

# A Practical Methodology for Evaluating Water, Sanitation and Hygiene Education and Training Programs

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**Abstract**—Many organizations in the Water, Sanitation and Hygiene (WASH) sector provide education and training in order to increase the effectiveness of their WASH interventions. A key challenge for these organizations is measuring how well their education and training activities contribute to WASH improvements. It is crucial for implementers to understand the returns of their education and training activities so that they can improve and make better progress toward the desired outcomes. This paper presents information on CAWST's development and piloting of the evaluation methodology. The Centre for Affordable Water and Sanitation Technology (CAWST) has developed a methodology for evaluating education and training activities, so that organizations can understand the effectiveness of their WASH activities and improve accordingly. CAWST developed this methodology through a series of research partnerships, followed by staged field pilots in Nepal, Peru, Ethiopia and Haiti. During the research partnerships, CAWST collaborated with universities in the UK and Canada to: review a range of available evaluation frameworks, investigate existing practices for evaluating education activities, and develop a draft methodology for evaluating education programs. The draft methodology was then piloted in three separate studies to evaluate CAWST's, and CAWST's partner's, WASH education programs. Each of the pilot studies evaluated education programs in different locations, with different objectives, and at different times within the project cycles. The evaluations in Nepal and Peru were conducted in 2013 and investigated the outcomes and impacts of CAWST's WASH education services in those countries over the past 5-10 years. In 2014, the methodology was applied to complete a rigorous evaluation of a 3-day WASH Awareness training program in Ethiopia, one year after the training had occurred. In 2015, the methodology was applied in Haiti to complete a rapid assessment of a Community Health Promotion program, which informed the development of an improved training program. After each pilot evaluation, the methodology was reviewed and improvements were made. A key concept within the methodology is that in order for training activities to lead to improved WASH practices at the community level, it is not enough for participants to acquire new knowledge and skills; they must also apply the new skills and influence the behavior of others following the training. The steps of the methodology include: development of a Theory of Change for the education program, application of the Kirkpatrick model to develop indicators, development of data collection tools, data collection, data analysis and interpretation, and use of the findings for improvement. The methodology was applied in different ways for each pilot and was found to be practical to apply and adapt to meet the needs of each case. It was useful in gathering specific information on the outcomes of the education and training activities, and in developing recommendations for program improvement. Based on the results of the pilot studies, CAWST is

developing a set of support materials to enable other WASH implementers to apply the methodology. By using this methodology, more WASH organizations will be able to understand the outcomes and impacts of their training activities, leading to higher quality education programs and improved WASH outcomes.

**Keywords**—Education and training, capacity building, evaluation, water and sanitation.

## I. INTRODUCTION

A range of organizations within the WASH sector, offer education and training activities to upgrade the capacities of local organizations and to provide skills and training to local personnel [1]. These include but are not limited to universities, private consultants, development banks, Non-Governmental Organizations (NGOs), and vocational schools. There has been a major shift from providing these services in the form of short term aid, to providing services in a sustainable manner to achieve long term knowledge retention and self-reliant communities [2].

Even with hundreds of organizations providing overlapping services in the WASH sector, local capacities are still far below desired levels. Those operating in rural and remote regions, often lack the necessary human resources to plan, execute, and monitor the effectiveness of water and sanitation services being offered [3]. This means WASH capacity building support from external implementers needs to be woven into organizational structures, informed by national and local policy and culture, in order to begin to satisfy the needs of a sustainable approach to improving delivery of water and sanitation services over the long term. For organizations providing WASH capacity building services, it is therefore important that they develop strategies to evaluate their services so that they can understand the impacts of their work, how they can improve their services, and so they can be accountable to stakeholders.

CAWST is a Canadian-based non-profit organization that provides support to organizations working in developing countries to serve populations without access to clean water and basic sanitation. This support is in the form of education, technical training and consulting services. CAWST realized a need for a practical evaluation methodology to evaluate the outcomes of its own education programs, and also identified the same need among its clients and collaborators. In response to this need, CAWST developed a practical, straightforward methodology for evaluating the outcomes and impacts of education and training programs. CAWST partnered with universities within the UK and Canada, conducting a number of

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studies between 2012 and 2015 in order to develop the methodology. This paper provides an overview of the studies, and describes the resulting evaluation methodology.

## II. OBJECTIVES

The objective of this research was to develop a practical methodology for evaluating the effectiveness of WASH education and training programs, test and refine this methodology through a number of field pilot studies, and then document and communicate the methodology within the WASH sector so that practitioners can use it to evaluate their education and training projects.

## III. APPROACH

The evaluation methodology was developed through a number of research studies and field pilots, spanning between 2012 and 2015. This section briefly describes the main purpose and outcomes from each of the studies and explains how each contributed in creating the final evaluation methodology.

### *A. Reviewing Methods for Measuring and Reporting Results of Education and Training in WASH*

In partnership with Cranfield University (UK) in 2012, CAWST conducted a global review of how capacity development organizations in the WASH sector measure and report their results [4]. Over 100 capacity building organizations were included in the review, and the organizations varied significantly in terms of their annual budget, base office location, number of staff and funds allocated for capacity building, which ensured a broad analysis of the sector.

The review found that only 1/3 of the organizations measured and reported the results of their capacity development activities. For those that did report their results, all of them used measures of output, such as the number of workshops delivered, or number of people trained. None of the organizations reported outcomes or impacts of their capacity building activities.

### *B. Investigating Metrics for Evaluating Education and Training*

In 2013, CAWST partnered with Cambridge University, (UK), to further investigate metrics used by capacity building organizations to measure and report their results. Organizations from both within and outside the WASH sector were included in this study [5].

The outputs that were typically reported by these organizations included the number of people trained, number of countries worked in, number of trainers delivering services, number of educational materials developed and the amount of time spent delivering services. Outcomes that were most often recorded included participant satisfaction, changes to behaviour of participants, online activity, employability and employment prospects, and changes in attitudes of participants.

Similar to the findings of study (A), it was found that very few organizations attempted to measure outcomes or impacts of their capacity development work.

The combination of studies (A) and (B) provided CAWST with an in-depth understanding of the current situation in the WASH capacity development sector, and emphasized the need for the development of a practical way for capacity development organizations to measure the outcomes and impacts of their work.

### *C. Developing an Initial Evaluation Methodology and Piloting It in Nepal and Peru*

In 2013, CAWST and Mount Royal University (Canada) reviewed over 20 evaluation frameworks and selected Kirkpatrick's four levels of learning as an appropriate framework to base the evaluation methodology on [6]. The Kirkpatrick Framework was considered easy to understand and apply, and relevant to the way CAWST and its partners worldwide provide their education and training services. The Kirkpatrick framework is based on the principle that in order for training activities to lead to improved practices, participants must not only acquire new knowledge and skills, they must also apply what they learn to influence others' behaviour after the training. It divides the outcomes of a training activity into the four categories of:

- Reaction - How did participants respond to the training?
- Learning - To what extent did the participants experience changes in knowledge, skills and attitudes as a result of the training?
- Behaviour – Can changes be observed in the participant's behaviour as a result of training?
- Results - How have organizational outcomes changed as a result of the training program?

The Kirkpatrick Framework was modified and applied to evaluate CAWST's education and training activities in Nepal and Peru, as a first pilot of the evaluation methodology [7]. CAWST had been active in Nepal and Peru for the previous 5-10 years, having provided 12 and 30 visits respectively to deliver a variety of training and consulting support related to water, hygiene and sanitation. The Kirkpatrick model was used to create an interview protocol in conjunction with Mount Royal University's Human Research Ethics Board. This protocol was designed to ensure careful consideration of the four levels of learning.

Results from the first pilot evaluation were found to be useful in understanding the long term outcomes of CAWST's educational activities in Nepal and Peru. Several opportunities for improving, and simplifying the evaluation methodology were identified, and implemented in subsequent pilots. This included broadening the methodology so it could be easily modified for different types of education programs, and including an improved mix of qualitative and quantitative data types in the evaluation.

### *D. Piloting Evaluation Methodology in Ethiopia*

In 2014, CAWST and CAWST's training partner in Ethiopia, the Ethiopian Kale Heywet Church Water Expertise and

Training Centre (EKHC WET C) adapted the evaluation methodology to evaluate the outcomes of a two-day WASH Awareness training program to Health Workers in rural communities of Ethiopia. The Health Workers are front line government staff who work with their communities on disease prevention. CAWST and EKHDC WET C had developed and delivered the training program to around 170 Health Workers within the year prior to the evaluation.

For this pilot, the objective was to evaluate the short to medium term outcomes of the training program, approximately one year after the training event. The evaluation was designed to be rigorous, and included two weeks of field work, as well as an additional two weeks before and after the field data collection for planning, and analysing the results. A total of 20 Health Workers, who had participated in the training, and 20 community members who the Health Workers work with were interviewed as part of the evaluation. The evaluation provided an in-depth level of information about the outcomes of the training, and specific recommendations for improvement.

While this study provided a detailed level of information, it was acknowledged that not all organizations would be able to invest six weeks to conduct an evaluation. The need for a 'light' version of the methodology, that could be applied rapidly, while still producing useful results was identified.

#### *E. Piloting Evaluation Methodology in Haiti*

Extending on the pilot evaluation in Ethiopia, CAWST and its partner in Haiti, Pure Water for the World Water Expertise and Training Centre (PWW WET C), conducted a rapid evaluation of a Community Health Promotion (CHP) training program in Haiti in 2015. The evaluation methodology was adapted to include only two days of data collection, and rapid analysis and reporting of the results, for immediate use in revising the CHP training program. Focus groups were utilized, in addition to interviews of Community Health Promoters and community members in order to collect useful data within a limited timeframe.

The outcomes of this pilot showed that it was possible to condense the evaluation methodology to provide a rapid evaluation that could still provide useful information needed for program improvement.

Through applying the evaluation methodology for different types of evaluations in Nepal and Peru, Ethiopia and Haiti, the methodology was refined and broadened so that it could be readily modified for application to evaluate different types of education programs. This was vital in developing a methodology that is widely applicable and practical to meet the needs of a range of organizations.

#### IV. RESULTS: FINAL EVALUATION METHODOLOGY

Following the research and pilot studies, the evaluation methodology was finalized. The methodology follows the principle that for training activities to lead to improved WASH practices at the community level, participants must not only acquire new knowledge and skills but also apply these new skills and influence the behaviour of others following the training.

One of CAWST's objectives was for the methodology to be practical and useable by practitioners who may not have background or experience in evaluations or research methods. A key to the application of the methodology was to make it simple, and able to be modified for different contexts.

The six steps of the evaluation methodology are described briefly below.

##### *1) Determine the Evaluation Goal*

The purpose of the evaluation must be agreed upon, and a goal statement should be developed as a starting point for the evaluation. The goal statement is essential for guiding the evaluation plan, and to ensure that the evaluation is designed to achieve its desired purpose.

##### *2) Decide What Information Is Needed (Using the Concepts of Theory of Change, and the Kirkpatrick Framework)*

For an evaluation to be useful, the information gathered must be relevant to meeting the purpose of the evaluation. Developing a theory of change for the project is a useful way to determine what information is needed. A theory of change is a description of how an organization believes their project activities make progress toward reaching their objectives. For evaluating an education program, the Kirkpatrick framework can help to define the theory of change in terms of the four categories: Reaction, Learning, Behaviour and Results. The theory of change can then be used to develop indicators which measure the key outputs, outcomes and impacts of the project. A set of clearly defined, SMART (Specific, Measurable, Achievable, Relevant, Time bound) indicators should be developed to guide the evaluation activities.

##### *3) Plan for Gathering the Information*

After defining what information is needed, a plan for how to gather that information should be developed. The first step is to identify all of the relevant information that has already been collected, so time is not wasted collecting it again. For new information that needs to be collected, information sources may include the training participants, beneficiaries, households or project sites. There also are a range of methods available to collect the information, including interviews, site visits, observations, surveys and focus groups. The most suitable methods should be selected based on the particular evaluation goal. Next, data collection tools can be developed for use during the evaluation.

##### *4) Gather the Information*

The data collection tools can then be used to gather the information. It is important to plan the logistics for how the information will be collected. A strategy should also be developed to ensure that the data collection team can collect and record the data in an efficient, effective, and accurate way. Throughout the data collection phase, the data collection plan must be reviewed regularly so that improvements can be made immediately in order to collect the best information possible.

### 5) Identify Gaps and Trends from the Information

After the data has been collected, the evaluation team must reflect on what it means, and conduct thorough analysis and interpretation. This is a critical step in the evaluation, and the time required for it is often underestimated. For an evaluation of educational activities, it is likely that there will be both qualitative and quantitative analysis methods required. Without a thorough process to analyze and interpret the information, the evaluation will not reveal useful or relevant findings.

### 6) Use the Findings

The next step is to develop recommendations for the project based on the findings. For each evaluation indicator, actions should be agreed upon, and planned for. The results can then be communicated with relevant stakeholders.

In order to make the methodology understandable and accessible to many, CAWST is developing comprehensive training and support materials to enable capacity development organizations to learn about the methodology, and apply it to their projects. The materials include a series of lesson plans and participant materials for a 3-day workshop. During the workshop, a case study approach is used to demonstrate how an organization could use the evaluation methodology to evaluate an education project. A series of technical support documents which provide background theoretical information are also being prepared. CAWST is also working with clients and partners to introduce the methodology and support them in using it.

## V. CHALLENGES

Several challenges that were encountered during the process of developing the evaluation methodology are described here:

- It was challenging ensuring that the methodology could apply to wide range of situations. After piloting the methodology using a variety of cases, adjustments were made so that it would be widely applicable.
- A key objective was to create a methodology that would be practical and easy to apply, so that it would be useable by practitioners who have limited research experience and minimal research budget. However, it was challenging to find a compromise between research rigour and practicality in the methodology.
- The methodology requires analysis of qualitative data to examine outcomes in-depth. This can be challenging for practitioners and can be subject to interpretive bias.
- Many practitioners are interested in evaluating training programs for which no baseline study has been completed. While it is always better to compare evaluation data with baseline data, the methodology has been designed to provide useful results in the absence of baseline data.

## VI. NEXT STEPS AND CONCLUSION

The next steps are for the educational materials relating to the evaluation methodology to be finalized, and made available as open content on CAWST's WASH Education and Training

Online Resources Website at [cawst.resources.org](http://cawst.resources.org). It is estimated that these will be finalized and available in the second half of 2016.

CAWST plans to not only use the methodology to evaluate its own education and training programs, but also hopes that other capacity building organizations within the WASH sector can learn about the methodology and use it to evaluate and improve their education programs.

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## REFERENCES

- [1] B. Broughton and J. Hampshire, "Bridging the gap: a guide to monitoring and evaluating development projects," Canberra, Australia: ACFOA, 1997.
- [2] D.C. Korten, "Third Generation NGO Strategies: A Key to People-centered Development," *World Development*, Vol. 15, Supplement. pp. 145-159, 1987.
- [3] UN-Water. *Global Annual Assessment of Sanitation and Drinking-Water (GLAAS)*. Geneva, Switzerland: World Health Organization and UN-Water, 2010.
- [4] T.K.K. Ngai, O. Mills, G. French, R. De Oliveira, C. Lepore, M. Mattens, T. Sibanda, M. Sweet, and A. Graves, "A global review of capacity building organizations in water, sanitation and hygiene for developing countries," 36th WEDC International Conference, Nakuru, Kenya, 2013.
- [5] B. E. Coff, T.K.K. Ngai, T. Hull Bailey, F. O'Hanlon, J. Price, and T. Viecco, "Measuring and reporting the capacity development performance of organisations in water and sanitation," 37th WEDC International Conference. Hanoi, Vietnam, 2014.
- [6] D.L. Kirkpatrick and J. D. Kirkpatrick, *Evaluating Training Programs: The Four Levels* (3rd ed). San Francisco, CA: Berrett-Koehler Publishers, 2006.
- [7] T.K.K. Ngai, B.E. Coff, E. Manzano, K. Seel, and P. Elson, "Evaluation of education and training in water and sanitation technology: Case studies in Nepal and Peru," 37th WEDC International Conference. Hanoi, Vietnam, 2014.