World Water Challenge 2022

BACKGROUND

The World Water Challenge was created as a special program of the Science and Technology Process in the 7th World Water Forum to identify imminent water problems that the world is facing and to find feasible solutions keeping in mind implementation, the core value of the 7th World Water Forum. The program aims to present science, technology and policy that are applicable to the real world and come up with the optimal solutions to defined water challenges. Attracting great attention in the 1st edition in 2015 at the 7th World Water Forum, the program has become one of the symbolic platforms of implementation which has been followed up over 8 years.

This year, the 8th edition of the World Water Challenge is expected to serve its role as an important platform to share the not only innovative scientific/technological methods but also policy towards solving the pre-identified water problems around the world. Particularly, given the current global circumstance in which the world is suffering from COVID-19 pandemic, WWCH 2022 is dealing with the special topic "Water and Health' along with 5 Main Topics to demonstrate a pathway to not only overcoming the current pandemic but also achieving the Sustainable Development Goals.

The best solution out of 9 selected solutions to the 7 water challenges will be decided through the final presentation and winners will be awarded with cash prize and an opportunity to be invited to the WWCH Showcase during the KIWW 2023 and/or the WWF10 to share their solutions with the experts from all around the world.

OBJECTIVES

- To set the local and global water initiative and share the vision for implementing water solutions based on water partnership and cooperation
- To bridge between developed and developing countries throughout sharing of innovative technologies and well-developed policies
- To raise awareness on water by providing water education and training programs
- To develop and provide interface between water technologies and policies
- To follow up and develop the results of the 7th World Water Forum in Korea

OVERVIEW

- **Date &Time** December 23-25, 2022
- **Venue** EXCO, Daegu, Rep. of Korea
- **Theme** Sustainable Water Management for Human and Nature
- **Host/Organizer** Ministry of Environment, Daegu Metropolitan City, K-water / Korea Water Forum (KWF)

Session Schedule

TIME	CONTENTS
13:30-13:32(02')	Opening
13:32-13:36(04')	Opening Remarks
13:36-13:40(04')	Welcoming Remarks
13:40-13:45(05')	Introduction of the final round
	Challenge 1: Scale-up of WASH for Public Health
13:45-14:05(20')	Empowering the local to access safe and sustainable drinking water in Laos
14:05-14:25(20')	Improving Access to WASH in school constructing latrines and hand washing facility
	Challenge 2: Integrated Management of Diversified Water Resources
14:25-14:45(20')	Micro solar desalinator, easily producible in underdeveloped countries
14:45-15:00(15')	Coffee Break
	Challenge 3: Flood Prevention and Management for Sustainable Water Cycle and Urban Regeneration
15:00-15:20(20')	Emergency Water Response (EWR) Unit
15:20-15:40(20')	Conservation and Income Generation through the construction of Ponds
	Challenge 4: Nature-based solutions for ecological recovery and reinstate natural process of rivers
15:40-16:00(20')	Restoration of the Riverine Ecosystem Through the Application of Nature-based Riparian Eco-belts
16:00-16:15(15')	Coffee Break
	Challenge 5: Energy Efficiency in Sewage, Waste Water, and Sea Water Recycling and Reuse
16:15-16:35(20')	Reuse of Fecal Sludge for Income and Environmental Quality Maintenance
	Challenge 6: NEXUS for Efficient Utilization of Limited Water Resources and Energy Recovery
16:35-16:55(20')	Grid connected solar irrigation pumps for economic and sustainable water solution
	Challenge 7: 'Smart' Solutions for Water Management: Definition and Case of 'Smart Solutions' by Region, Sector, and Target
16:55-17:15(20')	SISAM: Enhanced Solar Irrigation Solution
17:15-17:20(05')	Closing Remarks
17:20-17:24(04')	Group Photo Time
17:24-17:25(01')	Closing

Contents

World Water Challenge 2022

Main Focus 1

Water and Health

Challenge 1

Scale-up of WASH for Public Health

Solution 1

Empowering the local to access safe and sustainable drinking water in Laos

-Juliette Richard, Abundant Water

Solution 2

Improving Access to WASH in school constructing latrines and hand washing facility

-Natan Molla, Jimma University

Solution 1

Empowering the local to access safe and sustainable drinking water in Laos

Juliette Richard, Abundant Water

In remote areas of Laos, many communities still face issues with access to clean drinking water. This not only has an impact on the health of these communities, but lacking access to clean drinking water also has flow on effects at the economic level (lower work productivity, medical expenses), on education (lower school attendance), gender equality (water treatment and childcare is usually taken care of by women), and the environment (damaging of forests by boiling water with firewood, plastic bottle pollution, and carbon dioxide emissions).

Abundant Water has developed a strong strategy to overcome these issues and experience has shown that our work makes a significant impact in addressing the issues listed above.

Our organization improves access to clean drinking water through the production and distribution of affordable ceramic water filters. Made of coffee grounds and clay locally sourced in Laos, our water filters provide highly effective water filtration which are both easy to use and maintain. The biggest advantage of this solution is that materials needed for the filter production and the components needed for the filter set installation can be obtained locally, keeping production costs low to enable communities on lower incomes to afford them.

Another layer of our operations is our unique distribution network. In every region in which we install filters, we select a group of community members who are trained to raise awareness in villages on the importance of clean drinking water, filter use, installation, maintenance and the replacement of filters. These community members, also known as vendors, are trained on how to develop effective and resilient micro-enterprises and combine this with their local knowledge to bring clean drinking water solutions to the remotest communities in the country. In order to develop the capacity of local community members, we provide them with valuable skills in business, marketing and sales pitching which they can use both with Abundant Water and in other aspects of their career in order to increase their income and quality of life. This network enables our project to be sustainable by linking our filter producers to our beneficiaries through the development of trust in the product which a local community member brings. The development of a distribution network, driven through the power of social business, ensures communities can receive long-term support for water treatment through the assistance of local vendors, removing the requirement for ongoing aid or expensive technology.

Solution 1

Improving Access to WASH in school constructing latrines and hand washing facility.

Natan Molla, Jimma University

Due to inadequate access of hygiene and sanitation facility students are affected by water borne diseases discomfort on attending their class attentively. Safe water supply and sanitation are achieved and the incidence of diarrhea illness is reduced. One way of achieving this is by providing schools with safe drinking water, improved sanitation facilities and hygiene education that encourages the development of healthy behaviors for life.

School with safe drinking and water supply and hand washing facility can significantly affect the health and well-being of children through reduction in the prevalence of water related diseases. WASH in Schools not only promotes hygiene and increases access to quality education but also supports national and local interventions to establish equitable, sustainable access to safe water and basic sanitation services in schools.

Construction of toilet equipped with hand washing facility has enormous effect in the health of students in the school. Improving hygiene and sanitation practices of the students to reduce occurrence of diseases. In the school area there is shallow ground water resources for the sources of water and clay material good for brick manufacturing input for latrine building blocks. The community in the area also has good initiation to participate in this project.

Shallow ground water like Hand dug well provides an excellent water supply source for drinking water in schools. In areas of good yield of shallow ground water Hand dug well with rope pump are preferable to be economical manufacturing the machine from locally available material. Clay material that can be used to make brick building blocks and well lining and building storage facility can be taken in the future for other projects in the area as a business model to create job opportunity, so These projects not only focus on one specific technology or method but promote a series of key behavior changes by key stakeholders in a project area.

WASH in Schools also focuses on the development of life skills and the mobilization and involvement of parents, communities, governments and institutions to work together to improve hygiene, water and sanitation conditions. An efficiently and effectively implemented WASH in Schools program will lead to students who: Are healthier; Perform better in school; Positively influence hygiene practices in their homes, among family members and in the wider community; Learn to observe, communicate, cooperate, listen and carry out decisions about hygienic conditions and practices for themselves, their friends and younger siblings whose hygiene they may care for (skills they may apply in other aspects of life); Change their current hygiene behavior and continue better hygiene practices in the future;

In this project, it is expected there will be a significant component of community participation specially the parents. The projects seek to involve the whole community in the activities. This is based on the experience that most health-relevant forms of behavior related to WASH are practiced at household level. Additionally, it is important to recognize and consider the specific role women and girls play in regard to water and hygiene.

World Water Challenge 2022

Main Focus 2

Efficient Water Management

Challenge 2

Integrated Management of Diversified Water Resource

Solution 3

Micro solar desalinator, easily producible in underdeveloped countries

-Pak, Hunkyun, Solarinno Co, Ltd.

Solution 3

Micro solar desalinator, easily producible in underdeveloped countries

Pak, Hunkyun, Solarinno Co, Ltd.

During dry season in small islands without well, the residents may suffer potable water deficiency. In many cases, even with ground or surface water, sea water intrusion or heavy metal contamination may pollute water. For such cases, desalination system is required. However, independently operable small scale desalination system is too expensive to be installed in many remote locations in non-rich countries. More over, most of the modern desalination systems are manufactured and transported from developed countries to underdeveloped countries. Therefore, users in the underdeveloped countries should rely on foreign company/organization for purchasing, installing and maintaining.
If the independently operable, low cost, small size desalinator can be manufactured and supplied by local organizations or companies in the underdeveloped countries, it would be very much helpful for establishing self-sustaining potable water supply source for the people. Furthermore, it could be also helpful to enhance economy of the country.

Compare to modern high desalination technologies, solar stills can be easily constructed by common people in underdeveloped countries. However, it has very low efficiency to be a practical desalinator. It evaporates salty water by solar heat, and condenses the vapor to get fresh water. While condensation, the latent heat is wasted away, to have very low efficiency. This problem can be solved by multi-effect solar still (MES) technology. MES has a stack of multi layers of evaporation/ condensation layer, so that latent heat dissipated from the front side could be reused by backside, repeatedly. MES was studied nearly a century, and known to have as high productivity over 10~20 liters per square meter. However, it still has not commercialized yet, due to its complicate structure and high cost of manufacturing.
Since 2013, we have studied on developing practical MES. During the 1st world water challenge (2015) feasibility of low cost MES was shown with a miniature size, (0.22m2) home-made prototype. Originated on this earlier prototype, new MES model was developed. The model has following features.

- It can be assembled with simple hand tools only, such as drill, knife and awl.
- Low cost and industrially common materials, such as paper, plastic film, string, corrugated polypropylene board and double layer polycarbonate board, are used for the raw material. It is estimated for less than 20 USD for the material cost for making an independently operable unit of 3~5 liters per day (about 0.5 m2 effect area).
- It could be easily transported (light weight, 6 kg per unit), installed, and operated by the individual users themselves.
- It is powered by solar heat. No electricity nor fuel required.
- Water flows only by gravitational force. No delicate electronics or mechanical parts was used. Therefore, possibility of breakage would be minimized

The model could be implemented on underdeveloped countries, by technology transfer from the inventor to any research institute or academy in the countries. After then, local organization or company may produce and distribute the system over the country. More information on the device and implementation plan could be found in this application or further presentation.

World Water Challenge 2022

Main Focus 3

Water and Natural Disasters

Challenge 3

Flood Prevention and Management for Sustainable Water Cycle and Urban Regeneration

Solution 4

Emergency Water Response (EWR) Unit

-Kimberly Limpahan, Nxtlvl Water Technology INC.

Solution 5

Conservation and Income Generation through the construction of Ponds

-Durga Kumar Thapa, Hamro Prabidhi : Ramro Nepal (HPR Nepal)

Solution 4

Emergency Water Response (EWR) Unit

Kimberly Limpahan, Nxtlvl Water Technology INC.

Designed for disaster relief purposes, the Emergency Water Response (EWR) unit addresses the problem of providing consistent high-quality potable water to affected communities in the immediate aftermath of a disaster such as a typhoon or in any emergency scenario. With the reverse osmosis desalination and other filtration technologies, the EWR can effectively produce high quality potable water from almost any source (e.g. sea, river, pond, brackish water, etc.) for up to 1,000 people a day per system with multi-system scale available for larger communities.

The EWR is fully self-powered, with the use of an included solar panel and battery system, which are hand-portable in two military grade suitcases, and can be rapidly operational in two hours or less with minimal operations training. As a tool for DRRM operators (e.g. barangay officials, provincial engineers, DRRM response units), the FDA-compliant EWR provides the most rapid possible alleviation of crises for communities suddenly affected by loss of potable water sources. It is especially useful for far-flung or remote communities outside metro areas that are exposed to seasonal typhoons and who also often do not have strong access to logistics infrastructure that aids in normal disaster recovery and relief activities. By using the EWR, transportation and cost demands for trucking or flying in potable water to affected communities are greatly reduced, leading to both significant cost savings and alleviation of logistics resource burden. As a supplementary benefit, the solar power package of the EWR alleviates demand on diesel generators and fuel for water provision, and can also be configured to provide supplementary power for lights or mobile phone charging.

Compared to the existing solutions for water provision in disaster scenarios, the common solution used is the transport of 6L bottles of purified water, often from areas spared from the typhoon or surrounding military bases, via plane, truck or ship. This existing solution's net effective cost of each 6L bottle of water is often above PHP100, due to (1) high cost of bottled water, (2) transportation & fuel costs and (3) high labor costs of sourcing, loading/unloading & distribution. This heavy supply chain is what leads to potable water accounting for up to 60% of cost and resource use in DRRM deployments, and leads to large opportunity costs associated with not being able to allocate these resources to other necessary relief goods such as food and medicine.

With the costs mentioned above, it has shown that an investment of an EWR unit is more cost efficient – reaching the ROI within one standard 100-day use of the system due to cost savings versus the existing method. EWR can be easily maintained and prepped for multiple uses, any subsequent use of the system will generate savings above the cost of the system. More important, however, is that the EWR solution is much more rapid, reliable, and sustainable than current processes, and opens the door for recovery resources to be reallocated to other high-value operations such as food and medical relief.

Solution 5

Conservation and Income Generation through the construction of Ponds

Durga Kumar Thapa, Hamro Prabidhi : Ramro Nepal (HPR Nepal)

Nepal is among the richest in terms of water resource availability and it is one of the most important natural resource of the country. Water resources are abundant throughout the country in the form of snow covers, rivers, springs, lakes, and groundwater.

The highlands and Terai region of countries like Nepal are home to thousands of tiny rivers. These rivers are frequently used as a source of water throughout much of the year. However, rivers water level grow in rainy season when it rains a lot. These rivers have an excessive water flow for 15–20 days out of the year. Stones may also fall as a result. Every year, these rivers break through and flood the lower banks' villages and farmland, wreaking havoc. These little rivers may not have a long lifespan, but they have the power to inflict a lot of harm quickly. Traffic will be blocked, bridges will be destroyed, fields will be destroyed, and villages will be flooded. These rivers do not have a long catchment in the river system.

Due to impacts of global warming and climate change glaciers are melting forming small rivers as well. Every year new river streams are being formed. These streams destroy the villages, natural habitats of wild animals resulting in both human and natural loss.
Before this river takes the shape of a flooding river, it is necessary to collect the rainwater in upstream and divert and collect it in relatively large ponds. Similarly, apart from the flooding stream that comes in 15 -20 days, water of small consequence which is continuous throughout the year is also collected in this pond.

Around this pond, trees can be planted. When there is no water flow in the creek, the water collected in the ponds are supplied to the wells, pipes for drinking purposes as well can be used for irrigation all year long. Fish farming can be done in the ponds. Small Waterparks may also be constructed. This not only prevents the risk of floods into villages but also generates income. It also helps in the conservation of bio diversity and flora fauna of the region. These type of flood trapping ponds can be constructed in numbers of places starting from upstream so that the bigger size streams can also be controlled at the source to prevent from flooding in downstream. These ponds helps to sustain sustainable water ecosystem.

World Water Challenge 2022

Main Focus 4

Ecosystem and Water

Challenge 4

Nature-based solutions for ecological recovery and reinstate natural process of rivers

Solution 6

Restoration of the Riverine Ecosystem Through the Application of Nature-based Riparian Eco-belts

-Nash Jett DG. Reyes, Kongju National University

Solution 6

Restoration of the Riverine Ecosystem Through the Application of Nature-based Riparian Eco-belts

Nash Jett DG. Reyes, Kongju National University

Agricultural activities are considered as the primary source of excessive nutrient loads that deteriorate the water quality rivers and streams. In the rural areas and suburbs of the Philippines, people mostly rely on farming and livestock-raising for livelihood. These activities generate a significant portion of the country's economy; however, most agricultural systems do not have proper discharge management schemes which intensify the pollution in receiving water bodies. Moreover, most farms and croplands adjacent to rivers and streams do not have ecological buffers, thus resulting to direct deposition of pollutants in waterways. Nature-based solutions (NBS) are increasingly utilized to manage pollution from point and non-point sources. NBS focus on restoring or enhancing the ecosystem services on areas that were subjected to high pollutant loads and anthropogenic stressors. In this proposal, the concept of NBS was incorporated into a sustainable management approach to restore riverine systems impacted by pollutants and anthropogenic stressors. Most river networks in the Philippines serve as a critical water source for drinking and irrigation. The water quality and quantity of rivers in the Philippines have long been jeopardized as a result of over-abstraction, solid waste disposal, and excessive deposition of agrichemicals from the surrounding areas in the catchment basin. The idea to create an "eco-belt" along the different sections of main rivers has been proposed to alleviate the present condition of the river. Eco-belts aim to provide refugia for plants and animals in order to promote biodiversity. These eco-belts can also serve as buffer zones to prevent the excessive deposition of pollutants in the river from various point and non-point sources of pollution. Since the some of the rivers in the Philippines also experience recurrent phases of drying, it is also important to maintain the ecological flow in order to ensure the survivability of aquatic organisms. The eco-belts can serve as blue-green (B-G) networks that can sustain adequate streamflow even on dry periods. Generally, the proposal to establish riparian eco-belts in the Philippines' main river networks can help improve its water quality and quantity as a whole. The application of NBS for reinstating the natural processes in rivers can also be a sustainable practice for different regions around the world.

World Water Challenge 2022

Main Focus 5

Resource Recovery from Water and Wastewater System

Challenge 5

Energy Efficiency in Sewage, Waste Water, and Sea Water Recycling and Reuse

Solution 7

Reuse of Fecal Sludge for Income and Environmental Quality Maintenance(ROFSIEQ)

- Abubakari Zarouk Imoro, University for Development Studies, Tamale

Challenge 6

NEXUS for Efficient Utilization of Limited Water Resources and Energy Recovery

Solution 8

Grid connected solar irrigation pumps for economic and sustainable water solution

- Kamala Dhakal, Kinnovation Trading Pvt, ltd.
- Shisher Shrestha, International Water Management Institute

Solution 7

Reuse of Fecal Sludge for Income and Environmental Quality Maintenance (ROFSIEQ)

Abubakari Zarouk Imoro, University for Development Studies, Tamale

The open disposal of fecal sludge creates enabling environments for the spread of diseases related to fecal contamination. For instance, in 2017, deaths and disability resulting from enteric infections among school children cost Ghana about 377 million Ghana cedis in productivity losses, which is equivalent to 0.3% of Ghana's GDP (WASH budget brief, 2019). Also, in 2012, the World Bank reported that Ghana lost about USD 290 million due to poor sanitation and this was expected to continue if the sanitation situation of the country was not improved upon (Maina et al., 2012). In spite of this looming danger, as at 2020 the population of the country, which had access to basic sanitation, was only 24% (JMP, 2021).

Our initiative seeks to treat fecal sludge with bacteriophages and then convert the treated sludge into suitable media for the production of fungal mycelia. The fungal mycelia are then used to produce fabrics for clothes and leather for shoes, and bags. The spent growth media (treated fecal sludge) after mycelia harvesting is converted into biochar for soil quality improvement and briquettes as a source of fuel. Our proposed solution maximizes the use of resources (land space, water and virgin materials). In line with the sustainable development goal one (no poverty), our initiative has the potential to provide jobs to the poor when scaled up and thus will enhance local economies. It also addresses the sustainable development goal six (water and sanitation for all) leading to goal three (good health and wellbeing). It provides an alternative source of leather to animal leather, which consumes a considerable amount of water (104,310 L per hide ~1 m2) (Mekonnen and Heokstra, 2010) to process. In summary, the ROFSIEQ solution works on the principle of cyclic economy.

Solution 8

Grid connected solar irrigation pumps for economic and sustainable water solution

Kamala Dhakal, Kinnovation Trading Pvt, ltd.
Shisher Shrestha, International Water Management Institute

Only 31% out of 3.5 million hectares of cultivated land is irrigated in Nepal; about one-third of that gets irrigation from groundwater. The situation is similar in other countries in South Asia. However, the operational cost of groundwater pumping is relatively high, especially when using diesel pumps. Therefore, smallholder farmers are finding it hard to afford these pumps. Solar irrigation pump (SIP) technologies can be considered a solution for enhancing access to irrigation with minimal or no operational cost compared to diesel pumps. SIPs utilize freely available solar energy to pump water for irrigating farmlands. Governments are also supporting these individual solar pumps by providing subsidies. But the smallholder farmers are not getting benefits due to a lack of proper access to government subsidies. Individual Solar pumps owner are reluctant to share the pumped water with nearby farms of other ownership. Due to the lack of proper operation and control mechanisms, the farms with solar pumps are pumping more water and using the water inefficiently, thus, affecting water availability in the nearby areas. It is also impossible to take the pumped water long from the ground surface. Due to such improper management of irrigation facilities, there is rampant exploitation of groundwater. The cost of Solar DC pumps is too expensive to replace. This is the major drawback of individual solar pumps.

In Nepal, a large number of SIPs will be idle while there is no water demand (65% days of the year in average) or during the off-season of agricultural activities. But, depending on the weather condition, farmers do face intermittent and inadequate supply of power to the pumps. Over-supply or inadequate water supply of existing SIPs constrains optimum production and use of these SIPs. Additionally, inefficient water usage when no actual irrigation is required may lead to groundwater depletion.

Most of the SIPs installed so far are generally under-utilized for various reasons. Connecting them to local mini-grid or in national grids (If Available) would benefit in many ways, such as – i) Extra income to farmers by selling excess solar energy when not used for pumping water and therefore improving the benefit-cost ratio as well as reducing the payback period of SIPs; ii) Provide stable power in the system so that cases of pump damage due to voltage fluctuations can be reduced drastically; iii) Makes power/energy available to pump groundwater for irrigating during the no sunlight hours, thus reducing evapotranspiration loss and contributing to water conservation; iv) Net metering and connection to the grid also improves sustainability outcomes in the long run by ensuring that stand-alone, off-grid pumps do not get abandoned when national grid reaches these off-grid areas; and v) The electricity distribution line from mini-grid can be extended for more than 5-10 km, so that significantly more nos. of individuals pumps can be connected in mini-grid. The project aims replacing Solar DC Pumps by AC pumps. (DC pumps are too expensive in local market. The repair and maintenance is either too expensive or not available in Nepal. But AC pumps are much more affordable and possible to repair by local technicians).

World Water Challenge 2022

Main Focus 6

Smart Water Technologies

Challenge 7

'Smart' Solutions for Water Management: Definition and Case of 'Smart Solutions' by Region, Sector, and Target

Solution 9

SISAM: Enhanced Solar Irrigation Solution

-Maddalena Curioni, Electriciens sans frontières (Electricians without borders)

Solution 9

SISAM Program: Enhanced Solar Irrigation Solution

Maddalena Curioni, Electriciens sans frontières (Electricians without borders)

In Sub-Saharan Africa, climate changes are strongly affecting local populations, creating conflicts of resources and increasing the poverty of rural areas. Here, food, water and energy security are endangered and the need of a sustainable development is evident. Rural areas often do not have access to traditional electrical network, leaving the population without access to electricity. This lack negatively influences human and economic development, limiting the growth of remunerative activity such as market gardening. Moreover, climate changes impact water presence, leading to water scarcity conditions, where water availability is reduced as well as the possibility of agricultural production. This not only creates water insecurity, but can also effectively perturb food security, in areas where crop cultivation represents the main share of GDP.

For this reason, Electriciens sans frontieres, in partnership with various international and local actors, has developed SISAM Program: Improved Solar Irrigation Solution (Solution d'Irrigation Solaire AMéliorée) to boost climate changes resilience of rural population.

SISAM Program: Improved Solar Irrigation Solution (SISAM) implemented from April 2018 to November 2021 aimed to contribute to poverty reduction and rural food security by promoting the emergence and appropriation of sustainable and accessible irrigation methods (technology, financing, management, maintenance) to strengthen the capacities of small market gardeners in the Centre Est (Burkina Faso), Atacora et Dapaong (Benin) and Savanes regions (Togo).

The SISAM project aims to establish a reference solution that will be the result of local consultations and feedback from the planned projects. This solution will also be co-constructed with the national and regional authorities, which will facilitate its subsequent appropriation.

The main success factors of the pilot project are at several levels:

- Technical and economic performance of the equipment adapted to the needs;
- Socio-economic impact within each farm;
- Development of the pump production and distribution chain.

The content of this solution was established in relation with the local partners of the project representing small-scale market gardeners and/or groups of market gardeners. It is intended to be proposed autonomously by the local actors well after the 3 years of the project.

This project benefits primarily women and young people, who are heavily involved in costly and arduous irrigation tasks.

The direct beneficiaries of the project are:

- small-scale market gardeners and their families, for whom income will be increased and water chores reduced(mostly women and young people). The 130 installations directly benefit 1000 people;
- 6 distributors and installers (2 per country) that are trained and mobilised for the direct implementation of the project;
- 3 operators who benefit from a new activity;
- 3 partner associations whose skills are strengthened;

- 3 partner associations whose skills are strengthened;
- the centre in Burkina Faso in charge of the assembly of part of the solar pumps;
- at least 3 local microfinance institutions (1 per country) that adapt their financing solutions and diversify their activity towards a new market.

The project also benefits over 70,000 indirect beneficiaries.

MEMO