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Output-based Aid in Cambodia: Getting Private Operators and Local Communities to Help Deliver Water to the Poor – The Experience to Date

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The OBA pilot in small towns in Cambodia, funded by the World Bank, was one of the first OBA water supply pilots to be initiated. The project was initially hailed as a success: there were a relatively good number of bidders; there was substantial donor and government coordination; and the tendering process apparently led to an efficient result with the lowest subsidy required per output (connection) substantially lower than expected. However, as this paper demonstrates, the project has not to date delivered the expected results, especially in terms of private sector leveraging. The reasons for this are probably various and include deficiencies in the contractual arrangements and bidding processes/variables, and the lack of capacity of the operators.

This working paper provides insights into the initial lessons learned from the OBA pilot which are particularly interesting because of the possible comparison with more input-based schemes ("Design Build Lease" arrangements) undertaken at the same time and also funded through the World Bank credit. However, the full potential of the OBA scheme could not be measured at the time of this paper, since project implementation was impacted by the Bank's partial cancellation of its credit due to suspicions of fraud and corruption. Despite this setback, there remains a window of opportunity for the OBA scheme to be applied to larger water supply schemes and on a national scale.

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Background

After decades of war and social disruption in Cambodia, the country's physical infrastructure was left in a dismal state in the 1990s: publicly-run water utilities were few in number, services were mostly limited to provincial capitals[1], and service was poor. Most households relied on self-provisioning; the more affluent were serviced by unlicensed private operators which meant untreated water, intermittent service, and high connection costs.

Since then, much progress has been made in the country's urban water supply sector, due largely to the achievements of the Phnom Penh Water Supply Authority (PPWSA), a publicly-run water utility serving the capital city, which used about US$100 million in donor assistance to improve its services and capacity. At present, PPWSA is among the best-performing water utilities in the East Asia region. However, outside Phnom Penh, service levels remain poor and water service coverage is low; coverage in provincial towns with piped systems is only 15 percent. The poor are disproportionately affected by the lack of access to piped water supply as evidenced by health and poverty indicators (see **Table 1**).[2]

Table 1: Estimated Access to Piped Water Supply, Health and Poverty Indicators by Province, 2004

Region	Access to piped water supply (% of population)	Infant mortality (per 1,000 live births)	Child mortality (per 1,000 live births)	Incidence of diarrhea (% of population)	Poverty incidence (% of population)
Phnom Penh	83.7	16	13	2.2	4.6
Plains	3.8	38	29	3.5	32.5
Tonle Sap	3.6	49	33	3.9	42.7
Coast	9.4	36	23	3.2	28.8
Plateau/Mountain	3.5	63	33	2.5	51.8
Other Plateau/ Mountain	6.3	40	44	4.0	46.1

Source: Implementation Strategy for Urban Water Supply, World Bank, November 2006; based on raw data from the Cambodia Socio-Economic Survey, 2004

[1] Four out of 24 provincial capitals did not have any water supply system at all.

[2] Cambodia remains one of the poorest countries in the world with a per capita income of US$290 and almost 40 percent of the population living below the poverty line. (Source: 2000 Human Development Report, UNFPA)

In 2003, the World Bank provided a loan[3] to the Government of Cambodia to help the country reach the Millennium Development Goals in water supply and sanitation by 2015. Two approaches were piloted under the Cambodia Provincial and Peri-Urban Water and Sanitation Project, both designed to capitalize on the vibrant private sector presence in water supply provisioning in the country (it is reported that there are currently at least 300 private water providers of varying sizes and capacities[4]).

The *first* approach is the Design-Build-Lease (DBL) scheme which is similar to a construction contract. Payments are made to the winning contractor on the basis of inputs (90 percent of estimated capital costs), and the same contractor is responsible for operating and managing the system over a 15-year period. In exchange, the contractor/ operator pays the government a lease fee.

The *second* approach is the Output-based Aid (OBA) scheme using a Design-Build-Operate contract. Under this scheme, the winning contractor is paid an agreed amount for every connection made to a pre-identified poor household. The bulk of the payment is made only after the connections have been validated as functioning by an independent engineer. A list of poor households eligible for 'free' connection is disclosed to the bidders during the tendering process and is made part of the contract. The same contractor is made responsible for operating and managing the water supply system over a 15-year period but is not required to pay a lease fee to the government.

This case study focuses on reviewing the experience to date of the *second* approach. It examines OBA implementation in Cambodia in terms of (a) whether the premises and expectations during its design did, in fact, materialize, or whether there were any unintended outcomes; (b) more specifically, whether the contract design was sufficiently coherent with purported objectives or outcomes; and (c) whether there is potential for wider replication in the country building on lessons learned during implementation.

The current assessment is being made with limited information as only one water supply system has been completed and made operational out of six contracts awarded since the start of the program in 2003. Implementation was affected by the Bank's partial cancellation of credit for four OBA contracts in June 2006 (out of 22 contracts in this Bank project, including those under the DBL scheme) and temporary suspension of credit for the remainder because of suspicion of fraud and corruption.

At the time of the Bank's partial cancellation/temporary suspension, there were two OBA contracts under procurement and one under preparation. The contract that was under preparation was intended to pilot the OBA scheme under somewhat different conditions from earlier batches of towns and could have provided additional insights on improving OBA design for Cambodia. Thus, this assessment is preliminary and the findings should be subject to further validation based on the experiences of the remaining ongoing projects as they are completed and made operational, as well as the experiences of other donor-funded projects that adopt the OBA framework after this study. The comparison between OBA and DBL schemes, while unintentional, was inevitable as both schemes were implemented during the

[3] Credit in the amount of US$16.9 million and grants in the amount of SDR 3.1 million.
[4] Water Supply and Sanitation Project in Small Towns of Cambodia, Main Report, Final Draft, December 2006, AFD-FEPP funded project.

same period and both were conceived primarily to harness private sector resources and expertise in expanding and improving water supply services, although in different conditions.

The OBA scheme as conceived and designed

The underlying premise of the OBA scheme in Cambodia was that providing a subsidy[5] to a water supply project in an area with a relatively large population and with potential for high economic growth would encourage private investors to risk their capital. The fact that the government was granting the exclusive right to the contractor/operator to operate in the service area was expected to act as an incentive and result in the mobilization of significant private resources. The intended outcomes of the OBA scheme were thus: (a) expansion of service coverage; (b) a more efficient leveraging of private funds because of the output-based approach; (c) a better targeting of the subsidy because of its focus on the poor; (d) more efficient investments on the assumption that the private operator would introduce cost-efficient processes and technology during construction and operation; (e) poor households having access to better water supply service which traditionally has been difficult due to high connection costs; and, (f) service standards upgraded and maintained throughout the contract period because of services being subject to regulation.

The subsidy was on a per connection basis. The benchmark used in setting the maximum amount of subsidy was the average investment cost per connection of a publicly constructed system in a small town, estimated at US$500[6]. The subsidy covers the cost of the meter and a maximum of 10 meters of pipe to the household's property line - as well as other costs associated with delivering the service to the household, such as source development, treatment/storage, transmission line, and distribution system.

The water supply system is designed so that an 'initial' supply network is in place prior to start of operation that would be able to serve the requirements of the pre-identified poor households by the first year of operation, and to meet the projected service connections target over the long term. Non-targeted households are charged a service connection fee to connect to the system. The expectation is that as demand for services increases, service connections will be made up to the limits of the 'final' supply network.[7]

There is no subsidy on the water tariff on the assumption that the barrier to access to safe water for the poor is the high connection cost and not the tariff. The tariff, therefore, is the same for both 'poor' and 'non-poor' consumers. A tariff of 2,000 riels (about 50 US cents) per cubic meter, deemed as the affordable level, was set by the government for all OBA towns. The contract does not require a monthly minimum charge per connection, so the monthly bill is based on actual water consumption. The tariff is to be adjusted regularly based on inflation and may also be adjusted to take extraordinary circumstances into account, where these can be proven to have an impact on operating income.

[5] That is, no repayment to the government is required either from the contractor or the community.
[6] The amount of US$500 was based on the World Bank's project preparation studies carried out in 2000 for DBL projects in Cambodia.
[7] The 'final' supply network is the configuration of the water supply system when it has reached its full potential as designed and constructed. Beyond the 'final' supply network, any expansion is an investment decision of the operator.

Recipients of the subsidy were identified through a process involving local authorities and communities, after agreement was reached on a set of criteria for defining the poor (whether they were asset holders, type of dwelling, etc.), and the list was verified by an independent consultant. There was no ceiling set on total amount of subsidy to be received per town or the number of recipients of the subsidy per town.

The bid was structured as a "discount": the bidder who submitted the highest discount on the estimated cost won the bid. In other words, the tender was based on lowest cost: the bidder who required the lowest subsidy to build and operate the system for the 15-year period won the bid. The bid was accompanied by a conceptual design, estimated investment and operation and maintenance costs, and a financial analysis to support the viability of the bid and design proposal. These were reviewed by an independent consultant against prescribed technical specifications.

The contract required payment of the subsidy only upon certification from an independent consultant that the connection had been made to the pre-identified poor households. The payment schedule was on a staggered basis: 5 percent upon drilling of wells (abandoned or dry wells were compensated separately outside of the contract amount), 5 percent upon acceptance of the detailed design, 80 percent upon certification by an independent engineer of the connection made, and the remaining 10 percent upon demonstration that the functional guarantees in the contract had been met. The functional guarantees included water quality according to national drinking water standards and water pressure of at least 3 meters.

In terms of the risks incurred by the parties involved, the private provider assumed the technical, financial, market demand, and revenue risks. The private operator had to undertake all the preparatory work relating to raw water source verification and detailed design, and advance most of the capital costs involved, as well as the costs of marketing and raising awareness among potential customers in the service area; the Bank financed marketing and awareness-raising only where poor households were involved.[8] While the OBA-DBO contract does not require payment of lease fees, a minimal amount is required to be paid to the government annually for contract supervision and regulation (called the supervision fee). The risks to the operator were partly mitigated by the nature of the OBA pilot towns – more densely populated and with higher incomes than the DBL towns, and located along national highways connecting to other towns and provincial centers.

The government runs the risk of not achieving the desired expansion of coverage, given that there is no requirement in the contract for minimum coverage beyond connecting the identified poor households (on average, poor households comprise 22 percent of the service area population at the time of preparation). The technical specifications section of the contract mentions that connections should be made to at least 60 percent of the service area during the construction period. However, this condition was not included among the requirements for OBA payment, aside from the functional guarantees, in order to reduce the risk to the operator during contract implementation, and therefore the government has less leverage to enforce it. There are also no liquidated damages for delays in implementation on the contractor's part, so as to reduce the risk to the operator during the procurement process.

[8] A non-governmental organization, the Center for Development (CfD), was hired by the Bank to assist in public information dissemination in the OBA and DBL towns, primarily on health and hygiene issues related to the provision of water supply services of standard quality.

The financial risk to the government, however, is low as the bulk of payment relating to the subsidy is made only upon certification that a connection to a poor household has been made.

Observations from implementation

Selection of OBA towns (OBA 1 and OBA 2)

Six towns are implementing the OBA approach at the time of this writing, with an additional two towns subject to a rebid. These eight towns are located in one province, Kampong Cham, and were due to be implemented in two batches: the first four towns identified in 2002 (Chrey Vien, Peam Chi Kang, Skun, and Suong) and the second four identified in 2004 (Pha'av, Mesar Chrey, Prek Kak, and Kroach Chhmar). All involved the development of new water supply systems; prior to the project, they were serviced by unlicensed private providers and/or by self-provisioning e.g., dug/shallow wells. The first batch of projects was in areas with relatively large populations and generally in bustling, growing towns and settlements with good accessibility (located along major highways), largely in accordance with the design of the OBA scheme. Also, a significant proportion of the populations were involved in commercial and retail market activities. On average, populations in these OBA towns were over 10,000 (DBL towns had populations of less than 10,000). The second batch of towns, however, were in less accessible areas (one is located across a river that becomes impassable during the rainy season), which is one of the reasons why two towns in the second batch did not receive a bid in the first round of bidding.

A third batch was under preparation in May 2006[9] with conditions somewhat different from OBA 1 and 2 towns. This involved one pilot covering a provincial capital town with a much larger population (about 30,000 vs. average of 13,000 in the earlier pilot towns) and with experience of being served by an operating water utility. The arrangement with the private provider would have been a concession contract rather than a DBO contract. This would have supported the government's strategy of strengthening public utilities in the urban water sector and was based on the government's positive experience with PPWSA. The design would have taken into consideration the availability of data on consumption patterns and would thus have mitigated demand and revenue risks, a concern that was emerging in the projects in the OBA 1 and OBA 2 towns.

Targeting of poor households eligible for subsidy

The criteria for selecting poor households were generally established by consensus and depended on the ideas of local leaders, district councils, and communities, mainly due to the absence of an official methodology for defining the poor, such as a basic needs assessment survey tool. Nevertheless, the criteria tended to be similar across the towns and included common considerations relating to asset ownership, types of dwelling, etc. While the list of poor households was drawn up by the local authorities and communities working together, and subsequently verified by an independent consultant, the final decision was validated by the local elected leaders. Nonetheless, the involvement of an independent consultant mitigated the tendency for political influence on the list drawn up by the community.

[9] Preparation eventually did not proceed after the Bank's partial cancellation/temporary suspension of credit in June 2006. The provincial town has since awarded the concession to a private firm through negotiation.

Although there was no pre-set ceiling on the number of poor households that could be included in each town's list, the proportion of poor households on the lists tended to correspond to the official levels of poverty incidence in the towns (see **Table 2**). Meanwhile, the lack of a clear ceiling on the subsidy for each town created some confusion among the bidders: in the two towns that did not receive bids in the second round, the bidders assumed that the total subsidy for each town was not sufficient given that they were less accessible and less affluent than the earlier OBA towns.

Table 2. Targeting of Poor Households Eligible for Subsidy

Town	Population in service area 1/	No. of households in service area 1/	No. of identified poor households 1/	Equivalent population of poor households 1/	% of population of identified poor households in service area	Official poverty rates in 2000/2001 (%)
OBA Batch 1						
Chrey Vien	13,678	2,682	345	1,760	13	28-44
Peam Chi Kang	17,791	3,421	660	3,432	19	13-18
Skun	14,179	2,578	1,004	5,522	39	42
Suong	22,480	4,408	990	5,049	22	18-33
Total	**68,128**	**13,089**	**2,999**	**15,763**		
OBA Batch 2						
Pha'av	8,100	1,500	214	1,156	14	20
Mesar Chrey	17,080	3,163	751	4,055	24	28
Prek Kak 2/	5,959	1,146	180	936	16	No data
Kroach Chhmar 2/	11,076	2,130	366	1,903	17	22
Total	**42,215**	**7,939**	**1,511**	**8,050**		
Grand Total	**110,343**	**21,028**	**4,510**	**23,813**		

Notes: 1/ Figures are as of date of project preparation; Batch 1 towns in 2002 and Batch 2 towns in 2004
2/ Town did not receive a bid in the first round; it was rebid.
Source: Ministry of Industry, Mines and Energy - Project Management Office (MIME-PMO)

Normally in large cities, the poor tend to cluster in slums and depressed areas, making it possible for OBA subsidies to be targeted geographically without going through a detailed process of identification and selection of poor households. In Cambodia, however, the detailed process was felt to be necessary because, as in other developing countries where urbanized areas are not necessarily "cities", poor households intermingle with non-poor households in the same neighborhoods.

Bidding

Enthusiasm in the market was high during the bidding for the first batch of OBA towns in 2003, as shown in the number of firms that were pre-qualified, the number that actually submitted bids, the type of firms that submitted bids, and the bids themselves. On a per town

basis, there were eight pre-qualified firms, of which two submitted bids for each town. An international firm, a joint venture between a Singaporean and a local firm, SINCAM, won the bid for the four towns in the first batch.

The bidding for the second batch of four towns a year later did not elicit as much enthusiasm from the market; fewer firms participated (seven firms were pre-qualified, of which one submitted one bid for only two towns) and the bidding attracted only local firms. There were several reasons why two towns did not receive bids: one town was difficult to access (located across a river), increasing the cost of transporting construction materials; the source of raw water in the other town was potentially surface water which would have been more expensive than groundwater in terms of treatment and operating costs; the relative subsidy was perceived to be lower than for the first batch of towns; and income levels were assessed to be lower, making operations more risky for the private operator. The rebid for these two towns saw a slight revision in the tender conditions: bids of more than 100 percent of the estimated subsidy were allowed, the payment schedule included a 5 percent advance payment, and the construction period was extended from 20 to 30 months (an insignificant change since there were no liquidated damages for delayed completion). The rebid was carried out during the investigation process by the Bank, which was the subject of considerable media attention, and this increased the bidders' perception of the risks. The rebid resulted in much higher bids, as high as almost 200 percent of the estimated subsidy (see **Table 3**).

Table 3. Bids Received for the OBA Towns

Town	Bid (% of comparator)	Equivalent amount in US$
Public sector comparator		**500**
OBA Batch 1		
Chrey Vien	79.2	396
Peam Chi Kang	79.2	396
Skun	74.2	371
Suong	74.2	371
OBA Batch 2		
Pha'av	80.0	400
Mesar Chrey	89.0	445
Prek Kak a/	184.0 a/	920
Kroach Chhmar a/	187.0 a/	935

Note: a/ Bid received during rebid.
Source: MIME-PMO

In comparison to the OBA towns, the DBL towns generally attracted more bidders as they were perceived to be less risky, at least in the construction phase where the government was financing 90 percent of the cost as well as preliminary design work and physical surveys, which were made part of the bidding documents. The operational phase is different as DBL operators are required to pay a lease fee to the government (not required in the OBA-DBO contracts) and so they carry a revenue risk. The OBA scheme also places a risk on the operator to generate revenues to recover its costs, but to a lesser extent as the OBA operator has more flexibility in design and construction.

Extent of private financial resources mobilized

The OBA scheme was expected to mobilize private financial resources with the provision of the subsidy and the granting of an exclusive right to the contractor to operate (license) in the

service area. The bids show that the total amount of subsidy was 45 percent of the total capital costs on average, excluding the costs of physical surveys and detailed design preparation which was shouldered by the contractor. This left more than 55 percent of total investment costs to private financing (see **Table 4**).

Table 4. Estimated Capital Costs and Financing

Town	Total estimated capital costs (US$)	Total subsidy amount (US$)	%	Private operator contribution (US$)	%
OBA Batch 1					
Chrey Vien	406,723	133,170	33	273,553	67
Peam Chi Kang	754,424	254,760	34	499,664	66
Skun	450,434	362,042	80	88,392	20
Suong	686,405	356,994	52	329,411	48
Total	**2,297,989**	**1,106,966**	**48**	**1,191,020**	**52**
OBA Batch 2					
Pha'av	422,950	85,600	20	337,350	80
Mesar Chrey	700,402	334,195	48	366,207	52
Prek Kak	194,195	90,000	46	104,925	54
Kroach Chhmar	362,296	183,000	51	179,296	49
Total	**1,679,843**	**692,795**	**41**	**987,778**	**59**
Grand Total	**3,977,832**	**1,799,761**	**45**	**2,178,798**	**55**

Source: MIME-PMO

In the case of the completed contract (Peam Chi Kang) and another contract (Suong) under OBA, after 65 percent completion, it is estimated that about US$1 million was mobilized from the private sector. For the remaining four ongoing contracts which are less than 10 percent complete, it is uncertain whether the full amount of expected private financial resources will eventually be mobilized. Under DBL, public financing is 90 percent of the capital cost plus the cost of physical surveys and design studies, and private financing is 10 percent, although the public financing would be recovered through lease fee payments over a 30-year period (effectively two cycles of 15-year lease contracts).

Contract implementation

Contract implementation under OBA is relatively long given that the responsibility for raw water source investigation and confirmation and detailed design preparation is with the contractor. The contract period was set at 24 months for OBA 1 towns, 20 months for OBA 2 towns, and 30 months for OBA 2 rebid towns. On top of this is the time spent on preparing the list of poor households, which begins one year earlier.

Delays in implementation were due primarily to issues such as acquiring land for the water treatment plant, building commitment for the project among the local community, and especially confirming groundwater sources. The Peam Chi Kang project used surface water and it still took 27 months to complete. The other three OBA 1 towns were tapping groundwater sources; of these Suong, which is 65 percent complete, had a revised completion schedule of 30 months at the time the Bank's partial cancellation took effect. In Pha'av town (OBA 2) which was tapping groundwater, the Government undertook geo-resistivity surveys prior to tendering in the hope of facilitating project implementation and to reduce the risk to

the private provider. Despite this, the provider still encountered difficulties with the required water quantity during well drilling.

This long implementation period has had an effect on the poor households whose expectations were raised during the surveys and on the credibility of the project. In Peam Chi Kang, for example, actual connections made to poor households decreased by 7 percent (from 660 to 612) as some households had moved to other areas where water was available. Also, it is uncertain whether the earlier identified poor households are still considered poor or whether there should be new additions to the list.

Insights and lessons learned

While these are early days for OBA in Cambodia, the experience to date raises some important questions:

- Has the OBA scheme helped to ensure a minimum level of coverage and to expand service coverage significantly as envisioned?
- Has the OBA scheme been more efficient in mobilizing private financial resources than the DBL scheme?
- To what extent is the OBA scheme more cost-efficient in investments than the DBL scheme?
- Has the OBA scheme been helpful in providing the poor with access to better services? Is the OBA scheme, as currently designed, sustainable?

In attempting to address these questions, some suggestions are made on how to improve OBA design in any possible replications in the future. As mentioned earlier in this study, it is important to note that this assessment is being made with the available information and that circumstances may change in those projects still under implementation.

Has the OBA scheme helped to ensure a minimum level of coverage and to expand service coverage significantly as envisioned?

There are several reasons why the OBA scheme could be expected to ensure a minimum level of coverage and to expand service coverage significantly. First, the approved technical designs for the OBA towns assume that a certain number of connections are made by the design year (year 7 of operation). Second, the technical specifications require that at least 60 percent of the existing population is connected during the construction period (although this was not included in the parameters for functional guarantees in order to reduce the risk during implementation). Third, under OBA 1 projects, the average subsidy per connection paid out to the operator for connecting a poor household is US$369, while the average investment cost for any given connection (i.e., total investment divided by expected number of connections, to serve projected demand over a 7-year period) is US$136. Thus, the subsidy is financing a significant portion of the upfront costs of the water supply system which will be used by poor and non-poor households alike. It should thus provide an incentive (increased profits) to the operator to connect non-poor households, using their financial arrangements, to the extent that the system can accommodate.[10]

[10] To build incentives for the operators, the 'initial' supply network is constructed with 45 percent subsidy on average. Filling up the 'initial' supply network to its full capacity (that is, to its designed configuration which

In the case of Peam Chi Kang (the case for which most information is currently available), it is apparent that at the time of writing this paper, the operator has not fully realized the incentives offered by the OBA scheme. So far, the operator has concentrated on connecting the poor households (612 new connections) so that it could collect the subsidy of US$396 per connection, and has connected only about 370 non-poor households. With 982 connections at Peam Chi Kang at the time of writing, service coverage is only 28 percent, using 2002 data on service area population.

Lack of capacity on the part of the operator may be one of the reasons for this situation. While a joint venture between a foreign and local company won the bid for Peam Chi Kang, operation was essentially left to the local company, a construction firm with essentially no prior experience in water distribution and operation. This may explain the operator's tendency to cash in on OBA subsidy payments in the construction phase and its failure to realize the potential profits from maximizing operational capacity of the system by expanding coverage to the 'non-poor'.

Other factors may explain the operator's behavior, including its failure to do any marketing to raise awareness of the benefits of connecting to the system in terms of health and hygiene. First, the temporary suspension of the OBA payments could have created a shortage in cash for the operator to finance marketing activities. Second, marketing to households who have been used to their existing water sources (albeit unsafe and unreliable) requires some demonstration effect to prove that the service being provided is a better one in terms of service level and cost than their existing sources. Such demonstration effect requires time and a certain capacity for marketing on the part of the operator. Third, there is generally a 'wait and see' attitude among first-time users, common in developing countries (although this should be common in the DBL towns as well).

An effective marketing campaign could have countered the illegal (unlicensed) operators who were still active in the area and who were offering cheaper, but substandard, services to the customer, making it even more difficult for the operator to raise revenues.[11] In the future, the Ministry of Industry, Mines and Energy (MIME) should be able to regulate these illegal operators given that the contract with the operator grants it the exclusive right to operate in the service area.

Coverage can be expected to remain low, basically covering only the poor households, which represented between 13 and 34 percent of the service area at the time the surveys were undertaken, unless further technical assistance is provided to the operators to capitalize on the potential benefits of the OBA scheme. Also, the OBA contract may be revised to include a minimum level of coverage as part of the functional guarantees to help operators have a viable start-up level of operations, increasing the risk to the operator at the procurement stage.

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would make up the 'final' supply network) requires minimal additional costs to the operator that could be recovered from the service connection fee and tariffs.

[11] In the case of Peam Chi Kang, as many as five unlicensed operators are reported to be operating in the service area.

Has the OBA scheme been more efficient in mobilizing private financial resources than the DBL scheme?

On the surface, the OBA scheme seems to have more potential for mobilizing private resources given that public funding is only 45 percent of the capital costs on average, whereas in the DBL scheme the government funds 90 percent of the capital costs. However, the DBL scheme requires lease fee payments to recover public funding, while the OBA scheme does not. Therefore, under DBL, more private capital needs to be risked during operations to support continuous marketing and cost efficiency measures in order to be able to generate sufficient revenues.

A study funded by the French Development Cooperation Agency (AFD) in late 2005 revealed that the leveraging effect for private financing was potentially higher in DBL than in OBA because of the fact that public financing would be repaid, and this regardless of whether sufficient revenues could be generated from operations to finance the lease fee payments. The paper estimated that the leveraging effect was almost US$5 of private funds for every US$1 of public funds under DBL – although including technical assistance decreases the leveraging effect to less than US$2 – and a little over US$1 of private funds for every US$1 of public funds under OBA.[12]

In addition, the government considers the DBL scheme to have more leveraging effect on the sector, i.e. beyond the project, as the lease fee not only covers repayment of World Bank credit but also depreciation of the facilities. It thus allows the government to use the 'surplus' fund for developing other areas, an option the OBA scheme does not offer.

A strong private operator under the OBA-DBO scheme should have been able to realize what needs to be done to be a robust operator under the conditions. By teaming up with a foreign company (in the case of Peam Chi Kang and the rest of the batch 1 towns), the operator was expected to have such a capacity; however, it is apparent that the partnership was only to finance the construction phase.

To what extent is the OBA scheme more cost-efficient in investments than the DBL scheme?

Based on the figures in **Table 5**, the OBA scheme seems to provide a much lower average investment cost per connection, 34 percent lower than the DBL scheme. However, this is based on the assumption that the target number of connections would be reached. Based on the experience to date, the tendency is for the operator to connect households only to the extent of fulfilling requirements to complete construction. Under the OBA scheme, this means connecting the poor households on the agreed list (28 percent of service area population at the time of survey for Peam Chi Kang). Under the DBL scheme, it means connecting the households on the willingness to connect (WTC) survey list (average of 71 percent of service area population including poor and non-poor at the time of survey for three completed towns).

The DBL contract requires as part of the functional guarantees that 75 percent of the WTC list is connected at the start of the first year of operation and 90 percent by the second year. Such a guarantee would also have been useful in the OBA schemes, which did not appear to

[12] Study on Water Supply and Sanitation Project in Small Towns in Cambodia, AFD-FEPP, December 2005.

have sufficient in-built incentives to entice operators/investors to jointly make more connections of their own accord. If the assumption is that not many more connections in the OBA contracts will be made in the following years, the OBA scheme becomes much more expensive per connection because of the lower percentage of poor households provided with the subsidy as compared to DBL. Again, what is probably required is continued capacity building for the operators to enable them to realize that connecting more households and investing in marketing will make their operations more cost-efficient and profitable.

Table 5. Average Investment Cost for OBA vs. DBL Projects

Town	Target number of domestic connections by design year (year 7)	Estimated total capital cost (US$)	Average investment cost per connection (US$)
OBA Batch 1			
Chrey Vien	3,519	406,723	116
Peam Chi Kang	4,380	754,424	172
Skun	3,383	450,434	133
Suong	5,642	686,405	122
Total Average	**16,924**	**2,297,989**	**136**
OBA Batch 2			
Pha'av	1,828	422,950	231
Mesar Chrey	3,760	700,402	186
Prek Kak	1,257	194,195	155
Kroach Chhmar	2,336	362,296	155
Total Average	**9,181**	**1,679,843**	**183**
Total OBA Average	**26,105**	**3,977,832**	**152**
Total DBL1 Average	**8,924**	**2,227,310**	**250**
Total DBL2 Average	**8,617**	**2,652,803**	**308**
Total DBL Average	**17,541**	**4,880,113**	**278**

Source: Raw data from MIME-PMO

Has the OBA scheme been helpful in providing the poor with access to better services? Is the OBA scheme, as currently designed, sustainable?

To the extent that the list of poor households reflects actual conditions at the time of implementation (which is currently prone to substantial delay), the OBA scheme can be said to be helpful in providing poor households with the opportunity to access better services, otherwise requiring high connection costs and deemed unaffordable. However, the OBA scheme does not address affordability of tariff directly and if the poor come from the lowest rung of the income ladder, it is possible that sustaining the benefits from access would be a problem in the early stages of the operation.

Poor households tend to limit their consumption (currently 15 liters per capita per day on average in Peam Chi Kang) for cooking and drinking purposes, which still allows them to realize some health benefits and to supply their other water needs from water vendors at a cheaper price but with lower quality. This very low consumption level may affect the utility's viability and unless the utility is able to connect non-poor households with higher income and higher potential consumption, the sustainability of the system could be at risk.

In the OBA 3 town that was to be piloted in Kampong Chhnang, a provincial capital with a population of about 30,000 and with an existing system operated by a public utility serving only 20% of the service area, the issue of viability and sustainability would have been better

addressed in the design of the system (under a concession contract). This is because information on the consumption pattern of existing customers is available and revenues could be generated right away from existing customers while marketing for new customers was undertaken, mitigating some of the revenue risks.

Other insights

The OBA scheme helped to protect against corruption, an issue that led to the Bank's partial cancellation/temporary suspension of credit in the project. Because payments to the contractor/provider were essentially made towards the end of contract implementation, the pay-off for any corruption and fraud did not materialize and instead actually penalized the operator. While substantial accomplishments in construction have been achieved in at least two towns, payments for the subsidy have been minimal (see **Table 6**).

Table 6. Status of Works Completed, Certified for Payment and Payments Made from Subsidy

Town	Estimated value of works completed (%)	Works certified for payment 1/	Payment made from subsidy
OBA Batch 1			
Chrey Vien	10	10	10
Peam Chi Kang	97	95	10
Skun	3	0	0
Suong	65	10	10
OBA Batch 2			
Pha'av	3	5	5
Mesar Chrey	6	0	0

Note: Data are as of March 2007
1/ Does not include payment of abandoned wells; Skun and Mesar Chrey had one abandoned well each and Pha'av, two abandoned wells.
Source: MIME-PMO

Future plans

Prior to the Bank's partial cancellation/temporary suspension of credit in June 2006[13], MIME had planned to expand the OBA scheme to other towns under a modified design following OBA 3 through a new World Bank loan, including refining contract and implementation arrangements to address bottlenecks that were encountered in OBA 1 and 2. At the time of writing, these plans have been indefinitely suspended with the four remaining uncompleted contracts to be renegotiated by the government with the contractors without Bank involvement, but keeping the agreement of providing free connections to identified poor households.[14] A parallel program funded by the French government, MIREP, which involves many smaller water supply schemes in mainly rural areas implemented directly with local authorities, will pick up the OBA concept of providing subsidies for free connections to poor households.

There remains a window of opportunity for the OBA scheme to be applied to larger water supply schemes and on a national scale. The government is in the process of developing

[13] Suspension of Bank credit was lifted in February 2007.
[14]The renegotiation of the contract will involve replacing the payment of the output-based subsidy with other concessions, such as tax holiday, reduced standards in technical specifications, and allowing the contractor to expand business (e.g. providing concessions to bottled water, etc.).

laws for decentralization which place local authorities in the forefront of basic service delivery to the population, including water supply and sanitation. Through this decentralized institutional arrangement, the Bank may consider continuing with the implementation of OBA in Cambodia. Further, neighboring countries such as the Lao People's Democratic Republic have learned lessons from Cambodia's experience and are considering building upon them to pilot OBA themselves.

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The GPOBA Working Paper Series is a forum for presenting topics related to output-based aid approaches that may help in enhancing the design of future OBA projects. The series will focus on the infrastructure and social services sectors, but may also include papers that are non-sector specific. The forum is intended to be a relatively informal and efficient way to discuss relevant OBA design issues. The conclusions presented in each working paper are those conclusions of the authors, and do not necessarily represent the views of GPOBA or its donors.

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