

Scientific Research vs. Practical Application



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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.



Waterborne diseases dog valley denizens

Himalayan News Service
Kathmandu, July 12

The valley has been facing several outbreaks of waterborne diseases, including acute gastroenteritis, since April.

According to the Epidemiology and Diseases Control Division (EDCD), over 3,339 cases of gastroenteritis were reported in the valley from April 15 to July 10.

Out of the patients, 185 were confirmed as having cholera and five deaths were reported. The record is based on the number of patients in the Kanti Children Hospital, Patan Hos-

pital, Bhaktapur Hospital, Nepal Medical College and Sukraraj Tropical and Infectious Disease Hospital.

Gastroenteritis is an illness with symptoms of abdominal pain and cramps, fever, vomiting, diarrhoea and loss of appetite that is chiefly caused by contaminated water.

A survey on water quality of the valley, conducted by the Central Laboratory, Kirtipur, showed that water quality is deteriorating in the valley since April this year. In April-May, 28 per cent of water in the valley was found undrinkable. In May-June 39 per cent of water was found unsafe for drinking and the percent-

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.



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



Urinal & Faucet separating Comod-saving water to flush



Urinal & Faucet collection tanks at the basement



Urine as fertilizer



Area of house & space: 133 sq.m. (4 store 1 plot)
Family size: 4 members



Collection area for rainwater harvesting



Ground water exchange through drainage



Rainwater first flush back to washout dirt

Salient Features of ECO HOME

- 2000-litre Urinal and 2000-litre Sink water separator
- Rainwater harvesting system with 1000-litre storage tank
- Urinal water collection tank (1000-litre) and sink water separator (1000-litre) at the basement
- No separate water supply in the basement (a pipe network system is used for recycling urine for use as a fertilizer for the vegetable garden)

Total Water Demand and Consumption

Process	1 Day	1 Month
Drinking & cooking	70	2100
Showering, bathing & laundry	100	3000
Toilet flushing, cleaning, dusting & gardening	100	3000
Water for irrigation	100	3000
Water for household use	100	3000
Water for landscaping	100	3000



Compost bin at house



Water saving shower head



Water saving device



Water saving device



Vegetable garden maintained with the application of urine & faeces compost



Vegetables, Fruits and Flowers flourish with the application of urine & faeces compost



Vegetables, Fruits and Flowers flourish with the application of urine & faeces compost



A few years later, watering the plants is still less to bother

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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

