Private Sector Financing of Rural Water Supply in Vietnam and Cambodia

Dan Salter, February 2003

1 Executive Summary

One of the major challenges of scaling up RWS service delivery is the constraint of financial resources. The World Commission on Water estimates that in order to achieve the Millenium Development Goal to halve the number of people without access to clean water and sanitation will require an annual investment of 180 billion dollars. The current expenditure falls far short of this, at an estimated 75 billion dollars per year\(^1\).

This paper reflects upon experiences in Vietnam and Cambodia where the private sector, either with or without external assistance, has stepped into RWS provision investing its own funds, and leveraging funds from a fee-paying consumer base. The growth in private sector investment in RWS in Vietnam and Cambodia has occurred in response to a consumer demand that was not being met by public services. Governments in both countries recognize and support these private sector initiatives. They demonstrate that significant funds can be leveraged from investors and end users, and that institutional funds can be used to encourage private sector in RWS provision, and therefore leverage additional resources into the sector.

The development of private sector RWS providers is considered in three different markets:

- To some extent, a lack of sector regulation in Cambodia has provided an enabling environment for the development of thousands of micro water supply enterprises. Pilot projects are now underway to scale up some of these micro enterprises to develop village-wide systems that provide treated water to several hundred households. These are providing interesting lessons about financing arrangements, experimental regulatory frameworks, user willingness to pay, and consumer water use.

- In Vietnam markets are more fully developed, and in the southern province of Tien Giang, populated by some 1.6 million people, around 60% are already being served by non-state water companies. These include individually invested utilities generally financed using borrowed capital; cooperative invested and managed systems; and user-group systems where the capital is raised up-front by ‘investing’ users.

- In Central Vietnam where water access is relatively cheap, households are purchasing their own water sources at a cost that is only fractionally higher, and in some cases lower than connections to piped schemes elsewhere yet the water is free. A private sector supply market has developed in response to this demand, and by virtue of its structure provides cheaper and more localized services than comparative government suppliers in the same areas.

The discussion section considers the relative opportunities and limitations to increased private sector activities in the sector. It assesses the comparative advantages of the private sector in RWS provision that include leveraging of funds to the sector, the benefits of demand driven services, and the cost effectiveness of both the private sector itself and institutional investments made in support of private sector.

The paper considers there is a very encouraging future for private investment in the sector, given the experiences to date, and the attitudes of both governments towards these for-profit operators. It considers how private investors in the sector can be encouraged and best served in the future by donors and governments.

2 The Current Scope and Nature of Private Sector Involvement in RWS

The RWS market in Vietnam and Cambodia is being served by a growing private sector made up of tens of thousands of micro and small enterprises. They range from informal self-employed individuals that drill wells and install pumps, rain jar manufacturers and sellers, enterprising individuals that collect water and transport it for sale, to small ‘utility’ companies that provide piped water to individual households.

The private sector, in some form, has most likely been supplying water markets in these countries for hundreds if not thousands of years. Enterprises have grown rapidly over the last ten or so years in an increasingly investment-friendly environment to the point where they are now more visible and provide opportunity as contractors, investors, and operators in the sector. The nature of this private sector, and the services that it provides vary from place to place and is naturally tailored to local market circumstances – water resource availability, population density, consumer incomes, etc.

The nature of the private sector can be broadly categorized as follows:

- **Technology Supply Enterprises**
  
  Production / Supply chains of enterprises that make, distribute, sell, and install water access, storage, and purification technologies. The technologies supplied include tube wells, hand / electric / diesel Pumps, rainwater storage jars / tanks, and water purifiers. These suppliers (except in the case of large well drilling operators) are generally providing household technologies that enable their purchasers to access, store, or purify water for which they do not have to pay.

- **Water supply enterprises**
  
  Enterprises that sell water, and range from informal enterprises that collect water, transport it behind a motorcycle or in a truck, and sell it ‘door-to-door’, to piped-water scheme operators that provide pressurized metered water directly into individual households. The latter are essentially small utilities companies, providing water for tens, hundreds, or thousands or households.

It should be noted that most rural populations use more than one source of water. For example, even where small piped schemes are in operation, almost every consumer is additionally harvesting rainwater. In Cambodia it is noticed that many of the people that have treated water piped directly into their houses are additionally purchasing untreated water from door-to-door water sellers (preferred for cooking and drinking), and also harvest rainwater to supplement the expense of their two purchased water sources.

The following examples highlight experiences of private sector development in three differing circumstances in Cambodia and Vietnam. They provide practical experiences and inform subsequent discussion and analysis.

2.1 The Evolving Private Sector in Rural Cambodia
The RWS sector in Cambodia is currently un-regulated. Private sector activity is flourishing; from individual informal water collectors and sellers, to small and unregulated family run piped schemes, to larger experimental piped schemes that supply whole villages.

Water sellers are commonplace in the countryside, collecting water - from open water sources, community pumps, and open wells - and transporting that water for sale generally on trailers equipped with 200-liter water tanks pulled by motorcycle. These informal enterprises go into business with their own capital. The entry cost of these businesses is low. They typically sell water at around $2.5/ m$^3$, and whilst untreated, it is purchased for ‘consumption’ – drinking and cooking. Most families usually boil this water prior to consumption, but not always.

In parallel to these, and serving an identical market, are very small pump-and-pipe operators that have emerged in the more densely populated areas of villages. They erect small (2 – 6 m$^3$) water storage tanks usually supported by wooden structures and supply untreated water drawn from rivers, drilled wells, or ponds through pipes to individual households. Depending on the available water source, and cost to develop that source for extraction, a small enterprise supplying water to 20 - 60 households might cost in the order of $1,000 – $8,000. In an unregulated business environment they sell water at a local market rate, which at the time of entering business could be assessed from the cost of competing water supplied by informal water sellers described above.

These informal and relatively low-cost entry-level businesses have paved the way, and demonstrated the viability for larger investment in village-scale piped schemes that are now emerging. There are a few experiences, and the development of these systems is at present constrained by a lack of regulation to politically secure investments, and equally important, a limitation of investment capital, for these inherently capital-intensive businesses.

In Kbal Koh Commune, Kandal province, a scheme was developed five years ago that replaced a number of the small un-regulated pump-and-pipe operators to serve a total of 2,000 households, or 25% of the total village market. The pump-and-pipe operators sell untreated water at 37 US cents / m$^3$, and it entered the market providing treated water access at 35 US cents / m$^3$. The initial investment for this system is reportedly $800,000, which includes the land and buildings. The investors were not subject to the same constraints as mentioned above. They are high-ranking government officials, and the system is under the regulation of Ministry of Industry, Mines and Energy, that regulates the sector for small towns and peri-urban areas. Much of the investment capital was raised through solicitation of shareholders, many of whom work for the Department of Potable Water Supply. In addition, they charge $55 - $60 per
household in connection fees, which is some $40 above cost and enables them to recuperate some ten or so percent of their outlay directly from their consumer base. Their monthly operational and maintenance costs, with twelve full time staff, averages $3,800. Their monthly income from water sales averages $9,000 throughout the year. Its capacity is for 3,000 households, 50% more than it is currently supplying.

The MIREP program has six ongoing projects to pilot rural village-level private invested and operated schemes. The investors have previous experience in water supply, most of them formerly managing small informal piped schemes as described earlier. These projects are targeted to supply full access to villages that range from 250 – 400 households, and range from $17,000 to $66,000 in total investment capital. Three of these systems are thus far in operation, and the remainder still under construction and due to become operative later this year.

The project supplies institutional, financial, and technical support for the development of these piped water systems. This assistance overcomes the most critical constraints to private sector investment:

**Institutional:** Whilst there is currently no regulation governing rural water supply in Cambodia, the project facilitates contracts between the private sector and their respective commune council. Investors however do not trust their commune councils, and hence MIREP arranges for the contract to be additionally endorsed by the Provincial Governor.

**Financial:** A subsidy is provided that amounts to 30% of the total capital investment in the facility, equivalent to an average of $40 per household served with water. In addition they arrange for subsidized credit through a commercial bank. The market interest rate is nearly 25%, whereas the credit for these piped schemes is provided at 14%, achieved by guaranteeing some percentage of the loan risk for the borrowing bank. They also assist by negotiating with the bank to accept approximately 200% of loan value as collateral vs. 300%, which is more usual for rural investments.

**Technical:** The project provides water supply station designs, and technical support for operational management during start-up.

The schemes that are already in operation are working well. Investors are satisfied with the institutional arrangements, the financing, and their ability to collect water tariffs.

Whilst the connection rates attained thus far are impressive, and the water cost is lower than that supplied by either the water sellers or the informal pump-and-pipe operators that were replaced, there is a consumer preference for non-chlorinated surface or shallow ground water specifically for drinking

---

2 MIREP – A pilot program of the Ministry of rural development, implemented by GRET and KOSAN Engineering, financed SEDIF (a French water utilities Co.) and the French Ministry of Foreign Affairs

and cooking. There is also an obvious economic incentive for families to continue to harvest rainwater. Thus, even where piped schemes are in operation, end-users often buy and harvest additional water, predominantly for consumption purposes. In addition to a piped water scheme it is therefore common to find door-to-door water sellers providing ‘consumption’ water, and enterprises that make and sell rainwater-harvesting jars, all serving differing niches within the same consumer base.

The importance of this market segmentation to the end users is demonstrated by their willingness to pay for water at differential costs. For example in a single commune in Cambodia, metered water from a piped scheme costs from 30 – 50 US cents per cubic meter, whilst motorcycle-delivered untreated surface water costs $2.5 per cubic meter. Rainwater is of course harvested for free, but is essentially also worth $2.5 per cubic meter as it substitutes as a source of water for drinking / cooking.

It is important to consider consumer water-habits as any private investment is targeting those users as customers. It cannot be assumed that piping significantly cheaper treated water directly into houses will automatically result in a switch to ‘safe’ water consumption. This is not to say that increased access and cheaper water does not have health impacts, it does, through increased use for washing and bathing, but consumers may be using two if not three sources of water at any one time, and for different purposes.

### 2.2 Piped scheme development in Tien Giang Province in Vietnam’s Mekong Delta

In the Southern (Mekong) Delta of Vietnam, drilled water access is prohibitively expensive for individual households. Historically almost every house would harvest rainwater, as well as collect water from open water sources such as ponds and canals. There are also, in similar fashion to Cambodia though in much lower numbers, informal water-seller businesses that source water from community hand pumps or other available sources, and transport it for sale door-to-door.

In the early nineties, a number of small, initially unregulated privately invested piped-schemes that sourced water mainly from tube-wells emerged in response to an obvious demand and willingness to pay. Investment capital was usually raised from the consumers themselves, by charging a large up-front connection fee, typically in the order of $60 to $100 dollars. For this amount, the users did not own a share of the equipment but were still willing to finance at this ‘market’ connection rate.

Alternate management arrangements such as informal user-group invested systems (backed by commune level government), and cooperative managed systems also emerged. In these cases, members invested (usually in the order of $60) in a fund that was used to build a system.

In 1998, the Tien Giang Provincial Government issued a decree to govern the RWS sector. This stipulates investment / operating mechanisms, and which provincial level authorities regulate pricing, drilling, and water quality. In this short decree it also specifies that private investors can no longer raise investment capital from their target consumer base. However, some private investors continue to raise capital from users, but provide a reduced water tariff until such time as the user ‘investment’ is repaid. This is a very attractive proposition for private investors as these businesses have inherently large up-front investments, and relatively low operating expenditures.
The growth in private, cooperative, and user-managed systems has been staggering. In this province with a total population of 1.6 million people, 65% now have access to piped water, mostly through schemes developed since the mid to late nineties. The rate of development of new schemes is now so rapid (some 70-80 per year for the last couple of years), that the remaining 45% of the population will likely be served within the next three to four years. Of the current 415 schemes in operation, 49 are invested by state owned enterprises, 80 by private enterprises, 28 by cooperatives, and 258 by user groups. Most of these stations supply untreated groundwater, a few supply treated surface water.

In addition to these non-state invested systems, there are also 49 state owned enterprises, just eleven percent of the total, but representing some 29 percent of total invested capital in the province. In addition, the state budget has supported the construction of piped schemes in poorer areas. Generally the state provides 40% and the remaining 60% is raised by users. This State subsidy is only available to user-group and cooperative managed systems. Cooperatives are governed by ‘cooperative law’ whilst user-groups are not legally recognized, but define their own rules with local political endorsement.

Of the total invested capital in piped rural water supply schemes in the province: $3,645,000 (61%) has been invested by private investors and water users, $1,760,000 (29%) was invested by state enterprises, and $618,000 (10%) provided as subsidy from state budgets.

Of the capital invested by non-state funds; $998,000 was invested by private individuals, $610,000 by cooperatives, and $2,037,000 by user groups. Reasons for this high proportion of investment by user-groups are:

1. Vietnam is a country of remarkable social structure that reaches right down to the hamlet level. Thus organization of such group investments can take place with relative security of investment.
2. Hamlet leaders are motivated by social incentives that rank them on attainment of social ‘points’. These are awarded for such things as water supply coverage, latrine use, covered pathways, hamlet cleanliness, crime rate, etc. Thus, hamlet leaders are motivated to be pro-active in encouraging the development of these types of systems.
3. The provincial level decree tends to favor user-groups and cooperatives as they can raise adequate investment capital from the consumer (member) base. If an individual entrepreneur borrows capital for a piped scheme, he or she needs to charge accordingly higher tariffs to cover the interest on the loan. Interest rates in Vietnam are however lower than in Cambodia, at around 10% per annum cf. 25%. Water tariffs are tightly controlled, and whilst user-group and cooperative systems provide water at well below the ceiling price, this price has not been updated since 1998, and at the current cost of doing business in Vietnam, it is not very attractive to individual investors, especially if they have to borrow capital.

Since the decree was issued in 1998, the number of user-group invested systems has grown by 800%, cooperatives by 230%, and private investors 130%. In all cases, the government provides technical design support and has a series of pre-designed systems that are tailored for varying populations and water source conditions. Additionally, the drilling of wells is very tightly controlled and there are no private sector well drillers in the province. It is necessary to obtain a license for each and every well drilled.

Mr. Vo Thanh Nha’s rural water supply company

Mr. Nha’s water system was built in 2000 to supply water in Long Vinh Commune, Tien Giang Province. It draws water through a pipe from a canal that is one kilometer away into an 800 m² lined holding tank. From here it is pumped through a simple purification plant, and up to a water tower from where it gravity feeds through the village.

To raise his investment confidence, Mr. Nha designed a household survey that asked whether households would be willing to pay for purified piped water at the Government ceiling-rate of 25 cents/m³ (for water extracted from open water sources). 120 households agreed to this idea, and with this initial market research he invested $14,000 of his own money towards the system. The demand rapidly grew once other households saw the system, but he needed capital to extend the pipeline. He proposed to these interested households that they pay him $20, and he would provide reduced rate water (60% of cost) until their $20 was paid off. The number of connections grew from 120 to 480. He now needed to further upgrade the system, and buy a larger pipeline to feed the station. For this final expansion he borrowed $9,000 from the bank at a rate of 0.85% per month. He anticipates that by the end of 2003 he will have all 600 households connected.

Most of the consumers use his water for drinking, cooking, and animal husbandry – Chicken and Pig Raising. They all still collect rainwater, and they generally use pond water for washing and bathing. But Mr Nha is confident that in the future, more of his consumers will appreciate the value of ‘safe’ water and the consumption will increase. He is projecting that it will take ten years to cover his own and borrowed investment. He has reduced his operational costs by designing a scheme whereby five user’s representatives check meters and collect the tariffs. He pays these representatives with free water.

The 600 households of the village are spread across an area of 6km², which equates to an approximate population density of 500 people/km².

2.3 Technology Supply Chain networks in Central Vietnam

In large areas of Central Vietnam, along the populated coastlines, groundwater is easily accessible in shallow aquifers, of good quality, and replenished ever year through run off from the inland mountain ranges.
In the early nineties, with UNICEF support, the government developed provincial level capacity to drill shallow tube-wells and install VN No.6 pumps, mostly donated for community use. At this time, most rural folk (more than 85% of the population) collected water from uncovered open wells, either in community locations or installed at their homes.

An installed hand pump purchased through the government network cost in the order of $100 (to either donor or purchaser), and due to their centralized (Provincial Capital) location, it took some five simultaneous orders to get them mobilized and out to the countryside. Orders were taken through the commune political system, and passed back in the form of a request to the Centers for Rural Water Supply and Sanitation.

The UNICEF program set the technological standards for both the hardware and its installation. Capacity was built at a provincial level that could be used to further train other water source developers. International Development Enterprises (IDE) began a program in 1995 to expand on this government managed system by developing private sector capacity to provide hand and electric pump installations and after-sales services / maintenance throughout three provinces of Central Vietnam. This entailed building enterprise capacity to manufacture pumps, wholesale pumps and pipes, and drill wells and install pumps. In total some 150 branded well drilling and pump installation enterprises were built, and a corresponding manufacturer and supply network to feed their inventory.

The most critical intervention of IDE was not capacity building however; it was market development. Some 80% of the total program budget was used to finance a targeted commercial quality marketing campaign to fuel a demand for the services and technologies of these supply networks, as well as promote sanitary water handling, storage, and hand washing. Key to the success of this marketing strategy was that it tapped into the emotions and aspirations of the consumer base, separately targeting men, women, girls, and boys. It did not promote hand pumps or wells. It promoted dreams.

The result was a rapid growth in end-user financing of domestic hand pumps and tube-wells. As the project progressed, the marketing support was gradually withdrawn, and marketing tools were developed to enable the private sector to undertake their own promotional activities at a cost and level of effort that was appropriate for their scale of business and profitability. Such tactics included the use of commune loudspeaker systems, leafleting, door-to-door sales, and ‘hijack’ meetings, where a pump installer would give a pre-arranged pitch at an audience gathered for an alternate purpose within their commune.

The decentralization of the hand pump supply / well-drilling enterprises resulted in a cost reduction from approximately $100 to around $30. By the end of the project a total of 64,000 pumps had been purchased throughout 26 districts of three provinces, providing water to some 320,000 people. The total user-invested capital in these unsubsidized installations totaled $2.3 million.

In addition to these sales tactics, the private sector quickly learnt that their best promotion was indeed customer satisfaction as their greatest sales came through referrals. Thus the installers and pump

---

4 International Development Enterprises is a non-profit organization that establishes for-profit enterprises that supply socially beneficial technologies and services to their consumers at an unsubsidized rate. For more information see: www.idevn.org
sellers would focus a great deal of effort to follow up with after-sales servicing and spot check maintenance.

Cumulative Sales Through IDE’s RWS Project c.f. Donated Installations

---

3 Comparative advantages of private sector in RWS

3.1 Leveraging funds

It has been demonstrated that significant if not 100% of required funds can be raised for RWS infrastructure through investing enterprises, consumer fees, and consumers paying for water source development.

In the case of the MIREP projects in Cambodia, a total of 70% of the funds for piped scheme development are raised through investors and users, 61% and 9% respectively. In Tien Giang province in southern Vietnam the earliest pipe-schemes were financed by private investment as well as cash raised up-front from consumers. The majority of schemes are now financed entirely by the users themselves, and some private enterprises utilize a combination of private funds, bank loans, and user advance payments that are discounted from water bills. There are no formulas to derive a successful model. It depends on such things as the local economic situation, the cost of borrowed capital, the cost of water source development vs. user ability to pay, the amount of available investor capital, and so on.

The hand pump network and well drilling services in central Vietnam demonstrate that the private sector can and will invest in water source development services. These businesses do however have relatively low entry costs, and once relationships between suppliers are developed, their inventory is often provided on credit.

3.2 Demand driven services

Private enterprises are by nature customer focused. In a highly competitive business environment such as decentralized supply-chains that provide water pumps and drilled wells, this has some advantages:

1. They are responsive and adaptable. They will change their services to respond to changing consumer demands. If consumers want electric pumps over hand pumps, a pump with a pressurized outlet, or a larger diameter well because they will use it for irrigation in the future, then that is what they are sold. Centrally planned subsidized programs on the other hand often take decisions on behalf of their ‘consumers’ and provide what is deemed to be best for them.

2. Service quality is higher. The cost of marketing in rural areas is high, and entrepreneurs know that their next sales are most likely to come from satisfied customers. Whilst consumers may not proactively advertise good service, news of bad services travels fast.

Piped-scheme operators on the other hand are in a more monopolistic business environment. But they do often provide more localized decision-making, are less bureaucratic, and driven by bottom line. This translates into better service provision such as faster connection times, or faster responsiveness to pipe leakage. In the MIREP project systems in Cambodia user groups are established with elected representatives, and in Vietnam users are often investors and the operators elected. These mechanisms drive either social or financial accountability that is perhaps higher than might be found among salaried rather than profit-driven staff in state-run enterprises.

3.3 Cost effectiveness

Privately invested capital is inherently used with greater cost-consciousness than government invested resources. Thus total capital invested by private sector in the RWS sector is likely to be used more efficiently than equivalent investments by the public sector.

In the case of supply chains developed in central Vietnam, cost reductions achieved by switching to decentralized competitive distribution networks are dramatic. When hand pumps and drilled wells were installed by a centralized government structure, they cost in the order of $100. Hand pumps with
tube wells in the same areas are now purchased through decentralized sales and installation networks for less than one third of this cost.

3.4 **Profits = Greater Likelihood of Sustainability**

Sustainability of RWS interventions is clearly more likely where private entrepreneurs are making a profit and where end-users are paying for services. There is no need for long-term external financial support that, in its absence for whatever reason, would jeopardize the provision of services. There is a closed loop of financial transaction between supply enterprises and end-users.
4 Limitations of private sector in RWS

4.1 Private sector is profit driven, not socially driven

It is interesting to compare both regulated and unregulated market prices for water. In Phnom Penh, Cambodia’s capital, the State Company that managed water supply was privatized, but it is subject to government control on pricing. The result is a socially designed pricing structure to which the operating company must adhere – the less water one uses, the less one has to pay, and the more water one uses, the more one has to pay.

In a privately invested pipe scheme in Takeo Province where there is no such regulatory control, the investor has designed his price structure in reverse, i.e. the less one uses the more one has to pay, and the more one uses the less one has to pay, to encourage greater water use.

This example demonstrates the limitation of private sector in responding to purely social needs. The mechanism to achieve social goals is regulation, but it must be cautiously balanced such that the private entrepreneur can make a decent profit, and is therefore encouraged in the business.

4.2 Not all RWS ‘goals’ can be met through purely private sector strategies

RWS enterprises are responding to consumer water supply needs, which are predominantly cheaper water and more convenient access. Consumers are generally not aware of the health benefits of improved water quality. In an unregulated market and where consumers are not demanding water quality of the suppliers, then private sector is not focused on providing it.

This is amply demonstrated in Cambodia. The unregulated pump-and-pipe operators are not purifying water. Nor are the door-to-door water sellers. They are providing convenient access to untreated water that consumers prefer for drinking and cooking. The regulated pipe scheme operators, who are treating water, are not selling that water because it is treated. They are selling the water because it is cheaper and more convenient. In parallel to the treated water, consumers therefore continue to purchase untreated water from alternate supply networks.

Critical factors such as how end-users handle, store, and treat water will not be addressed through purely private initiatives. The cost of changing consumer habits to derive improvements in health that are one of the targets of almost every RWS intervention cannot be borne by the private sector.
5 **Facilitating the Growth of Private Sector**

Under the social and economic conditions existing in many places of Cambodia and Vietnam significant water development is taking place without any direct institutional financing. Rural investment capacity is growing, and is now approaching or passing the point where village-scale piped-schemes are a feasible investment for the wealthiest businesspeople. Institutional investments in the water sector need to target an acceleration of this growth as well as fill in for the limitations of purely private sector strategies in reaching the social goals of the sector.

Further in-depth research will be required to assess how best Government, Donors, and NGOs can facilitate private sector development. It is however, not a one-size-fits-all business. Circumstances vary greatly from place to place, both on supply and demand sides, and water resources vary dramatically. Thus assessments will have to look carefully at local conditions, and are best informed by whatever small-scale service providers are already in business.

This section discusses some of the crosscutting issues that need to be considered in building a pro-private sector platform and realizing optimal returns on institutional investments in the sector through private sector strategies.

5.1 **Ensure that Institutional Investments Support Rather than Constrain Private Sector**

The social sector is becoming aware of the opportunities of using private sector strategies to achieve social goals. However at present it probably constrains private sector more than supports it. Where intentions are pro-private sector, there is often a knowledge gap as to how to go about supporting it.

Numerous examples can be cited. In the areas where supply chains for hand pumps were being developed in Vietnam, donors that gave away free or subsidized pumps distorted the markets. They would almost never purchase through locally established installation services, often because their internal processes required complex tendering or sought cheapest technology purchases that usually means bulk purchases directly from manufacturers. But no matter how they went about donating pumps and wells, the cost to them was invariably higher than had they purchased directly from the locally established suppliers. These practices additionally generated conflicts of interest. In developing for-profit end-user paying networks, the provision of a donated pump essentially killed the demand for a while, as families that were considering buying, suddenly had an interest to wait and see if they would be donated a pump. In these cases, it was found difficult to discourage donations, or to encourage the donors to support the local networks and purchase through them. This would also have ensured that spare parts were locally available and ‘fitted’ the technologies.

Where subsidies are provided as a sizeable portion of larger investments such as piped schemes, ‘ownership’ can be dictated by political connection rather than a demonstrated willingness to enter business. Enterprises that are spoon-fed by the social sector are not as committed, may not have decided to enter business but been ‘put’ into business. The commitment and long-term success of businesses has much to do with their start-up personal investment risk. If it is necessary to provide direct subsidies, the challenge is to find a balance between two extremes – encouraging business, but not overdoing it to the extent that it jeopardizes the likely success of the intervention.

The MIREP project would only choose investors that had a demonstrated business track record, and were willing to take personal investment risks with their own money. At the other extreme, there is a tendency to mix social goals with business goals. It is more likely that there will be a net and long-term benefit for the poor by having a successful (and therefore relatively wealthy) businessperson serve the poor, than to attempt to implant entrepreneurial skills in someone who has never run a business. Whilst this may seem obvious, it is something that many aid practitioners just find difficult to do.
The aid community needs to ensure that its activities do indeed support rather than compete with private sector providers. Whilst building infrastructure through purely supply-side interventions does result in increased RWS coverage in the short term, if it has disrupted or discouraged private sector by competing with it, then in the long term it may indeed result in a net reduction in coverage.

5.2 Focus on Demand Driven Strategies

It is well known that much of the contamination of drinking water occurs between the water source and the mouths of consumers. A hand pump that provides ‘safe’ water has limited health impacts if users subsequently contaminate the water prior to consumption. Current knowledge is low - less than 50% of the rural population of Cambodia is currently aware that water can bring diseases.\(^6\)

The goals of RWS interventions cannot be achieved through purely supply-side activities. It is evident that providing treated piped water directly into houses will not necessarily result in a total transition to ‘safer’ drinking water. Users might pay for piped water, but if they do not change their consumption habits or systematically sterilize the untreated water they are purchasing in parallel for consumption, then the net gains on improved health may be limited.

To overcome these problems, an intimate understanding of consumer’s water use needs to be undertaken, and a marketing strategy needs to be employed that will encourage users to adopt sanitary practices. Private sector that supply drinking water or water pumping technologies simply cannot afford this undertaking. But herein lies the opportunity. Private sector does need assistance in marketing its services, especially in the case of technology providers. The two (product and social) marketing strategies can be linked, and there is greater efficiency of institutional resource use as the two objectives can be met with a tied marketing campaign. Additionally, this opens new marketing channels that might otherwise only be accessible to the social sector. For example; schools, health stations, and local political networks, all of which have been utilized for demand creation activities in the past.

The importance of demand creation cannot be overemphasized – there is a requirement for a software promotion component in almost all, and arguably all, WATSAN programs. Creating a demand is the most critical intervention that institutional resources can be utilized for. If rural populations wanted to consume sanitized water, if they want to wash their hands after defecation, if they want to build a sanitary latrine, etc, then the rest of the job becomes much easier. Creating a demand among rural populations will fuel a growth in services to supply that demand, and elevate consumer willingness to pay for those services.

5.3 Attach RWS Programs to Higher Value Sources of Water

Consumers are purchasing water or developing water resources because they attach some value to it. This value may be convenience, improved health, taste, etc., and marketing efforts can directly influence the consumer demand.

What the ‘drinking’ water constituency virtually never considers is that the greatest demand for water is actually for irrigation or animal husbandry, because these activities make money. Water is no longer an expense; it can be an income. A key lesson from the hand pump supply chain initiative described earlier is that sales are much higher in areas where consumers are additionally using their water source for irrigation.

In many areas of the world families cultivate crops or keep animals not in some remote farm, but at their houses, the same place that they need to have drinking water access. In one of the most rural piped-water schemes in Tien Giang Province, Vietnam, piped-water consumers use the water for small chicken and pig farms situated alongside their houses. In Cambodia, where supply networks

have been developed by IDE for irrigation, most of the consumers additionally use the water for
domestic use. The two are interlinked, and there exists opportunity to capitalize on this fact.

There is potential to enable even very poor populations to pay for their water source development
themselves by linking irrigation and drinking water. Examples have demonstrated this is possible, and
programs are now underway to demonstrate 100% cost recovery of water source development in poor
areas where source development is relatively expensive, by integrating drinking water and irrigation
needs.\footnote{Transforming Rural Water Access into Profitable Business Opportunities; Polak, Adhikari, Nanes, Salter,
Surywanshi; International Development Enterprises, January 2002}
6 Critical Ingredients for Private Sector Participation in RWS

6.1 Government Support for Private Sector

Government support for the private sector is critical, and will be a cornerstone in pro-private sector investments.

In both Vietnam and Cambodia there is recognition that private sector can and will play a significant role in RWSS. In Vietnam, private sector is a central theme of the Government’s National Rural Water Supply and Sanitation Strategy.

In Cambodia there is currently only a draft rural water policy, but this draft is pro-private sector. It stipulates that communities should pay the real (unsubsidized costs of water), and that private sector should be sought to invest and operate rural water systems.

6.2 Regulation

Whilst governments in both Cambodia and Vietnam are encouraging private sector, there is currently no regulation in the sector in Cambodia, and in Vietnam, it is dependent on individual provincial decrees, which are not yet developed throughout the country.

Government regulation is seen as both an opportunity and a constraint by private investors. It is a balancing act between the protection of an investment and over-regulation that inhibits profitability from that investment. It is likely that the lack of regulation in Cambodia and (formerly) in Tien Giang Province in Vietnam was a contributor to the development of small pump-and-pipe operators, as they were able to charge true market rates for water that enabled them greater profitability and incentive to expand and invest. On the other hand, it is likely that the lack of regulation will have limited the growth of these enterprises beyond a certain investment value in the absence of any licensing or political support for their businesses. A lack of licensing can additionally generate high ‘unofficial’ taxes for entrepreneurs in order to protect their investment.

Regulation is extremely important in determining the opportunities and constraints to increased private sector involvement in the sector. Issues of water pricing are perhaps the most critical and complex component to address. Water resource development costs, dispersion of populations, and user ability to pay, will vary from place to place and can have a dramatic effect on the break-even pricing of piped-water schemes. Thus, pricing controls need to be as decentralized as possible in order that investors are still encouraged into the sector in more challenging (higher cost to-do-business) areas.

The impact of tight regulation in Tien Giang Province has (perhaps unintentionally) favored cooperative and user-group investments over the private sector. It is beyond the scope of this study to assess the relative advantages or disadvantages of these various structures, but it does demonstrate the impact that regulation will have in determining the future structure of non-state operators, particularly in Vietnam.

6.3 Capital Requirements

Utility companies are inherently up-front capital intensive. For this reason, access to long-term credit is a critical factor determining the establishment of these systems. Borrowed capital, particularly in Cambodia is extremely expensive at market rates. Piped water supply businesses are also sensitive to economies of scale, thus it is a difficult decision for investors – they know the cost of borrowing is high, yet the cost of borrowing lesser amounts results in disproportionately higher operating costs per unit of product sold.
The entry cost of water technology supply businesses on the other hand, depending on the geology in their area of operation, is comparatively low. In the supply chain example from Vietnam, where well drillers are able to use hand-boring methods, investment in drilling equipment and start-up inventory is in the order of just $100 or $200. Additionally, once business-to-business relationships are built, their expanded inventory, mainly pumps and pipes, is usually provided on credit. These businesses do not therefore face the same capital start-up capital constraints, but unlike the pipe scheme operators, they do face much more challenging market development costs.

6.4 Technical Skills

A key requirement of private sector entrepreneurs is technical knowledge. In the case of piped-schemes this would include the design and operation of their systems (especially the water treatment components), and in the case of pump installation enterprises, well drilling. Whilst private sector has demonstrated its ability to figure these things out by itself, they are unlikely to meet standards that are acceptable in terms of preserving water resources, or providing their consumers with adequate water quality. They require support in this area, and at the scale of operators assessed in this study, the cost of these services may be prohibitive. The MIREP project in Cambodia is providing these services for aspiring small-scale water supply enterprises, and IDE covered the cost of these services in its programs. In Tien Giang Province, the government provides these services at no official cost to piped-scheme developers and operators.

6.5 Management Structure

The long-term success of the various management structures that are emerging needs to be considered – entirely privately invested and operated, user group investment and operation, cooperative investment and operation, and user investments with third party operation. It is too early to determine the relative effectiveness of these structures now, as these systems are relatively new and management issues are under greatest scrutiny once the systems need repair or upgrading.
7 Conclusion

There exists a vibrant yet relatively small-scale and informal private sector supplying RWS services throughout Vietnam and Cambodia. They are made up of both enterprises that sell water and enterprises that install water source technologies. They often operate in parallel, either providing different services for different populations, or providing different water to the same consumers for a variety of end uses.

This private sector, made up of thousands of micro and small enterprises, is able to earn a decent profit by providing services at a free market rate. It is not possible to estimate the total investment by these enterprises, or the total invested by users each year. However, it is likely that the total private sector/user investment in the sector far exceeds the institutional investment. Private sector providers have demonstrated themselves to be sustainable providers that grow and tailor their businesses to the changing demands of their consumer bases.

There are limitations however. The private sector is not socially, but profit oriented. The most critical effect of this is that they cannot afford, nor are they in the business of providing socially oriented ‘software’ marketing to their consumers. This needs to be funded by the social sector to derive the desired health improvements related to improved water access and sanitation. But herein lies a great opportunity. The social sector needs to promote software, and this promotion, if effective, will result in an increased demand for clean water and improved sanitation facilities. Thus, the social sector can fuel a demand, and in parallel, support the private sector providers with technical backstopping to fill the demand as it emerges.

The shortfall of global RWS resources to meet the Millennium Development Goals is estimated at approximately 140% (180 billion dollars required vs. 75 billion dollars available). However there are great opportunities to tap into and work with private investment in the sector. Private sector can provide 100% of infrastructure cost. Thus, the social sector needs to re-think how it uses the available resources - why spend on infrastructure if this can be financed from non-institutional resources. Why not instead spend the bulk of institutional resources to create the demand that is required to change domestic sanitation to meet health objectives and at the same time fuel end-user investment in support of private sector suppliers.

The projects cited in this report spend far less than 50% of their total resources for water source development. The MIREP project finances just 30%, and it may be possible in the future to reduce this amount even to zero. In Tien Giang province in southern Vietnam, public funds provide technical design, and some subsidy to poorer communities for water source development, but 62% of funds have come from non-public sources. In the IDE hand pump program, the resources spent on social change / demand creation and private sector capacity building was in the order of $1.2 million over the course of the project, and the total invested by end-users was $3.2 million.
8 **List of Resource Documents:**

4. MIREP Presentation – Jien Pierre Mahe
5. Emerging lessons second draft
9. Cash Flow for Pech Changva Piped Scheme - MIREP
10. Cash Flow Tram Knar Piped Scheme - MIREP
14. Decree No. 16, Tien Giang Peoples Committee.
15. General Review of Four Year’s Implementation of Decree No.16/CT of the People’s Committee of Tien Giang Province on Rural Domestic Water Management and an Introduction to the Rural Water Supply Strategy. People’s Committee of Tien Giang Province.