

United Nations Development Programme

조선민주주의인민공화국주재
유엔개발계획대표부



*Empowered lives.
Resilient nations.*

Terminal Evaluation of the “Sustainable Energy Solutions for Rural
Livelihoods in DPRK” Project (SES Project)
[Award ID: 00090996, Project ID: 00096469]

TERMINAL EVALUATION REPORT

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EXECUTIVE SUMMARY

This report is the result of the terminal evaluation mission which took place from November to December 2019, including the field mission in DPRK from 2 to 9 December 2019. It was conducted in accordance with the principles outlined in the UNEG ‘Ethical Guidelines for Evaluations’.

1. Project Summary Table

Project Title	“Sustainable Energy Solutions for Rural Livelihoods in DPRK” Project (SES Project)		
ATLAS Business Unit, Award #, Project ID	Business Unit: UNDP DPRK Award ID: 00090996, Project ID: 00096469		
Country:	DPRK	Date project manager hired:	March 2016
Region:	Northeast Asia	Planned closing date:	31-12-2019
Project Document (ProDoc) Signature Date:	26-08-2015	If revised, proposed closing date:	
Executing Agency/ Implementing Partner:	UNDP DPRK CO		
Other project partners:	<ul style="list-style-type: none"> • National Coordinating Committee (NCC) for UNDP • Ministry of Electric Power Industry (MEPI) • State Academy of Sciences (SAOS) • State Commission of Science and Technology (SCoST) • Central Bureau of Statistics (CBS) • Local counterparts at the county level: CPCs, NTDCs and beneficiaries of Hoechang County (South Pyongan Province), Singye County (North Hwanghae Province), Yonsan County (North Hwanghae Province), Unsan County (North Pyongan Province), Kaechon City (South Pyongan Province) and Yangdok County (South Pyongan Province) 		
Project Financing	<i>at Senior Management/Executive Board Level endorsement (US\$)</i>	<i>Actual Expenditure at Terminal Evaluation (US\$)</i>	
[1] UNDP contribution:	US\$6,117,572 (approved PRODOC budget)	US\$ 4,169,390.18	
[2] Government:	In-kind contributions	In-kind contributions	
[3] Other partners:			
Project Total Costs	US\$6,691,380	US\$ 4,169,390.18 (as of 3 December 2019)	

2. Project Description in Brief

DPRK experienced significant economic ramifications as a result of the collapsed socialist market systems in the 1990s. Combining with frequent severe natural disasters in the country, DPRK and its people faced socio-economic challenges. Hence, the DPRK national development strategy considered improvement in people's living standards as a high priority.

Rural areas and communities in DPRK lacked access to adequate and reliable energy services due to:

- i. insufficient supply of primary energy inputs;
- ii. inadequate infrastructure, technological and managerial know-how and competence for the sustainable exploitation of local renewable energy sources; and
- iii. lack of appropriate operational modalities enabling the sustainable delivery of the technologies to provide basic energy services.

The SES Project addresses this developmental challenge by drawing upon the lessons from two previous UNDP DPRK projects that focused on sustainable energy i.e. Sustainable Renewable Energy Development Programme (SRED), and Small Wind Energy Development Project for Rural Areas (SWEDPRA).

The SES Project focuses on the attainment of effective and sustainable local energy solutions that generate positive impact among rural beneficiaries. The SES Project will reinforce sustainability aspects and aims to strengthen energy service delivery at the local level.

The SES Project was formulated in August 2015 with the following objective:

To provide local rural communities in pilot areas with adequate, secure and reliable access to renewable energy resources, cost-effective energy efficiency and energy conservation technologies for meeting basic energy demands under appropriate operational modalities.

In order to achieve the above project objective, four outputs are expected from the SES Project:

- **Output 1:** Information about energy resources and feasible RE/EE solutions updated and made accessible to local beneficiaries.
- **Output 2:** Increased technical know-how of county-level personnel for energy planning and sustainable management of local renewable energy resources.
- **Output 3:** Strengthened supply chains for the delivery of appropriate RE/EE solutions for local communities in rural areas.
- **Output 4:** Increased energy security and self-reliance of rural population through the implementation of RE/EE solutions for local communities.

The SES Project is aligned with the UNDP DPRK CPD Outcome 6 which is "Strengthened enabling environment for use of conventional energy, and accessibility of alternative energy sources, and strategies in adaptation and mitigation to climate change", specifically Output 6.1 which is "Improved rural energy supply through development and utilization of renewable and conventional sources". Indirect contributions from the SES Project are expected towards the UNDP DPRK CPD Outcome 3 ("Increased standards of living and sustainable livelihood").

Adopting DIM, the SES Project's Implementing Agency is UNDP with a dedicated project management team based in the UNDP DPRK CO. An International Project Manager is responsible for the daily management of the project with assistance from national project staff and recruited consultants. The SES Project had the following project partners:

- National counterparts - NCC for UNDP, line ministries, State Institutions at the central level

- Local counterparts – County People’s Committees and other key stakeholders of: Hoechang County, South Pyongan Province; Singye County, North Hwanghae Province; Yonsan County, North Hwanghae Province; Unsan County, North Pyongan Province; Kaecheon City, South Pyongan Province; Yangdok County, South Pyongan Province

The SES Project has devised criteria for the selection of its sites in early 2016. Given the common parameters in terms of vulnerability, repeated exposure to disasters, and insufficient resources to respond, selected seven project sites in common with another ongoing “Strengthening the Resilience of Communities through Community-Based Disaster Risk Management” (CBDRM) Project in the portfolio, given the inter-connections between energy access and disaster management, through integrated responses to leverage synergies of both projects for a magnified development result.

3. Evaluation Rating Table

Overall Results/Impact:	Achievement Rating ^a
<u>Outcome</u> Strengthened enabling environment for use of conventional energy, and accessibility of alternative energy sources, and strategies in adaptation and mitigation to climate change.	
<u>Output 1</u> Information about energy resources and feasible RE/EE solutions updated and made accessible to local beneficiaries.	HS
<u>Output 2</u> Increased technical know-how of county-level personnel for energy planning and sustainable management of local renewable energy resources.	S
<u>Output 3</u> Strengthened supply chains for the delivery of appropriate RE/EE solutions for local communities in rural areas.	MS
<u>Output 4</u> Increased energy security and self-reliance of rural population through the implementation of RE/EE solutions for local communities <ul style="list-style-type: none"> • Renewable energy solutions identified and implemented through energy resource/demand assessments • Renewable energy solutions identified through 24 feasibility studies in targeted user groups in the pilot Counties were substantively not implemented 	HS U

Note:

a. Evaluation Rating:

6. Highly Satisfactory (HS): no shortcomings
5. Satisfactory (S): minor shortcomings
4. Moderately Satisfactory (MS): moderate shortcomings
3. Moderately Unsatisfactory (MU): significant shortcomings
2. Unsatisfactory (U): major shortcomings
1. Highly Unsatisfactory (HU): severe shortcomings

Evaluation Ratings:

Category	Rating ^b	Category	Rating ^b
Relevance	S	National Ownership	S
Effectiveness	S	Basic Human Needs/Gender Equality	S
Efficiency	MS	Synergy	S

Note:

b. Evaluation Rating:

6. Highly Satisfactory (HS): no shortcomings
5. Satisfactory (S): minor shortcomings
4. Moderately Satisfactory (MS): moderate shortcomings
3. Moderately Unsatisfactory (MU): significant shortcomings
2. Unsatisfactory (U): major shortcomings
1. Highly Unsatisfactory (HU): severe shortcomings

Sustainability Ratings

Category	Rating ^c
Sustainability	ML

Note:

c. Sustainability Rating:

4. Likely (L): negligible risks to sustainability
3. Moderately Likely (ML): moderate risks
2. Moderately Unlikely (MU): significant risks
1. Unlikely (U): severe risks

4. Summary of Conclusions and Lessons Learned

Conclusion #1: Significant External Factors/Challenges Severely Affected the Project

Significant external factors/challenges beyond the control of the UNDP DPRK CO were encountered throughout the entire SES project implementation, and severely affected the timely delivery of project outputs relating to procurement-related activities. The 6 rounds of UN Sanctions on DPRK (2016-2017) and the extended period of the banking channel disruptions/closure were identified as the main constraints.

The evaluation noted that the SES PRODOC had appropriate risk assessments which identified a total of 15 risks (1 governance risk, 3 operational risks, 5 strategic risks, 3 financial/fiduciary risks, and 3 sustainability risks) with impact and probability ratings, and prepared corresponding counter-measures/management responses which were appropriate at that point of time and during the project implementation (2015 to 2019). However, the risk analysis did not plan for scenarios of extreme UN sanction measures and the extended banking channel disruption/closure. Furthermore, the implementation of the SES PRODOC's counter-measures/management responses did not appropriately resolve the significant change of events caused by the UN Sanction measures and the extended banking channel disruption/closure during the project implementation.

Lesson Learned:

- Delayed efforts to complete procurement-related interventions, especially those listed as part of the feasibility studies severely disrupted county and village community (Ri) development plans/activities, resulting in potential economic hardship/losses and supply chain sustainability/productivity not fully realized.
- Long-term scenario planning together with annual reviews for change of direction should form part of risk assessment and mitigations in special country context projects.

Conclusion #2: The UNDP SES Project Team has done their best but there is room for improvement in project implementation

Despite the challenging circumstances, The SES Project Team has done their best and laid strong foundations to enable sustainable energy solutions at the village community (Ri) level. The SES Project Team was able to implement the project despite encountering the significant external factors and challenges that were beyond the control of the UNDP DPRK CO throughout the entire SES Project by:

- displaying good project management abilities and effectively utilising appropriate project management tools to implement the SES Project to the best of their abilities
- applying effective adaptive management in planning procurement activities

However, improvements/consistencies could still be further strengthened in the following areas:

1. Registering/updates of assets/delivered items list and tagging of assets/delivered items by project team, in full compliance and adherence to relevant UNDP Policies and Procedures and UNDP DPRK Guidelines for Field Monitoring Visits, should be more consistent to ensure complete and proper physical verification and handover for the intended use/purpose.
2. Signed acceptance at time of delivery and physical verification of all assets/items from the project, while continuing to monitor on the use of delivered items and assets in full operations, should be more consistent. This ensures successful delivery onsite and the use of the delivered items for their intended purpose to achieve the desired project results.
3. Field data collection to measure effectiveness and impact on completed project activities.
4. For improved financial accountability and transparency purposes as part of demonstrating the efficient use of funding on project output-based activities, future financial reporting processes and templates of UNDP DPRK projects should:
 - track and report consistent financial figures (budget and actual expenditure).
 - have consistent comparisons between budget and actual expenditure, as per project outputs, based on project CDRs, for submissions of all relevant project reports (including annual progress reports and submissions to PSC meetings).

Lesson Learned:

To maintain sustainability and determine any project output/activity effectiveness and impact, even after any formal hand-over and/or completion of project output technical support and assistance, it is important that project teams, at minimum during project implementation, still continue monitoring and reporting on post project initiatives, including the use of the assets and delivered equipment items after handover to project beneficiaries. This would ensure successful delivery onsite and the use of the delivered items for their intended purpose to achieve the desired project results.

For improved financial accountability and transparency purposes, financial reporting processes and templates should be consistent, especially on the:

- tracking and reporting of financial figures (budget and actual expenditure).
- consistent comparisons between budget and actual expenditure to demonstrate the efficient use of funding on project output-based activities.

Conclusion #3: SES model has potential for replication across DPRK but requires strong national ownership and commitment as the key to overcome any difficulties faced and achieve optimum results

The high level of national and local ownership ensured sustainability and positive environmental impact, despite the SES Project encountering external challenges that severely constrained the project beneficiaries.

The SES model has the potential to be replicated across DPRK in close partnership collaboration with National and Local Counterparts. However, this replication must be complemented with fully sustainable and well-equipped energy supply chains to benefit the end-users at the county/village community (Ri) level.

Lesson Learned:

- Strong national ownership combined with strong commitment/support and participation from CPCs and village communities (Ris) is key to accelerate the SES model to overcome any difficulties faced and achieve/bear lasting results.
- Replication of knowledge/operational capabilities and capacities of National Consultants to enhance the pool of national and local resources are strongly recommended.

Conclusion #4: Significant delays through the sanctions exemptions/clearance process and the extended banking channel disruption/closure hindered project implementation and severely affected UNDP's reputation of not being able to effectively deliver.

Significant delays through the sanctions exemptions/clearance process and the extended banking channel disruption/closure hindered project implementation and have severely affected UNDP's reputation as an organization of not being able to effectively deliver.

Many other significant achievements in the SES project at village community (Ri) level through the use of solar PV systems in 170 public institutions and EE retrofitting measures in 67 public community buildings across 15 village communities (Ris) should be given more on-the-ground recognition.

Lesson Learned:

Stronger on-the-ground visibility on UNDP's unique contributions would be required at current SES project sites and future SES-related interventions (such as UNDP logos, nameplates, asset/delivered item tags), and communication of project results among international and national stakeholders (through a suitable communications platform for active sharing of information and lessons learned). UNDP's reputation as an organization to deliver results would need to be restored

It is important to:

- better manage village community (Ri) expectations to avoid/minimize potential economic losses to counties/Ris due to extensive surveys, project document preparation, frequent site visits, and extended/delayed/disrupted delivery times of UNDP assets/items to project sites
- impart knowledge to local counties/village communities (Ris) on more effective electricity usage and better control of the demand and energy consumption
- observe and pay attention to safety measures and procedures for RE/EE equipment to minimize/prevent occupational accidents and hazards from occurring
- conduct an independent impact evaluation study as a future project output/activity component to measure impact effectiveness, final end-line indicators and actual benefits gained
- ensure the use of assets/delivered items for their intended purposes

Key Success Story:
The Use and Application of Renewable Energy/Energy Efficient Solutions
to Improve Rural Livelihoods

The SES Project aims to provide local rural village communities with adequate, secure and reliable access to renewable energy resources, cost-effective energy efficiency and energy conservation technologies for meeting basic energy demands.

UNDP made one crucial/important strategic decision in the early stages of the SES Project to identify and promptly implement RE/EE solutions at the village communities based on the comprehensive energy resource and demand assessments. The SES Project has mostly implemented humanitarian-oriented activities/interventions and resulted in producing notable positive impacts, especially to the rural community social service providers such as kindergartens, nurseries, hospitals and clinics as shown below.

	Prior to UNDP SES Project Interventions	Post UNDP SES Project Interventions
Kindergartens and nurseries	<ul style="list-style-type: none"> • Use of coal and firewood to heat up rooms and for cooking but the indoor temperature was still not warm enough in extreme cold conditions and this could increase unhealthy/hazardous indoor air quality conditions for the teachers and children • Using diesel and gasoline generators which is costly to purchase and incurred high maintenance costs • Rely on unreliable grid electricity which could only lasts a few hours a day and may have frequent power supply outages/cuts • Forming of ice and condensation on the walls would cause long-term damage to the building structure 	<p>Teachers and children are benefiting from the increased and better use of kindergartens and nurseries. This is because:</p> <ul style="list-style-type: none"> • cleaner air quality due to improved Ondol floor heating system using less coal which would improve the health and well-being of the teachers and children inside the building • there is no more forming of ice and water condensation on the walls which would improve the preservation and protection of the building structure • constant electricity supply means teachers can now use computers, electronic equipment and televisions to provide continuous and better education to the kindergarten children • the rooms are well insulated with suitable temperature conditions for the children to rest and sleep in comfort
Hospitals and clinics	<ul style="list-style-type: none"> • Very cold and difficult to control the indoor temperature to be constantly warm for patient well-being • Forming of ice and water condensation on the walls would cause long-term damage to the building structure • Rely on unreliable grid electricity which could only lasts a few hours a day and medical equipment could not be used • Use of coal to heat up the indoor environment could increase unhealthy/hazardous indoor air quality conditions for doctors, nurses and patients • Cannot fully operate the hospital/clinics during the night and during winter seasons which can be up to 6 months in a year 	<p>Hospitals and clinics are now able to provide more reliable services to vulnerable groups such as elderly, pregnant women, children, the sick, and people with disabilities. This is because:</p> <ul style="list-style-type: none"> • the hospital and clinic environment now have cleaner air quality (coal is not required) and the indoor temperature can be controlled to treat patients and ensure the comfort, health and well-being of doctors, nurses and patients • there is no more forming of ice and water condensation on the walls which would improve the preservation and protection of the building structure • constant electricity supply means medical equipment and computer equipment can be used to treat patients without any disruptions • hospitals and clinics are now able to operate 24 hours a day and whole year round, especially at night if need to

5. Recommendations

The evaluation proposes 7 recommendations for consideration and implementation whereby:

- 4 operational recommendations relate to how the UNDP DPRK CO could further improve the way it operates as an organization. It is to be noted that the implementation of these recommendations would be dependent on the future of the UNDP DPRK CO structure operating in DPRK in view of the geo-political environment and the availability of an approved UNDP DPRK CPD.

R1: Strengthen financial reporting processes

For improved financial accountability and transparency purposes, UNDP DPRK project financial reporting processes and templates should track and report progress of consistent financial figures i.e. budget and actual expenditure for consistent comparisons between budget and actual expenditure, as per project outputs, based on project CDRs, for submissions of all relevant project reports (including annual project progress reports), to demonstrate the efficient use of funding on project output-based activities.

R2: Extensive review and update of country office policies and procedures with long-term scenario planning

UNDP DPRK CO should ensure that suitable policies and procedures can be implemented to resolve future issues in the event of unforeseen circumstances and minimize reputational risks by:

- R2.1) working with UNDP Regional HQ to extensively review and update all operational, procurement and financial management policies and procedures to account for all that happened within the 2015-2019 period and appropriately mitigate any future constraints.
- R2.2) incorporating extensive long-term scenario planning processes with appropriate and specific risk assessments and counter-measures.

R3: Consistent monitoring and reporting of assets/delivered items

To ensure successful delivery onsite and the use of the delivered items for their intended purpose to achieve the desired project results (in line with the established practice, UNDP rules and procedures and UNDP DPRK ICF guidelines), UNDP DPRK must ensure the following:

- R3.1) procurement of any equipment/materials must strictly comply to relevant UNDP Policies and Procedures, with the monitoring process/procedure stringently following UNDP DPRK Guidelines for Field Monitoring Visits.
- R3.2) project team should register any assets/items in the asset/delivered items list and physically monitor them, regardless of how they are procured given the DPRK special context working environment.
- R3.3) continuation of monitoring and reporting on the use of the assets/delivered items after handover to project beneficiaries, at minimum during project implementation, should be adhered to.

R4: Management of reputational risks and stakeholder expectations

To restore its reputation as an organization that can deliver, UNDP DPRK should:

- R4.1) set conditions and mechanisms to implement “Force Majeure” or early termination of projects if need to.
- R4.2) strengthen its relationship management processes with project beneficiaries such as continued field visits, as practical and as relevant as required during the project implementation period, to better manage stakeholder expectations. By doing so, this would avoid/minimize potential economic and productivity losses to counties/village communities (Ris).

R4.3) minimize and/or avoid unequal distribution of delivered assets/items to avoid unhealthy comparisons between project beneficiaries and across any projects that have synergies.

- 3 recommendations relate to future directions by building on the successful pilot model in the SES Project. By doing so, this will further replicate and upscale with a significant focus on humanitarian-oriented interventions to attain effective and sustainable local energy solutions that generate positive impact among rural beneficiaries. Similarly, it is to be noted that the implementation of these recommendations would be dependent on the future of the UNDP DPRK CO structure operating in DPRK in view of the geo-political environment and the availability of an approved UNDP DPRK CPD.

R5: Rollout/replication of the SES Project in DPRK at county/village community (Ri) level

In the future of any approved UNDP CPD for DPRK, it is strongly recommended that UNDP DPRK should fully adopt the SES Project approach and continue to upscale from its successful pilot SES model for future rollout/replication at county/village community (Ri) level in DPRK. This should be done by working in close partnership with relevant DPRK national counterparts (MEPI, SCoST, SAOS and CBS) and local DPRK counties to implement at county/village community (Ri) level:

- R5.1) facilitate knowledge/operational transfer of the SES Project's procedural, operational and hands-on training manuals, guidelines, SOPs, CEMPs and other related SES equipment/materials on:
- Hybrid RE systems (electricity production for local village community (Ri) needs in rural environments).
 - RE and EE technologies such as eco-buildings (thermal insulation materials) and Solar PV panels (high performance energy efficiency).
 - Load management (more effective electricity usage and better control of the demand and energy consumption).
 - Establishing suitable and cost-effective RE/EE centers and manufacturing/maintenance workshops as part of strengthening the county/village community (Ri) energy supply chains.
- R5.2) organize study tours, in other countries of similar context and/or culture to DPRK, for increased exposure to acquiring knowledge/application of best practices in RE/EE.
- R5.3) conduct a base-line study to establish the starting indicators of current energy consumption and socio-economic development in local village communities (Ris).
- R5.4) conduct an independent impact evaluation study, as a future project output/activity component, to measure the impact effectiveness, final end-line indicators and actual benefits gained.

R6: Communication of project results

To strengthen the communication of project results and recognition of UNDP's unique contributions, UNDP DPRK should implement the following:

- R6.1) It is strongly recommended that any future SES-related projects should strengthen its communication/sharing platforms to engage in closer collaboration/synergies with international organizations/agencies on SES-related activities.
- R6.2) Current SES project sites and future SES-related interventions should display stronger on-the-ground visibility of UNDP's unique contributions at the county/village community (Ri) level through the consistent placing of UNDP logos, nameplates and/or asset/delivered item tags.

R7: Implementation of safety measures and procedures on RE/EE equipment

It is strongly recommended for UNDP DPRK that future SES-related project activities should incorporate safety measures and procedures for end-users when operating and maintaining any RE/EE equipment. These would include:

- R7.1) installing protective covering over live equipment for insulation from any electrical shocks.
- R7.2) creating risk-free and secured access to any sites housing the RE/EE equipment to minimize/prevent any potential workplace accidents.
- R7.3) developing safety procedures/manuals when operating, cleaning and/or maintaining any RE/EE equipment.