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39th WEDC International Conference, Kumasi, Ghana, 2016**ENSURING AVAILABILITY AND SUSTAINABLE MANAGEMENT
OF WATER AND SANITATION FOR ALL****Willingness to pay for WASH education services:
a case study in Honduras***B. Coff, D. Weatherill & S. Passmore (Canada)***REFEREED PAPER 2478**

Many organizations provide education and training services to improve the sustainability of water, sanitation and hygiene (WASH) interventions; however, it can be challenging to develop financially sustainable models for delivering such services. To address this, the University of Cambridge, the Centre for Affordable Water and Sanitation Technology, and Agua Pura Para el Mundo (APPM) completed a Willingness to Pay (WTP) study for WASH education services in Honduras. Rural community members had some WTP for education services, despite low income levels, and preferred when a product, e.g. a water filter, was provided as well. Individual WASH practitioners had moderate WTP (~25% of cost) for short courses. Organisations had relatively high WTP, compared with the other two groups (~50% of cost). The results were used to investigate potentially sustainable business models for APPM's education services. The methodology presented can support other organizations to develop sustainable business approaches for their capacity development services.

Introduction

Lack of ongoing maintenance and sustained use of WASH infrastructure is a key challenge to sustainable water, sanitation and hygiene (WASH) interventions (UNICEF & IRC, 2005). It is estimated that between 30-60% of existing water supply systems do not provide adequate services (Sabogal et al. 2014). Even when the facilities are working, the sustained use by target populations has been found to be as low as 10% (Cairncross, 1993). Education and training can contribute to overcoming these barriers through developing the knowledge, skills and motivations that local individuals and organizations need in order to implement, maintain, and use WASH infrastructure correctly, over the long term (UNICEF & IRC, 2005).

Realizing the need for capacity building, many organizations in the WASH sector provide education and training services. However, providing quality education and training services is a significant expense that can be difficult to justify to project funders. Often WASH training is provided free of charge to the participants, and in some countries it is standard practice for a per-diem payment to be given to training participants. It can be a significant challenge for organizations that are delivering capacity development services to develop sustainable business models that include the provision of high quality and comprehensive education and training services.

The Centre for Affordable Water and Sanitation Technology (CAWST) is a non-profit organization based in Canada that provides education, training, and consulting services in developing countries for organizations who implement WASH projects. CAWST partners with local WASH organisations, to develop Water Expertise and Training (WET) centres. These centres do nationally and regionally what CAWST does globally, training local individuals and organisations on a range of WASH topics. CAWST began working with Agua Pura Para el Mundo (APPM) as a WET Centre partner in 2014. The APPM WET Centre provides training services on topics such as biosand filter construction and maintenance, biosand filter project implementation, and latrine design and construction to local organizations that work on WASH projects throughout Honduras and the Central American region. Since the APPM WET Centre has only been operating for just over one year, it is expected that it will take some time to develop the credibility and profile of services needed for clients to appreciate the value added by those services.

The University of Cambridge, CAWST and the APPM WET Centre collaborated in a study to address the challenge of financial sustainability for WASH education and training services. Through a willingness to pay (WTP) study, the team investigated the viability and potential sustainability of different business models for education and training services, using the APPM WET Centre as a case study.

WTP studies are a well-known and accepted method for determining the demand and perceived value of the provision of water supply and treatment products, and developing appropriate income streams (Whittington et al., 1990; Walker et al., 1999; LaFond, 1995). However, no studies were identified that investigate the WTP for WASH education services. This study aimed to address this gap, by applying a WTP study methodology to investigate demand for, perceived value of, and sustainable business approaches to the provision of WASH education services.

Objectives

The objectives of this study were to:

1. Investigate the willingness to pay for WASH education services, using the APPM WET Centre in Honduras as a case study to investigate the perceived value of the services to APPM's clients, and predict to what extent payment for education services could form an income stream.
2. Identify potential business models for and barriers to developing a sustainable/viable business model for a WASH training centre, such as APPM Honduras.
3. Test an appropriate methodology that could assist other WASH education service providers to complete their own WTP studies.

Methodology

The study consisted of the following methodology:

1. Literature review:

A literature review was completed to investigate topics and methods that have been used for WTP studies in the WASH sector and to identify a range of potential business models.

2. Developed WTP survey methodology:

Based on the information collected, a WTP survey was designed. The stated preference method, which is a survey-based method that places monetary values on non-market goods, was selected for determining the WTP for the APPM WET Centre's education services (Carson, 2000). Stated preference methods have been used widely for valuing water or sanitation service provision or an increase in water quality; however, no examples were found in the literature of their application to WASH education services (Kimmorley, 2012). Among the stated preference methods, the Contingent Valuation Method (CVM) is used to measure the benefits that an individual expects to gain from the goods or services by directly asking their WTP (Fujita et al. 2005). The Choice Experiment Method (CEM) tests preferences for attributes of a good or service, and provides the marginal value of these attributes (Hanley & Barbier, 2009). Both the CVM and CEM methods were used for this study.

Surveys were developed for three target groups, to determine their WTP for the APPM WET Centre education services:

- *Community members:* A CVM survey was designed to investigate whether community members would be willing to pay for biosand filters, training, or both.
- *Individual workshop participants:* A CVM survey was designed for individuals who had participated in an APPM WET Centre workshop in the past. It investigated whether they would like to attend another training course and their WTP for the course out of their own finances.
- *Representatives of organizations:* One CVM survey and one CEM survey were designed to determine the WTP of decision makers in client organisations and potential clients of the WET centre.

All surveys were designed in accordance with Bennett's (1999) Choice Modelling guidelines, with revisions made in the field. The survey was comprised of a set of structured questions; it included a page of symbols to aid with framing of the survey, a payment card, and a table of attributes and levels for the choice experiments.

This study attempted to mitigate biases in the design of the survey tools by adopting recommendations made by Whittington et al. (1990) and Bennett (1999), who both recommend appropriate WTP survey designs for stated preference methods.

3. Data collection:

The data was collected in Trojes and Tegucigalpa, Honduras from 4-22nd May, 2015. Surveys were carried out face-to-face with the community members, on a paper survey for workshop participants, and either face-to-face or by Skype for organisations. Most surveys were conducted in Spanish, with a translator present.

- *Community member surveys* – A total of 20 community members were interviewed. The interviewees were selected based on accessibility.
- *Individual workshop participant surveys:* The workshop participants that were surveyed comprised 22 people – 7 female and 15 male – with a median age between 31-40 years. All interviewees participated in a latrine construction workshop in Tegucigalpa during the data collection phase.
- *Organization surveys:* The organisation surveys comprised 16 interviews across 15 organisations in Honduras and Nicaragua, with 14 CVM and CEM responses. The organizations were a mix of grassroots and local organizations, small and large international NGOs, and Government Agencies. This is well representative of APPM WET Centre's client base.

4. Data analysis:

The WTP results for all CVM questions were determined as a mean with a standard deviation, as outlined in the process carried out by Whittington et al. (1990). Data was compared with the incomes of the participants to interpret the value of the service to them. Comparison was also made with the current known costs of the services to APPM to interpret the impact of participant payment as a viable income source. The WTP for training services of the three client groups is described in the Results section.

5. Determining potential business models:

The WTP information was used to identify potential income sources and barriers to a business model for the APPM WET Centre's education services. As the main focus of this study was to establish and test a WTP methodology, the discussion of potential business models is brief. A more thorough analysis of potential business models is recommended as a future step for APPM.

Results**Results of the WTP surveys***Community members*

Seventeen out of 20 community members indicated that they would be willing to pay APPM for biosand filter installation and training, with a mean WTP of US\$33, and a standard deviation of US\$50. 59% of the respondents that were willing to pay (10 out of 17) indicated their preference to pay monthly for the filter, with a mean WTP of US\$ 7.70 per month and a standard deviation of US\$8.20. For the training component only, their mean WTP was US\$5, with a standard deviation of US\$3.50. These results indicate the value felt by community members, considering that they typically only earn between US\$1-5 per day.

The costs to APPM for full implementation of one biosand filter, which supplies water to a household (average of 5 persons), is around US\$210. The cost for the filter itself is around \$100, and the rest of the cost includes training community members, ongoing monitoring, water quality testing, materials for community agent support, posters, education manuals, safe water storage container, transport, and staff wages. Hence, asking for payment from community members is not a viable business approach to cover these costs. However, there is evidence that infrastructure is cared for more if the community members invest in it (Amaldoss & Jain, 2005), and so asking for payment may increase the sustainability of the intervention, even if it is not of significant economic benefit to APPM.

Individual workshop participants

Workshop participants were typically staff members of WASH organizations or volunteers working on WASH projects in the community. Each of the individuals that were surveyed had already attended a workshop with APPM. Of the 22 participants, 17 (77%) said they would like to attend another workshop with APPM, and 20 (91%) said they would pay for part of the course out of their own budget.

The participants estimated that the cost of a 5-day course to be US\$112, with a standard deviation of US\$84. The mean WTP for a 5-day course was US\$120, with a standard deviation of \$71, if their organization was paying for the training. If they were paying personally for the training, the WTP was US\$48, with a standard deviation of US\$31. The fact that participants were willing to pay from their own pocket for future training is important in showing that they felt the training had been valuable to them.

The true cost of a 5-day course to APPM can range from \$150-\$270 per participant based on an average 20 person group size, depending on the number of trainers present, and materials required. The WTP results indicated that payment from individual participants could be a viable income stream for APPM WET Centre; however, it would not cover the full costs of the training services, so other income streams would still be required. Reducing the costs of the service to APPM could increase the percentage of costs that could be covered through payment by participants. A host organization is typically identified to provide a venue and food for participants and cover other associated course delivery expenses to minimize the total training provision costs.

Organizations

The organizational representatives indicated a mean WTP of US\$134 for one of their staff members to attend a 5-day training course, with a standard deviation of US\$58. This is similar to the WTP of US\$120 that was found from individual participants, indicating some internal consistencies between the individual participants, and their organizations. While this is a higher WTP than individuals, it would still not cover the course costs. The organizational representatives also indicated that they would prefer to pay for APPM to train their staff members, compared with paying APPM to train community members directly.

Limitations

For the community member surveys, it is likely that the results were influenced by hypothetical bias (respondent does not understand a described good or service) and strategic bias (respondent answers in a way that they think may positively affect the provision of services to them). While the surveys were designed to reduce these biases as much as possible, the fact that the community members had not experienced the services being described, had a low level of education, and were not used to being interviewed makes some level of bias unavoidable. The hypothetical bias does not apply to the individual workshop participants or organizational surveys, since they had all experienced the relevant services. Strategic bias may have influenced results for the individuals or organizations.

A small sample size for all of the client groups also provides a limitation to the results of this study. It would be beneficial to repeat the methodology that was piloted with larger sample sizes to achieve more reliable results.

Investigating sustainable business models

A brief investigation of sustainable business approaches was undertaken, using the results of the WTP survey. There is potential for APPM to learn more by completing a more thorough analysis of sustainable business approaches as a next step following from this study. The results of the WTP survey indicated that the APPM WET Centre should focus on the following value propositions, as part of their business model in order to achieve financial sustainability:

- Targeting individuals who want to invest in their own professional development and organisations;
- Emphasising the cost savings of training for an organisation that provides both WASH and health services, as educating on WASH to prevent diseases is more cost-effective than treating waterborne illnesses;
- Emphasising how increasing motivation of a community through education can increase the effectiveness and sustainability of the organisation's projects; and
- Explaining how education can reduce technology failure rates and maintenance costs.

Using the results of the WTP surveys, it was found that the most appropriate funding model for APPM should be a hybrid version of the following models:

- Social Enterprise: charging a low fee (less than cost) for the courses from both individuals and organisations;
- Product Services System: charging a nominal, monthly fee from community members, who can rent the biosand filter;
- Public Private Partnerships: working with the Government to have courses approved so that APPM can supply government subsidised training courses; and
- Charity: donations and funding grants.

A methodology that others can apply

Although the study was specific to the APPM WET Centre's customer groups and educational services, the methodology could be applied to other organizations that are interested in developing sustainable business approaches for their education and training services.

The main steps in the methodology are:

1. Identify the potential customer groups, and carry out a WTP study. This process includes end users in the decision making process and quantifies the funding gap.
2. Identify other potential income sources and cost saving measures.
3. Select appropriate business models and combine aspects of them into one hybrid business model.

Although the methodology is relatively simple to implement, it is important to note that the methodology was designed to determine WTP after an education service was provided. Experience from CAWST and APPM has shown that potential participants of education workshops generally have a difficult time stating their willingness to pay for a workshop unless they have prior experience of the education workshop. Therefore, the results generated from this study methodology may not be applicable for potential workshop participants who have never experienced any CAWST or APPM services.

Conclusions and next steps

The University of Cambridge, CAWST, and APPM WET Centre carried out a WTP study to investigate the willingness of community members, individuals and organizations to pay for WASH education and training services in Honduras. It found that community members had some WTP, albeit small, and preferred when a product, such as a water filter, was provided in addition to the education. Individual WASH practitioners had a moderate WTP (~25% of cost) for short courses. Organisations had a relatively high WTP, compared with the other two groups (~50% of the cost), and showed a preference to pay for sending their staff on short courses, rather than paying for APPM WET Centre to directly train community members in their project areas.

The results of the WTP study were used to identify appropriate features of sustainable business models, and to start combining them into developing a potentially financially sustainable business model for the WET Centre. Multiple income streams were proposed to provide redundancy, or 'back-up', in the model. This study, as well as others (Guo, 2006; Pollinate Energy, 2015), found that a diverse business model is more sustainable and viable than focusing on a single income source.

The next steps are for APPM WET Centre to consider the identified funding streams and use them to improve the financial sustainability of their education services. In parallel, APPM and CAWST will consider other aspects of financial sustainability, such as the influence of reputation, and investigate how the current costs associated with services could be reduced. CAWST will monitor how effective this process is and may apply a similar methodology to other WET centres in different countries.

Acknowledgements

The author/s would like to extend thanks to all staff at APPM, and all participants of the WTP study. Your cooperation and enthusiasm made this study possible.

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