Scientific Research vs. Practical Application

Expert Group Meeting
28 – 30 October, 2009
Fukuoka, Japan

Dr. Roshan Raj Shrestha
Chief Technical Advisor, South Asia
Water for Asian Cities Programme
UN-HABITAT
Drinking Water & Surface Water Problems

- Microbial contamination;
- Chemical contamination (Arsenic, Iron, Ammonia and Nitrate);
- Urban rivers converting to Open Sewer;
- Frequent outbreaks of water borne diseases;
- Chronic shortage of Water in cities.
Response to Microbial Contamination

- PIYUSH is a 0.5% chlorine solution produced by local NGO -ENPHO in 1991/92
- Took nearly 10 years for its official recognition;
- UN-agencies like UNICEF and WHO started to promote need of household water treatment (HWT) from early 2000;
- International brand “WaterGuard” started its market in 2005
- Government launched National HWT Programme in 2005;
- Finally PIYUSH has been recognised.............
Response to Arsenic Contamination

- Joint systematic research by MIT and local Researchers and developed arsenic removal filter called **Kanchan Arsenic Filter** in 2003;
- Involvement of MIT with regular technical backstopping;
- Research papers and publications;
- International and National Award and Recognition;
- Follow up research and regular monitoring & evaluation;
- Can be assembled with locally available materials;
- Capacity building of local entrepreneurs;
- Government recognition.

**Expert Group Meeting, Fukuoka, Japan**
Response to Wastewater Management Problem

• Introduced Constructed Wetland in 1997
• Adequate scientific researches but limited professionals for practical applications;
• Consultants and contractors are not well trained;
• Government and donors procurement modality not appropriate;
• Ignorance in O&M; Challenges remain in its sustainable operation
• Took nearly 2 to 3 years to build a small unit;
• Socio-political factor, poor governance, lack of elected representative;
• No encouragement and least priority at all levels;
• Negative attitude towards WWT system.
ECO-HOME
An approach to sustainable water management
Use water wisely based on Human Values

Area of house & space: 135 sq.m (6 rooms 1 pal) Family size: 4 members

Total Water Demand and Consumption

<table>
<thead>
<tr>
<th>Source of Water Demand</th>
<th>Expected Use</th>
<th>Actual Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staying &amp; Dining</td>
<td>100 gallons</td>
<td>80 gallons</td>
</tr>
<tr>
<td>Cooking</td>
<td>50 gallons</td>
<td>40 gallons</td>
</tr>
<tr>
<td>Washing clothes</td>
<td>30 gallons</td>
<td>20 gallons</td>
</tr>
<tr>
<td>Bathing</td>
<td>50 gallons</td>
<td>40 gallons</td>
</tr>
<tr>
<td>Total</td>
<td>230 gallons</td>
<td>180 gallons</td>
</tr>
</tbody>
</table>

Catchment area for water collection
Rainwater harvesting through siphon
Greywater recycling for toilet flushing

Unravel soil
Replant
Connect the soak bed to septic tank

Expert Group Meeting, Fukuoka, Japan
Key Lesson Learnt

- Research can be operationalised – need patient and better strategy;
- Applied researches (need based) are more important for developing nations;
- Team work is the must;
- Need networking and partnership with national and international institutions;
- Advocacy through publication and dissemination;
- Need to link with livelihood or economic benefit
- Build local capacity;
- Government Recognition.
Way Forward