



Activity Report

Ensuring Safe Water Supply in Emergencies through the Maintenance of Mobile Water Treatment Units of DPHE including Continuous Engagement and hands on Training

July-September, 2024

**Department of Public Health
Engineering (DPHE)**



UNICEF



1. Introduction

This activity report presents an overview of the comprehensive program funded by UNICEF, implemented in partnership with the Government of Bangladesh's Department of Public Health Engineering (DPHE). The program, titled "Ensuring Safe Water Supply in Emergencies through the Maintenance of Mobile Water Treatment Units," is designed to enhance the operational readiness and effectiveness of Mobile Water Treatment Plants (MWTP) in disaster situations.

In recent years, the importance of ensuring access to clean and safe drinking water during emergencies has become increasingly critical, particularly in areas vulnerable to waterborne diseases. The program encompasses four key components aimed at reinforcing the operational capacity of the MWTPs and equipping DPHE personnel with the necessary skills and resources for effective water management.

1. **Support for Operation and Maintenance of MWTP:** This component focuses on the allocation of financial resources for skilled operators and dedicated drivers, ensuring the seamless operation and transportation of MWTPs during emergencies.
2. **Maintenance for Vehicle and Treatment Unit:** Proactive measures have been taken to maintain the operational condition of all MWTPs and associated vehicles, thereby guaranteeing reliability and efficiency in emergency water supply efforts.
3. **Hands on Training for the DPHE MWTP Operation and Maintenance:** A series of training sessions have been conducted to build the capacity of DPHE mechanics and staff in operating and maintaining the MWTPs, thereby ensuring their preparedness to deliver emergency clean water.
4. **Hands-On Training for Drone Usage in Damage Assessment and Disaster Response Planning through Aerial Photography and Geo-Referencing:** Recognizing the transformative potential of drone technology, this component focuses on equipping DPHE professionals with the skills to leverage drones for damage assessment and response planning during disasters.

This report synthesizes the activities and outcomes of these sub-programs, reflecting a collaborative effort to enhance the resilience and responsiveness of Bangladesh's water supply systems in emergencies. Through dedicated training, maintenance, and innovative technology integration, the program aims to ensure a sustainable and effective response to the pressing challenges posed by water scarcity in crisis situations.

2. Program Objectives

1. **Enhance Operational Readiness:** Ensure that all Mobile Water Treatment Plants (MWTP) are fully operational and ready to provide clean water during emergencies through effective maintenance and support for skilled operators and drivers.
2. **Capacity Building:** Equip DPHE staff, including mechanics and operators, with the necessary skills and knowledge to efficiently operate and maintain MWTPs, fostering a sustainable workforce capable of responding to emergency situations.
3. **Improve Response Efficiency:** Streamline logistical operations related to the transportation of MWTPs and related equipment, ensuring timely deployment and optimal resource utilization during disaster scenarios.
4. **Integrate Technology:** Utilize drone technology for damage assessment and response planning, enhancing the ability to conduct aerial surveys and make informed decisions in disaster management.
5. **Monitoring and Evaluation:** Implement a comprehensive monitoring and evaluation framework to assess the impact of training and operational efforts, ensuring continuous improvement in water supply management practices.

These objectives aim to strengthen the overall capacity and effectiveness of the water supply system in Bangladesh, particularly during emergencies, thereby safeguarding community health and resilience.

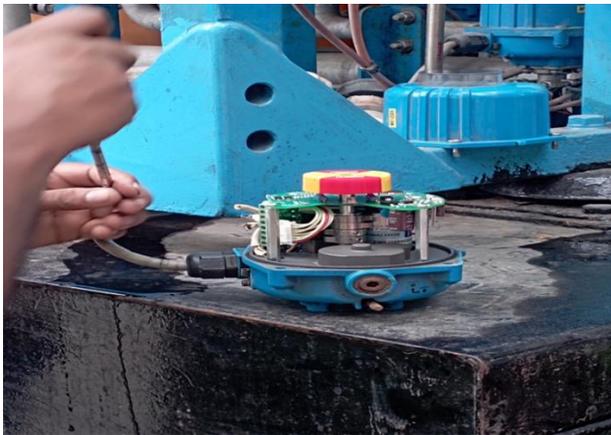
3. Program Components

i. Support for Operation and Maintenance of MWTP

The "Support for Operation and Maintenance of Mobile Water Treatment Plants (MWTP)" component focuses on ensuring that the skilled workforce responsible for the operation and logistics of MWTPs is adequately supported. By allocating funds for four skilled operators and three dedicated drivers, this initiative underscores the commitment to maintaining a high level of productivity and efficiency. These operators and drivers play a crucial role in the seamless functioning of the MWTPs, ensuring timely and safe water delivery during emergencies. Their expertise not only enhances operational effectiveness but also contributes to the overall success of the program, facilitating access to safe drinking water when it is most needed. In this field Tk. 462000 has been expended for Supporting Staffs (4 Operators & 3 Drivers) of MWTP. (Details of skilled operators are attached in Annex-1)

ii. Maintenance for Vehicle and Treatment Unit

The "Maintenance for Vehicle and Treatment Unit" component is dedicated to the proactive upkeep of the MWTPs and associated vehicles, ensuring their optimal operational condition. Over a three-month period, essential items for maintenance have been procured, and ongoing repairs have been undertaken to address issues such as tire replacements and routine servicing. With a total of 30 MWTP units in inventory, this component emphasizes a commitment to reliability and efficiency in water supply operations. By maintaining a comprehensive list of associated costs and maintenance activities, the program promotes transparency and accountability, ensuring that all resources are effectively utilized to sustain the fleet's capabilities in emergency situations.



iii. Hands on Training for the DPHE MWTP Operation and Maintenance

The "Hands-On Training for DPHE Staff" component is designed to build the operational and maintenance capacity of the personnel responsible for the MWTPs. Through a series of targeted training sessions, mechanics and operators from the Department of Public Health Engineering (DPHE) are equipped with essential skills to ensure the continued functionality of these critical water treatment units. Given the vital role that MWTPs play in providing clean drinking water

during emergencies, this training aims to enhance the readiness of DPHE staff, enabling them to respond effectively to water supply challenges during crises. By empowering personnel with the knowledge to operate and maintain these units, the program significantly contributes to improved public health outcomes in affected communities. (Trainee Details are attached in Annex-2)

SL.	District	Date	Venue	Mechanics	Driver/Security Guard/Office Assistant	Status
1	Khulna	12-Aug-24	Store Division, DPHE, Khulna	2		Completed
	Bagerhat			1	1	
	Satkhira			2		
2	Barishal	4-Jul-24	Store Division, DPHE, Khulna		2	Completed
	Patuakhali			1	1	
	Pirojpur			1	1	
3	Rangpur	18-Aug-24	Ex-En office, DPHE Rangpur	2		Completed
	Kurigram			1	1	
	Lalmonirhat			2		
4	Faridpur	18-Nov-23	Store Division, DPHE, Khulna	1	1	Completed
	Rajbari			2		
	Gopalganj			1	1	
5	Bogura	25-Nov-23	Ex-En office, DPHE, Gaibandha	3		Completed
	Gaibandha			4		
	Sirajganj			1	1	
6	Jamalpur	20-Dec-23	Ex-En office, DPHE, Tangail	2		Completed
	Tangail			1	1	
	Manikganj			2		
	Netrokona			2		
7	Sylhet	23-Dec-23	Ex-En office, DPHE, Sylhet	2	1	Completed
	Sunamganj			4	1	
	Kishorganj			1	1	
8	Chattogram	31-Dec-23	Ex-En office, DPHE, Cox's Bazar	2		Completed
	Coxsbazar			3		
	Bandarban			2		



Khulna Store Division, 12 August 2024



DPHE Office, Kurigram, 8 August 2024



DPHE Office, Sylhet 26 August 2024



DPHE Office, Gaibandha 19 August 2024

iv. Drone Training for Damage Assessment and Disaster Response Planning

The "Drone Technology Training" component introduces innovative technology into the realm of disaster response and water supply management. Recognizing the transformative potential of drones in data collection and analysis, this training program equips DPHE professionals with the skills necessary to leverage drone technology for damage assessment and response planning. Over six days, participants engage in a comprehensive curriculum that covers UAV operation, aerial photography, and practical exercises in real-world scenarios. This initiative not only enhances the technical capabilities of DPHE staff but also fosters teamwork and innovative problem-solving approaches. By integrating drone technology into emergency response efforts, the program aims to improve situational awareness and facilitate more effective decision-making during water supply crises.



Training Facilitators and Participants

The training program, attended by 12 participants from the Department of Public Health Engineering (DPHE), included 4 Assistant Engineers and 2 camera professionals. It was facilitated by Mr. Zubayer Al Billal Khan (CTO, Straight), Ms. Momo Mustafa (Aerial Photographer, Straight), Mr. T M Al Anam (R&D Engineer, UAV & Embedded Systems, Straight), and Mr. Farabi Sarker Shanto (Assistant Project Engineer, GIS, Esolve International Limited). The opening session on September 21, 2023, featured Mr. Mohammad Golam Moktadir (Project Director), Mr. Eheteshamul Russel Khan (Additional Chief Engineer), and A.H.M. Khalequr Rahman (Superintending Engineer). (List of Trainees is attached in Annex-3)

Training Activities Summary

Day 1: Introduced UAV technologies and the DJI Mavic 3 Classic, covering regulations and safety protocols.



Day 2: Focused on aerial photography principles, including ND filter settings and a practical outdoor mission.

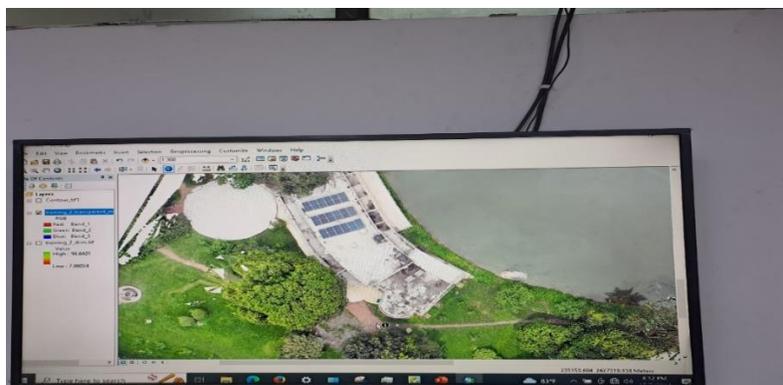


Day 3: Covered pre-flight procedures and basic flight controls, with hands-on practice and outdoor exercises.

Day 4: Discussed flight planning fundamentals and mission planning software, culminating in a practical flight test.

Day 5: Introduced photogrammetry and techniques for topographic surveying using drones.

Day 6: Training on creating ortho photos with Pix4D and post-processing with ArcGIS.



(Schedule of the Training is attached in Annex-4)

4. Challenges

The program faced several challenges during its implementation, including:

- **Logistical Issues:** Coordinating training sessions across multiple districts proved difficult, affecting attendance and engagement.
- **Skill Disparities:** Participants had varying levels of prior knowledge and experience, which made it challenging to ensure all could keep pace with the training.
- **Technical Difficulties:** Some participants encountered issues with drone operation and maintenance of the Mobile Water Treatment Plants (MWTP), requiring additional support.
- **Resource Allocation:** Ensuring timely procurement and availability of maintenance supplies for vehicles and MWTPs was occasionally problematic.

5. Outcomes

- **Enhanced Operational Readiness:** 24 out of 30 MWTP units are fully operational, contributing to effective water supply management during emergencies. Thanks to the success of this program, DPHE, with UNICEF's support, operated 12 MWTP units during the Eastern Flood of 2024, which caused unprecedented devastation in the region.
- **Capacity Building:** A total of 39 mechanics and drivers from 25 districts were trained, improving their ability to operate and maintain MWTPs.
- **Drone Proficiency:** Participants gained skills in drone operation, aerial photography, and topographic surveying, with a focus on disaster response.
- **Increased Confidence:** Participants reported greater confidence in using drone technology for emergency management and data collection.

6. Recommendations

- **Continued Support from UNICEF:** Given the significant success of the program during the Eastern Flood of 2024, where the Department of Public Health Engineering (DPHE) successfully mobilized 12 Mobile Water Treatment Plants (MWTP) to provide clean drinking water to flood-affected communities, it is essential for UNICEF to continue supporting similar projects. Ongoing assistance will ensure that these initiatives can be sustained and expanded.
- **Sustainability of Operations and Maintenance:** To maintain the effectiveness of the MWTPs, it is crucial to establish a sustainable framework for their operation and maintenance. This includes regular training sessions for staff and dedicated resources for necessary repairs and upgrades to the equipment.
- **Capacity Building for New Technologies:** As the integration of advanced technologies, such as drones, has proven beneficial for disaster response, it is vital to continue capacity-building efforts. Regular training programs should be established to equip DPHE personnel with the skills needed to effectively utilize and maintain these technologies.
- **Monitoring and Evaluation:** Implement a robust monitoring and evaluation framework to assess the long-term impact of the program. This will help identify successes and areas for improvement, ensuring that future projects are even more effective.

By following these recommendations, the DPHE and UNICEF can further enhance the impact of their initiatives, ensuring that vulnerable populations continue to have access to safe drinking water during emergencies.

7. Conclusion

In conclusion, the program significantly enhanced the capacity of the Department of Public Health Engineering (DPHE) to manage water supply in emergencies. Despite facing logistical and technical challenges, the training initiatives successfully built skills and knowledge among staff, ensuring the operational readiness of Mobile Water Treatment Plants. The collaboration with UNICEF proved vital in achieving program goals, underscoring the importance of continued investment in training and technology to strengthen disaster response capabilities in Bangladesh. This initiative lays a strong foundation for ensuring access to safe water in crisis situations, ultimately contributing to improved public health outcomes.

8. Annexes

Annex-1: Details of Skilled Operators

SL.	Name	Designation	Months	Status
1.	MD. Alauddin	Operator	June' 2024 to August'2024	Paid
2.	MD. Al Amin	Operator		
3.	MD. Rasel Khan	Operator		
4.	MD. Elias Sheikh	Driver		
5.	Md. Abu Bakar Siddique	Driver		

Annex-2: Trainee Details of Hand-on Training

SL.	Name	Designation	Workplace	Mobile
1	MD. Tanvir Hossain	Mechanic	Ashashuni,Satkhira	01757743248
2	Tushar Das	Mechanic	Shamnagar,Satkhira	01739518995
3	MD. Kaiyum Mir	Security Guard	Kochua,Bagerhat	01716875714
4	Sheikh Razib	Mechanic	Sharankhola,Bagerhat	01715029516
5	MD. Raisul Islam	Mechanic	Batiaghata,Khulna	01919265023
6	Noyon Karmaker	Mechanic	Fultola,Khulna	01739522195
7	MD. Nesar Uddin	Speed boat Driver	Barishal Sadar	01797020202
8	MD. Abdul Jalil	Speed boat Driver	Barishal Sadar	01799737048
9	MD. Noman Shikdar	Driver	Patuakhali Sadar	01712393987
10	Mostafa Kamal	Mechanic	Patuakhali Sadar	01731864916
11	MD. Jashim Uddin	Mechanic	Najirpur,Pirojpur	01774001956
12	Shahin Foraji	Driver	Pirojpur Sadar	01711717112
13	Mahmudur Rahman	Mechanics	Lalmonirhat Sadar	01736282258
14	Raihan Islam	Mechanics	Anitmari,Lalmonirhat	01712338359
15	MD. Shahnewaz	Mechanics	Kurigram Sadar	01724903235
16	MD.Abdul Halim	Driver	Kurigram Sadar	01715695424
17	MD.Sazzad Hossain	Mechanics	Pangamura,Rangpur	01719429603
18	Dipto Roy	Mechanics	Kaunia,Rangpur	01776027517
19	Asadijjan	Mechanic	Faridpur Sadar	01735810063
20	Abu Taiyab	Office Assistant	Faridpur Sadar	01734961990
21	Ranjit Biswas	Mechanic	Tungipara,Gopalganj	01924736994
22	Masum Sheikh	Mechanic	Kotalipara,Gopalganj	01518628959
23	Md. Sohrab Ali	Office Assistant	Rajbari Sadar	01720159822
24	MD. Shahin Shikder	Mechanic	Rajbari Sadar	01735034531
25	Md. Helal Uddin	Mechanics	Sariakandi,Bogura	01740545647

26	MD. Mehedi Hasan	Mechanics	Sariakandi, Bogura	01745911260
27	MD. Waliur Rahman	Mechanics	Sirajgang, Sadar	01780327727
28	MD. Bakulul Alam	Security Guard	Sirajgang, Sadar	01946232363
30	MD. Abdul Gafur	Mechanics	Gaibandha, Sadar	01724621877
31	MD. Abu Saleh	Mechanics	Gobindoganj, Gaibandha	01710143582
32	Mr. Rajeul	Mechanic	Ilampur, Jamalpur	01918251277
33	Shafiuddin Ahmed	Mechanic	Dewanganj, Jamalpur	01716627437
34	MD. Alamgir Hossain	Mechanic	Sadar, Tangail	01775531735
35	MD. Nazibul Islam	Driver	Tangail	01406756459
36	MD. Mahbubur Rahman	Mechanic	Sadar, Manikganj	01710550380
37	MD. Rubel Mia	Mechanic	Ghior, Manikganj	01743489958
38	Mr. Mostakim	Mechanic	Kolmakanda, Netrokona	01712307113
39	Bahadur Chowdhury	Mechanic	Khaliajury, Netrokona	01721682007
40	Biswajit Das	Mechanic	Sadar, Sylhet	01720060817
41	Apurba Das	Mechanic	Kanaighat, Sylhet	01760138734
42	Tahajjat Ali	Mechanic	Sadar, Sunamganj	01712149134
43	Emran Mia	Mechanic	Sadar, Sunamganj	01721482341
44	Shohidur Rahman	Mechanic	Tahirpur, Sunamganj	01719940818
45	Shafiq Mia	Driver	Sunamganj	01726147479
46	Nizam Uddin	Mechanic	Sunamganj	17657701928
47	Syeed Anowar	Driver	DPHE, Sylhet	01719234056
48	Md. Saiful Islam	Mechanic	Sundorganj, Gaibandha	01733152325
49	Raju Ahmed	Mechanic	Saghata, Gaibandha	01721915785
50	Rariual Islam	Mechanic	Fulchari, Gaibandha	01739968078
51	Shahadat Hossain	CCT	Kishorganj	01913451043
52	MD. Monirujjaman	Mechanic	Katiadi, Kishorganj	01747438715
53	Md. Afsar uddin	Mechanic	Sitakundo, Chattogram	01815502276
54	Titu rudra	Mechanic	Satkania, Chittagong	01872021830
55	Md. Arman	Mechanic	Sadar, Coxsbazar	01825656120
56	Shahidul Hasan	Mechanic	Moheshkhali, Coxsbazar	01833231732
57	Nurul Amin	Mechanic	Ukhia, Coxsbazar	01814370864
58	Raton Chandra Das	Mechanic	Sadar, Bandarban	01762149606
59	Shaimang Marma	Mechanic	Sadar, Bandarban	01556743934

ANNEX 4: Schedule of the Training

Day	Time	Session
21/09/2024	10:00 - 11:20	Overview of UAV technology and its applications.
	10 Min Break	Tea Break
	11:30 - 1:00	Introduction to the DJI Mavic 3 Classic drone: features, specifications, and capabilities.
	1-hour Break	Lunch and Prayer Break
	2:00 – 3:20	Drone regulations and compliance (local, national, and international)
	10 Min Break	Tea Break
	3:30 - 5:00	Safety protocols and best practices in drone operation. (Practice)
22/09/2024	10:00 - 11:20	Principles of aerial photography: composition, framing, and exposure
	10 Min Break	Tea Break
	11:30 - 1:00	Camera settings and modes for optimal image capture.
	1-hour Break	Lunch and Prayer Break
	2:00 – 3:20	Tips for capturing stunning aerial photographs. (Practice)
	10 Min Break	Tea Break
	3:30 - 5:00	Practical exercise: outdoor photography mission with the DJI Mavic 3 Classic. (Practice)
23/09/2024	10:00 - 11:20	Pre-flight procedures: drone setup, calibration, and equipment checks
	10 Min Break	Tea Break
	11:30 - 1:00	Basic flight controls and manoeuvres: take-off, landing, hovering, and navigation. (Practice)
	1-hour Break	Lunch and Prayer Break

Day	Time	Session
	2:00 – 3:20	Flight modes and intelligent features of the DJI Mavic 3 Classic. (Practice)
	10 Min Break	Tea Break
	3:30 - 5:00	Practical exercise: outdoor photography mission with the DJI Mavic 3 Classic. (Practice)
24/09/2024	10:00 - 11:20	Importance of flight planning: factors to consider and tools available.
	10 Min Break	Tea Break
	11:30 - 1:00	Mission planning software and applications (e.g., DJI Flight Planner).
	1-hour Break	Lunch and Prayer Break
	2:00 – 3:20	Hands-on mission planning exercise: designing a flight path for a specific task. (Practice)
	10 Min Break	Tea Break
	3:30 - 5:00	Final assessment: practical flight test and evaluation of skills acquired. (Practice)
25/10/2024	10:00 - 11:20	Flight Practise
	10 Min Break	Tea Break
	11:30 - 1:00	Flight Practise
	1-hour Break	Lunch and Prayer Break
	2:00 – 3:20	Drone Technology for Topographic Survey
	10 Min Break	Tea Break
	3:30 - 5:00	Introduction to Photogrammetry
26/10/2024	10:00 - 11:20	Data Processing in Photogrammetry software
	10 Min Break	Tea Break

Day	Time	Session
	11:30 - 1:00	Post Processing in ArcGIS
	1-hour Break	Lunch and Prayer Break
	2:00 - 4:00	Practise

ANNEX 5: List of Training Participants

Sl. No.	Name	Designation and Organization
1	Nasif-E-Anwar	Assitant Engineer, Store Circle, DPHE
2	Asif Amhmud Pranta	Assitant Engineer, Planning Divison, DPHE
3	Farhadur Rahman Ripon	Assistnat Engineer, Planning Circle, DPHE
4	Md. Golam Rabby	Assistant Engineer, R&D Division, DPHE
5	Aman Ullah	SAE, Ground Water Division, DPHE
6	Md. Al- Amin	Estimator, Dhaka Circle, DPHE
7	Khandakar A.H Mahmud	Programmer, GIS Unit, DPHE
8	Md. Omayer Sarker	Computer Technician, MIS-GIS Unit, DPHE
9	Sakibun Rahman Sajib	LDA cum Typist, Ground Water Division, DPHE
10	Abdullah Al Noman	Office Assistant, Design Division, DPHE
11	Md. Zahirul Islam	Filmmaker (Video Editor), MTI