

**Project Completion Workshop on the CIDA-GOB Funded BETV-SAM Project
Dhaka, 22-23 November 2009**

Deployment of Arsenic Removal Technologies (DART) Project in Bangladesh

Presented by

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children**



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Overview of Presentation

- **The Context**
- **Deployment of Arsenic Removal Technologies (DART) Project**
 - Overviews (objectives, project areas, scope of work, timeline, funding agency, implementing partners)
 - Project achievement and impacts
- **Social and Economic Assessment of ARTs**
 - Positive findings
 - Problems and constrains
- **Summary: The Challenges Ahead**

Overview of DART Project

The Context: DART project is a sub-project of BETV-SAM

Objective: To provide social verification of the four provisional verified ARTs (Sono, Alcan, Read-F and Sidko) through trial use in “real-life” condition

Timeline: Feb 2005 to Dec 2009

Funding agency: CIDA

Implementing Partners: DPHE, UNICEF, Field Agencies/NGOs

Project areas: 26 Unions of 12 upazilas, where villages having >80% arsenic contaminated tubewells

Project Cost: \$2,419,350



Project Outputs

Output 1

- To provide arsenic-safe water to people living in most arsenic affected villages through deployment of ART filters

Output 2

- To develop a robust system for deploying provisionally approved ARTs in a way which meaningfully involves community members in technology selection, installation, operation and maintenance.

Output 3

- To assess the four provisionally approved ARTs in terms of technical and socio-cultural suitability in real conditions

Project Intervention Areas

Social Development

- Social mobilization - Community Action Planning, facilitated by CHPs of SHEWAB project, to allow communities to make decision
- Inform choices - revise and update manuals of safe water options incl. ARTs and other arsenic avoidance options (dug wells, rainwater harvesting, etc)
- Awareness building on arsenic contamination and hygiene education
- Training and capacity building – LGI officials, DPHE SAE, field agencies, members of Upazila, Union and Ward Watsan Committees

Project Intervention Areas

Technology Deployment

- Deployment of household ARTs and community filters
 - 10-20% price was charged for HH filters
 - for Sidko plant, communities were required to deposit TK 20,000 at the time of installation to cover the eventual cost of media replacement

- Quality control – an independent auditing firm contracted to make random inspections of ARTs before and after delivery

Around 20,000 H.H. filters and 53 Sidko Plants were distributed
Over 100,000 people are provided with arsenic-safe water

Project Intervention Areas

Monitoring of Water Quality

- Initial testing (household) – CHPs tested raw and treated water for arsenic on the day on installation using field test kits (Arsenators)
- First follow-up – CHPs visited all newly installed ARTs within 3 weeks to check the systems are in proper use and measured WQ of raw and treated water
- Repeated visits – by CHPs, tested filtered water only, at least once per quarter
- QA/QC – 5% of all field test kits results checked in laboratory

Project Intervention Areas

Monitoring and Evaluation

- Baseline survey of socio-economic status, arsenic awareness, and water use practices
- Investigated status of installed filters
- Routine reporting by Field Agency
- Routine reporting by external monitoring agency

Findings from

Social and Economic Assessment of Arsenic Removal Technologies

About the Study

- This was an 8-month study started in January 2009, by an independent consulting firm named Pathways Consulting Services Ltd.

- **The Two Study Goals**
 - To support the GoB's Environmental Technology Verification process: Conduct social & economic assessment of four provisionally approved arsenic removal technologies
 - To analyze people's current thinking about arsenic, and water quality generally, in project implementation areas.

- Debriefing workshop successfully held on 16 August with 50 participants (DPHE, BCSIR, OCETA, ART Proponents, BEST representatives, NGOs)

- Final Reports submitted on 20 Oct.

Research Methods

- **Distinguish between responses to the technology itself, and cultural ideas about water**
- **Use a combination of quantitative and qualitative research methods**
 - **Questionnaire interviews**
 - **Structured observations**
 - **Key informant interviews**
 - **Group discussions/FGD**
 - **PRA methods: Social mapping, Technology ranking**

Filters – populations, survey sample, & qualitative interviews

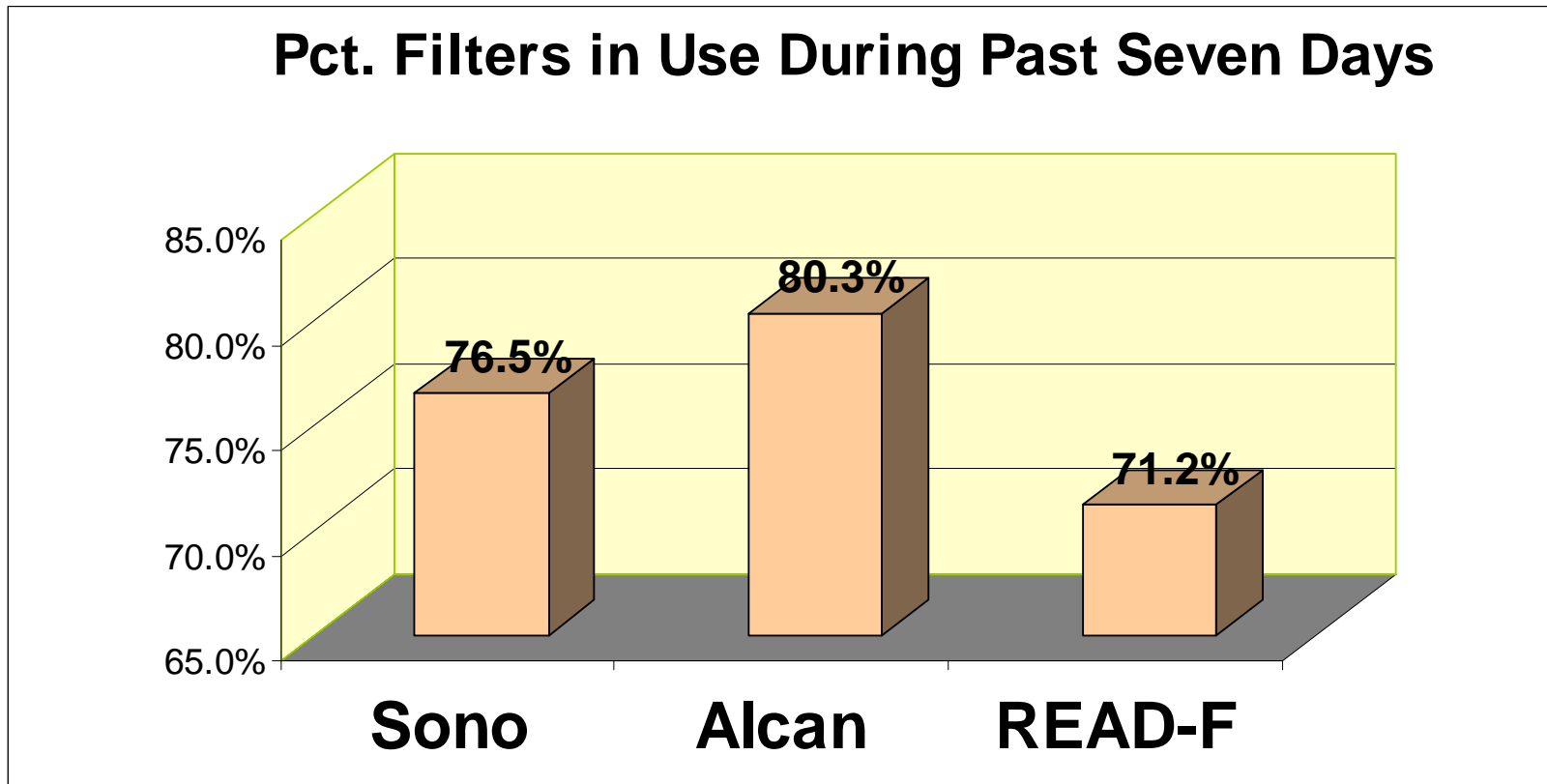
Description	Sono	Alcan	Read-F	SIDKO	All
Project Target of filters distribution	10,900	7,800	1,440	53	20,193
Filters distribution up to 31-10-08	8,378	5,381	1,084	53	14,896
Targeted sample households	400	400	200	53	1053
Questionnaire interviews (16-uz) (completed, filter acceptors)	417	376	177	53	1023
Control households (non-acceptors of filters)	-	-	-	-	500
Qualitative investigations (10 uz.) Household interviews: re: filters Focus Groups, Other discussions	29	34	24	30	117 90+

In addition, 2,458 water samples were collected from the sample households in 120 ml acidified bottles and sent to PMID for lab testing.

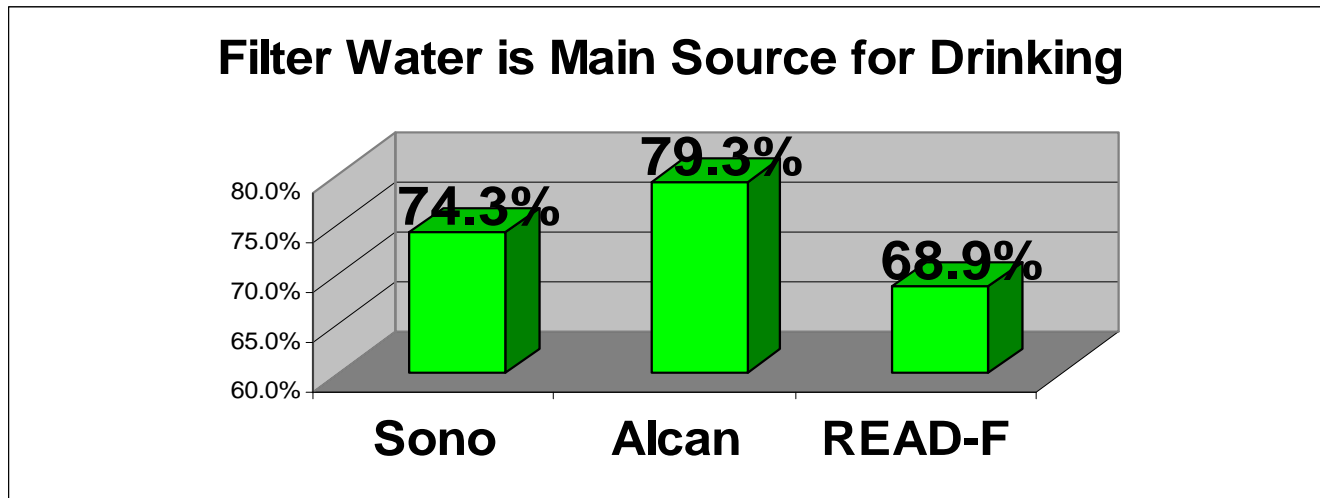
Key Findings From the Study



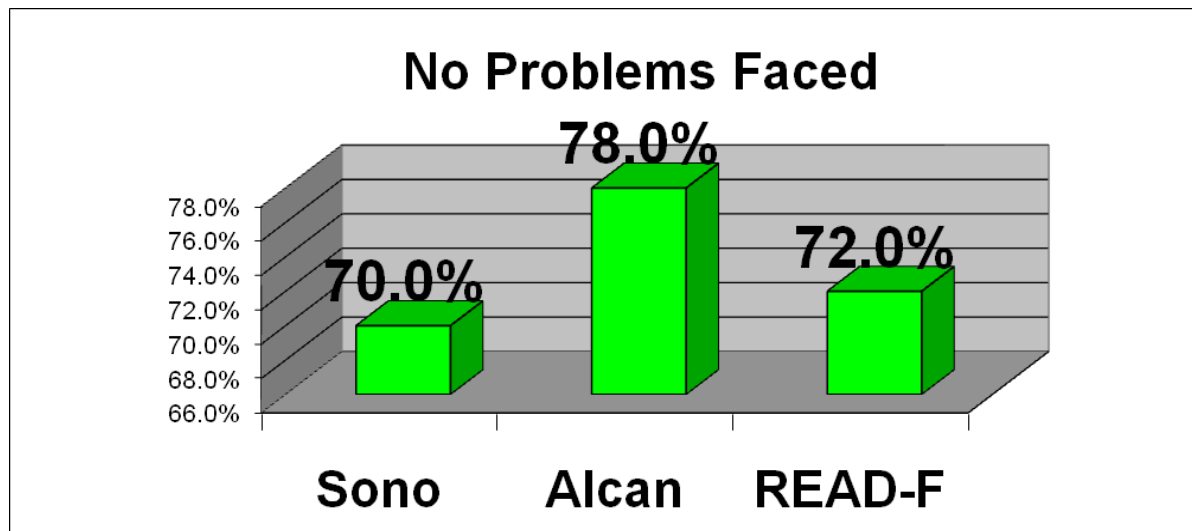
More than 70% of H.H. ARTs were found in Use



More than 70% Households Depend on ARTs for Arsenic-safe Water



Majority of Households Do Not Face Any Problems



Common problems found:

- #1: Water flow was reduced/stopped
- # 2: Filter tap was damaged
- # 3: Main part of filter broken/cracked

People's Perception About ARTs

- More people responded positively about ARTs

<u>ARTs</u>	<u>Positive Vs Negative</u>
Sono	n/a
Alcan	22/18
Read-F	19/11

- Perception on Water Quality of ARTs
(Example: Response from Sono users)

- ✓ Taste good (67%)
- ✓ Clean (46%)
- ✓ Arsenic-free (38%)
- ✓ Iron-free (33%)

- Motivation to get filters: problems with TW water & arsenic, other reasons

READ-F: Users Comments on Technology

Positive (11 respondents)

Good size/Portable (64%)

Instant water supply (55%)

Convenience of having
safe water inside house (27%)

Others (reduces anxiety,
removes arsenic)

Negative (9 respondents)

No water storage capacity (67%)

Too burdensome to clean (44%)

Slow flow rate/Clogged (22%)

Others (can't use when busy,
too much pouring and carrying of water)



* Based on In-depth Interviews, multiple responses

Sono: Users Comments on Technology

Positive (18 respondents)

Good size (78%)

Looks good (28%)

Arsenic-free water (22%)

Lower price [*subsidized price*] (22%)

Can store water long time (17%)

Good filter (1%)

Negative (16 respondents)

Slow flow rate (88%)

Low quality plastic (19% & four FGD's)

Others (hard/time consuming to clean,
can't use when busy, bad smell if not cleaned often enough)



* Based on In-depth Interviews, multiple responses

Alcan: Users Comments on Technology

Positive (11 respondents)

- Instant water supply (27%)
- Water access inside house (27%)
- Reduced anxiety (27%)
- Good size (18%)

Negative (17 respondents)

- Too burdensome to clean (35%)
- Broken tap (24%)
- Too small (18%)
- Filter foam no good (18%)
- Too expensive [*subsidized price too high*] (12%)
- Others (cannot use when busy with agric. work)

* Based on In-depth Interviews, multiple responses



Sono: Advantages

- Local technology/ Ingredients
- Lowest price among the 3 HH filters under review
- 5 year warranty
- Good water quality perception
- Less reporting of problems among the current users
- Provision for water storage
- Proponent (MSUK) is active elsewhere in Bangladesh
- International recognition as successful technology model

Major Challenges

- Highly subsidized DART price perceived as actual price
- Heavy weight of the unit causes chance of damage during storage, transportation, and handling
- Weak (thin plastic) bucket and lid
- Slow flow rate
- Insufficient awareness and practice of pouring hot water
- Water quality perception: 'Coldness' in winter
- Lack of MSUK network in the project area
- Ineffective warranty clause



Alcan: Advantages

- Moderate price
- Single bucket, handy unit
- Satisfactory flow rate
 - Less reporting of problems among the current users
- Provision of using local tap solved initial tap problem
- Good water quality perception, in general
- “Foreign made”: trusted technology

Major Challenges

- Highly subsidized price under DART & high media replacement cost
- Foam on top easily damaged, and discolored due to iron
- No replacement foam available in market
- Burdensome to clean
- Lack of awareness and practice of pouring hot water
- Water quality perception: ‘Coldness’ in winter, Bad smell in some areas
- Lack of proponent network in the project area
- No warranty clause

Read-F Advantages

- Small and handy unit
- Satisfactory flow rate
- Good water quality perception, generally
- Less reporting of problems among the current users
- Availability of recycled media at low price
- “Foreign made”: trusted technology

Major Challenges

- High price as compared to small size
- Highly subsidized DART price
- Lack of awareness and practice of pouring hot water
- Reports of media clogging in some areas
- Bad smell during first use period
- Water quality perception: ‘Coldness’ in winter, Bad smell at first
- Lack of proponent network in the project area
- No warranty clause

Sidko: Functional Status

48 (91%) out of 53 were found to be in use

Two were closed because of media exhaustion; some were still in use despite media exhaustion

Other reasons for closure: source tubewell malfunction, excessive iron in water



70% Sidko Plants Found in Good O & M Condition

- Cleanliness: 'good'/'very good' = 70%
- Backwashing: at least daily, 89% demonstrated correctly
- or almost correctly

Backwash	Union Batch		Total
	Batch-1	Batch-2	
2 x per day	62%	44%	52%
3 x per day	5%	44%	27%
Once/day	14%	7%	10%
Irregular/After few days	19%		8%
Rarely (4–5 times ever)		4%	2%
	100%	99%	99%

Other Common Problems

Common Problems

- Confused/Ignorant about duration of media
- Shocked at news of real filter price
- Many H.H. filter users “complained” that the flow rate is too slow
- Many H.H. user do not follow the instruction of pouring hot water to sterilize the filters
- Many Sidko plant users do not pay the monthly O & M charge (TK 50).

Fail to Comply with O & M Requirement

Frequency of Pouring Hot or Warm Water to Clean the Filter			
	Sono	Alcan	READ-F
Sample hh (n)	319	302	126
Pour hot water to clean the filter	50%	9%	16%
Pour warm water	47%	43%	39%
Do not pour hot or warm water to clean filter	4%	35%	45%

Challenges

Financial Sustainability - The cost of ARTs is beyond the ability of most villagers. There is a potential threat that filter media won't be replaced and ARTs would be abandoned

Monitoring ART Performance - earlier break-through caused by various factors, technical challenge to determine the time of filter break-through at field level

Filter Media Replacement – many ARTs will reach or are reaching break-through, how to make filter media available at affordable and a convenient location is essential for the sustainable use of installed ARTs

O & M - some earlier failure was due to lack of proper O & M, some Sidko plants failed to collect enough money to pay electricity bills

Challenges

Bacteriological contamination: a major concern, as 65% of filtered water found bacteriological contaminated

Water quality testing capacity at community level: low or non-existing, users have no way or no where to have their water tested, drinking arsenic-contaminated water unknowingly

Awareness of Arsenic Contamination: although general awareness of arsenic contamination has increased, people do become complacent over time. Repeated communication interventions required to remind people

Private sector involvement: limited roles during project implementation. For long-term sustainability, good post-sales services, and availability of filter media at an affordable price is essential

Thank You