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Consideration of funding proposals – Addendum 12

Independent Technical Advisory Panel's assessment

Summary

This addendum contains the independent Technical Advisory Panel's assessments of funding proposals (FP009-FP017) submitted for the Board's consideration at its thirteenth meeting.

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Independent Technical Advisory Panel's assessment of FP 009

Proposal Name:	Energy Savings Insurance (ESI) for Private Energy Efficiency Investments by Small and Medium-Sized Enterprises (SMEs)
Accredited Entity:	Inter-American Development Bank (IDB)
Project/Programme Size	Small

I. Assessment of performance against investment criteria

1.1 Impact potential *Scale: N/A*

1. The project presented by the Inter-American Development Bank (IDB) seeks to remove barriers that have been identified as hindering investment in energy efficiency measures and programmes in small and medium-sized enterprises (SMEs) in El Salvador. A study carried out by the country's development bank (BANDESAL) showed that great potential exists for energy efficiency in SMEs in El Salvador, but that the existence of constraints and barriers to investing in and financing energy efficiency projects in the country has so far prevented such potential being realized. Key barriers identified include:

(a) Lack of knowledge among local financial institutions (LFIs) and final beneficiaries (the SMEs) of the returns and risks associated with energy efficiency projects;

(b) Lack of trust by investors and their financiers in the capacity of energy efficiency services and technology providers (ESTPs) to deliver promised energy services;

(c) Energy efficiency projects not being a priority in the scheme of financing by LFIs; and

(d) Very limited access to finance within the country for such projects.

2. The proposed project is expected to address these barriers and the real or perceived risks through a combination of financial and non-financial instruments focused on building trust in the market for energy efficiency projects and thus resulting in catalysing and eventually scaling up SME investments in energy efficiency in the short to medium term.

3. The project-related documentation reveals that El Salvador's financial markets currently offer very limited medium- and long-term financing to SMEs to invest in productive investments, such as energy efficiency technologies; therefore, access to long-term credit has been identified as one of the most important barriers to SMEs competitiveness in the country.

4. Project cost is estimated to be USD 41.7 million, with USD 1.7 million as a non-reimbursable grant and a USD 20 million loan from the Green Climate Fund (GCF) to BANDESAL, through the IDB as an accredited entity of the GCF. The proceeds of the GCF loan will be blended with an equivalent amount of BANDESAL own resources (another USD 20 million) to structure and establish a dedicated concessional financing line, which will be available to SMEs in El Salvador through carefully selected LFIs which will make the concessional financing line available to qualified SMEs at lower interest rates (and better financing terms) than the ones currently offered in the Salvadorian financial market.

5. The impacts of these interventions are therefore expected to include:

(a) Stimulation of energy efficiency investments and the generation of a powerful demonstration effect in the local credit market;

(b) A leveraging of USD 1.5 for each USD 1.0 in financing provided by the GCF resulting from BANDESAL investments, LFIs co-financing and SMEs own capital contributions to energy efficiency projects;

(c) Tangible and measurable greenhouse gas (GHG) emission reductions from energy savings. The project is expected to deliver around 562,037 tonnes of carbon dioxide equivalent (t CO2 eq) in emission reductions over a 15-year period, or an average of 37,469 t CO2 eq per year. A review of the proposal indicated that, in the short to medium term, about 20 per cent of the universe of around 6,232 potentially eligible firms in El Salvador could be expected to reduce their energy-related emissions by 94,811 t CO2 eq annually. In the longer term, it has been estimated that, as a result of the potential replication of this project, GHG emission reductions of eligible SMEs in El Salvador could reach about 472,688 t CO2 eq annually, an amount equivalent to 8.4 per cent of the country's 2005 energy-related CO2 eq emissions (5.6 Mt CO2 eq); and

6. It is noted that the emission reduction performances quoted above are global estimates. It is expected that actual performances at the SME level on climate change emission reductions will be carried out for each SME using clear performance achievement criteria. The approaches and methodological framework used will need to be reported in a central knowledge-sharing platform, including concrete energy reduction performances and innovative technology utilization. This will enhance knowledge-sharing and the scalability of the project.

1.2 Paradigm shift potential *Scale: N/A*

1.2.1 **Potential for scaling up and replication**

7. The potential for scaling up and replicating the outcome of this intervention from the review of the proposal is considered to be good. The argument backing up this conclusion can be described as follows: of the universe of the over 6,000 potentially eligible SME firms in El Salvador, it is estimated that the project proper will allocate loans to 494 SMEs (about 8 per cent of the total population of SMEs in the country). It has been estimated that in the short to medium term, as a result of the project, the outcome of the project will be scaled up to get to a total capture of about 20 per cent, while in the long term the scaling up coverage is expected to cover almost all the eligible SMEs in the country. It is also very important to point out that this particular project will benefit from experiences gained from earlier similar interventions in Mexico and Colombia by the IDB. It can therefore be safely concluded that the success of the project covered by this submission should have good scaling and replicative impacts in other countries of Latin America which may also want to promote energy efficiency in the SMEs in their countries.

1.2.2 **Innovation**

8. The innovative components of this proposal include: the insurance scheme; the performance-based contracts; the third party due diligence reviews of the energy efficiency programme; as well as the third party due diligence reviews of the capability of the ESTPs to meet service obligations. The structure of these elements were first developed by the IDB in the earlier projects in Mexico and Colombia: jointly with Bancoldex in Colombia and the Mexican Trust Fund for Rural Development (FIRA) in Mexico, with support from the Clean Technology Fund and the Government of Denmark. These innovative approaches will not only ensure that shortfall in set targets is adequately compensated, but will also enhance the trust of stakeholders in the real benefits and risk mitigation capacities of the energy efficiency projects. The proposed energy efficiency financing strategy was assessed by the Global Innovation Lab for Climate Finance as one of the four most promising strategies for promoting private sector

investments in mitigation. This GCF intervention will help to apply this innovative scheme in a new and less developed market and hence accentuate the replication potential.

1.2.3 Potential for knowledge and learning

9. The capacity-building component of the programme has great potential for knowledge and learning. The programme will involve the building of the capacity of ESTPs, which will now supply energy efficiency services instead of selling energy efficient equipment only. The programme will also support the development, diffusion and dissemination of information on new risk mitigation products, such as standard contracts, monitoring, reporting and verification methodologies, and energy savings insurance (ESI) products, among relevant stakeholders, which were not available in the local market pre-project. These capacity-building efforts will help SMEs to prioritize energy efficiency investments as one part of their priority investments, and build their trust in the capacity of ESTPs to provide high-quality technical services. The capacity-building programme will also help the participating LFIs to build their knowledge and experience of the risks and returns associated with this type of project. The capacity-building efforts will also lead to an environment in which both ESTPs and LFIs see energy efficiency investments as an attractive business opportunity and, hopefully, this will incentivize them to start to actively promote the adoption and financing of energy efficiency measures to their potential SME clients. A review of the project proposal showed that the proposed training also includes gender issues associated with the use of energy efficiency in SMEs and the access to finance.

10. The successful implementation of this project will also enable the replication of the business model and achievement of even greater results in countries under similar circumstances where SMEs play prominent roles. The project will promote the collection of information and dissemination of lessons learned by developing learning materials (a target of six, including studies, webinars, presentations or guidelines), organizing regional events through banking and energy service providers' networks in Latin America, and a web-based knowledge sharing interface within IDB.

1.2.4 Sustainability, creation of enabling environment and regulatory framework

11. In the status quo ante, pre-project situation, investments in energy efficiency projects and interventions in SMEs have been hindered by various barriers. The proposed project has therefore been designed to mitigate these barriers and, hopefully, as a result, unleash needed investments in these enterprises on more efficient use of energy. By mitigating these barriers, the project is expected to create an enabling environment for private finance to flow towards energy efficiency investments. The project, by addressing these existing market barriers, will enhance the achievement of a relatively higher rate of return on energy efficiency investments, and thus generate increasing demand for energy efficiency projects and therefore project sustainability, when concessional financing has come to an end. A comprehensive set of activities has been designed to reduce the performance risk of the energy efficiency projects, generate demand and build the capacity of LFIs and SMEs to enter this new market. Project risks for LFIs and SMEs are addressed through standardized performance contracts and insurance policies. Evidence from the pilot project in Mexico suggests that the ESI package absorbs 60–80 per cent of the impact in the case of underperformance of energy savings in the sub-projects. Objective assessments by third-party verifiers, based on defined methodologies to calculate energy savings and establish the true capacity of an ESTP, will provide an independent and trustworthy measure of the results, as well as impart confidence in the process to SMEs and LFIs. Finally, knowledge and learning activities will be undertaken to enhance the capacities of LFIs and other key actors. The project will also create an enabling environment via incentivizing both LFIs and SMEs to enter a new market through the concessional loan financing provided by the GCF. Long-term funding from the GCF and BANDESAL will help to provide LFIs and SMEs

with longer-term credit lines than that which is currently available on the market. The availability of longer-term financing is especially beneficial to engage a wider range of financial institutions, many of which cannot access long-term credit through regular means.

1.3 Sustainable development potential *Scale: N/A*

12. The project will provide social, economic and environmental benefits to the nation of El Salvador, which will enhance the sustainable development of the country. In addition, envisaged wider benefits will include: local capacity-building, better planning and the establishment of a financial mechanism that will drive the implementation of energy efficiency measures, projects and programmes in the economy of El Salvador. Some of the sustainable development enhancing environmental, social and environmental benefits that will result from the project will include:

1.3.1 Environmental and social benefits

13. The reduction of fossil-fuel-based electricity consumption (0.6 per cent of the total national demand) is expected to result in environmental and social benefits in terms of air quality and health. In addition to this is the fact that the efficient use of energy that will be engendered by this project will result in a significant reduction in GHG emissions, which has been estimated to reach about 472,688 t CO2 eq annually, about 8.4 per cent of the country's 2005 energy-related CO2 eq emissions (5.6 Mt CO2 eq). Therefore, not only will the project contribute to the tenets of national sustainable development, but it will also enable El Salvador to contribute its quota to international climate mitigation responsibilities.

1.3.2 Economic benefits

14. According to the proposal reviewed, the most recent census in El Salvador showed that SMEs make up 99.6 per cent of the country's enterprises, generating 58 per cent of formal employment and 30 per cent of gross domestic product. SMEs therefore have a strong weight in the country's economy, and since the proposed project's focus is on SMEs, the success of the intervention will definitely leverage the strength of SMEs in El Salvador's economy with tremendous benefits to the country's economy. The project will facilitate long-term credit to SMEs and therefore stimulate investment, and provide important economic benefits, estimated at about USD 42.9 million. In addition, with the project resulting in the replacement of old inefficient equipment with more modern and energy-efficient equipment, there will be a reduction in energy consumption, which will lead to a reduction in the country's fossil fuel imports of USD 3.4 million annually, and a reduction in electricity expenses of 0.6 per cent, or USD 7.1 million.

15. Creation of jobs is another economic benefit that will accrue as a result of the project. According to the proposal, the project is expected to create one job per benefiting enterprise, based on the assumption that 15 per cent of the savings will be invested in hiring additional labour.

1.3.3 Gender-sensitive development impact

16. The project as presented in the proposal reviewed has adequate consideration for mainstreaming gender issues into the project implementation, especially the encouragement of women to participate in the capacitation of ESTPs, LFIs and validators, which in turn can further drive economic benefits. Both the marketing strategy and the capacity-building plan includes gender perspectives that will enable women-owned and women-led SMEs to benefit from the financing offered by the project.

1.4 Needs of the recipient *Scale: N/A*

1.4.1 Access to long-term loans

17. A key constraint/barrier to the adoption and implementation of energy efficiency measures, projects and programmes by SMEs in El Salvador is the lack of access to long-term loans. According to the proposal, SMEs in El Salvador currently lack access to project financing beyond a 1–2 year horizon, placing a constraint on the development of these businesses and the economy in general. The financial strategy adopted in this project combines a blend of financial and non-financial instruments and sources of financing, and market players that will provide:

(a) Sound access for SMEs to finance on adequate terms and conditions (long term, low interest rate, attractive moratorium, etc.) for the implementation of energy efficiency projects; and

(b) A good platform for SMEs to develop a robust pipeline of technically robust, bankable energy efficiency projects.

18. The project feasibility study conducted while preparing this proposal concluded that the provision of long-term credit lines to SMEs has potential transformative economic benefits.

1.4.2 Knowledge about energy efficiency measures and trust in capacity of energy services and technology providers

19. Key recipients of the funds and the benefits of the funds (the SMEs) under this project usually do not have adequate knowledge of the outcomes of energy efficiency projects. In addition, they usually do not have trust in the capacity of ESTPs to deliver on the outcomes of the energy efficiency measures. In addition to this, LFIs, which should pioneer the mustering of funds for energy efficiency measures, also suffer from lack of adequate knowledge of energy efficiency measures and lack of trust in the capacity of ESTPs operating in the country to deliver tangibly on energy efficiency targets. Hence SMEs have historically not committed their own funds to financing energy efficiency measures, since providing access to loans for such measures usually do not meet status quo loan granting considerations of LFIs. The strategy proposed for this project in the proposal reviewed will address these barriers through a combination of the tools of the ESI scheme designed for the project, and by providing training and awareness-raising.

1.5 Country ownership *Scale: N/A*

1.5.1 Alignment with country strategies

20. The objective of the proposed project and its expected outputs are aligned with El Salvador's intended nationally determined contribution (INDC), the Energy Strategy and the Environment Strategy of the country, as well as some key elements of the country's Five-Year Development Plan. For example, the INDC document includes, as an action, the revision of regulations with the goal of maximizing energy use efficiency in various sectors of the country's economy. The country's Energy Strategy also considers efficient use of energy as fundamental because of the scarcity of domestic primary energy resources and hence high dependence on imports. The Environment Strategy aims to incentivize efficient production and disincentivize the inefficient use of energy and primary resources. While the Climate Change Strategy does not specifically make reference to energy efficiency, it mentions the need for policies to identify strategic opportunities with co-benefits for other sectors, which is the case for this project.

1.5.2 Participatory process

21. A very well-structured participatory process has been built into the proposed project implementation process. Given the high participation of local entities in the process, it can be concluded that relevant local stakeholders will be effectively carried along in the development of the project. IDB, which is the accredited entity for this project working in cooperation with BANDESAL, the executing entity/beneficiary, has undertaken thorough consultations with all stakeholders in the design process and the elaboration of feasibility studies, including the private sector (surveys of SMEs and ESTPs, outreach to validators and insurance companies), the national designated authority and relevant governmental agencies. The process resulted in the identification of relevant inputs on the current and forecasted use of technologies, barriers to investment, energy savings potential and the expectations of stakeholders. Key stakeholders, including SMEs, ESTPs, validators, LFIs and insurance companies, will provide support and feedback for each of the standardized instruments during their development phase.

1.5.3 Capacity of executing entity to deliver

22. The executing entity is BANDESAL, the Development Bank of El Salvador. BANDESAL, with a current equity capital of about USD 219 million and total assets of about USD 522 million, will be responsible for developing the energy efficiency market using its financial instruments and technical assistance. BANDESAL's fiduciary capacity to execute GCF loans has been fully assessed and considered as of low risk, demonstrating a strong track record in intermediating financial resources. It currently has a USD 180.3 million portfolio in second-tier loans to SMEs, of which USD 94.1 million are medium- and long-term loans. BANDESAL's experience with energy efficiency, renewable energy and SME financing includes financing of clean energy projects and financing of technology adoption projects by SMEs in the industrial, trade and services sector. Through its own financial resources and guarantee fund, BANDESAL has been supporting access to investment credit by firms interested in undertaking projects that enhance productivity and sustainability through the adoption of clean energy technologies and the certification of their production processes. More specifically, BANDESAL already has a credit line geared to supporting the financing of renewable energy projects under its Programa Empresa Renovable . However, as elucidated in earlier sections of this review, BANDESAL's status quo provision of long-term financing for energy efficiency activities for SMEs has been very low owing to lack of appreciation of the benefits that can accrue from such financing as well as an overvaluing of the associated risks. Therefore, while the capacity to handle increased loans to SMEs for energy efficiency projects exists at BANDESAL, the proposed project will need to ensure that the capacity is well directed.

23. In addition to its stated capacity to execute the proposed energy efficiency programme, BANDESAL is and will be receiving technical cooperation from IDB for the development of enhanced systems for monitoring and evaluation and environmental and social safeguard assessment. It will benefit from training and other capacity-building activities through this project. All these will further enhance the deployment of the existing capacity of BANDESAL for the provision of long-term financing for energy efficiency measures, projects and programmes in SMEs in El Salvador.

1.6 Efficiency and effectiveness *Scale: N/A*

1.6.1 Financial viability and sustainability as a measure of efficiency and effectiveness

24. The financial viability of the project is demonstrated by a financial internal rate of return (IRR) estimated at 34.4 per cent, and an economic IRR of 36.2 per cent. If the ESI strategy is successful in addressing the initial market barriers, high returns will potentially generate demand for energy efficiency investments without further involvement of the GCF.

1.6.2 Co-financing and level of concessionality

25. The term of the USD 20 million loan to be provided by the GCF (interest rate 0.75 per cent per annum) is in line with the financial terms and conditions of the Fund's instruments approved in decision B.09/04. The 20-year loan rate in El Salvador is 8.7 per cent, resulting in a degree of concessionality of close to 8 per cent. GCF concessional resources will be blended with a USD 20 million loan from BANDESAL at between 6.125 per cent and 6.875 per cent, thereby lowering interest rates for LFIs and SMEs. Lower interest rates for LFIs attract them to participate in the new market. The majority of concessionality should benefit end users (SMEs), which will see interest rates lowered by approximately 2.5 per cent (from 14.3 per cent to 11.8 per cent). Given more attractive interest rates, SMEs will be adequately incentivized to undertake energy efficiency investments.

26. There is a risk that the benefits of the concessionality can be unduly captured by BANDESAL or LFIs. The following four risk mitigation mechanisms are considered reasonably sufficient to mitigate this risk:

(a) First, operational regulations will be developed to ensure that the spread charged by LFIs is aligned with the market, so that LFIs do not unduly capture the concessionality. Competition between LFIs will further ensure that rates from LFIs to SMEs are competitive;

(b) Second, part of the concessionality will be applied in the form of success fees given to SMEs upon verification of successful installation of the equipment, directly benefiting them;

(c) Third, semi-annual reporting and verification of the SME portfolio and activities financed with GCF funds will be carried out. The reporting and verification will specifically consider the appropriate application of concessionality and success fees; and

(d) Fourth, corrective measures in cases of non-compliance with the previous provisions will be defined in the operational regulations.

27. The GCF loan through BANDESAL has a longer tenor than the return period of individual investments to be undertaken by SMEs. To address this mismatch, the proposal is to have GCF resources in a revolving fund to ensure that loan repayments are used to finance additional energy efficiency projects. Thus, GCF funds will be used to finance multiple investments during the lifetime of the loan.

28. In addition to the co-financing from BANDESAL, the project is expected to leverage USD 10 million in private sector investment from the SMEs' own resources. The total leverage ratio of the GCF funding would be close to USD 1.5 per USD 1 contributed by the GCF.

1.6.3 Cost-effectiveness

29. The project estimates the cost per t CO2 eq of emission reductions to be about USD 38.6/t CO2 eq when only the requested GCF funding is considered and USD 74.2/t CO2 eq when

the total project cost is considered. It is comparable to the pilot project in Mexico coordinated by IDB. The project as proposed based on this metric is considered cost-effective.

1.6.4 **International best practice**

30. The project builds on the experience gained from similar energy efficiency initiatives (funded by IDB in Mexico and Colombia) and in other countries. It structures the products and addresses the risks for both the demand and supply side of investment financing, and adapts to the local circumstances of the market. Working through a wide network of LFIs will enable choice, competition and the use of local knowledge and best practice.

II. Overall remarks

31. The independent Technical Advisory Panel (TAP) recommends this project for approval subject to the following conditions:

(a) The annual progress report must include regular reporting on terms and conditions of loans made to SMEs for comparative assessment with loans normally made to SMEs in El Salvador outside of this ESI mechanism for energy efficiency projects. This will ensure that the concessionality of the GCF funds is not majorly appropriated by BANDESAL and the LFIs and that a reasonable proportion of the starting loan concessionality is passed on to the SMEs;

(b) In addition, the annual progress report should also include knowledge sharing and emission reduction results.

Independent Technical Advisory Panel's assessment of FP 010

Proposal Name:	De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits
Accredited Entity:	United Nations Development Programme (UNDP)
Project/Programme Size	Small

I. Assessment of performance against investment criteria

1.1 Impact potential *Scale: N/A*

1. The project is in line with Green Climate Fund's (GCF) objectives. Energy efficiency retrofitting for buildings is an emerging activity that promises mitigation (from saved energy). Armenia has been working on housing retrofitting over the past decade. Despite technological know-how, there still exist policy inhibition and financial constraints which hinder uptake of the retrofitting in Armenia. The project aims at addressing both policy (including institutional) and financial issues, making the technology and its market known to the people as well as to the government (to demonstrate the win-win option for public buildings). The project therefore has an immediate target of retrofitting a good number of private and a fewer public buildings/ apartment houses. As a long-term goal it has set to provide a stimulation and right impetus towards saving energy and reducing greenhouse gas (GHG) in the building sector.

2. The project-related documentation reveals that about 30 per cent of Armenian households spend more than 10 per cent of their income on energy services. And yet, they are forced to keep the ambient room temperature below the international standard for fear of much higher spending levels on energy. Room heating is the key element here. Retrofitting of such building, mostly occupied by energy-poor households, promises GHG emission reductions as well as savings in energy bills and improved living conditions. However, for poor families, the cost of retrofitting appears too high owing to poorly organized markets, a low to non-existent incentive structure and lack of financing. The project sets its specific objectives to address all these barriers.

3. The total project cost is estimated at USD 29.82 million; USD20 million is sought as grant from GCF, of which USD 14 million will be actually mobilized for retrofitting purposes. The project aims to retrofit directly about 6,000 flats and few public buildings, leading to reduction of approximately 1.39 million tonnes of carbon dioxide equivalent (Mt CO_2eq) during the lifespan of the retrofitting equipments/fittings (assumed to be 20 years).

4. The retrofitting effort will benefit about 50,000 people directly, while additional 160,000 people will also benefit from using public buildings. As auxiliary benefits, jobs will be created, building prices will be escalated and the enabling efforts will stimulate the market for the retrofitting of more private and public buildings.

5. The gross emission-related benefit is rather low, although the project's stimulation might inspire other actors including the government and the market to open up building retrofitting as a new modality to reduce emissions from space heating and energy efficiency in buildings.

6. The project intends to develop a business model for energy savings from inefficient buildings in Armenia, where the number of households with access to low-emission energy is likely to increase in future. A considerable scaling up is anticipated by the removal of barriers. A

decrease in energy intensity of buildings, both public and private, is highly likely to be stimulated. Although the immediate project related emission reduction is low, its future potential based on market stimulation could be higher.

1.2 Paradigm shift potential *Scale: N/A*

7. The project intends to address the low level of uptake of building retrofitting technology in Armenia through two distinct modalities: (a) stimulating the investment scene for the energy-poor households (primarily in Yerevan) by providing them with a token subsidy (only 9 per cent of the estimated cost of retrofitting per household), and (b) removing non-financial barriers that have been hindering uptake of the proven energy and utility-bills saving technologies. In addition, it aims to stimulate institutional processes to promote proven win-win mitigation options, for which several enabling activities including technical assistance (TA) sub-projects are proposed. All these elements constitute the theory of change for the project, though not explicitly described in the funding proposal.

8. Through the activities carried out prior to this project, the examples of retrofitting model buildings have been created; however, the paradigm shift towards energy-efficient buildings with comfortable living could not be delivered. It is believed that if the actors' respective capacities are adequately enhanced, especially through the TA components, and the immediate benefits from early retrofitting experiences are disseminated, the project will stimulate the potential for such activities to be scaled up and replicated across the country. The investment from the GCF is expected to engage the market and create appetite for more retrofitting, by drawing in a much increased level of financing, preparing both the market and the financial agencies to work out the operation rules and the government to mobilize the necessary funds for public buildings. If all these indeed take place as anticipated, the project is likely to bring a paradigm shift.

9. The project is not innovative as such. The primary ground work has been done earlier and the examples have been created in Armenia. Moreover, similar approach has been operationalized in many countries (within Europe, in Canada and the United States of America, for example). However, incentive-based market mechanisms are promised to be delivered, which makes the project interesting. There exists potential for knowledge generation and sharing, which will contribute to learning on energy efficiency and savings. There is a plan for disseminating the results of the retrofitting experience under the project.

10. The paradigm shift potential lies with the proposed engagement of the private sector, including financing institutions (i.e. banks) in the development of the business model for building retrofitting. Proposed activities are likely to change incentives for market participants by reducing costs and risks, also by addressing barriers to the deployment of low-carbon solutions. Once such an objective is achieved, the project will have a catalytic role towards expansion of the solution beyond the scope of the project.

11. The project, through its enabling activities, will contribute to the development of regulatory framework, particularly policies that concern building retrofitting. The project is likely to inspire scaling up of the scope and impact of the intended project. However, this is subject to the integration of a larger number of private sector actors, which might not be achieved without incurring costs additional to the project implementation costs. There is an element of risk which cannot be covered by the project. The overall paradigm shift potential is therefore low to medium.

1.3 Sustainable development potential *Scale: N/A*

12. The proposal indicates wider economic, health, environmental and social benefits. The detailed analysis presents 26 to 62 per cent savings in terms of average energy consumption of various building types. As a direct benefit, participating households will gain financially – although only nominally compared with their overall monthly income. However, such nominal financial savings will go towards paying off bank loans through periodic instalments. For public buildings, it is estimated that the savings from lower amount of fuel consumption would reach about 10 per cent of the energy expenditure for such buildings.

13. As a result of energy-efficient retrofitting in buildings, especially the dwellings owned by energy-poor households, the lifetime of the buildings will be increased. It may be inferred that the private owners of such dwelling units will financially gain from such consequences.

14. Although the majority of the dwelling units and buildings in Armenia rely on natural gas as the source of fuel for space heating, a small proportion of such units under the project are still using solid fuel for heating. The funding proposal has cited the World Health Organization and reveals that from 2012 about 1,123 deaths in Armenia are attributable to household air pollution from solid fuel use. Since the retrofitting efforts will reduce the use of solid fuel for heating, the indoor air quality will improve and the users will enjoy an improved living environment.

15. Since the temperature will be set at European standards inside the houses and buildings (including common areas), it is expected that it will have a positive health impact on the dwellers and users due to higher thermal comfort. Elderly people in dwelling units and children attending the public schools will certainly enjoy better living conditions following retrofitting efforts. As such, the project may be gender-neutral. However, women would be able to play roles in project implementation, as has been indicated in the gender assessment of the proposal.

16. The proposal anticipates the generation of approximately 50,000 person-months of paid labour and 1,700 new jobs in the construction sector in the long run (subject to expansion and replication, as envisaged). Since these may be categorized as green jobs, the project merits being considered as a springboard towards green development.

1.4 Needs of the recipient *Scale: N/A*

17. The proposal claims that the energy crisis is responsible for the increasing poverty levels in Armenia since 2007. The usefulness of building retrofitting has been given successful trials by earlier efforts (by the United Nations Development Programme (UNDP), the Global Environment Facility (GEF) and the Deutsche Gesellschaft für Internationale Zusammenarbeit); however, large-scale benefits of such pilots could not be realized owing to slow penetration – much of which may be attributed to lack of financing. The proposal indicates that at least one-fifth of households in Armenia are not able to afford the upfront cost of energy efficiency through building retrofits. The public debt has been around 40 per cent of the country's gross domestic product since 2013. Armenia, therefore, needs financing to popularize energy efficiency through building retrofits.

18. The proposal indicated the high dependence on imported energy in building heating and hikes in prices of heating energy as potential hindrances to building retrofitting; however it did not mention the potential discouragement among investors regarding energy efficient retrofitting as a consequence of a fall in the international energy price, which in turn might jeopardize any potential (large-scale) replication.

19. For the energy-poor households, energy security is a must. However, it is their lack of ability to arrange finance for proven beneficial energy efficient technologies, which is a major deterrent. Moreover, supporting the private sector and the market through technical assistance

and organizing the existing policy regime to result in an incentive-based business development around energy efficiency through building retrofitting have not been realized due to lack of investments. Opportunities exist to overcome specific financing and policy barriers. Armenia might have done better if external finances could have been mobilized for such causes.

20. When it comes to public buildings, the municipalities are said to be fiscally constrained with regard to advancing the budgetary allocations that are necessary to invest in public building energy efficient retrofitting. Authorities involving the public buildings need financial support to initiate energy efficient retrofits and gradually gain from energy savings.

21. The proposal clearly indicates how institutional gaps will be addressed, the private sector, including banks, will be stimulated by arranging TA and the implementation capacity of relevant institutions will be enhanced under the project. GCF funding could appear useful in realizing such objectives, as indicated in the funding proposal. However, given the economy of Armenia and the involvement of past proponents of building retrofits (i.e., UNDP and the Global Environment Facility) in overall development programmes in Armenia, the cost for implementing the enabling activities could already have been organized from other sources. The financial barrier for enabling activities does not appear fully justified to mobilize GCF funds.

1.5 Country ownership *Scale: N/A*

22. The project has been a follow-up of pilot experiences implemented earlier by involving a few public institutions in Armenia. The country keeps highlighting the need for achieving energy efficiency through building retrofits. This indicates how Armenia has been exhibiting her eagerness to address the EE issue in space heating.

23. Armenia has included energy efficiency and urban development (building and construction) in its intended nationally determined contribution document. The project objectives also find synergies with Armenia's third national communication. One of the national development priorities for Armenia is to achieve energy efficiency by means of retrofits, especially in multi-apartment buildings, which is enshrined in the National Energy Efficiency Programme (2007), the National Security Strategy (2007), the National Security Strategy Action Plan (2014) and the Concept of Ensuring Energy Security (2013). The 'Energy Efficient Public Buildings and Housing in Armenia NAMA' (2014) has made reference to energy efficient retrofit technologies and project interventions. Therefore, the references made to energy efficiency through retrofitting in key national documents have been consistent and in line with objectives put forward on climate change issues.

24. There is a general agreement on energy efficient retrofits among various stakeholders, as has been exhibited through previous engagements. The Covenant of Mayors agreement, signed by 10 cities, highlights the ownership of key stakeholders on energy efficient retrofit concept in the building sector. The accredited entity has undertaken consultations with relevant stakeholders, which include two civil society organizations. A project board involving government representatives and potential financing partners has been proposed, which is likely to ensure stakeholder coordination during project implementation. To furnish the proposal, a letter of no objection is duly served by the national designated authority – which also exhibits national ownership.

25. UNDP is proposed to be the national implementing entity (NIE), which will work with the Ministry of Natural Protection, the latter being the authority to implement energy efficient retrofits and frame an enabling policy regime. The Yerevan City Authority has indicated a co-financing, while UNDP has also promised a modest co-financing, which bear evidence of strong country ownership for the proposed project.

1.6 Efficiency and effectiveness *Scale: N/A*

26. A total of USD 29.82 million will be required to carry out the project activities, out of which USD 20 million is sought from the GCF as grant. In order to provide financial incentives to vulnerable groups, USD 14 million has been earmarked (USD 12.5 million for energy-poor households and USD 1.5 million for public buildings). The rest of the GCF funding is proposed to be spent for TA support to banks, home owner associations, local government institutions and marketing platform to create incentives and adequate policy reforms. The project ensures co-financing from Yerevan Municipality (USD 8.0 million) for creating access to affordable capital for EE retrofits. A modest USD 1.42 million co-financing is also proposed by the NIE UNDP. There are uncertainties in mobilization of a large investment (USD 86 million) from the European Investment Bank, what makes the project less attractive.

27. Considering the nature and scope of the project, the estimated costs in terms of price per tCO2e appears high to very high. For the overall project, the estimated cost appears USD 22 per tCO2e considering the total project cost, and the corresponding cost for GCF funding appears USD 14.4 per tonne of CO2eq. The energy savings potential and corresponding greenhouse gas (GHG) mitigation potential are also not so exciting. Considering the actual GCF investment of USD 14 million is mobilized for energy efficient retrofits (the rest being costs for enabling efforts), the actual lifetime GHG reduction potential appears only 1.39 Mt CO2eq.

28. The proponents, however, attempted to include the entire anticipated finance in the cost estimates and tried to give the project credit for all future anticipated energy efficient retrofit investments to make the project financially lucrative. However, other investors will also estimate their contribution and there is a high risk that the total GHG reduction estimates will be double counted, which is heavily discouraged under the measurement, reporting and verification regime of Paris Agreement.

29. The project is technically viable and socially desirable. The project seeks to promote the best available technology solutions, using European Union standards. However, financial viability will largely depend on all parties involved sharing responsibility with respect to removing barriers and making future expansion as a business proposition through the demonstration effect, driven by market mechanisms. Future expansion potential remains uncertain.

30. The long-term financial sustainability beyond the proposed intervention is uncertain due to the fact that the subsidy schemes coming out of the GCF grant are making the investments attractive, but they may not remain as attractive without the GCF subsidy scheme. However, the proposal indicates that arrangements for an exit strategy will be developed before the completion of the project to cover financial de-risking. A lot will depend on the effective implementation of such instruments, which are yet to be developed.

31. The economic performance of the project portfolio is presented on the basis of four financial and economic models, considering two dwelling types and two public building types. The economic rate of return (ERR) appears different for different types of buildings. For the single dwelling houses, the estimated return will be in the order of 4.5 per cent, while for apartments (typically 9 floors, 36 dwelling units) the ERR is estimated at 12.9 per cent and for public buildings the estimated ERR is between 13.6 and 17 per cent. At 12.7 per cent for the overall project portfolio, the proposed project estimates a positive net present value. As indicated in the funding proposal (page 55), the discount rates used for such an estimation appears high for Armenia. Despite the high discount rate used for the calculation, the ERR is relatively low.

32. The GCF funding increases the internal rate of return (IRR) from 7.5 per cent to 9.7 per cent for the project as a whole. Considering the four models, the GCF grant is found to have a greater impact on IRR for the apartment buildings, while the IRR for individual dwelling units

appear very low. Although it is argued that most residents in Central and Eastern Europe do not consider financial performance to be the most important factor in their decision-making about energy efficiency retrofits, the low economic performance of the project cannot perhaps be undermined. It is perhaps the enabling activities which make the project interesting.

33. Despite the uncertainties regarding performance of enabling activities, it is the effort towards barrier removal to expand the energy efficiency retrofit market along with the social, environmental and immediate health benefit potential which make the project interesting, if relatively low economic viability is somewhat overlooked.

II. Overall remarks

34. The TAP recommends to approve the funding proposal with the following conditions:

(a) The accredited entity shall provide an evidence of commitment from financial institution(s) (such as European Investment Bank which is referred to in the funding proposal), with the aim to confirm financing of energy efficiency retrofitting for private individual buildings and multiple flat housing complexes;

(b) In order to bring synergy between the components and successful implementation of component 4, a GCF-led independent technical review of components 1, 2 and 3 should be carried out by using proponent's co-financing not less than 24 months after the commencement of the project implementation. Positive results of this review should be a condition for disbursement of funds for component 4;

(c) The accredited entity shall submit fully developed exit strategy in substance satisfactory to the GCF.

35. The TAP recommends a revision of the allocation of the budget earmarked for the component 4, giving greater emphasis and priority on public buildings especially hospitals, schools and kindergartens.

Independent Technical Advisory Panel's assessment of FP 011

Proposal Name:	Large-scale Ecosystem-based Adaptation in the Gambia: Developing a Climate Resilient, Natural Resource-based Economy
Accredited Entity:	United Nations Environment Programme (UNEP)
Project/Programme Size	Small

I. Assessment of performance against investment criteria

1.1 Impact potential *Scale: N/A*

1.1.1 **Contribution to increased climate-resilient sustainable development**

1. By implementing large-scale Ecosystem-based Adaptation (EbA) in over 7,000 hectares of degraded forest, woodland, savannah and mangrove and 3,000 hectares of transformed land (including cultivated areas, fallow land and roadside verges), the project aims to increase the climate resilience of rural Gambian communities and to facilitate the development of a sustainable natural resource-based economy.

2. The project proposal estimates that 11,550 individuals (50 per cent women) will directly benefit and 46,200 individuals (50 per cent women) will indirectly benefit from the proposed interventions.

3. Although project activities do not explicitly include mitigation components, the project will contribute to reducing the net emissions of greenhouse gases as a result of improvements in land use and the restoration of natural ecosystems through EbA. The enhancement of vegetation cover, reduction in the clearance rate of natural vegetation and changes in agricultural practices will contribute especially to increasing carbon sequestration. This net reduction is not easily quantifiable but it is estimated to be considerable as the project entails EbA in over 10,000 hectares.

4. Regarding quantifiable adaptation benefits, the proposal estimates to increase the average annual household income by USD ~330 – 770, equivalent to an increase in gross domestic product (GDP) per capita of ~70 per cent.

5. The project expects to enhance the resilience of rural communities to the negative effects of climate change, mainly by: (a) increasing the availability and diversity of ecosystem goods and services; and (b) developing businesses based on natural resources to increase cash generation.

6. The alternative farming methods proposed by the project, such as agroforestry, can greatly contribute to increasing the availability and diversity of natural resources for locals (crops, fruit, fibres, medicines and honey), while gradually restoring ecological balance and soil fertility. As high biodiversity is an inherent quality of these methods, they guarantee continuous productivity throughout the year, thus ensuring food safety.

7. Furthermore, these methods do not require the use of agrochemicals (such as herbicides, insecticides and chemical fertilizers), which are expensive for small-scale farmers, and encourage local seed production. All this contributes to food safety and food sovereignty.

8. In general, activities of reforestation, afforestation and enrichment planting have great potential for positive effects on issues such as flooding, water supply, soil erosion and physical protection, as they contribute to increasing the water absorption capacity of soil and soil protection, thus diminishing rainwater run-off and erosion as well as increasing groundwater availability.

9. Additional benefits from the project's EbA interventions will include improved quality and quantity of freshwater supplies and reduced rates of soil erosion.

10. Component 3 of the project strongly focuses on strengthening national, subregional and regional policies, laws and institutions to support the large-scale implementation of EbA in the Gambia. It seeks especially to increase the technical capacity of the Ministry of Environment, Climate Change, Forestry, Water, and Wildlife ´s staff to identify, prioritize, design, implement and monitor large-scale EbA projects in the Gambia.

11. The project meets the impact potential criteria.

1.2 Paradigm shift potential *Scale: N/A*

1.2.1 **Potential for scaling up and replication**

12. The proposed project presents an innovative and cost-effective approach to addressing climate change adaptation and food sovereignty, by the implementation of large-scale EbA. A project of this type and size has no precedent in the Gambia and is an emerging field in climate change adaptation.

13. The project aims to demonstrate that EbA is a commercially viable investment as well as a cost-effective climate change adaptation response by increasing the evidence base, thereby encouraging public and private investment in the country's natural resource base.

14. The project initially identified 400 community-managed areas over 40,000 ha, of which 125 were selected for the project. Seventy-eight of them are areas proclaimed as community managed areas in 2015. Each community-managed area has several adjacent villages. The extent of the community-managed areas (40,000 ha) indicates the potential for scaling up this initiative.

15. The project is aligned with existing national policies to transfer the management rights of at least 200,000 hectares of forest to decentralized community forest committees, providing a potential mechanism to integrate EbA into mid- and long-term planning. Once the project is implemented, it can be up-scaled to include hundreds of community-managed areas.

1.2.2 **Potential for knowledge and learning**

16. Moreover, the project includes mechanisms to create a publicly available EbA knowledge platform in order to facilitate the design and implementation of future large-scale EbA projects. This will result in a 'state-of-the-art' publication on how to conduct large-scale EbA, based on the specific characteristic of each ecosystem type. This will constitute a very useful tool for the replication of EbA projects across the country. In addition, it also includes a strategic framework to promote long-term national research on EbA.

1.2.3 **Contribution to the creation of an enabling environment**

17. In regard to the arrangements to provide for long-term and financially sustainable continuation of relevant outcomes and key relevant activities derived from the project/programme beyond the completion of the intervention the project assesses potential mechanisms for encouraging investments in EbA and natural resource-based businesses. These

include matching grants, concessional loans to entrepreneurs, micro-finance, risk-sharing facilities provided to micro-finance institutions and credit, and REDD-plus financing.

18. The project meets the paradigm shift potential criteria.

1.3 Sustainable development potential *Scale: N/A*

1.3.1 **Environmental and social co-benefits**

19. The environmental co-benefits associated with the proposed GCF project EbA interventions include the following:

(a) Improved water quality as reforestation will reduce surface run-off and thereby reduce sediment load and fertilizer run-off in rivers and dams. For example, a 25 per cent increase in forest cover was shown to lead to a 2.9 per cent reduction in annual sediment loads (Ouyang et al. 2013);

(b) Improved fertility, infiltration and structure of soils through the restoration of degraded land with indigenous, soil-binding tree species. For example, a meta-analysis on the effect of afforestation on water infiltration found that the infiltration capacity of soils increases, on average, three-fold after planting trees in degraded agricultural land (Ilstedt et al. 2007);

(c) Enhanced biodiversity through the preservation and restoration of natural habitats. The proposed GCF project will restore 7,000 hectares of degraded forest, woodland, savannah and mangrove as well as 3,000 hectares of agricultural land;

(d) Decreased soil erosion as the restoration of degraded forest and agricultural landscapes reduces surface run-off. Indeed, a review of soil erosion and run-off prevention found that the establishment of plant cover is one of the most effective measures for erosion control (Zuazo and Pleguezuelo 2008);

(e) Increased carbon sequestration and storage in restored forests and soils. For example, in Ethiopia it was estimated that watershed restoration of an area of 7 ha sequestered 180 tonnes of carbon (Yitbarek et al. 2010); and

(f) Decreased temperature fluctuations within the restored landscapes through shading and micro-climate regulation.

20. The social co-benefits associated with the proposed GCF project EbA interventions include the following:

21. Improved health and well-being of at least 11,550 people who are expected to benefit directly from the proposed GCF project, through the provision of clean water and additional food supplies;

(a) Increased access to timber resources such as firewood and fodder from restored forests. The restoration of 10,000 hectares of degraded forest and agricultural landscapes with indigenous tree species, coupled with sustainable harvesting plans, will provide communities with a sustainable supply of timber products;

(b) Improved income streams through the sale of non-timber forest products (such as medicines, fibre, resin and honey) and additional job opportunities. The proposed project will generate short-term job opportunities for project direct beneficiaries, who will contribute labour to the establishment and maintenance of the project's EbA intervention sites. The establishment of community-managed, natural resource-based businesses will employ an estimated 11,550 project direct beneficiaries on a part-time or seasonal basis;

(c) Improved household nutrition and food security. Goods generated by the project – such as fruit, firewood and building materials – will be directly consumed by households, thereby improving household nutrition and food security, while reducing household expenditure of cash. The proposed GCF project will contribute to an increase in the average annual household income and food security by at least USD 330 per beneficiary household per year, assuming 11,550 beneficiary households;

(d) Increased enrolment in education due to improved income. The increase in annual income of at least USD 330 through the proposed GCF project can, for example, partly be used to pay for school fees; and

(e) Women empowerment through increased access to additional livelihood opportunities. It is estimated that 11,550 people (of which at least half will be women) will benefit directly from the adoption of diversified, climate-resilient livelihood options generated through the proposed EbA interventions.

22. Economic co-benefits: The proposal includes detailed economic analysis with scenarios of the potential natural-resource enterprises to be developed (processing wild fruit, honey production, timber production, rhun palm harvest and processing, and firewood collection). The total potential cash returns generated are, assuming the most conservative scenario, USD 2.5 million during the project lifetime and at least USD 75 million over the investment lifetime.

23. In addition, the project will help to increase contributions to the national forest fund generated by taxes and licensing fees, which will increase the operating resources of the Department of Forestry, particularly for activities that include forest protection, development and sustainable use of forest resources, promotion of community forestry, training of forestry staff, reforestation, and infrastructural development. The increased contributions to the national forest fund budget are conservatively estimated to be USD 380,000 during the project lifetime and USD 11.3 million over the 20-year investment lifetime.

1.3.2 Gender-sensitive development impact

24. Regarding gender issues, the proposal includes a gender-sensitive approach on the selection of natural resource-based businesses during the implementation phase which will give priority to alternatives which are expected to directly benefit women, in order to increase women's participation on the economy, and taking into account the accepted cultural norms of women's roles in the community. A representative of women will be appointed for each participating village.

25. The project meets the sustainable development potential criteria.

1.4 Needs of the recipient *Scale: N/A*

1.4.1 Vulnerability of the country

26. In the Gambia, the agriculture sector accounts for approximately 40 per cent of national exports and contributes approximately 26 per cent of the country's GDP. Over 70 per cent of Gambian households rely strongly on subsistence agriculture and natural resources as a source of food and income. Widespread environmental degradation and unsustainable land-use practices have resulted in a widespread depletion of soil fertility, reducing productivity and the availability of ecosystem goods and services.

27. The Gambia is ranked 168 out of 187 countries in the 2011 United Nations Human Development Index, with more than half of the population living below the USD 2 per day poverty threshold.

1.4.2 Vulnerable groups and gender aspects

28. The project targets Gambian rural populations, which are among the most vulnerable groups, due to their lack capacity to cope with climate change related threats and their dependence on subsistence farming. Project development took into account gender equity and an increase in women's participation on the economy.

1.4.3 Absence of alternative sources of financing

29. The facts that the Gambia has a high ratio of external debt to GDP (~43 per cent in 2012), one of the world's lowest GDPs per capita (USD ~488 in 2012) and a significant government budget deficit make it difficult to get other funding sources.

1.4.4 Need for strengthening institutions and implementation capacity

30. Presented in annex L, a preliminary assessment of the capacity of the Ministry of Environment, Climate Change, Forestry, Water, and Wildlife (MoE) to implement the project's activities through the Department of Finance and Department of Parks and Wildlife Management, proposes a baseline score of 2/10.

31. Component 3 of the project strongly focuses on the strengthening of the institutional framework and supporting the base of knowledge and information in the Gambia to ensure the sustained implementation of the project's activities during and beyond the GCF project implementation period. The project aims to improve the capacity score to at least 6/10.

32. The project meets the needs of the recipient criteria.

1.5 Country ownership *Scale: N/A*

1.5.1 Existence of a national climate strategy and coherence with existing policies

33. Project objectives are in line with the Gambia's priorities for low-emission and climate-resilient development, including the following national policies, strategies and programmes:

(a) The Forestry sub-sector policy (2010 – 2019),

(b) The Agriculture and natural resources policy document (2009 – 2015);

(c) Vision 2020, the Medium term development framework, and the Gambia environmental action plan;

(d) The Programme for accelerated growth and employment 2012 – 2015;

(e) The Forest Act 1998;

(f) The Gambia United Nations Development Assistance Framework 2012 – 2016;

(g) The National Biodiversity Strategy and Action Plan and the national action plan (for the United Nations Convention to Combat Desertification);

(h) The Gambia's intended nationally determined contributions; and

(i) The Sustainable Development Goals.

34. Also, the project is aligned with the following elements of the national adaptation programme of action:

(a) Improvement of freshwater availability;

(b) Diversification and intensification of agricultural production, processing and marketing;

(c) Expansion of community participation in the management of forests and protected areas;

(d) Expansion and intensification of agro-forestry and reforestation activities; and

(e) Improved livestock and rangeland management of food security and environmental sustainability.

1.5.2 Capacity of accredited entities or executing entities to deliver

35. The executing entity is the Ministry of Environment, Climate Change, Forestry, Water, and Wildlife. The project proponent assessed the current capacity of MoE to implement this EbA project to be 2/10. To overcome this barrier, project component 3 strongly focuses on providing MoE staff at national and regional level with sustained training and capacity-building on design, implementation and monitoring of EbA projects.

36. The accredited entity is the United Nations Environment Programme (UNEP). UNEP has a widely recognized technical and scientific capacity and vast experience in the implementation of climate change EbA projects. In the past, UNEP has supported the implementation of climate change adaptation projects in the Gambia, such as the Global Environment Facility-Least Developed Countries Fund project entitled "Strengthening of the Gambia's climate change Early Warning Systems". UNEP is currently implementing the second phase of this project. As a result, UNEP has already established ongoing relationships with the Gambia's MoE, and other ministries and departments.

1.5.3 Engagement with civil society organizations and other relevant stakeholders

37. During project development, consultations where held with multiple national, regional and local stakeholders. Consulted stakeholders include representatives of relevant ministries, departments, community-based organizations and non-governmental organizations such as the Global Corporate Citizenship Initiative, the Special Development Fund and the Food and Agriculture Organization of the United Nations. Consulted community-based organizations included community forestry committees, community protected area committees, village development committees and women's village development groups. Annex F contains summaries of in-country missions and a list of consulted stakeholders. Annex M describes the proposed approach for consultations with the project's multiple stakeholders during the implementation phase.

38. The project meets the needs of the country ownership criteria.

1.6 Efficiency and effectiveness *Scale: N/A*

1.6.1 Cost-effectiveness and efficiency regarding financial and non-financial aspects

39. The proposed project requests and amount of USD ~22 million to be provided exclusively as grant finance. It also includes co-financing from the Government of the Gambia for an additional USD ~5 million, demonstrating the local government's commitment.

40. Proposed investments are not economically attractive due to the various barriers described and to the lack of information on the return rate of the proposed small businesses to be developed. Thus, the Fund's support is not likely to crowd out any private or other public investments.

1.6.2 Project financial viability and other financial indicators

41. The proposal estimates a return rate of 4:1, giving a total investment of USD ~22 million and an expected net return of USD ~86 million over a 20-year investment lifespan.

42. Tax revenues generated by the project's activities will be directed to the national forest fund, therefore increasing the availability of public resources during and beyond the intervention of the GCF. Adding to the long-term sustainability of the project is the fact that the selection criteria of potential EbA interventions during the implementation phase will include the analysis of cost-effectiveness and potential return on the investment. Only cost-effective and commercially viable interventions will be taken into account.

1.6.3 Industry best practices

43. Best practices and lessons learned from past and ongoing similar initiatives seem to be taken into account in the design and implementation phase of the project. Also, EbA protocols will be informed by traditional knowledge, local and international best practices, and ongoing scientific research. The experience and knowledge of UNEP will aid in the identification and adoption of known best practices during the implementation phase.

44. The project meets the needs of the efficiency and effectiveness criteria.

II. Overall remarks

45. The independent Technical Advisory Panel recommends this project for approval with the following conditions to be met during the first year of the project:

(a) Deliver a vision of change with specific impact targets of the project and expected short-, medium- and long-term changes;

(b) Provide a complete market study of the community forest enterprises, including supply and demand opportunities, and possible value chains that could assure better prices to local communities; and

(c) Provide a long-term financial prospect, including expected revenues for the national forest fund and expected revenues from forest enterprises.

Independent Technical Advisory Panel's assessment of FP 012

Proposal Name:	Africa Hydromet Program – Strengthening Climate Resilience in Sub-Saharan Africa: Mali Country Project
Accredited Entity:	World Bank (WB)
Project/Programme Size	Small

I. Assessment of performance against investment criteria

1.1 Impact potential *Scale: N/A*

1. The project aims at providing much improved early climate-induced hazard warning to about 35 per cent of the country's total population including direct and indirect beneficiaries. Improvement of hydromet (i.e. hydrometeorological) information collection, data archiving, processing and modelling, hazard projection and generation of warning with increased lead time and accuracy will enable people to take precautionary measures, including safeguarding their crops by choosing crops that are less sensitive to known hazards (such as flood and drought) by the use of agromet (i.e. agrometeorological) advisories. Generally, similar projects elsewhere in the developing world have resulted in significantly increasing community resilience in hazard-prone areas. In particular, there will be potential for Malian crop producers (rain-fed as well as irrigated crops), livestock herders, fishermen, etc., to accrue direct benefits. Moreover, system-level stakeholders such as hydropower operators, transport operators, small and medium-sized enterprises, extractive industries, micro insurance, urban infrastructure designers and planners will be benefited by receiving early hazard warnings.

2. Early warnings with increased lead time and higher accuracy enable people to take precautionary decisions and measures which otherwise may not be possible. The single factor sometimes becomes a crucial one to safeguard livelihoods that are either dependent on or significantly influenced by hydrometeorological parameters. The project aims at a critical gap in building community resilience. Moreover, organized sectors will also find such information useful in making climate smart decisions.

3. The project provided for estimates of 'cost saved' that are related to losses due to adverse impacts of hydrometeorological hazards, which amount to USD 2.6 million per annum. Moreover, there will be direct gains from agricultural advisories, which are estimated at USD 19.5 million per annum. Furthermore, the saved cost of 'loss and damage (L&D) avoided' (due to humanitarian interventions which might have to be organized) is estimated at USD 0.7 million per annum. These estimates clearly highlight that the economic impact of the project will also be significantly positive.

4. However, the above-mentioned estimates are based on national-level average figures. There is a great deal of uncertainty regarding local-level costs being saved. The absence of local-level economic data regarding losses makes these estimates uncertain and therefore less compelling.

5. From purely disaster risk reduction (DRR) potential for hazard-prone communities, the project warrants greater attention, in the wake of climate change in drought-affected northern areas and flood-prone southern areas of Mali.

1.2 Paradigm shift potential *Scale: N/A*

6. The ongoing unreliable agromet services are proposed to be modernized, following African regional and international best practices. Therefore, this is not entirely a new concept and the degree of innovation is low. The technical design of the funding proposal (FP) is typical of agromet projects, comprising of enhancing human and institutional capacities, procurement of equipment, development of more advanced hydromet and agromet products, dissemination of such products along with decision support tools by means of ensuring 'last mile' connectivity, etc. However, the proposed activities have potential to catalyse impacts beyond this one-off project by setting up a National Framework for Climate Services involving a multi-institutional coordinated approach, if the equipment is maintained and safeguarded against military interventions, vandalism and theft.

7. No theory of change has been attached to the FP. Since the proposal is straightforward and a typical agromet service oriented one, the intentions are clear. The intended services will be for the entire nation, therefore replicability as such is not an issue.

8. The proposed outcomes will be likely to contribute to generate knowledge and inspire end users (farmers, fishermen, livestock rearers) to take informed decisions regarding DRR. Moreover, systematic collection of hydromet data and their analyses would have future potential, perhaps beyond the lifetime of the project, to help system-wide institutions to take informed decisions in future regarding infrastructural DRR – a much-needed service that typically starts with hydromet data collection. There is therefore a vertical scale-up potential of the FP. Moreover, the accredited entity envisaged a regional-level scaling up, which is worth pursuing in view of region-wide impacts of acute drought having teleconnection with the El Nino Southern Oscillation.

9. The FP indicates that an institutional assessment will be made to check whether a market for a climate information service may be developed through this project. This will be an essential component towards sustainability of the effort beyond the project period. Without cost realization, the operation and maintenance (O&M) of the equipment and analytical services cannot be ensured for a long period of time. The project is expected to give the right impetus towards self-sustaining efforts in hydromet and agromet service delivery. Overall, paradigm shift potential is moderate to high.

1.3 Sustainable development potential *Scale: N/A*

10. The orientation of the FP is towards equipment and delivering information services, with a strong focus on DRR against known hazards such as drought and flood. A systematic hydromet data generation and subsequent analyses do have the potential to significantly influence long-term planning for DRR as well as infrastructure (water resources, hazard defying communication networks), agricultural planning and extension, transport and aviation services, etc. Although these may not be realized within the perceived timeline of the FP, such positive externalities do call for an investment to be made that leads to sustainable development.

11. The outcomes, as perceived, will have significant social benefits. Early warnings generally save lives, lead to greater water and food security among beneficiaries, save costs of L&D and also save national investment for rehabilitation following a meteorological hazard turning into a disaster. Women, by default, benefit by avoiding being vulnerable to such hazards. Early warnings, if designed and delivered properly, can lead to pragmatic health decisions involving communities, especially resulting in improved health outcomes for children and old people.

12. The spin-off environmental co-benefits are generally indirect; however, system-wide improved DRR decisions coupled with adequate infrastructure can lead to safeguarding

ecosystems vulnerable to flood and/or drought. Improving the efficiency of the management of the water infrastructure can be crucial to safeguarding vulnerable ecosystems, where longer-term meteorological advisories play significant decision-making roles. Overall, the sustainable development potential is high.

1.4 Needs of the recipient *Scale: N/A*

13. Mali belongs to both African vulnerable country and least developed country (LDC) groups. Despite being heavily affected by pervasive droughts – a typical sub-Saharan phenomenon – Mali is also affected by sharp rainfall episodes leading to flood. Its agriculture is still dependent on rain-fed conditions, while livestock producers are accustomed to nomadic pastoral practices. In the south, people's settlement areas are prone to floods. All these make Mali a country vulnerable to climate variability and change. Mali deserves special and preferential treatment to secure finance from United Nations Framework Convention on Climate Change led processes in order to enhance its resilience. The need for improvement of hydromet and agromet services is paramount and fully justified.

14. The LDC does not have adequate financial capacity to invest in modernizing the rudimentary hydromet and agromet services, although these services are absolutely crucial for reducing vulnerability. The sporadic support received in the past could not quite help to develop a system-wide national framework for climate services. Internal mobilization of financial resources faces steep competition from other sectors and needs, which often undermine the financial arrangement required to address this crucial 'adaptation gap'. In view of the rather large proportion (about 35 per cent) of people in Mali requiring such modernized services, the need of the proposed recipient appears high.

1.5 Country ownership *Scale: N/A*

15. The FP highlights the priorities of the country, citing that the national adaptation programme of action (NAPA) had considered the project as the sixth out of 19 priority projects. The variety of institutions engaged in DRR services with specific mandates, roles and functions, including hydromet and agricultural extension delivery, indicates that the country has been trying to offer the intended services in view of its vulnerability to climate change induced hazards.

16. Although the FP did not substantiate any consultations which might have been organized to reflect the views of service recipients (i.e. community people) about the project, it indicates that several rounds of consultations have taken place in 2013 and 2015 as a part of the preparation of the FP. The feasibility study report outlines the outcomes of expert missions and workshops that are being conducted involving system-level stakeholders. Conducting the expert missions and convening workshops reflect that an institutional-level ownership has been forged by the proponents regarding the project.

17. The associated government agencies have supported the initiative. The FP itself talks about joint and coordinated activities involving four agencies towards implementation of the project. The national designated authority has been involved to duly forward the FP to the Green Climate Fund (GCF). The apparent gap in involving the grass-roots people may be addressed during the implementation phase, which promises a strong consultative component towards defining the agromet service demands from the grass-roots communities.

18. The accredited entity has been involved in designing and implementing similar projects elsewhere, across regions. It has a wealth of experience and track records with regard to dealing with similar projects. The executing agencies (EAs) in Mali have their track records in delivering

relevant components, as defined in the FP. Overall, country ownership for the FP appears to be high.

1.6 Efficiency and effectiveness *Scale: N/A*

19. A closer look into the project budgetary provisions reveals that the requested amount is on the higher side, somewhat heavy on components dealing with equipment, vehicles and consultancies. A large proportion is dedicated to supporting activities at the national level. Costs for procurement of hydrological and meteorological equipment (gauges, etc.) are sought from the GCF, while O&M costs are placed as co-financing from the Government of Mali. While the co-financing commitment for O&M is commendable in view of the small annual budget for the lead EA, one wonders how the long-term sustainability of the equipment will be ensured in remote places having military unrest, where vandalism and theft had ruined the past initiatives for collecting hydrological and meteorological data.

20. It is also questionable whether the inclusion of costs for the procurement of equipment and emergency vehicles for the proposed Operational Centre for Crisis Monitoring, Activation and Management in the GCF grant component is fully justified in a project which has set its objective to deliver hydromet and agromet services, not really to deliver emergency services! Component 2-iii therefore appears to be superficially included in the FP.

21. Against legitimate costs, the benefits streams are thought to be available for 15 years, well beyond the project lifetime. The net present value (NPV) is estimated at a 5 per cent discount rate, which is quite substantial (i.e. USD 124.4 million). The NPV therefore leads to a moderate efficiency in terms of benefits to be accrued against costs. The project's financial performance at different higher discount rates reveals that the project will still be viable at much higher interest rates (say, 15 per cent).

22. Since the project is likely to create public goods and services and without the GCF financing it would not be possible to finance a priority project (as per NAPA), it is justified that GCF grant financing is sought for the LDC. However, in the absence of revenue streams linked to a market for climate information and advisory products, the project would not be viable financially without public financing.

23. The efforts towards developing in-house capacities to run and maintain the equipment would require a substantial input into developing human capital within the relevant government agencies. Capacity restoration will be equally important as capacity-building. Community-level capacity-building towards the maintenance of the equipment will also be required. All these will add to ensuring the sustainability of the project beyond its lifetime. Overall, the effectiveness and efficiency of the project is moderate.

II. Overall remarks

24. The TAP supports the project and recommends that the GCF Board support the project with the following recommendations:

(a) GCF funding is dedicated for climatic change-related aspects, in particular for funding component 2.3.

(b) The TAP also recommends to have a plan for community engagement towards keeping the equipment (i.e., gauges etc.) in place and secure throughout the lifecycle of the project.

(c) The TAP recommends inclusion of O&M requirements in procurement agreements with suppliers and after-sales service contracts to ensure the availability of spare parts over the economic life of the project.

Independent Technical Advisory Panel's assessment of FP 013

Proposal Name:	Improving the Resilience of Vulnerable Coastal Communities to Climate Change Related Impacts in Viet Nam
Accredited Entity:	United Nations Development Programme (UNDP)
Project/Programme Size	Small

I. Assessment of performance against investment criteria

1.1 Impact potential *Scale: N/A*

1. The project "Improving the resilience of vulnerable coastal communities to climate change related impacts in Viet Nam" presented by the United Nations Development Programme (UNDP) seeks to increase the resilience of vulnerable coastal communities in 28 provinces of Viet Nam and reduce greenhouse gas (GHG) emissions through three project components: (1) resilient housing; (2) mangrove rehabilitation and planting; and (3) climate and economic risk assessments.

2. In terms of the first output the project claims to benefit 20,000 poor and highly disaster-exposed people in 100 communities by adding 4,000 new storm- and flood-resilient houses. If this number is achieved, the programme will demonstrate that it is possible to rethink the way large housing projects are designed, including climate change considerations and innovations to ensure resilient houses and neighbourhoods. The project also intends to involve the communities in this process and to upscale the model to other communities.

3. The second component, related to the regeneration of 4,000 hectares of coastal mangroves as buffers to storm surges using successful, evidence-based approaches, is ambitious, yet very realistic. Mangroves are a natural barrier to typhoons, sea level rise, storms and coastal flooding. Restoring and planting mangroves is feasible on a large scale with effective interventions. The potential reduction in emissions is calculated to be 93,036 tonnes of carbon dioxide equivalent per year. The methodology used to calculate the reduction in emissions is reported to be based on, and consistent with, the Intergovernmental Panel on Climate Change guidelines for Coastal Wetlands[1] and is considered appropriate. If areas are well selected, mangroves would also improve the livelihoods of vulnerable communities by ensuring resilience and at the same time providing co-benefits such as increasing opportunities for fishing and harvesting non-timber forest products associated with mangrove management.

4. The third component consists of an information system to provide enhanced climate, damage and loss information for private and public sector applications in all 28 coastal provinces of Viet Nam. This component will have an impact not only in providing better information for risk management, but also in ensuring that such information is used by key governmental institutions and the general public to make better informed investment decisions. However, the project lacks a detailed explanation of the real users and managers of the information system, including management and communication arrangements to ensure effective use of the information by local authorities and communities and by the national authorities.

[1] "2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands"

1.2 Paradigm shift potential *Scale: N/A*

5. The project has selected three interventions that are all interlinked and have the potential to make a real paradigm shift in the way coastal solutions in vulnerable countries are usually conceived. In this case, the impact is produced by building resilient housing, exploiting the potential of mangrove restoration and ensuring that quality information is used for policy and investment decisions.

6. Even though the project does not have an explicit "theory of change" vision, it conveys the message that the government is seriously thinking of plausible solutions that are upscalable with the country's own resources and that the project could result in a real paradigm shift in the long term.

7. The project also emphasizes the potential for learning though a well-thought-out participatory process engaging communities and the ability of the government to monitor pilot phases that could be successfully upscaled.

8. The project has a real potential to strengthen regulatory frameworks and policies to drive investment in resilient and low-emission housing technologies and to improve climate-responsive planning and development.

1.3 Sustainable development potential *Scale: N/A*

9. The project has concrete economic, environmental and social benefits.

10. In terms of economic benefits, the project aims to reduce disaster losses while at the same time ensuring that coastal communities have a safer and better quality of life. The project also improves the access to climate risk insurance products. Overall, the project plans to make smart investments that will benefit the coastal populations of the 28 provinces. However, it could be more explicit on the differentiated subsidies associated with the housing programme and the economic analysis associated with its long-term sustainability.

11. In terms of social benefits, improving access to safe housing will guarantee more secure livelihoods and could provide the opportunity for vulnerable communities to participate in the design and planning of their housing projects and increase their understanding of climate change resilience.

12. In terms of environmental benefits, protecting and restoring mangroves will ensure continuous provision of environmental services associated with this important ecosystem, including fisheries, tourism opportunities and non-timber forest products associated with mangroves such as tannin.

13. The project aims to improve the application of environmental safeguards and have better monitoring and information systems that will increase environmental knowledge.

14. The gender assessment is satisfactory, with the project aiming at a 30 per cent representation of women in community-level advisory groups and the enhancement of the role of Vietnam Women's Union.

1.4 Needs of the recipient *Scale: N/A*

15. While Viet Nam has been a remarkable success story in terms of economic development over the past quarter of a century, its coastal communities lag behind in resilience. These communities have double the poverty rate of the nation as a whole and are increasingly vulnerable to climate change impacts.

16. Viet Nam's coastline is over 3,260 km long, with approximately 30 per cent of the country's population of 90 million people living in the 28 coastal provinces. These areas are particularly vulnerable to sea level rise and the associated risks of salt water intrusion and super storm surge and flooding.

17. The projections of sea level rise contained in the second national communication forecasts a 57–73 cm rise in mean sea levels along the Viet Nam coast by 2100 that could potentially inundate approximately 30,000 km^2, which is equivalent to 9.3 per cent of the total national land surface.

18. The country will use Green Climate Fund resources as a way to upscale ongoing social protection programmes related to housing and the rehabilitation of mangroves, and to strengthen existing information and monitoring systems. The project will therefore build on existing experiences and will strengthen the capacity of institutions and communities to face climate change.

1.5 Country ownership *Scale: N/A*

19. The project is embedded in the country's key strategic plans. Viet Nam has a green growth strategy that seeks to achieve a low-carbon economy and to enrich natural capital. The country also has a sustainable development strategy stating that along with sustainable and effective growth the following must come: social progress and equality; protection of national resources and the environment; sociopolitical stability; and firm protection of the country's independence, sovereignty, unification and territorial integrity. The project is aligned with both strategies.

20. Furthermore, Viet Nam has a national strategy on climate change and a national strategy for environmental protection with a 2030 vision; both align with the proposed project.

21. The project builds on previous governmental projects and the three components of the project are directly associated with governmental policies and plans. It is to be noted that the future sustainability of the project relies on the real involvement of the government in future phases of the project.

22. The Ministry of Agriculture and Rural Development is a well-positioned entity to act as the executing agency hand in hand with UNDP.

23. The project builds upon existing partnerships and processes that have proved to be successful and mentions stakeholder consultation. However, further elaboration of stakeholder consultation and roles is advisable.

1.6 Efficiency and effectiveness *Scale: N/A*

24. The proposed project relies entirely on grant finance in line with the government's policy to finance adaptation with grant resources. The proposed interventions are public goods and there is no revenue-generating activity.

25. The project estimates a conservative internal rate of return of 14.3 per cent, using a 10 per cent discount rate, based on the nature of the benefits resulting from the project (environmental values and lives saved). The period of analysis covers 20 years. In the economic analysis of the project, the economic benefits are valued based on the benefits of avoided loss of lives, avoided loss of property (specifically housing) and ecosystem benefits from mangroves.

26. Each component has a reasonable economic evaluation, with real numbers from previous experiences.

27. Standard houses have an average cost of USD 4,000. However, a climate-resilient (i.e. flood-resilient) house is estimated to cost USD 6,000, including more robust and resilient designs. Co-financing related to the specific 4,000 homes targeted by the project is estimated at USD 8 million. However, it is generally understood that the same flood-resilient houses located in the vulnerable coastal zones will not be as resilient to climate change induced cyclones and those will remain at risk.

28. The economic value of the mangroves is based on studies of the plantation and regeneration of mangroves in the country. Regeneration of mangroves will apply a cost norm of USD 1,500 per hectare. Replanting will be considered in smaller areas if required, applying a cost norm of USD 6,000 per hectare. The project will include co-financing from Ministry of Agriculture and Rural Development of USD 1,406,625, including USD 1,226,625 for the maintenance costs that will be incurred over the next 20 years. These costs are vital to ensure that mangrove areas remain safe in the long run, and that the initial investment is effective.

29. Component 3 has a more basic cost analysis. It accounts for software systems and for general training of communities in the 28 provinces.

30. In general, the effectiveness of the investments will rely on strict implementation of the proposed targets in the three components and in the capacity of the government to learn, adjust and upscale the models to other areas in the country.

II. Overall remarks

31. The TAP recommends that this project be approved under the condition that within the first year of implementation the project provides further elaboration of component 3 related to the disaster database and information system including:

(a) The type of information that will be included in the system;

(b) Management arrangements to develop and maintain the information system; and

(c) Ways to maintain information flows with relevant stakeholders, including affected communities and provinces.

32. The above-mentioned information could be part of the annual performance report provided by the Accredited Entity to the Secretariat.

33. Additionally, in order that lessons can be learned from this investment, the TAP recommends that the Accredited Entity complete an examination of additional retrofit requirements for making the houses equally as resilient to cyclonic winds (of cyclone category 1 and 2) as to flooding risks and integrate those lessons into the implementation of component 1 before the release of the year 2 allocation.

Independent Technical Advisory Panel's assessment of FP 014

Proposal name:	Project to Support the World Bank's Climate Adaptation and Mitigation Program for the Aral Sea Basin (CAMP4ASB) in Tajikistan and Uzbekistan
Accredited Entity:	World Bank (WB)
Project/Programme Size	Medium

I. Assessment of performance against investment criteria

1.1 Impact potential *Scale: Low*

1. The project, presented by the World Bank, seeks to scale up the first phase of the World Bank Group (WBG) supported climate adaptation and mitigation programme for the Aral Sea Basin (CAMP4ASB), which focuses on Tajikistan and Uzbekistan with proposed Green Climate Fund (GCF) financing of USD 19 million. The overall programme expects to have future phases covering other Central Asian countries, including Kazakhstan, Kyrgyzstan and Turkmenistan, for which the World Bank will request a further allocation of US$27 million from GCF in the future.

2. The project focusing on Tajikistan and Uzbekistan seeks to create an investment facility with direct investment support coupled with facilitation and training, to help rural communities to design, implement and sustain investments to expand their productive assets for increased income and improved livelihoods in the face of climate change. The project has three components: the first one (USD 1 million) seeks to create an assessment mechanism to support the evaluation of investments as well as promoting outreach and coalition building, including holding an annual knowledge-sharing forum; the second one is the creation of the investment facility for USD 17 million; and the third one is for regional and national coordination. The project expects to target 205,000 direct beneficiaries.

3. The project only provides a list of eligible investments that will require a climate-resilient element, but the aggregated impact is only measured in number of beneficiaries and number of hectares. One could estimate that 170 communities will have USD 100,000 grants with USD 17 million GCF funding. However, isolated interventions in countries as big as Tajikistan and Uzbekistan will not have real impacts in terms of climate adaptation, unless the project selects specific areas of intervention with measurable aggregated impacts.

4. Furthermore, the project claims to be a pilot phase of regional cooperation among five Central Asian countries to address the mounting transboundary challenges and risks related to the management of transboundary ecosystems, which is well described in the section on "regional context", including the need for regional collaboration to enhance the scale and results of national actions, given the similarities in the climate challenges the countries are facing and inherent connections in water and land systems. However, in the development of practical actions in the proposal it gives the impression that the transboundary ecosystems approach is at a political level in the form of a knowledge-sharing platform for vulnerable communities, without focusing on real transboundary ecosystems actions. Again, isolated interventions in provinces that are not tackling joint management of vulnerable transboundary ecosystems could have only small and unsustainable impacts at the national and regional levels.

5. The impact potential seems low, as it depends on the creation of a small grants climate investment facility with several uncertainties in the real mitigation and adaptation potential of the aggregated investments.

1.2 Paradigm shift potential *Scale: Low*

6. This project seeks to create a small grants climate investment facility for farmers, and provide technical capacity with the support of national institutions capable of transferring knowledge and technology.

7. In general, extension projects for rural communities have been developed in many countries in the world, mainly through governmental rural development programmes. However, this six-year project will have to start from creating extension platforms, selecting institutions that could have the capacity to understand climate change, have access to communities and have the social skills to work in the field with local communities and be able to help in designing and monitoring projects.

8. The project has very vague information on the type of existing institutions in the two countries that would be able to manage all these different skills.

9. On the other hand, this project intends to put the focus on climate change resilience, as the Aral Sea countries are already very vulnerable to water stress that will intensify with climate change. However, it is difficult to assess innovation and best practices with a project that provides only a list of broad eligible investments such as conservation agriculture, livestock production improvements, pest and disease control, on-farm water resource management and improved productivity of field and agricultural crops. Furthermore, it does not elaborate on transboundary ecosystem-based adaptation potential impacts.

10. The project is not proving a paradigm shift, as an investment facility by itself is not new or innovative, the information on real climate change impacts on transboundary ecosystems is not evident, and the technical support to communities on climate change adaptation will rely on external institutions yet to be identified.

1.3 Sustainable development potential *Scale: Low*

11. Potential co-benefits from this project are difficult to assess at this stage. The project expects to:

(a) Achieve environmental co-benefits by introducing best practices interventions in land and water resources management as well as restoring and conserving ecosystems;

(b) Pay specific attention to the gender dimension, ensuring that at least 40 per cent of the project beneficiaries will be females, and monitor the project with gender-disaggregated data; and

(c) Achieve economic co-benefits by providing long-term employment opportunities and improving livelihoods and food security.

12. There is uncertainty at this stage on the real co-benefits as there is little information. In general, there could be potential if the project is effective in providing not just grant resources, but also real technical assistance, innovation and knowledge-sharing.

1.4 Needs of the recipient *Scale: High*

13. Countries in the Central Asia region are among the most vulnerable to climate change in Europe, and poverty levels are high. Around 60 per cent of the region's population (about 50 per cent in Uzbekistan (30 million inhabitants) and 70 per cent in Tajikistan (8.6 million inhabitants) is rural, with a large part being among the poorest, relying on over-depleted natural assets for their livelihoods.

14. According to the project, the sectors most at risk from climate change are agriculture, energy and water resources, with women disproportionately affected.

15. The Aral Sea countries need to improve their capacity to deal with climate change. The project proposes a complex institutional arrangement to support a local, a national and a regional platform for cooperation on climate change, including a contextual framework of transboundary ecosystems that is not well developed in the proposal.

16. In general, the Tajikistan and Uzbekistan rural population are in need of support to improve their rural livelihoods while coping with climate change. However, the project proposes to make small grants available to communities, with a facility that depends on external institutions to provide capacity-building to communities. The project does not provide any relevant information on how it will strengthen or be embedded in the current governmental policies on rural development or climate change, and how it will influence change in the long term. Giving grants to isolated communities will not solve the situation of rural communities in the two countries, unless a rural development climate system is really embedded in the countries' programmes with a concrete institutional lasting platform, financial sustainability and a theory of change with long-term impacts.

1.5 Country ownership *Scale: Low*

17. The proposal explains that an inclusive engagement process has been developed with a broad cross section of Central Asian stakeholders, in particular representatives from central government in each country, regional organizations and civil society organizations. This engagement helped to create consensus on a project for regional collaboration on climate action and reach agreement on the project's objective, scope, technical design and implementation arrangements.

18. Rural communities have not been directly consulted as beneficiaries of the climate investment facility. However, the project explains that an awareness-raising campaign in both countries is expected to begin soon, where information about the project's content and processes will be shared with potential beneficiaries directly through consultative meetings and other sources.

19. The projects lack a real explanation of the current public and private programmes to assist rural communities and how the project will support the governments of both countries in their climate adaptation agriculture policies. It also lacks a real sustainability scheme that will guarantee that this project goes beyond the creation of a facility that will disappear when the project ends. In general, country ownership is lacking to the extent that there is very little involvement of the countries' public institutions in charge of agriculture and rural development or other relevant entities.

20. There is a real concern in terms of the long-term sustainability of the project and the fact that this project is promoting "target subsidies" on a first come, first served basis, which could potentially imply risks of nepotism or favouritism.

1.6 Efficiency and effectiveness *Scale: Low*

21. Under the climate investment facility, matching grants will be available to rural communities for piloting and scaling up suitable technologies and practices for climate resilience, risk reduction and mitigation. Beneficiaries will be able to receive up to 80 per cent of a sub-project investment as a matching grant and are expected to contribute the remainder in cash and/or in kind. Total beneficiary contributions under the programme are estimated at USD 5 million. Matching grants of up to USD 100,000 will be provided to eligible communities

for each sub-project investment. With GCF resources, around 170 communities could end up being beneficiaries of this facility.

22. Facilitating organizations will be contracted by the project to raise the interest of potential beneficiary communities for climate investment opportunities under the programme, improve the quality of the funding proposals prepared by these communities and enhance the likelihood of success for these investments. These locally based organizations will be contracted to assist groups in the preparation and implementation of rural investments. However, there is very little information on possible institutions able to perform this job in an effective manner.

23. Along with USD 19 million in GCF financing, approximately USD 38 million will be provided in co-financing from International Development Association resources. There is no co-financing from the government of either country.

24. The long-term sustainability of the project's platform for regional dialogue and collaboration on climate action (managed by the Regional Coordination Unit, which is hosted by the Central Asia Regional Economic Cooperation programme and operating under the aegis of Executive Committee of International Fund for Saving Aral Sea will depend on future resources that can be mobilized to continue the climate knowledge service functions post-project implementation (i.e. after WBG and GCF project closing).

25. The economic analysis of the project makes several assumptions and is confusing. For example, it estimates that given the assumptions of phasing beneficiaries and investments, the project is expected to reach full development in year 14. An attrition (dropout) rate of 20 per cent by participating households and communities due to investment failure or for other reasons is assumed. In the central case, including all other project management, institutional support and knowledge management costs, cumulated net discounted benefits vary from USD 1.1 to USD 85 million by year 14, depending on the realized household-level benefit. The associated internal rate of return ranges from 0 to 44 per cent per annum.

26. Overall, there is a big question mark on the use of GCF resources to develop small grants facilities in countries, especially when the sustainability of the project depends on the availability of additional resources, and the creation of an institutional platform to support it. Furthermore, the proposed investment facility relies on a preliminary Project operational manual that is yet to be revised and shared with relevant communities to understand their concrete necessities and willingness to use the facility. (Note that the preliminary project operational manual arrived late at the GCF Secretariat.)

27. The draft manual expects peasant communities to have the capacity to develop sub-investment proposal formats, have organized communities able to constitute a general body expected to approve all activities, handle procurement, budgets and accounts and undertake self-assessments. The effectiveness of this arrangement with external non-governmental organizations overseeing the process is at this stage very difficult to assess.

II. Overall remarks

28. The TAP recommends that this project not be approved based on the following:

(a) Lack of aggregated adaptation performance impacts of the community investments in transboundary ecosystems in two countries;

(b) The absence of a more robust institutional framework in place, including the intake from national governmental institutions and adequate selection of external entities able to run the facility;

(c) The dependence on subsidies and lack of economic sustainability;

(d) The lack of a real theory of change; and

(e) The lack of real community consultations in developing a Project operational manual that works effectively for community adaptation purposes.

29. If the Board decides to approve it, the TAP recommends that prior to the first disbursement, the project should present:

(a) A selection of concrete transboundary ecosystems that will be targeted with the project interventions, including community arrangements and possible impacts;

(b) An agreement with the Governments of Tajikistan and Uzbekistan to develop the project in a way that could be appropriated in the long term by the country institutions in charge of agriculture and rural development or related institutions;

(c) A detailed list of possible locally based organizations that could be contracted to assist beneficiaries in the preparation and implementation of rural investments, with demonstrated capacities on community engagement, project development and management and with experience in delivering climate change adaptation;

(d) A theory of change, including long-term sustainability criteria; and

(e) A final Project Grant operational manual with a detailed sub-project selection process, selection criteria, application formats, terms and conditions of the grants, approval process and roles of the various parties, that has been previously discussed with relevant communities for its viability and purpose.

30. Even if these five conditions are met, the TAP believes that the project structure remains vulnerable to failure.

31. Furthermore, the TAP recommends that the Board define the guidelines for the development of small grants facilities with GCF resources.

Independent Technical Advisory Panel's assessment of FP 015

Proposal name:	Tuvalu Coastal Adaptation Project (TCAP)
Accredited entity:	United Nations Development Programme (UNDP)
Project/programme size	Small

I. Assessment of performance against investment criteria

1.1 Impact potential *Scale: N/A*

1. The considered project submitted by the United Nations Development Programme (UNDP) will contribute to the urgent adaptation needs of Tuvalu (small island developing State (SIDS)/least developed country (LDC)) with a population of 10,640 and located on nine small islands in the Pacific Ocean. The country has a coastal zone of 81,900 meters in total length, 26 per cent (21,300 meters) of which is highly vulnerable. In the case of successful implementation of the project, the length of the protected high-value coastlines will be increased from 7 per cent (570 meters) at baseline situation to 35 per cent (2,210 meters) after project implementation. About 29 per cent (3,100 people – 1,531 men and 1,569 women) of Tuvalu's total population will directly benefit from the project implementation in the form of reduced or avoided damage borne by the most vulnerable populations in terms of economic damage to houses, crops and other public infrastructures and social disruptions. Additional 3,499 people will benefit indirectly from the project (in total 62 per cent of the total population).

2. In the country context, the project could have a very great impact in the Green Climate Fund (GCF) result area, "increasing the resilience of infrastructure and enhancement of livelihoods of the most vulnerable communities in most vulnerable country".

3. However, it should be mentioned that because of the local character of almost all coastal zone protection measures (as well as general adaptation measures) and the very high risk of technologies/measures failing to be adequate in the long run, the scaling–up recommended for Tuvalu islands, particularly technologies/measures, has a very low chance of being replicated at any scale even in the region. However, experience gained (even negative) could be used by others. Therefore, the Fund-level impact is assessed as low while the country-level impact will be very high.

1.2 Paradigm shift potential *Scale: N/A*

4. Despite the existence of various feasibility studies, supported by donors assisting Tuvalu in coastal zone protection needs and analysing various coastal zones protection measures tested in the different regions, the sector itself has very high technological risks which automatically limit the replication potential of the proposed measures.

5. The potential for learning and knowledge gain is very high, covering all key stakeholders of the planning and implementation process, including local communities and women's societies, and is equally spread across all three components of the proposal. However, this potential might be limited at some level because of the project implementation modality (direct implementation from the UNDP side). As the knowledge and learning component of the proposal is key in Tuvalu's case, as explained under the barrier section, the independent management of the project (national implementation modality) with the strong support/backup

and quality assurance from the UNDP side would be a greater contribution to the country's sustainable development.

6. According to the proposal, the project will establish a sustainable financing mechanism for long-term adaptation efforts so that adaptation actions are financed and implemented through island-level plans. The successful establishment of such a nationally managed financial mechanism/fund and integration of climate change risks into the long-term planning process could be considered a significant transformational change in the country's planning process and creation of enabling environment.

7. The contribution of the project to the coastlines management policy and planning is to be considered, taking into account that after project implementation, coastline sustainable management plans will be developed at each island level.

8. According to the definition/clarifications of "paradigm shift" provided by the GCF, the project paradigm shift activity falls in the category of "overall contribution to climate-resilient development pathways consistent with a country's climate change adaptation strategies and plans".

9. It is stated in the proposal that this is the first case of its kind when climate change risks will be integrated into long-term planning of the coastal zone, which will be continued in future and applied in other strategic plans as well and therefore this process could be considered as transformational change at the country level.

10. These changes in long-term planning considered within the proposal could be considered transformational changes at the Fund level because all national strategic documents financially supported by the United Nations Framework Convention on Climate Change (UNFCCC) (national communication, national adaptation plan (NAP), national adaptation programme of action (NAPA), technology needs assessment, etc.) provide a strong recommendation to countries to integrate climate change phenomena into their adaptation plans. At the same time, it should be recognized that implementing this recommendation is a challenge for many developing countries and particularly for LDCs because of a lack of relevant local capacities and studies, a high level of uncertainty in the future forecast, high-risk of coastal zone adaptation technologies and additional financial needs for implementation.

11. On the other hand, it should be noted that the project has very limited potential to contribute to the Fund-level transformational change in its classical interpretation.

1.3 Sustainable development potential *Scale: N/A*

12. The highest value of the project is in its contribution to the sustainable development of the country through local capacity-building, better planning, increased resilience of vulnerable infrastructure, and the establishment of a financial mechanism.

13. Three main environmental co-benefits are generated by the project: (a) reducing land degradation such as coastal erosion and water logging; (b) avoiding underground drinking water salinization; and (c) creating a habitat for marine fauna with the three-dimensional structure of the sea walls, which provides an ideal habitat for fish. These fish can then potentially be caught by Tuvaluans, thereby providing an additional source of food.

14. However, in the case of the third benefit, according annex VI(b), no environmental and social impact assessment has been undertaken for the projects and the environmental and social management plan provided in annex VI(b) has been prepared based solely on the author's experience with projects of this nature, taking into consideration international good practice for these types of project. Therefore, particular attention should be given to the environmental impact assessment of this intervention on the natural environment when conducting the environmental and social impact assessment.

15. Among the different social co-benefits, the following should be particularly highlighted: reduction of waterborne diseases and psychological stress under continued tension/fear of attack from the sea; robust coastal protection and awareness about locally appropriate interventions bring the perception of safety; and reduced disruption of economic and agricultural activities. The level of education, public and medical services, and cultural activities are directly linked to the level of resilience in the society.

16. The project supports Tuvalu's key vision to protect its status as a nation and its cultural heritage by preventing, or significantly delaying, the scenario of Tuvaluan islands becoming uninhabitable. The TAP fully agrees with this vision.

17. The most unambiguous economic benefits from the proposed project is avoided economic losses from coastal inundation events caused by storm surges. In addition, this project will create 102 short- and medium-term job opportunities for the local labour force, especially youth and women.

18. Among the different activities where women's participation will be strengthened, the special role of women is highlighted in monitoring coastal change after receiving training in basic maintenance of coastal infrastructure and implementation of ecosystem-based solutions to coastal protection.

1.4 Needs of the recipient *Scale: N/A*

19. Detailed information describing the general and climate change vulnerability of Tuvalu is provided in the project document and annexes (annex XIII). Key climate-change-related phenomena putting catastrophic pressure on the territory of Tuvalu that are intensified because of climate change with the prospect of the intensification continuing in the near future are: tropical cyclones (the latest one – Cyclone Pam, in 2015 – badly damaged the islands of Nanumea and Nanumaga, which are included in this project), king tides, sea level rise, tropical storms leading to further land degradation, salinization of underground drinking water, damaging infrastructure and economy (agriculture, fishing).

20. Particularly vulnerable groups are the settlements/communities living close to the vulnerable segments (8 km) of coastline and are engaged in agriculture and fishing.

21. According to the United Nations classification, Tuvalu is a SIDS and an LCD. This classification itself speaks about the economic status and social needs of the country. In addition, Tuvalu is the fourth smallest country in the world with a long and vulnerable coastline, limited natural resources and 50 per cent of the population affected by exposure to sea attack.

22. The proposal demonstrates that there are several international, multilateral and bilateral financial sources already used by the country for adaptation. However, these sources are not an alternative to the GCF grant but they complement each other. Existing sources are still not enough for the country because of the high level of the country's vulnerability, high technological risks in the case of coastal zone protection measures, and the costs of measures to be implemented and maintained in long run. According to the proposal the short-, medium- and long-term recovery and vulnerability reduction activities across eight sectors (environment, infrastructure, health, agriculture, telecommunications, debris management, disaster risk management and education) are estimated to require additional USD 67.64 million.

23. Lack of human resources in general and qualified human resources, in particular, is highlighted in the proposal as one of the main barriers to the sustainable management of the coastline along with high maintenance and operation costs of different existing coastline protecting constructions. Limited replicability of hard measures that are adequate in one case but having significant challenges in the case of other islands is also considered to be among the

barriers which make integrated national-level planning ineffective, while disaggregated planning (preparation of island strategic planning) increases the planning costs.

1.5 Country ownership *Scale: N/A*

24. Tuvalu has prepared all the main strategic documents recommended by the UNFCCC for climate change adaptation, such as: Tuvalu Climate Change Policy, Tuvalu National Strategic Action Plan for Climate Change and Disaster Risk Management 2012–2016 (2012); National Adaptation Programme of Action (2007); and national adaptation plans.

25. Building coastal resilience is an urgent national priority and the formulation of this project has been led at the highest political level and the scope of the project has been fully discussed and devised by a technical working group comprising key government departments and non-governmental organization associations, representing communities. Coastal protection through increasing resilience of coastal areas and settlements is a priority in all policy documents provided in the proposal.

26. The accredited and executing entity for this project is UNDP, which has the required operational, financial and technical capacities and long-term experience in Tuvalu to effectively manage and guide this project.

27. According to the proposal, the level of engagement of civil organizations and vulnerable communities was very high at the proposal preparation stage and planned to be higher during implementation and monitoring activities.

1.6 Efficiency and effectiveness *Scale: N/A*

28. The cost-effectiveness of hard measures could not be assessed at this stage until the feasibility studies for concrete pilot projects are completed and therefore uncertainty of efficiency regarding financial and non-financial aspects of the proposal is high.

29. The costs of implementation are high because the UNDP direct implementation modality is chosen. This modality is not efficient financially and not effective qualitatively for such a type of project, given that the key project objective is to strengthen national capacities.

30. In the long-term perspective, it is planned that component 3 could leverage limited, but available, domestic financing at the outer island level for the maintenance and expansion of coastal protection. For the GCF project implementation phase, the Government of Tuvalu committed USD 2.86 million as co-financing.

31. Best practices applied worldwide in coastline protection will be implemented by the project. However, technological risk is still very high because of the very local character of coastal zones protection measures.

II. Overall remarks

32. This project is assessed by the TAP with strong consideration of the country's national conditions as well as the role of Tuvalu in the global process. Tuvalu is an LDC with practically no greenhouse gas emissions. This is an example of a country making zero contribution to global warming and climate change and at the same time being a serious victim of adverse impacts of climate change. The economic, social and climate change vulnerability level of the country is well demonstrated in the proposal as well as in the feasibility studies conducted by UNDP and other donors.

33. Despite the fact that the project could not have any significant transformational impact at the Fund level it will have a very great impact at the country level (60 per cent of the population will be protected) and could significantly contribute to the sustainable development of Tuvalu. This project is of the highest priority for the country.

34. Having in mind all the circumstances considered above, the TAP recommends that the Board approve the funding proposal and gives the following recommendations for strengthening the sustainability and ownership of the country:

(a) Support maximum involvement and use of national institutions in all components of the project implementation as all of them are equally important with regard to increasing the sustainability of the project in the long run.

(b) Utilize the existing national institution for the implementation of component 3 (financial mechanism) rather than making ad hoc arrangements (under the UNDP umbrella), so that the knowledge and capacity can be retained in the long run as recommended by the Secretariat; and

(c) Implement the project under the national implementation modality instead of direct implementation from UNDP weakening the country's sustainable development process, which is the key contribution of the project. National implementation with strong support and quality assurance from the UNDP side would be a real demonstration of country ownership.

Independent Technical Advisory Panel's assessment of FP 016

Proposal Name:	Strengthening the Resilience of Smallholder Farmers in the Dry Zone to Climate Variability and Extreme Events through an Integrated Approach to Water Management
Accredited Entity:	United Nations Development Programme (UNDP)
Project/Programme Size	Medium

I. Assessment of performance against investment criteria

1.1 Impact potential *Scale: Low*

1.1.1 Contribution to increased climate-resilient sustainable development

1. The proposed project has three main components:

2. Project component 1: upgrading and enhancing the resilience of village irrigation systems and scaling up climate-resilient farming practices in three river basins of the Dry Zone. The methodology for zone selection and technology implementation is described in adequate depth in the proposal and in the feasibility study (FS).

3. Project component 2: enhancing climate-resilient, decentralized water supply and management solutions to provide access to safe drinking water to vulnerable communities. The proposal indicates that this will be done through training of local officials and women-led community-based organizations (CBOs). The operation and maintenance of the new drinking water systems would be done by the CBOs and beneficiaries would pay for potable water, when produced by treatment plants.

4. Lessons learned from past CBO programmes in the water sector indicate that ex ante agreements (i.e. at the project preparation phase) with targeted communities in terms of technologies to be used, level of participation of community members and acceptance of proposed tariffs for water, among other issues, are key to the sustainability of these systems and, therefore, to guarantee their intended impact. The FS concurs with this position and states that "Key lessons from past experiences show that the participation of irrigation beneficiaries in designing, planning and implementation, as well as post-project operation of irrigation and water supply facilities, is essential to ensure the sustainability of the interventions." However, no community agreements in target villages were reached on the following: the technology selected (i.e. which type of water treatment and water delivery system, e.g. piping, trucks, fountains, etc., are chosen, which impacts directly on costs and labour related to its operation and management); on the price community members will be willing to pay for water (for instance, USD 6.80/m3 is mentioned in the proposal, which is 10 to 50 times higher than prices paid for piped water in urban areas); or on the level of community involvement in water management, such as whether community members agree to operate and maintain the potable water system. Lessons learned in rural water and sanitation projects show that without this type of agreement at the preparation level, community-based water projects of the type proposed cannot be successfully implemented.

5. Therefore, project component 2 will fail to produce the results expected.

6. For the drinking water component, the FS indicates that "The location of infrastructure and the number of facilities should be based on the requirement and locations identified by the

MCP&WS, but option is to be kept open to increase the coverage of Community based water supply schemes and RWH systems, depending on the demand that could change in response to health issues. Accordingly, this intervention should synergize with the efforts to improve watersheds of village irrigation systems and popularize ecological agriculture, in selected cascades." It is not clear how the proponents reached agreement on a budget, the number of different potable water technologies, and the number of beneficiaries if the location of infrastructure, number of facilities and technology to be used are kept open and based on a demand that could change in response to health issues and future consultations. This approach indicates that this is an open-ended component of the programme, which will go as far as the funding goes, adding additional uncertainty to the positive impact claimed.

7. In terms of drinking water, several generalizations are found in the FS, which show that more work is needed in the preparation of project component 2. For example, in one section, the FS indicates: "Generally, groundwater sources are considered as the first option. The groundwater source could be a dug well for reaching ground water at medium depth, ...", but in many sections of the FS the reader can find statements confirming the contamination of groundwater, for example, "Dug wells in the Dry Zone are used commonly but can have quality issues relating to hardness, presence of iron and fluoride and now increasingly, the presence of agro-chemical residues in the ground water. "

8. No indication whatsoever is given to sanitation (wastewater management). Without adequate wastewater management, the potential advantages of a drinking water programme will be jeopardized by potential contamination of water sources, thus reinitiating the cycle of contamination that the project intends to address.

9. Project component 3: Strengthening weather/climate and hydrological observations, forecasting and water management systems to enhance the adaptive capacity of smallholder farmers to droughts and floods is one of the main elements of the proposed project. Climate adaptation is based on the implementation of an early warning system that can be used by farmers to adapt their activities to current and predicted weather conditions, and address the increasing threats of weather variability. Project activities include training of trainers to aid farmers in understanding and using climate-based advisories and weather and seasonal forecasts. Technology implementation for component 3 is described in adequate depth in the proposal and in the FS.

10. NOTE: information presented in the FS indicates that climate change is not the main driver behind the problems that the project proposes to address in components 1 and 2. Degradation of irrigation systems has been caused by conflict and neglect as well as flooding. Lack of safe drinking water is mostly driven by deterioration of existing infrastructure and contamination of water sources (superficial and groundwater) with pesticides and other chemicals related to agricultural practices. The data presented to support the statement that problems faced in the Dry Zone are mainly caused by climate change does not have statistical significance (see the FS, figure 7).

1.2 Paradigm shift potential *Scale: Medium*

1.2.1 **Potential for scaling up and replication**

11. Paradigm shift would be stimulated through an integrated and holistic sub-basin level ecosystem-based approach on irrigation water, drinking water and agriculture. The proposal includes various innovative practices, such as: upgrading traditional cascades to be climate-resilient through design changes such as strengthened bunds; applying drinking water solutions such as rooftop rainwater harvesting and water purification and filtration systems; field testing new crops and low-cost methods of drip irrigation; and improved early warning of rainfall and water level monitoring to manage gate operation.

1.2.2 Potential for knowledge and learning

12. Project-level monitoring and evaluation would follow compliance with the United Nations Development Programme (UNDP) Programme and Operations Policies and Procedures and the UNDP Evaluation Policy. Arrangements for monitoring, reporting and evaluation are described under section H.2 of the Funding Proposal.

13. The project, if adequately prepared and implemented, would contribute to the generation of a database of technical knowledge related to climate-resilient practices, adapted to the local scenarios. This objective would be achieved by the development of a number of knowledge products, including guidelines for integrated water resources planning, an operation and maintenance (O&M) manual for upkeep of village irrigation systems and technical guidelines on climate-resilient water management at the sub-basin/cascade level with standard operating procedures (SOPs) for reservoir gate operation.

14. Also, project activities focus on building the capacity of Agrarian Service Centers (ASCs) to provide services, facilitate community-managed initiatives and maintain the scientific knowledge flow from outside to add value to local knowledge (and vice versa).

1.2.3 Contribution to the creation of an enabling environment

15. The project's contribution to the creation of an enabling environment lies within the enhancement of institutional coordination, knowledge-sharing and market linkages. These outputs would enable and incentivize private sector investment, beyond the project lifetime.

16. The proposal includes, in section E.2.1, the description of a theory of change showing how the proposed project contributes to the long-term objectives and how the project's impacts and outputs could be sustained, replicated and scaled up.

17. The generated database of technical knowledge and the project's knowledge products should serve as important tools for the implementation of the National Adaptation Plan, National Climate Change Adaptation Strategy and the National Disaster Mitigation Strategy.

18. If consistently achieved, project outputs would create an enabling environment to promote public and private investment. Positive externalities would provide incentives to private sector investments. Project proponents expect that Green Climate Fund (GCF) support will also encourage government agencies, communities and farmers to invest in climate-resilient related projects, enabling scaling up of existing efforts for transformative reach and impact across the country.

19. The project establishes pathways for future replication and upscaling through the following output activities: (a) integrated approach to water management; (b) capacity-building and training activities at the local, regional and national levels; and (c) knowledge products.

20. The proposal identified eight other Dry Zone districts with high replication potential, reaching almost 1.3 million smallholder farmers and creating a replication potential of up to four times.

1.3 Sustainable development potential *Scale: Low*

21. The weaknesses noted in the previous section for component 2 (drinking water) will prevent this project meeting its objectives in both scope and reach. For this reason, the potential for this project to contribute to sustainable development is rated as low.

22. If the project were adequately prepared, designed and implemented, the benefits listed below would contribute to sustainable development to a high level, provided that the

weaknesses indicated in the impact section of this assessment were taken into account at project preparation and proposal stage.

1.3.1 Environmental co-benefits

23. The project's environmental co-benefits include: (a) reduction of soil erosion, sedimentation, and siltation of anicuts (diversions) and village reservoirs; (b) improved micro-climate; (c) improved soil structure and fertility; (d) increased groundwater availability; (d) improved water quality; (e) increased biodiversity and agrobiodiversity (e) restoration of ecosystems; and (f) reduction of agrochemical contamination in soil, water, animals and plants. The implementation of agroforestry practices, the introduction of perennial crops and timber and the protection of forests will have positive impacts related to climate change threats, such as a decrease in extreme temperature events, reduced occurrence of floods and increased air humidity. These co-benefits are deemed as highly significant.

1.3.2 Social co-benefits

24. The project expects to help to improve intercommunity harmony by including farmers in the decision-making scheme and establishing protocols for water sharing for multiple uses. Increased water safety will help to improve household sanitary conditions, indirectly addressing issues of waterborne diseases. Early warning systems and climate information will assist in increasing the safety and well-being of benefited populations. In particular, the capacity to adapt cultivation practices according to seasonal forecasts will aid farmers in rationalizing inputs and assessing cultivation options, thus preventing losses and maximizing yields.

1.3.3 Economic co-benefits

25. Project outputs such as improved access to irrigation, adoption of climate-resilient cropping patterns, and market linkages are expected to increase the productivity and income of 130,000 smallholder families, translated into an additional benefit of USD 8 million per year to the agricultural sector. Improved water safety is expected to result in savings of about USD 2 million in labour hours along with benefits with regard to the reduction of health expenditures (costs of water-related illness). Furthermore, community-based enterprise development will create employment for around 20,000 people. Some project activities such as tank infrastructure rehabilitation, crop value addition (milling, transporting) and the building of a rainwater harvesting infrastructure will also generate indirect employment.

26. The implementation of home gardens and agroforestry practices will provide increased availability of local fruits, vegetables and grains, improving self-sufficiency and food safety, and reducing the need for imports.

1.3.4 Gender-sensitive development impact

27. Project activities put strong focus on positively impacting women's well-being and livelihood, as they conform a vulnerable group. Co-benefits that apply primarily to women include: (a) support to drought resilient home garden production with fruit/spice crops and low-cost, time saving micro irrigation, (b) promotion of women entrepreneurship, (c) technical and business training on women-led CBOs to run sustainable drinking water supply schemes as social enterprises, (d) adoption of ICT/mobile platforms to receive and transmit weather and climate information.

28. The project, if successfully developed and implemented, would have met the following United Nations Sustainable Development Goals (General Assembly Resolution A/RES/70/1,"Transforming our world: the 2030 Agenda for Sustainable Development"), inter alia:

(a) Goal 6.1 "By 2030, achieve universal and equitable access to safe and affordable drinking water for all." and Goal 6b "Support and strengthen the participation of local communities in improving water and sanitation management."

(b) Goal 1.5 "By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters."

(c) Goal 2 "End hunger, achieve food security and improved nutrition and promote sustainable agriculture."

(d) Goal 13 "Take urgent action to combat climate change and its impacts."

1.4 Needs of the recipient *Scale: High*

1.4.1 **Vulnerability of the country**

29. The country has a high rate of undernourishment, high youth unemployment (19 per cent), a high indebtedness and low participation of women in the labour force. Several districts of the Dry Zone are still trying to recover from the three decades of armed conflict that ended in 2009.

1.4.2 **Vulnerable groups and gender aspects**

30. Targeted beneficiaries are among the most vulnerable groups in the country in relation to climate-change-related threats. Project activities include support to women's organizations and unemployed youth.

31. Vulnerable groups and gender aspects

32. Targeted beneficiaries are among the most vulnerable groups in the country in relation to climate-change-related threats. Project activities include support to women's organizations and unemployed youth.

33. Economic and social development level of the country and the affected population

34. In Sri Lanka, nearly 80 per cent of the poor population live in the rural areas and depend on agriculture for food and income. In the seven districts included in the project, 80 per cent of the population live in rural areas, where agriculture is dominated by small-scale farmers, with lands of less than two hectares, who depend on agriculture for subsistence. During the last decade, the country experienced an increase in temperatures, variations in seasonal rainfall patterns, and increased flood and drought events, all of which affected rural food security and incomes.

35. In Sri Lanka, agriculture employs more than 30 per cent of the population and over 50 per cent of the population in rural areas.

1.4.3 **Absence of alternative sources of financing**

36. Private investment is not likely to occur because targeted populations are very poor and will be unable to repay instalment costs.

37. The Government of Sri Lanka will invest USD 14 million in project activities to support baseline funding of the proposed interventions, as well as commingling resources to support project implementation.

1.4.4 Need for strengthening institutions and implementation capacity

38. The following barriers, addressed by project interventions, hamper the implementation of a comprehensive and integrated river basin approach at baseline situation: (a) the historic sectorial nature of development planning and implementation; (b) multiple actors involved at the local level; (c) irrigation systems in a cascade often managed by several organizations based nationally or provincially, with other organizations (national departments/community groups) managing drinking water; (d) inadequate technical capacity to adopt existing policies at the farm level; and (e) limited knowledge at the community level of short-term and long-term solutions to water quality issues.

39. The proposed project focuses on strengthening the institutional capacity of government agencies through support to the planning, coordination and implementation of activities for water management, agriculture, and flood and drought response. Various project activities include training of staff at the national, regional and local levels for the development of water resources management, planning and implementation of climate-resilient agriculture, water source protection planning and drinking water solutions, agriculture and flood advisories, SOP development, etc.

1.5 Country ownership *Scale: High*

1.5.1 Existence of a national climate strategy and coherence with existing policies

40. The project is aligned with main national policies and strategies on climate change (National Climate Change Policy, National Climate Change Adaptation Strategy and Action Plan, and the commitments in the country's intended nationally determined contribution) and with the Government of Sri Lanka's key development goals, including enhancing food security and ending poverty and inequality.

1.5.2 Capacity of accredited entities or executing entities to deliver

41. The accredited entity (UNDP) has recognized experience in working both in Sri Lanka and globally on projects related to the outputs of the present proposal, such as: (a) strengthening institutional capacity and establishing national policies; (b) building capacity; (c) developing risk assessments; and (d) introducing climate change adaptation measures, disaster risk reduction and early warning systems into the development of local policies.

42. UNDP has well-established relations with the Ministry of Mahaweli Development and Environment (MMDE) owing to its participation in the implementation of at least 15 projects related to enhancing biodiversity, sustainable energy, sustainable land management and forestry.

43. MMDE is the executing entity. During the last few years, MMDE gained extensive experience in the implementation of a project with foreign funds, including from the Government of the Republic of Korea, the Government of Japan, the Asian Development Bank, UNDP, the World Food Programme, the United Nations Environment Programme and the Export-Import Bank of Korea.

44. MMDE participated in the Pro-poor Economic Advancement and Community Empowerment (PEACE) project (USD 33.6 million, (2006–2011), which addressed the increase in the productivity of agricultural lands through the rehabilitation of irrigation systems.

1.5.3 Engagement with civil society organizations and other relevant stakeholders

45. Consultations involving several non-governmental organizations (NGOs), financial organizations (FOs), women's organizations managing community water supply projects, and other CBOs were held during field visits. Consultations included visits to local ASCs and discussions with field extension officers of agrarian and agriculture departments. Provincial departments of agriculture and their extension services were also consulted.

46. Once initialized, the project will engage with provincial agencies, divisional secretariats, ASCs, farmers' organizations, community-based organizations, the private sector and NGOs to participate in project interventions and monitor project impacts.

1.6 Efficiency and effectiveness *Scale: Low*

47. As indicated in point 1 (impact potential), component 2 of the project is not well prepared and for this reason, the project is likely to fail to meet its objectives. Therefore, its efficiency and effectiveness are rated as low.

48. If in the future, the project was adequately prepared, designed and implemented, ceteris paribus, the potential efficiency and effectiveness are expected to be as follows:

1.6.1 Cost-effectiveness and efficiency regarding financial and non-financial aspects

49. The project requires a total investment of USD 52 million, requesting GCF funding for a total of USD 38 million in grant finance. The numbers will have to be revised based on the project preparation recommended in point 1 of this TAP assessment.

50. The project could yield economic benefits to the population and to the Government of Sri Lanka by increasing agricultural productivity (expected annual benefit of USD 8 million), improving water safety, agricultural practices, soil quality and cascade ecosystems (which could result in savings of about USD 2 million in labour hours and reduced health costs due to reduced incidence of waterborne diseases and better overall health due to increased availability and diversity of food).

1.6.2 Amount of co-financing

51. The Government of Sri Lanka will provide USD 14 million for investment in project activities, demonstrating the government's commitment.

1.6.3 Programme/project financial viability and other financial indicators

52. The expected rate of return for the project is of22 per cent, which exceeds 10 per cent, the assumed discount rate. Even under the worst-case scenario, combining a 20 per cent increase in investments costs with a 20 per cent reduction in total benefits, the economic internal rate of return remains above the minimum threshold. For detailed economic analysis please refer to annex XII.

53. As the project involves public services for poor populations, it is not expected to repay the expenses of the implementation of these services. The project's main economic benefits will be perceived by the benefited population as increased income and contribution to O&M of systems.

54. The project proposal expects to incentivize private sector investment beyond the project lifetime. However, it is difficult to see how the private sector can gain interest on investing in public services for the poor, even under a largely improved institutional and technical framework.

1.6.4 Industry best practices

55. The project development phase took into account various best practices learned on recent projects related to the application of a cascade-wide approach to minor irrigation rehabilitation, climate-resilient agriculture, forecast and early warning systems implemented in Sri Lanka, India and Viet Nam.

II. Overall remarks

56. The TAP recommends that this project be not approved.

57. The project requires more preparation to meet its stated objectives. As it stands, the project is likely to fail to be sustainable, particularly with respect to component 2 (drinking water). The preparation required to make this a successful component will involve additional fieldwork and analysis, which will take considerable time.

58. The TAP also noted that the project proposal has not shown that it is fully driven by the adverse impact of climate change. From the analysis of the information presented and the responses provided by the accredited entity on this issue, the TAP concludes that the main project drivers for components 1 (irrigation) and 2 (drinking water) are the damage caused by the war conflict that afflicted the area of intervention, the lack of adequate maintenance of the water infrastructure (both irrigation and drinking water) and inadequate agricultural practices, which have contaminated water sources. However, the TAP fully shares the view that, if the project had been adequately prepared, increasing the general resilience of the water supply system would have contributed to the adaptation of ongoing and future climate change adverse impacts.

Independent Technical Advisory Panel's assessment of FP 017

Proposal Name:	Climate Action and Solar Energy Development Programme in the Tarapacá Region in Chile
Accredited Entity:	CAF Corporación Andina de Fomento – Banco de Desarrollo de America Latina
Project/Programme Size	Large

I. Assessment of performance against investment criteria

1.1 Impact potential *Scale: Medium*

1. The proposal is to finance a 143 MW photovoltaic solar plant, the first phase of a 250 MW photovoltaic solar plant, to be built in the Atacama Desert region in Chile. The project will be financed based on an international project finance structure with debt financing from the GCF, CAF and local commercial banks, and will generate and sell power on a merchant plant basis in the spot market. The Atacama Desert has one of the highest solar radiation levels in the region.

2. Since 2004, Chile had been facing energy security issues due to curtailed gas supplies. Chile's water resources and hydropower generation have been severely impacted by climate change. Due to a widespread drought since 2007, its hydropower generation has been declining. As a result, the country has to increase its reliance on fossil-fuel energy generation, primarily through diesel and imported natural gas.

3. The project targets a carbon dioxide (CO_2) reduction of 3.697 million tCO_2 eq over its 20-year operation. This translates into an investment of USD 72 per tCO_2 eq saved. The project cost per MW is presented in the funding proposal as second lowest among the 14 solar power plants implemented since 2013. Therefore, the project's target CO_2 reduction per MW is considered to be competitive.

4. The power generated by the project offsets the annual household consumption of approximately 200,000 households in Chile in the event that a power sale arrangement is concluded with a distribution company.

5. The proposed project contributes to easing the current power constraint in Chile by adding a clean energy generation capacity of 143 MW (250 MW in total, if the second phase is implemented). Given the competitive tariff that the project is able to offer at a spot market, and the favourable government regulation, the project will substitute fossil-fuel based thermal power generation with clean energy generation.

6. The independent Technical Advisory Panel (TAP) supports the impact potential of the project represented in the funding proposal. Moreover it finds that the proposed project will contribute to the shift to a low emission sustainable development pathway.

1.2 Paradigm shift potential *Scale: Medium to Low*

7. The proposed project consists of the first phase of the 250 MW solar power plant. Once the first phase is successfully implemented, the project investors intend to develop the second phase. The GCF envisions that the successful implementation of the project will help in promoting further private investments in the renewable energy sector, more particularly solar

projects in the Atacama Desert region. The successful financing of the project will also help to create a financing appetite among local banks for these upcoming projects.

8. While there is some certainty development ofphase two of the project, the TAP views that the scalability will be constrained by the lack of long-term financing from international and local markets. Local banks have already participated in the financing of merchant solar power generators with short tenor loans. In the attempt by the accredited entity (AE) to syndicate local bank loans, it was reconfirmed that the tenor of the local bank loans is unlikely to extend beyond five years.

9. In the past, the majority of long-term project financing for renewable energy projects in Chile has been provided by development banks. Owing to their large exposure consequently, the funding capacity of those development banks for renewable energy projects in Chile is believed to be reduced. The replicability of the project's funding structure is therefore limited in the absence of banks that are able to offer long-term financing. As the funding proposal states, the project will have a better financing structure (more flexible to face spot price risk) because of the long-term funding provided by the GCF and AE.

10. As per the Secretariat assessment, the project also has the potential to demonstrate that clean energy can substitute/displace stranded hydro-power capacity, which has been unable to optimally operate in view of a sustained drought in Chile over the last few years. The TAP understands that clean energy is broadly recognized to be able to substitute conventional power generations, including hydropower. Therefore the TAP does not view that the demonstrational impact stated in the assessment is unique or unexampled.

11. Given that solar power generation technology is well-established and proven, and that solar power plants have been successfully installed in operations globally (and in Chile in particular), the paradigm shift potential of the project does not appear to be significant. The project's demonstrational impact and scalability will be constrained due to the lack of long-term financing in Chile.

1.3 Sustainable development potential *Scale: Medium*

12. The implementation of the project is expected to have tangible and intangible benefits in the economic, environmental and social spheres. The Secretariat assessment describes specific examples, as the impacts themselves are not concretely quantifiable.

13. While the project will require only about 20 permanent staff members for operation and maintenance, the project would enter into an Engineering Procurement Construction (EPC) contract, under which various skilled and unskilled workers would be hired. There would be economic opportunities as well in the vicinity of the project (towns of Matilla and Pica), like provision of goods, services, hotel rooms, etc.

14. The project aims to provide energy to be distributed to consumers and businesses through regional grids. The power generated by the project would offset the annual household consumption of approximately 200,000 households in Chile.

15. Chile has been historically dependent on imports for its energy supplies, primarily natural gas and petroleum products, with energy accounting for approximately 21 per cent of the total import. Therefore, construction of renewable energy projects, including the Atacama solar photovoltaic solar plant project serves to reduce dependence on imported fuels and will enhance the resilience of the local electricity sector.

16. The funding proposal indicates that the project investors are seeking to collaborate with academic and vocational centres in order to promote renewable energy. They intend designating '"women champions' as part of their environmental and social organizational structure and engaging with local organizations in order to promote women entrepreneurship.

17. Accordingly, the TAP believes that the project will contribute to the economy and society in the Atacama region. The TAP believes the project contribution to the economy and society appears clear.

1.4 Needs of the recipient *Scale: High*

18. The commercialization of the project will reduce dependence on imported fossil-fuel based power projects. Over 99 per cent of the generation capacity in the region where the project is constructed relies on power from conventional fossil-fuel based power plants. The energy-intensive mining sector, a significant contributor to the national economy, is the main consumer of the power. The project would reduce reliance on conventional sources of power for the mining sector, and the vulnerability of the mining sector to fluctuations in energy prices. Given the strategic importance of the copper mining sector to the economy, tapping underutilized solar energy resources will help the competitiveness of the economy.

19. Long tenor financing is required in order to implement critical renewable energy infrastructure such as the project. However, local banks have difficulties in mobilizing long tenor loans, while international banks are hesitant to assume merchant risk. Therefore, long term loans being considered by the GCF and AE are considered essential to developing and implementing the project. The financing structure provides an avenue for local banks to participate in the financing as well.

20. The TAP acknowledges the proposed project is needed for the country. GCF financing is also required so as to realize the proposed project in the absence of other long-term loan providers in both local and international markets.

1.5 Country ownership *Scale: High*

21. The project is consistent with the country's objectives on achieving emission reductions as outlined in the intended nationally determined contributions declared in September 2015. Chile has identified the energy sector, a significant contributor of greenhouse gas emissions, for reduction of green gas emissions in the future. In the National Agenda of Energy, the government, among others, targets the increase of electricity supply from renewable energies to 20 per cent by 2025. The government has also approved a tax on CO_2 emissions starting from January 2017. The government would be taxing carbon dioxide emissions, produced by establishments whose thermal power sources exceed 50 MWt. The tax will be levied at a rate of USD 5 per tonne of CO_2 emitted.

22. The AE has conducted extensive dialogues with Chile's national designated authority, which in turn has expressed support for the setting up of the project. Subsequently, the no objection letter has been issued.

23. Taking into account the government's favourable strategies and regulations in general, and its support for the project in particular, the TAP believes that country ownership is high.

1.6 Efficiency and effectiveness *Scale: High*

24. The project presents a clean, economic, and competitive viable alternative to the conventional fossil fuel power plants located in Chile. The cost of the project compares favourably with similar projects implemented in Chile. Consequently, the project is expected to offer a competitive tariff to the region, advancing the nation's overall renewable energy strategy. With its financial commitment of USD 49 million, the GCF aims to realize a

USD 265 million renewable energy project in the region, where fossil-fuel based power generators are dominant.

25. The project will be financed based on limited recourse finance in line with the international project finance template. According to the financial projection, the project is able to realize a reasonable economic and financial rate of returns. The most advanced technology and products with a proven operational track record are expected to be used with due cost consideration.

26. The TAP endorses the economic and financial efficiency of the proposed project.

II. Overall remarks

27. The TAP recommends that the Board approves the project with the following recommendations:

(a) The Secretariat receives evidence from AE that the proposed project is part of the national alternative energy plan, including its relationship with other relevant current projects and its contribution to the nationally determined contribution; and

(b) The project team develops a knowledge-sharing programme in order to disseminate information on the project impacts and lessons learned through project implementation and operation in order to assist stakeholders, such as local and international businesses and banks, to promote their involvement in developing solar power generation in Chile. In this context, relevant information should be gathered and reported periodically to the Secretariat to be effectively used in the programme. The programme may be considered funding under a separate project or modality, as appropriate.

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