

## **Domestic Rainwater Harvesting: Perceptions of Water Professionals and the way forward**

### **1. Survey**

A survey of water professionals and their perceptions on rainwater harvesting was done, using a questionnaire and personal interviews

The experience from previous surveys was taken into account: No fax or mail questionnaires were sent out. The distribution of the questionnaires was exclusively done by e-mail. Around 73 professionals of the a.m. groups were contacted. The result was not very encouraging, only around 12% (9 persons) of the contacted people answered, most of them already being familiar with rainwater harvesting.

The mailing list of GARNET, the Global Applied Research Network in Water Supply and Sanitation (called: "water-and-san-applied-research) was also used to distribute the questionnaire to more than 200 practitioners in the water field. Only three people responded.

Beside the mail survey professionals met at conferences (WEDC-conference 1999, Addis Ababa; World Water Forum 2000 in The Hague) or during travels in Africa (Southern Africa, May 2000) were interviewed.

### **2. Results**

#### **2.1 Respondents to the Water Professionals Questionnaire**

A total of 26 people answered either orally or by writing.

More than half (14) of the people who answered orally or by writing use either rainwater harvesting in their house or are involved with rainwater harvesting programmes or projects.

Three of them came to rainwater harvesting when assessing water resources of small islands.

It is obvious from the answers, that water professionals are not aware of the full range of possibilities of rainwater harvesting. Instead, they discuss the topic only for a specific application they know (e.g. only rainwater harvesting in the rainy season, only for a desert location,...). Rainwater harvesting is mostly associated with drylands by them so that even the title of the questionnaire/project (Domestic Roofwater Harvesting in the humid tropics) is overlooked.

#### **2.2 Future role of Domestic Roofwater Harvesting**

The wording of the question was as follows:

*"Will domestic roofwater harvesting play an important role for specific areas in securing drinking water needs of the future?"*

Three people who responded were not in favour of roofwater harvesting: they either had enough water within their own area, did not know anything about it or saw it as only a last resort if everything else fails. All others saw an important role of DRWH for the future in a resource threatened world. Specific geographical areas were mentioned:

- small islands
- peri-urban areas: the opinion on peri-urban areas was divided. While many saw a great potential for rainwater harvesting (corrugated iron roofs, water by vendors very costly, reduces flooding and can increase groundwater recharge) one person opposed: people do not own their shack and its owner does not own the land it is built on, there is generally very little space for storage in these surroundings
- dry (arid and semi-arid) areas (specifically in India, where rainwater harvesting was traditionally practised on a large scale, declined in the last decades and is now starting to be revived).

Problems experienced with water were cited for which rainwater harvesting could make a contribution towards a solution:

- **decreasing water availability** (i.e. in ground- and surface water sources). One person (of several who cite this problem) suggested that by using rainwater for non-potable purposes, drinking water sources could be conserved! (while others see the value of rainwater especially in its good quality!)
- **bad infrastructure** with unreliable supplies, esp in peri-urban areas
- **no access to ground- or surface water**
- **rising water prices** for piped water supplies (esp. in European countries)
- **long distances and time spent** to fetch water in rural areas of the South
- **decreasing water quality** due to contamination of water sources.

### 3.3 Advantages of Domestic Roofwater Harvesting

Many advantages of domestic roofwater harvesting are seen:

- **closeness** to the home. This aspect was mentioned most.
- **simple technology** and consequently simple operation and maintenance, an advantage esp. for rural areas with weak infrastructure
- **reliable and controllable source (because of individual ownership)** of good quality water. This statement is not shared with other respondents. Some of them point out the reasonable quality of rainwater or the easiness to improve the quality by simple means. Other see (bacteriological) quality as the main concern with respect to rainwater (see chapter 3.4). Good chemical quality is especially valued in areas with highly contaminated groundwater (such as with fluoride or arsenic). The soft rainwater is very suitable for washing with little soap.
- **economic advantages** (compared to standard solutions or water to be bought from vendors). This is certainly site specific and must be established at the location of the intended use of rainwater. The collected rainwater can also be used for kitchen gardens and animals and thus improve the household economy.
- **increases the available options** to a community (in some areas it might be the only option)
- **reduction of soil erosion**, flood water retention, can improve ground infiltration, but also protection of house walls from rainstorms

### 3.4 Concerns with regard to Domestic Roofwater Harvesting

The wording of the question:

*“What are your concerns with regard to domestic roofwater harvesting*

- *water quality?*
- *water quantity?*
- *other concerns?”*

**Water quantity** was voiced 6 times as a concern. Many respondents are fixed to rainwater harvesting during the rainy season, since otherwise the storage cost would get too high. This shows the very different and often limited knowledge of rainwater harvesting. Reliability of the water source was seen as a draw back as rain does not follow a regular pattern.

In-county information on rainfall data and specific water demand (of different water user groups for different purposes) was considered difficult to obtain in many cases.

**Construction skills** was seen as a serious concern, because of much damage to rainwater harvesting having been done in the past by bad design and construction. Tank building will always be needed so that specific and thorough training for artisans was demanded.

**Maintenance** of roofs and tanks was seen missing, i.e. essentially cleaning of these two components in regular intervals.

**No standard solutions** are available or are considered possible at all by one water professional.

Conditions for the use of rainwater are so much different and rainwater harvesting could be serving different purposes in different surrounding so that site specific designs have to be developed and experimented with. No design criteria to incorporate the varying parameters are available.

**Water quality** was the concern voiced by half of the respondents. This refers to the bacteriological quality. While 3 water professionals are convinced of the “excellent” quality of rainwater (or that its

quality can be kept high), others see rather problems with the (bacteriological) quality of rainwater when its use is intended for drinking purposes:

- problems of birds and their droppings especially on islands
- intrusion of small mammals in the storage container
- cleanliness of roof (and storage)
- collection from thatched and earthen roofs (still used as an important roofing material for houses in rural areas).

There is a persistent misconception of water getting bad over time when stored! This is actually not true; research shows that rainwater quality gets better with time when certain criteria are met (no light into the storage, protection from whatsoever animals, aeration).

For one professional, it is without doubt that the quality of rainwater cannot satisfy drinking water requirements and suggests solutions: solar heating of the water as a treatment process.

### **3. The next steps**

Rainwater harvesting is most often associated with

- rural areas and
- (semi)-arid climates.

The title of the research project “Domestic roofwater in the humid tropics” shows already that the scope for rainwater harvesting is much larger. The humid tropics have indeed some advantages for rainwater harvesting (e.g. small storage size)! At the same time the need for water is getting obvious in towns and cities and also here, rainwater harvesting could play a role.

#### **3.1 Peri-urban areas**

Although the introduction of rainwater harvesting into peri-urban areas was discussed very controversial and some respondents were opposed to it, it seems that there is an enormous need for water and a great potential for rainwater harvesting.

Urban water supply organisations seem rather helpless of how to tackle the problem of ever increasing peri-urban areas and their water supply. In the meantime street vendors sell water of doubtful quality at very high prices.

The advantages of domestic roofwater harvesting such as closeness to the home, economic advantages, simple technology and individual ownership (in an environment where often people come from different backgrounds and regions and are not willing to co-operate) combine in favour of its use in this environment. Further action research and closely monitored implementation of larger scale field trials are important!

#### **3.2 Water quality**

Half of all people interviewed voiced their concern on water quality of rainwater harvesting. This is the first argument that come to peoples mind when they are asked about rainwater. Quality means in this context always bacteriological quality. (Rainwater is one of the important options in areas with serious groundwater pollution with arsenic of fluorides).

Information on bacteriological quality of stored rainwater but also suggestions for treatment (before entering a storage tank, in it of after its withdrawal) must be made available as clear and simple messages.

#### **3.3 Closing the information**

Many people interviewed had never heard of rainwater harvesting as an option in water supply: Yes, in their village at home they tried to collect water from the roof when it rained with a pot but can this seriously contribute to household water supply? Half of all people of the survey specifically asked for more information, some for examples of where it was used with success. How can awareness on rainwater harvesting be created among water professionals? How can information reach the people in demand of water? In what form, in what messages should the information be conveyed?

## **Annex 1**

### **Domestic Roofwater Harvesting in the Humid Tropics, a short questionnaire**

Will domestic roofwater harvesting play an important role for specific areas in securing drinking water needs of the future?

yes, because of

I'm specifically thinking of these areas

no, because of

In order to make an informed decision, I would need reliable information on

What are your concerns with regard to domestic roofwater harvesting:

water quality, please specify

water quantity, please specify

other concerns like

or

Advantages often associated with domestic roofwater harvesting are its being close to the house and the individual ownership. Such harvesting may be operated for full or partial water supply.

What do you consider as advantages?

Have you had any close experience with domestic roofwater harvesting?

Yes, I use it in my house

Yes, I have been involved in projects where roofwater harvesting played a role.

We, the Rainwater Harvesting Research Group would appreciate, if you could give us details

No, never had experience but I'm interested

No, I can't think that it can be useful

Yes, I'm interested in roofwater harvesting, specifically in

Name/Organisation

Address

Phone/Fax

E-mail

I'm expressing my personal opinion

I'm expressing the organisation's opinion

Thank you very much for your time!