsible for making strategic guidelines, plans and policies on foreign aid as well as coordinating and making suggestions on major issues related to it. CIDCA also oversees the allocation of aid and the evaluation of its implementation.

In line with UNDP's emphasis and prioritization of South-South Cooperation, CIDCA marks a reinforcement of China's commitment to strengthen knowledge exchange and experience in the global south. Particularly the Belt and Road Initiative (BRI), to which Sri Lanka and Ethiopia are partner countries, will be a key priority for CIDCA and directly linked to UNDPs existing efforts to support the success of BRI

In December 2015, a call for proposals for new Trilateral South-South Cooperation projects was initiated. The call for proposals focused on three thematic areas: sustainable energy solutions; livelihood creation, tourism development and wildlife protection; and disaster risk reduction. Both Sri Lanka and Ethiopia project proposals were selected. In both countries, the Trilateral South-South Cooperation initiative builds upon existing GEF-UNDP engagements on renewable energy technology adoption and dissemination, and government development priorities. While the projects have been developed as stand-alone projects, they share common aspects such as the same Chinese implementing partners, common activities and management modalities.

The interventions detailed in this document focus on the Sri Lanka Trilateral South-South Cooperation Project.

Sri Lanka Energy-Development Nexus

Biomass and imported fossil fuels are the main energy resources used in Sri Lanka. Biomass remains a major primary energy resource used by households and the commercial sector for cooking as well as for thermal applications in the industrial sector (i.e. heating and boiling). Fuel wood and agricultural/animal residues are the most common energy sources used, although industrial and municipal wastes are emerging sources of energy supply.

Imported fossil fuels are used across sectors (transport, industries and agriculture). Until the mid-1990's most of the electricity demand in Sri Lanka was met by hydropower. Economically viable hydropower sites have since then been exploited, and with a growing demand for electricity, Sri Lanka has increasingly relied on fuel for power production. This has become a challenge for Sri Lanka's energy security and with the rise of the international price of petroleum products consumers' tariffs have spiked.

Sri Lanka had planned coal-fired thermal power stations development. However, acknowledging Sri Lanka's climate vulnerability, the government of Sri Lanka is now turning to renewable energy and energy efficiency options.

Energy industries¹ and the agriculture sector are the largest Green-House Gas (GHG) emitters, respectively representing around 59%, and 27% of the total national GHG emissions (SNC, 2011). They are therefore sectors where energy savings and use of Renewable Energy Technologies (RETs) can have a significant impact in terms of emission reductions.

Energy Efficiency and Renewables for Sustainable Development

In order to support sustainable development, the government of Sri Lanka has set ambitious targets and plans for energy savings and GHG emission reduction:

- Promoting demand side management and end use energy efficiency, with the target to reduce the total energy consumption by 20% by 2020;
- Reducing the reliance on imported fuel for energy generation, by adopting renewable energies and diversification of the energy mix. The target is to increase the share of renewable energy in electricity production by 20%;
- Promoting energy saving technologies in the agriculture sector;
- Reducing industrial energy consumption by 20% and phasing out GHG emissions from industries.

Exploited renewable energy sources are dominated by hydropower and wind resources, which are used for power production. In recent years, solar technology has spread over the country supported by government programs such as the net-metering program and the setting-up of supportive policies (i.e. feed-in tariff, regulations for investments in renewable energies and standardized power purchase agreements) to supply the electricity grid. In the past, biogas programs in Sri Lanka have primarily been implemented to increase energy access for cooking in off-grid areas. As the power grid has been extended to rural areas, community systems have increasingly been abandoned. Domestic biogas programs are however still underway, highlighting the Government commitment to sustainable and efficient domestic cooking energy access. Biogas has a large success rate, especially when Chinese systems are adopted. Despite an estimated potential of 700MWe, the market is not well developed.

¹ According to UNFCCC GHG source categories Energy industries comprise "emissions from fuels combusted by the fuel extraction or energy producing industries".

The development of the biogas sector in Sri Lanka is still limited by the availability of cost-efficient technologies, limited services offered by energy service companies, lack of skilled technicians, and limited credit facilities.

Ongoing UNDP-GEF Project

The Government of Sri Lanka is currently implementing a GEF project to develop “a robust, transparent and functional Nationally Appropriate Mitigation Action (NAMA) framework to support appropriate climate change mitigation actions in the energy generation and end-use sectors”. UNDP is supporting achieving these targets through supporting an increase in the uses of renewable energy technologies.

The NAMA framework is an organizational setting to prioritize actions that reduce GHG emissions and to enable the implementation of these actions through financial support, technology transfer and capacity-development activities. The proposed NAMA approach involves measurement, reporting and assessment of the contribution of identified and prioritized climate change mitigation actions towards the realization of the national climate change targets and goals.

The first two components of the GEF project addresses capacity and organizational development needs, through the setting of mechanisms to collect and analyse data on energy. The aim is to reinforce the capacity of energy stakeholders to assess carbon footprint of the energy and end-user sectors, and prioritize adapted mitigation actions based on informed technological choices.

Component 3 of the project seeks to address technical, financial and policy barriers to technology adoption and dissemination. The GEF project will define supportive policy measures (i.e. standards, testing and certification) and test business models as well as financial incentives to facilitate renewable energy and energy efficiency measures dissemination. This provides an excellent framework for renewable energy technology transfer from China ensuring that institutional and financial barriers are addressed.

Component 4 of the GEF project is embedded in the objective of NAMA actions to produce sustainable development outcomes. This component targets the development of a monitoring framework to assess NAMAs both in term of GHG emission reduction and development outcomes.

This project frames Chinese technology transfer within broader development objectives. The selected technologies, solar and biogas, are already technologies targeted under the GEF project to achieve emission reduction through changes in energy resources used and reduced electricity consumption within households’ domestic, commercial and agricultural activities. Building upon the GEF project framework the TSSC project:

1. Supports capacity development for GHG emission inventory in the agro-industry

This TSSC project component brings additional support to the GEF project by targeting another end-use sector and developing an overview of the carbon footprint of different agricultural activities. The latest support opens the GEF project to other government priorities and commitment to voluntary emission reduction by targeting emission reduction in the agriculture, livestock, and agro-processing sectors. The TSSC project will also result in increased coordination between energy institutions and other governmental organizations, as well as between national and local agencies, enabling condition for NAMAs implementation.

2. Tests biogas and solar potential for energy savings and GHG emission reduction potential for NAMAs

Component 3 of the GEF project includes technology demonstration, and as such the TSSC project will support 2-5 demonstration of solar and biogas uses in the agro-industry sector.

3. Tests biogas and solar potential for agro-industry productivity gains and income generation

The NAMA framework is broader than GHG emission reduction. The overall objective is to reach a state of climate resilient economic growth. In that sense, this project brings additional value by demonstrating the technology potential to enhance the productivity and development of the agro-industry sector, which still stands as a major economic driver for people's livelihoods and Sri Lanka growth.

Potential GHG Emission Reduction and Energy Savings in Agro-industry Sector

Even though Sri Lanka's economy is no longer driven by the agriculture sector, agricultural activities still account for more than 30% of total employment. While 100,000 additional jobs are created in support industries. The agro-industry sector varies in size and type of activities, from small livelihoods agriculture and farming activities to medium industrial and large export oriented processing activities.

- Export-oriented crops: Commercial crops include cinnamon, pepper, cocoa, coffee, and others, and are grown on small and medium land holdings. Plantation crops—coconut, rubber, and tea—are cultivated in large estates and on small and medium land holdings. Export oriented crops are primarily grown in rain-fed areas. This sub-sector has been identified as a potential target of the on-going GEF project for "Energy Efficiency Nationally Adapted Mitigation Actions", through the dissemination of High Efficient Motors (HEM) to reduce electricity consumption.
- Domestic food crop production: Food crops comprise rice, maize, fruits, vegetables and other crops cultivated by smallholder farms. About 1.65 million smallholder farmers operate on average less than 2 hectares, and contribute 80 percent of the total annual food production. These crops are mostly cultivated using irrigation. Based on the findings of North Western Province, most water pumps used for irrigation are powered by diesel and kerosene. Replacing fuelled powered generators as well as introducing organic wastes disposal management represent a potential for GHG emission reduction.

In 2014, Sri Lanka imported 765,000 tons of chemical fertilizer and approximately 8,200 tons of formulated pesticide products, of which more than 70 percent were distributed for paddy cultivation subsidized at almost 90 percent below the market cost. Reducing uses of inorganic fertilizers may significantly contribute to GHG emission reduction.

- Livestock: Around 30% of smallholder farmers are engaged in mixed crop production and livestock. The dairy sector is the most important of all livestock sub-sectors; however, the poultry sub-sector has emerged as a dynamic industry, most prominently in the broiler sector. It is estimated that 30% of agriculture sector GHG emissions come from livestock. There is therefore a potential for emission reductions through manure treatment.
- Agro-processing: Emerging industries have developed around manufacturing and preserving food derived from agriculture, animal husbandry and fisheries. Activities include salting, curdling, drying, pickling, as well as processing and frosting fruits, vegetables, fisheries, and meat products. The agro-industrial sector is the fastest growing industrial category, with an average annual growth rate of around 5%. With this growth rate, it is probable that energy savings from reduced electricity and biomass consumption may significantly contribute to GHG emission reduction.

Energy savings potential and GHG emission reduction in the agro-industry has not received due attention at national level. This may be attributed to the complexity of the sector (which covers numerous activities),

and the informal nature of smallholder farmer's activity. Furthermore, the data for the agro-industry is spread out over different energy end-use sectors. As a result, there is a:

- Lack of understanding on current energy demand and needs in the agro-industry;
- Lack of knowledge on GHG emission from the agro-industry sector;
- Lack of awareness on RET potential for agro-industry development.

The potential of RETs in energy savings and GHG emission reduction while stimulating productivity and income gains in the agro-industry sector has not yet been fully tested.

Solar and Biogas Energy in China's Agriculture Sector

Since the late 1970s and early 1980s China started using biogas technology as an element in its agriculture modernization programmes. By the end of 2006, the total annual biogas production reached about 8.5 billion cubic meters (incl. domestic biogas production) and more than 5,200 large and mid-sized biogas projects have been installed in livestock and poultry farms. China also developed 2,200 power grid biogas engineering projects for waste management in large animal farms, treating more than 60 million tons of manure a year.

A strong government commitment has resulted in the rapid development of biogas and private sector development in China. 2,810 biogas companies are now engaged in construction of biogas plants and 1,914 companies are specialized in the production of biogas appliances.

Solar technology is expanding in China, and China now accounts for nearly two-thirds of the entire world's production of solar photovoltaics. For years, China has supported access to solar technology programs in developing countries, including solar PV, solar water pumps, solar thermal and solar cook stoves.

Trilateral South-South Cooperation between China, UNDP, and Sri Lanka: Innovation and Opportunities

The innovation in the TSSC project approach lies in the organizational setting of the project. Various stakeholders are brought together under the umbrella of a unique project, addressing multiple development challenges and government priorities in both countries.

This project utilizes UNDP's global experience in encouraging climate-resilient economic development. UNDP has a large environmental portfolio globally and has accumulated abundant experience in tackling climate change mainly through carrying out GEF projects. Based on China's expertise in renewable energy technology transfer and climate change mitigation, this project will foster exchanges and cooperation between China and Sri Lanka, and support the transition to sustainable energy uses in the agro-industry sector for GHG emission reduction and increased income and productivity gains.

The project supports China's new policy on Climate Change South-South Cooperation as well as Sri Lanka's policy on climate change mitigation through adoption and dissemination of renewable energy technologies. The TSSC has been formulated with a focus on priority areas identified by Sri Lanka in light of China's capacity to provide support to the renewable energy sector. By engaging expertise, knowledge and technology from multiple Chinese entities, the project also increases coordination and coherence among Chinese government agencies in delivering assistance.

Through its capacity development activities, the project also supports Chinese institutions in carrying out relevant capacity development in South partner countries.

II. Strategy

Theory of Change

The theory of change articulates the multiple interventions required to reach a long-term objective. Activities are planned along a 'causal pathway' where they are nurturing a set of preconditions (outputs/outcomes) to be met to achieve the objective. Based on identified challenges presented in the situation analysis, the Government of Sri Lanka, the Government of China and UNDP have defined the following project objectives based on identified challenges presented in the situation analysis:

Supporting national target for energy savings and GHG emission reduction through trial and demonstration of biogas and solar in the agro-industry sector.

The preconditions for meeting the objective include:

1. Developing Provincial Council capacities to assess carbon footprint in different agriculture activities and monitoring RET potential for energy savings and GHG emission reduction in:
 - Livestock and fisheries (including aquaculture)
 - Crop cultivation
 - Agro-processing
2. Sharing Chinese knowledge and experience in biogas and solar for agro-industry uses targeting:
 - On-site electricity generation to offset fossil fuel and electricity consumption
 - Waste management
 - Slurry conversion to organic fertilizer
 - Energy efficient applications (powering boilers, dryers, water pumping, etc.)
 - Productivity gains and increased income generation
3. Determining suitable business models through South-South knowledge and experience sharing platforms.
4. Providing support to Chinese institutions on carrying out relevant capacity development in South partner countries.

Rationale and Approach

Leveraging support and experience from China

With a proven track record of renewable energy technology dissemination to meet various needs for its own development, supported by successful policies and business models, China is a strategic partner for the project. The project relies on technical know-how from The Ministry of Science and Technology Administrative Centre for China's Agenda 21 (ACCA21) and the China Agricultural University (CAU).

The Ministry of Science and Technology Administrative Centre for China's Agenda 21 (ACCA21)

Under the on-going South-South project for RET transfer in Ghana and Zambia, ACCA21 has developed:

- A large network of technology suppliers which can be used to link private sector actors between the three countries;

- Capacity to develop and manage a knowledge and experience exchange platform through the South-South Cooperation Centre (SSCC).

ACCA21 experience will be used to develop suitable business models and facilitate partnerships with the private sector to reinforce the energy service industry in Sri Lanka. ACCA21 will also use its existing network to institutionalize a platform of communication and exchanges to facilitate access to technical and financial resources. The overall aim is to provide access to technical information (E-learning course, technology manuals, etc.), and potential business partners in China to stimulate local businesses.

The China Agricultural University: CAU experience in R&D on biogas related technology; fermentation techniques; utilization of biogas and slurry; feedstock material and construction; development of biogas appliances essential to support capacity development activities and develop training material on biogas systems. CAU tested models on technology adaptation for the modernization of the agriculture sector (energy production, waste management, and integrated agricultural practices) will provide Sri Lanka with a set of experiences and expertise to support its own transition. CAU will provide guidance to the agro-industry carbon footprint assessment and ensure that technological answers are adapted to energy needs. It will also be a partner in facilitating joint research studies between Sri Lanka, Ethiopia and China.

Capacity development as an integrated project component

Capacity development is an integrated and fundamental aspect of the Trilateral South-South Cooperation framework. Based on UNDP's approach to capacity development, the project ensures that core principles of cooperation: national ownership, adaptation to local conditions, partners' equality, and use of national systems are embraced. UNDP's five step methodology to ensure sustainable capacity development outcomes has been translated into sub-activities within each capacity development component of the TSSC project. These steps are: 1) Engage stakeholders on capacity development; 2) Assess capacity and needs; 3) Formulate a capacity development response; 4) Implement the response; 5) Evaluate capacity development.

To ensure that learning takes place throughout project implementation process, stakeholders in Sri Lanka and China will implement activities jointly. To that effect some capacity development activities will be generated on-site, through the demonstration of Chinese technology and experience.

The demonstration phase shall ensure that, in the process of designing and constructing the generation facilities, local stakeholders (i.e. Provincial Councils, local association and end-users) are taught basic principles for construction, operation and maintenance of systems.

Capacity development in assessing carbon footprint in different agriculture activities will be assisted by a short term Chinese technical specialist. On-sites activities during the assessment and the construction phases will provide CAU experts with a field experience and knowledge of the Sri Lanka local context (i.e. capacities, barriers and opportunities). The overall UNDP framework for capacity development and field activities will support Chinese institutions in carrying out relevant capacity development in South partner countries.

Stakeholder Coordination

A key component of the project includes coordinating stakeholders' activities to generate lessons learnt. Knowledge transfer between project partners is critical to the project success. It will occur through collaborative activities encouraging information sharing, knowledge exchange platforms and development of an E-Learning course. With UNDP support, SLSEA, CAU and ACCA21 will coordinate and convene

stakeholders on a regular basis to get timely and relevant input to, for example, capacity development, generation of knowledge products and technology transfer.

A fundamental aspect of south-south cooperation between China and Sri Lanka is to create linkages between research institutes, private sector companies and government counterparts which will help ensure long term sustainability. Mutual understanding and creating deep collaboration between Sri Lanka and China can be ensured through UNDP facilitation, study visits, matchmaking between companies and establishing communication platforms (online/ offline). Communication platforms will not only involve the governments of both countries, but also enable energy service providers, financial institutions, and end-users to communicate efficiently.

Thematic alignment to national priorities

The project is aligned with UNDAF China Outcome 3 to expand and improve the effectiveness of China's development cooperation with other developing countries through TSSC framework; and UNDAF Sri Lanka Outcome 4 targeting that policies, programs, and capacities to ensure environmental sustainability, address climate change, mitigation and adaptation and reduce disaster risks are in place at national, sub national and community levels

The project is also supporting national priorities in terms of transition to sustainable energy production and consumption, as well as GHG emission reduction.

Sri Lanka formally ratified the Paris Climate Agreement in 2016. Sri Lanka also submitted INDC Readiness Plan in 2016 which has set a target of 20% GHG emission reduction from the energy sector. This target includes 4% unconditional and 16% conditional emission reduction in the sector by 2030. The achieved GHG emissions reduction through the implementation of pilot demonstrations under the proposed project will contribute to the national voluntary emissions reduction target. The proposed project will contribute to scale up and expand the scope of the GHG inventory to the agro-industry sector. Furthermore, GHG inventory information in agro-industry can be used to refine INDC targets in the future specifically under Third National Communication (TNC) which is due in the coming years.

Implementing Partners

The Sri Lanka Ministry of Power and Renewable Energy (MOPRE): is the Ministry responsible for implementing the Government of Sri Lanka's policies and regulations related to the energy sector which encompasses renewable and non-renewable conventional sources of energy. Renewable energy includes small-scale, hydropower, solar power, bioenergy, and wind power.

The Sri Lanka Sustainable Energy Authority (SLSEA): operating under the Ministry of Power and Renewable Energy is positioned as the apex body with wider powers in both regulation and facilitation in sustainable energy, including bioenergy. SEA was established in 2007. Its mission is to guide the nation in all its efforts to develop indigenous energy resources and conserve energy resources through exploration, facilitation, research & development, and knowledge management in the journey of national development, paving the way for Sri Lanka to gain energy security by protecting natural, human, and economic wealth by embracing best sustainability practices.

Provincial Councils of Sri Lanka: are legislative bodies of the 9 Provinces of Sri Lanka established through the 13th amendments to the constitution of Sri Lanka in 1987. In accordance with the Sri Lankan constitution, the Provincial Councils have legislative and planning power over a variety of matters including energy and agriculture, subject to alignment with national policy.

- Energy: Development, conservation and management of sites and facilities in the Province for the generation and promotion of electrical energy, other than hydro-electric power and power generated to feed the national grid.
- Agriculture and Agrarian Services: Agricultural extension, promotion, education, and agricultural services, which does not involve inter-provincial irrigation and land settlement schemes, State land and plantation agriculture. Rehabilitation and maintenance of minor irrigation works.

The project pre-selected the North-Western and the Eastern provinces as project demonstration provinces. The main reasons for the selection of these two provinces are as follows:

- Sri Lanka Sustainable Energy Authority is involved in the development of the NW Provincial Energy Plan 2015-2020. Memorandum of Understanding (MoU) has been signed between SLSEA and the North-Western province, and necessary approvals have been obtained and administrative structures such as a project management unit for the implementation of the Energy Plan is in place. This Energy Plan includes some development targets for Biogas and Solar PV powered irrigation in line with the Trilateral South-South Cooperation project. Additionally, Energy NAMA project of the UNDP is already supporting the biogas project in the North-Western Province. Further external assistances (technical, and financial) are required for the implementation of this plan.
- Similar to the North-Western province, the Eastern province presents very good demonstration opportunities within the fisheries, aquatic, and agricultural sectors. Moreover, the Governance for Local Economic Development Programme of UNDP Sri Lanka is currently having very well established Programme in the Eastern Province with its dairy and agricultural production.

The project shall capitalize on existing entry points in these two provinces to build coherence between existing projects and the current project. The project identifies that engaging the relevant stakeholders of these two provincial councils from the inception and project formulation is a crucial factor for successful project implementation.

The Ministry of Science and Technology, Administrative Centre for China's Agenda 21 (ACCA21): was established in 1994 to effectively promote the implementation of China's Agenda 21. ACCA21 mission is to support technological innovation and promote sustainable development in China. ACCA21 acts as an excellence research centre and project management unit for various projects. ACCA21 is also leading the creation of a South-South Cooperation Centre, which aim to become a platform of exchanges to facilitate and institutionalize partnerships with the South.

The China Agricultural University:

Under ***the China Agricultural University***, the Key Laboratory of Clean Production and Utilization of Renewable Energy focuses on the following research fields: pre-treatment of mixed-culture feedstock, advanced anaerobic digestion technology and equipment development, biogas clean production and safety discharge, technology evaluation and development strategy. The laboratory aims at promoting renewable energy development and providing consulting, research, development, and personnel training to developing countries.

Outcomes, Outputs and Activity Overview

Outcome 1: Demonstrated use of hybrid RET systems for energy savings and GHG emission reduction in small & medium sized agro-industry including farm, agricultural activities, and agro-processing

Demonstration sites will be chosen to:

1. Build Provincial Council capacities in assessing carbon footprint in different agriculture activities and monitoring biogas and solar potential for GHG savings.
2. Demonstrate uses of biogas and solar systems for energy savings and GHG emission reductions.
3. Demonstrate financial viability of biogas and solar uses and potential business model.

Demonstration will focus on biogas and solar technologies applications for the agro-industry and clean energy generation such as:

- Biogas for electricity generation for onsite use;
- Biogas thermal application or for heating (boilers, efficient dryers, etc.) for agro-processing;
- Slurry from biogas conversion to organic fertilizer;
- Solar PV systems to reduce fuel consumption and GHG emissions;
- RETs for productivity gains and increased income generation.

A Chinese short term technical specialist will assist Provincial Councils with this component. Responsible for capacity development, the specialist's presence will also ensure Chinese exposure to Sri Lankan local context (capacities, barriers, opportunities) at an early stage of the project.

Output 1.1 Capacity of two Provincial Councils to establish energy savings & GHG emissions reduction targets for the agro-industry

The activities will focus on developing Provincial Councils' capacities to manage the transition to RET for clean energy consumption and production: i.e. assess, set targets and monitor. It will bridge the data gap, by piloting a data collection system in one or more provinces that feeds into the NAMA framework for the agro-industry.

Activity 1.1.1: Stakeholders consultations to identify demonstration sites

Consultation of provincial stakeholders will be held to identify demonstration sites. At least one demonstration site by activity: farm, agricultural activities and agro-processing should be selected. The activity will include:

- Baseline data collection from current energy consumption in identified potential demonstration sites;
- GHG emission inventory at identified potential demonstration sites.

The data collection framework should be established to ensure that data can be transferred into existing ENERGIS database of SLSEA as well as provide a comprehensive set of information to establish an overview of the carbon footprint of different agro-industrial activities.

Activity 1.1.2: Develop a monitoring framework and train stakeholders in monitoring energy savings and GHG emission reduction.

Experts will trial a monitoring framework to ensure that energy savings and GHG emission reduction achieved through introduction of RET are recorded in a systematic way, allowing the opportunity to transfer data into a Provincial database. The development of a detailed and demonstration site's specific monitoring system will be a deliverable of the feasibility study (activity 1.3.2). However, training in data recording and introduction of ICT equipment will be part of activities under output 1.1. It is expected that it will also improve the capacities of end-users in monitoring energy savings and GHG emission reduction, and provide an overview of needs for the development of the monitoring system. Coordination mechanisms between Provincial council and RET end-users should be defined under this activity.

Output 1.2 Data consolidated to support formulation of provincial energy plans

Activities under this output are designed to support the GEF NAMA project through:

- Support to component 1 of the GEF project: In collaboration with SLSEA the Chinese specialist will revise and update ENERGIS database to disaggregate agriculture energy consumption in selected provinces.
- Support to component 1 & 4 of the GEF project: Increase capacity of Provincial councils to collect data, monitor progress and formulate energy saving targets.
- Support to component 3 of the GEF project: Increased understanding of RET potential for the agro-industry productivity and sustainable use of energy.

Data generated under activity 1.1.1 will be used as a basis to screen data required for a provincial level baseline of energy consumption and GHG inventory (i.e. energy needs, generated wastes and uses of fertilizers). The baseline will allow comparison with energy savings and GHG emissions reductions achieved through introduction of RETs and support the definition of targets for provincial energy plan.

Activity 1.2.1: Support Provincial Council in developing a data collection framework

- Support the Provincial Councils to collect and submit disaggregated data on energy consumption, waste generated and fertilizer used in the agro-industry to the ENERGIS.
- Study fuel usage for non-transport sector in selected provinces (i.e. water pumping, thermal application for agro-processing, other agricultural equipment). Study co-financed by SLSEA.

Activity 1.2.2 Revision/inclusion of energy savings targets for agro-industry sector in provincial energy plans

RET system users will monitor and report energy savings and GHG emission reduction from RET demonstrations in collaboration with the Provincial Councils. This will allow estimating biogas and solar potential at provincial level and defining targets for the agriculture sector.

Output 1.3: Capacity built through demonstration

UNDP will manage the procurement to build a consortium:

- Providing optimal integrated RET solutions, based on the energy need assessments.
- Partnering with Sri Lanka companies to ensure on-site training of technicians for operation and maintenance.
- Engaged in developing course curricula to train key stakeholders.

The selected consortium will be responsible for overseeing the complete planning and construction process per rules and regulations.

Activity 1.3.1: Site planning and construction

Standard criteria (i.e. scale, availability of feedstock) for site selection will be developed by Chinese experts in consultation with Provincial Councils and SLSEA. A technical workshop will be conducted to develop solid site selection criteria. Technical criteria for sites selection will incorporate findings from output 1.1, and be built-upon the potential for energy savings, GHG emission reduction, income, and productivity gains.

Detailed feasibility studies will be conducted for 2-5 selected demonstration sites (At least one demonstration site by activity: - livestock, fishery, crop cultivation and agro-processing- should be selected). They will include system costs, and will address the following:

- Agro-demonstration companies and, in accordance with project objectives (including detailed institutional arrangements for system ownership and operations).
- Detailed provision of operation and maintenance costs and management plan (including provision and replacement of spare parts and system hardware, existing suppliers, etc.).
- Conduct social and environmental screening.
- Development of a comprehensive monitoring system.

Each feasibility study should cover biogas for:

- Electricity generation for onsite use.
- Thermal applications, or for heating (boilers, efficient dryers, etc.) for agro-processing.
- Waste management.
- Productivity gains and increased income generation.

Activity 1.3.2: On-site training for operation and maintenance

Operation and maintenance are critical to ensure long terms uses and benefits of the technology. Past experiences have demonstrated that without proper operation and maintenance plans, technology systems are abandoned. The Chinese implementing partner will therefore engage in on-site training for system operation and maintenance.

On-site training in partnership with local associations will be developed and conducted, to build Provincial Councils and end-user capacity in system operation, maintenance, and safety.

Outcome 2: South-South Knowledge and Experience Exchanged

A number of approaches to sharing experience and knowledge will be developed. Initial ideas to be included in an online platform where project knowledge products and training curricula are shared. In addition, offline hands-on workshops shall be conducted to share key lessons learned.

Output 2.1 Tailored mentorship/traineeship program for exchange with China developed and participants trained

The training will target two main needs. On one hand developing a pool of experts capable to train in systems installation, operation, and maintenance. On the other hand, energy service providers and Provincial Councils' staff will be supported in developing capacities to design and plan biogas and solar systems.

For the success of biogas operation, technicians need to be trained in the anaerobic digestion process, both to understand the biological process (theory) as well as to maintain the right conditions for the system (practice). To ensure that technicians are exposed to both theory and practice, the project will support MOWIE in identifying potential candidates for MOFCOM trainings and scholarships. The trainings will be financed separately by MOFCOM. Coordination of support provided by the TSSC project and by parallel interventions from MOFCOM is critical for the success of this activity. During the inception phase, project partners will consult with MOFOCM on how to best address coordination needs.

One fundamental aspect of this output is to strengthen Chinese institutions in delivering adapted capacity development and training activities to South partner countries. To that effect, the UNDP approach to capacity development will be used, with a focus on ownership and adaptiveness, project objective oriented, and efficiency. Capacity development and training activities will be systematically evaluated based on these criteria. These evaluations will serve to generate lessons learnt to adapt UNDP's support to South-South Cooperation initiatives.

Activity 2.1.1 Training of trainers in installation, operation & maintenance

The training courses will lead to the formulation of manual for operation and maintenance of specific system; for example, maintaining ph levels, feedstock, screening safety protocols, operation of machinery for biogas systems. Infographic, video, reading materials, quiz, etc. that can be used on the demonstration sites will be developed.

Activity 2.1.2 Training on system design

The training courses will lead to curricula development on designing biogas and solar systems and advisory services for agro-industry (i.e. energy audits, sizing and system optimization, costing systems, biogas upgrading, etc.), including the formulation of online courses.

Finally, in order to reinforce the South-South knowledge exchange, Chinese implementing partners (e.g. China Agricultural University) will adapt the training material to an E-Learning course that will be made accessible by ACCA21 on the South-South Cooperation Centre website.

Output 2.2 Energy stakeholders in China and Sri Lanka are exposed to best business practices in the RE industry

Under this output, experience and business models will be developed to cater to hybrid RET systems such as biogas and solar PV.

The knowledge platform will address direct barriers and challenges faced by energy stakeholders, such as:

- Existing financial barriers to biogas and solar dissemination and potential for development of ESPs financial services portfolio.
- Procurement of systems and appliances through Chinese suppliers as well as supply and maintenance of solar photovoltaic systems.

Activity 2.2.1 Develop and trial Sri Lanka Renewable Energy Awards

To promote good management and competition between institutions, an Award Show will be organized to encourage sector players to commit to RET adoption. Success stories will be showcased by stakeholders including, public institutions, private associations, research organizations.

Categories potentially including: "best China-Sri Lanka cooperation", "Greenest Universities", "Energy Efficiency", "Reduction of GHG", "Innovative RET uses", etc. will be developed under an overall concept.

The award shall be nationally hosted to reinforce and coordinate with existing initiatives such as Sri Lanka National Energy Efficiency Award scheme of SLSEA.

Activity 2.2.2 Facilitate business best practices forum

The forum will address the lack of information and knowledge the energy service providers face in terms of investment opportunity as well as raising awareness among financing institutions on successful business models for RET dissemination. The forum would encourage critical feedback from a financial sector perspective to improve financial viability of investment plans.

It will be facilitated through the organization of a best practices workshop, and collection of reports, information and awareness products to be made accessible through the South-South Cooperation Centre platform of knowledge.

Best practices for the agro-industry to key stakeholders including the financial sector will be presented during a workshop to be held in Sri Lanka. Knowledge products will include among other:

- Presentation of financing models (public/private) for RE systems. Inspired by Chinese and international experience, context specific presentations on financing models shall be used to introduce a range of existing models.
- Market analysis presentation that defines necessary and demand driven energy services to be developed by energy service providers for the agro-industry. This includes targets for GHG emission reduction defined by the two demonstration provinces.
- With support from Chinese experts, presentation of investment plan to support loan making decisions of financial institutions and banks.
- Presentation of renewable energy loan portfolio by different banks. Considering the synergies with the GEF project, it will be merged with the existing de-risking renewable energy investments activity
- Present financial justification and business model of demonstration projects developed in output 1.3

Possible participants include Sri Lanka banks with existing renewable energy loan portfolio, People In Need, Chinese investors, Chinese financial institutions, Chinese ESCOs. The forum will also raise awareness of the applicability and commercial viability of hybrid and single RET solutions in agro-industry through the dissemination of promotional brochures on RET business case in agro-industry.

Activity 2.2.3: Coordinate business match-making platform for energy service providers

The match making platform will help identify suppliers and facilitate business relationships to match potential demand for RETs in Sri Lanka agro-industry sector. Chinese partner will identify the Sri Lanka energy service providers demand in terms of access to technology hardware and develop an online catalogue of demand-driven biogas and solar PV products/appliances and technologies for agro-industry.

Chinese partners will also organize and host trade fairs for RET technology with possible site visits for technology demonstration and business match-making.

Activity 2.2.4: Joint research projects

Joint research projects should include private companies, technical agencies and local/provincial universities, and academic institutions from the three countries. In-country visits are expected.

Through a set of collaborative research and consultations the project will mainstream biogas and solar potential for a transition to sustainable energy consumption and production patterns. Studies and consultation will consider:

- Why various technologies and technical systems have failed?
- Potential for biogas standardization.
- Socio-economic study on farmer behaviour, young farmer expectations.
- Promotional packages on appropriate technologies for farmers in rural areas.

Joint research studies will be conducted through partnership/twinning with Sri Lanka, Ethiopia, and Chinese research institutes.

UNDP Roles and Functions

UNDPs role and mandate in a trilateral project falls into the following priorities for United Nations support listed below:

1. Support South-South cooperation efforts;
2. Strengthen partner country institutional and technical capacities;
3. Improve the exchange of knowledge, experience and know-how among China-Ethiopia and Sri Lanka;
4. Respond to the specific development challenges of partner countries.

The following table provides a summary of what and how UNDP can provide support to contribute to achieving expected outcomes:

| <i>Role (what)</i> | <i>How (processes)</i> | <i>Outcomes</i> |
|----------------------------|---|---|
| <i>Convener</i> | <ul style="list-style-type: none"> • Bring parties together and facilitate dialogue • Support partners in identifying and planning project approaches and implementation | <ul style="list-style-type: none"> • Consensus reached and project formulated • Consultative and inclusive processes that take partners development needs and priorities into account. • Technical capacities of Sri Lanka energy stakeholders strengthened, including private sector • Experience on SSC institutionalized within key partners in China. |
| <i>Knowledge broker</i> | <ul style="list-style-type: none"> • Bridge knowledge gaps by linking supply and demand of expertise and experience • Identify, document and disseminate good practices • Ensure quality of training and capacity development activities | <ul style="list-style-type: none"> • Knowledge exchange platform between Ethiopia, China and Sri Lanka facilitated • Successful practices documented for adaptation or scaling up • Sri Lanka institutions connected and networked • UNDP approach and methodology for capacity development used and adapted training delivered. Capacity Development evaluated |
| <i>Partnership builder</i> | <ul style="list-style-type: none"> • Rally partners and key project stakeholders • Organize forums, meeting and events • Mobilize resources • Coordinate and leverage UN and other donor support | <ul style="list-style-type: none"> • Inclusive partnerships and strategic alliances forged between Ethiopia, China and Sri Lanka • Technical and financial resources mobilized • MOFCOM and GEF co-funding is efficiently managed to support project objective achievements |

UNDP will specifically provide project oversight through its project management setup, modalities and its standard rules and procedures. Project oversight ensures that objectives and outcomes are met and management is adaptive to the context in which the project operates. This includes assessing strategic opportunities as they arise and adopting these when relevant. UNDP will play an important role in facilitating communication and coordination between the implementing partners. At the activity level, UNDP will support processes of capacity development that takes place between the implementing partners and provide quality assurance services to that effect.

At the national strategy level, UNDP, through its roles and functions outlined above, will contribute to both China and Sri Lanka national priorities and strategic outlook.

III. Joint Results and Resources Framework

Intended Outcomes as stated in the respective CPs' RRFs:

China Outcome 3: China expands and improves the effectiveness of its development cooperation with other developing countries through TSSC framework

Sri Lanka Outcome 4: Policies, programs and capacities to ensure environmental sustainability, address climate change, mitigation and adaptation and reduce disaster risks in place at national, sub national and community levels

Outcome indicators (as stated in the RRF of CP of respective partner countries, including baselines and targets):

Sri Lanka UNDAF Output 4.3: Technologies and approaches used by government and private sector towards Climate Change Mitigation (CCM) improved

Indicator: Amount of Green House Gas (GHG) emissions reduced as a result of promotion of renewable energy and energy efficiency technologies

Baseline: N/A

Target: N/A

China UNDAF: Output 3. The effectiveness of China's engagement in international cooperation is enhanced for the mutual benefit of China and the world.

Indicator:

Baseline: Zero (2019)

Target: 1 by 2020

Partnership Strategy: *Sri Lanka Sustainable Energy Authority (SLSEA) & Provincial Councils - Administrative Centre for China's Agenda 21 (ACCA21) - China Agricultural University (CAU)*

Project title and ATLAS Project (formerly Award) ID: Biogas and Solar Trilateral Cooperation - Transitioning to Sustainable Energy Uses in the Agro-Industry in Sri Lanka - China – Ethiopia. Sri Lanka Project

Outcome 1: Demonstrated use of hybrid RET systems for Energy Savings and GHG emission reduction in small & medium sized agro-industry including farm, agricultural activities and agro-processing

| INTENDED OUTPUTS | OUTPUT TARGETS FOR (YEARS) | INDICATIVE ACTIVITIES | RESPONSIBLE PARTIES | Input Matrix | | | | |
|---|---|---|---------------------|--|--------------------|------------|------------|-------------|
| | | | | China | SLSEA | UNDP SL | UNDP China | Funding |
| <p>Output 1.1 Capacity of two Provincial Councils to establish energy savings & GHG emissions reduction targets for the agro-industry</p> <p>Country/ Partner: Sri Lanka/SLSEA-Provincial Councils</p> <p>Indicators:</p> <ul style="list-style-type: none"> - No of sites selected according to project objectives - Data collection system established - No of Provincial Council staff and beneficiaries trained - Number of equipment transferred & tested at demonstration sites -No of monitoring system established <p>Baselines: GEF Project/ None</p> | <p>Targets (year 1)</p> <p>2-5 demonstrations sites to be identified for the project</p> <p>2-3 Provincial staff and 2-5 beneficiaries trained in data collection</p> <p>Procurement of ICT data collection system</p> <p>Target (year 2)</p> <p>Monitoring system defined (by site or by technology)</p> | <p>Activity 1.1.1: Stakeholders consultation to identify demonstration sites</p> <p>Activity 1.1.2 Develop a monitoring framework and train stakeholders in monitoring energy savings and GHG emission reduction.</p> | SLSEA | <p>CAU Support in defining data collection framework/ Provide technical specialist</p> <p>CAU training</p> | Staff coordination | Overall QA | Overall QA | UNDP SL/GEF |

| | | | | | | | | |
|--|---|---|---|---|--|---|--|---------------------------------------|
| <p>Output 1.2 Data consolidated to support formulation of provincial energy plans</p> <p>Country/IP: Sri Lanka-China/SLSEA-ACCA21</p> <p>Indicators:</p> <ul style="list-style-type: none"> - Communication strategy - Data used in ENERGIS - Report on biogas and solar potential in achieving ES and GHG reductions - No of provincial energy plans updated <p>Baselines: one province-level energy plan (North Western) among 9 provinces</p> | <p>Targets (year 1)</p> <p>Communication system between technical department for data retrieval established</p> <p>Data on energy consumption and GHG emission in the agro-industry consolidated and transferred into ENERGIS database</p> <p>Targets (year 2)</p> <p>2 provincial energy plan updated</p> | <p>Activity 1.2.1: Support Provincial Councils in developing a data collection framework</p> <p>Activity 1.2.2 Revision/Inclusion of energy savings targets for agro-industry sector in provincial energy plans</p> | <p>Provincial Councils</p> <p>Provincial Councils</p> | <p>CAU Support in defining data consolidation/Provide technical specialist</p> <p>CAU review energy plans</p> | <p>Staff coordination</p> <p>Staff coordination & review energy plans</p> | <p>Overall QA</p> <p>Review energy plans</p> | <p>Overall QA</p> <p>Review energy plans</p> | <p>UNDP SL/GEF</p> <p>UNDP SL/GEF</p> |
| <p>Output 1.3: Capacity built through demonstration</p> <p>Country/ IP: Sri Lanka/SLSEA-Provincial Councils</p> <p>Indicators:</p> <ul style="list-style-type: none"> - No of sites selected - No of feasibility studies endorsed - Equipment that meet quality and cost-efficiency standards procured -No of capacity need assessment reports - Training plan - No of people trained - % of positive evaluation of the training | <p>Targets (year 1)</p> <p>Technical criteria developed in collaboration with Provincial councils</p> <p>2-5 Sites shortlisted/2-5 feasibility studies conducted</p> <p>EPC signed and Procurement of RET systems</p> <p>Targets (year 2)</p> <p>2-5 Sites equipped</p> <p>Targets (year 1)</p> <p>Stakeholders engagement, capacity assessment and training</p> | <p>Activity 1.3.1: Site planning and construction</p> <p>Activity 1.3.2: On-site training for operation and maintenance</p> | <p>Provincial Councils</p> <p>Provincial Councils/SLSEA</p> | <p>Technical inputs from China expert</p> <p>Technical inputs from CAU</p> | <p>Facilitate and ensure partnership between local stakeholders and Chinese EPC Contractor</p> <p>Quality control of equipment</p> <p>Provincial Council staff</p> | <p>Procurement</p> <p>QA capacity development</p> | <p>MOFCOM/SLSEA</p> <p>MOFCOM</p> | |

| | | | | | | | | |
|--|---|--|--|--|---------------------|--|------------|--------------------|
| <p>-No of operation, maintenance and safety manuals</p> <p>- No of operational RETs systems</p> <p>Baselines: 0/Current capacity of system operators limited. Systems failure at HH level because of lack of technical capacities to operate and maintain the system.</p> | <p>plan delivered</p> <p>Identify stakeholders to be trained (at least one staff per demonstration site/at least 1 staff per Provincial council) which can take part in the ongoing on-site training</p> <p>Targets (year 2)</p> <p>End users & Provincial Council trained in operation, maintenance & safety; Operation, maintenance and safety manual developed</p> <p>Training evaluated</p> | | <p>Biogas association to provide accreditation</p> | | <p>for training</p> | | <p>ent</p> | <p>UNDP SL/GEF</p> |
|--|---|--|--|--|---------------------|--|------------|--------------------|

Outcome 2: South-South knowledge and Experience Exchanged

| INTENDED OUTPUTS | OUTPUT TARGETS FOR (YEARS) | INDICATIVE ACTIVITIES | RESPONSIBLE PARTIES | Input Matrix | | | | |
|---|--|--|---------------------|---|---|---|--|-----------------------------------|
| <p>Output 2.1 Tailored mentorship/traineeship program for exchange with China developed</p> <p>Country/IP: China/CAU</p> <p>Indicators:</p> <p>-No of capacity need assessment reports</p> <p>- No of participants to training</p> | <p>Target (Year 1)</p> <p>Stakeholders engagement, capacity need assessments, identification of trainees</p> <p>Design training of trainers' courses for construction, operation and maintenance</p> <p>Training of trainers courses for</p> | <p>Activity 2.1.1 Training of Trainers in installation, operation & Maintenance</p> <p>Activity 2.2.2 Training on system</p> | <p>CAU</p> | <p>China</p> <p>ACCA21 to coordinate and facilitate E-learning course</p> | <p>SLSEA</p> <p>Staff training Coordinate with project activities</p> | <p>UNDP SL</p> <p>QA Capacity development</p> | <p>UNDP China</p> <p>QA Capacity development</p> | <p>Funding</p> <p>UNDP SL/GEF</p> |

| | | | | | | | | |
|---|---|---|---|--|---|---|---|---------------|
| <p>- Training course material</p> <ul style="list-style-type: none"> - No of participants to system design training - % of positive evaluation of the training - Hands-on training course for design and optimization - E-learning course on SSC centre website - No of views and subscription to online course <p>Baselines: 0</p> | <p>construction, operation and maintenance in China (At least 1 staff from Provincial councils/1 staff from SLSEA/1 staff from People in Need/1 staff from biogas association)</p> <p>Capacity need assessment in system design</p> <p>Design training course on system design and optimization held in Sri Lanka</p> <p>Target (Year 2)</p> <ul style="list-style-type: none"> -Trainings evaluated -Training curricula added on SSC centre website as E-Learning course | <p>design</p> | <p>CAU</p> | <p>ACCA21 to coordinate and facilitate E-learning course</p> | <p>Coordinate with GEF activities</p> | <p>Review list of participants to business forum, planned site visit and trade fair</p> | <p>Design award</p> | <p>SL/GEF</p> |
| <p>Output 2.2 Energy Stakeholders in China and Sri Lanka are exposed to best business practices in the RE industry</p> <p>Country/IP: China/ACCA21/CAU</p> <p>Indicators:</p> <ul style="list-style-type: none"> - No of reports produced and presented to best practices workshop - No of participants to best practices workshop - No of FIs attending forum - No of Sri Lanka participants to business platform in China - % participants satisfied with | <p>Target (Year 1)</p> <p>Conduct private energy service providers mapping in China (biogas and solar)</p> <p>Online Catalogue of suppliers/appliances developed and regularly updated</p> <p>Target (Year 2)</p> <p>Award designed and hosted</p> <p>Study reports finalized and presented to best practices workshop in Sri Lanka:</p> <ul style="list-style-type: none"> - Technology and financial needs | <p>Activity 2.2.1 Develop and trial Sri Lanka Renewable Energy Awards</p> <p>Activity 2.2.2 Facilitate Business Best Practices Forum</p> <p>Activity 2.2.3: Coordinate business match-making platform for energy service providers</p> <p>Activity 2.2.4: Joint Research projects</p> | <p>SLSEA</p> <p>ACCA21</p> <p>ACCA21</p> <p>CAU</p> | <p>Coordinate with GEF activities</p> | <p>Review list of participants to business forum, planned site visit and trade fair</p> | <p>Design award</p> | <p>SLSEA</p> <p>MOFCO M</p> <p>MOFCO M</p> <p>MOFCO M</p> | |

| | | | | | | |
|--|---|--|--|--|--|--|
| <p>Business match-making platform and trade fair</p> <p>- % of users satisfied with online catalogue service</p> <p>Baselines: 0</p> | <p>in the agriculture sector in Sri Lanka</p> <p>- Financing model for biogas and solar solutions in the agriculture sector</p> <p>- Provincial Councils to prepare report on potential energy savings and GHG reduction for demonstration sites</p> <p>Financial stakeholders mapping in China & Sri Lanka. At least 2 representatives of financial institutions involved in renewable energy portfolio invited to best practice workshop.</p> <p>Best practices workshop with at least 50 people stakeholders held in Sri Lanka</p> <p>At least 10 stakeholders from Sri Lanka (private companies, biogas association, government counterparts) invited to business match-making platform.</p> <p>Trade fair hosted/Site visit in China</p> | | | | | |
| <p>Budget for China (MOFCOM) <i>(core, non-core, to be mobilized)</i></p> <p>Budget for SL (Government) <i>(core, non-core, to be mobilized)</i></p> | <p>1,000,000</p> <p>1,000,000</p> | | | | | |

IV. Multi-Year Work Plan

Country: Sri Lanka Implementing Partner: Sri Lanka Sustainable Energy Authority

| EXPECTED OUTPUTS[1] And baseline, indicators including annual targets | PLANNED ACTIVITIES <i>List activity results and associated actions</i> | TIMEFRAME | | | RESPONSIBLE PARTY | PLANNED BUDGET | |
|---|---|-----------|----|----|---------------------|----------------|------------------------------------|
| | | Y1 | Y2 | Y3 | | Funding Source | Budget Description Amount (USD) |
| Outcome 1: Demonstrated use of hybrid RET systems for Energy Savings and GHG emission reduction in small & medium sized agro-industry including, farm, agricultural activities and agro-processing | | | | | | | |
| Output 1.1 Capacity of two Provincial Councils to establish energy savings & GHG emissions reduction targets for the agro-industry Country/ Implementing Partner: Sri Lanka/SLSEA-Provincial Councils Indicators: - No of sites selected according to project objectives - Data collection system established - No of Provincial Council staff and beneficiaries trained - Number of equipment transferred & tested at demonstration sites - No of monitoring system established Baselines: GEF Project/ None Related CP outcome: Sri Lanka UNDAF Outcome 4 | Activity 1.1.1: Stakeholders consultations to identify demonstration sites | X | | | SLSEA | UNDP SL/GEF | 35,000 |
| | Activity 1.1.2 Develop a monitoring framework and train stakeholders in monitoring energy savings and GHG emission reduction. | X | | | Provincial Councils | UNDP SL/GEF | 141,000 |
| Output 1.2 Data consolidated to support formulation of provincial energy plans Country/IP: Sri Lanka- China/SLSEA Indicators: - Communication strategy - Data used in ENERGIS - Report on biogas and solar potential in achieving ES and GHG reductions - No of provincial energy plans updated Baselines: one province-level energy plan (North | Activity 1.2.1: Support Provincial Councils in developing a data collection framework | X | | | Provincial Councils | UNDP SL/GEF | 93,000 |
| | Activity 1.2.2 Revision/Inclusion of energy savings targets for agriculture sector in provincial energy plans | | X | | Provincial Councils | UNDP SL/GEF | 7,000 |

| | | | | | | |
|---|---|-------------------------------------|-------------------------------------|---|--|---|
| <ul style="list-style-type: none"> - No of participants to training - Training course material - No of participants to system design training - Hands-on training course for design and optimization - % of positive evaluation of the training - E-learning course on SSC center website - No of views and subscription to online course <p>Baselines: 0 Related CP outcome: China UNDAF Outcome 3/ Sri Lanka UNDAF Outcome 4</p> | <p>Activity 2.1.2 Training on system design</p> | <p>X</p> | <p>X</p> | <p>CAU</p> | <p>UNDP SL/GEF</p> | <p>69,000</p> |
| <p>Output 2.2 Energy Stakeholders in China and Sri Lanka are exposed to best business practices in the RE industry</p> <p>Country/IP: China/ACCA21/CAU</p> <p>Indicators:</p> <ul style="list-style-type: none"> - No of reports produced and presented to best practices workshop - No of participants to best practices workshop - No of FIs attending forum - No of Sri Lanka participants to business platform in China - % participants satisfied with Business match-making platform and trade fair - % of users satisfied with online catalogue service <p>Baselines: 0 Related CP outcome: China UNDAF Outcome 3/ Sri Lanka UNDAF Outcome 4</p> | <p>Activity 2.2.1 Develop and trial Sri Lanka Renewable Energy Awards</p> <p>Activity 2.2.2: Facilitate Best Practices forum</p> <p>Activity 2.2.3: Coordinate Business match-making platform</p> <p>Activity 2.2.4 Joint Research Projects</p> | <p>X</p> <p>X</p> <p>X</p> <p>X</p> | <p>X</p> <p>X</p> <p>X</p> <p>X</p> | <p>SLSEA</p> <p>ACCA21</p> <p>ACCA21</p> <p>CAU</p> | <p>SLSEA</p> <p>MOFCOM</p> <p>MOFCOM</p> <p>MOFCOM</p> | <p>110,000</p> <p>91,000</p> <p>112,000</p> <p>55,000</p> |
| South-South Project Management Project Structures | | | | | | |
| <p>Management Structures</p> | <p>Project identification and stakeholders' consultation</p> | <p>X</p> | <p></p> | <p></p> | <p></p> | <p>25,000</p> |
| | <p>Set-up project management structures in China</p> | <p>X</p> | <p></p> | <p></p> | <p></p> | <p>10,000</p> |
| | <p>Set-up project management structures in Sri Lanka</p> | <p>X</p> | <p></p> | <p></p> | <p></p> | <p>76,000</p> |

| | | | | | | | | | |
|-------------------|--|---|---|--|--|--|--|--|-----------|
| | Inception/Launch workshop and study tour to Sri Lanka | X | | | | | | | 36,000 |
| | PB meeting and study tour in China | | X | | | | | | 36,000 |
| | Establish coordination mechanisms and communication platform | X | | | | | | | 67,000 |
| | Communication equipment | X | | | | | | | 4,000 |
| Total Project GMS | | | | | | | | | 130,000 |
| TOTAL | | | | | | | | | 2,000,000 |

V. Management Arrangements

In China, the implementation modality will fall under UNDP's Direct Implementation Modality (DIM). UNDP China will be the executing agency on behalf of MOCOM and responsible for the management of Chinese implementing partner's technical and financial inputs to the TSSC project.

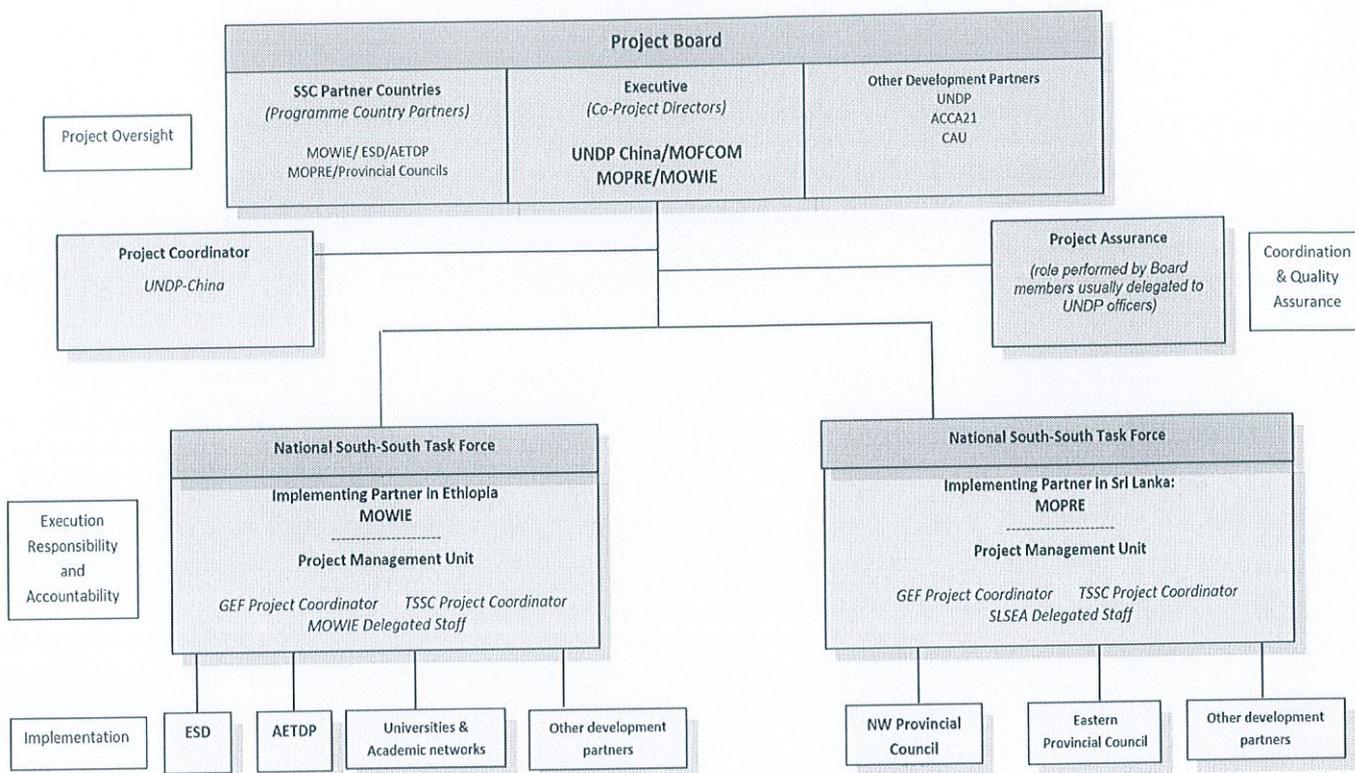
In Sri Lanka, the implementation modality will fall under UNDP's Nationally Implemented Modality (NIM). The Ministry of Power and Renewable Energy (MOPRE) will be the project executing agency.

To facilitate a high degree of partnership and ownership among partners, who have not yet had the opportunity to meet and discuss in detail the organizational set-up, the inception phase includes a short consultation workshop. The objectives of the consultation workshop shall be:

- Confirm & adjust the organizational set-up;
- Confirm & adjust funding streams and accountability safeguards;
- Setup the project management units and procedures including elaboration of the project administration, communication, and coordination manual;
- Plan and agree upon the Annual Work Plan between Sri Lanka and Chinese stakeholders as well as joint Annual Work Plan between Sri Lanka, Ethiopia, and China;
- Ensure that all project partners understand project objectives and main activities and take ownership of the project;
- Plan TSSC Project board meetings to increase coordination between the two projects, including reporting modalities.

To ensure TSSC project scalability, policy impact and sustainability, the project will be implemented within broader engagement between UNDP and MOPRE. The management structure outlined in the diagram below represent the overall TSSC programmatic management structure for both Ethiopia and Sri Lanka projects. UNDP China will manage both projects under the same modalities to increase consistency and efficiency. A common Project Board will be convened to ensure overall project coordination and will be co-executed by UNDP China on behalf of MOFCOM, MOPRE and the Ethiopia Ministry of Water, Irrigation and Electricity (MOWIE).

The roles and responsibilities of both the overall management structure and national projects' management is described in details below.



Project Board

This is the highest body for strategic guidance, oversight, and coordination of the project, and as such will guide project direction and advisory services. The Board is responsible for making, by consensus, management decisions for the TSSC project when guidance is required by respective Country Project Managers, including recommendation for UNDP approval of project work-plans and revisions. To ensure UNDP's ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition. In case a consensus cannot be reached within the Board, final decision shall rest with the UNDP Country Offices concerned.

Responsibilities for joint review of project results and joint decision making will be maintained at the project board level. In addition, the project board's main functions include:

- Maintain general oversight of the Project;
- Ensure linkages to national development priorities in each of the represented countries and UNDP;
- Provide strategic guidance to Implementing Partners based on global trends and development priorities to improve the project;
- Provide strategic guidance to Implementing Partners based on South-South Cooperation trends and priorities to improve the project;
- To ensure appropriate and high-level buy-in to the project, the modality, and its objectives
 - o Ongoing tracking of the value of trilateral cooperation

- to consolidate and disseminate experience on whether the approach is successful
- Provide feedback to national institutions and maintain ongoing dialogue with these;
- Provide strategic advice on how to scale-up the initiative;
- Approve any major changes in plans or in the project;
- Ensure commitment of resources to support project implementation;
- Arbitrate any conflicts within the project,

In addition to typical roles in project management the four following roles² are highlighted:

- **Project Directors** (also called Executive role): representing the project ownership to chair the group. This role typically held by Partner Governments or UNDP.
- **Development Partners** (*also called Supplier role*): representing the interests of other parties which provide funding and/or technical expertise to the project. Typically includes representatives from Implementing Partners, UNDP, and donors.
- **Beneficiary Representatives**: representing the interests of those who will ultimately benefit from the project.
- **Project Assurance**: Project Assurance is the responsibility of each Project Board member; however, the role can be delegated. The project assurance role supports the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures that appropriate project management milestones are managed and completed. Project Assurance must be independent of the Project Managers. UNDP Programme Officers, or M&E Officers, typically hold the Project Assurance role on behalf of UNDP.

Project reviews by this group are made at designated decision points during the implementation of the project, or as necessary when raised by the Project Coordinator. This group is consulted by the Project Coordinator for decisions when Project Manager's tolerances (normally in terms of time and budget) have been exceeded (flexibility). Based on the approved annual work plan (AWP), the Project Board may review and approve project quarterly plans when required and authorizes any major deviation from these agreed quarterly plans. It is the authority that signs off the completion of each quarterly plan as well as authorizes the start of the next quarterly plan. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems between the projects and external bodies.

The Project Board also plays a critical role in UNDP commissioned project evaluations by quality assuring the evaluation process and products, and using evaluations for performance improvement, accountability, and learning.

The Project Board will meet annually.

² <https://intranet.undp.org/global/popp/ppm/Pages/Programme-and-Project-Management-Arrangements.aspx>

Project Coordinator

The Project Board appoints this role to coordinate, on behalf of the Project Board, day-to-day collaborative efforts at the overall project level. The project coordinator plays a key role in coordinating and incorporating the programmatic contributions of all partner countries and is responsible for

- Compiling joint project reports, with specific inputs from each partner country;
- Facilitating communication and coordination among partners;
- Preparing for project board meetings;
- Facilitating joint activities as needed; and
- Managing of Chinese implementing partners' technical and financial inputs to the TSSC project.

The Project Coordinator is supported by the Coordinating Office, UNDP China.

Coordinating Office

UNDP China is appointed as the Coordinating Office to provide coordination services to the project. These services should include:

- Preparing joint project reports by consolidating information on results and resources;
- Facilitating management arrangements, for example by convening Project Board meetings;
- Facilitating communication and coordination between partners;
- Coordinating project evaluations and reviews, as needed;
- Facilitating joint activities, as needed;
- Acquiring, overseeing, and coordinating technical inputs from Chinese partners, as needed;
- Act as focal point for all interaction with MOFCOM.

The cost for services provided by a Coordinating Office should be covered by the project budget.

National South-South Task Force

A National South-South Task Force will be established to oversee project implementation and ensure coordination with all the project partners and related initiatives. The NSSTF will be aligned to the existing GEF Project Board and convene representatives from MOPRE, SLSEA, North Western and Eastern Provincial Councils and, UNDP China. Chinese Implementing Partners (i.e. UNDP China, ACCA21 and CAU) will be represented as needed. Its main responsibility will be to:

- Oversee implementation of the project;
- Review and approve annual work plans, deliverables, and budgets;
- Approve minor changes in project plans related;
- Provide technical inputs and advices.
- Oversee project progress;
- Oversee the financial management and production of financial reports;
- Ensure that risks are being tracked;
- Provide direction and oversee revisions of annual work plans.

MOPRE will convene NSSTF coordination meetings twice a year. The Chinese Economic and Commercial Counsellor may seat as an observer to ensure that MOFCOM interests are represented.

Project Management

The UNDP Country Offices in Sri Lanka

UNDP Sri Lanka will provide project management support and coordination through assigned project managers.

UNDP managers will be responsible to:

- Oversee the project;
- Provide administrative and technical support;
- Control project finances including: (i) disbursement of funds to implementing partners, (ii) providing financial and audit services to the project; (ii) overseeing financial expenditures against project budgets approved by the TSSC Program Board; (iii) appointing independent financial auditors and evaluators; (iv) collect, review and approve quarterly and annual reporting; and (v) ensuring that all activities including procurement and financial services are carried out in strict compliance with UNDP procedures;
- Oversee interoffice communication and coordination;
- Manage international procurement;
- Monitor and evaluate the project as well as to ensure quality assurance.

The Project Management Unit

SLSEA, North-Western and Eastern Provincial Councils, as implementing partners on behalf of MOPRE, will have the responsibility of the day to day management of the project as well as the responsibility to oversee the TSSC project implementation in Sri Lanka. To increase coordination of project activities the Project Management Unit will be assisted by projects coordinators from GEF and TSSC projects. The project coordinators will ensure smooth project implementation and raise key concerns to be addressed as they arise and in a timely manner. Specific responsibilities will be to:

- Manage and coordinate project implementation in accordance with objectives, work plan and budget;
- Manage the day-to-day operations of the budget, including the management of financial and other records to facilitate audits of the project;
- Prepare work plans and associated budget;
- Plan and coordinate project activities and project-related meetings, incl. accounting and quarterly and annual progress reporting;
- Supervision of consultants and suppliers;
- Produce monitoring report for submission to UNDP.

Supporting South-South Cooperation and learning between Sri Lanka and China

Project support will be provided by the Chinese government in form of a seconded staff member. The staff member will support key project processes and ensure linkages to national institutions, private sector in both China and Sri Lanka, and will function as a core member of the project management unit. The staff member shall have induction briefing and debriefing at the UNDP China office for the first two weeks and the last two weeks of the project support period.

The implementing partners will work closely together to implement joint activities as defined in the AWP. Such joint activities need joint planning, coordination and ongoing communication. Such close cooperation requires frequent communication via teleconference and in person meetings. To the extent possible, project coordination shall be planned as an extension of planned study tours and exchanges to reduce direct costs. Other project coordination travel may be necessary.

The list of partners and their corresponding responsibilities is provided below:

| Partner's Name | Type of Institution | Location | Responsibilities |
|-------------------------------|----------------------------|--------------------|--|
| UNDP Sri Lanka | International Organization | Colombo, Sri Lanka | <ul style="list-style-type: none"> Coordinates project and partners in Sri Lanka Project monitoring and evaluation, quality assurance Member of the Project Board Produce and deliver inputs for quarterly progress and final reports (in English) |
| UNDP China | International Organization | Beijing, China | <ul style="list-style-type: none"> Overall project coordinator Collaborate with UNDP Sri Lanka office to ensure project objectives are met Liaison with GoC/MOFCOM officials and other Chinese institutions (i.e., MOA - MOST) Organize and conduct monitoring trips with MOFCOM and UNDP Sri Lanka Collect and consolidate inputs from partners to produce and deliver quarterly progress and final reports Share quarterly and annual progress reports with MOFCOM (and translate into Chinese) Produce, in collaboration with UNDP Sri Lanka, final assessment of project for MOFCOM |
| Ministry of Agriculture | Government Organization | Beijing, China | <ul style="list-style-type: none"> Technical partner Assist with the identification and selection of Chinese technical experts or consultants, where applicable |
| ACCA21 | Government Organization | Beijing, China | <ul style="list-style-type: none"> Local Chinese project partner Liaison with UNDP China Partner for development of detailed project plans, including needs assessment, and project monitoring and evaluation Assist with the identification and selection of Chinese technical experts or consultants, where applicable Provide input and feedback to quarterly progress and final reports Represented on the Project Board |
| China Agricultural University | Public Institution | Beijing China | <ul style="list-style-type: none"> Local Chinese project partner Liaison with UNDP China Provide designing and training capabilities Talent cultivation Partner for development of detailed project plans, including needs assessment, and project monitoring and evaluation |

| | | | |
|--|-------------------------|--------------------|---|
| | | | <ul style="list-style-type: none"> • Provide input and feedback to quarterly progress and final reports • Represented on the Project Board |
| Sri Lanka Ministry of Power and Renewable Energy | Government Organization | Colombo, Sri Lanka | <ul style="list-style-type: none"> • Local Financial and Technical project partner • Partner for development of detailed project plans, including needs assessment, and project monitoring and evaluation • Assist with the identification and selection of Chinese technical experts or consultants, where applicable • Provide feedback to quarterly progress and final reports |
| Sri Lanka Sustainable Energy Authority | Government Organization | Colombo, Sri Lanka | <ul style="list-style-type: none"> • Local Financial and Technical project partner • Liaison with UNDP Sri Lanka and Provincial Council • Partner for development of detailed project plans, including needs assessment, and project monitoring and evaluation • Assist with the identification and selection of Chinese technical experts or consultants, where applicable • Provide feedback to quarterly progress and final reports • Represented on the Project Board |
| North Western and Eastern Provincial councils | Government Organization | Colombo, Sri Lanka | <ul style="list-style-type: none"> • Local technical project partner • Partner for development of detailed project plans, including needs assessment, and project monitoring and evaluation • Assist with the identification and selection of Chinese technical experts or consultants, where applicable • Provide feedback to quarterly progress and final reports |

VI. Monitoring Framework and Evaluation

An inception phase will bring all project partners from Sri Lanka, Ethiopia, and China together to:

- Coordinate with MOFCOM and UNDP Sri Lanka to confirm whether a final evaluation will be required and plan a budget line accordingly.
- Define a detailed monitoring and evaluation plan that considers and proposes coordination modalities for reporting on national components activities as well as overall project progress, as described below.

The project is composed of one national and a common component with Ethiopia. The monitoring will therefore request coordination between reporting project progress nationally and globally.

- A detailed Monitoring Plan will be prepared, to capture all outcome 1 activities (i.e. national component) the project carries out in Sri Lanka.
- A Joint Monitoring Plan will be prepared to capture all activities the project carries out in China, Sri Lanka, and Ethiopia. Sri Lanka TSSC project manager in collaboration with UNDP China will prepare an overall Joint Monitoring Plan for all activities carried out under outcome 2 and determine how to integrate the monitoring of national components.

In accordance with the programming policies and procedures outlined in the UNDP POPP, the project will be monitored through the following:

Inception Report:

The inception report should address agreements reached during the stakeholders' workshop including:

- Outline of programme and project management procedures and set-up, including elaboration of the programme/project administration, communication and coordination manual;
- Revised Annual Work Plan between Sri Lanka and Chinese stakeholders as well as joint Annual Work Plan between Sri Lanka, Ethiopia, and China;
- Schedule of TSSC Programme Project board meetings;
- Monitoring and Joint monitoring plans, as well as evaluation plan if deemed necessary.

Quarterly Report:

Project managers will provide to UNDP a quarterly report outlining project progress and undertaken monitoring activities including site visits. A financial report will also be generated. The risks will be monitored and the risk log updated accordingly.

Annual Report:

A project review shall be conducted annually to assess the performance of the project and appraise the Three-Year Work Plan (TYWP). In the last year, this review will be a final assessment. The project managers will report annual assessment findings in an Annual Review Report following UNDP's reporting to be shared with UNDP and presented to the TSSC Project Board.

VII. Legal Context

This project document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government of China and UNDP, signed on 29 June 1979, and between the Government of Sri Lanka and UNDP, signed on 29 May, 1990.

Consistent with the Article III of the SBAA, the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the Implementing Partner's custody, rests with the Implementing Partner. To this end, the Implementing Partner shall:

- a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- b) assume all risks and liabilities related to the Implementing Partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of the Implementing Partner's obligations under this Project Document [and the Project Cooperation Agreement between UNDP and the Implementing Partner].

The Implementing Partner agrees to undertake all reasonable efforts to ensure that no UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under/further to this Project Document.

VIII. ANNEXES

Risk Analysis

| | |
|---|------------------|
| Project Title: Biogas and Solar trilateral cooperation - Transitioning to Sustainable Energy uses in the Agro-Industry | Award ID: |
| Date: | |

| # | Description | Type | Impact & Probability | Countermeasures / Mngt response |
|---|--|-------------|--|--|
| 1 | Insufficient maintenance of equipment provided | Operational | Insufficient maintenance would lead to premature deterioration and break down of equipment leading to non-sustainability of project interventions Probability= 3 Impact=5 | On-site training is planned targeting local administration, local association and end-users who will run the demonstration sites. The project will also provide extensive training on operation, and safety to build a pool of experts. Finally, the project will provide each demonstration sites with manual and information material. |
| 2 | Inappropriate selection of technologies/ providers | Operational | Inappropriate selection of technologies and providers would lead to rejection by users and non-performance of demonstrations sites resulting in project failure Probability=2 Impact=5 | This is a major component of the project. Preliminary activities have been defined around technology selection for a specific use to ensure adapted technology. Furthermore, UNDP china and UNDP Sri Lanka will closely monitor and QA activities. |
| 3 | Inappropriate selection of pilot demonstration sites and end-users | Operational | Inappropriate selection of demonstration sites would lead to rejection by users and non-performance of demonstrations sites resulting in project failure Probability=2 Impact=5 | This is a major component of the project. Preliminary activities have been planned to ensure sites are selected based on consistent criteria. Experts will be define these criteria and feasibility studies will be conducted. Furthermore, UNDP china and UNDP Sri Lanka will closely monitor and QA activities. |

| | | | | |
|---|--|--------------------------|---|--|
| 4 | Differences among member countries in the Project Board | Political | Changes in the bilateral relations amongst China and Sri Lanka may affect mobility of goods and people. Probability =1 Impact = 5 | Project partners cannot mitigate this risk, but can ensure/increase coordination with the Chinese Embassy in Colombo |
| 5 | Non-availability of competent local Energy Service provider for pilot demonstrations implementations and continued O&M. | Operational | Expected performance of pilot demonstrations are not achieved and rejection by the users, and unsuitable to be used a promotional/demonstration sites Probability=1 Impact=5 | Careful selection of Energy Service providers (ESCOs) with some significant experience on the subject areas. Engage them throughout the project from very beginning and build these selected ESCOs capacities further. The project is to provide them extensive training in required areas. |
| 6 | The South-South Cooperation Centre is not established under Ghana-Zambia projects. | Operational Political | Without the centre established, the project would be slowed down and face challenges to scale up the initiative. Exchange of knowledge may be lost. Probability=2 Impact=4 | This Centre is in line with ACCA21's organizational vision and is being set up as the new target to achieve an effective south-south technology transfer. Most importantly, this Centre is fully resourced by Ghana-Zambia project, and additional resources will be provided under this project to institutionalize the role of the centre. |
| 7 | Socio-environmental impact for the demonstration project not properly assessed | Operational | If not properly assessed, there is a likelihood of affecting the ecosystems and livelihood. Probability = 2 Impact = 4 | The project requires a socio-environmental impact assessment. The activity will be implemented and supervised in collaboration between SLSEA, Provincial Councils and UNDP |
| 8 | Local stakeholders in China do not want to engage in project led initiatives leading to limited technology and Know-how transfer | Operational | Chinese identified partners might decide not to support and be involved in project interventions leading to delays in project implementation, incl. technology transfer and exchange of knowledge. Probability=3 | An initial stakeholder meeting with all partners will be held in Sri Lanka. ACCA21 is already engaged as a South-South partner and has a direct interest in embedding additional projects to institutionalize the South-South Cooperation Centre. The MOA is the leading ministry in biogas research and technology transfer. |

| | | | | | |
|----|---|--------------------------|---|--|--|
| | | | Impact=3 | | |
| 9 | Lack of Coordination between implementing partners | Operational | Poor coordination would lead to delays in project implementation Probability=3 Impact=3 | A communication and coordination of activity strategy will be defined at the start of the project to ensure coordination and facilitate communication. UNDP will supervise the development of these strategies to ensure consistency and lessons learnt are used from past projects. | |
| 10 | Change in UNDP's approach to South-South cooperation. | Organizational Strategic | Delays in Project implementation Probability = 1 Impact = 3 | MoU signed between China and UNDP. South-South Cooperation aligned with UNDAF | |
| 11 | Budgeting delays in project beneficiary country | Organizational Strategic | Delays in Project implementation Probability = 1 Impact = 3 | The project is designed as incremental support to existing projects in Sri Lanka, for example GEF project on NAMA framework. Incremental activities to existing projects will be co-financed through these projects. | |
| 12 | Difficulty in recruiting new staff for TSSC with required skills and competencies | Organizational | Delays in Project implementation Probability = 2 Impact= 2 | The project has budgeted a Chinese technical assistant to support activities in provinces. Furthermore, a Project Manager will be hired and work closely with the GEF NAMA project. | |

Other Partner Organizations

Climate Change Secretariat: which is the National Focal Point for the UNFCCC and Kyoto Protocol under the preview of Ministry of Mahaweli Development and Environment (MoMDE).

People in Need & Janathakshan: have built extensive experience in developing and implementing biogas systems in the provinces and have engaged in training and developing a network of skilled masons for biogas construction as well as biogas digesters operation managers.

Lanka Biogas Association: has been established to promote the triple benefits of biogas; management of bio-degradable waste, produce clean energy, and provide valued inputs to organic agriculture.

BIOMA: The Chengdu Biogas Scientific Research Institute (BIOMA) is the lead research institution in the development of the theory and process of biogas fermentation, including advanced research on microbiology. BIOMA has been a major contributor to the development of rural environmental engineering, safe organic wastes disposal in rural areas and containment of water pollution. It also operates an international training and research centre in Chengdu, Sichuan Province. The centre is already training biogas experts from Southern countries through bilateral agreements managed by the Chinese Embassy locally and funded by MOFCOM. The project will provide support in identification and application of potential candidates to the BIOMA program. Experts from BIOMA may provide technical inputs to the project as requested.

The Department of Environment Protection and Rural Energy (DEPRE) under the China Ministry of Agriculture: Responsible for the execution of biogas programs, the DEPRE may provide additional technical support through their network of biogas experts and private companies. The project may draw upon this pool of experts and MOA past experience to leverage support in business model formulation and capacity development to reinforce the development of the energy service industry and technology dissemination modalities (incl. financial aspects).

List of Stakeholders consulted during the project formulation mission

| Organization | Contact |
|---|---|
| UNDP China | Devanand Ramiah, Deputy Country Director |
| | Zhang Weidong, Programme Manager |
| | Niels Vestergaard Knudsen, Team Leader & Assistant Country Director |
| | Teng Yue, Government Relations Officer |
| China Ministry of Agriculture Rural Energy & Environment Agency | Prof. Quanhui Wang, Director |
| | Suu Liying, Senior Engineer |
| The administrative Center for China Agenda 21 (ACCA21) | Dr. Jiutian Zhang, Director |
| | Zhang Xian, Project Director |
| China Agricultural University Key Laboratory of Clean Production and Utilization of Renewable Energy, Ministry of Agriculture (CPURE) | Dr. Renjie Dong, Executive Deputy Director |
| | Dr. Yuguang Zhou |
| BIOMA | Tai-pien, Director General |
| | Libin Wu, Program Officer |
| UNDP Sri Lanka | Lovita Ramguttee, Deputy Country Director |
| | Vishaka Hidellage, Assistant Country Director |
| | Tharuka Dissanaikie, Policy Specialist (NOC) |
| | Gayana Subasinghe, GEF Project Coordinator |
| Ministry of Power and Renewable Energy | Mr Sulakshana Jayawardena |
| SLSEA | M. M. Pathmasiri, Director General |
| | Harsha Wickramasinghe, Deputy Director General |
| Embassy of the People's Republic of China/Economic and Commercial Counsellor's Office | Wang Yingqi, Counsellor |
| People in Needs/Janathakshana | Hugo Agostinho, Country Director |
| Gamini Senanayake Associates | Gamini Senanayake, Managing Director |

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|---|--|
| Help O Eco Green Ltd | Chathura Welivitiya, Managing Director |
| Nikini Automation Systems Ltd. | Upendra Weerasuriya, Managing Director |
| Ministry of Science, Technology and Research/Lanka Biogas Association | Prof. Ajith de Alwis |
| Climate Change Secretariat | Dr. Jayathunga |
| Central Environmental Authority | Ajith Weerasundara, Director Waste Management Unit |
| Provincial Councils representatives | |

TORs Trilateral South-South Cooperation Project Coordinator

General:

The Trilateral South-South Cooperation Project Coordinator will oversee the harmonized implementation of the Trilateral South-South Cooperation project activities and ensure overall project management, including financial management, on a full-time basis.

The Trilateral South-South Cooperation Project Coordinator will work closely with all implementing partners, UNDP Sri Lanka, UNDP China, the Ministry of Power and Renewable Energy (MOPRE), the Sri Lanka Sustainable Energy Authority (SLSEA), the Provincial Councils, and other local partners.

Duties and Responsibilities

The Project Coordinator will report to SLSEA and UNDP Sri Lanka and will be responsible for timely project implementation. The Project Coordinator will manage the project on a day-to-day basis on behalf of SLSEA, within the Government and UNDP procedures; with policy guidance from the Project Board. The Project Coordinator will be responsible for activities coordination; financial management and disbursements, with accountability to MOPRE and UNDP. The Project Coordinator will work closely with other responsible parties, the UNDP China Country Office, and other Project Implementing Partners.

Coordination of Project Activities:

- Coordinate implementing partners in carrying out their tasks to ensure timely project implementation;
- Maintain close linkages with relevant sectoral government agencies (e.g. Ministry of Environment), UNDP, NGOs, civil society, international organizations and implementing partners of the project;
- Recruit and supervise technical and training experts as required for implementation of the project, including preparation and approval of ToRs;
- Coordinate recruited experts in carrying out their tasks in a timely, project objective oriented and cost-effective manner;
- In collaboration with implementing partners, prepare quarterly and annual work plans and budgets;
- Compile, summarize, record and maintain information on project activities and its financial data;
- Prepare, update and maintain project P.R. materials such as brochures;
- Facilitate and coordinate with project partner compilation and circulation of project literature to all interested parties.

Support Implementing Partner in Event Management – Organizing workshops and meetings:

- Assist in the organization of workshops, seminars, and round table meetings including preparation of workshop materials and tools;
- Prepare budget and draft requests for disbursements of funds for project staff participation to workshops, meetings and other events.

Provision of Progress and Monitoring Reports:

- Coordinate inputs into all project reports as required (including Annual Project Reports, Inception Report, Quarterly Reports and the Terminal Report);
- Prepare project progress reports (technical and financial) for comments and approval by the Implementing Partner and UNDP Country Office;
- Support implementing partners for the monitoring of project activities and facilitate monitoring process to ensure timely and quality delivery of monitoring reports;
- Coordinate with UNDP China to ensure project progresses and challenges are all captured in all joint reports.

Project Management:

- Ensure all general administrative matters of the project are managed effectively.
- Preparation of required budget revisions and drafting requests for disbursements of funds under the project;
- Assisting in the compilation of required documentation for project audits;
- Support MOPRE in the implementation of the audit recommendations in a systematic manner;
- Supporting the monitoring of project activities by previewing a variety of records, including control plans, progress reports, project inputs, budgets and financial expenditures;
- Undertaking visits to project sites and preparing reports on them
- Documenting of all project meetings and other activities as required.
- Raise key concerns to be addressed as they arise and in a timely manner;
- Provide additional support as requested and reasonable by the implementing partners.

Qualifications and experience:

- A minimum of Master's degree or equivalent in renewable energy, engineering natural sciences, environmental management, institutional / organizational development, or related fields.
- A minimum of 5 years working experience in areas related to at least one or two of the project thematic areas (renewable energy, energy services delivery, climate change mitigation and adaptation, etc.);
- Previous experience in the management of large, complex projects;
- Demonstrated facilitation and coordination skills, ability to manage multi-country and multi-stakeholder teams;
- Practical experience in process-oriented and strong ability to work closely with diverse teams, conflict resolution and negotiation skills;
- Fluency in English.

Duty Station:

The Project Coordinator will work at the SLSEA offices in Colombo and should be willing to travel outside Colombo as needed.