

PEOPLE-CENTRED APPROACHES TO WATER AND ENVIRONMENTAL SANITATION

**MIREP: An Innovative Approach to Private Participation in Rural Water Infrastructure.**

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*Acting on the insufficiency of financial resources is most probably one of the major stakes in access to drinking water in developing countries. The goal of the millennium is to halve the number of people deprived of drinking water and sanitation by 2015. The World Water Commission estimates that 180 billion dollars per year need to be spent to accomplish this; current expenditure is less than 75 billion. This level can only be reached through the massive mobilisation of private investors. But who should these private investors be and what framework for cooperation should be applied? For the past two years in Cambodia, GRET and the Cambodian engineering firm Kosan have been testing (in the framework of the MIREP Programme) the creation of rural piped water systems using local private investments in partnership with local decentralisation stakeholders.*

**Cambodia: limited access to water in rural areas**

There are 12 million people in Cambodia (Picture 1), of whom 85 % live in rural areas. Nowadays, only 27% of rural inhabitants have access to drinking water, and only 11% have safe water at home. Although improving, their knowledge on water use is very low since half the rural population doesn't know that water can spread diseases.

People mostly obtain their drinking water from rainwater in the rainy season and from ponds or river in the dry season. Few drink water from community boreholes, because groundwater contains excess minerals (calcareous, iron, manganese, and even arsenic!), and many are out of service because of a lack of appropriate maintenance. The demand

for safe water at home is increasing among those living in rural boroughs. More and more people are ready to pay for such services. As a result, small private piped water systems have appeared in rural areas. However, those services are often limited to commercial areas of big villages and the quality of water and service vary greatly.

**MIREP in brief**

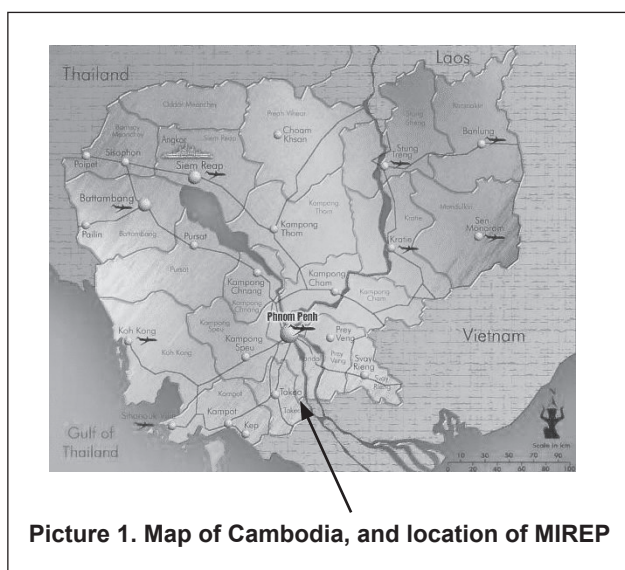
- Duration: 3 years, 2001-2004
- Budget: 700,000 Euros
- 10 piped water systems installed (200 to 500 households each)
- MIREP is set up by GRET (French NGO), Kosan Engineering (Cambodian consulting firm) and BURGEAP (French consulting firm).
- It is financed by SEDIF (a French water utility) and the French Ministry of Foreign Affairs.

**MIREP: Develop rural water supply based on private sector participation.**

These observations led the MIREP (“Mini Réseau d’Eau Potable” or small piped drinking water systems) programme to be launched in 2001 to help rural communes and the local private sector to set up piped water projects based on public/private partnerships.

The major objective of MIREP was to take advantage of the private sector interest in water supply to set up a water system that could serve more people more efficiently.

This programme fits with the new water policy that emphasises two major elements: a response adapted to the demand (especially regarding individual service at home)



Picture 1. Map of Cambodia, and location of MIREP

and the participation of the local private sector water infrastructures.

Ten projects of 200 to 800 households each are currently underway in Takeo and Kampot provinces in southern Cambodia.

**Help decentralized governments to contract private entrepreneurs**

Cambodia had its first communal elections in February 2002. Since then, commune councils have held the responsibility for water services in rural areas.

Within MIREP, communes have designed their projects, defined the coverage zones, selected private investors by bidding process and established PPI contracts with them. Those contracts include mostly full private models (divestiture) and BOT. The technical competence of communes is still low, but they have been well supported by Provincial Rural Development Committees (PRDC) whose role is notably to select eligible sites, allocate and control subsidies, validate contracts (Picture 2) with the private sector and supervise works.

The involvement of this provincial structure has also been a key factor to attract and provide guarantees for local investors.

**Developing rural private investment requires an institutional context adapted to decentralisation.**

In Cambodia, the regulatory framework for the water sector is being elaborated. The situation regarding private services is quite clear in urban zones whereas private water systems in semi-rural and rural areas represent a grey area where rules concerning contracting, monitoring, technical specifications, and authorisation are not clearly defined.

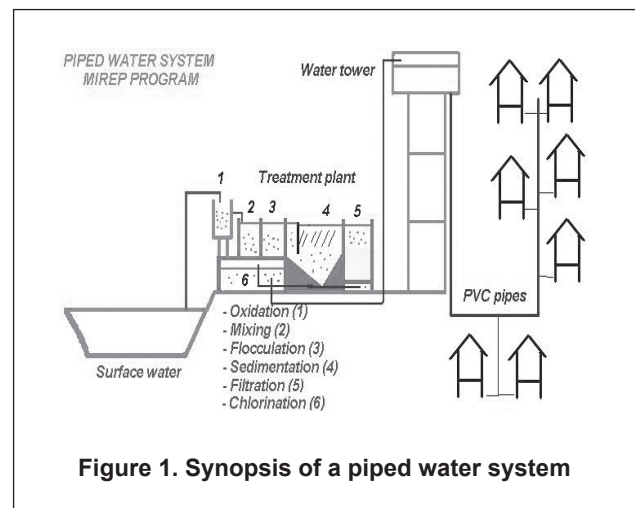
(In addition, the legal system’s lack of clarity does not favour the establishment and respect of contracts, a decisive element to draw private investment to rural infrastructures).

MIREP aims to show to decision makers that local governments represent a pertinent level of contracting

water services, especially because they are responsive to the demand of local people and can ensure a direct and efficient control of the service.

**Appropriate technology can make piped water systems more accessible.**

MIREP is active mainly in areas where groundwater is rare or of poor quality (excessively hard or alkaline, or even containing arsenic). MIREP systems therefore consist in a surface water pumping station, a treatment plant, a water tower, PVC piping and meters (Figure 1). The systems are based only on the local population’s capacity to pay. All materials can be found locally, local contractors have been trained to build and operate these systems. MIREP’s engineers have developed low cost concrete-made treatment plants (coagulation - flocculation - settling – rapid filtration - chlorination) from 8m3/h to 30 m3/h costing from \$8,000 to \$25,000 respectively. As a result, the average investment per household for MIREP systems is about \$150/household whereas it can be up to \$800 for other piped water systems.



**Figure 1. Synopsis of a piped water system**



**Picture 2. Signature of a concession contract**

**Financing**

With a limited volume of subsidies (30% of the capital investment), all 10 MIREP schemes have attracted \$260,000 of private investment (60% of the total investment), the rest (10%) being financed by the users themselves (Graph 1).

**Private investment**

Rural private entrepreneurs (Picture 3) are usually keen on investing in rural water infrastructure because the level of investment is reasonable (from \$10,000 to \$80,000) and technical aspects are considered simpler than other industrial activities (such as food industry).

Although returns on investment for a piped water system are long (7 to 10 years), these entrepreneurs appreciate



**Picture 3. Mrs Meas Yan in front of her treatment plant**

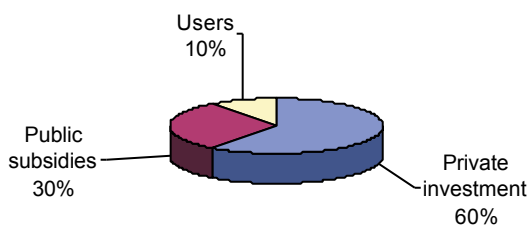
the long-term perspectives of such activities, notably for their retirement. They usually favour full private systems instead of BOT, as they see less risk for their investment. They invest on a sole ownership basis but often with family financial support.

**An adapted credit mechanism**

A refinancing and guarantee funds has been set up in the Rural Bank of Development to convince a commercial bank to provide medium-term loans (3 to 5 years) at 14%/year over whereas the usual rural credit is about 20%/year over 1 or 2 years. Credit is seen by the investors as a good way to pressure clients to pay the sums due by highlighting their need to reimburse the loan.

**A upfront subsidy for water treatment**

MIREP provides an upfront subsidy of \$8/per. to help the entrepreneurs to build a water treatment plant. The subsidy, channelled through the provincial rural development committees, is calculated on an anticipated output (a number of household to be connected) set in the contract with the commune. This subsidy reduces the investment cost for the entrepreneurs by 30% and allows a decrease of tariff of about 20%.



**Graph 1. MIREP piped water systems, sources of finance**

**Connexion fees**

The connection fees cover about 10% of the total investment. Connection fees are limited at \$ 15 per household to allow a maximum number of families to connect.

**Service**

**The service covers the demand, except the chlorination.**

Users living in the area served by MIREP piped water systems are small-scale vendors, local entrepreneurs and farmers. Their monetary income varies between 75 to 150 US\$/month. Recent studies have shown that they spend 3% to 5% of their income in water, whether piped water, bottled pure water or other sources.

People consume usually between 30l/d/c to 50l/d/c from the piped system, but still rely on other sources (rainwater, wells). A noteworthy increase in consumption can be seen among those who have been connected for some time (+20%/first year) as well as the development of hygiene equipment such as poor flush latrines.

The average rate of connection is 60% and it is increasing every month. In the 3 first equipped villages (in 2001 and 2002), this rate is already above 80%.

The chlorinated taste of the water remains largely unacceptable despite information campaigns on this subject. Because of this, a limited number of families (about 40%) use piped water for drinking (Picture 4) and many users continue to take their drinking water from the pond (which is often unfit for consumption).

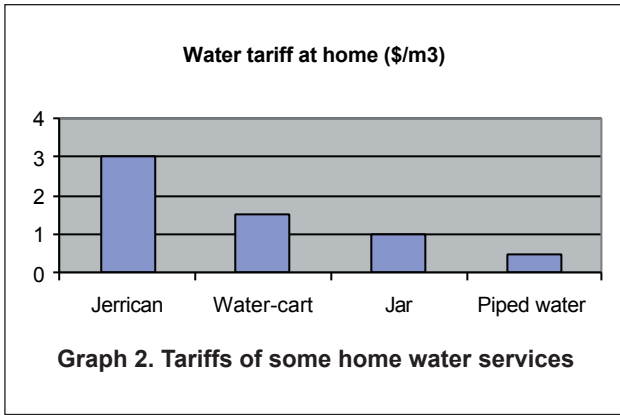
There is not much requirement regarding pressure and full-time service since most people fill jars in their yards rather than use taps or showers inside their house.

**Tariffs are high but well accepted.**

Tariffs reflect the real cost of the water (O&M and depreciation). They are high (\$0,4 to 0,5/m<sup>3</sup>), mostly because of the limited scale of the system (on average they serve 250 families with low consumption (6 to 7 m<sup>3</sup>/month/HH), and also because of the large dependence on expensive imported fuel. Fuel represents about 50% of the treatment costs.



**Picture 4. Drinking piped water in rural areas.**

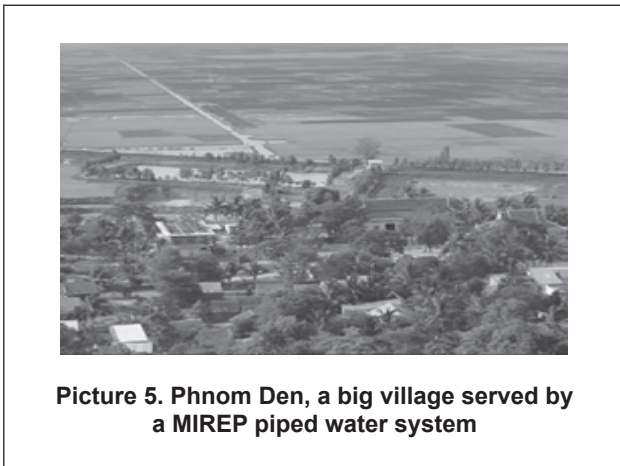


On the other hand, users are satisfied with the tariff of piped water as it is usually much less than that charged by other vendors who deliver water at home (Graph 2). Currently, the average rate of bill payment among the MIREP piped water systems is 99%.

**Develop alternative sources for the poor.**

One of the major objectives of MIREP is to maximize the number of people that have access to piped water:

- The piped area includes the poorest areas,
- The cost of connection is limited to 15% with a possibility of credit,
- The resale of water is regulated,



**Picture 5. Phnom Den, a big village served by a MIREP piped water system**

Despite these efforts, piped water remains too expensive for a few families (about 10% of the population). Connecting for free would not necessarily make water available to the poorest. Therefore, MIREP prefer to encourage the communes to develop alternative sources of potable water for the poorest, notably by using the concession fees (paid by the investor, from \$200 to \$500/year) to buy or rehabilitate public wells.

**Note/s**

- <sup>i</sup> PPI: Private Participation in Infrastructure.
- <sup>ii</sup> PRDC was created to help the communes put in place rural infrastructures such as water systems, schools, rural roads, irrigation schemes.
- <sup>iii</sup> Build Operate Transfer.

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