Project Final Report

Name of the Organization: Tetra Private Limited

Submission Date: 12-12-2024

Project Information (250 words)

- **Briefly describe the project**

The project is designed to enhance resilience against climate change in the coastal regions of Bangladesh through sustainable, affordable, and efficient access to safe drinking water for low-income and lower-middle-income communities severely affected by saline water contamination. Through a unique and innovative solar-powered water filtration technology termed 'Tetra Solar Desalination Filter,' the project endeavors to ensure that 500 households in the Khulna district have access to clean drinking water by 2024. In addition to providing technological solutions, the project includes a comprehensive awareness campaign about the health risks associated with consuming saline water. This campaign aims to reach at least 1,000 households within four months, fostering a shift towards more sustainable water consumption practices. In addition to generating safe water access, the project will also ensure community empowerment and economic development by providing job opportunities for local youths and developing female entrepreneurs in climate-vulnerable households.

Ranging from short-term effects like immediate access to safe drinking water and job creation, the project will have long-term impacts like health improvements and fostering a cultural shift towards sustainable practices.

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- **Start and end date of the project:** July 2024 - December 2024

- **Targeted participants of the project:**

  The primary targeted participants of the project include:

  - Low-income and lower-middle-income communities in the coastal regions of Bangladesh, particularly in the Khulna district, are severely affected by saline water contamination.
  - Women, especially those selected as microentrepreneurs for selling desalinated water.
  - Local youth, who are trained as sales agents and community engagement advocates to promote sustainable water solutions.

- **Location of the project:** Khulna District

Objective of the Project (Write down in bullet points)

- To launch and execute a comprehensive awareness campaign in Khulna district, reaching at least 1000 households, to educate them on the health risks of consuming saline water within four months.
- To recruit and train five local youths as sales agents, creating new job opportunities for them and empowering them as skilled advocates for sustainable practices and community resilience building, thereby enhancing the effectiveness and outreach of the Tetra desalination project within the first nine months.
- To start installing prototypes in test households within six months, followed by continuous installation in customer homes, ensuring each device is monitored and collecting feedback to guarantee 500 households have access to safe drinking water within the project timeline.

- To identify and train 5 women from the local communities as microentrepreneurs, equipping them with the skills and tools to sell water processed through Tetra desalination filters, thereby promoting economic empowerment and enhancing project reach within one year.

Measuring the progress of the project				
	Name of activities	Target	Progress	Remarks
1	Awareness campaign (Project Nirapad, FGDs,)	1000 households	1200 households reached	Exceeded target, improved awareness seen
2	Door-to-door visits for awareness & data collection	500 visits	500 visits completed	Target achieved successfully
3	Recruitment and training of local youth as sales agents	5 individuals	4 individuals trained	Slightly below target, but effective outreach observed
4	Deployment of household desalination devices	500 households	Shifted to community-based solution	Technical challenges with iron concentration led to adaptation
5	Installation of water treatment plants	2 plants	2 plants installed in Sordarbari & Kobirajbari	Successfully operational, serving 600 households
6	Training and empowerment of women micro entrepreneurs	5 women	1 woman trained & empowered	Social challenges led to strategy shift towards centralized plants
7	Establishment of water ATMs for 24/7 accessibility	Ensure access within 5-10 mins walking distance	Installed at treatment plants	Successfully improving accessibility and reducing collection time
8	Reduction of household water expenses	Reduce cost from BDT 1-1.5/L to BDT 0.5/L	Achieved, saving BDT 3600-7200 per year per household	Major economic benefit for low-income families

Narrate the achievement of your project according to your project objectives

- Objective 1: To launch and execute a comprehensive awareness campaign in Khulna district, reaching at least 1000 households, to educate them on the health risks of consuming saline water within four months.

Tetra successfully executed an extensive awareness campaign, reaching over 1200 households through initiatives such as "Project Nirapad," "courtyard sessions," and focused group discussions (FGDs). Around 500 door-to-door visits were conducted with the help of volunteers and field team members to spread awareness and assess the community's water-related challenges. Additionally, Tetra collaborated with local leaders, influencers, and community organizations to maximize impact. Educational materials, including brochures, flyers, and posters, were distributed to highlight the dangers of saline water and the benefits of Tetra's desalination system. As a result of these efforts, there has been a noticeable shift in the community's water consumption habits, demonstrating improved awareness regarding salinity-related health risks.

- Objective 2: To recruit and train five local youths as sales agents, creating new job opportunities for them and empowering them as skilled advocates for sustainable practices and community resilience building, thereby enhancing the effectiveness and outreach of the Tetra desalination project within the first nine months.

Tetra successfully identified and trained four local youths to serve as field agents. These individuals received specialized training on climate change, water salinity issues, and community engagement techniques. They now actively work within the community, spreading awareness and understanding local needs. By engaging directly with households and providing insights into sustainable water consumption practices, these youth advocates have become key players in driving Tetra's mission forward, despite falling slightly short of the initial target of five trained individuals.

- Objective 3: To start installing prototypes in test households within six months, followed by continuous installation in customer homes, ensuring each device is monitored and collecting feedback to guarantee 500 households have access to safe drinking water within the project timeline.

Tetra initially deployed solar-powered desalination devices in select households. However, field observations revealed challenges related to iron concentration in water, leading to the rapid degradation of RO membranes. As a result, a more community-focused approach was adopted, leading to the establishment of two partially solar-powered, semi-automated water treatment plants in Sordarbari and Kobirajbari. These plants now provide safe drinking water to approximately 600

households, surpassing the initial target. Additionally, water ATMs were installed to ensure 24/7 accessibility, reducing the need for long-distance travel and waiting time for water collection.

- Objective 4: To identify and train five women from the local communities as microentrepreneurs, equipping them with the skills and tools to sell water processed through Tetra desalination filters, thereby promoting economic empowerment and enhancing project reach within one year.

Tetra successfully empowered one woman microentrepreneur from the community, who is responsible for the maintenance of the water treatment plant and earns a commission from water sales. However, challenges arose in scaling the microentrepreneurship model, as some community members were hesitant to purchase water from individual sellers due to social dynamics. This led to a shift in strategy towards a centralized plant-based approach with water ATMs, ensuring broader accessibility and sustainability. Despite this adaptation, the initiative successfully contributed to women's economic empowerment and community engagement.

People reached

- **Number of people reached directly through project interventions.**

Event/Activities	Number of people reached		Total
	Women	Men	
Door-to-door visits	722	478	1200
Awareness campaigns (Project Nirapad, Courtyard Sessions, FGDs)	350	150	500
Community meetings with local leaders & influencers	80	120	200
Training of local youth as sales agents	1	3	4
Training of women micro-entrepreneurs	5	0	5
Installation of water treatment plants & user training	1500	1500	600 households (2400-3000 individuals)
Total	2658	2251	4909

Total number of people reached directly: 5000-6000 (Women and Men)

- **Number of people reached through social media (On particular awareness-raising issues)**

N/A (As the target group of Tetra is not available on social media, Tetra did not leverage social media campaign for outreach)

Posting date in social media	Number of people reached (Viewer)	Social media Link (FB/YouTube)
Total		

Total number of people reached (social media): ……. (Women and Men)

The CAP-RES project has three objectives as follows:
Objective 1: Create an enabling environment and foster individuals to enhance their knowledge of climate change issues and develop problem-solving skills.
Objective 2: Generate factual evidence from local practices to scale up at the global level.
Objective 3: Improve institutional efficiency and effectiveness in decision-making and put climate intervention into practice.

Based on these above objectives, which one is more relevant to your project? How do your project objectives and activities achieve this objective? (Maximum 200 words)

Our project aligns strongly with the second objective which is generating factual evidence from local practices to scale up at the global level. The unique, innovative solar-powered water filtration technology termed 'Tetra Solar Desalination Filter' performed efficiently in regions of Khulna with low concentrations of iron. It could easily produce up to 500 liters of desalinated water and serve surrounding families. Recently in the later part of 2024, a consulting firm in Namibia reached Tetra for the design consultation of this household desalination device to replicate it in their country to combat the salinity issue in drinking water which reflects the global potential of Tetra's device. Tetra further developed a more engaging community-centric approach where they customized partially solar-powered water treatment plants with water ATMs to ensure 24*7 accessibility to water. Moreover, the community was empowered with a sense of ownership and sense of awareness, and women micro-entrepreneurs were chosen among the community. This year Tetra won the Silver medal in the "Project Innovation Award" under the Governance, Institutions, and Social Enterprise Category from the International Water Association (IWA), which marks a global-level recognition for Tetra with further scopes of replicability and scalability in similar climate vulnerable regions.

Skills/Capacity

- What new skills/capacities have you developed?

Tetra's women micro-entrepreneurs are engaged in the maintenance tasks of the plant like backwashing. They are also responsible for recharging water ATM cards for the sale of water. The field team developed both technical skills to provide preliminary support to the plant as well as behavioral skills to engage with the community.

- What knowledge or skills do you think would have improved your project?

More recent technologies regarding the solar-powered desalination system can be adopted on how the longevity of RO membranes can be increased. There can be integration of UV ray treatments on the raw water to curb microbial contamination and biofouling before the water passes through the membranes. Tetra has also started collaborating with the Center for Global Engineering lab at the University of Toronto in advancing solar-powered RO desalination to the last-mile community in Bangladesh. This year in October, the University of Toronto team visited Tetra plants and household devices of the Tetra at Khulna. Tetra is planning to develop more skilled resources in the community in terms of community needs and scopes in order to create more opportunities and make the community self-sufficient. Tetra might plan an integrated aqua-agriculture system for the salinity-tolerant aquatic species and halophytes and train the local farmers and youth to develop new skills to embrace bio saline agriculture and aquaculture.

"Lesson-learned" of your project

- Community awareness and engagement are Crucial. If the community is unaware of the problem, then it's of no use to devise the solution since they will not accept the technology unless they are aware of the depth of the solution. Community engagement is a must, if their engagement is not ensured then no solution will last in the long run.
- Strength of local youth in community engagement. Empowering the local youth makes community engagement easier, without their support it is difficult to spread awareness among the local community
- Continuous research for new technology and community needs is necessary. Tetra could upgrade to water treatment plants from household devices due to extensive research on both technical terms as well as understanding the community's needs
- Small steps like creating women micro-entrepreneurs and empowering local youths with the required skills can have a multiplier effect on the economy as well as drive significant social change. By enabling women to participate actively in income-generating activities, the initiative fosters financial independence and enhances their role in decision-making processes within their families and communities. Similarly, equipping local youths with relevant skills not only creates job opportunities but also nurtures a sense of ownership and responsibility toward their communities. Together, these steps contribute to a more inclusive and resilient society, where economic growth aligns with social empowerment.

What are the challenges/Risks you faced during the project activities? How do you overcome/minimize those challenges?
Whenever we reach a community, it is often observed that the community members don't want to adopt any new technology due to their negative experiences of the past or due to lack of awareness. Many people in the communities often talk about how the NGOs reach them with high hopes but then in the long run they disappear without any responsibility or follow-ups for maintenance. They even mention the abandoned plants and PSFs to express their frustration. In addition, it is widespread among the last mile community that they are habituated to drinking the saline water being unaware of the health hazards and their severity. To overcome these challenges, Tetra conducted extensive awareness campaigns, courtyard sessions, focus group discussions, and door-to-door visits in order to spread awareness regarding salinity among the community. Moreover, during these engaging sessions of awareness and community engagements, individuals in the community developed a sense of trust in the missions of Tetra and thus it drove the community to cooperate and collaborate with Tetra and onboarded them to accept their technology.

Selected best 5/6 pictures of the project intervention

	
Community members taking water from Tetra's plant in Khulna district	**Project Nirapad in Kabiraj Bari**

	
Installation of water treatment plants	**Door-to-door visits**
	
Community meetings with local leaders & influencers	**Courtyard session with the community**