مركز الملك سلمان للإغاثة والأعمال الإنسانية
KING SALMAN HUMANITARIAN AID & RELIEF CENTRE

UNDP

Empowering Yemen Women Catalysing on Renewable Energy Project

Report: Final Report

Reporting Period: 01 November 2024 to 31 October 2025

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1 Project Report - Summary Sheet

Project title	Empowering Yemen Women Catalysing on Renewable Energy Project (KSR WE)		
Country & Location	Republic of Yemen, Two governorates: Hadramout and Lahj		
Project dates	Agreement signature's date	27 September 2024	
	Project Duration	12 months	
	Start date	Original: 1 November 2024	Actual: 1 November 2024
	End date	Original: 31 October 2025	Actual: 31 October 2025
Implementing partners details			
Type	☐ United Nations ☐ International non-governmental organization ☐ Local non-governmental organization ☐ Others		
Partner Name	United Nations Development Programme		
Focal Point	Zena Ali Ahmad		
Telephone	+967 712 222 201		
E-mail	zena.ali-ahmad@undp.org		
Budget Summary (in USD)			
Project Budget	Total Contribution: 2,555,103.35 M&E Budget: 74,420.49 Net Contribution: 2,480,682.86		
Total Received	$1,984,546.29		
Percentage of total received	80%		
Actual Expenditures	$ 2,435,408.45		
Progress Summary			
Planned Percentage of completion	**100%**		
Actual Percentage of completion	**100%**		

Type of report					
Final Report	Period covered:	from	01 November 2024	to	31 October 2025

Executive Summary:

Between 1 November 2024 and 31 October 2025, UNDP, partnering with For All Foundation (FAF), implemented the Empowering Yemen Women Catalysing on Renewable Energy Project in Al Qatn (Hadramout) and Al Qabaitah (Lahj) to empower women through renewable-energy livelihoods and improve energy access for vulnerable households. The project established and supported 375 women-led microbusinesses, delivered integrated business, life skills, and vocational training, and rolled out TVET-approved manuals for solar ovens and lanterns. A local Training of Trainers (ToT) pipeline (31 trainers) and continuous advisory support underpinned quality assurance and market readiness.

Production achieved 100% of targets of 18,000 ovens (9,000 per district) and 3,000 lanterns (1,500 per district). Distribution reached 100% for lanterns and 98% for ovens (17,705 units in total), with a shortfall of 295 ovens due to heavy rains in mountainous Al Qabaitah; these units were withdrawn from distribution, and no replacements were arranged within the project period due to the constrained duration of the project implementation. The project mapped and registered 21,000 vulnerable households and distributed products accordingly.

Collaboration with the Technical Institute in Al Qatn transformed a public institution into a training/production hub; equipment and an installed solar energy system strengthened operations and created a durable asset for ongoing service delivery. By combining local production with targeted training, tools, and inputs, the project improved household lighting and clean cooking, while enabling women's income generation through paid production incentives. The approach advances KSrelief's objective of bridging humanitarian assistance and longer-term development and offers clear lessons: prioritize high-adoption product lines (lanterns), refine oven design/logistics for rugged, high-rainfall contexts, and maintain specialized technical oversight, field monitoring continuity, and modest contingencies to protect quality and delivery.

The project main achievements include:

- Local consultations & beneficiary identification: 2 district workshops; permits/clearances obtained; 375 women registered (200 Al Qatn, 175 Al Qabaitah).
- TVET-approved training manuals: manuals for solar ovens and lanterns (Trainer, Trainee, User) reviewed and approved by TVET; used across business, life skills, and vocational modules.
- Business, life skills & vocational training: 375 women trained; 31 trainers (ToT) developed (16 Al Qatn, 15 Al Qabaitah); 375 completed vocational training (17 days).
- Microbusiness establishment & market linkages: 375 women-led microbusinesses established; 375 toolkits provided; 2 market-linkage/networking events held.
- Sample input kits: 1,125 kits (375 lanterns and 750 ovens) distributed for sample production and QA/demonstration.
- Advisory & QA support: 3 months hands-on advisory by trainers/consultants; daily mentorship and quality-assurance oversight for production groups.
- Targeting & registration: 32 enumerators trained; electronic registration (Kobo); 21,000 vulnerable households registered (100% of target).
- Procurement of inputs: competitive tender (eligibility, technical, financial evaluation; best-value-for-money); 21,375 input packages procured; phased deliveries and inspection/acceptance; advance payment secured by bank guarantee.
- Production: 18,000 ovens produced (9,000 Al Qatn; 9,000 Al Qabaitah); 3,000 lanterns assembled (1,500 per district); 31 supervised production groups comprising 375 women; 100% completion.
- Distribution: 17,705 ovens distributed (9,000 Al Qatn; 8,705 Al Qabaitah) = 98%; shortfall 295 ovens withdrawn due to heavy rains and storage constraints in mountainous Al Qabaitah; all 3,000 lanterns distributed (1,500 per district).

2 Project Overview

2.1 Background and Project Rationale

After 10 years of conflict, Yemen is more fragmented than at any time in its recent history. The war has exacerbated long-standing grievances, created new fractures in Yemen's social fabric and entrenched exclusion and poverty. Yemen is one of the world's most climate vulnerable countries, and ensuring resilient recovery is extremely important to plan and prevent future climate risks from triggering the next wave of crises. Factoring in future climate risks is key in resilient recovery approaches, making use of solar solutions for closing the energy gap. Yemen is a signatory to the Paris Agreement on climate change, with its Intended National Determined Contributions (INDC) to climate change having been submitted in 2015.

Sustainable energy actions, including renewable energy, energy efficiency and energy access, are among the major actions proposed under Yemen's INDC to achieve commitments under the Paris Agreement. Yemen's INDC includes 14 percent Green House Gases (GHG) emission reduction target below Biennial Update Report (BAU) by 2030 and this includes 1 percent unconditional target and 13 percent conditional target. Thus, the INDC study will generate synergies on how the renewable energy investment plan will help contribute to achieving country's commitments under the Paris Agreement through recovery in the energy sector.

The Empowering Yemen Women Catalysing on Renewable Energy Project introduced innovative solutions to enhance the application and utilization of solar energy, with a particular focus on empowering women in small solar enterprises. By supporting vulnerable women and women-headed households, the project enables them to develop and manage solar businesses, thereby creating sustainable income opportunities and contributing to the recovery and maintenance of essential social services.

The project's focus is on the application of renewable energy for basic household needs and lighting, and actively engaged vulnerable women in business creation, addressing the energy requirements of underserved communities and tapping into energy markets. The project targeted the creation of 175 microbusinesses in Al Qabaitah and 200 in Al Qatn. Ultimately, the distribution of 21,000 solar items to vulnerable households and IDPs will not only illuminate homes and enable cooking but also cultivate economic growth within the community.

Through these efforts, the project not only aimed to enhance energy access but also to empower women as key players in the renewable energy sector.

2.2 Purpose and Expected Results

The project aimed at promoting innovative solutions for spreading the application and use of solar energy and enhancing engagement of women in small solar businesses. Vulnerable women and women-headed households were supported to develop and manage solar businesses enabling sustainable income generation as well as contributing to the recovery and maintenance of social delivery services.

The project promoted the spread of renewable energy applications and covers the needs for basic household activities and lighting. It will engage vulnerable women in business creation addressing energy needs of vulnerable communities and energy markets.

3 Review of Achievements and Implementation

3.1 Important Achievement for the Reporting Period (By Activity)

Activity	Activities	Target	Achievement	Achievement percentage (%)	Deviation narratives (If applicable)
1.1	Conduct local consultations in targeted communities to identify groups and women-headed and renewable energy needs for basic lighting and household applications.	● 3 Workshops ● Beneficiaries selected and verified	● Permits and clearance obtained ● Launching workshop conducted ● Two local introductory workshops completed in both districts ● The districts Need Survey was completed and List of 375 beneficiaries developed	100%	
1.2	Development of training manuals and guidelines on traditional oven (Tanur) and assembly of solar lanterns	● 2 Manuals & guidelines	● Three training manuals developed for each solar item (Trainers, Trainees, Users) for solar lanterns and solar ovens, based on approved designs. ● Product assessment favoured solar ovens; manuals were adapted accordingly. ● A consultant reviewed and facilitated TVET Ministry approval of the manuals. ● Approved manuals are currently used in the project's training programs.	100%	
1.3	Provide vocational, life and business skills training on traditional oven (Tanur) and assembly of solar lanterns (including occupational health hazards awareness and response) to targeted beneficiaries including victims of GBV and women-headed households among IDPs/returnees)	● 31 received ToTs ● 375 Women received Business Training ● 375 Women received Vocational Training	● Business and life skills programme completed for 375 beneficiaries ● ToT programme was completed for 31 participants. ● Vocational training programme was completed for 375 beneficiaries.	100%	

Activity	Activities	Target	Achievement	Achievement percentage (%)	Deviation narratives (If applicable)
1.4	Support development of women-led solar micro-businesses and business networking	● 375 microbusinesses established ● 375 Toolkits for 375 microbusinesses ● 2 Networks/market linkage organized	● Women headed microbusinesses selected and trained and supported with productions tools. ● 375 comprehensive toolkit bags distributed to women microbusiness for operation, assembly and production. ● Networking and market linkage workshops were completed in both districts.	100%	
1.5	Procure and distribute solar equipment (inputs) to women group micro-business to develop samples units	● 375 lanterns inputs distributed ● 750 Ovens inputs distributed	● Supply and distribution of raw materials to women micro businesses for a total of 1,125 products: 375 for lantern samples, and 750 for ovens.	100%	
1.6	Provide business advisory services linking to solar energy markets for traditional ovens (Tanur) and lanterns.	● Solar Market Assessment ● 2 Months hands on support for 375 women on production	● Assessment conducted ● Vocational trainers served as technical consultants, providing daily hands-on support and mentorship to women-led microbusinesses. They oversaw quality assurance and help improve the production and market readiness of solar products, especially traditional ovens (Tanur) and solar lanterns, while also supporting distribution efforts. ● The support was for three months	100%	
2.1	Survey and mapping of vulnerable households and IDPs in targeted in need of alternative energy sources for basic lighting and household cooking devices.	● Districts Survey conducted ● Database developed	● 32 enumerators selected and trained on survey methods for vulnerability assessment. ● Standardized templates created and refined for consistent data collection on vulnerability and energy needs.	100%	

Activity	Activities	Target	Achievement	Achievement percentage (%)	Deviation narratives (If applicable)
			● Enumerators surveyed and mapped vulnerable households and IDPs in targeted areas. ● 100% registration completed in both districts ● Analysis is completed and draft report is produced.		
2.2	Procure equipment and materials for production of solar lanterns, traditional oven (Tanur) by the established women businesses	● 21,375 inputs packages procured	● Specifications developed and document prepared. ● Tenders were advertised for competitive bidding. ● Bids analysed and evaluated ● Vendor selected and procurement agreement signed. ● Areas warehouses rented. ● Supply ongoing	100%	
2.3	Assemble solar lanterns for basic lighting purposes and produce traditional oven (Tanur) by the established women businesses	● Lanterns assembled: 3,000 ● Ovens produced: 18,000	● 18000 solar ovens have been produced (9000 units in Al-Qatn and 9000 in Al-Qabaitah). ● 3000 solar lanterns were assembled (1500 Al-Qatn and 1500 Al-Qabaitah).	100%	
2.4	Distribute solar lanterns and traditional oven (Tanur) to the identified vulnerable households and IDPs in the targeted areas.	● Lanterns distributed: 3,000 ● Ovens distributed: 18,000	● 17,705 ovens were distributed to targeted households: 9000 in Al-Qatn District and 8,705 in Al-Qabaitah District. (295 ovens were damaged by the seasonal floods) ● 3000 solar lanterns were distributed (1500 Al-Qatn and 1500 Al-Qabaitah).	98%	-2%

3.2 Progress Towards Project Outputs

Project Output 1: Women micro-businesses on basic household solar-based energy appliances created to address energy use gaps.

Activity 1.1: Project Launch and Beneficiary Identification

The UNDP project team and the Responsible Party (RP) conducted a series of local consultations in the target districts of Al Qatn (Hadramout) and Al Qabaitah (Lahj). The objective of these consultations was to assess community solar energy needs and engage key stakeholders, including local authorities, community leaders, and women's groups, in project design and beneficiary selection. The consultations were carried out through the following structured activities:

1. **Coordination and Planning Workshops.** Initial workshops were held with local authorities and community committees to introduce the project objectives, implementation framework, and activity plans. Follow-up workshops in each target district facilitated context-specific planning, including risk and opportunity assessments. During these sessions, the responsible party trained community committees on beneficiary selection criteria and the registration process, leading to the identification and registration of 375 direct beneficiaries (200 in Al Qatn and 175 in Al Qabaitah). This process ensured community ownership and alignment with local needs.
2. **Community Consultations and Focus Group Discussions.** A specialized consultant was engaged to conduct field assessments of renewable energy needs, with an emphasis on basic lighting and household applications. Through focused group discussions, held in safe and inclusive settings, and structured surveys, the consultant gathered qualitative and quantitative data from community members, including marginalized groups and female-headed households. These discussions identified key energy access barriers and usage patterns, providing an evidence-based foundation for designing tailored renewable energy solutions. These participatory mechanisms enabled meaningful community involvement in shaping project implementation, ensuring that interventions are appropriately adapted to the local context and contribute to enhanced quality of life through improved energy access.

Activity 1.2: Development of Training Manuals and Guidelines

The UNDP and responsible party team project team collaborated to evaluate potential solar product designs specifically solar ovens and solar lanterns. Following this assessment, a decision was made to develop initial prototypes for testing before finalizing any training materials. The prototypes underwent evaluation and performance testing by the UNDP. Based on feedback received, the solar advisor refined the designs to optimize functionality, align with the approved budget, and ensure suitability for the geographical and social context of the target districts. Upon successful completion of prototype testing, the solar advisor developed comprehensive training and guidance manuals for both products, leveraging his technical expertise to ensure the materials were tailored to local needs and aligned with the finalized prototypes.

To ensure educational quality and local relevance, the project, through the RP, partnered with the Ministry of Technical Education and Vocational Training in Aden Governorate. The ministry reviewed the training manuals for compliance with national vocational standards. Following this review, all manuals received formal approval from the Ministry.

The approved training materials include:

Solar Oven (Box-Type)

- Training Programme:Trainer's Guide
- Training Programme: Trainee's Guide
- User Manual: Instructions and Basics for Operation

Solar Lantern

- Guide for Installation, Operation, and Maintenance – Trainer's Guide
- Guide for Installation, Operation, and Maintenance – Trainee's Guide
- User Manual: Instructions for Installation, Operation, and Maintenance

Google drive link: https://drive.google.com/drive/folders/1FnX5wG2DYHjkOC3kvVZmHMsjz5kPd1nH

Activity 1.3: Implementation of Business, Life Skills, and Vocational Training

This activity was successfully completed in both target districts. Business and life skills training programmes were delivered to 375 women, 200 in Al Qatn and 175 in Al Qabaitah. The programme beneficiaries were organized into 18 training groups, each comprising 20 participants. This small-group structure enhanced individualized attention and facilitated interactive, participatory learning.

The training programme integrated life skills with business development fundamentals, covering the following core topics:

- **Financial Literacy:** Principles of budgeting, saving, and managing expenses.
- **Business Planning:** Developing a structured business plan, including market research and customer identification.
- **Marketing Strategies:** Effective techniques for product promotion and customer outreach.
- **Leadership and Self-Confidence:** Building personal agency and initiative to foster community leadership.

In addition, a 10-day ToT programme was conducted, preparing 31 participants (16 from Al Qatn and 15 from Al Qabaitah) as qualified trainers. This initiative was designed to build local training capacity and ensure the high-quality, sustainable dissemination of technical skills to the wider cohort of women entrepreneurs.

Vocational training was delivered to all 375 beneficiaries over a 17-day period, providing practical skills in the assembly and production of solar ovens and lanterns. Utilizing a blended theoretical and practical methodology, the curriculum covered essential topics including production techniques, quality control, and occupational safety.

The training was conducted by trainers who had graduated from the project's ToT programme. Beneficiaries were organized into 31 practical production groups of 12 individuals each. This hands-on approach ensured participants not only acquired technical knowledge but also developed strong applied competencies. The training concluded with a demonstration of the assembled products, verifying the participants' readiness for independent manufacturing.

Activity 1.4: Support for Women-Led Solar Micro-Businesses and Business Networking

This activity was successfully completed in both target districts. A total of 375 women-led microbusinesses were established, trained, and provided with in-kind grants to support their launch. Each microbusiness received a comprehensive toolkit to facilitate the operation, assembly, and production of solar products.

Raw materials were also distributed to enable the mass production of solar ovens and lanterns, benefiting thousands of families across the two districts.

The project provided dedicated business consultancy support to the newly established women-led micro-businesses. This was implemented by contracting accredited consultants, specialized in micro-enterprise advisory services, to evaluate and refine each beneficiary's business proposal according to the local economic context of Al Qatn and Al Qabaitah districts. To ensure ongoing support, consultants were linked with beneficiaries through dedicated WhatsApp groups. These forums facilitated the remote review of business plans and provided a channel for continuous technical guidance and mentorship to the micro-business owners.

Activity 1.5: Distribution of Sample Unit Materials

This activity was successfully completed: the direct supply and distribution of raw material kits to women-led micro-enterprises. The initiative was designed to lower the primary barrier to entry for these entrepreneurs, the high upfront cost of materials, enabling them to commence production immediately. A total of 1,125 production kits were distributed across the target districts. This included 375 kits for the assembly of energy-efficient lanterns and a larger allocation of 750 kits for the construction of clean-cook ovens. This strategic supply chain support directly empowered hundreds of women, equipping them with the essential resources to generate income and serve their local communities.

A project-contracted solar energy specialist identified all necessary equipment and tools for the production and assembly of solar ovens and lanterns, aligning the specifications directly with the approved training manuals. This ensured the technical compatibility and practical utility of the inputs for the beneficiaries' new businesses. To ensure a transparent and efficient procurement process, the project provided 375 in-kind startup grants. Each beneficiary received a customized toolkit containing all essential items required to assemble the solar products, thereby equipping them with the physical capital necessary to launch their micro-enterprises.

Activity 1.6: Provision of Business Advisory Services and Market Linkages for Solar Energy Products

Under this activity, a specialized consultant was contracted to conduct a rapid market assessment in the target districts. The purpose of this assessment was to identify key market needs, challenges, and opportunities relevant to beneficiaries entering the local solar energy sector. The methodology included direct interviews with community members and established business owners operating in renewable energy. The assessment's key deliverables included actionable findings for the project and a practical database of local suppliers for solar assembly materials. This resource was developed to facilitate direct linkages between the new micro-enterprises and reliable supply chains.

Trainers from the vocational programme served as technical consultants and have initiated hands-on support for the women-led microbusinesses. These consultants were working closely with women entrepreneurs daily, providing hands-on mentorship and overseeing the quality assurance of production processes. Their support was focused on enhancing the production and market readiness of solar energy products, particularly traditional ovens (Tanur) and solar lanterns, while also facilitating the distributions activities for solar items produced.

The networking and market Linkage activity was also successfully implemented in both districts, strengthening collaboration and improving access to local markets for the women entrepreneurs.

Project Output 2: Vulnerable households and IDPs provided with alternative solar-based energy sources for basic lighting and household cooking appliances produced by the women businesses.

Activity 2.1: Survey and Mapping of Vulnerable Households and IDPs in Need of Alternative Energy Sources
The activity was successfully completed in both target districts. A comprehensive survey and mapping exercise was conducted to identify vulnerable households and IDPs in need of alternative energy solutions for basic lighting and household cooking. As a result, 100% registration was achieved, with a total of 21,000 vulnerable households registered.

For this survey and mapping, 32 enumerators were trained to conduct the identification and registration of approximately 21,000 vulnerable households and IDPs, ensuring precise targeting for assistance. The enumerators, carefully selected in coordination with local authorities across the targeted districts, received comprehensive training on the established core criteria. This included identifying vulnerable and women-headed households, IDPs, marginalized groups, and other key selection indicators. To enhance accuracy and efficiency, the process adopted an electronic registration methodology. Enumerators were trained to use the Kobo platform, enabling all household registration data to be recorded digitally in a secure and centralized system.

Activity 2.2: Procurement of Equipment and Materials for Solar Product Production

The activity was successfully completed. The responsible party conducted an openly advertised competitive tender in line with UNDP procurement principles; bids were eligibility-screened, technically evaluated against the approved specifications, and financially assessed on a best-value-for-money basis by an evaluation panel. The resulting contract included phased deliveries to district warehouses, inspection and acceptance upon delivery, warranty provisions, and an advance payment secured by a bank guarantee to mitigate liquidity risk. Procurement of raw materials and equipment required to produce solar lanterns and traditional ovens (Tanur) for the established women-led microbusinesses was finalized. In total, 21,375 input packages were procured and utilized, enabling mass production of solar items to meet the energy needs of vulnerable households across both districts.

Activity 2.3: Assembly and Production of Solar Lanterns and Ovens

Completion: 100%.

A total of 18,000 solar ovens were produced, 9,000 in Al Qatn and 9,000 in Al Qabaitah, and 3,000 solar lanterns were assembled (1,500 per district). The phased production schedule ensured efficient use of inputs and adherence to quality standards across product lines. Production groups operated under a structured quality-assurance regime, with 31 supervisory consultants providing routine inspections and technical guidance to the 375 women led microbusinesses.

Despite a tight budget envelope and increased costs of materials and production, the project team procured and furnished all required production inputs in line with the approved budget, enabling 100% completion of production.

Activity 2.4: Distribute Solar Lanterns and Traditional Oven (Tanur) to the Identified Vulnerable Households and IDPs in the Targeted Areas

Completion: 98%.

Distribution reached 17,705 ovens, 9,000 in Al Qatn and 8,705 in Al Qabaitah, and 3,000 lanterns (1,500 per district). The shortfall (295 ovens) resulted from heavy rains in Al Qabaitah and the large dimensions of the ovens, which led to water damage during temporary storage. These units were withdrawn from distribution. Furthermore, no replacements were arranged within the project period due to the constrained duration of the project implementation.

3.3 Assessment of Project Performance

A locally driven production model in challenging rural contexts

Despite operating in districts where many women still face basic living constraints, the project piloted a local production approach that mobilized community capacity rather than relying on external supply chains. This shift, bringing training, tools, and inputs into Al Qatn and Al Qabaitah, proved both feasible and impactful, especially for women who had limited prior access to income-generating opportunities.

Gender Component and Women's Contribution to Economic Resilience

The KSR Women project placed women at the centre of its design and implementation, recognizing their pivotal role in driving economic resilience and community development. By establishing 375 women-led microbusinesses and providing integrated training in business, life skills, and vocational competencies, the project enabled women to transition from passive beneficiaries to active economic agents.

Women not only produced and distributed renewable energy products but also engaged in market linkage activities, demonstrating leadership and entrepreneurial capacity. Each woman received financial incentives totalling USD 560 for production, along with an in-kind grant of a complete toolkit to support business operations. These resources were complemented by comprehensive training programs, equipping women with new technical and entrepreneurial skills to strengthen income generation and long-term sustainability.

This empowerment has improved household income security, expanded access to clean energy, and fostered inclusive growth in rural areas. The approach illustrates how gender-responsive programming can simultaneously address energy poverty and promote sustainable livelihoods, contributing to broader goals of resilience and recovery in Yemen.

Capacity built at multiple levels: women, trainers, and markets

The project delivered integrated business, life skills, and vocational training to 375 women, supported by a local ToT cohort of 31 trainers. Training manuals were TVET reviewed and approved, and the practical methodology combined classroom learning with hands on assembly and quality assurance. Day-to-day advisory support (including remote mentoring and production group supervision) created a strong coaching environment, enabling participants to convert new skills into consistent output. In large production sites, around 100% of the workforce were women, visibly demonstrating the empowerment and inclusion objectives.

Production and distribution outcomes.

- **Lanterns:** 3,000 units were assembled and fully distributed (1,500 per district), with solid user acceptance due to ease of use, reliable lighting, and straightforward maintenance. Lanterns emerged as the stronger product line for rapid adoption and near-term livelihood potential.
- **Ovens:** 18,000 units were produced (100% of the target). Distribution achieved 98% (17,705 ovens), 9,000 Al Qatn and 8,705 Al Qabaitah.

Appraisal of oven performance and what we learned

Field testing and iterations improved oven design (e.g., enhanced heat absorption), but performance was not uniformly optimal across all use cases and conditions. Even with these limitations, the project successfully demonstrated local mass production at scale under constrained budgets, creating structured work opportunities and building technical know-how that can be leveraged in future product upgrades. The clear lesson is to prioritize high adoption items (lanterns) while refining oven specifications with additional resource to upgrade their performance in any future initiatives.

Local Innovation, local ToT, advisory, and market linkages

The local ToT pipeline and continuous advisory support were decisive success factors, ensuring quality control, troubleshooting, and sustained engagement beyond classroom training. Networking and market linkage activities connected microbusinesses to suppliers and community demand, and the input package procurement (with phased deliveries and inspection/acceptance procedures) made large volume production possible inside the districts.

Stakeholder engagement & public institution support

As in the collaboration with the Technical Institute in Al Qatn, the project transformed a local public institution into an active training and production hub by utilizing its facilities, providing essential equipment, and installing a complete solar energy system that ensured uninterrupted power for machinery, computers, lighting, and air conditioning. This partnership strengthened institutional capacity, reduced power related downtime, and improved training quality and women's attendance; institute staff also joined the ToT cohort, delivered advisory and quality assurance support to women led microbusinesses. The institute's enhanced capabilities alongside its role in hosting market linkage activities and aftersales troubleshooting, demonstrate effective stakeholder engagement and leave a durable asset that sustains service delivery beyond the project period, showing how targeted support to public institutions multiplies impact and improves the sustainability of local renewable energy livelihoods.

Contribution to livelihoods and energy access

By equipping 375 women led microbusinesses and reaching 21,000 registered vulnerable households with solar items, the project delivered tangible gains in household lighting and clean cooking, while enabling women's income generation through paid production incentives and the foundations of small enterprise operations. This aligns with KSrelief's strategy to bridge humanitarian assistance and longer term development, while supporting national efforts to expand access to renewable energy solutions.

The project met its core production targets, delivered full lantern distribution, reached 98% oven distribution under difficult conditions, and built local capability that will outlast the project particularly through ToT, practical training, and advisory mechanisms.

4 Main Challenges and Constraints

Description of challenge	Action Taken
Security Challenges in Al Qabaitah: Field missions were restricted due to the proximity of conflict touchlines areas, making direct access unsafe.	Local field monitors were hired to oversee production and distribution activities and provide daily updates. Similar monitors were also deployed in Al Qatn to ensure consistent oversight.
Limited Budget for Field Visits: Budget constraints limited the number of field visits, particularly to Al Qatn.	The project team recruited local field monitors to conduct visits, especially during the production and distribution phases.
Oven Technical and Budgetary Challenges: The production of solar ovens faced several technical difficulties, including the need to replace multiple components. Additionally, the high quantity required placed considerable pressure on the project budget, limiting the ability to enhance the design or increase oven size.	To improve oven quality within budget limits, faster-heating metals and black-coloured materials were introduced to enhance heat absorption and reduce cooking time.
Battery Capacity for Women Microbusinesses: The batteries initially provided were too small to meet the operational needs of the women led businesses.	Non-essential items such as system bags were removed, allowing for an upgrade in battery capacity to better support business operations.
Logistical and Seasonal Challenges: The large volume of raw materials required to produce 18,000 solar ovens and 3,000 lanterns	The project team negotiated with suppliers to temporarily store raw materials in their warehouses until existing inventory was cleared. To protect produced solar items from rain damage,

Description of challenge	Action Taken
created logistical and financial pressures. Costs increased due to storage, handling, and complex delivery logistics—especially in Al Qabaitah, where mountainous terrain and poor road conditions prevented large trucks from reaching all four production centres. Additionally, heavy rains in July caused delays in transportation, production, and distribution, as vehicles could not access certain areas until floodwaters receded.	waterproof tarp covers were procured and used at production sites. These covers are deployed only when rain is expected, offering flexible and effective prevention.
Banking Challenges. Delays occurred due to Yemen's severe liquidity crisis and the struggling banking sector, hindering timely financial commitments processing.	The UNDP operations team employs robust risk management protocols for its financial partners, proactively addressing projected uncertainties. Partnerships have been established primarily with solvent banks possessing extensive branch networks to facilitate remittance of money to the Responsible Party accounts with minimal delays possible.
Security and Logistic Challenges. The country's security situation impacts logistics and the movement of goods, particularly large shipments between governorates. This sometimes impacts team movement and shipping of the production input materials.	To manage supply difficulties, the responsible party rented warehouses at the project sites, and the agreement with the supplier includes delivery to these designated stores via multiple smaller shipments. Additionally, the project's security team provides clearance for each instance of team movement on a case-by-case basis.
Budget Constraints. The project faced a tight budget, particularly concerning project management and allocations for essential functions. The need for close monitoring through regular field missions further strains the available financial resources. The limited budget slightly impacted the capacity of tools needed for operating women's income generating activities, especially the power supply needed to operate and produce large numbers of units.	UNDP addressed this issue by allocating a significant portion of HR costs to its broader portfolio accounts, drawing resources from other ongoing projects. To manage the power supply need, the project team will operate large technical workshops for women groups where enough power is for group production and assembly.
Technical Requirement. Meeting the technical requirements for producing the solar items was another challenge for the project team. Sourcing a supplier capable of providing the numerous and specific inputs needed proved time-consuming. This led to delays, particularly in the development of precise tender documents and in guaranteeing that the required specifications were met while adhering to the project's limited budget.	To address this, a consultant was engaged to develop precise technical specifications, and the tender period was extended to broaden bidder participation. Furthermore, the team increased the advance payment to the selected supplier, secured by a bank guarantee, to mitigate potential supply delays due to liquidity constraints.
Project Duration. The relatively short timeframe allocated for the project presents a challenge, demanding intensified efforts to ensure the timely completion of all planned activities. As this is a development project, adequate time is essential to allow for meaningful community engagement, capacity-building, and sustainable implementation. The need to accelerate progress and potentially	The project team developed an acceleration plan to ensure timely completion of project activities. These include: ● Intensive Training to optimize training schedules for efficiency. ● Expedited procurement to streamline tendering and to incentivize suppliers for consistent supply. ● Starting Business Training early to leverage production wait times.

Description of challenge	Action Taken
undertake extensive activities to realign with the initial schedule requires careful planning and resource management.	An Early Needs Assessment fast-tracked beneficiary identification for timely distribution.

Complaints and feedback management

UNDP and the responsible party operated a beneficiary Grievance and Response Mechanism (tollfree line, suggestion boxes, and exit interviews) and **r**esponded in a timely manner to all complaints and product related concerns, particularly those regarding oven performance and durability. UNDP worked closely with the responsible party and local trainers to improve quality, providing usage guidance and onsite technical advice to women led production groups and beneficiaries. To strengthen oversight, UNDP assigned field monitors to follow production and distribution; however, due to limited resources, five monitors were recruited across the two districts on a parttime basis for three months**.** Their spot checks and reports were integrated into quality assurance actions and operational adjustments during implementation.

Response to KSrelief request (ovens – Al Qabaitah). Upon receiving KSrelief request, UNDP convened an immediate meeting with KSrelief and agreed, together with the project teams in Aden and Riyadh, on urgent follow-up actions. UNDP then established a technical committee to provide a detailed, timely response, conducted on-site verification in Al Qabaitah, and checked production batches against the approved specifications and standards. UNDP responded immediately to KSrelief's request to review complaints concerning oven performance and input materials reported from Al Qabaitah**.**

The UNDP team, working with the RP, conducted on-site verification, checked batches against the approved specifications, and documented findings. UNDP then submitted to KSrelief a complete dossier of supporting documents (inspection notes, photos, delivery records, and QC checklists) together with a formal report outlining observations and practical mitigation measures implemented within the available budget.

The investigation did not find evidence of systemic non-compliance with the approved oven specifications, and laboratory testing did not substantiate any health risk claims related to the coating. Where isolated logistical or behavioural issues arose, corrective actions were taken (tightened QC, engagement with authorities, reinforced monitoring).

The investigation found that part of the escalation was linked to administrative/contractual disputes and personal grievances rather than technical non-compliance. A principal complaint tied to unjustified financial claims by a former consultant was not substantiated and that consultant's assignment was subsequently terminated for conduct/administrative reasons. Another engineering complaint was not corroborated; separate written complaints alleged attempted solicitation of funds from a supplier by the same individual. These HR/compliance matters were handled through internal administrative channels. For more details on the case please see the report submitted to KSrelief.

Report attached: KSRelief - WE - Investigation Report.docx

5 Donor Visibility – Media Report

Please refer to Annex A for the final Media Report.

6 Recommendations

1. **Appoint specialized technical leads.** Allocate resources to engage a small, dedicated team of domain experts (solar energy, materials manufacturing) to provide direct oversight and be the single authority for design approvals and changes.
2. **Extend technical windows for new/complex designs.** Taken the tight time of this project, it is recommended to allocate additional time to prototype, run iterative QC, and correct issues before mass production, particularly for ovens where performance varies by terrain and climate
3. **Strengthen field monitoring continuity.** Resource a continuous monitoring line from input reception through storage, transport, production, and distribution; train larger numbers of monitors to detect technical non-compliance and feed findings back into procurement and QC.
4. **Increase budget flexibility with small buffers.** Provide limited contingency to protect essential functions (quality, monitoring, advisory) and absorb shocks.
5. **Prioritize high adoption lines; refine oven specifications.** Scale lanterns (high user acceptance, reliable, easy maintenance). For ovens, when budgets permit, pursue context specific refinements (materials, dimensions, insulation) to enhance acceptance and usability.
6. **Sustain ToT and advisory support.** Continue local ToT and routine production group coaching and QA checklists. Maintain collaboration with the Technical Institute in Al Qatn as a training/production hub, its equipment and installed solar system have strengthened operations and created a durable public asset for ongoing service delivery.
7. **Consolidate supplier networks and user feedback.** Build and maintain a local supplier database for inputs/spares and host market linkage events connecting women led microbusinesses to buyers/installers. Provide simple aftersales guidance (troubleshooting sheets, warranty terms) and channels for user feedback to inform product improvements.
8. **Calibrate targets to rural delivery capacity and budget.** For future production initiatives, set output targets and timelines that are proportionate to rural access constraints and the available budge
9. **Investigating production material used**. UNDP's investigation in the alleging non-compliance with technical specifications and purported health risks related to oven materials found no systemic noncompliance with oven specifications and no coating related health risks, and the complaint largely reflected administrative/contractual disputes, including an unsubstantiated financial demand complaint by a former consultant (assignment terminated), an uncorroborated engineering claim, and a supplier solicitation allegation, handled through internal HR/compliance.
10. **Targets Size**. Though a pilot, the large number of beneficiaries (approximately 21,000) posed a significant challenge, given the project's focus on production and innovation. This challenge was further compounded by an issue with resources, particularly for project management, and the complexity of operating in the targeted areas, especially Al-Qabaitah, which presented logistical and operational difficulties.

7 Financial Information

7.1 Financial Tracking Sheet History:

Instalment no.	1	2	3	4	5	6	Total
Instalment amount (USD)	1,240,341.43	744,204.86	496,136.57				2,480,682.86

Instalment percentage	50%	30%	20%				100%
Paid instalment Date	Nov-24	Jun-25	N/A				-
Total Budget	**2,480,682.86**						

7.2 Financial Statement

Please refer to Annex B for the final Financial Report.

8 Annexes

8.1 Annex A – Media Report

Annex A – Separate Word file (Signed & Stamped)

8.2 Annex B –Financial Report

Annex B – Separate Excel file (Signed & Stamped)

IMPLEMENTING PARTNER	RERESENTATIVE	SIGNATURE AND STAMP	DATE

DocuSigned by:
Zena Ali Ahmad
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