Project Title: Ten-Country Project: Scaling Solar Applications for Agricultural Use (SSAAU)
Project Number: 132202
Start Date: **End Date:** **PAC Meeting date:**

Countries Participating:

Country	Implementing Partners	Outputs to be delivered by country
PHASE I		Test new and innovative deployment models for Solar Water Pumps, that can be replicated and scaled, to support national plans for sustainable development.
1. SENEGAL	UNDP Senegal CO	
2. MALI	UNDP Mali CO	
PHASE II		
3. NIGER	UNDP Niger CO	
4. REPUBLIC OF BENIN	UNDP Benin CO	
5. TOGO	UNDP Togo CO	
6. UGANDA	UNDP Uganda CO	
PHASE III		
7. DEMOCRATIC REPUBLIC OF THE CONGO	UNDP DRC CO	
8. REPUBLIC OF SUDAN	UNDP Sudan CO	
9. SOUTH SUDAN	UNDP South Sudan CO	
10. TUVALU	UNDP Fiji PO	

CO – Country Office; PO – Pacific Office
Executing Agencies : UNDP India and ISA (PMU)

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Brief Description

Brief narrative outlining the scope, outputs and management arrangement of the project for this multi-country initiative and/or south-south and triangular cooperation

Globally, the agricultural sector is reeling under the destabilizing effects of climate change, resulting in a visible decline in global food production. Today millions of individuals (primarily children) remain undernourished, with this representing just one of many poverty-driven deprivations in the Global South. A majority of the food producers at the forefront of this challenge are small-scale, subsistence farmers who rely largely on rainfed irrigation. They remain unprepared for the unpredictable weather patterns and unequipped for the added stress on the local irrigation systems. Moreover, these vulnerabilities are exacerbated without access to sustainable and resilient modes of development.

Clean, cheap and reliable solar water pumps (SWPs) can help scale agricultural production sustainably, while simultaneoulsy contributing to climate change mitigation and community resilience. They are quickly replacing diesel pumps as the preferred source of irrigation given their efficiency, cost-effectiveness and relatively easy operations. Further, successful installations of decentralized solar water pumps in varying geographies, across the globe, have showcased a myriad of socio-economic co-benefits, especially when deployment models are adapted to the local context. New and innovative business (deployment) models like pay-per-use (energy service company) or pay-as-you-go (PAYGo) remove the burden of large upfront cost therefore increasing affordability. More importantly, models can be tailored to encourage efficient water management and prevent excessive groundwater withdrawal, by incentivizing sale of excess energy and/or pumped water.

The International Solar Alliance (ISA) Programme on Scaling Solar Applications for Agricultural Use (SSAAU) was introduced in response to an overwhelming demand to ISA's call for Expression of Interest (EoI) for solar water pumps, from its Member Countries. The combined demand from 22 Member Countries was estimated at 272,579 decentralized solar water pumps (SWPs). In light of this reality, ISA and UNDP India developed a concept note on SSAAU to be piloted in at least 10 member countries. The India, Brazil and South Africa (IBSA) facility for Poverty and Hunger Alleviation has agreed to fund the pilot stage of SSAAU to support 10 developing/least developed countries in their adoption of sustainable and clean irrigation practices. The project will capitalize and showcase the benefits of South-South and Triangular Cooperation (TrC), while simultaneously testing new and innovative deployment models that can be scaled both within the country and across the region. To ensure continued operations and efficient maintenance of the deployed systems, the project will include salient components to train skilled labour and develop a local market for solar water pumps. The project will be conducted in phases, staggering implementation in countries to phases. In Phase I the project will be implemented in two (2) Member Countries, followed by four (4) Member Countries each in Phase II and III, respectively. The Phases will begin in quick succession of each other– thus covering all 10 countries during the project duration of two years.

As the primary executing agencies, United Nations Development Programme (UNDP) India and the International Solar Alliance (ISA) will plan and coordinate project activities in close association with the UNDP Country Offices (COs), National Focal Points (NFPs) and Lead Ministry (ies). UNDP COs will lead and direct activities in their respective countries. The project will conduct feasibility studies to determine demand; will release a global tender to procure high quality technology at reduced costs; experiment with innovative deployment models (tried and tested in developing countries) to meet the local context; and hire and train local labour for technical services such as installation, operation and maintenance. Further, the project will employ local partners to ensure

a consultative process during deployment and to document experience, best practices and learnings. The overall aim is to encourage scale-up and build local capacity for large-scale solar energy projects/programmes.

Lastly, to capitalize on the plethora of shared knowledge and experience, ISA will facilitate improved flow of information and resources within its Member Countries. The ISA platform will allow Member Countries to share key learnings, skills and successful initiatives; and will mobilize its in-house or external experts to aid scaling up of these pilots within the countries. To facilitate mutual learning and solution sharing, the pilot project in each country will be thoroughly documented, adding to the plethora of knowledge products developed by ISA and its many knowledge partners.

Total resources required:	2,000,000	
Total resources allocated:		
	UNDP-ISA:	
	UNOSSC (IBSA):	2,000,000
	Government:	-
	In-Kind:	-
Unfunded:		

Contributing Outcomes (UNSDF/CPD/RPG/GPD):

UNDAF/ CPD (India): *By 2022, environmental and natural resource management (NRM) is strengthened and communities have increased access to clean energy and are more resilient to climate change and disaster risks.*

UNDP (SP): (b) *By 2021, catalyse tangible progress on accelerating structural transformations for sustainable development, especially through innovative solutions that have multiplier effects across the SDGs.*

Indicative Output(s) with gender marker:

UNSDF/CPD (India) 6.6 – *Enhanced energy access within vulnerable communities.*

ISA - *Number of new and innovative deployment models for Solar Water Pumps demonstrated, that can be replicated and scaled to support national plans for sustainable development.*

GEN 2: *Number of women (direct/indirect) significantly benefitted in the pilot project.*

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PROJECT COUTRIES	CONTRIBUTING OUTCOMES (CPD)
SENEGAL	**Output 3.2:** Ministries in charge of environment and energy have enhanced capacities to promote and facilitate access to techniques and technologies for renewable energy, energy efficiency and waste management
MALI	**Output 3.3:** Solutions adopted to achieve universal access to clean, affordable and sustainable energy and to generate income for women and young people through innovative technologies and financing.
NIGER	**Output 1.2** : Vulnerable communities in targeted rural areas, especially women and youth, have the capacity to sustainably manage natural resources with increased access to renewable energies and alternative technologies *(translated from French)*
REPUBLIC OF BENIN	**Output 1.3** Solutions adopted for rural and urban populations to achieve access to clean, affordable and sustainable energy.
TOGO	**Output 3.2:** Solutions adopted to achieve universal access to clean, affordable, and sustainable energy
UGANDA	**Output 2:** By the end of 2025, underserved communities and institutions have increased and equitable access to, and use of affordable clean and renewable energy services
DEMOCRATIC REPUBLIC OF THE CONGO	**Output 2.2:** National and subnational institutions have capacities to formulate and implement inclusive, sustainable energy and climate change adaptation solutions.
REPUBLIC OF SUDAN	**Output 3.1.** Access to clean energy for the poor enhanced.
SOUTH SUDAN	**Output 2.2.** National and subnational institutions have capacities to formulate and implement inclusive, sustainable energy and climate change adaptation solutions.
TUVALU	**Output 1.1**. Scaled-up action on climate change adaptation and mitigation across sectors which is funded and implemented.

Agreed by (signatures)[1]:

Output 3.2: Ministries in charge of environment and energy have enhanced capacities to promote and facilitate access to techniques and technologies for renewable energy, energy efficiency and waste management

Government [SENEGAL]	UNDP [SENEGAL]
Print Name: **Mr. Djiby Ndiaye,** Director General, National Agency for Renewable Energies 120 Cité Asecna Liberté 6 Extension- Dakar.	Print Name: **El Kebir Mdarhri Alaoui** Resident Representative, UNDP Senegal Immeuble Wolle Ndiaye- Route du Meridien President Dakar
Date:	Date:

[1] Note: This document, including the signature page, may be customized as needed. Separate signature pages (one per country) can be created and signed if needed to facilitate timely approval and budget revision if multiple countries are participating. Separate signature pages should still reflect all participating partners.

[2] The Gender Marker measures how much a project invests in gender equality and women's empowerment. Select one for each output: GEN3 (Gender equality as a principle objective); GEN2 (Gender equality as a significant objective); GEN1 (Limited contribution to gender equality); GEN0 (No contribution to gender quality)

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Agreed by (signatures):

Output 3.3: Solutions adopted to achieve universal access to clean, affordable and sustainable energy and to generate income for women and young people through innovative technologies and financing.

Government [**MALI**]	UNDP [**MALI**]
Print Name: **Dr. Souleymane Berthe,** Director General, AER-MALI Ex-CRES Badalagougou Hill, Bamako	Print Name: **Jo Scheuer** Resident Representative, UNDP Mali United Nations House, Badalabougou - Bamako
Date:	Date:

Agreed by (signatures):

Output 1.2 : Vulnerable communities in targeted rural areas, especially women and youth, have the capacity to sustainably manage natural resources with increased access to renewable energies and alternative technologies *(translated from French)*

Government [NIGER]	UNDP [NIGER]
Print Name: **Mr. Zakari Abdou,** **Head of Grid Connected Renewable Energy Services,** Department for Promotion of Renewable Energy Ministry of Mines and Energy, Avenue Mali Béro, Niamey	Print Name: **Diana Louise Ofwona** Resident Representative, UNDP Niger United Nations House, Niamey
Date:	Date:

Agreed by (signatures):

Output 1.3 Solutions adopted for rural and urban populations to achieve access to clean, affordable and sustainable energy.

Government [**REPUBLIC OF BENIN**]	UNDP [**REPUBLIC OF BENIN**]
Print Name: **Mr. ASSAN T. Flinso** Director General New and Renewable Energy, Ministry of Energy, Cotonou	Print Name: **Aouale Mohamed Abchir** Resident Representative, UNDP Benin Lot 111 Residential zone, Cotonou
Date:	Date:

Agreed by (signatures):

Output 3.2: Solutions adopted to achieve universal access to clean, affordable, and sustainable energy

Government [TOGO]	UNDP [TOGO]
Print Name: **Mr. Robil Nassoma** Director General, AT2ER, Ministry of Energy, Lomé REPUBLIQUE TOGOLAISE AGENCE TOGOLAISE D'ELECTRIFICATION RURALE ET DES ENERGIES RENOUVELABLES AT2ER	Print Name: **M. Aliou Mamadou Dia** Resident Representative, UNDP Togo 40, Avenue des Nations Unies PO Box: 911 Lomé Programme des Nations Unies pour le développement PNUD Togo
Date: 10 FEV 2022	Date: 10 FEV 2022

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Agreed by (signatures):

Output 2: By the end of 2025, underserved communities and institutions have increased and equitable access to, and use of affordable clean and renewable energy services

Government [**UGANDA**]	UNDP [**UGANDA**]
Print Name: **Dr. Brian E. Isabirye, Ph.D** Commissioner for Renewable Energy Department, Ministry of Energy and Mineral Development, Amber House; Kampala Road; Kampala Email: b.isabirye@energy.go.ug|brianisabirye@yahoo.com| brianisabirye@gmail.com	Print Name: **Elsie G. Attafuah** Resident Representative, UNDP Uganda 11 Yusuf Lule Rd, Kampala
Date:	Date:

Agreed by (signatures):

Output 2.2: National and subnational institutions have capacities to formulate and implement inclusive, sustainable energy and climate change adaptation solutions.

Government [**DEMOCRATIC REPUBLIC OF THE CONGO**]	UNDP [**DEMOCRATIC REPUBLIC OF THE CONGO**]
Print Name: **Mr. Beyokoloku,** Coordinator of the National Solar Energy Unit, Ministry of Hydraulic Resources and Electricity, Kinhasa	Print Name: **M. Dominic SAM** Resident Representative, UNDP DRC Losonia Building, Boulevard du 30 Juin, Commune de la Gombe, Kinshasa
Date:	Date:

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Agreed by (signatures):

Output 3.1. Access to clean energy for the poor enhanced.

Government [**REPUBLIC OF SUDAN**]	UNDP [**REPUBLIC OF SUDAN**]
Print Name: **Yasir Abdalla Saied,** Renewable Energy Director General, Sudan Electricity Holding Company, Ministry of Energy and Mining, Khartoum	Print Name: **Yuri Afanasiev** Resident Representative, UNDP Sudan Gama'a Avenue, House 7, Block 5, Khartoum
Date:	Date:

Agreed by (signatures):

Output 2.2. National and subnational institutions have capacities to formulate and implement inclusive, sustainable energy and climate change adaptation solutions.

Government [SOUTH SUDAN]	UNDP [SOUTH SUDAN]
Print Name: Mr. **Joseph Africano Bartel** Undersecretary, Ministry of Environment & Forestry, Juba 7/2/2022	Print Name: **Samuel Gbaydee Doe** Resident Representative, UNDP South Sudan UNDP Compound, Plot 21, Ministries Road, Juba 08-02-2022
Date:	Date:

Agreed by (signatures):

Output 1.1. Scaled-up action on climate change adaptation and mitigation across sectors which is funded and implemented.

Government [**TUVALU**]	UNDP [**TUVALU**]
Print Name: **Mr. Vavau Fatuuga** Secretary & CEO Ministry of Transport, Energy & Tourism Government of Tuvalu	Print Name: **Mr. Levan Bouadze** Resident Representative, Pacific Office in Fiji Level 8, Kadavu House 414 Victoria Parade, Suva, Fiji
Date:	Date:

DEVELOPMENT CHALLENGES (1/4 PAGE - 2 PAGES RECOMMENDED)

Describe the development challenges the project seeks to address and how it is relevant to the common as well as individual development priorities of all participating countries, as relevant. Include evidence to support the analysis, such as data demonstrating the magnitude of the problem and how it affects different population groups (esp. women and men, and minority and other excluded groups) and why it is important for poverty reduction and addressing inequality and exclusion. Identify the immediate, underlying and root causes of the challenge (including capacity limitations) which have been identified in the problem tree analysis feeding into the Theory of Change. Please be specific.

In the agricultural sector, climate change and poverty are two closely intertwined challenges. Interventions seeking to alleviate the former can have positive implications for the latter as well, particularly through sustainable and integrated solution aimed at the nexus of energy-food-water. Agriculture currently employs as much as 40% (2.5 billion people) of the world's population, mostly as small subsistence farmers with limited incomes[2]. Small and subsistence farmers in developing countries are generally more vulnerable to climate change, especially since they lack access to what is sometimes referred to as "coping mechanisms", such as crop insurances, chemicals and fertilizers, knowledge on efficient cropping practices, and technology/energy for irrigation. Scaling up sustainable agricultural practices, including efficient and reliable irrigation, is imperative to ensure food security, especially for the steadily increasing populations relying on limited arable land[3]. Including solar water pumps (SWPs) to the toolbox of coping mechanisms also fosters climate change mitigation and community resilience, which are both pivotal for national development strategies:

First, the increasing energy demand for irrigation is currently being met largely by fossil fuels, either through grid-powered electric pumps that rely on emission intensive sources, or directly from *in-situ* diesel pumps. McKinsey research found that over a 20-year period, GHG emissions from the agriculture sector accounted for 20% of global GHG emissions[4].

Fortunately, solar energy has proven (especially in the last decade) to be a clean, reliable and cheap way to extend electricity access to areas that are not or are insufficiently serviced by grid. Therefore, SWPs are gaining traction, and recent technology improvements have rendered them, generally,

a) more reliable than rain-fed agriculture,
b) cheaper than conventional technologies, and
c) a cleaner, distributed source of energy for irrigation.

Second, over 80% of the world's cultivated land is dependent on rainfall for its irrigation, whose patterns are becoming increasingly unpredictable. The remaining 20% of world's cultivated land is irrigated and responsible for about 40% of the global food production, providing an accurate gauge of the importance of good irrigation practices[5]. Unfortunately, agricultural productions have witnessed a slump in the last few years, contributing to an uptick in instances of hunger in the growing population. The Food and Agriculture Organization (FAO) estimates that 690 million people

[2] http://www.fao.org/climate-smart-agriculture-sourcebook/enabling-frameworks/module-c7-social-protection/chapter-c7-5/en/

[3] https://sustainabledevelopment.un.org/topics/foodagriculture

[4] https://www.mckinsey.com/~/media/mckinsey/industries/agriculture/our%20insights/reducing%20agriculture%20emissions%20through%20improved%20farming%20practices/agriculture-and-climate-change.pdf

[5] http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/facts-and-figures/all-facts-wwdr3/fact-24-irrigated-land/

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are undernourished, of which one-fifth are on the edge of starvation[6]. According to the latest data, "9.2 percent of the world population were exposed to severe levels of food insecurity in 2018, implying reductions in the quantity of food consumed to the extent that they have possibly experienced hunger". The African subcontinent has the highest prevalence of undernourishment but least developed and developing countries across the globe remain unequivocally affected.[7] Though man-made conflicts and inadequate economic policies are contributors to this dire situation; climate change is the biggest threat to global food supply chains. Annual yield losses from climate change disasters such as pest outbreaks, long droughts and insufficient irrigation are growing year by year. Therefore, ensuring food security will require major shifts in the way in which food is produced, distributed and consumed.

Third, as with hunger, poorer segments of the global population are also disproportionately affected by lack of access to reliable energy. Globally, 789 million people live without electricity and millions more receive substandard electricity (which can be just as debilitating)[8]. It is estimated that about 620 million people will remain without access in 2030, concentrated in developing countries. This affects their standards of living and access to social services, but more importantly, it limits their opportunities for livelihoods. As indicated earlier, climate change is compounding developmental progress and further exacerbating these trends.

Decentralized SWPs offer an opportunity for incremental income generation that is climate-aligned way, especially benefitting remote and rural population. Moreover, when they are not in use for irrigation, the solar energy-harvesting parts of the SWPs can be repurposed for direct electricity generation. This excess electricity can be used to raise standards of living and create additional opportunities for livelihoods, thereby holding an enormous potential for poverty alleviation, social mobilization and rural development for the community[9]. Pilot projects of SWPs in India, Mexico and Senegal, among others, have reiterated the socio-economic co-benefits of SWPs.

At the food-water-energy nexus, the ISA programme on SSAAU will aim to ensure sustainable agricultural interventions that increase food security, efficient use of water and clean energy use. Decentralized SWPs are a coherent solution to seemingly disparate issues, plaguing the farmers of the world. The programme has the potential to strengthen delivery of the 2030 sustainable development agenda, specifically advancing the following sustainable development goals (SDGs):

1. **SDG #1**: End poverty in all its forms everywhere
2. **SDG #2**: End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. **SDG #7**: Ensure access to affordable, reliable, sustainable and modern energy for all.
4. **SDG #8**: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
5. **SDG #11**: Make cities and human settlements inclusive, safe, resilient and sustainable
6. **SDG #13**: Take urgent action to combat climate change and its impact

[6] http://www.fao.org/3/i9047en/I9047EN.pdf

[7] http://www.fao.org/3/ca5162en/ca5162en.pdf

[8] https://irena.org/-/media/Files/IRENA/Agency/Publication/2020/May/SDG7Tracking_Energy_Progress_2020.pdf

[9] https://sunmoksha.com/kyonza-rwanda/

At the ISA platform, Member Countries have pledged to increase their share of solar energy, aiming to build resilience among vulnerable populations that are worst hit by climate change. Unfortunately, due to a host of developmental challenges, the agricultural sector often remains the worst prepared for extreme weather events. Most Member Countries have witnessed unusually low precipitation and high temperatures in recent years, negatively impacting agricultural production. This trend remains the same across least developed/developing economies that are highly dependent on the agriculture sector both for food security and economic growth. The pilot project is expected to have tremendous transformative-change potential. Beneficiaries will be equipped with low carbon and climate-change resilient technology, that can improve their livelihood activities. The reliability and sustainability of SWPs will help beneficiairies to scale food production and enhance their farmer livelihoods, and therefore reduce poverty and hunger within the beneficairy communities and help increase food security for the country.

Selection of Pilot Countries

Pilot countries for the overall ISA programme on Scaling Solar Applications for Agricultural Use (SSAAU) were shortlisted based on their own self-determined demand for solar water pumps in response to the ISA call for expression of interest (EOI). Of the 22 countries, the 10 pilot countries were chosen based on several criteria, including but not limited to, quantity of self-determined demand for SWPs; support from national stakeholders (UNDP Country Office (CO) and Lead Ministry) for project implementation; prior experience with solar energy applications and their ranking in ISA's Ease of Doing Solar 2020. Country factors such as population, GDP, Multidimensional Poverty Index (MPI), agricultural production, women in agricultural labour etc were collated to substantiate choices of countries for the pilot project on SSAAU (Annexure) and determine project outcomes/results. The selected pilot countries have the largest demand, together the total demand is estimated at 265,800 SWPs (See Annexure for Key Country Indicators).

Beneficiary communities will be selected based on their vulnerabilities, with the aim to reduce poverty and inequality as per government plans and strategies. Even within the farming community, the endeavour would be to facilitate small/marginal land holders and women access the solar water pumps for efficient productive and livelihood activities. These beneficiaries would be identified by engaging with the communities, the local administration as well as local implementation partners. They will collaboratively designate farmers to benefit from the installed solar water pumps, agreeing, where appropriate, on ways for benefit-shaing. A well defined criteria for identification and selection of beneficiaries will be adopted that would include inter-alia– land owned (area), household head (male/female), previous ownership of diesel pump, etc. These criteria would also differ based on the deployment model selected. Similarly, gender inequalities will be addressed by ensuring that a significant number of the beneificiaries will be women.

GEN ***[Gender Marker]: GEN 2*** (Score for projects that will make significant contributions to gender equality)

In Africa and large parts of Asia, women constitute the majority of the agricultural labour force in small-scale and subsistence farming[10]. They bear the brunt of poverty and are often excluded from

[10] https://www.globalagriculture.org/report-topics/women-in-agriculture.html

decision-making in the development process of the country. Women also are more severely affected across the different indices of multidimensional poverty. Access to solar-powered irrigation would help reduce labour intensity of agricultural production, freeing up time and energy for women to engage in other productive activities. Scattered examples show that when women contribute to households' income, they tend to gain more bargaining power in decision-making.[11] Additionally, women's income will help rural families raise their standard of living, particularly benefitting children. The aforementioned will advance the agenda of **SDG #5**: Achieve gender equality and empower all women and girls.

The pilot project on Scaling Solar for Agricultural Use will make significant contributions to gender equality and therefore is assigned Gender Marker Score of GEN 2. Women entrepreneurs, women SHGs, women farmers will be identified and included in the project. Women's participation would also be prioritised in the training and capacity building activities to develop local solar technicians and solar entrepreneurs. Overall it is envisaged that at least 30% of the project's direct beneficiaries would be women.

[11] https://www.researchgate.net/publication/319018101_Contribution_of_women_to_household_income_and_decision_making_in_some_selected_areas_of_Mymensingh_in_Bangladesh

STRATEGY (1/2 PAGE - 3 PAGES RECOMMENDED)

Explain what UNDP will do with partners to address the development challenges described above. Describe how the multi-country approach would effectively promote mutual benefits that address/meet these challenges through SS&TrC and other methods in an integrated way and through partnership and collaboration. Identify the approach that has been selected, with a clear rationale backed by credible evidence, integrating gender concerns into the approach. Identify what knowledge, good practices and lessons learned (including from evaluation) have informed the analysis of available choices and the selected strategy.

Detail the project's selected approach overall and in each participating country and explain how it is expected to lead to change at the output level. Clearly link the project's ToC to the respective programme/CPD's ToC by stating how the project will contribute to the UNDAF/CPD outcome in each participating country. State key assumptions about what will change, for whom, and how this will happen. Assumptions should include consideration of internal factors (relating to project design and implementation) and external factors (relating to other partners, stakeholders and context) that will be critical for achieving expected changes. Cite best available evidence which supports these key assumptions in the ToC, including findings from evaluation and other credible research, as well as knowledge, good practices and lessons learned from previous work by UNDP and others, in these countries and in other relevant contexts.

The ISA programme on Scaling Solar Applications for Agricultural Use (SSAAU) is of particular interest to agri-dependent countries reeling under the negative impacts of climate change. In line with ISA's objective to increase the use of solar energy in a safe, convenient, affordable, equitable and sustainable manner, the SSAAU Programme will aim to enable pilot installations of solar water pumps in 10 countries that have evinced significant demand for the technology.

In response to their self-determined demand, the pilot project will demonstrate a clean and resilient solution to address the twin challenges of climate change and development. The project will present integrated solutions for the provision of sustainable livelihood opportunities for beneficiaries, while simultanouesly addressing structural barriers to solar energy deployment. The primary aim is to test new and innovative deployment models to find the most suitable candidates for easy replicability and scalability in the pilot countries. The project recognizes that there is no "one size fits all". It will therefore rely on feasibility studies and commendations from country stakeholders for determining project implementation modalities in each of the countries to ensure national ownership for scaling solar energy adoption. The demonstration projects in each of the pilot countries will be tailored to the local context and additionally, will ensure local skilled capacity. Project activities will fully affirm the priorities of Member Countries' development plan, ensuring advancement of national strategies and vision.

While facilitating deployment of solar water pumps, the pilot project on SSAAU will also aim to develop mutually beneficial relationships between Member Countries for collaborative deployment and knowledge exchange. Building on principles of South-South Cooperation, the IBSA funded pilot project will facilitate deployment of solar water pumps (SWPs) in 10 countries, staggering installation across three phases of 2, 4 and 4 countries each to ensure learnings can be incorporated.

The SSAAU project in pilot countries will be initiated with a detailed Feasibility Study that would determine the actual potential and demand, the direct and indirect beneficiaries for the pilot project, the deployment models and the implementation partners who will be key to implementing this model. Feasibility studies will be crucial for project implementation as there is no standard

deployment model or irrigation solution to be adopted. Tailoring and piloting models and solutions suited to local socio-economic and agricultural patterns will be crucial to ensure wider applicability and scaling up in the respective countries. Therefore, following the feasibility study, the UNDP CO in consultation with the Lead Ministry will finalize the SWP technology type, deployment approach/model, identify local implementation partners and initiate channels with beneficiaries/community to ensure long-term sustainable operations.

Project procurement will be conducted through a global tender for solar water pumps (SWPs) building on the experience of procuring LEDs for the large, aggregated demand of lights in India (reduced the costs of LED bulbs and greatly scaled everyday application). As evidence, ISA developed an International Competitive Bid (ICB) document for price discovery, in consultation with the Global Advisory Committee and National Focal Points to account for variation in technology type and required support services for SWPs. The discovered costs were markedly lower than current prevailing prices of SWPs in the 22 ISA Member Countries, averaging around USD 5513 per 5 HP DC Surface Pumps[12]. In addition to determining the cost of the technology, the bid provides an all-encompassing estimate on additional charges for supply, custom clearance, local transportation, testing, installation, commissioning and maintenance services at the project site.

Therefore, for cost-effective procurement, UNDP will capitalize on the Procurement Service Unit (PSU)'s Crisis Response & Energy/Environment (CREE). The CREE has facilitated delivery of specialized procurement to Country Offices (CO) for a multitude of projects in the area of Renewable Energy. The aim will be to procure cost-efficient solutions that are tailored to the local context, through a transparent and competitive process.

Based on the clarity provided by the feasibility study, the PSU will conduct an RFQ through the Solar Turnkey Solutions LTA (GP600537). The vendor with the lowest priced offer among those technically compliant will be awarded. The selected vendor will implement the pilot project in the pilot countries by sourcing the solar water pumps required in each, including the installation, commissioning, and trainings as required in the RFQ. The detailed steps of the process and timelines are presented below:

Step 1: PSU will appoint a technical evaluation committee appointed, followed by the sgning of a Declaration of Impartiality and Confidentiality (DoIC) by all persons participating directly in the tender process

Step 2: Based on the outcomes of the feasibility study, finalize the technical specifications for the procurement of the solar water pumps in consultation with UNDP India, and UNDP's technical expert and UNDP PSU.

[12] ISA has also initiated additional steps to reduce the costs by proposing that ISA member countries exempt all taxes including import, custom, excise, local and other on the import of Solar Systems like Solar Water Pumping Systems, Solar Modules, Solar Inverters, Batteries for Solar Systems, Balance of Systems required for installation of all categories of Solar Systems. In addition, ISA proposes an Income Tax holiday for at least five years to the Companies implementing Solar Projects. This proposal has been approved by the Finance Committee of the ISA and will be submitted for consideration by the member countries

Step 3: PSU will conduct and lead the tender process through its available LTAs in collaboration with UNDP CO will be conducted following the structure below:

1. PSU CPH procurement staff will prepare the Request for Quotation (RFQ) document incorporating approved technical requirements.
2. Requests for clarification from the bidders will be received by PSU. PSU will share the questions with UNDP India, UNDP technical expert, or UNDP CO depending on the scope of the question. PSU will compile responses and share these with bidders. *Reponses will have to be submitted within at least 3-5 working days prior to the tender deadline to ensure the timely implementation of the process*

Step 4: PSU will review the offers submitted against the main qualification criteria and evaluate them based on completeness and availability of all relevant documentation and adherence to critical requirements. The offers will also evaluate against the technical requirements stipulated in the tender and financially evaluated based on the rule "unit price prevails".

Step 5: PSU will prepare a Tender Outcome Report to share with UNDP India including the names of the bidders and the total value of the offer.

Step 6: Once tender is finalized, UNDP India will create Vendor based on the information that will be provided by PSU (Vendor Form, Bank account details, etc.). Simultaneously, PSU will notify the awarded bidders of the outcome and schedule a meeting with the bidder to sign the contract and initiate implementationFor sustainable and effective implementation within the countries, UNDP India and ISA will mobilize their network of stakeholders, primarily UNDP Country Offices (COs) and Lead Ministries. Local implementation partners may include local NGOs, CSOs, farmer cooperatives etc to facilitate beneficiary engagement. Consultations with beneficiairies will be crucial to ensure that the solar water pumps supplement traditional agricultural practices. Consultations will also help identify climate sensitive irrigation solutions that prevent excessive damage to land and water resources.

Together with local implementation partners, the project will facilitate access to knowledge (learnings, best practices) and experience from other similar initiatives to develop a systematic, integrated approach in each of the countries. Trainings will be held with the aim to to equip project stakehodlers for both project implementation with the aim to create a conducive ecosystem for a clean-energy powered and resilient agri value-chain..

1. with project implementors and beneficiaires;
2. with technical service providers for post-installation service;and
3. financial institutions/ micro lenders for payment/re-payment,.

As stated in the **Country Programme Document for India (2018-2022)**, UNDP India will "**By 2022, environmental and natural resource management is strengthened and communities have increased access to clean energy and are more resilient to climate change and disaster risks.** ". Therefore as a co-executing agency, UNDP India will be supporting this outcome, measuring it with

the indicator "**Enhanced energy access within vulnerable communities.**". These aforementioned outcomes are strategically aligned with the pilot project on SSAAU, which specifically aims to provide farmers in least developed/developing countries with clean, affordable, reliable and sustainable energy for irrigation, to enable decent livelihoods and improved standards of living. In terms of key results, the pilot project on SSAAU will increase visibility of technology through demonstration installations of clean and reliable SWPs; showcase affordability and the applicability by experimenting with new and innovative deployment models; and develop national capacities through trainings and technology transfer.

The specific project activities for each of the pilot countries will be determined post the feasibility study and in discussions with the national stakeholders. Together, UNDP and ISA, will capitalize on its experience with similar projects and its large pool of expertise. The project will equip vulnerable beneficiairies with solar water pumps and sustainable irrigation solutions, aimed at transforming food systems with the goal to achieve nature positive impacts. The project will also incorporate principles of efficienct water consumption and energy use to ensure that an increase in agricultural production does not strain the natural systems and resources. Simultaneously it will also facilitate knowledge exchange to build capacities of beneficiaries to adopt effective practices to scale and employ sustainable agriculture. Therefore, providing resilience to climate change and opportunities for development. It is envisaged that ultimately this demonstration project would help kickstart, encourage and assist the scale-up of solar energy, making it ubiquitous - improving access, enabling productive end-uses, increasing employment opportunities and spurring economic growth in these least developed/developing countries. Moreover, even though the project is primarily aimed at providing irrigation services to the agricultural sector, it will pave way for extending access for decentralized applications. This, for instance, could include essential social services such as pumping for community drinking water or electricity for productive/commercial activities, as may be required by the beneficiaries or the community. Towards this, the project will aim to inform and build capacities of local stakeholders such as policy makers, technology providers and financiers by providing access to reliable technology, equipping them with tools and approaches to scale solar energy within the country.

RESULTS AND PARTNERSHIPS (1.5 - 5 PAGES RECOMMENDED)

Expected Results

Translate the strategy above into the work we will do through the project. Describe the planned interventions and explain why those interventions are best suited to achieve the intended results, linking this to the theory of change. State what change we expect to see that will be attributable to the project. Expected development change should be included in the results framework and monitored regularly by the project. Link the expected results to the relevant higher-level results (i.e., programme outcome, UNDAF, Strategic Plan.)

Programmatically this project will be in coherence with the overall UNDP Strategic Plan[13], which seeks "to help countries to achieve sustainable development by eradicating poverty in all its forms and dimensions, accelerating structural transformations for sustainable development and building resilience to crises and shocks"; and linked to one of the UNDP's Six Signature Solutions, namely **Access to Clean, Affordable Energy**.

Through the South-South Cooperation, the project will allow countries to exchange knowledge, solutions and experiences to support long-term sustained growth of their solar energy markets. Therefore, the project activities will aim at optimization and integration of a market ecosystem that can support a demand-driven solar energy market, including demonstrating technology; developing local skilled capacity, national policies and regulations, etc.

At the country level, these results will be brought about by the following key interventions:

- **Feasibility study to determine true demand for SWPs.** A comprehensive feasibility study to firm up the demand and determine locations, project implementation partners, beneficiaries and relevant technology, deployment models and providing suggestions for ancillary technologies such as storage or IoT applications. This will be key to project formulation and implementation. Information will be collected and collated through questionnaires, consultation meetings and workshops with key stakeholders at the national, regional and beneficiary level to inform the deployment modalities for the pilot project on SSAAU.

  It is envisaged that close to 200 farmers will be directly benefitted from the project activities. This and the number of indirect beneficiaries would be defined based on the deployment models and the project locations that will be finalized after the feasibility studies. The study will also map and assess capacities, both technical and institutional, to determine and develop a strategy to strengthen these capacities. Since the primary aim of SSAAU is to showcase applicability of technology, it is imperative that planning, procurement, installation, operations and maintenance of decentralized SWPs are transparent, easy, reliable and cost effective. The feasibility study will ensure that these factors are controlled and based on well-informed decisions, ensuring project success.

[13] DP/2017/38. UNDP Strategic Plan, 2018-2021.

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- **Demonstratation of innovative and locally-relevant deployment (technical and financial) models** that can be easily replicated and scaled in the country and the region. The pilot project components will explore a range of deployment models for affordable adoption, and enable specification, procurement, installation and post-installation services. These models would be tailored to the local context and ensure maximum benefit to the intented target beneficiairies. Replicability and scalabilty would also be the main criteria for identifying and selecting a specific deployment model such that the requisite enabling environment (systems and processes) are either already in place or can be easily established.

- **Capacity-building of national institutions and key stakeholders in each of the ISA Member Countries** for future deployment of solar energy and its applications and to strengthen national ownership. A local institution will be identified to be developed as a National Training Centre for solar technologies, to support not only SSAAU project and its subsequent scale-up but also other solar energy technologies in the country. These Centres will be essential to develop and disseminate training programs (online and in-personne) for all solar energy stakeholders (technicians, trainers, project developers, engineers, policy makers, etc) in the respective countries and in the region. ISA as part of their STAR-C initiative will extend access to capacity building modules developed by ISA and its partners and to the ones hosted on other platforms. Similarly, ISA's knowledge project called Infopedia will enable access to its wider network of experts to facilitate free, un-inhibited exchange of information, while simultaneously working on using this knowledge to define standards for solar energy technology and applications.

  NOTE: Currently *ISA is already training about 250 engineers and 200 bankers from banks/national financial institutions from a dozen countries. Based on the feasibility study and suggestions from the Lead Ministry(ies) and NFPs, the project* ***will devise appropriate capacity building programmes*** *adapted to local conditions and local demand.*

- **Documentation of project process and learnings will bewidely circulated** both within the countries and across ISA member countries with similar human development indicators, agricultural practices and geographies. Country-wise best practices and successful deployment models will be documented and widely circulated. In parallel, the project will also develop knowledge products, collating and compiling key learnings on deployment of SWPs. It will publicise and share lessons and results with the appropriate audiences. Additionally, all components will rely heavily on stock-taking of the successes and challenges of similar projects, either current or completed, in order to remain innovative and additional.

Project implementation will benefit from UNDP's experience, specifically that of climate change adaptation projects, which have supported more than 4.8 million smallholder farmers in adopting climate-smart agricultural practices, incorporating new techniques in water conservation, crop and income diversification, enabling market linkages, improved land management, and weather insurance. Moreover, it will capitalize on the network under the UNDP Sustainable Energy Hub,

building on the knowledge and expertise of its partner organizations' on solar energy technology and applications.

Additionally, through a common platform, ISA and UNDP will enable cross-country knowledge exchange between participating countries with an aim to establish mutually beneficial relationships in a bid to tackle common cross-border challenges. Expertise from countries like India and others in the region who already have experience of implementing solar pumping programmes would be utilized for this component (South-South Cooperation). Since, countries of the global south face similar challenges (technology barriers, availability of finance, etc.), facilitating south-south cooperation would prove invaluable.

Resources Required to Achieve the Expected Results

Describe what resources are required to achieve the expected results. Thinking about the change pathway in your theory of change, state the key inputs (people, purchases, partnerships, etc.) that are required to deliver the outputs. This should include UNDP staff time from the country, region or HQ level, which must be adequately estimated, costed, and included in the project budget.

Theory of Change

- In the face of climate change, agricultural production systems must simultaneously address three interrelated challenges, namely increasing agricultural productivity and incomes in a sustainable manner, building resilience to the effects of climate change, while contributing to climate change mitigation.
- Lack of clean, reliable and affordable irrigation is increasing the vulnerabilities for farming communities, who face food insecurity and poverty. Through demonstration of new, innovative ans sustainable deployment models for solar water pumps, the pilot project on SSAAU aims to address these three interrelated challenges. Through installation of close to 200 SWPs across 10 countries, the project will remove the commonly prevalent barriers to access irrigation through solar pumps and post-installation services in the beneficiary localitons. This can help the larger community to expand solar energy usage, thereby reversing the poverty/unproductivity trap; the project will also address climate change mitigation and gender inequalities.
- The project's other key outputs include capacity-building and strengthening of various stakeholders and relevant agencies, who can support scaling of climate change mitigation and resilience practices in pilot countries, thereby encouraging national ownership. It will provide technical training to over 400 people, facilitate knowledge-exchange meetings and workshops; and develop relevant knowledge products.

People & Purchases

I. **Project Implementation arrangements**

- This multi-country solar water pump deployment pilot project will be hosted by the Project Management Unit (PMU) located in the UNDP India office. Together, they will guide project implementation and direct project fund management. UNDP, as the project's primary executing agency, will ensure that the project is implemented according to the financial and

technical rules and procedures of the organization.

- Ownership and overall leadership in the pilot country lies with the home government, who will act via the Lead Ministry(ies). ISA National Focal Point (NFP) or the Project Focal Point at the Lead Ministry will coordinate with UNDP CO on project implementation, contributing to project implementation, monitoring and evaluation. They will provide inputs to determine key modalities and parameters of the project.

- Beneficiaries, both direct and indirect, will be identified after the feasibility study as and agreed upon, by government stakeholders and using a participatory approach with representatives of the beneficiary communities. Technology suppliers, chosen through an international bidding process, will facilitate this process.

- UNDP COs will engage local implementation partners for monitoring and reviewing of project implementation, against indidcators and outcomes in this document. Further, the UNDP COs will be responsible for ensuring UNDP quality standards and financial regulations.

- A Project Steering Committee, will meet twice every year to review project implementation and give further recommendations to improve project success.

- UNDP will recruit a Project Coodinator at New Delhi, India. He/She will plan, coordinate and manage the day to day project activities through the various project stakeholders. He/She will also ensure compliance to project guidelines, efficient use of resources and timely disbursement of funds in accordance with the project annual work plan (AWPs).

II. Project Procurement Arrangements

- About 75% of the total project budget is slated to be utilised for deployment of solar water pumping systems in the target countries, including feasibility studies, transport, installations, operations, maintenance and additional training of local staff. For procurement of agency for feasibility studies in the countries and of solar pumping technology, UNDP will utilize its regional Procurement Service Unit (PSU)'s Crisis Response & Energy/Environment (CREE). The CREE units has considerable experience with delivering specialized project procurement to Country Offices (CO), particularly in the area of Renewable Energy solutions.

- A single or multiple consultants will be recruited to conduct the feasibility studies in each of the 10 pilot countries. The feasibility studies will identify the project locations and the primary target groups like small/marginal land holders and women groups to access the solar water pumps. They will also collect key data points to determine project beneficiaries, most ideal deployment model; determine implementation and capacity gaps; and determine sequential order of activities for the annual work plan (AWP).

- Technology vendors during procurement will also include costs of custom clearance, local transportation, installation, testing, commissioning of complete system, services at beneficiary site (and training for service staff at site) of Solar PV based Agricultural Pump Set system and Comprehensive Maintenance Contract (CMC) for 5 years.

- The remaining budget components include:
    i. Additional staff to support project activities, monitoring, coordination and management at UNDP India, including a project manager)
    ii. National-level trainings for specialized engineering staff and capacity building activities for financing institutions
    iii. Awareness raising, advocacy and information sharing to the targeted beneficiaries under the pilot project
    iv. International or national consultants/ service contractors to conduct final project evaluation in respective countries.
    v. Project documentation and knowledge management to aid future installations nationally and interntionally.

SSAAU project will be delivered with a total financial budget of USD 2,000,000 (two million US Dollars) over a period of two year in 10 pilot countries. Special attention will be paid to strengthen existing national systems and mechanisms and build local capacities, ensuring alignment with the national development plans. The pilot project offers sustainable development assistance with financial support, that will be employed in accordance with their national plans and programmes. To ensure the aforementioned and sustained participation throughout the project, UNDP India and ISA have organized consultation meetings with key Ministries and UNDP COs to apprise them of the project's objectives, tentative activities and expected deliverables.

Finally, as elaborated earlier, the pilot project on SSAAU will aim to maximize on the cross-cutting benefits across several possible SDGs. To advance the 2030 Agenda for SDGs, the project will intensify collaboration through multi-stakeholder partnerships at national, regional and global levels; bolster Ministries, policy and regulatory departments; and encourage local market players and public-private partnerships.

Multi-Country Project Activities and Corresponding Budget

Outputs	Activity	Per Country Allocation	Budget Allocation (USD)								Total
			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	
Output 1: Local demandcapacities; deployment models and implementation partners assessed and finalized in ten identified Pilot Countries.	Develop detailed questionnaires and conduct interviews with a range of key country stakeholders.	25000	50000	100000	100000						250,000
	On ground assessments to firm demand for solar water pumps, and identify project sites to pilot solar water pumps in each of the 10 countries										
	Deployment models identified for each of the SWPs, considering a combination of financial and implementation modalities based on local socio-economic circumstances and requirements [gender involvement] in each of the 10 countries										
	MONITORING: Ensure feasibility studies have been conducted and successfully determined key implementation modalities for all 10 countries										20,000
Output 2: Solar water pumps for agricultural use installed, using sustainable and innovative deployment models, in each of the pilot countries. Gender marker: GEN2	Project beneficiaries and locations selected to pilot SWPs and ancillary technologies/sustainable practices to enable environmentally benign technology for irrigation, in each of the 10 countries	125000		250000	500000		500000				1,250,00
	Specification, procurement, and installation of pilot solar water pumps in each of the 10 countries.										

	MONITORING: Ensure Successful deployment and ensure systems are in place to ensure prolonged operational performance, in all 10 countries									35,000
Output 3: Local ecosystem enabled and strengthened for deployment of solar water pumps and other solar energy applications Gender marker: GEN 2	Training for specialized engineers and extension staff from lead ministry(ies) aimed at building local technical expertise to size, install and service solar energy applications.	10,000			1,00,000					1,00,000
	Trainings and capacity building exercises for national/regional banks/entities to effectively finance solar energy applications.									
	MONITORING: Ensure each of the pilot project sites have sufficient technical and financial support to ensure continued operations and timely maintenance; and that pilot countries with strengthened capacities for achieving energy transformation at scale									10000
Output 4: Knowledge generated and disseminated on sustainable operation of SWPs and ancillary technologies through lessons and learning documentation and knowledge exchange events	A comprehensive report documenting SSAAU pilot project implementation, including SWP deployment modalities, benefits of ancillary technologies, sustainable agricultural practices and lessons learned etc.	10,000			20,000		40,000		40,000	1,00,000
	MONITORING: Ensure each of the pilot countries have developed quality knowledge products and diseeminated information effectively to key stakeholders.									10,000

Evaluation: FINAL	7,000							70,000	70,000
PMU Costs	59750								59,750
Sub - Total									19,04,75
GMS (5%)									95,250
TOTAL									20,00,00

Color Legend:

Phase I Countries	Phase II Countries	Phase III Countries
Senegal	Niger	South Sudan
Mali	Republic of Benin	DRC
	Togo	Republic of Sudan
	Uganda	Tuvalu

Applies to all countries, project activities will take place simultaneously.

Project Outputs	Per Country Allocation (USD)	Total Budget Allocation (USD)
Feasibility study	25,000	2,50,000
Demonstration	125000	12,50,000
Capacity Building	10,000	1,00,000
Knowledge Management	10,000	1,00,000
Project Monitoring	7,500	75,000
Evaluation: FINAL	7,000	70,000
GMS (5%)	8660	95,250
	1,93,160	19,40,250
Project Management Unit Costs		59,750
Total Project Allocation		20,00,000

Partnerships

Describe how the project will work with partners to achieve results and briefly map what other stakeholders and initiatives are doing to address the development challenge. This should not be simply a list of partners; it should be linked to the theory of change. For example, what are the assumptions and expected results achieved by partners that are critical for the achievement of results of this project?

The Multi-country pilot project on SSAAU will adopt a partnership-based approach to leverage the range of international skills and resources needed for effective solutions in the relatively nascent countries. PMU as the executive entity will engage the UNDP COs to implement the project in the 10 pilot Countries. ISA will mobilize relevant National Focal Points (NFPs) in key Ministries. Under the guidance of key partnerships in the country, the project will demonstrate how effective partnerships can be utilized to leverage skills and expertise and aid successful deployment of sustainable techology.

The formalized network of partnerships are detailed below:

STAKEHOLDERS	ROLE/ACTIVITIES	ASSUMPTIONS/EXPECTED RESULTS
International Solar Alliance (ISA) and National Focal Points (NFPs)	ISA will ensure project details are effectively communicated during project formulation and implementation between the PMU and government stakeholders. ISA NFPs will represent the country (10 in number) at the ISA platform, and liaise between PMU, COs and the Lead Ministry (ies). They will be responsible for country buy-in and to monitor if project activities are in line with country objectives. ISA will use this pilot project to operationalize future multi-country projects towards the larger goal of scaling solar energy deployment through South-South Cooperation.	ISA has a NFP or an alternate NFP (ANFP) in each of the 10 pilot countries. To ensure national engagement, ISA NFPs will mobilize relevant Lead Ministries, regional Departments and other government national stakeholders for project implementation. They will also confirm project beneficiaries/locations and determine any capacity gaps in implementation, in accordance with countries' national plans and strategies. NFPs will also interact with one another to identify future programmes and share experiences. They will also be given ample opportunity to interact and seek advisement from international experts – policy, technical and financial. Overall, ISA will determine a working multi-country project implementation model to scale SSAAU and other ISA programmes.
National Lead Ministry (ies)	Countries, through NFPs, nominate one or more Lead Ministries (energy or agriculture) The Lead Ministry will be consulted at every stage of project implementation, to provide key insights and project support. Since the aim is to strengthen local systems to scale solar energy applications in the pilot countries,	The Lead Ministry will be actively involved in project formulation and implementation, providing guidance and suggestions as per National Development Plans and Strategies. In parallel, it will utilize the resources, experts and knowledge products: • To build on the feasibility study to determine in-country end-use demands from other sectors, e.g. solar pumping for drinking water, roof-top solar, etc;

	the Lead Ministry(ies) will make key decisions on project implementation modalities for pilot projects in the countries. Lead Ministries can also bilaterally collaborate with ISA and capitalize on plethora of knowledge to strengthen local institutions, systems, and develop local skilled capacity.	• To train local labour and develop skilled capacity to support solar energy deployment. • To develop policy and regulations; establish/stregthen key departments and institutions; and systems for solar energy deployment
Other Implementation Partners	The pilot project on SSAAU will require mediators at the project sites such as NGOs, CSOs, farmer cooperatives, micro lenders and donors, etc. to serve as **implementation partners** based on identified deployment models. They will be engaged by the UNDP CO, but only after consultation with the Lead Ministry(ies) and/or NFPs. They will provide technical and logistical support in to maintaining crucial lines of communicatin with project beneficiaries. Their specific roles and responsibilities will be defined by the UNDP COs and embedded in the final project document.	Local implementation partners will be fundamental to address project implementation issues to ensure project success and engage communities to increase public awareness. Their involvement will help build trust in the technology and the project, encouraging neighbouring farmers and communities to adopt soalr energy technology. They will also serve as project evaluation and monitoring partners, allowing follow-up on project progress and speedy redressal in case of operational difficulties.
	National Educational and Training Institutions will be chosen to to build local capacities to support solar energy value chain, creating significant employment. They will be supported and equipped by ISA's Solar Technology and Application Resource Centre (STARC) project. Moreover, ISA has developed several online trainings and knowledge products, which the national institutes can utilize to improve local knowledge and understanding of solar irrigation technology and even sustainable irrigation practices.	These Training Institutions, one each in every pilot country, will utilize ISA's platform to ensure training and capacity building towards: • Skilling manpower for installation and after-instalaltions services such as continued operations and maintenance for solar energy installations • Raising awareness among project beneficiaries on SWPs before project installation and in sustainable agricultural practices, post installation. • Effective project implementation by educating Implementation Partners on SWP technology and modalities of deployment, as detailed in the final project document • Cross-country knowledge exchange on ideal policy and regulations for solar energy deployment, for Ministries and relevant government authorities

All stakeholders in this project will be given due credit for their engagement in this initiative. IBSA partners will be provided with visibility and recognition for their instrumental role supporting this project. Credit will be given to IBSA partners during public engagements by the project, particularly in interactions with the media, public and academic appearances and presentations, relations with the local community, with respective country Governments, project visitors and other institutions. Other efforts will be made where appropriate to provide visibility to IBSA and the South-South cooperation elements of this project. Additionally, a complaint/issue redressal mechanism will also be put in place so that the project partners including the project beneficiaries and other key implementation partners can raise complaints.

Risks and Assumptions

Specify the key risks that can threaten the achievement of results through the chosen strategy and the assumptions on which the project results depend. Describe how project risks will be mitigated, especially how potential adverse social and environmental impacts will be avoided where possible and otherwise managed. Refer to the full risk log, which should be attached as an annex.

Project risks vary in form and range from political risks to financial and even technology risks, as detailed in the table below.

#	DESCRIPTION	DATE IDENTIFIED	TYPE	IMPACT & PROBABILITY	COUNTERMEASURES/ MANAGEMENT RESPONSE	OWNER	SUBMITTED /UPDATED BY	LAST UPDATE	STATUS
1	Impacts of climate change typically manifest as increase in average temperatures; unpredictable rainfall patterns; and extreme weather events. First, the rise in temperatures would have adverse impacts on evapo-transpiration rates at water storage locations as well as on crop water requirements. Second, changes in rainfall patterns could adversely impact the rainfed agriculture – directly impacting the smallholder farming community in these least developed countries who largely practice rainfed agriculture.		Environmental Risk 1. Climate Change and Resilience Risks 2. Weather and Natural Disaster Risks	Impact (I) = 3 Probability (P) = 2 Risk Category = L/M	Irrigation is an effective adaptation strategy to the increasing risks faced by farmers reliant on rain-fed agriculture. The solar pumping technology for irrigation would be an effective mechanism to build resilience of small and marginal farmers to the impacts of climate change and is widely being proposed by respective national Governments. They have the added benefit of being a clean source of reliable energy, offering a resilient mode of climate				

	Moreover, climate change is also responsible for more frequent and destructive extreme weather events such as cyclones and dust storms, which also have the potential to impact Solar Water Pump (SWP) operations significantly.				mitigation for the agricultural sector.				
2	Political and regulatory irregularities have the ability to derail the project and render it unfeasible. Lack of Government commitment to scaling-up the use of solar energy technologies or even a different solar energy strategy could shift priorities away from the project to other developmental projects. Moreover, changes in governing policies and/or regulations could lead to delays in permits, licences, interconnections. These can impact project finances or leave the project redundant.		Political Risk 1. Government commitment 2. Political will 3. Political instability Regulatory Risks 1. Changes in the regulatory framework within the country of operation 2. Changes in the international regulatory framework affecting	Impact (I) = 2 Probability (P) = 1 Risk Category = L	Stability and support from the ISA Member Country are paramount to the success of any developmental project, especially in the demonstration phase. Any lack of (or low) commitment stems from low awareness and experience of implementing solar energy projects. This would be addressed through capacity building and institutional strengthening of key departments, organizations and entities			

			the whole organizatio n 3. Deviation from UNDP internal rules and regulations Financial Risks		Additionally, ISA Missions to all target countries have reinforced their commitments towards implementing and scaling up of solar energy applications. However, in case of any exigencies, the demonstration project can easily be adapted and implemented in another country that has showcased interest in SWPs.			
3	In most member communities, the proposed demonstration project on solar energy for irrigation would be a relatively novel technology, Unfamiliar with the technology, new users are hesitant and even wary. Lack of project beneficiaries interest/awareness could translate to disuse, non-payment of any loans that are linked to operations, or excessive water withdrawal etc.		Counter Party/Beneficia ry Risks Operational Risks 1. Technical and Infrastructu re Failure Risks 2. Water-Extraction Risks	In most of the countries proposed for this demonstration Impact (I) = 4 Probability (P) = 2 Risk Category – L/M	In addition to the demonstration project, the programme will be accompanied by awareness-raising, mobilisation and capacity building programme both for beneficiaries and for the community as a whole. The project would use appropriate information tools to create awareness amongst the project beneficiaries			

	Therefore, a key component of the project is to demonstrate solar pump technology that is right-sized and with the appropriate deployment model to meet the irrigation water requirements of different farm sizes/beneficiaries.				through local agents like extension service workers, NGOs, etc., with an aim to familiarize stakeholders with solar pump technology and provide assurance of its technical and financial benefits. A combination of capacity building for project beneficiaries testing to appropriately size the pumps; and adoption of efficient, sustainable irrigation techniques will help overcome this risk.				
4	Technology risk is primarily linked to the quality of products and vendors in the member countries. Ensuring technical specifications and standards for SWP will ensure that farms/beneficiaries are not burdened with substandard products. Moreover, without the right sizing and deployment model,		Operational Risk 1. Technology Risk	Impact (I) = 3 Probability (P) = 1 Risk Category – L	ISA price discovery exercise was aimed at both lowering the cost of solar pumping system as well as to standardize the goods and services provided across countries, ensuring international standards of quality for procured SWPs. The programme				

	beneficiaries might revert to other modes of irrigation.				will also look to enhance the institutional (and technical) capacities in the target countries to develop standards and technical specifications for solar pump components, and clearance documents for solar pump components as well as sub-components.				
5	There are capacity constraints in target countries to plan, finance and implement solar water pumps projects. Project faces operational risks, for example, in the event of machinery breakdown and downtime, it might take days and even weeks to repair in the absence of locally available skilled technicians. Moreover, difficulty in finding suitable skilled technicians can significantly inhibit any future projects on solar energy.		Operational Risk 1. Human Resource Risk 2. Institutional/ Execution Capacity Risk 3. Governance Risk 4. Processes and Procedures Risk	Impact (I) = 3 Probability (P) = 2 Risk Category – L/M	In addition to demonstrating the solar pumping technology and business models, the project has a specific component on building requisite technical capacities and establish/strengthen local systems and institutions, build capacity of key stakeholders and train/upgrade the skills of professionals to provide necessary certified services.				

					This will ensure availability of local technical expertise, capable of sizing, installing and servicing solar water pumps				
6	Though the life-cycle costs of solar PV pump are lower than that of diesel pump sets, their high initial cost is a major deterrent for project beneficiaries (especially the small and marginal farmers). In many countries, this has been addressed to a large extent by Government subsidizing the costs. However, even with subsidies, there would be a requirement of credit – especially by the economically weaker project beneficiaries. External financial risks such as increasing interest rates, exchange rate fluctuation, inflation, currency exchange can impact the financial feasibility of the project and		Financing Risks	Impact (I) = 2 Probability (P) = 1 Risk Category = L/M	To ensure availability of local credit, national and local banks/ financial institutions will be trained in the various aspects of financing solar energy-based applications. Moreover, this project will aim to pilot different business models that will test use of different financial mechanisms based on the needs of the project beneficiaries and the kinds of financial instruments available in the respective countries. Further ISA is also in the process of getting solar technology included in the concessions lists of				

the country-wise budget allocation and even co-financing if needed.		items/equipment so as to reduce the burden of tax and customs duties on solar pump and its components, globally.			

However, the risk of most concern, especially in a sector affected by the negative impacts of climate change is the water extraction risks.

Water Extraction Risks - The project may also bear some water extraction risks, which are of a cumulative nature (i.e. in synergy with anthropic and non-anthropic vectors) on the receiving environments. The overuse of water pumps can have either a low or moderate impact on groundwater levels, depending on the environment and its aridity. Indeed, an aggressive and unaccompanied scaling up of irrigation programmes in increasingly dry locations could prove dire for groundwater levels if the rhythm of water extraction exceeds its renewal pace.

To mitigate this risk, the project will include ancillary technology or measures on sustainable crop-water management (IOT led drip and sprinkler irrigation practices), that have been proven to be successful. For example, in the Indian state of Jharkhand, UNDP India in conjunction with the State Government nodal agency piloted SWPs integrated with sensor-based Climate-Smart technology (or Internet of Things) that powered micro-irrigation based on soil moisture levels[14].

This will be accompanied by an extensive awareness-raising, mobilisation and capacity building programme. It will also encourage and facilitate the development of relevant national policies on ground water recharging. Further, the project shall include ground water mapping and cropping system mapping in Member Countries to ensure environmental sustainability with solar irrigation projects.

[14] This includes a grid-connected solar photovoltaic (PV) system to power the submersible water pump (2 HP & 3 HP) and accessories such as pump controller; operational regulator – starter and relay systems; and mechanisms for controlled discharge of water through a drip irrigation. An automatic sensor mechanism (Tensiometer) is used to measure and relay the data on soil humidity and moisture level, to an intelligent central console (Type 1) or a stand-alone programmable logic controller (PLC) Unit (Type 2). The latter receives data from the sensors and operates the SWPs accordingly. In addition to improving water use efficiency, the project has seen agricultural productivity grow. Smart technologies can ensure that crops and vegetables receive water, as per their requirements preventing over and under irrigation.

Moreover, the project is aware of the implications of unregulated water withdrawal and therefore includes promotion of sustainable agriculture practices as a key component. While experimenting with deployment models, it will also encourage implementation of water efficient irrigation techniques to promote the long-term sustainability in water use. Awareness drives targeted at beneficiaries and neighbours will detail the significance of water management initiatives, highlighting convenient and beneficial solution for the local context.

Stakeholder Engagement

Identify key stakeholders and outline a strategy to ensure stakeholders are engaged throughout, including:

1. *Target Groups: Identify the targeted groups that are the intended beneficiaries of the project. What strategy will the project take to identify and engage targeted groups?*
2. *Other Potentially Affected Groups: Identify potentially affected people and a strategy to engage them and ensure they have access to and are aware of mechanisms to submit concerns about the social and environmental impacts of a project (e.g. UNDP's Social and Environmental Compliance Review and Stakeholder Response Mechanism).*

The pilot project on SSAAU incorporates mulitple actors from conceptualization and design to implementation and follow-up, including government policy-makers, national implementing and coordination partners, regional governments, civil society organizations, private sector, technical institutions, and other stakeholders like the beneficiaries. Therefore for effective coordination the PMU will, as and when required, hold cross-country and in-country consultations to facilitate effective collaboration and project coordination.

UNDP CO in consultation with the Lead Ministry will identify national implementation stakeholders in the country, from local wings of Government agencies, Ministry departments to financial institutions, and technical institutions, to regional CSO, NGO or farmer cooperatives and private sector actors (entrepreneurs, technology providers, etc). The ground-level implementation partners will be tasked with strengthening ties and maintaining continued presence in the beneficiaries communities during the project period, to alleviate any pressing concerns and enable a structure mechanism to realize quick redressals with UNDP and the government counterparts. Moreover, early in project implementation, they will engage in consultations with members of the beneficiary communities to raise project awareness and to negotiate terms for fair benefit -sharing to ensure that the benefits of the solar pumping systems are shared amongst the community in an equitable manner. This collaborative decision making to develop a community water resource management will ensure that there are minimal or no conflicts of interest amongst the community – especially between the beneficiary farmers and other farmers.

The primary beneficiary (and indirect beneficiaries) target group remains the farming community who would benefit directly from this project. These will be identified during the feasibility studies, in consultation with national and regional government stakeholders. A well defined criteria for identification and selection of beneficiaries will be adopted that would include inter-alia– beneficiary vulnerabilities and location, previous ownership of diesel pump, and number of indirect beneficiaries, etc. These criteria may be added to, based on the deployment model selected to ensure that the beneficiary farmers are selected in a democratic and consensual manner amongst the community. Further, the pumps will be installed on land identified by the respective beneficiraies such that the land rights and necessary clearances are obtained.

The aforementioned feasibility study will also endeaour to list neighbouring farms and communities who could be negatively impacted by the project, or by excessive water withdrawal. Project initiation will be coupled with a UNDP's Social and Environmental Screening Procedure to maximize social and environmental benefits and strengthen resilience of the community. Neighbouring communities sharing the same water-table could be affected if water withdrawal exceeds normal rates and does not respect his/her water extraction rights. Therefore local implementation partners

will also work to enable clear grievance mechanisms both at community level (if one or more farmers feel they are negatively impacted), and with UNDP and the Lead Ministry.

South-South and Triangular Cooperation (SSC/TrC)

Describe how the project intends to use SSC/TrC to achieve and sustain results.

The impacts of climate change are felt disproportionately by the disadvantaged, who in the least developed/developing countries are unprepared for its perilous consequences. Growing levels of inequality even amongst the developing nations reaffirms the need for a systemic, coordinated approach, seeking collective solutions through cooperation with other developing countries. To build on the North-South Cooperation framework, South-South Cooperation will enable knowledge-exchange and collaboration among Member Countries, therefore contributing to the development, transfer, dissemination and diffusion of sustainable solutions for development and hence the collective progress towards the 2030 Agenda for Sustainable Development.

To illustrate the advantages of South-South and Triangular Cooperation, the project will build synergies and modes of cooperation between ISA Member Countries, to allow free and easy exchange of knowledge and learning. Led by its principles, UNDP India and ISA have mobilized financing from the India, Brazil, South Africa (IBSA) Facility at UNOSSC to enable pilot projects in 10 developing nations. These agriculturally reliant countries face similar issues ranging from lack of energy, rural poverty, food security to climate vulnerability and low community resilience. In response to similar developmental challenges, countries through the shared experience and learnings can find solutions that could successfully be transferred and easily adapted in other least developed/developing countries. The pilot project on SSAAU aims to showcase how cooperation and sustainable development. Through the promotion and demonstration of solar water pumps, the project will build national capacity in pilot countries to enable solutions to combat climate change, as envisioned in their respective Country Programme Document in accordance with UNDP Strategic Plan.

Experience from countries like India, Bangladesh and Ethiopia on solar powered irrigation can stimulate or support sustainable development, but these need to be complemented by active government policies tailored for local context. In India for example, there are state-led initiatives on solar water pumps where excess electricity generated can be injected back into the grid and be compensated. This simple deployment model assured reliable electricity for irrigation from a clean source; and encouraged efficient water usage by promising extra income. In Bangladesh, a sponsor sells water to a group of farmers, who pay irrigation charges proportional to their water usage. The model called "water as a service" avoids the need for farmers to raise capital funds for procuring the SWPs. Similarly, in Ethiopia's out-grower scheme, sponsors support smallholder farmers, by providing upfront financial support for farm preparation and SWP technology. In return, the famers repay back the cost of the SWPs through monthly instalments or at the time of harvest, as agreed to in the contracts.

Emerging demands from countries show that the developmental issues are not static and require innovative, cross-sectoral, malleable approaches. Enabling collective growth hinges on the ability to share ideas, experiences, practices, key learnings, expertise and institutional learnings. Such

knowledge exchange can prove crucial to tailor solutions to specific development contexts and demands, while seeking mutual benefits.

Ideated on the principles of South-South Cooperation, this multi-country partnership will allow pilot countries to collaboratively pursue their shared objectives through exchanges of knowledge, skills, resources, experience, and technical knowhow, to enable regional and interregional collective actions, including partnerships involving governments, regional organizations, civil society, academia, and the private sector, for their individual benefit. It is expected that the pilot project on SSAAU, given its number of participants, will contribute to creating a sizeable "**community of practice**" for solar water pumps, under the aegis of South-South collaboration. Through the ISA platform, this community will extend beyond the 10 pilot countries and enable easy exchange of knowledge and experience.

The PMU will endeavour to support additional partnerships with financial and technical experts to ensure that the pilot project is cost-efficiently and sustainably deployed. UNDP (HQ, Regional Bureaus and Country Offices) and ISA would utilize their respective national and international expertise to provide technical assistance and guidance for pilot and future project activities.

Knowledge

Describe any specific knowledge products, besides evaluations, that will be produced by the project (e.g., publications, databases, media products, etc.) and how the project will create visibility for knowledge and lessons learned generated by the project so others can benefit.

As mentioned earlier, producing relevant knowledge products on solar energy is an indispensable component of the the larger ISA agenda. It is envisaged that the documentation efforts will be an integral part of the project and will document all project activities. The specific products on documentation would include case studies, monographs, information brochures, digital stories, etc. to disseminate the findings and lessons from all stages of the project. It will collate policy, technical and financing lessons to reduce financial risks, manage affordability, ensure returns and successful operation.

Successful deployment models and their learnings will be thoroughly documented from each target country and distributed widely among technical and knowledge partners, banks and financial bodies, think tanks and advocacy groups, consultants, and industry stakeholders in all ISA member countries. Short video stories or testimonials from beneficiaries will also be produced documenting their experience and specific benefits from the project.

Sustainability and Scaling Up

Describe how the project will use relevant national systems, and specify the transition arrangement to sustain and/or scale-up results, as relevant. Describe how national capacities will be strengthened and monitored as relevant, and how national ownership will be ensured.

The SSAAU project is designed to demonstrate technology; document learnings; and disseminate knowledge on solar water pump technology and deployment modalities, among the wider collection of ISA Member Countries. The executing partners, UNDP India and ISA will engage the

UNDP CO and Lead Ministry(ies) respectively for the implementation of project activities. UNDP recognizes that a fundamental way to ensure sustainability and scale-up of the project's impacts is to actively foster project ownership within national stakeholders and beneficiary community. In parallel, project activities will support the lead Ministry to establish and/or strengthen national processes and systems for a structured scale-up in the Pilot Country.Therefore, country stakeholders and implementation partners will ensure that the suggested pilot projects are in line with the National Climate Change Mititgation and Development Plans.

First, building on the self-determined estimate, the pilot project will facilitate feasibility studies to firm up the demand and identify ideal project beneficiaires for the immediate adoption of solar water pump and sustainable irrigation practices. These market/feasibility assessment will guide governments' interventions to where they are most cost-efficient, valuable or both and where, consequently, they have the most chances of being sustainably used throughout their useful lifetime. These studies will also aid the methodical determination of ideal deployment models that are tailored to fit the context of the beneficiaries' economic status, agricultural practices and pumping demand. The project will also suggest micro -irrigation techniques or auxillary technologies that can ensure water sustainability and efficient energy usage. Such mapping of the best fit for SWP will also provide a clear way for government to encourage the broader deployment of SWP.

Second, to ensure long-term sustainability of the pilot project, it will adopt a two-tier strategy. At the multi-country stage, technology procurement will be backed by post-installations service contracts. And at the national stage, the pilot project's design will be embedded with a component on national capacity building, which will aim to skill beneficiaries in daily operations and regular maintenance of the solar water pumps. During the feasibility studies, country stakeholders in consultation with the project implementation partners will pinpoint weaknesses in implementation knowledge or readiness. Subsequently, ISA will mobilize expertise to address and develop national capacity building strategies with the identified National Training Institute to overcome the identified constraints. ISA will also facilitate mulit-country trainings for technical, policy and financial actors to apprise and build confidence on solar energy applications.

Third, the project seeks to higlight, with the demonstration installations of the SWPs, practices and technologies that can contribute to reducing water intensity for various cultures. This will futher add to the sustainability and replicability potential of the project, since successful application of SWP will both reduce costs associated with diesel pumps as well as increasing yields/efficiency of irrigation and thus help vulnerable farmers generate revenues for themselves and their community.

Fourth, the pilot project activities will aim to establish pathways for scaling-up adoption in the ten countries. It will utilize in-country partners for project execution and conduct trainings to build local/national capacities to ensure that the countries are prepared and ready for developing solar programmes suited to local contexts and implementing them. By streamlining national processes and systems for adoption of solar energy applications, the project hopes to kindle a market for the technology with the potential to draw new investments for scaling-up.

Even though efforts are still necessary to scale up its uptake, solar energy is no longer a radical choice but an obvious, cost-conscious one. In addition to increased agricultural production, SWPs

also enable community resilience to the impacts of climate change – they are applicable to a wider range of crops over longer time horizons and seasons, increased incomes either by selling excess water to other farmers or selling excess energy produced to the grid. For example, in a global research study by the Food and Agriculture Organization (FAO), a vast majority of respondents accepted that there was a significant increase in incomes after the installation of SWPs for irrigation[15]. Similar results have been reported from studies conducted in other countries like India, Zimbabwe, etc. The project will aim to replicate similar results in the pilot countries.

Last but not the least, it will enable the operationalization of ISA, as it establishes modalities and the general framework for multi-country projects on solar energy applications. First, it will enable the subsequent scaling-up phase of the SSAAU to the remaining 12 countries. Second, it will aid the implementation of ISA's varied multi-country proposals on solar application programmes. Following the principles of South-South Cooperation, the pilot project will establish pathways for exchange of experiences and expertise, between ISA Member Countries, in particular the ability to build on the shared knowledge to determine effective deployment strategies.

PROJECT MANAGEMENT (1/2 PAGES - 2 PAGES RECOMMENDED)

Cost Efficiency and Effectiveness

Identify how the strategy is expected to deliver maximum results with available resources. Include measures based on good practices and lessons learned and explain why this is the most efficient and effective approach of available options. This can include:

i) Using the theory of change analysis to explore different options to achieve the maximum results with available resources

ii) Using portfolio management to improve cost effectiveness by leveraging activities and partnerships with other initiatives/projects

iii) Through joint operations (e.g., monitoring or procurement) with other partners.

The basic premise behind developing this SSAAU project for implementation in 10 countries simultaneously is to achieve for cost efficiencies and effectiveness. There are several activities and components in the project implementation that would be cost effective when done for a group of countries together rather than individually for each country. A few of these components that would lead to cost efficiencies are detailed below:

Project management: utilising respective UNDP country offices as implementing agencies is a cost effective proposition as this will reduce overhead/establishment costs while providing a cost-efficient and effective project delivery. As stated earlier, UNDP India will be responsible for the overall project management including administration, disbursement and monitoring as per the UNDP standard policy and practices. It will also be responsible for reporting on donor funds as per standard practice and as agreed with the donor. Both these measure will lead to efficient and ethical fund utilization and project implementation. UNDP CO will be responsible fr ensuring on ground compliance of project implementation

[15] https://www.ssael.co.in/images/Library/files/Solar-Pumps-Impact--SSAEL-Report.pdf

Feasiblity Study: The feasibility study to firm up demand, determine the most suitable deployment model and identification of local implementation partners is the first key step for the project. It will ensure that beneficiaries are assessed so that they are provided access to the most effective technology and solutions, suited to their irrigation needs. This feasibility study would be done simultaneously for the countries in three batches by the same agency.

Procurement of SWPs: Demand aggregation has proven to be cost efficient and ISA has already conducted a price discovery tender for the aggregated demand from 22 countries. The bids received were significantly lower than prevailing prices of solar water pumps in the country, including installation and operation services..The technology will be procured through a transparent bidding process to ensure that the most cost-efficient technology is provided to the beneficiairies. Procurement will also include training of local staff to support a sustainable operations of the solar water pumps and Comprehensive Maintenance Contract (CMC) for 5 years.

Training delivery: One of the key components of the project is building capacities for long term sustainability of solar PV systems and projects in the country. Since the project is being implemented in African countries, the trainings programmes would be designed and delivered in a way where more than one country participates leading to cost effectiveness. Additionally, the pilot countries will have access to a repository of knowledge resources to build capacity and strengthen systems for implementation of effective deployment of national solar energy programmes.

Project Management

Describe how coordination will be done to ensure that we are working collaboratively towards results, including stating the role of the coordinating office. Information on the location(s) where the project will be operationalized, the number and location of physical project offices, arrangements for dedicated or shared operations support, how the project will work with other projects, etc. In this section, also describe the audit arrangements, collaborative arrangements with related projects and UNDP Direct Country Office Support Services and direct project costing, as applicable.

Given the participation of 10 member countries and more importantly, the cross-cutting nature of SWPs, the multi-country project will engage a wide range of stakeholders. A Project Steering Committee (PSC), co-chaired by ISA and UNDP India, will provide strategic direction, review progress and introduce corrective measures during the project period. It will include representation from the IBSA Facility at UNOSSC, ISA National Focal Point (NFPs) from the Lead National Ministry and the UN Country Offices (COs). They will provide a level of oversight, consulting with the Project Management Unit (PMU) at regular intervals. The PMU will comprise the two primary executing agencies, UNDP India and ISA. They will determine project activities as detailed in this Project Document (ProDoc) and in respective Annual Work Plans (AWPs). Following which they will direct and coordinate implementation across the pilot countries, through the UNDP COs. Through a project coordinator based at the UNDP India office, the PMU will coordinate and support the UNDP COs, who will subsequently mobilize National Implementing Partners, as needed. Specifically,

I. UNDP India will be responsible for financial and technical assurance, reporting and recruitment for the PMU in line with UNDP rules and procedures. It will also facilitate project implementation in conjunction with the respective country offices. This will also include

quality assurance of the project following UNDP procedure at the design, implementation and closure stages.

II. ISA will mobilize and utilize its own network of technical and financial expertise to support the Member Countries, through their NFPs. It will focus on building their capacity and systems within the country to support scale-up of this project and other solar energy applications

UNDP will draw national and international experts (on part time basis), from a pool of Regional and Global experts (having extensive experience on renewable energy and financial management) to advise and support the PMU, as and when needed. PMU will also be responsible for project documentation, monitoring and evaluation, which will be supported by country stakeholders, including but not limited to its UNDP Country Office (CO), country National Focal Points (NFPs), Lead Ministry(ies), national training institutes and other implementing partners.

The onus of project activities in the country will be on the UNDP COs, who will manage activities in the pilot countries, in accordance with the implementation plan developed by the PMU. The UNDP COs will also work under advisement of the Lead Ministry(ies) and the NFPs. Complementing the pilot demonstration, the PMU will work in close association with the UNDP COs to improve deployment modalities, reduce risks, and strengthen local systems to support a demand driven expansion of the solar energy sector in the respective countries.

Number of implementation partners and their roles in countries can vary based on the modalities of procurement, deployment and maintenance. After the feasibility study, the final project document will have a detailed requirement of partners needed on the ground. They can be categorized broadly as:

1. Ministries and their sub-national departments to coordinate with Lead Ministry and assist in project implementation.
2. National/rural banks; farmer cooperatives and collectives; and local NGOs to facilitate deployment and monitoring.
3. Training institutes to conduct capacity building workshops and build local capacity to deploy, operate and maintain SWPs.

MULTI-COUNTRY RESULTS FRAMEWORK[16]

Note: UNDP country offices will include the SSAAU pilot project activities as an additional outcome to similar project already in works in the country. Alternatively, in the absence of any existing solar energy/ solar water pump project, country offices will introduce a new project.

Intended Outcome as stated in the UNSDF/country programmes of participating countries: UNSDF (India): By 2022, environmental and natural resource management (NRM) is strengthened and communities have increased access to clean energy and are more resilient to climate change and disaster risks **Intended Outcome of the ISA:** Pilot projects installed and institutional capacities strengthened for the development and implementation of solar energy projects in ISA Member Countries, enabling un-served, vulnerable communities to access clean, affordable, reliable and sustainable energy to support decent employment and standards of living.
Outcome indicators as stated in the UNSDF/country programmes, including baseline and targets: **UNSDF/CPD (India):** Enhanced energy access within vulnerable communities. **Project outcome indicators (Pilot - Programme on Scaling Solar Applications for Agricultural Use):** Test new and innovative deployment models for Solar Water Pumps, that can be replicated and scaled, to support national plans for sustainable development. **Baseline:** 0; **Target:** 4 GEN 2: Number of women (direct/indirect) will be significantly benefitted in the pilot project
Applicable Output(s) from the UNDP Strategic Plan:

[16] Multiple countries/IPs can contribute to the same output and can share the same indicators. UNDP publishes its project information (indicators, baselines, targets and results) to meet the International Aid Transparency Initiative (IATI) standards. Make sure that indicators are S.M.A.R.T. (Specific, Measurable, Attainable, Relevant and Time-bound), provide accurate baselines and targets underpinned by reliable evidence and data, and avoid acronyms so that external audience clearly understand the results of the project.

Accelerating structural transformations for sustainable development, especially through innovative solutions that have multiplier effects across the Sustainable Development Goals 2.5.1.1 Number of countries with strengthened capacities for achieving energy transformation at scale: Indicative Output(s) with gender marker: GEN 2[17]								
Project title and Atlas Project Number: ISA – Scaling Solar for Agricultural Use (xxxxxx)								
EXPECTED OUTPUTS	**OUTPUT INDICATORS[18]**	**DATA SOURCE**	**BASELINE**		**TARGETS (by frequency of data collection)**			**DATA COLLECTION METHODS & RISKS**
			Value	**Year**	**Year 1**	**Year 2**	**FINAL**	
Output 1 Local demand, capacities; deployment models and implementation partners assessed and finalized in ten identified Pilot Countries.	1.1 Number of pilot project countries that have completed Feasibility and Capacity Assessment	Data aggregated from key national stakeholders through interviews, surveys and questionnaires ; from a range of primary and	0	2021	10	0	10 (ten) Feasibility and Capacity Assessment Reports that provide firm demand (project locations and beneficiaries), deployment models and	Local implementation partners will be authorized to confirm the results of the feasibility studies and establish if project beneficiaries

[17] Gender Marker Score 2 for projects that will contribute significantly to gender equality.

		secondary research data sources; and tools such as GIS, spatial analysis mapping and remote sensing.					capacity gaps for SWP deployment	and deployment models chosen are in accordance with the project outcomes.
Output 2 Solar water pumps for agricultural use installed, using sustainable, new and innovative deployment models, in each of the pilot countries. Gender marker: GEN 2	2.1 Number of solar-based irrigation systems installed, with project support [and capacity (in kw)]. **UNDP Strategic Plan IRRF Output Indicator 2.5.1.c.** Growth in installed base of power generation from clean and/or renewable energy sources	Data aggregated from different sources including key national government stakeholders, technology vendors and local implementation partners.	0	2021	At least 120 Solar based Irrigation systems installed in 6 countries [450 kWp installed]	At least 76 Solar based Irrigation systems installed in 4 countries [312 kWp installed]	At least 196 SWPs installed in 10 countries, using new and innovative deployment models. --	Installations of SWPs and ancillary systems will be tracked by the PMU, at various stages and through various sources, including project reports submitted by implementing partners. Since no prior systems of reporting exist in the countries, there is
	2.2 Number of project beneficiaries, in each		0	2021	At least 120 direct project	At least 76 direct project	Approximately 196 direct project	

	of the pilot countries disaggregated by 1. <u>direct beneficiaries</u> - women farmer: - men farmer: 2. <u>indirect beneficiaries</u> - women farmer: - men farmer:				beneficiaries in the 6 pilot countries. *NOTE: The other indicators will be established during the feasibility study.*	beneficiaries in the 4 pilot countries *NOTE: The other indicators will be established during the feasibility study.*	beneficiaries in 10 countries, cumulatively	considerable risk associated with the quantity and quality of ground-level data available. Therefore, efforts will be made to establish structured data collection, reporting mechanisms and verify information with assistance from the implementation partners.
	2.3 **UNDP Strategic Plan IRRF Output Indicator 2 .5.1 b.** Solutions applied at scale to accelerate transition to improved energy efficiency and clean energy.		0	2021	At least 2 new and innovative deployment models	At least 2 new and innovative deployment models	At least 4 new and innovative deployment models	
	2.4 Percentage reduction in per kW cost for installation of SWPs .		0	2021	Current local market rate to be established during the feasibility study (per kW cost)	Target rate to be at least 25% lower than local market costs, as determined in the	TBD	

						baseline study.		
Output 3 **Local ecosystem enabled and strengthened for deployment of solar water pumps and other solar energy applications** Gender marker: GEN 2	3.1 Number of countries with strengthened capacities for achieving energy transformation at scale	Information will be gathered in questionnaires from NFPs and relevant Ministry (ies). Additionally, Relevant Annual Reports of Lead Ministries and other National and International research documents will also be consulted.	0	2021	0	At least one new solar pumping scale up programme identified or designed in each of the 10 target countries	A total of 10 solar water pumping scale-up programmes designed	Lead Ministry will also be consulted to confirm/update information..
	3.2 Number of individuals (men and women) trained to install, operate and service solar water pumps; and also on	Comprehensive records will be maintained by the National Trianing Institute (s)	0	2021	At least 150 individuals trained.	At least 250 individuals trained.	At least 10 trainings, covering at least 400 individuals	ISA will maintain records of participants to its range of online training

	business development and financing for solar water pump deployment.	and ISA for all trainings conducted under the aegis of the pilot proejct on SSAAU.						and in-person trainings. NFPs will track any other trainings at the National Training Institute. Additionally, participants/trainees will be requested to fill a feedback form.
Output 4: Knowledge generated and disseminated on sustainable operation of SWPs and ancillary technologies through lessons and learning documentation and knowledge exchange events	4.1 Number of technical briefing notes/good practices documents developed on improving cost-efficiency and project effectiveness, in SWP deployment.	ISA, UNDP CO and local implementation partners will develop relevant projects documentation, especially collating good practices and key learnings.	0	2021	0	At least 10 reports produced (one form each target country) documenting the planning, implementation, partnerships, and scale up potential	All 10 country reports will be collated and key learnings will be summarized succinctly.	Further, ISA, will convert the aforementioned information into effective knowledge product to be added to its and disseminate it. ISA will track project documentation and readership.

	4.2 Number of knowledge exchange events conducted such as workshops, seminars and roundtables.	ISA, National government stakeholders and national trainings institute will maintain records of knowledge exchange events conducted.	0	2021	2 knowledge exchange events organized	3 knowledge exchange events organized	5 knowledge exchange events organized over two years	Records on knowledge exchange events at ISA will be used to validate results.

MONITORING AND EVALUATION

In accordance with UNDP's programming policies and procedures, the project will be monitored through the following monitoring and evaluation plans: *[Note: monitoring and evaluation plans should be adapted to project context, as needed]*

Monitoring Plan

Monitoring Activity	Purpose	Frequency	Expected Action	Partners (if joint)	Cost (if any)
Track Results Progress	Progress data against the results indicators in the RRF will be collected and analysed to assess the progress of the project in achieving the agreed outputs	Quarterly and Annually	Results progress reports will be submitted to the IBSA Fund Board of Directors through its Secretariat at the UN Office for South-South Cooperation (UNOSSC). Slower than expected progress or any deviations will be addressed by the PMU, under guidance from the IBSA board, PSC and country stakeholders including NFPs and country offices.	The PMU and UNDP CO will track and compile project progress reports in association with Lead Ministry (ies) and national implementation partners.	
Monitor and Manage Risk	Specific risks will be identified that may threaten achievement of intended results, identify and monitor risk management actions using a risk log including monitoring measures and plans required as per UNDP's Social and Environmental Standards. Audits will be conducted in accordance with UNDP's audit policy to manage financial risk.	Quarterly	Risks will be identified by the PMU and actions taken to manage risk. The risk log is actively maintained to keep track of identified risks and actions taken.	PMU will maintain the risk log, updating it with inputs from national implementation partners	
Learn	Knowledge, good practices and lessons will be documented regularly, as well as actively	Bi- annually	Relevant lessons will be collated and captured regularly, as well as actively	PMU assistance from country	

	sourced from other projects and partners and integrated back into the project.		sourced from other project partners and integrated back into the project to inform management decisions ISA with assistance from the National Implementation Partners will also develop knowledge products from the learnings in this pilot project, making them publicly available on their information portal	stakeholders including NFPs, UNDP CO and national implementation partners. ISA will build on these to develop knowlwedg products.	
Annual Project Quality Assurance	The quality of the project will be assessed against UNDP's quality standards to identify project strengths and weaknesses and to inform management decision making to improve the project. These will also be essential to inform following ISA programmes, including the expansion of the pilot stage of SSAAU.	Annually	Areas of strength and weakness will be reviewed by PMU and used to inform decisions to improve project performance.	Suggestions will be drawn from PSC and other country stakeholders including NFPs, UNDP CO and national implementation agencies	
Review and Make Course Corrections	Internal review of data and evidence from all monitoring actions including field visits, compliance and extensive project reporting. These will be documented in regular project progress reports to inform decision making.	Bi- annually	The PMU will develop project reports, which will include updates on budgets and timelines for activities as detailed in the AWP to determine any deviations on project outcomes and results. Performance data, risks, lessons and quality will be evaluated by the project	All reviews will be conducted by country stakeholders including NFPs, UNDP CO and national	NA

			steering committee and used to make course corrections.	implementation agencies	
Project Progress Report	A progress report will be presented to the Project Steering Committee and key stakeholders, consisting of progress data showing the results achieved against pre-defined annual targets at the output level, the annual project quality rating summary, an updated risk long with mitigation measures, and any evaluation or review reports prepared over the period.	Bi-annually, and at the end of the project (final report)	Reports will be compiled by country stakeholders including NFPs, UNDP CO and national implementation agencies, to be submitted to the UN Office for South-South Cooperation (UNOSSC).	National implementing agencies/partners will be crucial for field data on project progress. Data to be verified by UNDP CO.	
Project Review (Project Steering Committee)	The project's governance mechanism (i.e., project steering committee) will hold regular project reviews to assess the performance of the project and review the Multi-Year Work Plan to ensure realistic budgeting over the life of the project. In the project's final year, the Project Steering Committee shall hold an end-of project review to capture lessons learned and discuss opportunities for scaling up and to socialize project results and lessons learned with relevant audiences..	Biannually	Any quality concerns or slower than expected progress shall be discussed by the PSC and management actions agreed to address the issues identified.	Suggestions will be drawn from country stakeholders including NFPs, UNDP CO and national implementation partners	NA

Evaluation Plan[19]

Evaluation Title	Partners (if joint)	Related Strategic Plan Output	UNSDF/CPD Outcome	Planned Completion Date	Key Evaluation Stakeholders	Cost and Source of Funding
Final Evaluation	UNDP CO through a national consultant/contractor will conduct a final evaluation assisted outputs and outcomes and overseen by programme staff with inputs from country stakeholders including NFPs, Lead Ministry and national implementation partners.	Accelerating structural transformations for sustainable development, especially through innovative solutions that have multiplier effects across the Sustainable Development Goals	By 2022, environmental and natural resource management (NRM) is strengthened and communities have increased access to clean energy and are more resilient to climate change and disaster risks	Quarter 8 / Year 2	Beneficiaries and implementation partners	USD 70,000

[19] Optional, if needed

MULTI-YEAR WORK PLAN BY PARTNER COUNTRY[2021]

A separate, subsidiary multi-year work plan must be prepared for each partner country with an Implementing Partner. ***Only the contribution by one country/IP should be present in any one subsidiary work plan.*** *Joint results are included in the joint Results Framework. All workplans together will yield the joint results framework. The respective work plans may be annexed to the project document. All anticipated programmatic and operational costs to support the project, including development effectiveness and implementation support arrangements, need to be identified, estimated and fully costed in the project budget under the relevant output(s).*

EXPECTED OUTPUTS	PLANNED ACTIVITIES	Planned Budget by Year		RESPONSIBLE PARTY	PLANNED BUDGET		
		Y1	Y2		Funding Source	Budget Description	Amount ($)
Output 1: Local demand, capacities; deployment models and implementation partners assessed and finalized in ten identified Pilot Countries. Indicator : XXX Basline: XXX	1.1 Develop detailed questionnaires to garner understanding of ground-capacity through responses from a wide range of key country stakeholders.			UNDP CO	IBSA	The PMU will develop a standardized information format to determine institutional, technical and financial capacity	
	1.2 On ground assessments to firm demand for solar water pumps, and identify project sites to pilot solar water pumps in each of the 10 countries			UNDP CO	IBSA	UNDP CO procures contractual services, with support from UNDP India.	

[20] Cost definitions and classifications for programme and development effectiveness costs to be charged to the project are defined in the Executive Board decision DP/2010/32

[21] Changes to a project budget affecting the scope (outputs), completion date, or total estimated project costs require a formal budget revision that must be signed by the project board. In other cases, the UNDP programme manager alone may sign the revision provided the other signatories have no objection. This procedure may be applied for example when the purpose of the revision is only to re-phase activities among years.

Traget : XXX	1.2.1 Senegal	25,000					
	1.2.2 Mali	25,000					
	1.2.3 Niger	25,000					
	1.2.4 Republic of Benin	25,000					
	1.2.5 Togo	25,000					
	1.2.6 Uganda	25,000					
	1.2.7 Democratic Republic of the Congo	25,000					250,000
	1.2.8 Republic of Sudan	25,000					
	1.2.9 South Sudan	25,000					
	1.2.10 Tuvalu	25,000					
	1.3 Deployment models identified for each of the SWPs, considering a combination of financial and implementation modalities based on local socio-economic circumstances and requirements [gender involvement] in each of the 10 countries			UNDP CO	IBSA	UNDP CO in consultation Lead Ministry (ies) and PMU will identify the most suitable deployment modalities for implementation.	
	MONITORING: Ensure feasibility studies have been conducted and successfully determined key implementation modalities for all 10 countries	20,000		UNDP COs		UNDP COs will apprise the PMU of the completion of activities under Output 1.	20,000

	Sub-Total for Output 1						2,70,000
Output 2: Solar water pumps for agricultural use installed, using sustainable and innovative deployment models, in each of the pilot countries. Gender marker: GEN 2	2.1 Project beneficiaries and locations selected to pilot SWPs and ancillary technologies to enable environmentally benign technology for irrigation, in each of the 10 countries			UNDP CREE/PSU		UNDP CREE/PSU	
	2.2 Specification, procurement, and installation of pilot solar water pumps in each of the 10 countries. Training of local support staff for post-installation services.			UNDP CREE/PSU	IBSA	UNDP CREE will contract externl vendors through an international, transparent bidding process. The project vendors will deploy solar water pumps in identified pilot locations, under the guidance of UNDP CO	1,250,000
	2.2.1 Senegal	125000					
	2.2.2 Mali	125000					
	2.2.3 Niger	125000					
	2.2.4 Republic of Benin	125000					
	2.2.5 Togo	125000					
	2.2.6 Uganda	125000					
	2.2.7 Democratic Republic of the Congo		125000				
	2.2.8 Republic of Sudan		125000				
	2.2.9 South Sudan		125000				

	2.2.10 Tuvalu		125000				
	MONITORING: Successful deployment and ensure prolonged operational performance.	20000	15000	UNDP CO	IBSA	UNDP CO will apprise the PMU of the completion of activities under Output 1	35,000
	Sub-Total for Output 2						12,85,000
Output 3: **Local ecosystem enabled and strengthened for deployment of solar water pumps and other solar energy applications** Gender marker: GEN 2	3.1 Training for specialized engineers and extension staff from lead ministry(ies) aimed at building local technical expertise to size, install and service solar energy applications.	20000	30000	UNDP CO	IBSA	Training workshops and other capacity building modules	1,00,000
	3.2 Trainings and capacity building exercises for national/regional banks to finance solar water pump deployment.	20000	30000	UNDP CO	IBSA	Training workshops and other capacity building modules	
	MONITORING: Ensure each of the pilot project sites have sufficient technical and financial support to ensure continued operations and timely maintenance.	5000	5000	UNDP CO	IBSA	UNDP CO will apprise the PMU of the completion of activities under Output 1	10,000
	Sub-Total for Output 3						1,10,000

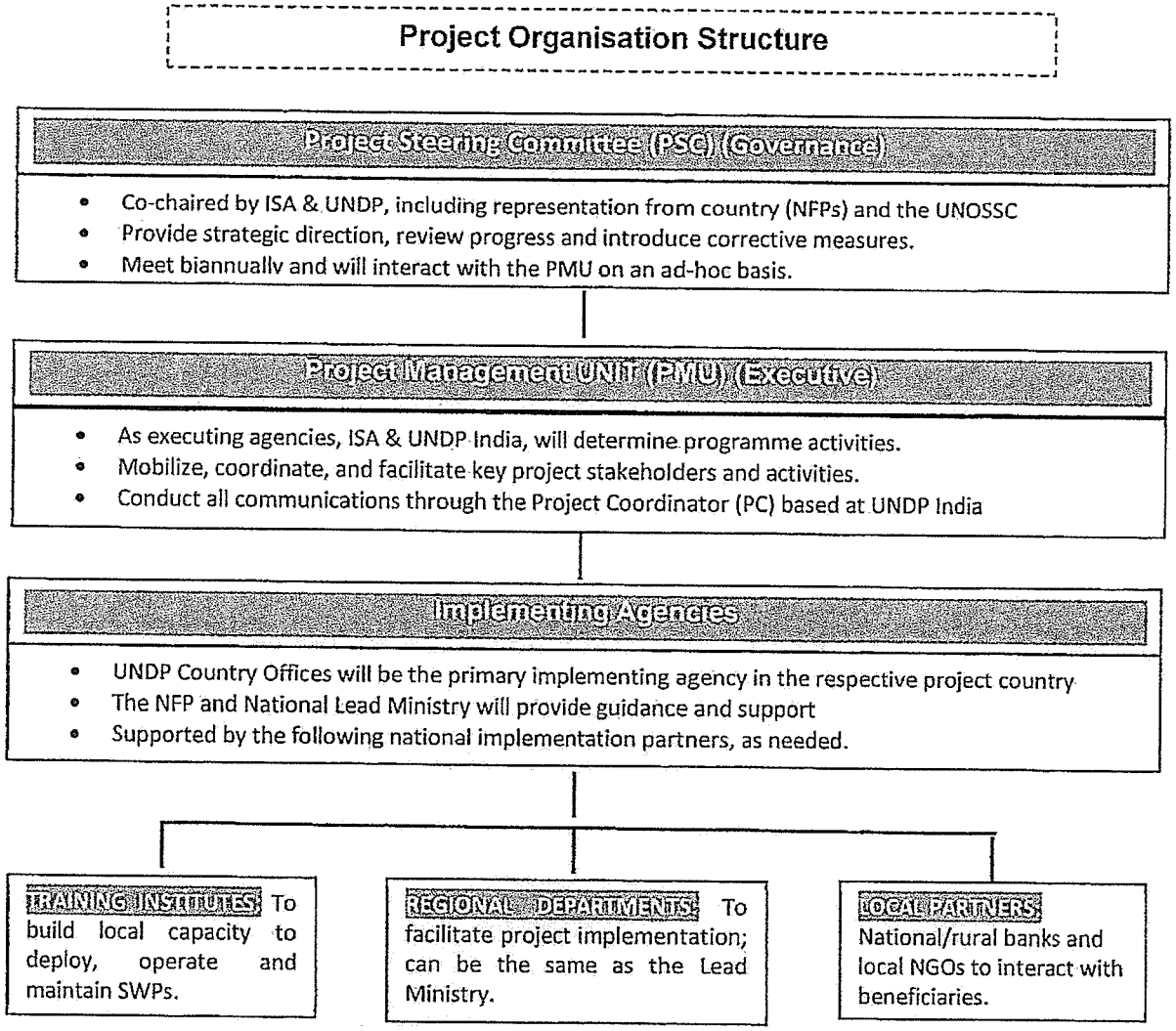
Output 4: Knowledge generated and disseminated on sustainable operation of SWPs and ancillary technologies through lessons and learning documentation and knowledge exchange events	4.1 A comprehensive report documenting SSAAU pilot project implementation, including SWP deployment modalities, benefits of ancillary technologies, sustainable agricultural practices and lessons learned etc.			UNDP CO	IBSA	UNDP CO will summarize all activities in consultation Lead Ministry and NFP. Knowledge Management Products will be compiled by PMU for dissemination across ISA Member Countries	1,00,000
	4.1.1 Senegal	10,000					
	4.1.2 Mali	10,000					
	4.1.3 Niger		10,000				
	4.1.4 Republic of Benin		10,000				
	4.1.5 Togo		10,000				
	4.1.6 Uganda		10,000				
	4.1.7 Democratic Republic of the Congo		10,000				
	4.1.8 Republic of Sudan		10,000				
	4.1.9 South Sudan		10,000				
	4.1.10 Tuvalu		10,000				
	MONITORING: Ensure each of the pilot countries have developed quality knowledge products and diseeminated information effectively to key stakeholders.		10,000	UNDP CO	IBSA	PMU will track and compile knowledge management activities and products, provided by UNDP CO.	10,000
	Sub-Total for Output 3						1,10,000

Final Evaluation	UNDP CO through a national consultant/contractor assisted with inputs from country stakeholders including NFPs, Lead Ministry and national implementation partners. PMU through a national consultant with inputs from country stakeholders including NFPs, UNDP CO and national implementation partners, Reviewed and revised by UNOSSC before submission to IBSA Board.		70000	UNDP COs	IBSA	Independent Evalautor will assess: 1. Progress on project implementation - effectiveness and efficiency of the project activities 2. Risks to project sustainability, 3. Social and environmental risks 4. Gender equity; 5. Country ownership 6. Innovativeness towards low-emission and climate resilient development pathways; 7. Replication and scalability – the extent to which the activities can be scaled up in other locations within the country or replicated in other countries	70,000
	PMU costs (Personnel and associated costs) for providing implementation support, coordinating activities and developing project reports	29,875	29,875	UNDP India	IBSA	Contractual services	59,750
	General Management Support			UNDP	IBSA		95,250
TOTAL							19,04,750

GOVERNANCE AND MANAGEMENT ARRANGEMENTS

There is one joint multi-country project board for a multi-country project. Explain the roles and responsibilities of the parties involved in governing and managing the project. While an example diagram is below, it is not required to follow this diagram exactly. Other project requirements should also be done jointly to the extent possible, such as a joint LPAC and joint reporting.

Minimum requirements for a project's governance arrangements include stakeholder representation (i.e., UNDP, national partners, beneficiary representatives, donors, etc.) with authority to make decisions regarding the project. Describe how target groups will be engaged in decision making for the project, to ensure their voice and participation. The project's management arrangements must include, at minimum, a project manager and project assurance for each participating country that advises the project governance mechanism. One office is selected as the project coordinating office to coordinate the management of the project. This section should specify the minimum frequency the governance mechanism will convene (i.e., at least annually.)



Programme Steering Committee (PSC): The key role of Programme Steering Committee would be to provide timely guidance and strategic direction to the Executing agencies. The PSC would also be tasked with review and monitoring the progress of the project and provide inputs to achieve the desired outputs in a temaily fashion. To fulfil its role it is envisaged that the PSC would be meeting twice in a year.

Project Management Unit (PMU): The Project Management Unit will be the main part of the Project Organization responsible for managing the project and implementing it through the respective UNDP Country Offices. The PMU will be set up in UNDP India and will work in conjunction with representatives from ISA. The PMU will be staffed with a Project Coordinator. The Project Coordinator's would be responsible for:

- Compiling joint project reports, with specific inputs from each partner country
- Facilitating communication and coordination among partners
- Preparing for and convening project steering committee meetings
- Facilitating joint activities, as needed, and
- Coordinating and commissioning project evaluations.

Communicating between the various stakeholders, especially between PMU, PSC and UNDP COsThe PMU will also employ the services of UNDP CREE to facilitate the procurement, delivery and sustainable operations of of SWP systems in respective countries, to achieve Output 2.

Implementing Agencies: The UNDP COs will be responsible for project implementation in the respective countries. They will ensure technical and cost efficiency in both installation and continuous operation of the SWPs. UNDP CO, working in conjunction with the Lead Ministry would be responsible for overall project implementation that would include inter-alia facilitating a feasibility study, define deployment (business models) and financial (mode of payments) modalities, and project implementation partners - vendors, farmer cooperatives, non-governmental organizations, banks etc pertinent to the pilot phase of the ISA programme on SSAAU. The UNDP CO will:

- Employ experts to facilitate a Feasibility Study, to contribute to Output 1
- Engage with local implementation partners as suggested in the feasibility study
- Facilitate awareness and capacity building within beneficiary communities to contribute to Output 3.
- Assist in project documentation to highlight activities, progress, successes and learnings, to contribute to Output 4.
- Perform quality assurance of the project following UNDP procedure at the design, implementation and closure stages.

National Lead Ministry: The UNDP CO will work closely with the focal or Lead Ministry as nominated by Government to deliver the project. UNDP CO will consult the Lead Ministry at every stage of project implementation. Since the aim is to scale solar energy applications in the member countries, the Lead Ministry will ensure that the projects are in line with National targets; and also collaboratively develop sound policies and regulations for solar energy. It will also use this opportunity to capitalize

- on the plethora of knowledge on solar energy to define policy, regulation, subsidy etc;
- on the feasibility study to determine in-country end-use demands from other sectors, e.g. solar pumping for drinking water, roof-top solar, etc;
- on the ISA platform (experts and knowledge products) to train local labour and develop skilled capacity to support future deployment of solar energy applications.

LEGAL CONTEXT

[NOTE: Please choose out of the following options, as applicable to the countries participating in the multi-country project. If there are different contexts, preface each with the country name to which the clauses apply. Delete all other options from the document]

Option c. For Global and Regional Projects

This project forms part of an overall programmatic framework under which several separate associated country level activities will be implemented. When assistance and support services are provided from this Project to the associated country level activities, this document shall be the "Project Document" instrument referred to in: (i) the respective signed SBAAs for the specific countries; or (ii) in the Supplemental Provisions to the Project Document attached to the Project Document in cases where the recipient country has not signed an SBAA with UNDP, attached hereto and forming an integral part hereof. All references in the SBAA to "Executing Agency" shall be deemed to refer to "Implementing Partner."

This project will be executed by ISA and UNDP India ("Programme Management Unit"/ executive partners) in accordance with its financial regulations, rules, practices and procedures only to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP. Where the financial governance of an Executive Partner does not provide the required guidance to ensure best value for money, fairness, integrity, transparency, and effective international competition, the financial governance of UNDP shall apply.

RISK MANAGEMENT

[NOTE: Please choose the option that corresponds to the implementation modality of the Project. Delete all other options.]

Option b. UNDP (DIM)

UNDP (Direct Implementation Modality)

1. UNDP Country Offices as the Implementing Partners will comply with the policies, procedures and practices of the United Nations Security Management System (UNSMS.)

2. UNDP as the Executive Partner will undertake all reasonable efforts to ensure that none of the [project funds][22] [UNDP funds received pursuant to the Project Document][23] 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/sc/committees/1267/aq_sanctions_list.shtml. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

[22] To be used where UNDP is the Implementing Partner

[23] To be used where the UN, a UN fund/programme or a specialized agency is the Implementing Partner

3. Social and environmental sustainability will be enhanced through application of the UNDP Social and Environmental Standards (http://www.undp.org/ses) and related Accountability Mechanism (http://www.undp.org/secu-srm).

4. UNDP as the Executive Partner will: (a) conduct project and programme-related activities in a manner consistent with the UNDP Social and Environmental Standards, (b) implement any management or mitigation plan prepared for the project or programme to comply with such standards, and (c) engage in a constructive and timely manner to address any concerns and complaints raised through the Accountability Mechanism. UNDP will seek to ensure that communities and other project stakeholders are informed of and have access to the Accountability Mechanism.

5. All signatories to the Project Document shall cooperate in good faith with any exercise to evaluate any programme or project-related commitments or compliance with the UNDP Social and Environmental Standards. This includes providing access to project sites, relevant personnel, information, and documentation.

6. UNDP as the Executive Partner will ensure that the following obligations are binding on each responsible party, subcontractor and sub-recipient:

    a. Consistent with the Article III of the SBAA *[or the Supplemental Provisions to the Project Document]*, the responsibility for the safety and security of each responsible party, subcontractor and sub-recipient and its personnel and property, and of UNDP's property in such responsible party's, subcontractor's and sub-recipient's custody, rests with such responsible party, subcontractor and sub-recipient. To this end, each responsible party, subcontractor and sub-recipient shall:
        i. 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;
        ii. assume all risks and liabilities related to such responsible party's, subcontractor's and sub-recipient's security, and the full implementation of the security plan.

    b. 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 responsible party's, subcontractor's and sub-recipient's obligations under this Project Document.

    c. Each responsible party, subcontractor and sub-recipient will take appropriate steps to prevent misuse of funds, fraud or corruption, by its officials, consultants, subcontractors and sub-recipients in implementing the project or programme or using the UNDP funds. It will ensure that its financial management, anti-corruption and anti-fraud policies are in place and enforced for all funding received from or through UNDP.

d. The requirements of the following documents, then in force at the time of signature of the Project Document, apply to each responsible party, subcontractor and sub-recipient: (a) UNDP Policy on Fraud and other Corrupt Practices and (b) UNDP Office of Audit and Investigations Investigation Guidelines. Each responsible party, subcontractor and sub-recipient agrees to the requirements of the above documents, which are an integral part of this Project Document and are available online at www.undp.org.

e. In the event that an investigation is required, UNDP will conduct investigations relating to any aspect of UNDP programmes and projects. Each responsible party, subcontractor and sub-recipient will provide its full cooperation, including making available personnel, relevant documentation, and granting access to its (and its consultants', subcontractors' and sub-recipients') premises, for such purposes at reasonable times and on reasonable conditions as may be required for the purpose of an investigation. Should there be a limitation in meeting this obligation, UNDP shall consult with it to find a solution.

f. Each responsible party, subcontractor and sub-recipient will promptly inform UNDP as the Executive Partner in case of any incidence of inappropriate use of funds, or credible allegation of fraud or corruption with due confidentiality.

   Where it becomes aware that a UNDP project or activity, in whole or in part, is the focus of investigation for alleged fraud/corruption, each responsible party, subcontractor and sub-recipient will inform the UNDP Resident Representative/Head of Office, who will promptly inform UNDP's Office of Audit and Investigations (OAI). It will provide regular updates to the head of UNDP in the country and OAI of the status of, and actions relating to, such investigation.

g. UNDP will be entitled to a refund from the responsible party, subcontractor or sub-recipient of any funds provided that have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of the Project Document. Such amount may be deducted by UNDP from any payment due to the responsible party, subcontractor or sub-recipient under this or any other agreement.

   Where such funds have not been refunded to UNDP, the responsible party, subcontractor or sub-recipient agrees that donors to UNDP (including the Government) whose funding is the source, in whole or in part, of the funds for the activities under this Project Document, may seek recourse to such responsible party, subcontractor or sub-recipient for the recovery of any funds determined by UNDP to have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of the Project Document.

Note: The term "Project Document" as used in this clause shall be deemed to include any relevant subsidiary agreement further to the Project Document, including those with responsible parties, subcontractors and sub-recipients.

h. Each contract issued by the responsible party, subcontractor or sub-recipient in connection with this Project Document shall include a provision representing that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the proposal, have been given, received, or promised in connection with the selection process or in contract execution, and that the recipient of funds from it shall cooperate with any and all investigations and post-payment audits.

i. Should UNDP refer to the relevant national authorities for appropriate legal action any alleged wrongdoing relating to the project or programme, the Government will ensure that the relevant national authorities shall actively investigate the same and take appropriate legal action against all individuals found to have participated in the wrongdoing, recover and return any recovered funds to UNDP.

j. Each responsible party, subcontractor and sub-recipient shall ensure that all of its obligations set forth under this section entitled "Risk Management" are passed on to its subcontractors and sub-recipients and that all the clauses under this section entitled "Risk Management Standard Clauses" are adequately reflected, *mutatis mutandis*, in all its sub-contracts or sub-agreements entered into further to this Project Document.

Special Clauses. In case of government cost-sharing/financing through the project, the following clauses should be included:

1. The schedule of payments and UNDP bank account details.
2. The value of the payment, if made in a currency other than United States dollars, shall be determined by applying the United Nations operational rate of exchange in effect on the date of payment. Should there be a change in the United Nations operational rate of exchange prior to the full utilization by the UNDP of the payment, the value of the balance of funds still held at that time will be adjusted accordingly. If, in such a case, a loss in the value of the balance of funds is recorded, UNDP shall inform the Government with a view to determining whether any further financing could be provided by the Government. Should such further financing not be available, the assistance to be provided to the project may be reduced, suspended or terminated by UNDP.
3. The above schedule of payments takes into account the requirement that the payments shall be made in advance of the implementation of planned activities. It may be amended to be consistent with the progress of project delivery.
4. UNDP shall receive and administer the payment in accordance with the regulations, rules and directives of UNDP.

5. All financial accounts and statements shall be expressed in United States dollars.

6. If unforeseen increases in expenditures or commitments are expected or realized (whether owing to inflationary factors, fluctuation in exchange rates or unforeseen contingencies), UNDP shall submit to the government on a timely basis a supplementary estimate showing the further financing that will be necessary. The Government shall use its best endeavours to obtain the additional funds required.

7. If the payments referred above are not received in accordance with the payment schedule, or if the additional financing required in accordance with paragraph [] above is not forthcoming from the Government or other sources, the assistance to be provided to the project under this Agreement may be reduced, suspended or terminated by UNDP.

8. Any interest income attributable to the contribution shall be credited to UNDP Account and shall be utilized in accordance with established UNDP procedures.

   In accordance with the decisions and directives of UNDP's Executive Board:

   The contribution shall be charged:

   a. [5%] cost recovery for the provision of general management support (GMS) by UNDP headquarters and country offices

   b. Direct cost for implementation support services (ISS) provided by UNDP and/or an executing entity/implementing partner.

9. Ownership of equipment, supplies and other properties financed from the contribution shall vest in UNDP. Matters relating to the transfer of ownership by UNDP shall be determined in accordance with the relevant policies and procedures of UNDP.

10. The contribution shall be subject exclusively to the internal and external auditing procedures provided for in the financial regulations, rules and directives of UNDP."

ANNEXES

1. **Project Quality Assurance Report (please prepare design QA along with tthis Prodoc)**

2. **Social and Environmental Screening Template .(please prepare SES Doc)**

3. **Risk Analysis.** Use the standard Risk Log template. Please refer to the **Deliverable Description of the Risk Log** for instructions

4. **Capacity Assessment:** Results of capacity assessments of Implementing Partner (including HACT Micro Assessment): *If required this will be done post the Country-specific Detailed Feasibility and Capacity Assessmemnt study*

5. **Project Board Terms of Reference and TORs of key management positions** – To be developed later in consultation with respective UNDP COs and ISA

6. **Country wise demand for solar water pumps, in response to ISA call for EOI.**

7. **Solar Water Pump – Business Models**

8. **Member Country Profiles**

Annexure 1

PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

NOTE: THE PROJECT QA ASSESSMENT WILL BE FINALIZED FOLLOWING OUTPUT 1: FEASIBILITY STUDY

OVERALL PROJECT

EXEMPLARY (5) ⚉⚉⚉⚉⚉	HIGHLY SATISFACTORY (4) ⚉⚉⚉⚉○	SATISFACTORY (3) ⚉⚉⚉○○	NEEDS IMPROVEMENT (2) ⚉⚉○○○	INADEQUATE (1) ⚉○○○○
At least four criteria are rated Exemplary, and all criteria are rated High or Exemplary.	All criteria are rated Satisfactory or higher, and at least four criteria are rated High or Exemplary.	At least six criteria are rated Satisfactory or higher, and only one may be rated Needs Improvement. The Principled criterion must be rated Satisfactory or above.	At least three criteria are rated Satisfactory or higher, and only four criteria may be rated Needs Improvement.	One or more criteria are rated Inadequate, or five or more criteria are rated Needs Improvement.

DECISION

- APPROVE – the project is of sufficient quality to be approved in its current form. Any management actions must be addressed in a timely manner.
- APPROVE WITH QUALIFICATIONS – the project has issues that must be addressed before the project document can be approved. Any management actions must be addressed in a timely manner.
- DISAPPROVE – the project has significant issues that should prevent the project from being approved as drafted.

RATING CRITERIA

For all questions, select the option that best reflects the project

STRATEGIC

1. Does the project specify how it will contribute to higher level change through linkage to the programme's Theory of Change? • 3: The project is clearly linked to the programme's theory of change. It has an explicit change pathway that explains how the project will contribute to outcome level change and why the project's strategy will likely lead to this change. This analysis is backed by credible evidence of what works effectively in this context and includes assumptions and risks. • 2: The project is clearly linked to the programme's theory of change. It has a change pathway that explains how the project will contribute to outcome-level change and why the project strategy will likely lead to this change. • 1: The project document may describe in generic terms how the project will contribute to development results, without an explicit link to the programme's theory of change. **Note: Projects not contributing to a programme must have a project-specific Theory of Change. See alternative question under the lightbulb for these cases.*	3 | 2 | 1 **Evidence:** Through demonstration of new and innovative deployment models for solar irrigation, the project will simultaneously address three interrelated challenges, namely increasing agricultural productivity and incomes in a sustainable manner, building resilience to the effects of climate change, while contributing to climate change mitigation. The project will also focus on building local capacity and establishing framework to aid the scale-up of solar energy applications. NOTE: Further elaborated in the ProDoc.
2. Is the project aligned with the UNDP Strategic Plan? • 3: The project responds to at least one of the development settings as specified in the Strategic Plan[24] and adapts at least one Signature Solution[25]. The project's RRF includes all the relevant SP output indicators. *(all must be true)*	3 | 2 | 1 **Evidence:** The project outputs are closely aligned to SP Outcome 2: "Accelerating structural transformations for sustainable development, especially through innovative solutions that have multiplier effects across the Sustainable Development Goals". Moreover,

[24] The three development settings in UNDP's 2018-2021 Strategic Plan are: a) Eradicate poverty in all its forms and dimensions; b) Accelerate structural transformations for sustainable development; and c) Build resilience to shocks and crises

[25] The six Signature Solutions of UNDP's 2018-2021 Strategic Plan are: a) Keeping people out of

PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

NOTE: THE PROJECT QA ASSESSMENT WILL BE FINALIZED FOLLOWING OUTPUT 1: FEASIBILITY STUDY

• 2: The project responds to at least one of the development settings as specified in the Strategic Plan[4]. The project's RRF includes at least one SP output indicator, if relevant. *(both must be true)* • 1: The project responds to a partner's identified need, but this need falls outside of the UNDP Strategic Plan. Also select this option if none of the relevant SP indicators are included in the RRF.	the results framework includes output indicators that are reflective Integrated Results and Resources Framework detailed under the SP 2018-2021. NOTE: Further elaborated in the Multi-Country Results Framework section of the Project Document.

3. Is the project linked to the programme outputs? (i.e., UNDAF Results Group Workplan/CPD, RPD or Strategic Plan IRRF for global projects/strategic interventions not part of a programme)	Yes	No

RELEVANT

4. Does the project target groups left furthest behind? • 3: The target groups are clearly specified, prioritising discriminated and marginalized groups left furthest behind, identified through a rigorous process based on evidence. • 2: The target groups are clearly specified, prioritizing groups left furthest behind. • 1: The target groups are not clearly specified. *Note: Management Action must be taken for a score of 1. *Projects that build institutional capacity should still identify targeted groups to justify support*	3 / 2 / 1 **Evidence:** Beneficiary communities will be selected based on their vulnerabilities, typically small/marginal land holders with the aim to reduce poverty and inequality in accordance with government plans for development. These beneficiaries would be identified through a collaborative process among the various project stakeholders, agreeing, where appropriate, on ways for benefit-sharing. A well defined criteria for identification and selection of beneficiaries will be adopted that would include inter-alia– land owned (area), household head (male/female), previous ownership of diesel pump, etc. These criteria would also differ based on the deployment model selected. Similarly, gender inequalities will be addressed by ensuring that a significant number of the beneficiaries will be women. NOTE: Beneficiaries will be confirmed by the UNDP CO following a feasibility study, which will engage communities, the local administration as well as local implementation partners.
5. Have knowledge, good practices, and past lessons learned of UNDP and others informed the project design? • 3: Knowledge and lessons learned backed by credible evidence from sources such as evaluation, corporate policies/strategies, and/or monitoring have been explicitly used, with appropriate referencing, to justify the approach used by the project. • 2: The project design mentions knowledge and lessons learned backed by evidence/sources, but have not been used to justify the approach selected. • 1: There is little or no mention of knowledge and lessons learned informing the project design. Any references made are anecdotal and not backed by evidence.	3 / 2 / 1 **Evidence:** The Project Document was developed on the basis of the UNDP Multi-Country Project Framework. Moreover, project details were ironed out in collaboration with executive partners, ISA, and with UNDP headquarters – who in their right are experienced solar irrigation project experts. UNDP in-house experts were consulted for the various sections of the Project Document to ensure that the project met the guidelines and standards of UNDP.

poverty; b) Strengthen effective, inclusive and accountable governance; c) Enhance national prevention and recovery capacities for resilient societies; d) Promote nature based solutions for a sustainable planet; e) Close the energy gap; and f) Strengthen gender equality and the empowerment of women and girls.

PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

NOTE: THE PROJECT QA ASSESSMENT WILL BE FINALIZED FOLLOWING OUTPUT 1: FEASIBILITY STUDY

*Note: Management Action or strong management justification must be given for a score of 1	Additionally, UNDP India and ISA conducted meetings the UNDP Country Offices and National Focal Points in the Lead Ministries (most relevant Ministry) to include project suggestions and make relevant edits.
6. Does UNDP have a clear advantage to engage in the role envisioned by the project vis-à-vis national/regional/global partners and other actors? • 3: An analysis has been conducted on the role of other partners in the area where the project intends to work, and credible evidence supports the proposed engagement of UNDP and partners through the project, including identification of potential funding partners. It is clear how results achieved by partners will complement the project's intended results and a communication strategy is in place to communicate results and raise visibility vis-à-vis key partners. Options for south-south and triangular cooperation have been considered, as appropriate. *(all must be true)* • 2: Some analysis has been conducted on the role of other partners in the area where the project intends to work, and relatively limited evidence supports the proposed engagement of and division of labour between UNDP and partners through the project, with unclear funding and communications strategies or plans. • 1: No clear analysis has been conducted on the role of other partners in the area that the project intends to work. There is risk that the project overlaps and/or does not coordinate with partners' interventions in this area. Options for south-south and triangular cooperation have not been considered, despite its potential relevance. *Note: Management Action or strong management justification must be given for a score of 1	3 | 2 | 1 **Evidence:** The project in ideated on the principles of South-South Cooperation, where international, national and local partners will be mobilized to aid project implementation. Though the roles and responsibilities of the international and national partners have been penned, identification of local partners and their activities can only be detailed following a feasibility study. Local implementation partners will be determined, based on the beneficiaries, deployment models for solar irrigation and local capacity. They will be chosen by the UNDP CO in consultation the Lead Ministry and the local implementation partners.
PRINCIPLED	
7. Does the project apply a human rights-based approach? • 3: The project is guided by human rights and incorporates the principles of accountability, meaningful participation, and non-discrimination in the project's strategy. The project upholds the relevant international and national laws and standards. Any potential adverse impacts on enjoyment of human rights were rigorously identified and assessed as relevant, with appropriate mitigation and management measures incorporated into project design and budget. *(all must be true)* • 2: The project is guided by human rights by prioritizing accountability, meaningful participation and non-discrimination. Potential adverse impacts on enjoyment of human rights were identified and assessed as relevant, and appropriate mitigation and management measures incorporated into the project design and budget. *(both must be true)* • 1: No evidence that the project is guided by human rights. Limited or no evidence that potential adverse impacts on enjoyment of human rights were considered. *Note: Management action or strong management justification must be given for a score of 1	3 | 2 | 1 **Evidence:** Selection of beneficiaries will follow a human rights based approach, in that it will negotiate terms for fair benefit -sharing to ensure that the benefits of the solar pumping systems are shared amongst the community in an equitable manner. This collaborative decision making to develop a community water resource management will ensure that there are minimal or no conflicts of interest amongst the community – especially between the beneficiary farmers and other farmers. Additionally, project implementation will be combined with the establishment of complaint redressal systems, offering beneficiaries and non-beneficiaries with pathways to raise complaints with both the Lead Ministry and the UNDP CO. Moreover, the project document development will follow UNDP guidelines to assess the possibility of any such risks and adopt suggested management measures.
8. Does the project use gender analysis in the project design?	3 | 2 | 1

PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

NOTE: THE PROJECT QA ASSESSMENT WILL BE FINALIZED FOLLOWING OUTPUT 1: FEASIBILITY STUDY

• 3: A participatory gender analysis has been conducted and results from this gender analysis inform the development challenge, strategy and expected results sections of the project document. Outputs and indicators of the results framework include explicit references to gender equality, and specific indicators measure and monitor results to ensure women are fully benefitting from the project. *(all must be true)* • 2: A basic gender analysis has been carried out and results from this analysis are scattered (i.e., fragmented and not consistent) across the development challenge and strategy sections of the project document. The results framework may include some gender sensitive outputs and/or activities but gender inequalities are not consistently integrated across each output. *(all must be true)* • 1: The project design may or may not mention information and/or data on the differential impact of the project's development situation on gender relations, women and men, but the gender inequalities have not been clearly identified and reflected in the project document. *Note: Management Action or strong management justification must be given for a score of 1	**Evidence:** Selection of beneficiaries will consider GEN2 gender marker of the envisioned project, which translates to significant contribution towards gender equality. In the project, the activities will aim to benefit equal number of women as men, offering them ownership of assists and technical training. NOTE: A comprehensive gender analysis will be done following the feasibility study, if pertinent.
9. Did the project support the resilience and sustainability of societies and/or ecosystems? • 3: Credible evidence that the project addresses sustainability and resilience dimensions of development challenges, which are integrated in the project strategy and design. The project reflects the interconnections between the social, economic and environmental dimensions of sustainable development. Relevant shocks, hazards and adverse social and environmental impacts have been identified and rigorously assessed with appropriate management and mitigation measures incorporated into project design and budget. *(all must be true).* • 2: The project design integrates sustainability and resilience dimensions of development challenges. Relevant shocks, hazards and adverse social and environmental impacts have been identified and assessed, and relevant management and mitigation measures incorporated into project design and budget. *(both must be true)* • 1: Sustainability and resilience dimensions and impacts were not adequately considered. *Note: Management action or strong management justification must be given for a score of 1	3 | 2 | 1 **Evidence:** At the food-water-energy nexus, the ISA programme on SSAAU will aim to ensure sustainable agricultural interventions that increase food security, efficient use of water and clean energy use. Solar based irrigation is a coherent solution to seemingly disparate issues, plaguing the farmers of the world, including improved livelihoods and poverty alleviation. It will strengthen delivery of the 2030 sustainable development agenda, specifically advancing the following sustainable development goals (SDGs): 7. **SDG #1**: End poverty in all its forms everywhere 8. **SDG #2**: End hunger, achieve food security and improved nutrition and promote sustainable agriculture 9. **SDG #7**: Ensure access to affordable, reliable, sustainable and modern energy for all. 10. **SDG #8**: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. 11. **SDG #11**: Make cities and human settlements inclusive, safe, resilient and sustainable 12. **SDG #13**: Take urgent action to combat climate change and its impact
10. Has the Social and Environmental Screening Procedure (SESP) been conducted to identify potential social and environmental impacts and risks? The SESP is not required for projects in which UNDP is Administrative Agent only and/or projects comprised solely of reports,	Yes | No An overall Project wide SESP has been developed. Country-wise SESPs will be

PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

NOTE: THE PROJECT QA ASSESSMENT WILL BE FINALIZED FOLLOWING OUTPUT 1: FEASIBILITY STUDY

coordination of events, trainings, workshops, meetings, conferences and/or communication materials and information dissemination. [if yes, upload the completed checklist. If SESP is not required, provide the reason for the exemption in the evidence section.]	conducted along with the Detailed Feasibility and Capacity Assessment Study for each country.

MANAGEMENT & MONITORING

11. Does the project have a strong results framework? • 3: The project's selection of outputs and activities are at an appropriate level. Outputs are accompanied by SMART, results-oriented indicators that measure the key expected development changes, each with credible data sources and populated baselines and targets, including gender sensitive, target group focused, sex-disaggregated indicators where appropriate. *(all must be true)* • 2: The project's selection of outputs and activities are at an appropriate level. Outputs are accompanied by SMART, results-oriented indicators, but baselines, targets and data sources may not yet be fully specified. Some use of target group focused, sex-disaggregated indicators, as appropriate. *(all must be true)* • 1: The project's selection of outputs and activities are not at an appropriate level; outputs are not accompanied by SMART, results-oriented indicators that measure the expected change and have not been populated with baselines and targets; data sources are not specified, and/or no gender sensitive, sex-disaggregation of indicators. *(if any is true)* *Note: Management Action or strong management justification must be given for a score of 1	3 | 2 1 **Evidence:** The project document is built on the backbone of UNDP's Multi-Country Results Framework. Therefore SMART outputs, result-oriented indicators (target group focused, sex-disaggregated) have been clearly defined. Rough estimates for baselines, targets and data sources have also been provided, these will be firmed up by the UNDP CO, after the feasibility study, in consultation with Lead Ministry and local implementation partners.
12. Is the project's governance mechanism clearly defined in the project document, including composition of the project board? • 3: The project's governance mechanism is fully defined. Individuals have been specified for each position in the governance mechanism (especially all members of the project board.) Project Board members have agreed on their roles and responsibilities as specified in the terms of reference. The ToR of the project board has been attached to the project document. *(all must be true).* • 2: The project's governance mechanism is defined; specific institutions are noted as holding key governance roles, but individuals may not have been specified yet. The project document lists the most important responsibilities of the project board, project director/manager and quality assurance roles. *(all must be true)* • 1: The project's governance mechanism is loosely defined in the project document, only mentioning key roles that will need to be filled at a later date. No information on the responsibilities of key positions in the governance mechanism is provided. *Note: Management Action or strong management justification must be given for a score of 1	3 | 2 1 **Evidence:** Project Organization Structure is detailed in the project document. Key executive and implementation partners have been identified. UNDP India and ISA are in the process of meeting and apprising these identified partners of the project activities and gaining their backing. NOTE: The Project will invariably require local implementation support, their wider roles and responsibilities have been listed but their need will differ from beneficiary location to location, and with the deployment model adopted. Therefore, these local implementation partners will only be identified following the feasibility study after the project beneficiaries have been identified.
13. Have the project risks been identified with clear plans stated to manage and mitigate each risk? • 3: Project risks related to the achievement of results are fully described in the project risk log, based on comprehensive analysis drawing on the programme's theory of change, Social and Environmental Standards and screening, situation analysis, capacity assessments and other analysis such as funding potential and reputational risk. Risks have been identified through a consultative process with key internal and external stakeholders. Clear and complete plan in place to manage and mitigate	3 | 2 1 **Evidence:** Possible project risks have been identified based on key learnings from other similar projects, accounting for both extraneous risks and project-led risks that could impact the long-term sustainability of the project. The risk log was developed in consultation with the executive partners, based on their learnings from previous projects. Similar UNDP projects in various geographies were also consulted to

PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

NOTE: THE PROJECT QA ASSESSMENT WILL BE FINALIZED FOLLOWING OUTPUT 1: FEASIBILITY STUDY

each risk, reflected in project budgeting and monitoring plans. *(both must be true)* • 2: Project risks related to the achievement of results are identified in the initial project risk log based on a minimum level of analysis and consultation, with mitigation measures identified for each risk. • 1: Some risks may be identified in the initial project risk log, but no evidence of consultation or analysis and no clear risk mitigation measures identified. This option is also selected if risks are not clearly identified and/or no initial risk log is included with the project document. *Note: Management Action must be taken for a score of 1	ensure comprehensiveness of risk log and relevant mitigation measures. Water extraction risks for the beneficiary communities have been assigned high-priority. The possibility of a water table study has been suggested, if required. NOTE: Further elaborated in the Risk Log of the Project Document.

EFFICIENT

14. Have specific measures for ensuring cost-efficient use of resources been explicitly mentioned as part of the project design? This can include, for example: i) using the theory of change analysis to explore different options of achieving the maximum results with the resources available; ii) using a portfolio management approach to improve cost effectiveness through synergies with other interventions; iii) through joint operations (e.g., monitoring or procurement) with other partners; iv) sharing resources or coordinating delivery with other projects, v) using innovative approaches and technologies to reduce the cost of service delivery or other types of interventions. *(Note: Evidence of at least one measure must be provided to answer yes for this question)*	Yes (3)	No (1)
	Evidence: Developed under the aegis of the larger ISA project on Scaling Solar Applications for Agricultural Use (SSAAU), the project employed the theory of change analysis to identify cost- effective activities and sustainable pathways to achieve UNDP's Strategic Plan and 2030 Agenda for SDGs. 1. The project is building on ISA's mandate to showcase benefits of demand aggregations to enable cost efficiency and quality standards. Demand aggregation can help slash procurement costs for products and post-installations services. Similar principles will be applied, where applicable, to other activities such as feasibility studies, monitoring and evaluations. 2. The project will enable demonstration installations in each of the 10 countries, where it will pilot new and innovative deployment models for solar water adoption. These can increase affordability, expand usability and scalability. It will in parallel train technical staff, skilled to manage solar water pump operations and maintenance. Local capacity can encourage project sustainability but also reduce costs of services. 3. The project will also look to combine efforts and funds from existing projects at the UNDP CO and/or the Lead Ministry.	
15. Is the budget justified and supported with valid estimates? • 3: The project's budget is at the activity level with funding sources, and is specified for the duration of the project period in a multi-year budget. Realistic resource mobilisation plans are in place to fill unfunded components. Costs are supported with valid estimates using benchmarks from similar projects or activities. Cost implications from inflation and foreign exchange exposure have been estimated and incorporated in the	3	2 1
	Evidence: The project has received in-principle funding approval, based on which the project scope and activities were framed.	

PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

NOTE: THE PROJECT QA ASSESSMENT WILL BE FINALIZED FOLLOWING OUTPUT 1: FEASIBILITY STUDY

budget. Adequate costs for monitoring, evaluation, communications and security have been incorporated. • 2: The project's budget is at the activity level with funding sources, when possible, and is specified for the duration of the project in a multi-year budget, but no funding plan is in place. Costs are supported with valid estimates based on prevailing rates. • 1: The project's budget is not specified at the activity level, and/or may not be captured in a multi-year budget.	
16. Is the Country Office/Regional Hub/Global Project fully recovering the costs involved with project implementation? • 3: The budget fully covers all project costs that are attributable to the project, including programme management and development effectiveness services related to strategic country programme planning, quality assurance, pipeline development, policy advocacy services, finance, procurement, human resources, administration, issuance of contracts, security, travel, assets, general services, information and communications based on full costing in accordance with prevailing UNDP policies (i.e., UPL, LPL.) • 2: The budget covers significant project costs that are attributable to the project based on prevailing UNDP policies (i.e., UPL, LPL) as relevant. • 1: The budget does not adequately cover project costs that are attributable to the project, and UNDP is cross-subsidizing the project. *Note: Management Action must be given for a score of 1. The budget must be revised to fully reflect the costs of implementation before the project commences.	3 | 2 1 **Evidence:** The budget accounts for all project activities (including feasibility studies; procurement of technology, installation and post-installation services; capacity building; knowledge management, monitoring and evaluation) in accordance with UNDP policies.
EFFECTIVE	
17. Have targeted groups been engaged in the design of the project? • 3: Credible evidence that all targeted groups, prioritising discriminated and marginalized populations that will be involved in or affected by the project, have been actively engaged in the design of the project. The project has an explicit strategy to identify, engage and ensure the meaningful participation of target groups as stakeholders throughout the project, including through monitoring and decision-making (e.g., representation on the project board, inclusion in samples for evaluations, etc.) • 2: Some evidence that key targeted groups have been consulted in the design of the project. • 1: No evidence of engagement with targeted groups during project design.	3 | 2 1 **Evidence:** The project will identify beneficiaries through a consultative process, ensuring beneficiary farmers are informed and interested in solar water pumps deployment for irrigation support. Beneficiaries will be confirmed by the UNDP CO and Lead Ministry following a feasibility study, which will engage communities, the local administration as well as local implementation partners. NOTE: The Feasibility study will conduct excessive consultations with concerned Ministries and departments, and with the beneficiaries and local implementation partners. Following which, the project document will be further strengthened by including specifics on project modalities.
18. Does the project plan for adaptation and course correction if regular monitoring activities, evaluation, and lesson learned demonstrate there are better approaches to achieve the intended results and/or circumstances change during implementation?	Yes (3) | No (1)
19. The gender marker for all project outputs are scored at GEN2 or GEN3, indicating that gender has been fully mainstreamed into all project outputs at a minimum. *Note: Management Action or strong management justification must be given for a score of "no"	Yes (3) | No (1) **Evidence**

PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

NOTE: THE PROJECT QA ASSESSMENT WILL BE FINALIZED FOLLOWING OUTPUT 1: FEASIBILITY STUDY

SUSTAINABILITY & NATIONAL OWNERSHIP

20. Have national/regional/global partners led, or proactively engaged in, the design of the project? • 3: National partners (or regional/global partners for regional and global projects) have full ownership of the project and led the process of the development of the project jointly with UNDP. • 2: The project has been developed by UNDP in close consultation with national/regional/global partners. • 1: The project has been developed by UNDP with limited or no engagement with national partners.	3 / 2 / 1	**Evidence:** The concept note was developed by UNDP India and ISA in response to the demands exhibited by ISA member countries, to an EOI for solar water pumps. The demand for SWPs was drawn from the NFPs of the 10 pilot countries, and they continue to be consulted and updated on the project activities. NFPs in turn mobilize the Lead Ministry, the most relevant Ministry, to draw their inputs and advice on aligning the project activities with National Plans for Development and Climate Change. NOTE: The Feasibility study will conduct excessive consultations with concerned Ministries and departments. Following which, the project document will be further strengthened by including specifics on project modalities.
21. Are key institutions and systems identified, and is there a strategy for strengthening specific/ comprehensive capacities based on capacity assessments conducted? • 3: The project has a strategy for strengthening specific capacities of national institutions and/or actors based on a completed capacity assessment. This strategy includes an approach to regularly monitor national capacities using clear indicators and rigorous methods of data collection, and adjust the strategy to strengthen national capacities accordingly. • 2: A capacity assessment has been completed. There are plans to develop a strategy to strengthen specific capacities of national institutions and/or actors based on the results of the capacity assessment. • 1: Capacity assessments have not been carried out.	3 / 2 / 1	**Evidence:** Though key institutions and systems have been identified, if needed, the HACT assessment to determine capacities, will be conducted in parallel the feasibility study and identification of beneficiary locations.
22. Is there is a clear strategy embedded in the project specifying how the project will use national systems (i.e., procurement, monitoring, evaluations, etc.,) to the extent possible?	Yes (3)	No (1)
23. Is there a clear transition arrangement/ phase-out plan developed with key stakeholders in order to sustain or scale up results (including resource mobilisation and communications strategy)?	Yes (3)	No (1)

Annexure 2

SOCIAL AND ENVIRONMENTAL SCREENING TEMPLATE (2021 SESP TEMPLATE, VERSION 1)

The completed template, which constitutes the Social and Environmental Screening Report, must be included as an annex to the Project Document at the design stage.

NOTE: COUNTRY-WISE SOCIAL AND ENVIRONMENTAL SCREENING REPORT WILL BE DEVELOPED FOLLOWING PROJECT OUTPUT 1: FEASIBILITY STUDY

Project Information

Project Information	
1. Project Title	Scaling Solar Applications for Agricultural Use
2. Project Number (i.e. Atlas project ID, PIMS+)	
3. Location (Global/Region/Country)	Global
4. Project stage (Design or Implementation)	Design
5. Date	28/03/2021

Part A. Integrating Programming Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Programming Principles in Order to Strengthen Social and Environmental Sustainability?
Briefly describe in the space below how the project mainstreams the human rights-based approach
The overall aim of the ISA – UNDP pilot project on Scaling Solar for Agricultural Use (SSAAU) is to enable access of uninterrupted irrigation to marginalized and vulnerable farmers, as identified by the national governments, with solar powered pumps. The programme will tackle the twin problem of poverty and climate change in the agricultural sector, which employs as much as 40% (2.5 billion people) of the world's population. Most are small and subsistence farmers who lack access to "coping mechanisms" to adapt to pervasive poverty and climate change. The SSAAU project will consciously adopt a human rights-based approach to ensure that interventions seeking to alleviate poverty can have positive implications in building climate resilience. The project will consistently strive to align project activities with the overall goal of human development as elaborated under the UN Charter, the Universal Declaration of Human Rights and subsequent legally binding human rights conventions/treaties. Moreover, it will follow a participatory approach where beneficiaries and project stakeholders will help determine deployment modalities.

Through solar water pumps, the SSAAU pilot project will equip these farmers with modes of clean, reliable and sustainable irrigation to help support and increase their agricultural productivity. Traditional modes of irrigation are experiencing considerable strain due to climate change – increasing temperature and depleting water resources. For most, agriculture remains the only source of livelihood and hence their only avenue for economic development. By ensuring the right to decent work, the project also presents an opportunity to raise standards of living and other essential social services, thereby promising an all-round human development which also assures basic rights to freedom, well-being and dignity. Further, when solar water pumps are not used for irrigation, the solar energy generated can be utilised either for household loads or even create additional opportunities for livelihoods and incomes, thereby holding an enormous potential for poverty alleviation, social mobilization and rural development.

Lastly, in addition to providing pilot installations of solar water pumps, the project will simultaneously help participating countries, primarily least developed/developing countries, strengthen local technical and institutional capacities for solar energy programmes. By adopting the aforementioned approach, the pilot phase of the SSAAU programme will help tackle some fundamental bottlenecks in pilot countries, additionally providing tools and trainings to scale solar energy applications.

Briefly describe in the space below how the project is likely to improve gender equality and women's empowerment

In most of the developing countries, women undertake or have a majority share in agriculture-related activities and responsibilities. Moreover, they bear the brunt of poverty and are often excluded from being decision-makers in the developmental processes. In Africa and large parts of Asia, women constitute the majority of the agricultural labour force in small-scale and subsistence farming. Women also are more severely affected across the different indices of multidimensional poverty. Solar-powered irrigation would help reduce labour intensity of agricultural production, freeing up time and energy for women to engage in other productive activities. Scattered examples show that when women contribute to households' income, they tend to gain more bargaining power in decision-making. Additionally, women's incomes will help rural families raise their standard of living, particularly benefitting children.

Agricultural productions have witnessed a slump in the last few years, contributing to an uptick in instances of hunger. The Food and Agriculture Organization (FAO) estimates that 690 million people are undernourished, of which one-fifth are on the edge of starvation, primarily women and children. Therefore the project will also address issues of food security and help improve levels of nutrition, at the point of production.

Briefly describe in the space below how the project mainstreams sustainability and resilience

Globally, the agricultural sector is reeling under the destabilizing effects of climate change, resulting in a visible decline in global food production. Today millions of individuals (primarily children) remain undernourished, with this representing just one of many poverty-driven deprivations in the Global South. A majority of the food producers at the forefront of this challenge are small-scale, subsistence farmers who rely largely on rainfed irrigation. They remain unprepared for the unpredictable weather patterns and unequipped for the added stress on the local irrigation systems.

These vulnerabilities are exacerbated without access to sustainable and resilient and climate change mitigating technology.

Clean, cost effective and reliable solar water pumps (SWPs) can help scale agricultural production sustainably, while also addressing climate change mitigation and community resilience. They are quickly replacing diesel pumps as the preferred source of irrigation given their efficiency, cost-effectiveness and relatively easy operations. Moreover, successful installations of decentralized solar water pumps in varying geographies across the globe have showcased a myriad of socio-economic co-benefits, especially when deployment models are adapted to the local context. New and innovative business (deployment) models like pay-per-use (energy service company) or pay-as-you-go (PAYGo) remove the burden of large upfront cost therefore increasing affordability. More importantly, models can be tailored to encourage efficient water management and prevent excessive groundwater withdrawal, by incentivizing sale of excess energy and/or pumped water.

Therefore, the project will serve to reduce GHG emissions through the adoption of solar water pumps, and when combined with efficient irrigation practices can improve water use efficiency.

Briefly describe in the space below how the project strengthens accountability to stakeholders

UNDP India, as the primary executing agency will uphold the principles of accountability and the rule of law, participation and inclusion and equality and non-discrimination and ensure meaningful, effective and informed participation of all key stakeholders including the beneficiaries in project formulation, implementation, monitoring and evaluation. The project will ensure accountability in line with the UNDP commitment to mainstream social and environmental sustainability in our Programmes and Projects. It will do so through:

- A Compliance Review to respond to claims that UNDP is not in compliance with applicable environmental and social policies;
- A Stakeholder Response Mechanism (SRM) that ensures individuals, peoples, and communities affected by projects have access to appropriate grievance resolution procedures for hearing and addressing project-related complaints and disputes

The standardized framework established under the UNDP's Social and Environmental Standards (SES) objectives are to:

- Strengthen the quality of programming by ensuring a principled approach
- Maximize social and environmental opportunities and benefits
- Avoid adverse impacts to people and the environment
- Minimize, mitigate, and manage adverse impacts where avoidance is not possible
- Strengthen UNDP and partner capacities for managing social and environmental risks
- Ensure full and effective stakeholder engagement, including through a mechanism to respond to complaints from project-affected people.

Part B. Identifying and Managing Social and Environmental Risks

QUESTION 2: What are the Potential Social and Environmental Risks? *Note: Complete SESP Attachment 1 before responding to Question 2.*	**QUESTION 3: What is the level of significance of the potential social and environmental risks?** *Note: Respond to Questions 4 and 5below before proceeding to Question 5*			**QUESTION 6: Describe the assessment and management measures for each risk rated Moderate, Substantial or High**
Risk Description (broken down by event, cause, impact)	***Impact and***	***Significance***	***Comments (optional)***	***Description of assessment and management measures for risks***

	Likelihood (1-5)	***(Low, Moderate Substantial, High)***		***rated as Moderate, Substantial or High***
Risk 1: The project aims to deploy decentralized solar water pumps to beneficiaries who rely on rainfed agriculture or as a replacement for diesel pumps. Solar powered irrigation is an effective mitigation and adaptation strategy to the counter the increasing climate change risks faced by the beneficiaries. However, a large portion of these will pump from the steadily depleting ground water reserves, posing a significant risk.	Impact (I) = 3 Probability (P) = 2 Risk Category = L/M		1. Environmental Risk 2. Ground water extraction 3. Soil degradation or compaction	Though use of water pumps for irrigation can lead to excessive ground water extraction, solar powered pumps are also self-limiting as they function only during the day. Therefore, the risk posed is classified as low to moderate. Moreover, most of these solar pumps will either be replacing diesel pumps or will be installed at locations already having bore-holes. Thus the pumps installed under SSAAU do not pose additional risks To further ensure sustainable irrigation, the project includes a significant component on facilitating efficient irrigation techniques and water conserving agricultural practices accompanied by awareness raising activities.
Risk 2: Technology risk is primarily linked to the quality of products and vendors in the member countries. Lack of technical specifications and standards for solar water pumps can burden farms/beneficiaries with substandard products yet high recurring payments,	Impact (I) = 3 Probability (P) = 1 Risk Category – L/M		Operational Risk 1. Technology Risk 2. Human Resource Risk 3. Institutional/ Execution Capacity Risk 4. Governance Risk	To counter the technology risks, UNDP will procure the technology through a standard tendering process which would ensure technical quality, training to users and maintenance for a specific time period. Further a targeted capacity building strategy will enhance and strengthen institutional and technical capacities in

forcing them to revert to other modes of irrigation. An extension of the technology risk, is the absence of experienced capacity to plan, finance and implement solar water pumps projects These constraints can pose a range of operational challenges, for example, in the event of machinery breakdown and downtime, it might take days and even weeks to repair in the absence of locally available skilled technicians. Moreover, difficulty in finding suitable skilled technicians can significantly inhibit any future projects on solar energy.			5. Processes and Procedures Risk 6. Accountability and Compensation 7. Institutional Arrangements	the target countries to develop standards, technical specifications, repair and maintenance capacities for solar pump components and sub-components. Towards this, it will train key departments, organizations and entities. The project has a specific component on building requisite technical capacities and strengthening local institutions train/upgrade the skills of professionals to provide necessary certified services for standardization of goods and services as per international standards of quality and technical capacity capable of sizing, installing and servicing solar water pumps.
	QUESTION 4: What is the overall project risk categorization?			
	Low Risk		☐	
	Moderate Risk		☐	The primary risk is the environmental risk that the project faces, specifically water extraction and soil degradation. The project will aim to raise awareness and facilitate the adoption of efficient

			irrigation practices to mitigate the risk. A feasibility study will be undertaken to study in detail the available water resource and propose appropriate deployment and installation models. It will also put in place water conversation and sustainable irrigation measures. Given that the project will not seek to establish water pumps in new locations, but only where there is already bore holes, there is very little risk related to land use, indigenous or other. For all other risks, the project has taken pre-emptive steps and will continue to monitor and manage them through various levels of project management.
	Substantial Risk		
	High Risk		
	Questions only required for Moderate, Substantial and High-Risk projects		**Comments**
	Principle 1: Human Rights	☐	
	Principle 2: Gender Equality and Women's Empowerment	☐	
	1.Biodiversity Conservation and Natural Resource Management	☐	
	2.Climate Change Mitigation and Adaptation	☐	
	3.Community Health, Safety and Working Conditions	☐	

	4.Cultural Heritage	☐		
	5.Displacement and Resettlement	☐		
	6.Indigenous Peoples	☐		
	7.Pollution Prevention and Resource Efficiency	☐		
	Is assessment required? (check if "yes")			
	if yes, indicate overall type and status ***Are management plans required? (check if "yes)***	X		***Status? (completed, planned)***
		X	**Targeted assessment(s)** Water resources assessment in project locations (national, sub-national and site-specific if need be) to be conducted in locations with over-extraction problematics.	To be completed during site assessments (feasibility studies to include water extraction risks to aquifer resources)
	if yes, indicate overall type and status ***Are management plans required? (check if "yes)***	☐	ESIA (Environmental and Social Impact Assessment)	
	If yes, indicate overall type	☐	SESA (Strategic Environmental and Social Assessment)	
	If yes, indicate overall type ***Based on identified risks, which Principles/Project-level Standards triggered?***	☐	Targeted management plans (e.g. Gender Action Plan, Emergency Response Plan, Waste Management Plan, others)	

	If yes, indicate overall type ***Based on identified <u>risks</u>, which Principles/Project-level Standards triggered?***	☐	ESMP (Environmental and Social Management Plan which may include range of targeted plans)	
		☐	ESMF (Environmental and Social Management Framework)	
	Overarching Principle: Leave No One Behind			
	Human Rights	☐		
	Principle 1: Gender Equality and Women's Empowerment	☐	The project will ensure that certain percentage of project beneficiaries are women, who are actively engaged in project formulation, implementation and awarded ownership rights.	
	Principle 2: Accountability	☐	The project will define a redressal system where beneficiaries and other key implementation partners can raise complaints and realize quick redressals	
	1. Biodiversity Conservation and Sustainable Natural Resource Management	☐	The project will be accompanied by water conservation and efficient irrigation practices, which will contribute to more sustainable/rational resource consumption.	
	2. Climate Change and Disaster Risks	☐	The project seeks to replace diesel by a non-GHG emitting solutions, while also increasing the resilience of water extraction systems to supply chain disruptions (of Diesel supply)	
	3. Community Health, Safety and Security	☐	By reducing the usage of diesel, the project will contribute to lowering particulate emissions associated with inefficient diesel engines	

	4. Cultural Heritage	☐	-
	5. Displacement and Resettlement	☐	-
	6. Indigenous Peoples	☐	-
	7. Labour and Working Conditions	☐	-
	8. Pollution Prevention and Resource Efficiency	☐	Project will reduce particulate pollution, GHG pollution as well as noise pollution

Final Sign Off

Final Screening at the design-stage is not complete until the following signatures are included

Signature	*Date*	*Description*
QA Assessor		UNDP staff member responsible for the project, typically a UNDP Programme Officer. Final signature confirms they have "checked" to ensure that the SESP is adequately conducted.
QA Approver		UNDP senior manager, typically the UNDP Deputy Country Director (DCD), Country Director (CD), Deputy Resident Representative (DRR), or Resident Representative (RR). The QA Approver cannot also be the QA Assessor. Final signature confirms they have "cleared" the SESP prior to submittal to the PAC.
PAC Chair		UNDP chair of the PAC. In some cases PAC Chair may also be the QA Approver. Final signature confirms that the SESP was considered as part of the project appraisal and considered in recommendations of the PAC.

Checklist Potential Social and Environmental Risks	
INSTRUCTIONS: The risk screening checklist will assist in answering Questions 2-6 of the Screening Template. Answers to the checklist questions help to (1) identify potential risks, (2) determine the overall risk categorization of the project, and (3) determine required level of assessment and management measures. Refer to the SES toolkit for further guidance on addressing screening questions.	
Overarching Principle: Leave No One Behind **Human Rights**	Answer (Yes/No)
P.1 Have local communities or individuals raised human rights concerns regarding the project (e.g. during the stakeholder engagement process, grievance processes, public statements)?	*No*
P.2 Is there a risk that duty-bearers (e.g. government agencies) do not have the capacity to meet their obligations in the project?	*Yes*
P.3 Is there a risk that rights-holders (e.g. project-affected persons) do not have the capacity to claim their rights?	*No*
Would the project potentially involve or lead to:	
P.4 adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	*No*
P.5 inequitable or discriminatory impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups, including persons with disabilities?[26]	*No*
P.6 restrictions in availability, quality of and/or access to resources or basic services, in particular to marginalized individuals or groups, including persons with disabilities?	*No*
P.7 exacerbation of conflicts among and/or the risk of violence to project-affected communities and individuals?	*No*
Gender Equality and Women's Empowerment	
P.8 Have women's groups/leaders raised gender equality concerns regarding the project, (e.g. during the stakeholder engagement process, grievance processes, public statements)?	*No*
Would the project potentially involve or lead to:	
P.9 adverse impacts on gender equality and/or the situation of women and girls?	*No*
P.10 reproducing discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	*No*

[26] Prohibited grounds of discrimination include race, ethnicity, sex, age, language, disability, sexual orientation, gender identity, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender and transsexual people.

P.11 limitations on women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? *For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being*	*No*
P.12 exacerbation of risks of gender-based violence? *For example, through the influx of workers to a community, changes in community and household power dynamics, increased exposure to unsafe public places and/or transport, etc.*	*No*
Sustainability and Resilience: Screening questions regarding risks associated with sustainability and resilience are encompassed by the Standard-specific questions below	
Accountability	
Would the project potentially involve or lead to:	
P.13 exclusion of any potentially affected stakeholders, in particular marginalized groups and excluded individuals (including persons with disabilities), from fully participating in decisions that may affect them?	*No*
P.14 grievances or objections from potentially affected stakeholders?	*No*
P.15 risks of retaliation or reprisals against stakeholders who express concerns or grievances, or who seek to participate in or to obtain information on the project?	*No*
Project-Level Standards	
Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management	
Would the project potentially involve or lead to:	
1.1 adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services? *For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes*	*No*
1.2 activities within or adjacent to critical habitats and/or environmentally sensitive areas, including (but not limited to) legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	*No*
1.3 changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	*No*
1.4 risks to endangered species (e.g. reduction, encroachment on habitat)?	*No*
1.5 exacerbation of illegal wildlife trade?	*No*
1.6 introduction of invasive alien species?	*No*
1.7 adverse impacts on soils?	*No*
1.8 harvesting of natural forests, plantation development, or reforestation?	*No*
1.9 significant agricultural production?	*Yes*
1.10 animal husbandry or harvesting of fish populations or other aquatic species?	*No*
1.11 significant extraction, diversion or containment of surface or ground water?	*No*

	For example, construction of dams, reservoirs, river basin developments, groundwater extraction	
1.12	handling or utilization of genetically modified organisms/living modified organisms?[27]	*No*
1.13	utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)[28]	*No*
1.14	adverse transboundary or global environmental concerns?	*No*
Standard 2: Climate Change and Disaster Risks		
Would the project potentially involve or lead to:		
2.1	areas subject to hazards such as earthquakes, floods, landslides, severe winds, storm surges, tsunami or volcanic eruptions?	*No*
2.2	outputs and outcomes sensitive or vulnerable to potential impacts of climate change or disasters? *For example, through increased precipitation, drought, temperature, salinity, extreme events, earthquakes*	*No*
2.3	increases in vulnerability to climate change impacts or disaster risks now or in the future (also known as maladaptive or negative coping practices)? *For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding*	*No*
2.4	increases of greenhouse gas emissions, black carbon emissions or other drivers of climate change?	*No*
Standard 3: Community Health, Safety and Security		
Would the project potentially involve or lead to:		
3.1	construction and/or infrastructure development (e.g. roads, buildings, dams)? (Note: the GEF does not finance projects that would involve the construction or rehabilitation of large or complex dams)	*No*
3.2	air pollution, noise, vibration, traffic, injuries, physical hazards, poor surface water quality due to runoff, erosion, sanitation?	*No*
3.3	harm or losses due to failure of structural elements of the project (e.g. collapse of buildings or infrastructure)?	*No*
3.4	risks of water-borne or other vector-borne diseases (e.g. temporary breeding habitats), communicable and noncommunicable diseases, nutritional disorders, mental health?	*No*
3.5	transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	*No*
3.6	adverse impacts on ecosystems and ecosystem services relevant to communities' health (e.g. food, surface water purification, natural buffers from flooding)?	*No*
3.7	influx of project workers to project areas?	*No*
3.8	engagement of security personnel to protect facilities and property or to support project activities?	*No*

[27] See the Convention on Biological Diversity and its Cartagena Protocol on Biosafety.

[28] See the Convention on Biological Diversity and its Nagoya Protocol on access and benefit sharing from use of genetic resources.

Standard 4: Cultural Heritage		
Would the project potentially involve or lead to:		
4.1	activities adjacent to or within a Cultural Heritage site?	*No*
4.2	significant excavations, demolitions, movement of earth, flooding or other environmental changes?	*No*
4.3	adverse impacts to sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	*No*
4.4	alterations to landscapes and natural features with cultural significance?	*No*
4.5	utilization of tangible and/or intangible forms (e.g. practices, traditional knowledge) of Cultural Heritage for commercial or other purposes?	*No*
Standard 5: Displacement and Resettlement		
Would the project potentially involve or lead to:		
5.1	temporary or permanent and full or partial physical displacement (including people without legally recognizable claims to land)?	*No*
5.2	economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	*No*
5.3	risk of forced evictions?[29]	*No*
5.4	impacts on or changes to land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources?	*No*
Standard 6: Indigenous Peoples		
Would the project potentially involve or lead to:		
6.1	areas where indigenous peoples are present (including project area of influence)?	*No*
6.2	activities located on lands and territories claimed by indigenous peoples?	*No*
6.3	impacts (positive or negative) to the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples (regardless of whether indigenous peoples possess the legal titles to such areas, whether the project is located within or outside of the lands and territories inhabited by the affected peoples, or whether the indigenous peoples are recognized as indigenous peoples by the country in question)? *If the answer to screening question 6.3 is "yes", then the potential risk impacts are considered significant and the project would be categorized as either Substantial Risk or High Risk*	*No*
6.4	the absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	*No*

[29] Forced eviction is defined here as the permanent or temporary removal against their will of individuals, families or communities from the homes and/or land which they occupy, without the provision of, and access to, appropriate forms of legal or other protection. Forced evictions constitute gross violations of a range of internationally recognized human rights.

6.5	the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	*No*
6.6	forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources? *Consider, and where appropriate ensure, consistency with the answers under Standard 5 above*	*No*
6.7	adverse impacts on the development priorities of indigenous peoples as defined by them?	*No*
6.8	risks to the physical and cultural survival of indigenous peoples?	*No*
6.9	impacts on the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices? *Consider, and where appropriate ensure, consistency with the answers under Standard 4 above.*	*No*
Standard 7: Labour and Working Conditions		
Would the project potentially involve or lead to: (note: applies to project and contractor workers)		
7.1	working conditions that do not meet national labour laws and international commitments?	*No*
7.2	working conditions that may deny freedom of association and collective bargaining?	*No*
7.3	use of child labour?	*No*
7.4	use of forced labour?	*No*
7.5	discriminatory working conditions and/or lack of equal opportunity?	*No*
7.6	occupational health and safety risks due to physical, chemical, biological and psychosocial hazards (including violence and harassment) throughout the project life-cycle?	*No*
Standard 8: Pollution Prevention and Resource Efficiency		
Would the project potentially involve or lead to:		
8.1	the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	*No*
8.2	the generation of waste (both hazardous and non-hazardous)?	*No*
8.3	the manufacture, trade, release, and/or use of hazardous materials and/or chemicals?	*No*
8.4	the use of chemicals or materials subject to international bans or phase-outs? *For example, DDT, PCBs and other chemicals listed in international conventions such as the Montreal Protocol, Minamata Convention, Basel Convention, Rotterdam Convention, Stockholm Convention*	*No*
8.5	the application of pesticides that may have a negative effect on the environment or human health?	*No*
8.6	significant consumption of raw materials, energy, and/or water?	*Yes*

Annexure 3: Risk Analysis

OFFLINE RISK LOG

(see Deliverable Description for the Risk Log regarding its purpose and use)

NOTE: COUNTRY-WISE RISK LOGS WILL BE DEVELOPED FOLLOWING PROJECT OUTPUT 1: FEASIBILITY STUDY

Project Title: Scaling Solar Applications for Agricultural Use (SSAAU)	Award ID:	Date:

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Management response	Owner	Submitted/ Updated by	Last Update	Status
1	Impacts of climate change typically manifest as increase in average temperatures; unpredictable rainfall patterns; and extreme weather events. First, the rise in temperatures would have adverse impacts on evapo-transpiration rates at water storage locations as well as on crop water requirements. Second, changes in rainfall patterns could adversely impact the rainfed agriculture – directly impacting the smallholder farming community in these least developed countries who largely practice rainfed agriculture. Moreover, climate change is also responsible for more frequent and destructive extreme weather events such as cyclones and dust storms, which also have the potential to impact Solar Water Pump (SWP) operations significantly.		Environmental Risk 3. Climate Change and Resilience Risks 4. Weather and Natural Disaster Risks	Impact (I) = 3 Probability (P) = 2 Risk Category = L/M	Irrigation is an effective adaptation strategy to the increasing risks faced by farmers reliant on rain-fed agriculture. The solar pumping technology for irrigation would be an effective mechanism to build resilience of small and marginal farmers to the impacts of climate change and is widely being proposed by respective national Governments. They have the added benefit of being a clean source of reliable energy, offering a resilient mode of climate mitigation for the agricultural sector.				

2	Political and regulatory irregularities have the ability to derail the project and render it unfeasible. Lack of Government commitment to scaling-up the use of solar energy technologies or even a different solar energy strategy could shift priorities away from the project to other developmental projects. Moreover, changes in governing policies and/or regulations could lead to delays in permits, licences, interconnections. These can impact project finances or leave the project redundant.		Political Risk 4. Government commitment 5. Political will 6. Political instability Regulatory Risks 4. Changes in the regulatory framework within the country of operation 5. Changes in the international regulatory framework affecting the whole organization 6. Deviation from UNDP internal rules and regulations Financial Risks	Impact (I) = 2 Probability (P) = 1 Risk Category = L	Stability and support from the ISA Member Country are paramount to the success of any developmental project, especially in the demonstration phase. Any lack of (or low) commitment stems from low awareness and experience of implementing solar energy projects. This would be addressed through capacity building and institutional strengthening of key departments, organizations and entities Additionally, ISA Missions to all target countries have reinforced their commitments towards implementing and scaling up of solar energy applications. However, in case of any exigencies, the demonstration project can easily be adapted and implemented in another country that has showcased interest in SWPs.				

3	In most member communities, the proposed demonstration project on solar energy for irrigation would be a relatively novel technology, Unfamiliar with the technology, new users are hesitant and even wary. Lack of project beneficiaries interest/awareness could translate to disuse, non-payment of any loans that are linked to operations, or excessive water withdrawal etc. Therefore, a key component of the project is to demonstrate solar pump technology that is right-sized and with the appropriate deployment model to meet the irrigation water requirements of different farm sizes/beneficiaries.		Counter Party/Beneficiary Risks Operational Risks 3. Technical and Infrastructure Failure Risks 4. Water-Extraction Risks	In most of the countries proposed for this demonstration Impact (I) = 4 Probability (P) = 2 Risk Category – L/M	In addition to the demonstration project, the programme will be accompanied by awareness-raising, mobilisation and capacity building programme both for beneficiaries and for the community as a whole. The project would use appropriate information tools to create awareness amongst the project beneficiaries through local agents like extension service workers, NGOs, etc., with an aim to familiarize stakeholders with solar pump technology and provide assurance of its technical and financial benefits. A combination of capacity building for project beneficiaries testing to appropriately size the pumps; and adoption of efficient, sustainable irrigation techniques will help overcome this risk.				
4	Technology risk is primarily linked to the quality of products and vendors in the member countries. Ensuring technical specifications and standards for SWP will ensure that farms/beneficiaries are not burdened with substandard products.		Operational Risk 2. Technology Risk	Impact (I) = 3 Probability (P) = 1 Risk Category – L	ISA price discovery exercise was aimed at both lowering the cost of solar pumping system as well as to standardize the goods and services provided across countries, ensuring international standards of quality for procured SWPs. The programme will also look to				

	Moreover, without the right sizing and deployment model, beneficiaries might revert to other modes of irrigation.				enhance the institutional (and technical) capacities in the target countries to develop standards and technical specifications for solar pump components, and clearance documents for solar pump components as well as sub-components.				
5	There are capacity constraints in target countries to plan, finance and implement solar water pumps projects. Project faces operational risks, for example, in the event of machinery breakdown and downtime, it might take days and even weeks to repair in the absence of locally available skilled technicians. Moreover, difficulty in finding suitable skilled technicians can significantly inhibit any future projects on solar energy.		Operational Risk 5. Human Resource Risk 6. Institutional/ Execution Capacity Risk 7. Governance Risk 8. Processes and Procedures Risk	Impact (I) = 3 Probability (P) = 2 Risk Category – L/M	In addition to demonstrating the solar pumping technology and business models, the project has a specific component on building requisite technical capacities and establish/strengthen local systems and institutions, build capacity of key stakeholders and train/upgrade the skills of professionals to provide necessary certified services. This will ensure availability of local technical expertise, capable of sizing, installing and servicing solar water pumps				
6	Though the life-cycle costs of solar PV pump are lower than that of diesel pump sets, their high initial cost is a major deterrent for project beneficiaries (especially the small and marginal farmers). In many countries, this has been addressed to		Financing Risks	Impact (I) = 2 Probability (P) = 1 Risk Category = L/M	To ensure availability of local credit, national and local banks/ financial institutions will be trained in the various aspects of financing solar energy-based applications. Moreover, this project will aim to pilot different				

	a large extent by Government subsidizing the costs. However, even with subsidies, there would be a requirement of credit – especially by the economically weaker project beneficiaries. External financial risks such as increasing interest rates, exchange rate fluctuation, inflation, currency exchange can impact the financial feasibility of the project and the country-wise budget allocation and even co-financing if needed.				business models that will test use of different financial mechanisms based on the needs of the project beneficiaries and the kinds of financial instruments available in the respective countries. Further ISA is also in the process of getting solar technology included in the concessions lists of items/equipment so as to reduce the burden of tax and customs duties on solar pump and its components, globally.				

Annex 6: Country wise demand for solar water pumps

S No	Country	Demand for Pumps
1	Democratic Republic of Congo	80,000
2	Republic of Benin	50,000
3	Republic of Sudan	50,000
4	Uganda	30,000
5	Mali	15,000
6	Niger	15,000
7	Tuvalu	10,000
8	South Sudan	6,800
9	Togo	5,000
10	Senegal	4,000
	Total	**265,800**

Annex 7: Solar Water Pump- Business Models

Not a comprehensive list, since several permutation and combinations exist based on local conditions, crop type and irrigation patterns, and any other additional social demand for water or energy.

1. Entrepreneurs Model - Under this model, one or a few farmers are offered a low-cost loan to procure solar water pumps, either individually or as a group. They can restrict solar water pump use for to self-consumption and/or offer water as a service. The ownership lies with the entrepreneurs who collect irrigation charges for irrigating other farms, based on the quantum of water consumed. In addition to servicing the loan, they must collect a maintenance fund. In India, International Water Management Institute (IWMI) together with Consultative Group on International Agricultural Research offers entrepreneurs a 40% subsidy over the low-cost loan, and Aga Khan Rural Support Program (AKRSP) acted as the executing agency.

2. Community-Model – Under this model a group of farmers, either rely on a farmer co-operative or take a shared loan to cover capital payment of the solar water pump. Therefore, the ownership can vary, based on the number of farmers, a group of farmers typically adopt a co-operative model to procure a solar water pump can be used to benefit a host of neighbouring farmlands. Under the co-operative model, ownership lies either with a farmer co-op board or the funding agency and the farmers put together a maintenance fund using their energy savings. The sharing of capital costs decreases the burden of the large capital cost; bank credit risks and the payback period. Sharing the loan burden and incentivizing water (or even energy) use ensures that both the asset and the pumped water are sustainably used.

3. Out-grower Model – Under this model, farmers are provided a loan for solar water pumps with forward contracts for pre-determined, guaranteed purchase of their harvest. Typically, this is an agri-business and a crop insurer that offer flexible financing loans, with lenient interest rates and easy pay back conditions. For example, in Ethiopia, the beneficiary can pay the commercial business directly for the irrigation equipment (and other inputs), in equated monthly instalments, at the time of harvest. Other options include deduction at the source or provision of grants that require no payback. In Kenya; for example, 60% of Kenya's tea and sugar are produced in out-grower schemes and quickly growing since the yield/production outweighs both the investments costs and the project risks.

4. Leasing to Own Model – A national development organization accumulates grants and soft term credit from international donors and development partners, and subsequently offers them to sponsors as loans to procure solar water pumps. Farmers are provided these solar water pumps on cash or credit basis and in return have to an initial installation fee for the solar water pump and an additional monthly rental fee as lease payment till ownership is passed on to the farmer. In Bangladesh, Infrastructure Development Company Limited (IDCOL) acts as the intermediary, mobilizing money from a host of entities, comprising 15% Equity, 35% Debt and 50% Grant. Suppliers are compensated to lease solar water pumps at lenient conditions (interest rate of 6% with a repayment period of 10 years).

5. Portable Solar Water Pumps Model – As the name indicates, these are solar water pumps on a motorized rickshaw that can be transported from location to location based on the irrigation demand. The farmer typically schedules an appointment with the solar water pump operator, a few days in advance, for use as per the irrigation requirement/demand. Farmer pays the service contractor for the quantum of water used of a fixed fee. Under this model, the farmer is neither responsible for the maintenance nor the operations. The portable solar water pump can be owned by a farmer entrepreneur/co-operative/organization/NGO or even the vendor/supplier of the solar water pump. This model eliminates the financial burden of capital costs and any the risk of system performance, while providing the farmer/beneficiary with the benefits of the solar water pump. The responsibility of operating and maintenance resides with the owner or a hired system operator. Assigning cost to the water used ensures sustainable use of water and the portability increases farmer reach and therefore ensures asset utilization.

6. Grid-Connected Model – Under this model, the solar water pumps are connected to the electricity grid, exporting any excess energy from solar generation. Electricity distribution companies (DISCOMs) cover the capital cost of the solar water pump and offer an incentive for the excess electricity, treating the farmers as micro-generators. Distributed generation helps save on transmission and distribution losses. Such projects are typically financed by a developmental bank or fund.

In India, the World Bank with other lending agencies have backed the Andhra Pradesh state government to enable the grid-connected solar water pumps. Farmers do not have to cover the capital investment and receive additional compensation for the electricity fed into the grid. However, they do not allow for flow back to the farmer like in a net-metered system ensuring grid-electricity is not misused. Incentivizing excess electricity generation ensures asset security and water conservation. The state government released a tender and replaced 206 inefficient AC pumps with grid-connected solar water pumps, additionally offering a 5-year insurance and warranty.

In another permutation, the Gujarat state government takes a 7 year of 65% loan from National Bank for Agriculture and Rural Development (NABARD) topped with an additional subsidy from the state government. The state government share of the loan (30%) will be serviced by the compensation for exported electricity. The farmer/beneficiary is only required to initial investment equalling 5%. The solar PV system is installed on an agricultural feeder that is kept connected for 12 hours in the daytime, allowing for export of excess electricity to the grid. The exported electricity is procured at a pre-determined rate for 25 years, capping annual export to 1000 units per kilowatt (kW). A good feed in tariff (FiT) ensures that neither energy nor water is over-used. Additionally, advanced metering systems and remote monitoring assure that solar water pumps are effectively utilized. But the feeder can only be solarized if 70% of the connected farmers/beneficiaries agree. In all models, a supplier is hired to install the system and/or a service contractor/operator is hired to ensure continuous operations, maintenance and/or irrigation fee collection.

Financing for Solar Water Pump

1. Blended Finance – Creating a technology fund with blended finance (50% grant and 50% loan) that can subsequently be utilized to support procurement either as loans through a national bank or offered to a service contractor or an operator. It can be used to replace existing diesel pumps or just the procurement of new solar water pumps. enable community-based water supply organizations. In Tanzania for instance, the Global Partnership for Results based Approaches has enabled the COWSO Renewable Energy Fund (CREF) that is used to install community based water supply organizations or offered as loans for the replacement of diesel pumps in the country. The set up of institutions and mobile banking platform have made the process easy and widely accepted.

2. Solar Loans - A new brand of loans where the monthly payments are kept below the average monthly electricity bills can encourage consumers to take up solar for water pumping. It offers beneficiaries the additional benefit of self-sufficiency and clean energy, all the while owning an asset that generates significant financial value and/or energy-bill savings. These loans can be offered via development/rural banks or even from the local government. The smaller-access based loans are gaining traction. They can have various pre-conditions, interest rates and pay back periods but are collectively called microfinance options.

Annex 8: Country Profiles

I. Business Models Mapped Country-Wise	
Country	**Business Models**
Republic of Benin	Out-Grower and Leasing
Democratic Republic of Congo (DRC)	Out-Grower and Leasing
Mali	Out-Grower and Leasing
Niger	Out-Grower and Leasing
Senegal	Leasing
South-Sudan	Out-Grower
Republic of Sudan	Out-Grower
Togo	Community-Based and Portal Model
Tuvalu	Portable, Grid-Connected, Out-Grower, and Solarizing Feeders
Uganda	Portable and Our-Grower

II. Key Development Indicators [30]

Country	GDP in US$ (GDP growth in %) 2019	Population in thousands (population growth in %)	Rural population (% of total population)	Electricity Consumption (in BU)	Access to electricity (% of population) 2018	Renewable electricity output (% of total electricity output) 2015	Solar Capacity: Solar Off-grid Capacity (in MW) 2019
Republic of Benin	14390.71 (6.9)	11801.15 (2.7)	52	1.2	41.5	5.56	2.9:1.5
Democratic Republic of Congo	47319.62 (4.4)	86790.57 (3.2)	55	7.2	19	99.82	18.9:18.9
Mali	17510.14 (5.0)	19658.03 (3.0)	57	1.4	50.9	43.52	19.6:19.6
Niger	12928.15 (5.8)	23310.72 (3.8)	83	1.1	17.6	0.75	27.1:20.1
Senegal	23578.08 (5.3)	16296.36 (2.7)	52	4	67	10.42	134:12
South-Sudan	11997.8 (-10.8)	11062.11 (0.8)	80	498 MU	28.2	0.61	0.7:0.7
Republic of Sudan	18902.28 (-2.6)	42813.24 (2.4)	65	13	59.8	64.54	18.6:18.6
Togo	5459.98 (5.3)	8082.37 (2.4)	58	1.4	51.3	75.31	3:3
Tuvalu	47.27 (9.8)	11.65 (1.2)	37	9.6 MU	100	28.17	2.2:1.4
Uganda	34387.23 (6.5)	44269.59 (3.6)	76	3	42.6	92.95	82.2:28.2

[30] https://data.worldbank.org/indicator

III. Key Agricultural Indicators						
Country	Agriculture in economy (% GDP)	Agricultural land (% of land area) 2016	Agricultural irrigated land (% of total agricultural land)	Annual freshwater withdrawals, total (% of internal resources)	Employment in agriculture, (% of male) 2020	Employment in agriculture, (% of female employment) 2020
Republic of Benin	23% of GDP	33.2 (2016)	0.3 (2008)	1 (2002)	46	30
Democratic Republic of Congo	40% of GDP	11.5 (2016)		0 (2007)	58	72
Mali	33% of GDP	33.7 (2016)		9 (2007)	62	62
Niger	40% of GDP	36 (2016)	0.2 (2018)	28 (2007)	79	69
Senegal	16.9% of GDP	46 (2016)	0.7 (2006)	9 (2002)	33	24
South-Sudan				3 (2014)	41	72
Republic of Sudan	33.3% of GDP		2.2	673 (2014)	35	53
Togo	41% of GDP	70.2 (2016)		1 (2002)	39	35
Tuvalu	NA	60 (2016)	NA	NA	NA	NA
Uganda	20% of GDP	71.8 (2016)	0.1	2 (2012)	68	77

IV. Easy of Doing Business Solar Ranking (Out of 80 countries)[31]										
Countries	Senegal	Mali	Republic of Sudan	Republic of Benin	Togo	Niger	South Sudan	Democratic Republic of Congo	Tuvalu	Uganda
Technology Feasibility	14	7	16	43	69	21	20	66	42	25
Macroeconomy	31	61	80	39	58	53	74	68	28	30
Market Maturity	26	40	66	49	70	57	76	79	24	47
Policy Enablers	20	21	77	43	51	49	79	61	47	38
Infrastructure	40	73	66	21	16	76	68	72	23	19
Financing	39	51	61	56	42	58	77	78	35	53
Energy Imperatives	36	27	11	51	32	52	45	43	61	49
World Bank EODB Score	59.3	52.9	44.8	52.4	62.3	56.8	34.6	36.2	NA	60
Ease of Doing Solar Classification	Influencer	Influencer	Potential	Progressive	Potential	Progressive	Potential	Potential	Influencer	Progressive

[31] ISA Ease of Doing Solar 2020 Report