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INDEPENDENT TERMINAL EVALUATION

Strengthening the capacity of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan

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Abbreviations and acronyms

Acronym	Definition
EOI	Expression of Interest
ESMP	Environmental and Social Management Plan
ET	Evaluation Team
FDI	Foreign Direct Investment
GoJ	Government of Japan
IED	Independent Evaluation Division
ISID	Inclusive and Sustainable Industrial Development
ITPO	Investment and Technology Promotion Office
METI	Ministry of Economy, Trade and Industry
MOFA	Ministry of Foreign Affairs
OECD-DAC	Organisation for Economic Co-operation and Development - Development Assistance Committee
SME	Small and Medium Enterprises
STePP	Sustainable Technologies Promotion Platform
TE	Terminal Evaluation
ToC	Theory of Change
TOR	Terms of Reference
UNEG	United Nations Environmental Group
UNIDO	United Nations Industrial Development Organisation

Glossary of evaluation-related terms

Term	Definition
Baseline	The situation, prior to an intervention, against which progress can be assessed.
Effect	Intended or unintended change due directly or indirectly to an intervention.
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Impact	Positive and negative, intended and non-intended, directly and indirectly, long term effects produced by a development intervention.
Indicator	Quantitative or qualitative factors that provide a means to measure the changes caused by an intervention.
Lessons learned	Generalizations based on evaluation experiences that abstract from the specific circumstances to broader situations.
Logframe (logical framework approach)	Management tool used to facilitate the planning, implementation and evaluation of an intervention. It involves identifying strategic elements (activities, outputs, outcome, and impact) and their causal relationships, indicators, and assumptions that may affect success or failure. Based on RBM (results-based management) principles.
Outcome	The likely or achieved (short-term and/or medium-term) effects of an intervention's outputs.
Outputs	The products, capital goods and services which result from an intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.
Relevance	The extent to which the objectives of an intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donor's policies.
Risks	Factors, normally outside the scope of an intervention, which may affect the achievement of an intervention's objectives.
Sustainability	The continuation of benefits from an intervention, after the development assistance has been completed.
Target groups	The specific individuals or organizations for whose benefit an intervention is undertaken.

Executive summary

UNIDO's Investment and Technology Promotion Office, Tokyo (ITPO Tokyo) is one of nine offices worldwide belonging to UNIDO's ITPO Network. The mission of UNIDO ITPO Tokyo is to help developing and emerging countries and economies in transition in their efforts to achieve inclusive and sustainable economic development by promoting foreign direct investment (FDI) and technology transfer from Japan.

In 2019, the COVID-19 pandemic disrupted the world, with disproportionate impact on the poor. A rapid and suitable response was required, particularly to support health systems in developing and emerging countries to address the needs of the pandemic and potential other health risks. Recognizing this challenge and the need for international commitment and solidarity as well as to address the pressing economic issues facing Japanese companies, the Government of Japan (GoJ), the Ministry of Foreign Affairs (MOFA) allocated supplementary funds to an emergency response project. ITPO Tokyo submitted an innovative project concept that was accepted by MOFA and the detailed concept was further developed through a collaborative approach between MOFA and UNIDO.

ITPO Tokyo was already managing the Sustainable Technologies Promotion Platform (STePP) that provided a ready mechanism to link Japanese companies producing public health technologies with developing countries to address identified public health requirements. The existence of the STePP program was an important factor in providing the platform from which this Project could rapidly mobilize within the context of the COVID-19 pandemic. On the basis of the project document submitted, an amount of almost USD4 million was approved by MOFA for the period of one year from June 1, 2020, to May 31, 2021 with the objective of engaging ten Japanese companies to address COVID-19 health needs in developing countries.

Evaluation purpose and methodology

The purpose of this evaluation was to independently assess the project with two objectives: (i) to assess the project performance in terms of relevance, effectiveness, efficiency, coherence, sustainability and progress to impact; (ii) identify key findings, lessons and recommendations for enhancing the design of new and implementation of ongoing and future projects. The evaluation covers all project activities across the entire project period to date, from June 1, 2020 to December 31, 2021. The Project was still on going at this stage, with an extension to March 31, 2022 being approved during the period of the evaluation.

Key Findings

The overall objective for this Project was “to contribute to capacity building of developing countries to mitigate impacts of the COVID-19 epidemic crisis through appropriate technology transfer from Japan.” The aims were to:

- Support developing and emerging countries to improve health, sanitary and hygiene environment to fight against COVID-19 and other infectious diseases through technology transfer;
- Leverage capacity of Japanese enterprises, especially SMEs, to meet the demand in this emergent situation; and
- Demonstrate commitment of the Government of Japan to the international cooperation and the call of United Nations system to mitigate the socio-economic impacts of the COVID-19 crisis.

The project aimed to support 10 companies to access 10 countries with a sub-project for improved technology to address COVID-19 and other infectious disease control. The project was able to support a total of 16 sub-projects, involving 13 companies over 12 countries, with 10 different technologies. Two sites, Myanmar and Nepal were subsequently cancelled or relocated, due to factors beyond the control of the project. Two companies (Marusyo and Chuwa) had multiple sites. This resulted in fifteen active sub-projects as follows:

Cooperating Company and site	Technology
1. JTOP (India)	Water regeneration system
2. MARUSYO (Kenya, Mongolia, initially Nepal, moved to India)	Photocatalytic coating with antibacterial effect.
3. SOLAR WIND (Indonesia)	Hypochlorous acid type disinfectant
4. KINSEI SANGYO (Kenya)	Gasification incinerator for medical waste.
5. TSP TAIYO (Kenya)	Mobile health inspection with solar.
6. CHUWA (Madagascar, Senegal)	Incinerator for medical waste.
7. HINODE. (Morocco)	Domestic wastewater treatment system.
8. MITSUBISHI (Myanmar, cancelled)	Water purification unit for hospitals.
9. TECHNO MEDICA (Nigeria)	Blood test analyzer.
10. TERIOS-TEC (Senegal)	Hypochlorous acid water generator.
11. AGC (Vietnam)	Hypochlorous acid water generator.
12. TROMSO (Vietnam)	Water purifying system.
13. SARAYA (Uganda)	Alcohol-based hand rub production.

Source: ITPO, 2021. Note: full company names are provided in the main report, short names are used in text for brevity

The Project has satisfactorily addressed all three aims. The technology supported has largely resulted in positive results in terms of use of disinfectants or incineration to combat viral spread, improved practices for disease control and improved access to clean water. The project has clearly contributed to the capacities of developing countries to mitigate the impacts of the COVID-19 pandemic.

Moreover, the Project was able to successfully deliver on most of the specific targets for project implementation. Nonetheless, challenges were experienced, and the implementation varied across different countries and with each company. The evaluation assessed the performance in relation to the four components of the project using the standard UNIDO evaluation criteria with the following findings by criteria.

Relevance. The project was assessed as a relevant and important response to the COVID-19 pandemic context. It built from existing relationships between ITPO and Japanese technology producers in the health and sanitation industries. The need was clear, the response from all stakeholders was rapid and positive, and the commitment to the project aims and benefits was strongly confirmed. The Expression of Interest (EOI) process ensured the interest of the participating companies and the in-country discussions ensured that the technologies proposed were largely in line with the stated needs of the country participants.

The selection process for the companies was rigorous and appropriate. There was no prior needs assessment as noted in the project concept; rather the companies nominated their country and technology through a proposal. Once the proposal was accepted, there was a targeted process at the country level to identify the most appropriate recipients for the technology demonstration. Given the emergency context of COVID-19 and the need to expedite implementation, the amendment of the STePP approach to focus on COVID-19 and in-country demonstration was an appropriate amendment. The EOI process, although related more to the interests of the company, rather than the countries, were in line with the needs of the countries and also resulted in high

ownership of the project at all levels. However, allocating more time at the initial stages could have more strongly engaged country level stakeholders and smoothed some implementation issues.

Effectiveness. The implementation was effective across all of the project activities. The EOI and screening process was highly effective. There were complications due to the number and range of sub-projects. This complexity did raise implementation challenges, but these were largely addressed and specific objectives for most of the sub-projects were successfully achieved. Project mobilization fast and expedited by all stakeholders, although engaging the country stakeholders at an earlier stage may have prevented challenges during implementation.

Generally, operations were smooth. Procurement and shipping were effectively supported by ITPO, UNIDO HQ management staff, UNIDO country offices and the Japanese Embassies. Stakeholders reported that communication between ITPO, the Japanese and national companies was excellent. There were issues with national customs clearance in some instances, but these were effectively facilitated by the Project. Most companies delivered effectively on their specific contract performance indicators, although some delays were experienced. The national level installation proceeded well when national partners were operationalized.

The training and capacity development activities were praised throughout the evaluation consultation. The companies found that remote training was possible, particularly with the involvement of an engaged local partner. Training manuals were translated, and follow-up support was already occurring for most sites at the time of the evaluation. National counterparts highly appreciated the training and the improved technologies.

Efficiency. Overall, the project was assessed as efficient. The project management was proactive, and budgets were managed carefully. Contracts generated in time and financial performance was tracked. However, the timeframe was delayed from the original design, mostly due to COVID-19 concerns and cargo capacity issues. At the same time, the UNIDO brand helped to facilitate procurement, approvals and shipping and facilitate processes to proceed faster than some other cargo.

With the delays, there was a requirement to extend the project twice to ensure completion of the project activities. MOFA approved the two extensions. This was exceptional, given the standard MOFA processes but MOFA reported that the requests for extension were well-substantiated. The main reasons of shipping delays and approvals were due to conditions beyond the control of the project. The positive progress achieved and the momentum towards further achievement was sufficient to warrant continuing the activities to ensure maximum benefits to the targeted countries and companies. The budget allocations were used efficiently in line with the designated budget categories for each component and at the time of the evaluation, 92% of the resources had been disbursed. There was some realignment of budget from travel and meetings to support the staffing required to support the extended timeframe.

A major factor in the efficiency of the project was the acceleration of the initial phase of project planning, selection, procurement and mobilization at the country level. This project demonstrated the ability of ITPO, the UNIDO HQ and the private sector partners to mobilize fast in an emergency context. This is an important consideration for the potential design of future projects.

Sustainability of benefits. The sustainability of the results that have been achieved through the project is positive at present but uncertain for all sub-projects. The viability of the technology is an issue for two sub-projects, one where the technology needs to be adjusted for commercial rather than community use (JTOP) and the other where approval of the product is still pending (AGC). Nonetheless, both companies are committed to proceeding with the initiatives to address

the issues and build from the project activities. For three technologies that require a larger investment (Chuwa, Kinsei Sangyo, TSP Taiyo), the country stakeholders are interested but do not have the resources to replicate the demonstration without external support or longer-term budgetary planning. In these circumstances, the role of UNIDO in engaging major national stakeholders with budgetary control, or to support funding applications to other development partners, provides a potential pathway forward.

Overall, the initiatives have commenced a potential commercial engagement with the target countries, apart from Nepal and Myanmar where operations were not possible. In addition, all companies have understood the need to provide on-going support and monitoring beyond the period of the project and the commitment to continue this is positive. Consequently, sustainability is assessed as moderately satisfactory.

Gender mainstreaming. There was good participation of women in each of the sub-projects, largely in medical and school facilities where the proportion of female employees is high. The project itself had women as staff in implementation and gender disaggregated data was collected. However, there was no specific focus on gender-sensitivity training or mainstreaming, although this largely related to the direct responsiveness to the context to train as many medical staffs (or engineers) as possible regardless of gender. Consequently, this is assessed as moderately satisfactory.

Results—based management. The project management in ITPO was excellent throughout the project. The speed and effectiveness of mobilization and solution-oriented approach was noteworthy. The careful and regular weekly management resulted in rapid response to any issues arising. Contract management, both at ITPO and UNIDO HQ were satisfactory. There could, however, been stronger liaison with country offices at an earlier stage of the project. The monitoring and evaluation included good focus on data at commencement but little systematic tracking of outcomes during implementation. It is expected, as the project nears completion, that the project attention will turn from just implementation to gathering more data on the outcomes, particularly at the country level, in establishing stronger processes for sustainability and in considering the effectiveness of the model for future replication and upscaling.

Overview of key conclusions and recommendations

Conclusions. The original design of the project as an emergency response to support developing countries in improving their response to the pandemic was conceptually appropriate. All partners were strongly engaged with and committed to the process. The project approach worked well in implementation. The technologies supported were largely of benefit to the recipient country partners, given the focus on health and hygiene. Although the interventions were relatively small and were technology demonstrations, most introduced positive innovations and have potential for further replication. Several technologies were less appropriate, particularly where the need was not initially evident so that while helpful, the project local partners either had other priorities or where the technology was not sufficiently fit for purpose. Overall, the Project has been satisfactory in attaining its aims and achieving the expected outputs and outcomes. In addition, it has reached these achievements in very challenging and complex circumstances.

Recommendations

Conclusion	Example	Recommendation	Responsibility
<p>The innovative approach of the STePP-Demo project within an emergency context was successful and generated a range of valuable lessons on how to expedite development initiatives between private sector partners and developing countries.</p>	<ul style="list-style-type: none"> • Identification of joint focus on development need and private sector opportunities. • Selection of companies with pre-existing relationships in country • Engagement with local Embassies of Japan and local governments for assistance with bureaucratic processes and procedures, including import and tax requirements. • Remote training techniques that enabled scaling-up and wider audiences such as Chuwa’s training of trainers approach. 	<ol style="list-style-type: none"> 1. The project has developed a range of innovations that need to be documented with relevant data to enable future development partners to learn from and replicate the experience. 2. Companies that will benefit from such projects in the future, should ensure the availability of training videos and material, preferably in the target country’s language or dialect. 	<p>UNIDO and GoJ MOFA to promote innovation through the project.</p>
<p>In countries where there was active involvement of UNIDO offices, they were able to facilitate local processes but for some the notification came too late (India, Kenya)</p>	<ul style="list-style-type: none"> • Marusyo was able to contact the relevant Ministries of Health with the assistance of the UNIDO country offices. 	<ol style="list-style-type: none"> 3. UNIDO offices need to be more involved in the planning stages of the Project to provide intelligence on local conditions, approval processes and potential synergy, overlap with on-going projects. 	<p>UNIDO Management, ITPO HQ</p>
<p>The technologies that were most successful were directly appropriate to COVID-19. This assisted in gaining rapid approvals and the required support.</p>	<ul style="list-style-type: none"> • Medical waste incineration was an urgent need in most countries so was an obvious selection. • The reduction of noxious fumes for incinerators was of high interest to national stakeholders. • Hypochlorous acid water that has demonstrated a high efficacy rate was fast-tracked through alternate approval mechanism to expedite use. 	<ol style="list-style-type: none"> 4. In similar projects, greater attention should be given to the direct purpose of the project i.e. emergency response and COVID-19. This gives a clearer purpose and understanding for all participants and allows identification of relevant projects without extensive needs assessment processes. 	<p>ITPO TOKYO, UNIDO HQ for future project management</p>

I. Evaluation objectives, process and methodology

A. Objectives and scope of the evaluation

Evaluation Objectives. The purpose of this evaluation is to independently assess the UNIDO Project ‘Strengthening the capacity of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan.’ The overall objective for this Project was “to contribute to capacity building of developing countries to mitigate impacts of the COVID-19 epidemic crisis through appropriate technology transfer from Japan.”¹

The evaluation had two specific objectives: **Objective 1:** Accountability/results: to assess the project performance in terms of relevance, effectiveness, efficiency, coherence, sustainability and progress to impact; and **Objective 2:** Identify key findings, lessons and recommendations for enhancing the design of new projects and implementation of ongoing projects.

Evaluation Questions. In order to address these objectives, the evaluation responded to the following questions as outlined in the evaluation Terms of Reference (ToR) Annex 1:

How well has the project performed?

What are the project’s key results (outcomes and impact)?

What are the key drivers and barriers to achieve the long-term objectives?

What lessons can be drawn from the successful and unsuccessful practices in designing, implementing, and managing the project, particularly given the COVID-19 context, the need for rapid action and the early engagement of the private sector in design?

Evaluation Scope. The evaluation covers all Project activities across the entire project period to date, from June 2020 to December 2021. This scope includes activities conducted by technology providers in India, Indonesia, Kenya, Madagascar, Mongolia, Morocco, Myanmar, Nepal, and Nigeria.

B. Evaluation methods and Theory of Change

Evaluation Process. The evaluation was conducted in accordance with the UNIDO Evaluation Policy, UNEG Norms and Standards for evaluation and the UNIDO Guidelines for the Technical Cooperation Project and Project Cycle. The evaluation was conducted by Ms. Dorothy Lucks, Team leader and Mr. Demosthenes Doumenis, Team member, between September 2021 and January 2022, with oversight from the UNIDO Independent Evaluation Division (IED) to ensure the quality of the evaluation. Active data collection occurred through October and November 2021. This report provides a summary of the findings of the evaluation in line with the standard UNIDO evaluation criteria.

Methodology. The evaluation was carried out as an independent in-depth evaluation using a participatory approach whereby key parties associated with the project were consulted throughout the evaluation. The evaluation used a theory of change (ToC) approach and mixed methods to collect data and information from a range of sources and informants. It paid attention to triangulating the data and information collected to ensure an evidence-based and credible evaluation, with robust analytical underpinning.

¹ UNIDO, 2020, *Project Document for Strengthening the capacity of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan*

Data collection. The evaluation used a mixed methods approach to gather data from diverse sources. The following are the main instruments used for data collection:

- (a) **Desk and literature review** of documents related to the project. This included contracts and progress reports for the projects, technical data on the products supported and other relevant documentation. (See Annex 2. Bibliography)
- (b) **Stakeholder consultation** was undertaken through structured and semi-structured interviews and/or focus group discussions with key project stakeholders. These stakeholders included: i) UNIDO management, country office representatives and project staff, ii) donor and counterpart representatives, iii) Representatives of Japanese technology providers in the selected technologies at both management and technical levels, and, iv) Industry representatives in the recipient countries particularly key government officials, local technical experts, professionals and companies in health, sanitary and hygiene sectors. Consultation was undertaken online due to travel restrictions associated with the COVID-19 pandemic. See Annex 3 for a List of Interviewees.
- (c) Interviews (written and online) were conducted with the relevant UNIDO Country Office(s) representative to the extent that he/she was involved in the project, and the project's management members and the various national [and sub-regional] authorities dealing with project activities as necessary
- (d) An online survey covering a wider range of key informants for triangulation purposes. A survey of private sector and country partners was circulated through Project offices in all countries with operations. The survey received 48 responses from 11 countries and 13 companies.

Sample countries. The Project initially covered 12 countries (India, Indonesia, Kenya, Madagascar, Mongolia, Morocco, Myanmar, Nepal, Nigeria, Senegal, Uganda, and Viet Nam). For the evaluation, documentation on implementation progress were reviewed for all countries but a sample of countries were selected for deeper investigation based on i) regional coverage; (ii) varied country size and contexts; (iii) number of contracts, and (iv) performance levels. The four countries and respective companies and technologies listed in Table 1 were a focus for detailed consultation and deeper investigation of project progress.

Table 1. Countries selected for virtual data collection missions

Country	Cooperating Company	Technology
INDIA	<ul style="list-style-type: none"> • JTOP CO., LTD. • MARUSYO SANGYO CO., LTD. (transferred from Nepal) 	<ul style="list-style-type: none"> • Water regeneration system • Photocatalytic coating with antibacterial effect
KENYA	<ul style="list-style-type: none"> • KINSEI SANGYO CO., LTD. • MARUSYO SANGYO CO., LTD. • TSP TAIYO INC. 	<ul style="list-style-type: none"> • Gasification incinerator for medical waste • Photocatalytic coating with antibacterial effect • Mobile inspection system with solar system
SENEGAL	<ul style="list-style-type: none"> • CHUWA INDUSTRIAL CO., LTD. • TERIOS-TEC CO., LTD. 	<ul style="list-style-type: none"> • Incinerator for medical waste • Hypochlorous acid water generator
VIET NAM	<ul style="list-style-type: none"> • AGC INC. • TROMSO CO., LTD. 	<ul style="list-style-type: none"> • Hypochlorous acid water generator • Water purifying system

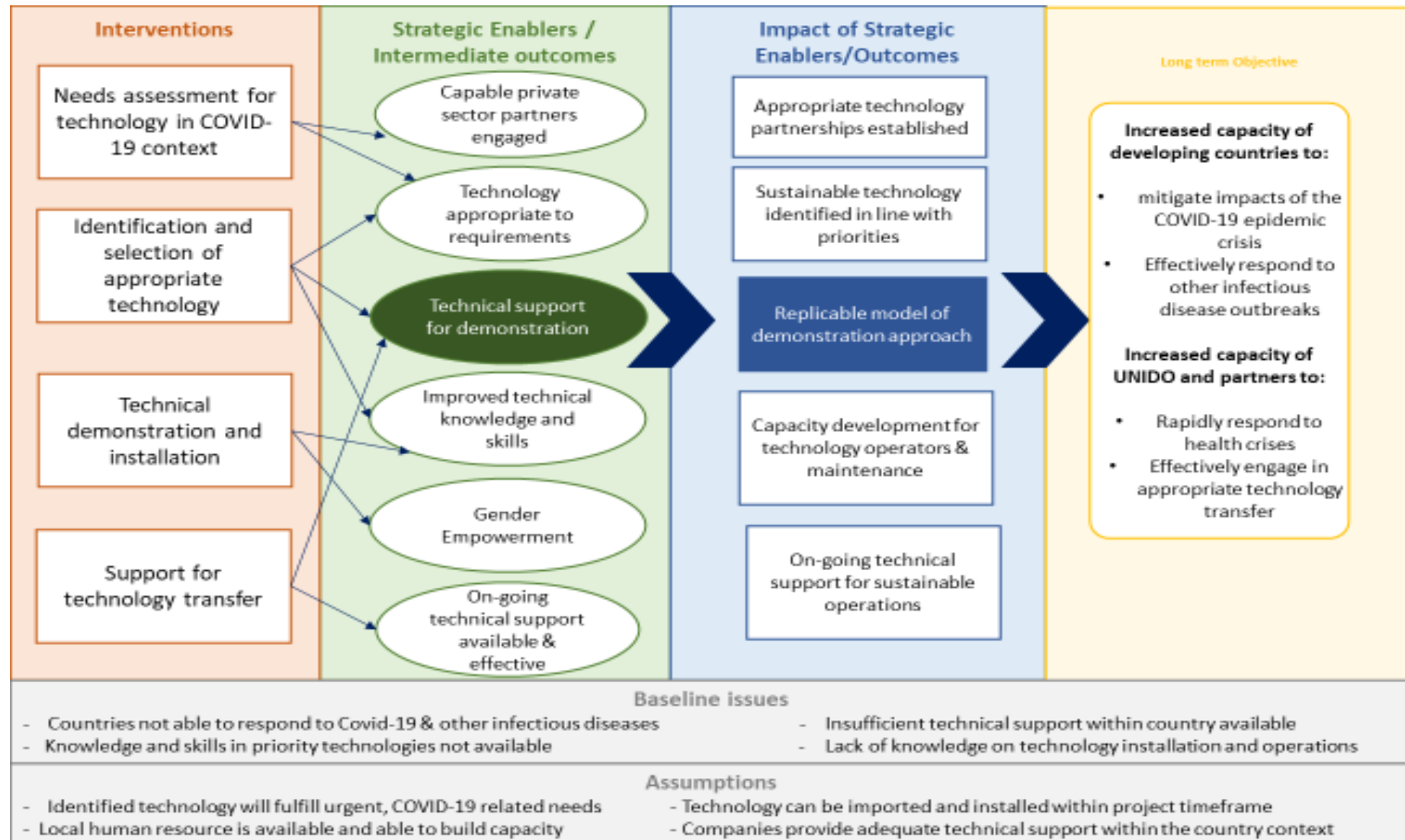
Theory of Change. A reconstructed ToC was developed to illustrate the intended causal pathways through which project activities contribute to the project objectives, outcomes and overall impact (Figure 1). While the Project Document identified four project components, the evaluation team has identified interrelated chains of results that need to be considered. The ToC also presents the baseline issues and assumptions related to achievement of the project results. The ToC assisted Project analysis in that the identified causal pathways could be tested to identify the biggest contributions of the Project and where challenges limited progress (See Figure 1).

C. Limitations encountered and validity of findings.

The evaluation faced several limitations and took action to mitigate these as far as possible. Project operations were on-going and the project was extended as the evaluation was being conducted. It was agreed between ITPO and the evaluation team to analyze data up to December 31, 2021 rather than October 2021 as originally planned and extend the evaluation period to accommodate further activities. Further accomplishment was expected to be achieved in early 2022 but this was largely completion, sustainability and promotional activities so this report is reflective of the overall progress achieved.

Given the wide scope of project activities, it was not possible to cover all subprojects. Nonetheless, the selected sample provided a good range of sub-project countries and companies. Some language difficulties were experienced but the ITPO team provided support to identify a translator and as a result all targeted interviews were completed and useful. Expected difficulties in contacting key stakeholders due to the COVID-19 pandemic occurred. Yet, over time, all targeted key stakeholders were reached. The Project did not have a tracking process in place in relation to the key results indicators, but these were generated during the evaluation. A further limitation was that the project investments were at early stages, so the impact and sustainability were hard to assess.

Figure 1. Reconstructed Theory of Change



II. Project Background

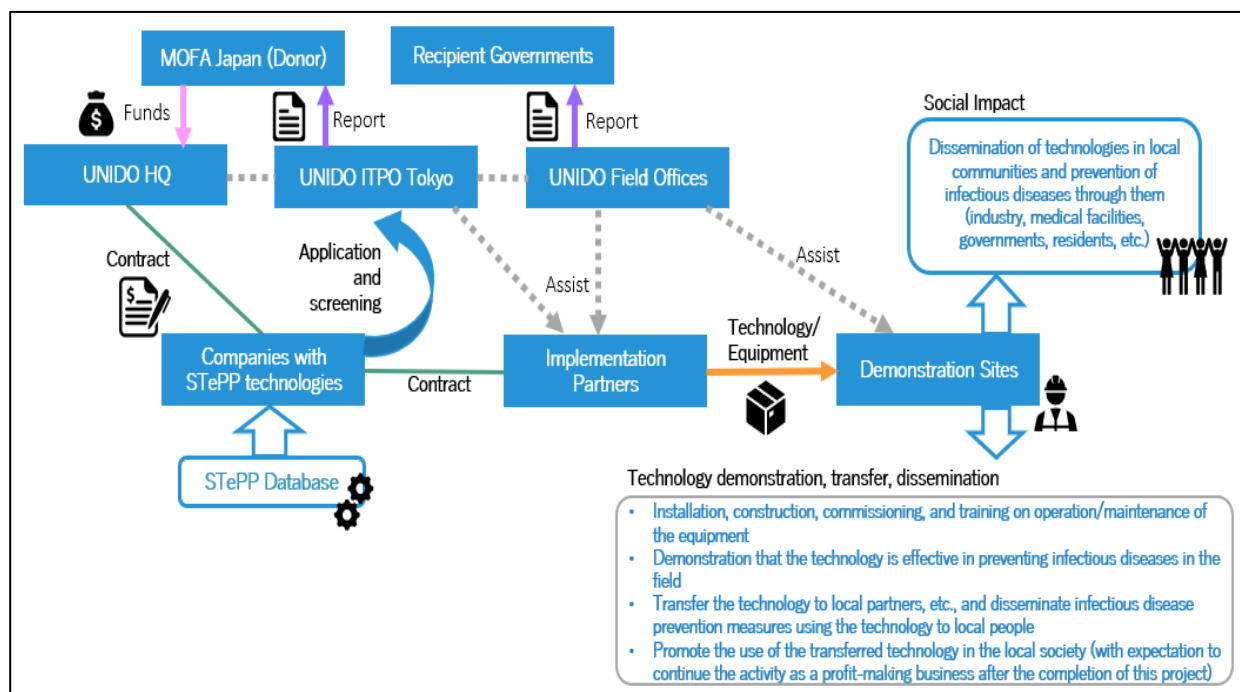
A. Project Context

Background. UNIDO’s Investment and Technology Promotion Office, Tokyo (ITPO Tokyo) was established in March 1981 in accordance with an agreement concluded between UNIDO and the Government of Japan and is one of 9 offices worldwide belonging to UNIDO’s ITPO Network. The mission of UNIDO ITPO Tokyo is to help developing and emerging countries and economies in transition in their efforts to achieve inclusive and sustainable economic development by promoting foreign direct investment (FDI) and technology transfer from Japan.

ITPO Tokyo supports various activities including a delegate programme (invitation of government officials to Japan), technology transfer (identifying and promoting Japanese energy and environment technologies), seminars and events (country promotion, sector promotion, environment exhibitions), capacity building (special programmes for embassies in Japan), and activities overseas (business missions and networking). In addition, programmes and activities are publicized through services such as the “UNI-World” journal, the “UNIDO Investment News” newsletter, press releases, annual reports, and information dissemination through the office’s homepage.

UNIDO ITPO Tokyo was already supporting the transfer of “Human Health Technologies”, registered in the Sustainable Technologies Promotion Platform (STePP) 2016-2022 (UNIDO DATABASE ID 160239). This project promotes applicable technologies through demonstration and technology transfer, including facilitating connections with developing countries that have expressed interest in Japanese technologies as well as supporting technology transfer as illustrated in Figure 2.

Figure 2. STePP Demo Stakeholders & Implementation Overview



Source: ITPO Tokyo, 2021

The STePP project is implemented directly by ITPO Tokyo, supported by the Vienna-based ITPO Coordinator as the Project Manager at UNIDO HQs. This project is implemented in collaboration with the Government of Japan (GoJ) Ministry of Economy, Trade and Industry (METI).

B. Sector- Specific Issues and Concerns

The COVID-19 pandemic is primarily a global health crisis, but it also has far-reaching economic consequences. Worldwide, it has disrupted millions of people's livelihoods, with disproportionate impact on the poor, thereby jeopardizing the successful achievement of the 2030 Agenda for Sustainable Development. In order to meet an unprecedented global challenge of the COVID-19 pandemic, there was high demand for the international community to provide an agile and suitable response towards the socio-economic impacts worldwide. In particular, concerning fragile health infrastructures in developing and emerging countries. Development partners were called upon to provide a rapid and suitable response particularly to support health systems in developing and emerging countries to address the needs of the pandemic and potential other health risks.

Recognizing this challenge and the need for international commitment and solidarity, the GoJ worked to provide supplementary budget for an emergency program to address critical COVID-19-related technology needs as well as to support Japanese technology providers. There was a particular focus on small and medium enterprises (SMEs), which own their technical know-how but have limited channels for international expansion. The GoJ through the Ministry of Foreign Affairs (MOFA) contacted several development partners to consider possible approaches to address these needs. ITPO quickly developed a concept for the approach which was then discussed with MOFA to agree a suitable approach.

The existence of the STePP initiative was an important factor in providing the platform from which this Project could rapidly mobilize within the context of the COVID-19 pandemic. The STePP project had a ready list of registered companies in its database that had already expressed interest in supporting developing countries with new technologies whilst also securing new business opportunities for the participating countries. The technologies covered a range of sectors including public health.² The STePP project therefore provided a suitable mechanism to link Japanese companies producing public health technologies with developing countries to address the identified public health requirements.

C. Project Summary

Project Rationale. The Project was designed to build from the STePP design, with a demonstration effect of how UNIDO and the GoJ could respond to crisis situations (termed the "STePP-demo" approach). The design also considered the recommendations in the report, UNIDO's measures "Towards a Common UNIDO Response to the COVID-19 crisis". Furthermore, the project activities were designed to reflect "UNIDO Gender equality and empowerment of women strategy 2020-2023 (GC.16/8 and GC.18/15)" and contribute to the capacity building and more employment opportunities for women as well as for men, as a result of UNIDO interventions on public and private investment and technology policy and promotion. An additional objective of the project was to assist technology companies from Japan facing difficulties with the economic impact due to the COVID-19 pandemic in their efforts to expand their business into developing and emerging countries.

The project concept was designed to:

- (1) Support developing and emerging countries to improve health, sanitary and hygiene environment to fight against COVID-19 and other infectious diseases through technology transfer.

² Sectors covered by STePP included energy, agribusiness, environmental and public health technologies.

- (2) Leverage capacity of Japanese enterprises, especially SMEs, to meet the demand in this emergent situation.
- (3) Demonstrate commitment of the GoJ to the international cooperation and the call of United Nations system to mitigate the socio-economic impacts of the COVID-19 crisis.

At the project design phase, MOFA, in order to formulate a cooperation project proposal with concrete involvement of Japanese private companies within a very short timeframe, approached development partners which they considered as best suited to respond to these requirements. The number of organizations approached was less than five, including UNIDO, through ITPO. ITPO prepared a submission which was viewed positively and MOFA, ITPO and the UNIDO HQ worked rapidly to refine the project proposal and fast-track the necessary approvals.

The project was expected to result in increased business potential in developing countries and in Japan. The capacity and resilience of recipient countries and technology providers was expected to be strengthened for sustainable investment and technology promotion. The Project targeted ten Japanese companies, with the number of countries to be determined through the needs assessment process, but with prioritization given to development countries supported by MOFA. The project design was presented by ITPO Tokyo based on the initial guidance of MOFA. The detailed project design was formed through the mutual exchange of ideas between ITPO and MOFA.

Project objective and components. The overall objective for this Project was “to contribute to capacity building of developing countries to mitigate impacts of the COVID-19 epidemic crisis through appropriate technology transfer from Japan.”³ The Project had four components with associated outcomes as summarized in Table 2. A complete results framework is available in Annex 4.

Table 2. Project Components

Component	Expected Results
1. Needs assessment in recipient countries	Emerging needs in developing countries/economy in transition identified (needs assessment) and support services provided to the target countries and technology providers for a strategic planning for appropriate technology transfer.
2. Identification and selection of technology	Sustainable technologies identified, based on the gender responsive needs assessment in the target countries
3. Technology demonstration/ installation	Selected technology installed, and technical training provided to the local engineers in recipient countries.
4. Support for technology transfer	Capacity of recipient countries and technology providers built and strengthened for sustainable investment and technology promotion.

Project structure. The existing structure of the STePP programme was mirrored in this Project to the extent that the Project was called the “STePP-demo” Project. This was because the

³ UNIDO, 2020, *Project Document for Strengthening the capacity of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan*

allocation of funds was considered to provide a means for companies to trial or pilot technologies in the target countries in a way that would provide a demonstration of the technology to local stakeholders. Project management was designed to follow the same model as the STePP approach, but with the process tailored to the needs of the pandemic response and with a more intensive support arrangement. In this regard, the resources of the ITPO office were mobilized to focus on support for the Project, and additional staff were recruited, specifically for the Project.

Given the COVID-19 pandemic context, the Project faced circumstances that were constantly shifting. The STePP-demo project and the associated funding provided by the GoJ came at a crossroads for ITPO Tokyo, where most traditional activities were greatly reduced due to the pandemic situation e.g., the delegate program, travelling to target countries, reduced output and ability from Japanese companies to travel abroad etc. Correspondingly, the Project was also organized in a manner that responded to the COVID-19 context.

The STePP-demo project provided the means to continue operations, but in an entirely different context. Whereas a traditional project could take 3-4 years to complete, this project called for at least 10 interventions (sub-projects) across different countries within the timeframe of one year. This meant that from the design stage, it was apparent that different processes would be needed from the normal design and establishment process followed in a normal cooperation project.

To address this volatility, the Project instituted a regular weekly meeting for the whole ITPO team to respond to the unfolding context. This led to careful tracking of logistical situations that required close follow-up by the project team. It was this innovative process that added an extra dimension of learning from the Project as a potential model to mobilize private sector engagement in future crises.

Project Financing. The project was funded by MOFA to the amount of US\$3,481,898 and this was to be utilized within 12 months. Project management was covered through the UNIDO service arrangements and through reallocation of the ITPO resources to the Project so was not included in the operational budget. The funds were distributed across the components as shown in Table 3.

Table 3. Financing plan summary

Project outcomes	Total (US\$) (excl. Support costs)
Component 1: Needs assessment in recipient countries	14,834
Component 2: Identification and selection of technology	97,623
Component 3: Technology demonstration/installation	3,100,633
Component 4: Support for technology transfer	235,810
Monitoring and Evaluation	33,000
TOTAL	3,481,898

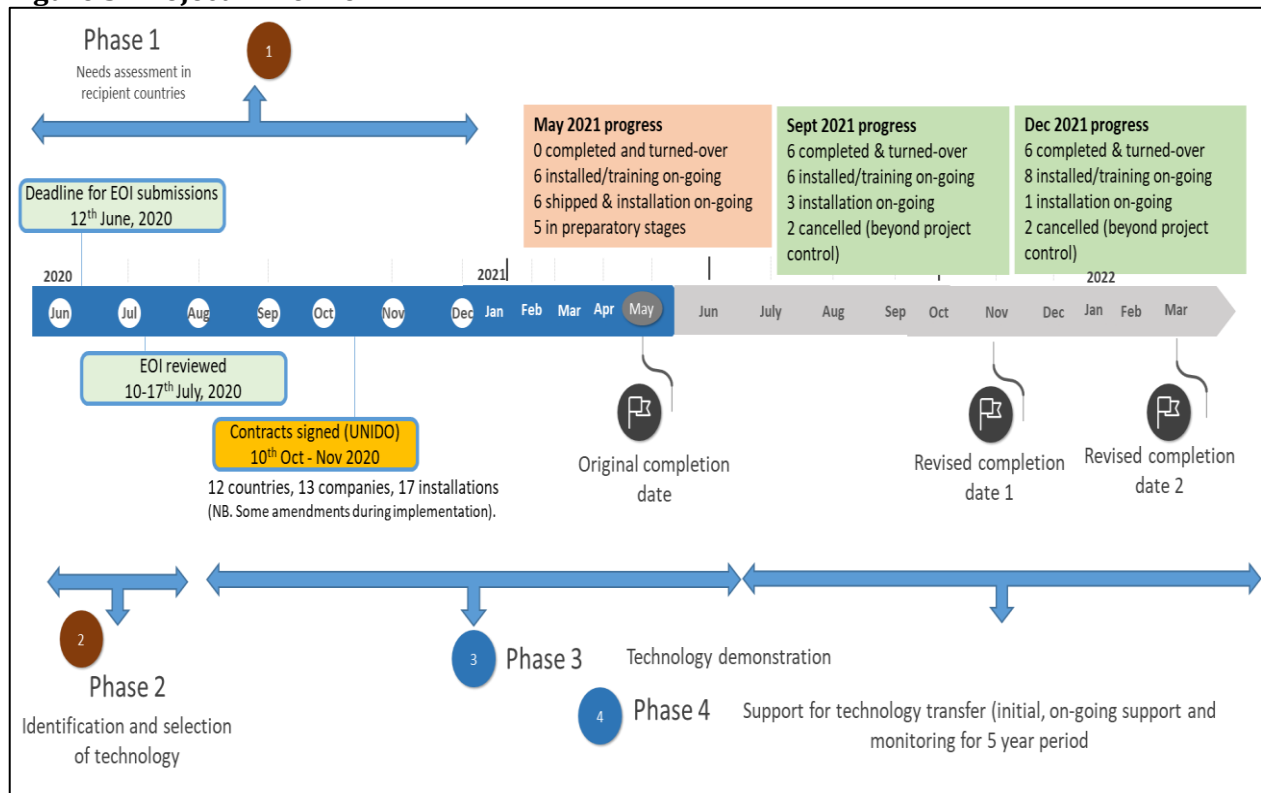
Source: Project Design document, 2019.

Project timeline. The original project duration was from 1 June 2020 to 31 May 2021. An extension to December 2021 was approved to address the challenges that had been faced in several of the sub-projects with identifying national partners and the logistics of subproject installation. A final extension to March 2022 was approved to allow completion of the remaining sub-projects and to conduct official launch and promotion activities. It also allowed UNIDO with the GoJ to consider the effectiveness of the pilot as a potential model for future projects. The original budget plan was re-adjusted within the approved ceiling, taking into consideration the additional operational costs for the demonstration and transfer of technologies as well as the additional staff cost associated with the project implementation.

The Project was implemented in a series of consecutive Phases, although not all companies moved through Phase 3 and 4 at the same rate. The progress of the Project across the timeline of implementation is shown in. The level of progress was very rapid in the Phases 1 and 2, delays were experienced in Phases 3 and 4 that stretched the implementation period and resulted in two no-cost extensions for the Project closing date.

Figure 3. The level of progress was very rapid in the Phases 1 and 2, delays were experienced in Phases 3 and 4 that stretched the implementation period and resulted in two no-cost extensions for the Project closing date.

Figure 3. Project Timeline



Source: Evaluation Team, 2021

Detailed Project Description. The following project activities were prepared for each component to achieve the project objectives and the implementation of the components following a phased approach. The first two phases (Phase 1: Needs assessment in recipient countries and Phase 2: Identification and selection of technology) were completed by November 2020. The following two phases (Phase 3: Technology installation and demonstration and Phase 4: Support for technology transfer) were being conducted at the time of the evaluation and until March 2022. Detailed activities planned for each phase are shown below.

1. Project Component 1: Needs assessment in recipient countries

- 1.1. Conduct online survey and/or a site visit to identify emerging and resilient needs in recipient countries, geographical areas and local counterparts, which match the unique nature of the current crisis
- 1.2. Establish a strategy for technology demonstration, including an Environmental and Social Management Plan (ESMP)
- 1.3. Make a business plan for maintenance and future expansion

2. Project Component 2: Identification and selection of technology

2.1. Identify suitable technologies from the STePP-registered technologies and possible target countries/sectors
2.2. Evaluate and select appropriate proposals from the STePP-registered companies
2.3. Elaborate the selected proposals for the project in consultation with companies
3. Project Component 3: Technology demonstration/ installation
3.1. Plan a schedule for shipment and installation in line with UNIDO's procurement and the Environmental and Social Management Plan
3.2. Install the equipment on the site and start initial operation
3.3. Provide online and/or on-site training for operation and maintenance
4. Project Component 4: Support for technology transfer
4.1. Organize a training session for local engineers, industry associations, and local/central Government officials
4.2. Demonstrate the performances of the project to promote dissemination of the technology to relevant local stakeholders and companies in recipient countries, including promotion of investment and technology implementation policy and/or business matching sessions for relevant local stakeholders
4.3. Demonstrate the prospective impacts of the project to central governments and the international community, as part of the communication and advocacy, by proposing policy instruments for further dissemination

Results-based management. Project management was conducted through a Tokyo-based Project Coordinator and a Vienna-based Project Manager. The project team met regularly each Monday to review project progress. Each subproject included the preparation of a detailed contract agreement with specific performance clauses. Specific Project Officers were designated to track and support the implementation of certain companies and subprojects.

Institutions involved. As noted in the project timeline, the Project issued an Expression of Interest (EoI) for companies on the STePP database to make a proposal for Project consideration. A total of 32 submissions were received and 13 proposals across 12 companies were selected for support. The selection process was comprehensive and systematic. Key criteria were used to screen and rank the proposals in a four-point scale (very good, good, fair, and poor), (Table 4. List of Criteria). The screening process involved at least three assessors and a transparent process of compiling and ranking the companies for approval.

Table 4. List of Criteria

Criteria		Sub-criteria
• Impact	1-1	Effectiveness for infectious disease prevention
• Compatibility with Demand	2-1	Country needs and confirmed priorities
	2-2	Impact on improvement of public health
	2-3	Sufficiency of technology transfer and promotion plan
	2-4	Applicability to the local conditions
• Possibility of Implementation	3-1	Strength of the team (skill, knowledge, experience, labor, organization, finance)
	3-2	Rationality of implementation and demonstration plan
	3-3	Cash flow
• Provision for Dissemination	4-1	Excellence of business model to scale up
	4-2	Possible effect on policymakers
• Other Priorities		Prioritized countries
		Gender Assessment

Source: ITPO Tokyo, 2020

The screening process resulted in the participating companies, technology and countries as shown in Table 5. The original target was for the selection of ten companies, but given the high quality and interesting proposals, a total of 13 proposals were originally accepted, across 16 sites. Nepal faced difficulties and so a new site in India was added during implementation. The shaded countries and companies as below were contacted as part of the evaluation consultation. A brief summary of findings for each selected company is included in Annex 5.

Table 5. List of Countries, Companies & Technology Intervention

Country	Cooperating Company and site	Technology
INDIA	<ul style="list-style-type: none"> • JTOP CO., LTD. • MARUSYO SANGYO CO., LTD. 	<ul style="list-style-type: none"> • Water regeneration system • Photocatalytic coating with antibacterial effect. (moved from NEPAL)
INDONESIA	<ul style="list-style-type: none"> • SOLAR WIND TECHNOLOGY INC. 	<ul style="list-style-type: none"> • Hypochlorous acid type disinfectant
KENYA	<ul style="list-style-type: none"> • KINSEI SANGYO CO., LTD. • MARUSYO SANGYO CO., LTD. • TSP TAIYO INC. 	<ul style="list-style-type: none"> • Gasification incinerator for medical waste. • Photocatalytic coating with antibacterial effect. • Mobile inspection system with solar system.
MADAGASCAR	<ul style="list-style-type: none"> • CHUWA INDUSTRIAL CO., LTD 	<ul style="list-style-type: none"> • Incinerator for medical waste.
MONGOLIA	<ul style="list-style-type: none"> • MARUSYO SANGYO CO., LTD. 	<ul style="list-style-type: none"> • Photocatalytic coating with antibacterial effect.
MOROCCO	<ul style="list-style-type: none"> • HINODE SANGYO CO., LTD. 	<ul style="list-style-type: none"> • Domestic wastewater treatment system.
MYANMAR	<ul style="list-style-type: none"> • MITSUBISHI CHEMICAL AQUA SOLUTIONS CO., LTD. 	<ul style="list-style-type: none"> • Water puri-fication unit for hospitals.(cancelled due to country unrest)
NEPAL	<ul style="list-style-type: none"> • MARUSYO SANGYO CO., LTD. 	<ul style="list-style-type: none"> • Photocatalytic coating with antibacterial effect. (cancelled due to COVID-19 context, moved to INDIA)
NIGERIA	<ul style="list-style-type: none"> • TECHNO MEDICA CO., LTD. 	<ul style="list-style-type: none"> • Blood test analyzer.
SENEGAL	<ul style="list-style-type: none"> • CHUWA INDUSTRIAL CO., LTD. • TERIOS-TEC CO., LTD. 	<ul style="list-style-type: none"> • Incinerator for medical waste. • Hypochlorous acid water generator.
VIET NAM	<ul style="list-style-type: none"> • AGC INC. • TROMSO CO., LTD. 	<ul style="list-style-type: none"> • Hypochlorous acid water generator. • Water purifying system.
UGANDA	<ul style="list-style-type: none"> • SARAYA CO., LTD. 	<ul style="list-style-type: none"> • Mass production of alcohol-based hand rub and hygiene education.
TOTAL 12 Countries	13 companies; 16 sites - 15 active sites (1 was cancelled, 1 diverted)	11 technologies – 9 active (1 cancelled)

Source: ITPO Tokyo, 2020



Source. TSP Taiyo Mobile Inspection System, Project records, 2021

Major changes to project implementation. During implementation, several changes to the list of countries occurred. The proposal for Myanmar was unable to proceed due to changes in the country context. The proposed initiatives in Nepal were also unable to proceed due to the severe COVID-19 context in the country at the time that meant it was not possible to proceed with the necessary activities. To address this issue, the company relocated its operations to India where it already had a national partner in place. This was a practical decision given the time imperative of the project.

Positioning of the UNIDO Project. The Project was designed in the context of a crisis situation so was not subject to strategic positioning in relation to the portfolio. Nonetheless, the positioning of ITPO's work in Tokyo was a critical factor in the approach by the Government of Japan's Ministry of Foreign Affairs in relation to the project concept. The design of the STePP project was instrumental in ITPO being able to communicate with Japanese companies as well as in-country partners in the targeted countries.

UNIDO was well placed to work in a neutral manner with the target countries and the UNIDO brand was a factor in securing audience with key decision-makers in each country to progress

the project. In working for each sub-project, the liaison with country partners both government and private sector, as well as with the UNIDO officers was important.

III. Project assessment

A. Project Design

The Project concept was to identify and select appropriate technology to respond to the COVID-19 pandemic, as well as contribute to control and mitigation of other infectious diseases. The long-term objectives of building capacity of private sector partners and of developing countries through a facilitated process based on the STePP approach was a sound concept. The project mechanisms, building on the STePP approach provided a means to rapidly mobilize and engage with companies with appropriate capacity that were interested in expanding internationally. In this respect, the design was consistent with the aims within the context of the COVID-19 pandemic, the interests of the partners and the capability of ITPO and the UNIDO support systems.

Given the crisis context in which the Project was developed, an action-oriented approach to Project design was adopted. This approach produced a results framework which included outputs and associated activities to guide implementation compared with a usual approach of indicators for outcomes and associated outputs. The indicators for each component were later retrofitted to the stipulated activities. As such, there is a level of disconnect between the activity-based progress and narrative approach to assess the activities.

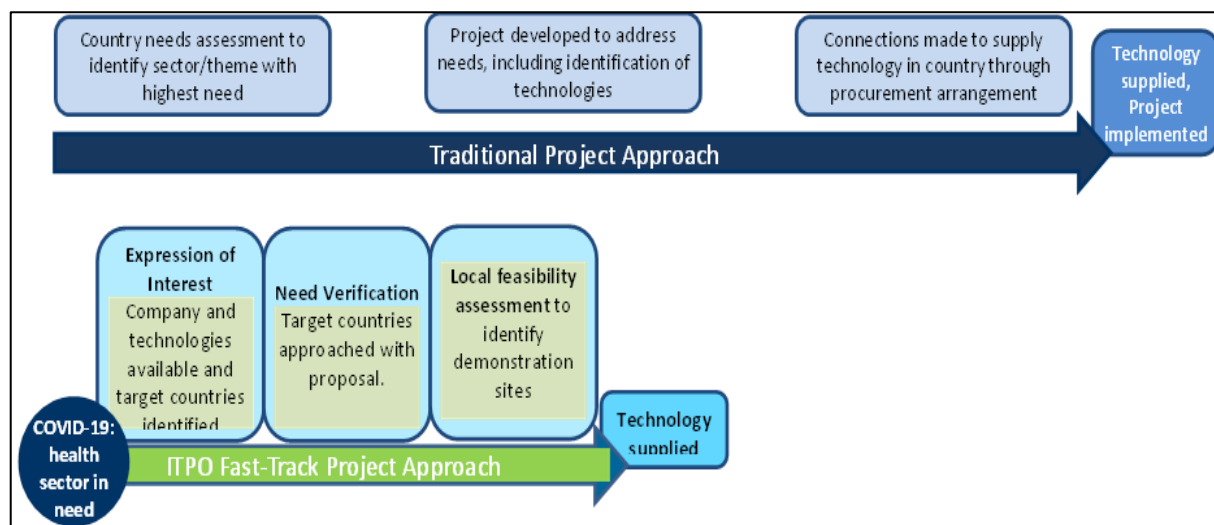
An approach was designed that called for an EOI from companies already registered with the StePP program. Concepts for technology demonstration and a business plan for maintenance and future expansion were prepared, by the shortlisted companies. Due to the travel restrictions under the COVID-19 measures, consultation with the local implementation partners were conducted via online meetings and email communication, with the support of the four UNIDO ITPO Tokyo advisors in Africa as well as colleagues at UNIDO HQ and Field Offices.



Source: CHUWA Incinerator for Medical Waste, Project records, 2021

A traditional UNIDO project, takes normally 3-4 years to complete. However, during the COVID-19 pandemic and considering the GoJ requirements, all interventions had a one-year horizon due to the urgency of the situation. For example, in a normal UNIDO project, identification of requirements often takes months to complete, with a tender to identify compatible technologies and companies. In this process, the STePP-demo selection process, which only took 2-3 weeks, STePP-registered companies were asked to apply and the selection committee identified the most relevant projects from those available which are not necessarily the best ones available in Japan. The whole process was accelerated substantially at the commencement to meet a much shorter timeline as illustrated in Figure 4.

Figure 4. Project approach to needs assessment



Source: Evaluation Team, 2021

B. Implementation performance

1. Ownership and relevance

The process involved a wide range of actors, from the companies themselves, the local stakeholders, the local UNIDO offices, the local country authorities etc. Country stakeholders and companies were largely supportive of initiatives. The Project also involved a number of local Embassies of Japan to the target countries. These Embassies were officially informed of the project by Tokyo in November 2020, when the recipient countries and the partner companies were selected. Officials from the MoFA in Tokyo provided a list of the contact persons in the Embassies to UNIDO for further direct cooperation. Tokyo has never received any negative feedback from the Embassies regarding the handling or implementation of the Project.

Given the short project period and the need to mobilize quickly, demand was assessed from the company perspective based on their proposals. Using this approach, the Project assessed needs in specific contexts in 13 countries within a period of 10 days. This approach was appropriate given the emergency concept. Consequently, although the Project did not proceed with a detailed needs assessment, there can be confidence that the technologies being considered had direct and relevant application. The assessment of effectiveness explores the extent to which this worked in practice, but the accelerated approval processes were a sound design in the circumstances of COVID-19.

In general, most of the technologies were supply-driven rather than demand-driven, but there was freedom for the country stakeholder to express their demand and interest to accept the technology. In most cases, the national private sector partners worked to identify specific recipient organizations with the help of their national partners and in some circumstances with the local UNIDO office. National stakeholders were consulted such as the Ministry of Health, other relevant Ministries such as Education or Water and relevant local Government officials at the specific sites. Where technologies were introduced to hospitals, schools and health clinics, this required the national partner to engage with a range of local officers to ensure that the installation of the technologies was adequately prepared. The feedback from stakeholders through the survey indicated a high degree of satisfaction with the Project, with 27% of survey

respondents rating the Project excellent and another 49% rating the Project as good. Based on the qualitative feedback from national stakeholders during the evaluation, most of the technologies filled a clear need and were highly appreciated, apart from a few difficulties.

The technologies were largely appropriate to needs with a few exceptions. There is recognized science in reducing transmission of viruses in situations of communicable diseases. This includes the strengthening of disinfection processes, reducing human contact through barrier methods and by social distancing. The importance of disposing effectively of human waste to avoid transmission of the virus is also clear. Access to safe water is also a major benefit both for access to potable water and for maintaining cleanliness. All of these factors were considered in the proposals from the Japanese companies, in line with their own expertise. There was innovation in the conversion of some technologies to the country context, for instance, generating smaller portable units to allow for flexible delivery of safe water, disinfectants or for PCR testing. In this respect, all of the sub-projects were relevant and valid at the design stage.

There were two practical aspects that impacted on relevance during the installation stage. These related to the painting of photocatalytic coating in Kenya, India and Mongolia and the water regeneration process in India. Both were valid technologies but the coating required access to hospitals during a pandemic context so local stakeholders reported that this was difficult to manage within the emergency context and would have been better being installed in periods when the hospitals were not at capacity. The water regeneration process was more applicable to industry use because the treated water had reduced turbidity and looked clean but was not safe for potable use so there were risks for use at the country level. Commercial uses are now being considered. Consequently overall, the ownership and relevance of the project approach and of the sub-project design is assessed as satisfactory.

2. Effectiveness

The project identified the following Key Performance Indicators in its results framework.

1. Emerging needs in developing countries/economy in transition identified (needs assessment) and support services provided to the target countries and technology providers for a strategic planning for appropriate technology transfer.
2. Sustainable technologies identified, based on the gender responsive needs assessment in the target countries.
3. Selected technology installed, and technical training provided to the local engineers in recipient countries.
4. Capacity of recipient countries and technology providers built and strengthened for sustainable investment and technology promotion.

The following detailed activities were conducted to progress towards the expected outcomes. Output indicators per component were incorporated in the project design at the level of the individual contracts. Companies were required to report on their specific contract performance measures that would contribute to these indicators. The extent to which the outputs were achieved is provided in the following paragraphs and tables, indicating whether activities were fully, partially complete or not completed. The targets and respective accomplishment for each output are provided in each table. These are shown in blue if targets have been exceeded or orange if significantly below target.

Component 1: Needs assessment in recipient countries (Completed). This phase focused on consultation, online research and information gathering to identify emerging and resilient needs in recipient countries, taking into consideration geographical areas and feasibilities of the

technology demonstration, which match the unique nature of the current crisis as discussed in the design section above.

Table 6. Component 1 Extent of Achievement

Output 1. Emerging needs in developing countries/ economy in transition identified (needs assessment) and support services provided to the target countries and technology providers for a strategic planning for appropriate technology transfer			
Activities			Extent of achievement
1.1 Conduct online survey and/or a site visit to identify emerging and resilient needs in recipient countries, geographical areas and local counterparts, which match the unique nature of the current crisis			Not completed.
1.2 Establish a strategy for technology demonstration			Completed.
1.3 Make a business plan for maintenance and future expansion			Partially completed.
Indicator	Target	Actual	Comment
Number of target developing countries and needs identified (gender-responsive)	10	10	Project team decided to expand scope due to high quality applications. Identification of technology was supply rather than demand driven. 12 were approved but two countries were cancelled.
Number of potential local company and institutions identified	10	12	Thirteen companies were approved, 12 proceeded. Myanmar had to be cancelled
Number of meetings arranged with public and private sector players	10	6	Covid-19 affected
Number of support services provided to local counterparts and technology providers	10	-	Covid-19 affected
Number of training workshops completed	1	7	More are likely to be achieved beyond the project period.
Number of participants, sex-disaggregated (target: 40% female participation)	30	95	Participation varies per product – some require high # of participants e.g. water purifier.
- Number of male	18	45	Target exceeded.
- Number of female	12	50	Target exceeded.

As discussed in section III, given the short project period and the need to mobilize quickly, demand was assessed from the company perspective based on their proposals and then verified rather than identified at the country level. Using this approach, the Project assessed needs in specific contexts in 12 countries against a target of 10. The motivations for companies submitting EOIs varied with 62% of survey respondents being motivated by the response to COVID-19 and 58% stating an objective of selling equipment.



AGC: Disinfectant production

The Project itself incorporated the support to companies to prepare technology demonstration. This was not recorded as a stand-alone strategy but was applied on a case-by-case basis. The Project completed 7 training workshops with 95 participants compared with a target of 1 and 30 respectively. Other areas of support provided by the Project included provision of background information, organization of meetings between participating country and industry partners and assistance with transport/shipping/tax exemption. Survey respondent companies that received assistance to negotiate with a potential partner indicated the highest level of satisfaction with 56% of these respondents rating Project support as 'excellent'.

The project contracts included a clause that required companies to maintain and report on on-going activities for five years. Interviews indicated that few companies have yet considered the feasibility of future expansion. At the time of the evaluation, most companies had maintenance plans in place, but had not yet developed formal expansion plans.

Component 2: Identification and selection of technologies (Completed). The registration of technologies on UNIDO ITPO Tokyo's STePP was one of the core criteria for technology selection in this project. More than 100 Japanese companies which had been registered on the STePP under the regular technology promotion activities of ITPO Tokyo, especially those which potentially improve health, sanitary and hygiene environment to fight against COVID-19 and other infectious diseases, were invited to submit their expressions of interest and preliminary proposals to become the project partners.

Among those STePP-registered companies, 32 companies responded and expressed interest in the technology demonstration and transfer activities, together with short preliminary proposals of their plans. The technology assessment committee, composed of seven technical experts, including the Head of the UNIDO ITPO Tokyo, reviewed the documents based on the criteria (i.e., impacts; compatibility with demand; possibility of implementation; provision for dissemination; and other key priorities such as gender assessment) and short-listed 13 technology providers for further consideration.

The short-listed companies were again assessed by the Procurement Division at HQ, together with the project team, based on UNIDO's procurement rules and regulations. After the clearance of respective proposals of the shortlisted companies, the contracts (i.e., Purchase Orders) with 13 companies were issued and countersigned by mid-November 2020. These technologies include disinfectant, medical waste incinerators, water purification, medical equipment and antibacterial coating, and implemented in 12 countries in Africa and Asia, namely India, Indonesia, Kenya, Madagascar, Mongolia, Morocco, Myanmar, Nepal, Nigeria, Senegal, Uganda and Viet Nam.

Table 7. Component 2 Extent of Achievement

Output 2. Sustainable technologies identified, based on the needs assessment in the target countries			
Activities		Extent of achievement	
2.1 Identify suitable technologies from the STePP-registered technologies and possible target countries/sectors		Partially completed.	
2.2 Evaluate and select appropriate proposals from the technology providers registered at STePP		Completed.	
2.3 Elaborate the selected proposals for the project in consultation with technology providers		Completed.	
Indicator	Target	Actual	Comment
Number of STePP technologies surveyed, identified and selected*	18	9	Some similar technologies supported for a total of 17 technology interventions. Most technologies were appropriate to pandemic response but some were more crucial than others. Protection of all infectious diseases was also considered important.
Number of fact finding and study tours organized to target countries	-	3	Affected by COVID-19
Number of participants in study tours, sex--disaggregated (target: 40 % female participation)	-	20	Gender targets achieved
- Number of male	-	12	Gender targets achieved
- Number of female	-	8	Gender targets achieved
Number of meetings and study groups organized	-	-	Affected by COVID-19

The urgency of technology provision in the COVID context meant that the identification of technologies and target countries/sectors was more demand-driven than first envisioned with an EOI process being adopted. The Project rigorously reviewed the proposals and did screen the project proposals according to the Project aims and objectives as a proxy means to assess need. There was also an in-country process to ensure acceptance by the local recipients prior to installation.

The contracts and terms of references developed by the Project following receipt of proposals were detailed and sufficient to guide implementation and outline responsibilities. The Project organized 3 study tours with 20 participants as fact-finding activities. 9 STePP technologies were surveyed, identified and selected compared with a target of 10. Although this is below the actual number of technologies, several companies had the same technology resulting in 13 investments so exceeding the target of 10. Once the technologies were identified 16 (target: 10) the most relevant countries/sectors were selected.

Component 3: Technology installation and demonstration (Ongoing) Once the contracts with the 13 companies were countersigned, they initiated the implementation, in consultation with UNIDO ITPO Tokyo, UNIDO HQs, Field Offices and their local partners. The companies first started

with detailed analysis on technical assessment, implementation site analysis, environmental impact assessment, and research on local laws and regulations. Then the companies ordered and/or manufactured the custom-made equipment and goods and arranged the shipment for installation, in cooperation with local partners. However, due to the severe disruption and constraints of the global seaborne trade/logistics caused by the prolonging COVID-19 impacts, more than half of the companies have had challenges to proceed with the shipments on time. Once the equipment and goods were received and installed at recipient sites, the contracted companies provided a mix of online and/or on-site training for operation, and maintenance to initiate the operation.

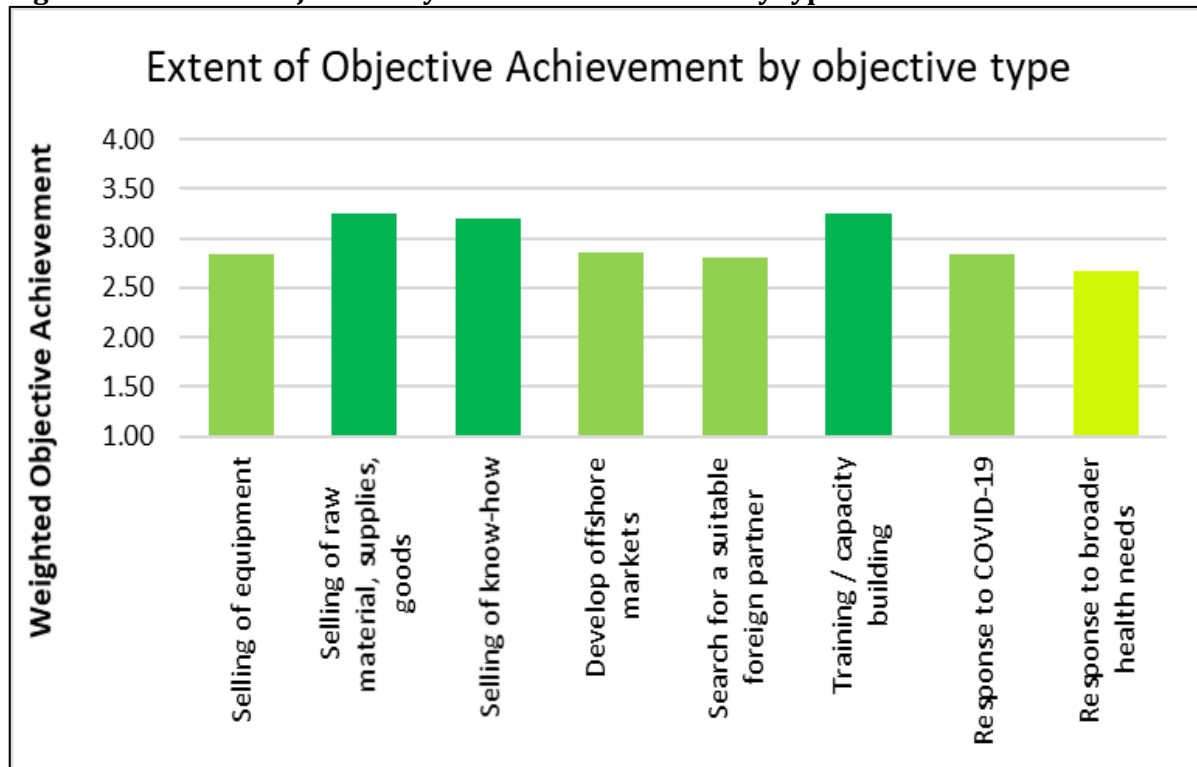
Table 8. Component 3 Extent of Achievement

Output 3. Selected technology installed, and technical training provided to the local engineers in recipient countries			
Activities			Extent of achievement
3.1 Plan a schedule for shipment and installation in line with UNIDO's procurement			Partially completed.
3.2 Install the equipment on the site and start initial operation			Partially completed.
3.3 Provide online and/or on-site training for operation and maintenance			Completed.
Indicator	Target	Actual	Comment
Number of selected STePP technologies installed for demonstration in target countries in alignment with the Environmental and Social Management Plan (ESMP)	10	6	At the time of the evaluation installation for most technologies was on-going with the expectation that almost all would be complete by the completion of the Project. Installation was delayed in most cases due to difficulty in shipment schedules. Firms with existing national partners achieved installation faster and more effectively.
Number of technical training provided to local engineers in target countries	10	15	Training has been largely through remote technology and has been effective. Some firms will continue to use the methodology but others still prefer trouble-shooting through direct contact.
Number of engineers trained, sex-disaggregated (target: 40 % female participation)	80	314	Trainees were generally not engineers but operators.
- Number of male	48	189	Training was found to be effective and gender sensitive.
- Number of female	32	125	As above
Number of UNIDO Headquarters missions supported	1	-	Affected by COVID-19

The Project facilitated installation of 6 identified STePP technologies in target countries in alignment with the ESMP. The target for this indicator was 10 technologies. For the 13

demonstration sites, there has been successful installation in 10 sites, with three still under preparation. Survey responses most commonly indicate the following reasons for intended results not having been or yet being fully realized: i) changed conditions in the participating country or ii) negotiations are on-going. Nonetheless, more than 75% of survey respondents say that their objectives have been fully or largely met with the range of objectives shown as in Figure 5.

Figure 5. Extent of Objectives by stakeholder achieved by type.



Source: Evaluation survey, 2021. Weighted achievement where 4 is high and 1 is low.

The training undertaken by companies has been in various formats depending on the resources available and the familiarity of the local partner with the product. In total, 314 individuals, against a target of 80 engineers were trained. Not all of those trained were engineers with many operators receiving training. Some training has involved manufacturing of manuals, production of instructional videos and/or demonstration sessions by the local partners. The quality of the training provided received the highest level of satisfaction from survey responses compared with other areas of Project support.

Component 4: Support for technology transfer (Ongoing). Once technologies are installed, technical training and workshops are organized locally on the site and/or virtually. Final workshops for each technology demonstration will be arranged for a wider audience in close cooperation with local partners, such as local governments, Japanese Embassies and our UNIDO counterparts in the field. If conditions permit, promotional activities and events will also be organized in Tokyo and in Vienna, and/or through virtual platforms. The technology providers are expected to report regularly to UNIDO ITPO Tokyo about their scale-up of the technology transfer in recipient countries even after the completion of this Project, which will help ensure long-term impact and sustainability.

Table 9. Component 4 Extent of Achievement

Output 4. Capacity of recipient countries and technology providers built and strengthened for sustainable investment and technology promotion			
Activities			Extent of achievement
4.1 Organize a training session for local engineers, industry associations, and local/central government officials			Partially completed.
4.2 Demonstrate the performances of the project to promote dissemination of the technology to relevant local stakeholders and companies in recipient countries, including promotion of investment and technology implementation policy and/or business matching sessions for relevant local stakeholders			Completed.
4.3 Demonstrate the prospective impacts of the project to central governments and the international community, as part of the communication and advocacy, by proposing policy instruments for further dissemination			Completed.
Indicator	Target	Actual	Comment
Number of local counterparts identified to consider further dissemination of technologies on commercial basis number of joint activities with Japanese institutions	5	13	This is indicative at the time of the evaluation given the early stage of completion.
Number of promotional activities using gender-inclusive language (i.e. Number of events (seminars, workshops, etc.), news articles, social media posts, local media articles, etc. that highlight/mention gender issues and perspective)	5	6	Currently under development due to current planning of end-of project activities.
Number of events attended or organized to promote UNIDO, its services as well as SDGs. (i.e. Number of events organized/co-organized/participated as speaker in recipient countries, HQ, or Tokyo. For instance seminar, workshops, promotional events)	5	6	Positive response from country and company stakeholders so far on the events organized. More events are planned for 2022 before project closure.
Number (and kind of) of communication and outreach campaigns conducted using gender-inclusive language	5	18	Communication and outreach was largely through the training materials which were well received. There was no evidence of genderized material and participation. Feedback indicates good uptake of material.
Number of media contacts established (HQ and field)	5	40	Mainly at HQ, few contacts at country level. For further consideration in relation to upscaling.

The Project exceeded targets for training with 15 engineers in target countries receiving technical training compared with a target of 10. Training for industry association and local counterparts was not quantitatively reported. The Project exceeded targets for promotional activities (Table

10). The Project aimed to identify 5 local counterparts to consider further dissemination of the demonstrated technologies on a commercial basis whereas 13 were actually identified.

Table 10. Component 4 Promotional activities

Indicator	Target	Actual
Number of promotional activities using gender-inclusive language (i.e. Number of events (seminars, workshops, etc.), news articles, social media posts, local media articles, etc. that highlight/mention gender issues and perspective)	5	6
Number of events attended or organized to promote UNIDO, its services as well as SDGs. (i.e. Number of events organized/co-organized/participated as speaker in recipient countries, HQ, or Tokyo. For instance seminar, workshops, promotional events)	5	6
Number (and kind of) of communication and outreach campaigns conducted using gender-inclusive language	5	18
Number of media contacts established (HQ and field)	5	40

Component 5: Evaluation (Ongoing) Finalization of this report will constitute achievement of this component.

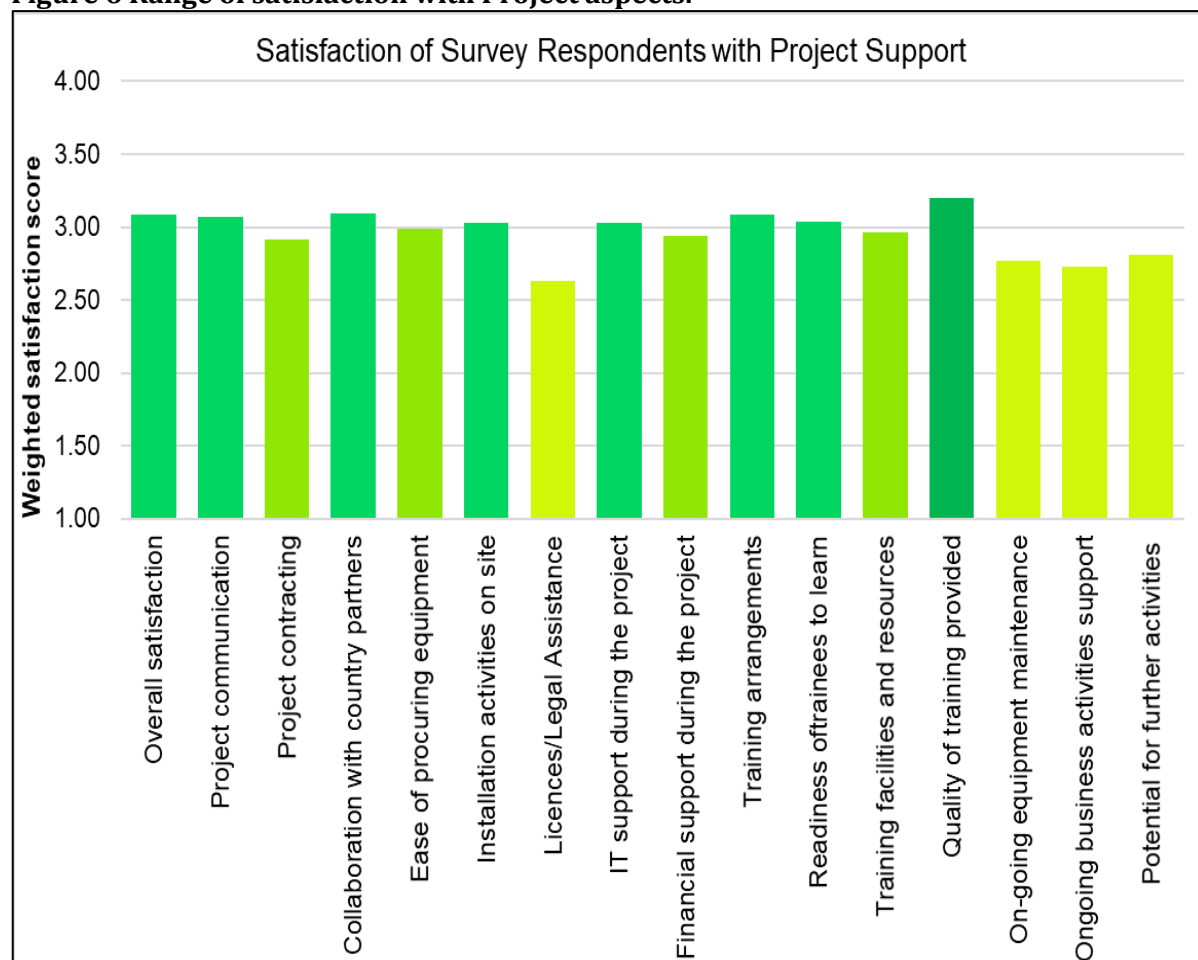
Table 11. Component 5 Extent of Achievement

Output 5. Evaluation		
Activities	Responsibility	Extent of achievement
5.1 The project assessed and evaluated	ITPO Coordination in cooperation with ITPO Tokyo	Completed With finalization of this report.

Implementation was particularly successful where good national partners were engaged.

The ITPO office was responsive and communication was effective to support implementation. Remote training and capacity development was successful. Overall, stakeholders had a high degree of satisfaction with the Project. More than three quarters (76%) of stakeholders responded highly to overall satisfaction in the survey. The survey further explored the level of satisfaction with different aspects of the Project as shown in Figure 6. Most aspects of the Project were seen as being effective. The highest satisfaction was with those who received assistance to negotiate with a potential partner (56% excellent, 33% good – high rating by 89%). The lowest related to the extent of financial assistance with (a) capital investments with 17% providing a low rating and (b) Operations - 13% low rating. This related to demand for additional installation at country level, and the operational costs involved for companies (shipping and management costs particularly)

Figure 6 Range of satisfaction with Project aspects.



Source: Evaluation survey, 2021

The evaluation team, based on the compilation of the survey and notes, carried out an analysis by intervention and company to assess how the actual implementation of the sub-projects performed in comparison to the original project screening process. The summary of assessment is shown in Table 12.

Table 12. Sub-Project Evaluation Matrix

Company	Country	Score Range
TSP TAIYO INC.	Kenya/Nairobi	8-10
KINSEI SANGYO CO., Ltd.	Kenya/Nairobi	8-10
CHUWA INDUSTRIAL CO., LTD. M.K.D. Corporation • STELLA ENVIRONMENT CORPORATION	Senegal/Dakar and Madagascar/Antananarivo	8-10
AGC Inc./KANAZAWA INDUSTRY CO. LTD.	Vietnam/Ho Chi Minh and Da Nang	8-10
Tromso Co., Ltd.	Vietnam/Sok Trang	6-8
Terios Tech Co., Ltd.	Senegal/Dakar	6-8
MARUSYO SANGYO CO. LTD.	Kenya/Nairobi Mongolia/Ulaanbaatar India/ Delhi	4-6

Company	Country	Score Range
JTOP Co. Ltd.	India	2-4

This analysis indicates that most companies performed in line with the initial project assessment. In the lower ranges, the issue was not related to the performance of the company but more to the compatibility of the technology within the COVID-19 context. For these companies, the technology would have scored higher in a different context.

In conclusion, the overall effectiveness of the Project is rated as satisfactory, with high performance in implementation, effectively addressing needs in developing countries, with largely appropriate technologies. The technologies were mostly installed at the time of the evaluation and the capacity development support is already well advanced and showing positive results through the functionality of the technologies at the project sites.

3. Efficiency

The overall cost-to-benefit relationship in the implementation of the Project, coupled with partner countries' contribution to the achievement of project objectives was positive. Due to the crisis situation, the Project team mobilized resources rapidly and both the Project team and the company teams in Japan and in the country demonstrated commitment to operating quickly and efficiently to progress necessary actions. The Project achieved more results than originally targeted, with 12 sub-projects compared with an expected 10 sub-projects.

Nonetheless, the COVID-19 pandemic caused delays and logistical issues for most sub-projects. Shipping processes were difficult in the COVID context, mainly due to limited cargo spaces during COVID-19 as global travel came to a standstill and the available slots were considerably more expensive. Some delays were observed in providing the necessary tax status in the ports of destination, which were facilitated by the local UNIDO offices. Custom costs were sometimes higher than expected, and the company expectations for tariff free import were not met in all circumstances. This resulted in unexpected delays.

The original project duration was 1 year, with a first extension of 7 months then a further extension of 3 months. The extensions to the time frame were no-cost extensions. The Project largely kept to the agreed work plans and the delays mainly related to the customs and shipping delays. Another factor that contributed to delays was the difficulty in finding national partners for several of the companies. Once a national partner had been secured, this usually resulted in accelerated processes.

There was close and frequent collaboration between ITPO Tokyo and the GoJ and any delays in the time plans and execution were quickly identified, reported and followed up in an efficient manner by both UNIDO and the GoJ. Financial reports were presented to MOFA as required and these were of satisfactory standard. All activities were covered within the original budget ceiling of USD 3,934,545 (including 13% support cost). The actual expenditure to November 31, 2021 was as shown in Table 13. This demonstrates that the Project had expended approximately 90% of the allocated budget at the time of the last progress report.

Table 13. Budget versus expenditure by component

Project outcomes	Total (US\$)(excl. Support costs)	Revised Budget(excl. Support costs)	Actual Expended to Date	% expended
Component 1: Needs assessment in recipient countries	14,834	16,834	14,308.9	85
Component 2: Identification and selection of technology	97,622	97,623	92,741.85	95
Component 3: Technology demonstration/installation	3,100,632	3,098,633	2,943,701.35	95
Component 4: Support for technology transfer	235,810	235,810	54,236.3	23
Monitoring and Evaluation	33,000	36,000	29,520	82
TOTAL	3,481,898	3,484,900	3,136,410	90%

Source: ITPO STePP- Demo Project Progress report November 21, 2021.

An update of the financial data at December 31, 2021 indicates that further progress has been achieved as shown in Table 14. This suggests that the financial performance of the project by the end of the Project period will be close to fully completed.

Table 14. Project expenditure versus budget as of December 31, 2021 in USD

Released Budget	Payments	Expenditure	Funds Remaining	% expended
3,481,898.23	2,270,782.25	3,203,808.97	278,089.26	92%

Source: UNIDO Financial System extract, December 31, 2021.

Several budget reallocations occurred in discussion between ITPO and MOFA. These related to limitations in some project activities, such as domestic/international travels, leaving travel budgets unspent. Most activities planned to take place at the implementation sites were changed to online webinar style events, resulting in savings. This enabled the Project to increase the level of staffing for the extended period of the project. There were also some changes in the activities for countries, which faced critical issues due to COVID-19 or other incidents that required changes to the planned activities. Cancellation of the Contract 'Myanmar – Mitsubishi Chemical Aqua Solutions Co., Ltd in Myanmar' as of February 2021, meant that although the sub-project could no longer continue, funds had already been expended. All other changes were made with no cost implications and with the approval of MOFA.

At the project level, operations were largely efficient, for instance, in Vietnam, the installation of the water purifiers meant that the participating schools and clinics were able to stop buying water, resulting in a significant cost savings. However, more detailed assessment of the potential viability of the proposed technology would have been of benefit. In some cases (e.g. water purification by Tromso with activated carbon filters from rice husks) the cost of the machines was high for the local economies, so the business plan was modified to provide it as a service with a monthly fee keeping ownership of the equipment with the manufacturer. The concerns related to financing was that after setting up all the necessary contacts and facilities, a budget increase

would allow the companies to install more machines etc. given that the overheads were already accounted for.

In theory alternative approaches to the Project may have been possible. An obvious approach would have been to focus attention on fewer countries, fewer companies and fewer technologies. This is likely to have been simpler to implement but would have restricted the benefits across countries and companies. This may have led to faster and broader impact within the countries of focus but with a smaller scope of benefits in terms of number of countries. Consequently, the course of action pursued by the Project was at least of comparable efficiency and, with potential of wider long-term benefits, arguably more efficient than alternatives.

4. Sustainability

The sustainability of the results that have been achieved through the Project is positive at present but uncertain for all of the sub-projects, consequently sustainability is assessed as moderately satisfactory.

All countries understood the need to provide on-going support and monitoring beyond the period of the Project and the commitment to continue this is positive. The viability of the technology is an issue for several the sub-projects. For technologies that require a large investment, the country stakeholders are interested but do not have the resources to replicate the demonstration without external support or longer-term budgetary planning. In others, there are still key approvals that are required before commercialization of the technology can proceed. Viability is uncertain for some while others have potential for commercialization, especially the larger companies.

The likelihood of continued operations is potential for 10 out of the 12 sub-projects. There are only two sub-projects where the viability of the technology in the country is uncertain. In Vietnam with AGC, a major hurdle still to be addressed is approval of the hypochlorous acid for commercial sale by the Ministry of Health within Vietnam. This is a prolonged process that will rely on continued rigorous testing and reporting by the company. In India with JTOP, the sustainability of the technology is uncertain in its current design. Both JTOP and the national partner are considering shifting the technology for commercial rather than community use. This will require further investment and amended marketing arrangement. Arrangements for operation and maintenance are in place for most products.

For the sub-projects with larger scale investments such as the incinerators (e.g. Chuwa Incinerators for medical waste in Madagascar and Senegal as well as the Kinsei Sangyo gasification incinerator in Kenya), the operational budget for the initial investments has been secured and therefore the sub-project themselves can be considered sustainable. Nonetheless, the participating countries face budgetary constraints that may prevent expansion of the technology.

Other positive aspects of sustainability are the remote training approach that has been supported by the Project. All 12 companies see the remote training approach as a positive learning that they will continue to use for future operations. All have committed to continue reporting on the results for a period of five years. This has potential to generate rich lessons learned from the approach and will be a means to identify risks to sustainability that can be quickly addressed; consequently, increasing the likelihood of sustainability.

5. Project Coordination and Management

Project management in ITPO was excellent throughout. The speed and effectiveness of mobilization and solution-oriented approach was noteworthy. Project design was prepared in an

emergency situation, yet it was creative, ambitious and also practical. The careful and regular weekly management resulted in rapid response to any issues arising. Contract management, both at ITPO and UNIDO HQ were satisfactory. There could, however, have been stronger liaison with country offices at an earlier stage of the Project.

The open and useful communication of the Project team was commended by several of the companies supported. Most survey respondents (79%) rated Project communication as either excellent or good.⁴ This positive feedback regarding communication was echoed by stakeholders interviewed during the evaluation. Survey respondents indicated that they were least satisfied with the license/legal assistance and ongoing support (e.g. maintenance, business planning and future activities). Nonetheless, these areas of support still received a weighted average score of 2.63, 2.77, 2.73 and 2.81, respectively on a scale of 1 to 4 where 1 indicates low satisfaction and 4 indicates excellent satisfaction. One area of Project management that some stakeholders felt could have been improved was in relation to the inclusion of financial support to cover project management costs for each Japanese company to help with the initial investment and support establishment of the innovation seed costs.

6. Monitoring and Evaluation

Monitoring and evaluation included good focus on data at commencement but little systematic tracking of outcomes during implementation. The focus of implementation was on effective project management, and this generated important data that was used for reporting. The reports generated were excellent from the perspective of providing updates on progress and expected outputs, and this aligned with the budget tracking. However, the results framework was found in several instances to be not easily measured, or not relevant to the actual process of the Project.

Given the emergency and innovative nature of the Project, some differences in the initially proposed performance indicators could be expected. A clearer focus on use of monitoring and evaluation from the beginning to understand the outcomes of the project would have helped to understand whether the physical performance was on track to achieve the outcomes. The Project was designed as a pilot and one of the key objectives was to learn about the potential of the methodology for future interventions. A robust monitoring system that was used during implementation and could be harnessed for on-going monitoring for the five-year period could have assisted this process. For this reason, monitoring and evaluation was assessed as moderately satisfactory.

C. Gender Mainstreaming

Gender mainstreaming. There was good participation of women in each of the sub-projects, largely in medical and school facilities where the proportion of female employees is high. Almost all projects impacted on gender, especially on lives, health, prosperity and conditions of women at home and at work. Gender disaggregated data was collected for training as noted in the effectiveness section and there was a high proportion of women that participated in the practical training sessions for use of the technology.

The December 2021 progress report illustrated specific benefits to women including, the gasification incinerators that helped medical workers, a majority of whom are female. Overall, the female workers in the health, education and hospitality industries are those that are most likely to be in contact with the public in situations where virus spread is most virulent. This puts female workers at higher risk than males. In this respect, most of the technologies benefit women.

Furthermore, ITPO staff included women (7 staff (54%)) although senior leadership was predominantly male.

There was no specific focus on gender-sensitivity training or mainstreaming. The stakeholders interviewed during the Project were focused on general benefits to public health and did not make any specific efforts towards gender sensitivity or mainstreaming. The Project did specify that there would be consideration of gender-sensitive approaches and while participation rates and benefits were positive, this was largely passively achieved. For this reason, the gender mainstreaming is assessed as moderately satisfactory.

IV. Conclusions, Recommendations and Lesson learned

Conclusions. Overall, the Project has been satisfactory in attaining its aims and achieving the expected outputs and outcomes. In addition, it has reached these achievements in very challenging and complex circumstances. The original design of the project as an emergency response to support developing countries in improving their response to the pandemic was conceptually appropriate. The credibility of ITPO through the STePP programme was an asset that has been effectively built upon. All partners were strongly engaged with and committed to the process.

The design was ambitious, targeting 10 subprojects in a period of 12 months and ultimately a longer period was required for effective completion of the Project. The Project approach worked well in implementation and most outputs were satisfactorily achieved. The key drivers for the successful implementation were the ITPO support that was active and excellent communication, facilitating problem solving as problems arose. Delays were experienced in all sub-projects related to shipping and customs clearance but the assistance of local partners, UNIDO country offices and Japanese Embassies in the target countries was invaluable. The national partners and local UNIDO offices were essential to understand the local conditions in each country and address the local barriers.

The technologies supported were largely of benefit to the recipient country partners, given the focus on health and hygiene. Although the interventions were relatively small and were technology demonstrations, most introduced positive innovations and have potential for further replication. Several technologies were less appropriate, particularly where the need was not clearly evident so that while helpful, the project local partners either had other priorities or where the technology was not sufficiently fit for purpose.

Despite the delays experienced in implementation, the COVID-19 pandemic was the reason why the donor accepted the justification for two extensions. This was exceptional for GoJ Supplementary budget funds and demonstrated the emergency context and the understanding that implementation was proceeding as efficiently as possible given the constraints faced.

There were significant innovations in the Project. The COVID-19 context accelerated the process and created a new approach to project design and implementation. This was driven and strongly supported by the donor and created a new approach to project design and selection of participants, driven by the emergency nature of the context. A fast-tracked selection process and the implementation of over 10 projects in a period of one year compared with a normal single UNIDO project which takes 3-4 years to complete was unprecedented. The demonstration aspect of the project carried out jointly by the companies and the national partners contributed to the likely sustainability of the investments. The project included in its design a 5-year reporting period to ensure results are sustainable and their impact is maximized.

Table 15. Overall Project Performance Ratings⁵ by evaluation criteria

#	Evaluation Criteria	Rating	Explanation
A	Progress to Impact	5	
B	Project Design		
1	Overall Design	5	<p>STePP design was important as a springboard for the demonstration design. Ability to link with larger and smaller companies was important: larger were more successful and sustainable, smaller were generally more innovative. The design was an appropriate mix of good practice, close project management and innovation.</p> <p>Engagement with regional and national UNIDO staff could have been improved and longer planning timeline for first phase could have been extended.</p> <p>Initial needs assessment did not proceed given the emergency context so this was not adequately factored into the design. This was done within the StePP-registered companies and not following an international tender due to time constraints</p>
2	Logframe	4	Log frame did not have measurable indicators that aligned with project activities. Important aspects of the project design (e.g. demonstration) was not included in the indicators. Logframe was not converted to a full M&E system.
C	Project Performance		
1	Relevance	6	The initial trust shown by the donor in the commitment of large funds in an emergency situation demonstrates the relevance of the ITPO capacity and the confidence in the STePP approach. The need was clear and the response from all stakeholders was rapid and positive. The set-up of the Project was appropriate and commitment of companies to COVID context was important.
2	Effectiveness	5	Project mobilized rapidly and expedited processes. Generally, operations were smooth. EOI screening process was effective. Communication was good and appreciated. Procurement and shipping were supported although customs were problematic but despite project facilitation. Most companies delivered on their performance indicators. Training was good. Relationships with country partner companies was generally good and facilitated achievement.
3	Efficiency	5	The ability of ITPO to mobilize quickly was evident and contributed to efficiency. The UNIDO brand helped to facilitate procurement, approvals and shipping. Contracts were generated in time. Budget was used efficiently. Donor extended the Project twice

⁵ Rating scale: Highly satisfactory (6), Satisfactory (5), Moderately satisfactory (4), Moderately unsatisfactory (3), Unsatisfactory (2), Highly unsatisfactory (1).

#	Evaluation Criteria	Rating	Explanation
			due to COVID and cargo capacity. This was exceptional and requests for extension due to conditions beyond the control of the project was considered to be well-substantiated.
4	Sustainability of benefits	4	Commitment of companies to continue is good. Commitment to measure for 5 years is agreed. Viability is uncertain for some. Others have potential for commercialization, especially larger companies.
D	Cross-cutting Performance Criteria		
1	Gender mainstreaming	4	Gender disaggregated data collection was aligned with requirements in the indicators. Some involvement of women as staff in implementation but no specific focus on gender-sensitivity training or mainstreaming. Benefits to women were generally broad as a result of sector-specific benefits (e.g. health)
2	M&E	4	Good focus on data at commencement but little systematic tracking during implementation. Complete progress reports produced as required. Project officers were responsible for tracking progress through contract management.
3	Results-based management	5	Implemented active team-based management. Regular review meetings contributed to rapid action to correct any implementation concerns.
E	Performance of Partners		
1	UNIDO	5	The ITPO team were solution-oriented, worked well and operated smoothly. HQ supported the Project as required, particularly in the preliminary stages. HQ worked to introduce innovations in procurement but less involved in day-to-day operations. Regional and country teams were not sufficiently engaged, particularly at the beginning. UN brand was important.
2	Counterparts	5	Companies were very enthusiastic about the Project. National counterparts were appreciative of the opportunity to participate but were not always able to facilitate national processes for approval to ensure sustainable outcomes. This requires further initiatives beyond the project period.
F	Overall Assessment	5	

CONCLUSIONS

The innovative approach of the STePP-Demo project within an emergency context was successful and generated a range of valuable lessons on how to expedite development initiatives between private sector partners and developing countries. Identification of joint focus on development need and private sector opportunities. Selection of companies with pre-existing relationships in country and engagement with local Embassies of Japan and local governments for assistance with bureaucratic processes and procedures, including import and tax requirements greatly facilitated implementation. Remote training techniques enabled scaling-up and wider audiences such as Chuwa's training of trainers' approach.

The selection process was conducted very quickly which did affect the relevance and effectiveness of several sub-projects. Increased engagement at the country level, including with the UNIDO country office at this stage may have improved the relevance of activities, for instance with JTOP and AGC. In countries where there was active involvement of UNIDO offices, they were able to facilitate local processes but for some the notification came too late (India, Kenya). Marusyo was able to contact the relevant Ministries of Health with the assistance of the UNIDO country offices.

Companies that were most successful already had national partners already in place. For instance, Kinsey Sangyo's pre-existing and long-running relationship with a national partner facilitated a smooth technology transfer, including effective problem solving. Delays in Morocco and Kenya related to difficulties in finding suitable national partners.

The technologies that were most successful were directly appropriate to COVID-19. This assisted in gaining rapid approvals and the required support. Medical waste incineration was an urgent need in most countries so was an obvious selection. The reduction of noxious fumes from incinerators was of high interest to national stakeholders. Hypochlorous acid water that has demonstrated a high efficacy rate was fast-tracked through alternate approval mechanism to expedite use.

Recommendations

Recommendation	Responsibility
<p>1. The project has developed a range of innovations that need to be documented with relevant data to enable future development partners to learn from and replicate the experience.</p> <p>2. Companies that will benefit from such projects in the future, should ensure the availability of training videos and material, preferably in the target country's language or dialect.</p>	<p>UNIDO and GoJ MOFA to promote innovation through the project.</p>
<p>3. UNIDO offices need to be more involved in the planning stages of the Project to provide intelligence on local conditions, approval processes and potential synergy, overlap with on-going projects.</p>	<p>UNIDO Management, ITPO HQ</p>
<p>4. In similar projects, greater attention should be given to the direct purpose of the project i.e. emergency response and COVID-19. This gives a clearer purpose and understanding for all participants and allows identification of relevant projects without extensive needs assessment processes.</p>	<p>ITPO TOKYO, UNIDO HQ for future project management</p>

Lessons Learned

1 A thorough needs assessment involving the local stakeholders such as the UNIDO offices in the field especially at the project design stage would identify problematic processes or more relevant technologies for the countries in question. Especially during the program design phase could ensure a minimization of future problems.

2 Close coordination, communication and management by the Project team facilitated early identification of potential issues and rapid problem solving that avoided some major delays in implementation and was appreciated by the stakeholders involved.

3 The selection process could have been more in depth, with consultation with in-country partners, prior to confirmation of the Project.

4 Effective collaboration between the local Embassies of Japan and local Governments ensured beneficial tax treatment for their equipment import and dealing with the local bureaucracy and procedures. This was valuable to the companies and facilitated project implementation that would have not been possible with the companies working independently.

5 The most successful projects were carried out by companies with extensive experience in the target countries and existing sub-contractors in the field. Most importantly, contacts in the local beneficiaries (e.g. hospitals, schools, local government etc.) ensured a seamless handover of the equipment. These local partners who speak the country language(s) as well as Japanese ensured a smooth communication and translation of training and material.

6 Consideration needs to be given to the extent of contact already in the country. If there is no national partner already available, timeframes need to be adjusted to find suitable partners. The on-going partnerships in country may need support to continue beyond the project period.

7 Due to COVID restrictions, companies had to provide remote training as they could not travel to the target countries. This training allowed local stakeholders to train others and most importantly, online training can easily scale to more recipients, while face to face training cannot scale as well. In addition, sending an extra machine purely for training purposes would be advantageous.

8 Larger companies were experienced with export formalities and import procedures, while smaller companies often had to team up together to share the transportation cost(s).

9 Some equipment offerings which were considered too expensive to buy by the local beneficiaries, were provided as a service to cover the cost of consumables and a minimal cost towards repaying the equipment (e.g. water purifiers).

Annexes

Annex 1. Evaluation Terms of Reference

Scope and purpose of the evaluation

The terminal evaluation (TE) will cover the whole duration of the project from its starting date up to the date of the evaluation. Its overall purpose is to assess whether the project has achieved or is likely to achieve its main objective, i.e. contribute to capacity building of developing countries to mitigate impacts of the COVID-19 epidemic crisis through appropriate technology transfer from Japan. It will also assess the project's sustainability and scaling-up factors for ensuring sustainable results.

The evaluation has two specific objectives:

Assess the project's performance in terms of relevance, effectiveness, coherence, efficiency, sustainability and progress to impact;

Identify key findings, lessons and recommendations for enhancing the design of new and implementation of ongoing and future projects.

Evaluation approach and methodology

The TE will be conducted in accordance with the UNIDO Evaluation Policy⁶ UNEG Norms and Standards for evaluation and the UNIDO Guidelines for the Technical Cooperation Project and Project Cycle⁷.

The evaluation will be carried out as an independent in-depth evaluation using a participatory approach whereby all key parties associated with the project will be informed and consulted throughout the evaluation. The evaluation team leader will liaise with the UNIDO Independent Evaluation Division on the conduct of the evaluation and methodological issues.

The evaluation will use a theory of change approach and mixed methods to collect data and information from a range of sources and informants. It will pay attention to triangulating the data and information collected before forming its assessment. This is essential to ensure an evidence-based and credible evaluation, with robust analytical underpinning.

The theory of change will identify causal and transformational pathways from the project outputs to outcomes and longer-term impacts, and drivers as well as barriers to achieving them. The learning from this analysis will be useful to feed into the design of the future projects so that the management team can effectively manage them based on results.

Data collection methods

The ET will use a mixed methods approach to gather data from diverse sources, as necessary. The following are the main instruments for data collection:

Desk and literature review of documents related to the project, including but not limited to: The original project document, monitoring reports (such as progress and financial reports), mid-term review report, output reports, back-to-office mission report(s), end-of-contract report(s) and relevant correspondence, notes from meetings of committees involved in the project

⁶ UNIDO. (2018). Director General's Bulletin: Evaluation Policy (DGB/2018/08, dated 1 June 2018)

⁷ UNIDO. (2006). Director-General's Administrative Instruction No. 17/Rev.1: Guidelines for the Technical Cooperation Programme and Project Cycle (DGAI.17/Rev.1, 24 August 2006)

Stakeholder consultations will be conducted through structured and semi-structured interviews and focus group discussion. Key stakeholders to be interviewed include: UNIDO Management and staff involved in the project; and Representatives of donors and counterparts

Online Interviews

Interviews (written and online) with the relevant UNIDO Country Office(s) representative to the extent that he/she was involved in the project, and the project’s management members and the various national [and sub-regional] authorities dealing with project activities as necessary
Online surveys covering a wider range of key informants for triangulation purposes

Key Evaluation Questions and Criteria

The evaluation team will develop interview guidelines. Field interviews will take place either in the form of focus-group discussions or one-to-one consultations, all conducted online.

The key evaluation questions are the following:

What are the key drivers and barriers to achieve the long-term objectives? To what extent has the project helped put in place the conditions likely to address the drivers, overcome barriers and contribute to the long-term objectives?

How well has the project performed? Has the project done the right things? Has the project done things right, with good value for money?

What are the project’s key results (outcomes and impact)? To what extent have the expected results been achieved or are likely to be achieved? To what extent will the achieved results be sustained after project completion?

What lessons can be drawn from the successful and unsuccessful practices in designing, implementing, and managing the project?

The evaluation will assess the likelihood of sustainability of project results and identify key risks – in terms of financial, socio-political, institutional, and environmental risks. It will also explain how these risks could affect the continuation of results. Table 5 below provides the key evaluation criteria to be assessed by the evaluation.

Table 3. Summary of Project evaluation criteria

Index	Evaluation criteria	Mandatory rating
A	Progress to Impact	Yes
B	Project design	Yes
1	Overall design	Yes
2	Logframe	Yes
C	Project performance	Yes
1	Relevance	Yes
2	Effectiveness	Yes
3	Efficiency	Yes
4	Sustainability of benefits	Yes
D	Cross-cutting performance criteria	
1	Gender mainstreaming	Yes

Index	Evaluation criteria	Mandatory rating
2	Environment and socio-economic aspects ⁸	
3	M&E: (focus on Monitoring) M&E design M&E implementation	Yes
4	Results-based Management (RBM)	Yes
E	Performance of partners	
1	UNIDO	Yes
2	National counterparts	Yes
3	Donor	Yes
F	Overall assessment	Yes

Performance of partners

The assessment of performance of partners will ***include*** the quality of implementation by project executing entities (business or professional associations, training institutions, research institutes, etc.) in discharging their assigned roles and responsibilities. The assessment will consider the following:

Quality of Implementation: the extent to which the agency delivered effectively, with focus on elements that were controllable from the given GEF Agency's perspective and how well risks were identified and managed.

Quality of Execution: the appropriate use of funds, procurement and contracting of goods and services

Rating System

In line with the practice adopted by many development agencies, the UNIDO Independent Evaluation Division uses a six-point rating system where 6 is the highest score (highly satisfactory) and one (1) the lowest score (highly unsatisfactory).

Evaluation Rating Scale

Score	Definition*	Category
6	Highly satisfactory Level of achievement presents no shortcomings (90% - 100% achievement rate of planned expectations and targets).	SATISFACTORY
5	Satisfactory Level of achievement presents minor shortcomings (70% - 89% achievement rate of planned expectations and targets).	
4	Moderately satisfactory Level of achievement presents moderate shortcomings (50% - 69% achievement rate of planned expectations and targets).	
3	Moderately unsatisfactory Level of achievement presents some significant shortcomings (30% - 49% achievement rate of planned expectations and targets).	UNSATISFACTORY
2	Unsatisfactory Level of achievement presents major shortcomings (10% - 29% achievement rate of planned expectations and targets).	
1	Highly unsatisfactory Level of achievement presents severe shortcomings (0% - 9% achievement rate of planned expectations and targets).	

Note: * For impact, the assessment will be based on the likelihood of continued results, as it is often too early to assess the long-term impacts of the project at the project completion point.

Evaluation process

The evaluation will be conducted from August to December 2021. The evaluation will be implemented in five phases which are not strictly sequential, but in many cases iterative, conducted in parallel and partly overlapping:

Inception phase: The evaluation team will prepare the inception report providing more details of the theory of change and the evaluation instruments, including an evaluation matrix; and consideration of the findings and recommendations of the mid-term review.

Desk review and data analysis;

Interviews, survey and literature review;

Online presentation of preliminary findings and recommendations to key stakeholders

Data analysis and report writing

Time schedule and deliverables

The evaluation is scheduled to take place from August to December 2021. At the end of the field mission, there will be a presentation of the preliminary findings for all stakeholders involved in this project. The tentative timelines are provided in Table 7 below.

After the evaluation field mission, the evaluation team leader will visit UNIDO HQ for debriefing and presentation of the preliminary findings of the terminal evaluation. The draft TE report will be submitted 4 to 6 weeks after the end of the mission. The draft TE report is to be shared with the UNIDO PM, UNIDO Independent Evaluation Division, the UNIDO GEF Coordinator and GEF OFP and other stakeholders for receipt of comments. The ET leader is expected to revise the draft TE report based on the comments received, edit the language and form and submit the final version of the TE report in accordance with UNIDO ODG/EIO/EID standards.

Table 4. Tentative timelines

Timelines	Tasks
August 2021	Desk review and writing of inception report
End-August 2021	Preparatory consultation with the project manager, the project team and the Evaluation Manager, based on the Inception Report
September 2021	Survey and interviews with key informants
End September 2021	Presentation of preliminary findings, lessons and recommendations
October 2021	Preparation of first draft evaluation report
Early November 2021	Review of the report by Evaluation Manager, Project Team and key stakeholders for fact-checking and finalization of the report
December 2021	Submission of final evaluation report

Evaluation team composition

The evaluation team will be composed of at least one international evaluation consultant acting as the team leader and one national consultant. The evaluation team members will possess relevant strong experience and skills on evaluation and evaluation management, including social safeguards and gender. Expertise and experience in the related technical subject of the project is desirable. The evaluation consultants will be contracted by UNIDO.

An evaluation officer will be also assigned to manage the evaluation and will participate in its conduct.

The tasks of each team member are specified in the job descriptions in Annex 3 to these terms of reference.

According to UNIDO Evaluation Policy, members of the evaluation team must not have been directly involved in the design and/or implementation of the project under evaluation.

Reporting

Inception Report (IR)

These Terms of Reference (ToR) provide some but not all of the information on the evaluation methodology. This is done in the Inception Report.

After reviewing the documentation and initial interviews with the project manager, the International Evaluator will prepare, in collaboration with the national evaluator, a short inception report that will operationalize the ToR. It will provide more details on what type of evidence is needed (evaluation matrix) and how that evidence will be collected (data collection instruments). The IR will be discussed with and approved by the Evaluation Manager.

The Inception Report will focus on the following elements:

Proposed theory model(s)

Quantitative and qualitative approaches evaluation matrix

Division of work between the International Evaluator and National Evaluator

People to be interviewed and proposed surveys to be conducted

A debriefing and reporting timetable⁹.

Evaluation report format and review procedures

The draft report will be delivered to UNIDO's Independent Evaluation Division (the suggested report outline is in Annex 4) and circulated to UNIDO staff and national stakeholders associated with the project for factual validation and comments. Any comments or responses, or feedback on any errors of fact to the draft report provided by the stakeholders will be sent to UNIDO's Independent Evaluation Division for collation and onward transmission to the project evaluation team who will be advised of any necessary revisions. Based on this feedback and the comments received, the evaluation team will prepare the final draft terminal evaluation report.

The TE report should be concise and easy to understand. It must explain the purpose of the evaluation, exactly what was evaluated, and the methods used. The report must highlight any methodological limitations, identify key concerns, and present evidence-based findings, conclusions, recommendations, and lessons. The report should include an executive summary that summarizes the ET's assessment, for use in dissemination and distillation of lessons.

Findings, conclusions, and recommendations should be presented in a complete, logical and balanced manner. The evaluation report shall be written in English and follow the outline given in annex 4.

Evaluation report and review procedures

The draft report will be delivered to UNIDO Independent Evaluation Division (the suggested report outline is in annex 4) and circulated to UNIDO staff and national stakeholders associated with the project for factual validation and comments. Any comments or responses, or feedback on any errors of fact to the draft report provided by the stakeholders will be sent to UNIDO Independent Evaluation Division for collation and onward transmission to the project evaluation team who will be advised of any necessary revisions. On the basis of this feedback, and taking into consideration the comments received, the evaluation team will prepare the final version of the terminal evaluation report.

⁹ The Evaluators will be provided with a Guide on how to prepare an evaluation inception report.

The ET will present its preliminary findings to the local stakeholders at the end of the field visit and take into account their feed-back in preparing the evaluation report. A presentation of preliminary findings will take place at UNIDO HQ after the field mission.

The TE report should be brief, to the point and easy to understand. It must explain the purpose of the evaluation, exactly what was evaluated, and the methods used. The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should provide information on when the evaluation took place, the places visited, who was involved and be presented in a way that makes the information accessible and comprehensible. The report should include an executive summary that encapsulates the essence of the information contained in the report to facilitate dissemination and distillation of lessons.

Findings, conclusions and recommendations should be presented in a complete, logical and balanced manner. The evaluation report shall be written in English and follow the outline given in annex 4. The ET should submit the final version of the TE report in accordance with UNIDO Independent Evaluation Division standards.

Quality assurance

All UNIDO evaluations are subject to quality assessments by UNIDO Independent Evaluation Division. Quality assurance and control is exercised in different ways throughout the evaluation process (briefing of consultants on methodology and process of UNIDO Independent Evaluation Division, providing inputs regarding findings, lessons learned and recommendations from other UNIDO evaluations, review of inception report and evaluation report).

The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality, attached as annex 5. UNIDO's Independent Evaluation Division should ensure that the evaluation report is useful for UNIDO in terms of organizational learning (recommendations and lessons learned) and is compliant with UNIDO's evaluation policy and these terms of reference. The draft and final evaluation report are reviewed by UNIDO Independent Evaluation Division, which will issue and circulate it within UNIDO together with a management response sheet, as well as submit to relevant stakeholders as required.

Annex 2. Bibliography

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Progress Summary, Strengthening the capacity of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan (Project ID: 200108), 15 November 2021

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UNIDO, 2021, *Japanese companies work remotely to deliver technologies to fight COVID-19*, <https://www.unido.org/stories/japanese-companies-work-remotely-deliver-technologies-fight-covid-19>

UNIDO, 2021, *Japanese technologies help Africa and Asia fight COVID-19*, <https://www.unido.org/news/japanese-technologies-help-africa-and-asia-fight-covid-19>

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TSP TAIYO INC., 2021, *Demonstration and Transfer of Technology Project for the Prevention of COVID-19 Infections Using a Mobile Inspection System with Solar Modules* Presentation

STePP, 2021, *Gender Impact: How Japanese technologies mitigating the effects of COVID-19 impact women in communities and working places*

UNIDO, 2020, *Strengthening the capacity of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan* Project Document

UNIDO, 2020, *Strengthening the capacity of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan* Budget Revision Request

UNIDO, 2021, *Progress Summary (Kenya): Strengthening the capacity of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan* 1 November 2021

TSP TAIYO INC. *Training Manuals: Mobile PCR Testing Station User manual*

Mr Yuichi Yanaka, 2020, *Tromso Co., Ltd.* Presentation

UNIDO, 2020, *Contract between The United Nations Industrial Development Organization (UNIDO) and Kensei Sangyo Co. Ltd.*

UNIDO, 2020, *Contract between The United Nations Industrial Development Organization (UNIDO) and JTOP Co. Ltd.*

UNIDO, 2020, *Contract between The United Nations Industrial Development Organization (UNIDO) and Chuwa Industrial Co. Ltd. (Contract 3000084398)*

UNIDO, 2020, *Contract between The United Nations Industrial Development Organization (UNIDO) and Kensei Sangyo Co. Ltd. (Contract 3000084393)*

UNIDO, 2020, *Contract between The United Nations Industrial Development Organization (UNIDO) and AGC Inc.*

UNIDO, 2020, *Contract between The United Nations Industrial Development Organization (UNIDO) and Hinode Sangyo Co. Ltd.*

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Uganda, Product: Sanitiser

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Kenya, Product: Mobile PCR Testing Laboratory

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Nigeria, Product: Blood gas analyser

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Multiple, Product: Disinfectant Paint

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Kenya, Product: Medical Waste Incinerator

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Senegal, Product: Medical Waste Incinerator

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Madagascar, Product: Medical Waste Incinerator

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Viet Nam, Product: Hypochlorous acid water

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Indonesia, Product: Hypochlorous acid water

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Senegal, Product: Hypochlorous acid water

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UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Myanmar, Product: Water treatment plant

UNIDO, 2020, Terms of Reference for Technology transfer, demonstration, and trainings for the project of “Strengthening the capacity of developing countries to mitigate the impacts of the COVID19 pandemic through appropriate technology transfer from Japan” (UNIDO DATABASE ID:200108), Country: Morocco, Product: Aeration device for wastewater treatment system

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Chuwa Industrial Co. Ltd. for provision of services related to verification and transfer of technology used in “smokeless incineration for medical waste” in Madagascar

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Chuwa Industrial Co. Ltd. for provision of services related to verification and transfer of technology used in “smokeless incineration for medical waste” in Senegal

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Hinode Sangyo Co. Ltd. for provision of services related to

technology demonstration/transfer of the HMBS Decentralized Wastewater Treatment System in Morocco.

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and JTOP Co. Ltd. for provision of services related to water cycle project to supply sanitary domestic water in India

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Kinsei Sangyo Co. Ltd. for provision of services related to demonstration and transfer of a waste incinerator of gasification system to prevent infection by infectious medical wastes in Medical Institutions in Nairobi Kenya.

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Marusyo Sangyo Co. Ltd. for provision of services related to preventing indoor infections by visible light reaction type of Photocatalyst coating in Nepal, Mongolia and Kenya

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Saraya Co. Ltd. for provision of services related to mass production of anti-viral alcohol based hand rub, improvement of hygiene environment and infection prevention and control in hospitals by hygiene instructors in Uganda

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Solar Wind Technology Inc for provision of services related to production of long-lasting disinfectant consist of Hypochlorous acid solution (HCIO solution) in Indonesia

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Techno Medica Co. Ltd. for provision of services related to physical condition management of severely infectious disease patients with utilising Blood Gas Analyser in Nigeria

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Terios-Tech Co. Ltd. for provision of services related to dissemination of safe and secure disinfection system and construction of value chain by hypochlorous acid water generator in Senegal

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and Tromso Co. Ltd. for provision of services related to demonstration and transfer for a water purifier that uses activated carbon from rice husks for the prevention of infectious diseases in Soc Trang Province, Socialist Republic of Viet Nam

UNIDO, 2021, Amendment to contract between United Nations Industrial Development Organization (UNIDO) and TSP Taiyo Inc for provision of services related to demonstration and transfer of technology for the prevention of COVID-19 infections using a Mobile Inspection System with Solar Modules in Kenya

Annex 3. List of Interviewees

Donor Affiliated

Ministry of Foreign Affairs	Permanent Mission of Japan to the International Organisations in Vienna	First Secretary	Ms	Sae Horikawa
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UNIDO Affiliated

UNIDO HQ	UNIDO	Chief	Mr	Weixi Gong
UNIDO HQ	UNIDO	Associate Expert	Ms	Yoshie Fujiyama
UNIDO HQ	UNIDO	Industrial Development Expert	Ms	Nahomi Nishio
UNIDO Viet Nam	UNIDO	Administrative Assistant	Ms	Van Tran Tuyet
ITPO Tokyo	UNIDO	Assistant Head – Donor Relations	Mr	Hideki Murakami
ITPO Tokyo	UNIDO	Partnership Expert	Ms	Miho Suzuki
ITPO Tokyo	UNIDO	Head	Mr	Yuko Yasunaga
ITPO Tokyo	UNIDO		Mr	Masahiko Goto
ITPO Tokyo	UNIDO		Ms	Yuki Onozaki
ITPO Tokyo	UNIDO		Ms	Azuza Matsumoto
ITPO Tokyo	UNIDO	Deputy Head	Mr	Ferda Gelegen
ITPO Tokyo	UNIDO		Ms	Yukiko Fukuyama
ITPO Tokyo	UNIDO		Mr	Kosuke Kuroda

Company Stakeholders

ITPO Tokyo PIC	Country	Project Code	Type of Organization	Name of Organization	Job Title	Honorific	Name	Main Contact	Official Project Name
MG	Viet Nam	Tromso in Viet Nam	Primary implementing Japanese company	Tromso Co., Ltd.	CEO	Mr.	Masaaki Uesugi	X	Verification and technology transfer project for a water purifier that uses activated carbon from rice husks for the prevention of infectious diseases in Soc Trang Province, Socialist Republic of Vietnam
MG	Viet Nam	Tromso in Viet Nam	Others	CONG TY TNHH SAN XUAT THUONG MAI DICH VU HIKARU	President	Mr.	Mai Van Thanh	X	as above
AM	Viet Nam	AGC in Viet Nam	Primary implementing Japanese company	AGC Inc.	Professional, SDGs Division, Corporate Planning General Division	Mr.	Masaaki Okabe	X	Technology demonstration and transfer for Hypochlorous Acid Water production equipment by ion exchange membrane in Viet Nam
AM	Viet Nam	as above	Local stakeholder	The University of Danang	Director of the Japan Center	Dr.	Hoang Hai	X	as above
AM	Viet Nam	as above	Local stakeholder	DCSE lab	Assoc. Prof., Mechatronics Engineering Department/Director, National Key Lab for Digital Control and System Engineering	Dr.	Nguyen Tan Tien	X	as above
YF	Kenya/Nepal/ Mongolia	Marusyo Sangyo in Kenya/ Nepal/ Mongolia	Primary implementing Japanese company	MARUSYO SANGYO Co., Ltd.	Managing Director	Mr.	Takayuki Yoshikawa	X	Preventing Indoor Infections by Visible Light Reaction Type of Photocatalyst Coating

ITPO Tokyo PIC	Country	Project Code	Type of Organization	Name of Organization	Job Title	Honorific	Name	Main Contact	Official Project Name
YF	Kenya	as above	UNIDO field office	UNIDO Kenya	National Programme Officer	Ms.	Linet Luvai	X	as above
YF	Kenya	as above	UNIDO field office	UNIDO Kenya	STePP Project Administrative Support	Ms.	Rosemary Lubembe	X	as above
YF	Kenya	as above	Embassies	Embassy of Japan in Kenya	Second Secretary, Economic Affairs and Economic Cooperation Section	Mr.	Fumihiko Uchikoshi	X	as above
YF	Kenya	as above	Local stakeholder	Ministry of Industrialization, Trade and Enterprise Development	Assistant Director of Industries/UNIDO Desk Liaison Officer	Ms.	Lydia Musyimi	X	as above
YF	Kenya	TSP Taiyo in Kenya	Primary implementing Japanese company	TSP TAIYO INC.	Manager	Ms.	Mio Kawamura	X	Demonstration and Transfer of Technology Project for the Prevention of COVID-19 Infections Using a Mobile Inspection System with Solar Modules in Kenya
YF	Kenya	TSP Taiyo in Kenya	UNIDO field office	UNIDO Kenya	National Programme Officer	Ms.	Linet Luvai	X	as above
YF	Kenya	TSP Taiyo in Kenya	UNIDO field office	UNIDO Kenya	STePP Project Administrative Support	Ms.	Rosemary Lubembe	X	as above
YF	Kenya	TSP Taiyo in Kenya	Embassies	Embassy of Japan in Kenya	Second Secretary, Economic Affairs and Economic Cooperation Section	Mr.	Fumihiko Uchikoshi	X	as above
YF	Kenya	TSP Taiyo in Kenya	Local stakeholder	Machakos Government	Deputy Director Laboratory Services, Department of Health and Emergency Services	Mr.	David Mutunga	X	as above
YF	Kenya	TSP Taiyo in Kenya	Local stakeholder	Ministry of Industrialization, Trade and Enterprise Development	Assistant Director of Industries/UNIDO Desk Liaison Officer	Ms.	Lydia Musyimi	X	as above
YF	Kenya	Kinsei Sangyo in Kenya	Primary implementing Japanese company	Kinsei Sangyo Co., Ltd.	Managing director	Mr.	Keiichi Kaneko	X	Demonstration and Transfer Project of a Waste incinerator of gasification system to Prevent Infection by

ITPO Tokyo PIC	Country	Project Code	Type of Organization	Name of Organization	Job Title	Honorific	Name	Main Contact	Official Project Name
									Infectious Medical Wastes in Medical Institutions in Nairobi – Kenya
YF	Kenya	as above	UNIDO field office	UNIDO Kenya	National Programme Officer	Ms.	Linet Luvai	X	as above
YF	Kenya	as above	UNIDO field office	UNIDO Kenya	STePP Project Administrative Support	Ms.	Rosemary Lubembe	X	as above
YF	Kenya	as above	Embassies	Embassy of Japan in Kenya	Second Secretary, Economic Affairs and Economic Cooperation Section	Mr.	Fumihiko Uchikoshi	X	as above
YF	Kenya	as above	Local stakeholder	Ministry of Industrialization, Trade and Enterprise Development	Assistant Director of Industries/UNIDO Desk Liaison Officer	Ms.	Lydia Musyimi	X	as above
YF	Kenya	as above	Local stakeholder	Nairobi Metropolitan Service (NMS)	Sub County Public Health	Mr.	James Ngocho	X	as above
YF	Kenya	as above	Local stakeholder	Mutuini Hospital	Medical Supretendant	Mr.	Josephine Nguri	X	as above
YO	Senegal	Chuwa in Senegal	Primary implementing Japanese company	Chuwa Industrial		Mr.	Kyoji Sugiura	X	Verification and transfer of technology used in "smokeless incinerators for medical waste" in Senegal
YO	Senegal	Terios Tec in Senegal	Primary implementing Japanese company	Terios Tec		Ms.	Rie Matsushima	X	Dissemination of safe and secure disinfection system and construction of value chain by hypochlorous acid water generator in Senegal
MG	India	JTOP in India	Primary implementing Japanese company	JTOP Co., Ltd.		Mr.	Naoya Masuda	X	Water Cycle Project to Supply Sanitary Domestic Water to Developing Countries
MG	India	as above	Other Japanese company	Sojitz India Private Ltd.		Mr.	Yuki Nishikaze	X	as above

ITPO Tokyo PIC	Country	Project Code	Type of Organization	Name of Organization	Job Title	Honorific	Name	Main Contact	Official Project Name
MG	India	as above	Local stakeholder	SBSEnviro Aqua Concepts Pvt. Ltd.	Managing Director	Mr.	D.S. Srinivas Rao	X	as above
YO	Madagascar	Chuwa in Madagascar	Primary implementing Japanese company	Chuwa Industrial		Mr.	Kyoji Sugiura	X	Verification and transfer of technology used in "smokeless incinerators for medical waste" in Madagascar
YF	Myanmar	MCAS in Myanmar	Primary implementing Japanese company	Mitsubishi Chemical Aqua Solutions Co., Ltd.		Mr.	Suguru Kudo	X	Pilot on On-Site Water Treatment and Supply System for hospitals in Myanmar
YF	Myanmar	as above	UNIDO field office	UNIDO Thailand	UR	Mr.	Stein Hansen	X	Pilot on On-Site Water Treatment and Supply System for hospitals in Myanmar
AM	Morocco	Hinode Sangyo in Morocco	UNIDO field office	UNIDO Country Office Morocco	Country representative	Ms.	Hanan Hanzaz	X	Technology demonstration/transfer of the HMBS Decentralized Wastewater Treatment System in Morocco
AM	Morocco	as above	Local stakeholder	INGEDEVUR	Consultant	Mr.	Najib Benyahia	X	Technology demonstration/transfer of the HMBS Decentralized Wastewater Treatment System in Morocco
AM	Morocco	as above	Primary implementing Japanese company	Hinode Sangyo Co., Ltd.	Director	Ms.	Kaori Fujita	X	as above
AM	Morocco	as above	Local stakeholder	Boughanim Association for the Development and Agricultural Cooperation	President	Mr.	Khalifa Elmasfioui	X	as above
AM	Uganda	Saraya in Uganda	Primary implementing Japanese company	SARAYA CO. LTD.	Global Operations Div, Africa Business Development Section	Ms.	Tamaro Stephanie Nakamura	X	Mass production of anti-viral alcohol based hand rub, improvement of hygiene environment and infection prevention and control in hospitals by hygiene instructors in Uganda

ITPO Tokyo PIC	Country	Project Code	Type of Organization	Name of Organization	Job Title	Honorific	Name	Main Contact	Official Project Name
AM	Uganda	as above	Primary implementing Japanese company	SARAYA Manufacturing (U) LTD	General Manager- SARAYA Manufacturing (U) LTD	Mr.	Fortunate Collins	X	as above
YF	Mongolia	Marusyo Sangyo in Kenya/ Nepal/ Mongolia	UNIDO HQ	UNIDO PFC/RFC/ASP (Mongolia)	National Programme Coordinator	Ms.	Munkhbolor GUNGAA,	X	Preventing Indoor Infections by Visible Light Reaction Type of Photocatalyst Coating
MS	Indonesia	Solar Wind Technology Inc.	Primary implementing Japanese company	Solar Wind Technology Inc.	Project Leader	Mr.	Michio Horiuchi	X	Production of Long-lasting Disinfectant Consist of Hypochlorous Acid Solution (HClO solution) in Indonesia
MS	Indonesia	Solar Wind Technology Inc.	Primary implementing Japanese company	Solar Wind Technology Inc.	Sales planning, quality control, product design	Mr.	Kazunori Ishida	X	Production of Long-lasting Disinfectant Consist of Hypochlorous Acid Solution (HClO solution) in Indonesia
MS	Indonesia	as above	Local stakeholder	Universitas Pendidikan Indonesia (Indonesia University of Education)	Project Direccgor	Prof.	Dianni Risda, M.Ed	X	Production of Long-lasting Disinfectant Consist of Hypochlorous Acid Solution (HClO solution) in Indonesia
MS	Indonesia	as above	UNIDO field office	UNIDO Indonesia	UNIDO Rep.in Indonesia &Timor &Timor Leste	Mr.	Esam ALQARARAH	X	Production of Long-lasting Disinfectant Consist of Hypochlorous Acid Solution (HClO solution) in Indonesia
MS	Nigeria	Techno Medica	Primary implementing Japanese company	Techno Medica Co., Ltd.	Project Manager	Mr.	Eiichi Goto	X	Physical condition management of severely infectious disease patients with utilizing Blood Gas Analyzer
MS	Nigeria	as above	UNIDO field office	UNIDO Nigeria	Administrative Assistant	Mr.	Oluoyomi Laniyan	X	as above

Annex 4. STePP Demo-targets and achievements

Objective, Outcomes & Outputs		Target	Result	Difference	Ratio
Contribute to capacity building of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan	Number of developing countries mitigating impacts of COVID-19 through UNIDO interventions	10	14	+4	140.0%
	Number of technology companies from Japan reporting increased cases of penetration and demonstration in developing countries	10	11	+1	110.0%
	Number of firms in Japan and developing countries reporting new business potential as a result of UNIDO interventions	10	14	+4	140.0%
	Number of actors gaining awareness/knowledge/skills as a result of UNIDO interventions on public and private investment and technology policy and promotional tools (sex-disaggregated (target: 40% female participation))	27	1,234	+1,207	4570.4%
	- Number of male	16	649	+633	4056.3%
	- Number of female	11	579	+568	5263.6%
	- % of female	41%	47%	6%	115.2%
Outcome: Capacity of recipient countries and technology providers built and strengthened through sustainable investment and technology transfer	Number of new technologies developed as a result of UNIDO interventions*	5	10	+5	200.0%
	Number of countries reporting the adoption of new technologies as a result of UNIDO interventions	5	13	+8	260.0%
	Number of firms (project counterparts) reporting the acquisition of new technologies as a result of UNIDO interventions* (i.e. New technologies acquired by the stakeholders in developing countries)	6	9	+3	150.0%
	*Data shall indicate the number of project counterparts that focal points are female		-	-	-
Output 1: Emerging needs in developing countries/ economy in transition identified (needs assessment) and support services provided to the target countries and technology providers for a strategic planning for appropriate technology transfer	Number of target developing countries and needs identified (gender-responsive)	10	13	+3	130.0%
	Number of potential local company and institutions identified	10	16	+6	160.0%
	Number of meetings arranged with public and private sector players	10	6	-4	60.0%
	Number of support services provided to local counterparts and technology providers	10	-	-10	0.0%
	Number of training workshops completed	1	7	+6	700.0%
	Number of participants, sex-disaggregated(target: 40% female participation)	30	95	+65	316.7%
	- Number of male	18	45	+27	250.0%
	- Number of female	12	50	+38	416.7%
	- % of female	40%	53%	13%	131.6%
* Baseline and targets will be established during the first 6 months of the project phase.		-	-	-	
	Number of STePP technologies surveyed, identified and selected*	10	9	-1	90.0%

Objective, Outcomes & Outputs		Target	Result	Difference	Ratio
Output 2: Sustainable technologies identified, based on the needs assessment in the target countries	Number of fact finding and study tours organized to target countries	-	3	+3	-
	Number of participants in study tours, sex-disaggregated (target: 40 % female participation)	-	20	+20	-
	- Number of male		12	+12	-
	- Number of female		8	+8	-
	- % of female	-	40%	-	-
	Number of meetings and study groups organized	-	-	0%	-
	*Data shall indicate whether the proposals stem from women or men--led enterprises/or composition of executive board in terms of board members' sex		-	-	-
	** Baseline and targets will be established during the first 6 months of the project phase.		-	-	-
Output 3: Selected technology installed, and technical training provided to the local engineers in recipient countries	Number of selected STePP technologies installed for demonstration in target countries in alignment with the Environmental and Social Management Plan (ESMP)	10	6	-4	60.0%
	Number of technical training provided to local engineers in target countries	10	15	+5	150.0%
	Number of engineers trained, sex-disaggregated (target: 40 % female participation)	80	314	+234	392.5%
	- Number of male	48	189	+141	393.8%
	- Number of female	32	125	+93	390.6%
	- % of female	40%	40%	0%	99.5%
	Number of UNIDO Headquarters missions supported	1	-	-1	0.0%
	* Baseline and targets will be established during the first 6 months of the project phase.		-	-	-
Output 4: Capacity of recipient countries and technology providers built and strengthened for sustainable investment and technology promotion	Number of local counterparts identified to consider further dissemination of technologies on commercial basis number of joint activities with Japanese institutions	5	13	+8	260.0%
	Number of promotional activities using gender-inclusive language (i.e. Number of events (seminars, workshops, etc.), news articles, social media posts, local media articles, etc. that highlight/mention gender issues and perspective)	5	6	+1	120.0%
	Number of events attended or organized to promote UNIDO, its services as well as SDGs. (i.e. Number of events organized/co-organized/participated as speaker in recipient countries, HQ, or Tokyo. For instance seminar, workshops, promotional events)	5	6	+1	120.0%
	Number (and kind of) of communication and outreach campaigns conducted using gender-inclusive language	5	18	+13	360.0%
	Number of media contacts established (HQ and field)	5	40	+35	800.0%
	* Baseline and targets will be established during the first 6 months of the project phase.		-	-	-

Project Component	KPIs/Indicators	Means of Verification
<p>Project Objective Contribute to capacity building of developing countries to mitigate the impacts of the COVID-19 pandemic through appropriate technology transfer from Japan.</p>	<ul style="list-style-type: none"> • Number of developing countries mitigating impacts of COVID-19 through UNIDO interventions • Number of technology companies from Japan reporting increased cases of penetration and demonstration in developing countries • Number of firms in Japan and developing countries reporting new business potential as a result of UNIDO interventions • Number of actors gaining awareness/knowledge/skills as a result of UNIDO interventions on public and private investment and technology policy and promotional tools (sex-disaggregated (target: 40% female participation) 	<ul style="list-style-type: none"> • Periodic surveys and/or interviews with project beneficiaries • Site visits • Records of supply use • Company reports on achievements • Institution reports on achievements
<p>Project Outcome Capacity of recipient countries and technology providers built and strengthened through sustainable investment and technology transfer.</p>	<ul style="list-style-type: none"> • Number of new technologies developed as a result of UNIDO interventions* • Number of countries reporting the adoption of new technologies as a result of UNIDO interventions • Number of firms and/or institutions reporting the acquisition of new technologies as a result of UNIDO interventions* • Number of bankable proposals elaborated by firms as a result of UNIDO interventions* • Number of new bankable proposals financed by banks as a result of UNIDO interventions¹⁰ 	<ul style="list-style-type: none"> • Reports by project beneficiaries • Company's annual report & statements of financial position • Periodic interviews with project beneficiaries • Site visits • Records of supply use
<p>Output 1 Emerging needs in developing countries/ economy in transition identified (needs assessment) and support services provided to the target countries and technology providers for a strategic planning for appropriate technology transfer</p>	<ul style="list-style-type: none"> • Number of target developing countries and needs identified (gender-responsive) • Number of potential local company and institutions identified • Number of meetings arranged with public and private sector players • Number of support services provided to local counterparts and technology providers • Number of training workshops completed • Number of participants, sex-disaggregated (target: 40% female participation) <p>* Baseline and targets will be established during the first 6 months of the project phase.</p>	<ul style="list-style-type: none"> • Reports by project beneficiaries • Company and institution reports • Periodic interviews/surveys with project beneficiaries • Site visits • Records of supply use • Media reports
<p>Output 2 Sustainable technologies identified, based on the needs assessment in the target countries</p>	<ul style="list-style-type: none"> • Number of STePP technologies surveyed, identified and selected* • Number of fact finding and study tours organized to target countries • Number of participants in study tours, sex-disaggregated (target: 40 % female participation) • Number of meetings and study groups organized <p>*Data shall indicate whether the proposals stem from women or men-led enterprises/or</p>	<ul style="list-style-type: none"> • Reports by project beneficiaries • Company's reports • Periodic interviews with project beneficiaries • Site visits • Records of supply use • Media reports

¹⁰ Data shall indicate whether the technologies stem from women or men-led enterprises/or composition of executive board in terms of board members' sex

Project Component	KPIs/Indicators	Means of Verification
	<p>composition of executive board in terms of board members' sex</p> <p>** Baseline and targets will be established during the first 6 months of the project phase.</p>	
<p>Output 3 Selected technology installed, and technical training provided to the local engineers in recipient countries</p>	<ul style="list-style-type: none"> • Number of selected STePP technologies installed for demonstration in target countries in alignment with the Environmental and Social Management Plan (ESMP) • Number of technical training provided to local engineers in target countries • Number of engineers trained, sex-disaggregated (target: 40 % female participation) • Number of UNIDO Headquarters missions supported <p>* <i>Baseline and targets will be established during the first 6 months of the project phase.</i></p>	<ul style="list-style-type: none"> • Reports by project beneficiaries • Company's reports • Periodic interviews with project beneficiaries • Site visits • Records of supply use • Media reports
<p>Output 4 Capacity of recipient countries and technology providers built and strengthened for sustainable investment and technology promotion</p>	<ul style="list-style-type: none"> • Number of local counterparts identified to consider further dissemination of technologies on commercial basis number of joint activities with Japanese institutions • Number of promotional activities using gender-inclusive language • Number of events attended or organized to promote UNIDO, its services as well as SDGs. • Number (and kind of) of communication and outreach campaigns conducted using gender-inclusive language • Number of media contacts established (HQ and field) <p>* <i>Baseline and targets will be established during the first 6 months of the project phase.</i></p>	<ul style="list-style-type: none"> • Company and institution reports • UNIDO reports • Meeting minutes/conference papers/etc. • Media reports and list of media contacts

Annex 5. Summary of consultation by company

Country	India	Company	JTOP Co, Ltd
Product	Water regeneration system		
Registered with ITPO STEPP prior to project? (Y/N)	Yes	Date of Company Establishment	1907
National Partner name	Sojitz	Recipient organization	Vietnam Ministry of Health

Summary of proposal

Company and Product. JTOP manufactures and installs activated carbon water filtration systems in a semi-permanent way which is their main product. This was their first project in India. They applied for the project with their local partner Sojitz.

National needs. In India, water is much dirtier, often with e-coli bacteria and also darker. The technology could cope with Indian water, but the cartridges needed to be cleaned more frequently. A typical village in India, contains about 300 households. A recycling machine can clean about 20 units (there is a model capable of 300 units). Water machines are portable, although recycling machines are a bit heavier, but still movable. Recycling machines due to the high temperatures involved, needed a bit of caution to avoid burns, so the operators need to be well trained.

Innovation. The cartridges are reusable and are collected in a collection point. They are heated to 430 degrees Celsius for cleaning organic particles by heat. Filters do not need to be disposed of, they can be reused, helping the environment and reducing running costs.

Results achieved

Installation. The company felt that their inability to travel to India due to COVID-19, constrained the testing process. Otherwise they would have provided more technical instructions. The local company was very helpful and had a deep understanding of the product.

Demonstration. Online meetings, manual and instructional videos were provided in English and Sojitz provided close collaboration with the locals. However, the system has not yet been effectively tested nor is operational so no demonstration effect has been progressed.

Benefits. Product is used in Japan for non-drinking water, especially wastewater or for disaster recovery emergency water (e.g. in Osaka). However, the feedback from both the partner and the local company is that the equipment is not suitable for community use due to the treated water still not being potable, the high energy requirement for the filter recycling equipment and the limited scope of the equipment given the size of Indian communities.

Prospects for the future. JTOP plan to sell equipment for industrial use for which the product application is better suited, and is JTOP's prime market in Japan. As manufacturing in Japan is very expensive, they are looking for a local manufacturing company to reduce manufacturing and shipping costs. They believe that the project is viable even without external funding.

Lessons Learned.

- A more thorough needs assessment and selection process, particularly involving national stakeholders such as the UNIDO office could have identified the challenges with relevance to the India market early in the process.
- Shipping machines from Japan to India incurred some delays and tariffs that JTOP were not used to in previous projects through JICA. ITPO also was not aware of the Government of India requirements so closer liaison with the UNIDO country office would have been advisable



Country: India
 Company: JTOP Co., Ltd.
 Installation of the water filtration device and the regeneration device



Country: India
 Company: JTOP Co., Ltd.
 Training on operation and maintenance

Country	Kenya	Company	Kinsey Sangyo
Product	Gasification incinerator for medical waste		
Registered with ITPO STEPP prior to project? (Y/N)	Yes	Date of Company Establishment	1967
National Partner name	<ul style="list-style-type: none"> • Yakiguchi • Furukawa • Kashic • Nairobi Metropolitan Services (NMS) • National Environment Management Authority (NEMA) 	Recipient organization	Mutuini Hospital

Summary of proposal

Company and Product. Kinsey Sangyo was established in 1967 and was originally active in the construction sector. In 1970, these activities were practically cancelled, and the company focused in incinerators, originally copying the designs of others without a deep understanding of the process. This eventually led them to develop their own proprietary technology. They originally met with UNIDO in a 2012 trade show and were informed about challenges in other countries. They have a long cooperation with their consultant and have been working together in Kenya for 5 years which facilitated their STePP demo project in Kenya. A network in Kenya was developed involving the Furukawa consulting company which helps Japanese companies expand overseas, as well as the Kashic consulting company.

National needs. First time Kenya had a smokeless incinerator, which caused interest from other hospitals in Kenya. Seminars and survey to healthcare providers. Have talked to 240 sites who are interested in installing at their site.

Innovation. The incinerator uses high temperature, smokeless combustion and does not require segregated waste (e.g. paper, plastic, normal waste). The technology separates the gas container to the combustion container. For this project, they made a small plant, but 100x or even 200x bigger plants are possible. Such systems are already set up across Japan.

Results achieved

Installation. The project was delayed due to COVID, but the flexibility of MoFA and UNIDO meant that the delay was only 2 months. Transportation was difficult and 5x more expensive due to lack

of transport capacity during COVID. Unit is plug-in, requiring only 4kW (similar to a regular heater in consumption), and no special power provisions. Bigger units need special power requirements but are more power-efficient compared to existing units. During COVID, installation took only 2-3 days. Incinerator was separate from hospital beds, so no risk of infection. The same model has been working in Japan for 15 years. This is not a prototype unit, but a full working unit inside the hospital used on a daily basis and is automatic so very easy to operate.

Demonstration. When the contract was signed, they were planning to send engineers 3 times to Kenya but had to do remote training. A local IT streaming company helped with this. They provided manuals, instructional videos and a 3-day training to maintain the machines which was well received.

Benefits. The unit is functional and feedback from the hospital is that the equipment is more efficient than their existing incinerator. There are positive reports from the hospital and surrounding area regarding the reduction in smoke.

Prospects for the future. They plan to manufacture in Kenya and expand in Africa. “Nobody in Kenya knew of Kinsei Sangyo, but now, thanks to UNIDO they begin to know us”

Lessons Learned.

- The existence of Japanese-speaking partners with experience in Kenya, especially who had a prior experience with Kinsei Sangyo was extremely important in providing a quick start in the project and contributing to successful installation and operation.



Country: Kenya
Company: Kinsei Sangyo Co., Ltd.
On-site assembly and installation work



Country: Kenya
Company: Kinsei Sangyo Co., Ltd.
Dissemination seminar



Country: Kenya
Company: Kinsei Sangyo Co., Ltd.
Training on operation and maintenance



Country: Kenya
Company: Kinsei Sangyo Co., Ltd.
Technical setting for online implementation

Country	Kenya, India, Mongolia, Nepal	Company	Marusyo-Sangyo
Product	Photocatalytic coating with antibacterial effect		
Registered with ITPO STEPP prior to project? (Y/N)	Yes	Date of Company Establishment	1983
National Partner name	UNIDO Kenya approved local partners	Recipient organization	Kenya Ministry of Health

Summary of proposal

Company and Product. Marusyo-Sangyo, established in 1983, is a company of 17 staff that has developed a photocatalytic coating since 2002 to prevent healthcare associated infections in hospitals. The coating is applied in 2-3 rooms per hospital, usually operation rooms, out-patient examination rooms and in-patient rooms. It also works for other infectious diseases. Marusyo registered with STePP in 2019 under the health category and applied for 5 countries, securing funding for 3 contracts. Marusyo had connections in all the target countries, but no prior business. They were already operating in Mali and Malaysia.

National needs. The Ministry of Health was contacted via local UNIDO offices to identify hospitals that could benefit from antibacterial coatings to stop the spread of COVID-19 and other infectious diseases. In Nepal there was a long lockdown which provided uncertainty for the future, so they shifted it to India, where they were already operating in Mumbai, so had a pre-existing partner.

Innovation. Online services allowed a small company to be present in multiple locations.

Results achieved

Installation. The installation faced several challenges due to COVID including with transportation and identifying target hospitals, given that many were full of COVID patients. It was difficult for Marusyo to find local workers in Kenya, although UNIDO Kenya helped and judge how much time and money a local worker would require, it was still a challenge.

Demonstration. Marusyo provided videos on how to apply the chemicals. They taught the locals how the materials behaved before and after the antibacterial coating. They provided training and then the locals could use the videos on their own. They had a handover ceremony supported by UNIDO Kenya which the company appreciated.

Benefits. The coating does help to keep health facilities protected against infection. While country stakeholder appreciated the technologies, there were difficulties in providing access due to competing priorities at a time of high stress in the facilities as a result of their response to COVID-19.

Prospects for the future. Marusyo are looking for a distributor in Kenya and Mongolia

Lessons Learned.

- Presence in the local countries was a benefit, as well as contacts with local hospitals via local UNIDO offices (e.g. Kenya).
- Remote training and availability of videos was suitable for applying the chemicals.
- Local UNIDO offices would have preferred to be consulted during the program design to provide their feedback and minimize pitfalls.



Country: Kenya
 Company: Marusho Sangyo Co., Ltd.
 Medical workers and coating technicians



Country: Kenya
 Company: Marusho Sangyo Co., Ltd.
 Coating applications



Country: Kenya
 Company: Marusho Sangyo Co., Ltd.
 Bacterial tests



Country: Kenya
 Company: Marusho Sangyo Co., Ltd.
 Bacterial test results

Country	Kenya	Company	TSP Taiyo
Product	Mobile inspection system with solar system		
Registered with ITPO STEPP prior to project? (Y/N)	Yes	Date of Company Establishment	1922
National Partner name	<ul style="list-style-type: none"> SEC 	Recipient organization	Kenya Ministry of Health and Ministry of Industry. Machakos County Government with Machakos County Referral Hospital

Summary of proposal

Company and Product. TSP Taiyo was the only company that was new to STEPP. Before the project, TSP had a fixed “box” that performed COVID-19 PCR tests, that they attached to a trailer to make it mobile. A solar expert was involved to integrate solar panels and batteries for mobile operation. SEC, the local partner, had been working in Kenya for 5 years and was familiar with the procedures. Registration in Kenya was not complicated and overall, a positive experience. The original non-mobile “box” had 532 units already installed in Japan.

National needs. The Ministry of Health in Kenya was interested in collecting samples from remote areas and increasing testing during the COVID-19 pandemic without requiring potential patients to visit a fixed testing station. The technology could also be used in emergency and evacuation procedures. There was also a need to prevent infection of frontline medical staff.

Innovation. The mobile station is completely independent of grid resources (e.g. water, electricity) and can be placed in the most remote villages, collecting a number of samples for

further analysis. The design was jointly developed with existing partners working together to address the specific COVID-19 needs for testing.

Results achieved

Installation. The mobile station requires minimal site preparation and only needs to be towed to the installation site with a vehicle and installed there, much in the same manner a person would install a camper van. System is solar powered and mobile, so needs no infrastructure. No foundation work needed. Potential patients are tested following all the necessary safety protocols, keeping test samples within the unit itself, which contains a solar-powered refrigerator. After receiving a number of samples, the unit is towed to the medical analysis facility to have the samples analyzed.

Demonstration. TSP TAIYO provided “Remote Training” to at least 20 medical workers and operators (at least 40% are female). TSP TAIYO organized the “Remote Seminar on Technology Transfer to Prevent the Spread of COVID-19 Disease” inviting at least 30 medical workers.

Benefits. Can collect large numbers of test samples from otherwise inaccessible areas, or to critical work sites and minimizing time and cost for sample analysis.

Prospects for the future. TSP TAIYO plan to investigate business opportunities in other locations in the future. Also want to manufacture some parts in Kenya.

Lessons Learned.

- A good implementing partner and technical consultant were important, not only for their area of expertise but also their contacts within local government and previous experience with UNIDO. Partners had both Japanese and English speakers so communication was smooth.
- Remote training was smooth and easy to scale in most cases.



Presentation - TSP
Taiyo.pdf



Country: Kenya
Company: TSP Taiyo Inc.
Training on PCR



Country: Kenya
Company: TSP Taiyo Inc.
Unloading of the equipment



Country: Kenya
Company: TSP Taiyo Inc.
Towing of the trailer

Country	Madagascar, Senegal	Company	CHUWASTAR
Product	Incinerator for medical waste		
Registered with ITPO STEPP prior to project? (Y/N)	Yes	Date of Company Establishment	2020
National Partner name	Stella Environment (Senegal) Gabriel Sarr Ltd (Madagascar) Shinoda (Madagascar)	Recipient organization	University Hospital Joseph Raseta Befelatanana (Madagascar) University Hospital Fann (Senegal)

Summary of proposal

Company and Product. CHUWASTAR (Chuwa) was established in 1969 and produces several waste incinerators, including for medical waste, as well as other equipment. The medical waste incinerators are smokeless and can incinerate a high volume of waste quickly. The company exports to more than 30 countries across most regions but had no previous experience in Africa.

Gabriel Sarr: Small local company, was originally involved in very small incinerator for Dioubeel hospital (through Embassy of Japan), was asked by Chuwa to help. In administrative role, exemption documents, customs clearance, final delivery. Also made some environmental studies to aid Chuwa in measuring pollution. Afterwards involved (with SHINODA - Dabo) in face-to-face training.

Shinoda: Established in 2020, former resident of Japan (speaks Japanese), used to install solar panels for Stella incinerators. Stella introduced him to Chuwa and he was originally introduced to Stella by Embassy of Senegal in Japan.

National needs. With the spread of COVID across Africa, there was an increased focus on correct disposal of medical waste to minimize the risk of hospital-acquired infections for healthcare workers, waste handlers and patients. Not many hospitals in Madagascar or Senegal had the budget for functioning incinerators. The incinerators that were present produced smoke with negative environmental impacts.

Innovation. The smoke produced by previously used incinerators has negative impacts on the environment and so the alternative to have smokeless incineration was attractive. One of the national partners (Stella) in Senegal was already manufacturing small incinerators, but to accommodate an increased volume they worked with Chuwa as their incinerator is 40-50 times larger and can incinerate 500Kg/day.

Results achieved

Installation. The initial stages progressed well, despite some challenges, due to good coordination, with the products manufactured and shipped in one and a half months. Challenges experienced related to working in a COVID hospital context, unexpected circumstances, power supply problems and being unable to send engineers into the field due to COVID. Worked with UNIDO coordinator in Kenya to facilitate procedures for 3-phase power connection. The local partners helped to overcome challenges associated with unfamiliar contexts and remote installation. Instructional videos for installation were provided. While the equipment was shipped, Chuwa developed and provided online training material which expedited the process. Chuwa's experience did not differ majorly between Senegal and Madagascar. However, internet difficulties in Senegal were experienced and made video-calling and teleworking more difficult. associated with being unable to send engineers to the field,

Demonstration.

The demonstration sites were selected in discussion with the Ministries of Health and Social Action. The University Hospitals were selected as they accept COVID patients. Feedback suggests that local stakeholders found the new incinerators to be much better due to capacity, energy use and cleanliness. Based on information about hospital and amount of waste generated, the choice of incinerator model was correct. Ongoing maintenance is to be carried out by local engineers. Additional guidance material on disaggregation of waste may be required, as only technical guides are currently available. A handover ceremony is pending and is awaiting coordination of key personnel.

Benefits. Great cooperation between Chuwa as a bigger and more experienced company, Shinoda with ability to move during lockdowns and Gabriel Sarr trained by Shinoda to train users and provide local support. Sarr provided administrative training, while Shinoda provided functional training.

Prospects for the future. CHUWASTAR is interested to pursue the format adopted by the Project into the future, providing remote guidance with a local partner which avoids the costs of sending Japanese engineers to the field. The company also wants to expand to Thailand, but the volumes are currently too low to justify this. In Vietnam they started with 1 hospital and now they support 360, demonstrating potential for growth. There are plans to send the trainers from Senegal to Equatorial Guinea to expand the training network.

Lessons Learned.

- Key local partners such as Gabriel Sarr and Shinoda were crucial in the success of the project. Shinoda as a national partner with Japanese contacts meant that travel to Japan was possible, even during lockdowns. This allowed for the training of trainers who could return to Madagascar and train other local partners and end users.
- Africa Advisor in Senegal was involved late in the project after the incinerator was installed. Earlier involvement could have facilitated the project and resulted in faster resolution of issues.



Country: Madagascar
 Company: Chuwa Industrial Co., Ltd.
 Hospital staff using the incinerator



Country: Madagascar
 Company: Chuwa Industrial Co., Ltd.
 Demonstration to the Minister of Health and Japanese Ambassador at the ceremony

Country	Senegal		Company	Terios-Tec Co, Ltd	
Product	Hypochlorous acid water generator				
Registered with ITPO STEPP prior to project? (Y/N)	Yes	Date of Company Establishment	2020		
National Partner name	Gridfree		Recipient organization	Local Hospitals	

Summary of proposal

Company and Product. Terios-Tec is a newly established company (est. 2020) producing machines that generate hypochlorous acid water. Hypochlorous acid water is a disinfectant that originated in Japan and is very effective against COVID-19 and other infectious diseases. The machine is 1.2x1.8x1m and weighs 100kg. Their local partner, Gridfree, was active in Senegal and introduced Terios to the locals stakeholders in recipient hospitals.

National needs. As COVID spread throughout Africa, research was indicating that transmission of the virus from surfaces was a concern, especially in medical and high contact community settings such as restaurants. An urgent need to install and/or manufacture local disinfection suitable to assist with infectious disease control was identified.

Innovation. Hypochlorous acid was not available in the local market in Senegal so this was introducing a new product that is effective and less caustic than other disinfectants.

Results achieved

Installation. It was hard for Terios to organize shipping to Senegal, so they joined forces with fellow STePP company Chuwa, with the facilitation of ITPO Tokyo. Chuwa was able to manage the shipping through their local contacts. Nonetheless, the shipping company was not experienced in the requirements involved for Senegal and some challenges were experienced. The US\$40,000 machine and associated products went through four different ports and some items were stolen but ultimately the equipment arrived safely. Installation was very easy with requirements only for a water and electricity supply as well as hypochloric sodium which is a food additive and readily available.



Demonstration. Training was planned to have finished in November 2021. The original training was in English and will later be translated into French for the local audience. Maintenance is very easy. However, some parts need to be shipped from Japan.

Benefits. The method has distinct advantages over alcohol in terms of virus and infection control and less toxicity for human use. These benefits are well documented and presented in the health sector. The equipment was appropriate for local production and has potential for replication.

Lessons Learned.

- The difficulties faced in dealing with the formalities of Senegal, made teaming up with more experienced Chuwa valuable. Otherwise, the project could have failed.

Country	Vietnam	Company	AGC Inc
Product	Acidic electrolyzed water generator using ion-exchange membranes technology		
Registered with ITPO STEPP prior to project? (Y/N)	Yes	Date of Company Establishment	1907
National Partner name	DCS – OEC; University of	Recipient organization	Vietnam Ministry of Health

Summary of proposal

Company and Product. AGC, through its subsidiary, Kanabi Industries manufactures hypochlorous acid. Hypochlorous acid water is effective for disinfecting surfaces against COVID as well as other viruses and bacteria. The technology was designed to be small and lightweight to ensure mobility and enable flexible use in hospitals and industry. AGC had already worked for several years in Vietnam in the agriculture sector but had not previously produced hypochlorous acid in Vietnam.

National needs. The Ministry of Health in Vietnam was seeking antibacterial solution to stop the spread of COVID. They had already been looking at Japanese solutions and had approved a product called Now-Clean which is also produced by AGC.

Innovation. This was the first time AGC had packaged a compact, mobile unit that mixes two salts to make hypochlorous acid. They sent the two salts with the equipment. There is potential to find the salt in the local market but given the urgency of the situation, AGC sent from their stocks.

Results achieved

Installation. AGC shipped 8 pieces of equipment, 4 were to hospitals and 4 to food factories. Shipment was relatively smooth. A local partner, OEC were responsible for installing the equipment and for the training. A local University was already working with OEC on environmental technological survey for wastewater and solid waste management. UNIDO Vietnam helped to support customs clearance. The process for installation usually takes three to four months but because of the COVID potential it was completed in about 6 weeks, demonstrating the level of interest in the product.

Demonstration. AGC trained the technicians using an iPhone and zoom. The equipment has to be adjusted depending on the tap water pressure to avoid breaking the membranes. If the membranes break, they have to send them from Japan so it is important to have good maintenance. Training was simultaneous for the partner and about 30 hospital staff so the local

partner had to learn about the product and translate. AGC later held a seminar to demonstrate the effectiveness of the machines and UNIDO invited the Minister of Health and other government officials.

Benefits. The local partner is tracking the equipment on a monthly basis. The testing so far is recording good results with over 90% efficacy directly on the skin and still 75% effective through clothing. But they don't have any data yet on how long protection lasts.

Prospects for the future. To fast-track approvals, the project was set up as a university research project to ensure approval for use to get the immediate benefits and build research data to help get it through the approval processes. The solution cannot be commercially sold yet, i.e. must be donated. AGC have developed a proposal to JICA for both Vietnam and India and believe that they will be able to commercialize the product.

Lessons Learned.

- A good implementing partner and technical consultant were important because they already had contacts in the Ministry of Health and had worked with UNIDO before. Partners had both Japanese and Vietnamese speakers, so communication was smooth.
- Remote training was suitable for simple concepts but when things were more complicated it was more difficult. Sending one machine purely for instruction would have been helpful.
- As a larger company, AGC had previous experience of export and had experienced staff who were able to effectively implement but only received 70% of the proposal cost and had no approved budget for project management. Project requirements had to be covered in addition to full-time work so caused stress for staff.



Country: Viet Nam
Company: AGC Inc.
Workshop at the University of Danang

Country	Vietnam		Company	TROMSO
Product	Water purifying system			
Registered with ITPO STEPP prior to project? (Y/N)	Yes	Date of Company Establishment	1994	
National Partner name	Hikaru		Recipient organization	Vietnam Soc Trang Province Center for Rural Water Supply and Sanitation

Summary of proposal

Company and Product. Tromso originally made fuel out of rice husks for household boilers but moved to manufacturing active carbon water filters from rice husks. They created a 1m tall water filter design, with rice husk cartridges that need replacement every 10,000L. A pre-filter is also

used in areas of hard water. Rice husk activated carbon is made by Sony who own the patents and is better than coconut activated carbon for filtration purposes. Cartridges were imported from Japan and most parts of the purifier were assembled in Vietnam, at the local partner's (Hikaru) plant.

National needs. The Soc Trang Province identified primary schools of 300-400 pupils to benefit from the filter and Tromso sent 200 units and 200 filters. The Soc Trang City has a sister city arrangement with Hiroshima in Japan with a series of joint projects, so they were familiar with the requirements of working with Japanese companies.

Innovation. In Vietnam, schools use plastic 20 Lt water bottles that need to be disposed of and this is both bad for the environment and difficult to carry and replace. On the other hand, locally purifying water in the school, is more convenient, filter cartridges are easier to carry and the whole cost is lower than buying 20 Lt water bottles.

Results achieved

Installation. Transportation to Vietnam port went smoothly, but land transportation within Vietnam was problematic due to lockdown. The installation is simple in rural areas, if there is a stable water supply, ideally where tap water is available. In places where water pressure is not constant, this can be created by putting water in a barrel and lifting it up. All the school and healthcare facilities were surveyed to ensure tap water availability.

Demonstration. Original instructions and videos were in Japanese but the local partner helped to translate these. They used smartphones to assess the situation and provide solutions. Tromso were asked to also provide in Vietnamese to widen their audience. The units have been installed in various locations and the local partner is monitoring use and providing on-site technical support.

Benefits. Buying 20 Lt water bottles is both more expensive than local purification and water quality cannot be guaranteed due to the water bottle storage conditions. Using local purification, the authorities can control the water quality and check whether the filter cartridges need replacement compared to their nominal working life of 1-2 years.

Prospects for the future. Vietnam Ministries of Education and Health, wanted to install units in more locations. Subsequently, another 400 were requested. Tromso wants to set-up a legal entity in Vietnam and manufacture the water filters locally instead of shipping from Japan, only shipping the rice husk filter cartridges as consumables. They plan to produce 30,000 home purifiers in the following years. They want to be involved in follow-up projects.

Lessons Learned.

- The cost of buying a water filter was high for the local communities and it was decided to provide it as a service (on lease) to make it considerably more affordable.
- The process worked fast and managed to complete the project before COVID-19 reached its peak in Vietnam, otherwise some units would have been left in storage facilities, not able to be moved for installation. Currently 10 units were not installed due to travel restrictions.
- The services provided to Tromso by Hikaru in Vietnam were invaluable for the success of the project. They also have their own plant, and they made the local connections to jump-start the project. Hikaru's communication was directly with Tromso in Japanese and they could deliver the technology in Vietnamese to make it more accessible.
- Selection of installation locations. Currently, locations are spread around the Province and some are not accessible by truck and need to use a motorbike which is more dangerous and the vibrations could loosen joints or damage the unit. Could select locations which are

grouped, accessible and nearby and assemble units in the Province as opposed to Hikaru's plant in Ho Chi Minh City.



Country: Viet Nam
Company: Tromso Co., Ltd.
Installation of the water purifier



Country: Viet Nam
Company: Tromso Co., Ltd.
Equipment: Activated carbon filter
(left: activated carbon made from rice husk,
right: filter cartridge)

Annex 6. Summary of Project Identification and financial data

Short-listed technologies and SC No.					
	SC# 11*	Shortlisted technologies to be demonstrated	STePP registered companies	Target countries/ cities	Estimated amount (USD)
1	143802	Antibacterial/antiviral technology demonstration and transfer for prevention of nosocomial infection	Saraya Co.,Ltd.	Uganda/ One of the following cities: JIAJA, KUMI, MBALE, TORORO or BUSIA	169,529.22
2	143805	Mobile PCR testing laboratory	TSP TAIYO INC. (Cooperation with The Glass Recycling Committee of Japan and Japan Renewable-Energy Research Institute Japan Future Renewable Energy Research Institute Co.,Ltd.)	Kenya/ Nairobi, Machakos	282,359
3	143806	Blood gas analyzer GASTAT-700	Techno Medica Co., Ltd.	Nigeria/ Lagos	227,791
4	143807	'Inviroshield M5', liquid which consists of visible-light responsive photocatalyst based on titanium dioxide particles to prevent indoor infections	MARUSYO SANGYO CO.,LTD.	(1) Kenya/ Nairobi (2) Mongolia/ Ulaanbaatar (3) Nepal/ Kathmandu	160,325
5	143808	KINSEI gasification system	KINSEI SANGYO CO., Ltd.	Kenya/ Nairobi	281,529
6-1)	143809	Smokeless incinerator for medical waste with a water-cooled structure and heat recovery function	CHUWA INDUSTRIAL CO., LTD. M.K.D. Corporation · STELLA ENVIRONMENT CORPORATION	(1) Senegal/ Dakar and	141,479
6-2)	143811	Smokeless incinerator for medical waste with a water-cooled structure and heat recovery function	CHUWA INDUSTRIAL CO., LTD. M.K.D. Corporation · STELLA ENVIRONMENT CORPORATION	(2) Madagascar/ Antananarivo	141,482
7	143813	Acidic electrolyzed water generator using ion-exchange membranes technology	AGC Inc./KANAZAWA INDUSTRY CO.,LTD.	Vietnam/ Ho Chi Minh and Da Nang	209,000

Short-listed technologies and SC No.					
	SC# 11*	Shortlisted technologies to be demonstrated	STePP registered companies	Target countries/ cities	Estimated amount (USD)
8	143814	Hypochlorous acid type disinfectant: JIAT X KIREIKUKAN produced by a patented technology "Electrostatic field filtration method"	Solar Wind Technology inc. KANKYO BUNKA KENKYUSHO Co., Ltd. Aga Material Co., Ltd.	Indonesia/ Jakarta	179,633
9	143816	Hypochlorous acid water generator with patented technology: buffer method	Terios Tech Co.,Ltd.	Senegal/Dakar	162,863.51
10	143817	Mobile on-site water regeneration system with the activated carbon filtration unit	JTOP Co., Ltd.	India	172,660
11	143818	On-site water treatment and supply system with combined pre-treatment process and membrane separation technology	Mitsubishi Chemical Aqua Solutions Co., Ltd.	Myanmar/ Yangon	171,524
12	143819	Water purifying machines with rice husk activated carbon to prevent infectious diseases	Tromso Co., Ltd.	Vietnam/ Sok Trang	226,635
13	143820	Wastewater treatment system with Hinode Microbubble technology	HINODE SANGYO Co., Ltd.	Morocco/ Haouz	277,528