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**\*Abstract:** A significant constraint to effective and sustainable water and sanitation provision is the “lack of capacity at the local level” (WHO, 2010); however there is uncertainty in how the efforts of capacity builders should be measured, and improved (Brown, et al., 2001). The Centre for Affordable Water and Sanitation Technology (CAWST) and the Institute of NonProfit Studies at Mount Royal University (MRU) have collaborated to address this issue. An evaluative framework, based on the Kirkpatrick model (Kirkpatrick, D.L. & Kirkpatrick, J.D., 2006), was developed to assist capacity builders in the water and sanitation sector to capture and interpret the results of their education and training activities. The framework was applied to evaluate CAWST’s training activities in Peru and Nepal. The findings provide new perspectives on the impacts of CAWST’s work, and provide insight into how the framework can be valuable in assisting other capacity building organizations in capturing and interpreting the results of their education and training activities. Opportunities for further research and modifications of the framework were identified.

**\*Keywords:** Water and sanitation, capacity building, training, education, project evaluation, measuring impacts

# Evaluating the Effectiveness of Education and Training in Water and Sanitation

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## 1. The Research Problem

One of the important constraints to effective and sustainable water and sanitation provision in the developing world is the “lack of capacity at the local level” (WHO, 2010). Many countries do not have adequate human resources to skillfully plan and implement the delivery of water and sanitation services, especially to the most vulnerable populations in peri-urban and rural regions (WHO, 2010). A recent study which investigated human resources capacity gaps in the water and sanitation sector in fifteen countries showed significant overall shortages in technically qualified staff including engineering and social development professionals (IWA, 2013). Infrastructure built quickly becomes non-functional (Montgomery, et al., 2009).

Recognizing the challenge, universities, vocational schools, private consultants, and experienced non-governmental organizations (NGOs) are offering education and training activities (i.e., capacity building activities) to upgrade the technical and management capacities of governments and NGOs responsible for water and sanitation provision.

However, questions are increasingly raised on the effectiveness of these efforts, with evidence that many governments and NGOs aren’t getting the education and skills needed to achieve desired program outcomes (IWA, 2011). An important limitation is that it is often unclear whether the capacities of governments and NGOs have actually increased, whether communities received clean water and sanitation, and whether health and well-being has indeed improved (Broughton & Hampshire, 1997; Cracknell, 2000).

One of the key challenges is the lack of clarity on how the results of education and training in water and sanitation can be effectively measured and evaluated. A global review of over 100 leading capacity builders in the water and sanitation sector found that only one-third measured their results (Cranfield University, 2012). Among these, the evaluation methods used are often ad-hoc and deploy prescriptive criteria to assess only whether outputs are achieved (e.g., the number of people trained). Unless results are measured effectively, one cannot evaluate outcomes and improve community impact.



A training workshop to community health workers in Nepal



Education and training materials used in Nepal



## 2. Objectives

The overall objective of this research project was to design an evaluative framework to assist capacity builders in the water and sanitation sector to capture and interpret the results of their education and training activities, and to assist them to understand how they can maximize their positive impacts.

This research objective was met; however, as the project progressed, the key purpose for the evaluation framework evolved and became more targeted. From review of 22 different evaluative frameworks, we found that there was not a perfect tool for all situations - every tool has its own strengths and weaknesses. For example, some tools are more general and theoretical, and others are more specific and only appropriate for certain applications. Some are simple and quick to apply, while some are complex and require long-term data collection. Some are qualitative and some are quantitative.

We realized that the evaluation tool should be selected based on a number of contextual factors such as the scope of education and training services provided by the capacity builder, the relationship between the capacity builder and the participants, and the objectives of the evaluation. Furthermore, the tool should be simple and easily understood by non-academic capacity builders.

Therefore, we first had to clarify the purpose and the intended use of the evaluation tool. Rather than developing a general tool for capacity builders in the water and sanitation sector to capture and interpret the results of their education and training activities, we determined that there is more value in developing a tool that is specific to the way CAWST and its worldwide partner organizations provide education and training services in water and sanitation. In addition, the focus of the tool should be on how the education and training has directly impacted the participants/recipients and their organizations over time. We decided that the impacts on the communities where these participants and organizations operate are a lower priority. This is because the impacts on the communities are influenced by multiple factors, many of which are outside the control of the education and training organization, such that there may be little that education and training organization can do or change. We decided to pursue research to focus on impacts on communities in the next research project.

The evaluation framework that we have developed is a customization of Kirkpatrick's four levels of learning evaluation (Kirkpatrick, D.L. & Kirkpatrick, J.D., 2006). We found Kirkpatrick's evaluation tool simple, easy to understand and apply, and relevant to how CAWST and its worldwide partner organizations provide education and training services.

We applied the framework to two case studies to evaluate CAWST's education and training activities in Nepal and Peru. Through the process of applying the framework we identified strengths, weaknesses, and potential opportunities for the framework to be scaled up and applied to other capacity building organizations.

### 3. Methodology

We conducted stakeholder mapping as the first step of the project, in order to understand and summarize the relationships between CAWST, their partners and other relevant organizations and communities.

Next we reviewed 22 different evaluation methodologies to develop an appropriate framework for evaluating the impacts of education and training activities in the water and sanitation sector. The reviewed methodologies included the logic model, outcome mapping, balanced score-card, nine steps to success, most significant change, randomized controlled trials, contribution analysis, splash and ripple, ladder of change, appreciative inquiry, case study, critical system heuristics, development evaluation, horizontal evaluation, institution history, innovation history, participatory rural appraisal, positive deviance, social return on investment, utilization-focused evaluation, and Kirkpatrick's four levels of learning evaluation.

As described in Section 2, the evaluation framework we have developed is a customization of Kirkpatrick's four levels of learning evaluation. The framework has four main sections – reaction to training, learning, behavior change, and results. In each of these sections, we created a number of questions and discussion points relevant to CAWST's activities. These questions and discussion points formed the basis of the interview protocol. The interview protocol was approved by the Mount Royal University Human Research Ethics Board on 1<sup>st</sup> March 2013.

In May 2013 we applied the framework and interview protocol to evaluate the impact of CAWST's training activities in Peru, and in September 2013 we conducted a second case study evaluation of the impacts of CAWST's training activities in Nepal. The evaluation team travelled to Peru and Nepal to conduct semi-structured interviews with individuals who had participated in CAWST's training and consulting support activities. We conducted a total of 12 interviews in Peru and 18 in Nepal. All interviews were conducted in person, and were recorded with the permission of the interviewees. For both case studies the interviewees were comprised of staff members from a range of organizations, including local NGOs, international NGOs, community groups, community health promoters, and local entrepreneurs. Many of the interviewees had first received training from CAWST over five years ago.

Both case studies utilized the same interview protocol however, some changes were made to the interview style for the interviews in Nepal based on lessons learned from the first set of interviews in Peru. The changes related to the style of questioning and also the selection of interview candidates. For Nepal, questions were asked in a more open ended style, and a greater effort was made to cover all four levels of the Kirkpatrick framework. The changes resulted in more comprehensive interview responses for the Nepal interviews. Additionally, the interview team was well known to the interviewees in Nepal, and because of this,



Inspecting filter use at a home in Peru

they felt that the responses were more open and honest than for the Peru interviews. The larger number of participants (eighteen in Nepal as compared with twelve in Peru) also resulted in more comprehensive results for the Nepal case study. The process of reflecting on and improving the evaluation process after the first case study and applying changes for the second case study was valuable in determining the benefits associated with changes to the interview approach.

We presented and discussed the preliminary research findings and evaluation methodology with 30 CAWST staff members and collaborators as part of an internal conference in January 2014 (the CAWST Learning Exchange). The presentation was also attended by ten online participants. This assisted the evaluation team in analyzing the findings of the study, as well as identifying strengths and weaknesses with the evaluation methodology. This was a particularly important part of the methodology in determining the relevance of the research findings and alignment with the experiences of field staff.

We then compared the results and developed recommendations for CAWST to improve its education and training activities, as well as to identify strengths and weaknesses to the evaluation methodology and opportunities for further research.

We also shared this project's findings at a Learning Exchange hosted by the Environment and Public Health Organization (ENPHO) (CAWST's partner organization) in Nepal in March 2014. It was attended by training organization partners of CAWST from Nepal, Laos, Cambodia, Zambia, Haiti, and Honduras. The total number of participants was approximately 30.

#### **4. Project Activities, Management and Implementation**

Table 1 summarizes the activities that were undertaken during the project, the timeline for each activity, and the involvement from the research team members. The activities are consistent with those proposed in the project proposal.

One of the significant changes in the project implementation was the move by Dr. Keith Seel from Mount Royal University (MRU) to Bow Valley College (BVC) around the time of project start-up. In the original proposal, the principal investigators are Dr. Tommy Ngai of CAWST, and Dr. Keith Seel of MRU. Because of this move, MRU appointed Dr. Peter Elson, Senior Research Associate at MRU, as the main contact for the project. MRU subsequently hired Dr. Keith Seel as a consultant to carry out some of the roles and responsibilities of MRU as written on the original proposal.

Although this resulted in slightly more complicated administrative processes, the new structure proved to be very beneficial to the project. Dr. Peter Elson provided fresh perspective, from his experience in adult education, to clarify and strengthen the project objectives and plans. Dr. Keith Seel was able to garner extra support from BVC, which is highly experienced in education for disadvantaged groups, to contribute towards the project.

Furthermore, as described in the original proposal, CAWST provided practical perspectives in developing the evaluation framework based on its experience in working in 40+ countries. The two in-country partners in Peru (AguaSAN) and Nepal (ENPHO) contributed to the project by

highlighting local context and local constraints in carrying out evaluation of education and training. This multi-disciplinary approach in research and knowledge-sharing was very effective.

Throughout the project, each member of the research team developed an increased understanding of the capabilities and research interests of the other team members. This will catalyze future opportunities for CAWST, MRU, and BVC to collaborate.

**Table 1: Project Activity Table**

<i><b>Activity</b></i>	<i><b>Timeline</b></i>	<i><b>Team Member</b></i>
Stakeholder mapping (including literature review, stakeholder interviews, and graphical mapping)	Nov – Mar 2013	Tommy Ngai, Eva Manzano, Keith Seel
Literature review of 22 evaluation methodologies and identification of strengths and weaknesses	Jan – April 2013	Eva Manzano, Tommy Ngai
Development of evaluation framework, based on Kirkpatrick’s four levels of learning evaluation	April – May 2013	All team members
Development of interview protocol for primary data collection	April – May 2013	Keith Seel, Tommy Ngai
Field study and interviews in Peru	May 2013	Tommy Ngai, Eva Manzano, Keith Seel
Transcription of Peru interviews	June – Aug 2013	Eva Manzano
Field study and interviews in Nepal	Sept – Oct 2013	Tommy Ngai
Development of interim project report	Oct 2013	Tommy Ngai
Transcription of Nepal interviews	Oct – Nov 2013	Brittany Coff
Analysis of case study data and development of case study reports	Nov 2013 – Jan 2014	All team members
Presentation of preliminary results at CAWST Learning Exchange in Calgary	Jan 2014	Brittany Coff, Tommy Ngai
Development of final results, recommendations (including recommendations for improving CAWST’s education and training activities, and recommendations for improving the evaluation framework and methodology), and opportunities for further research	Jan 2014	All team members
Development of final report	February 2014	All team members
Preparation of research paper for submission to 37 <sup>th</sup> Water, Engineering, and Development (WEDC) conference	February 2014	Brittany Coff, Tommy Ngai
Presentation of findings at a Learning Exchange hosted by CAWST’s partner, ENPHO, in Nepal	March 2014	Tommy Ngai
Presentation of findings at MRU research seminar, open to public	May 2014	Tommy Ngai, Brittany Coff, Keith Seel

## 5. Project Outputs

Table 2 summarizes the project outputs. All project technical documents and other outputs are included in Appendices A – G of this report.

**Table 2: Project Outputs Table**

<i><b>Original Expected Outputs</b></i>	<i><b>Details of Completed Outputs</b></i>	<i><b>Major Finding/Result</b></i>
Documented outputs of stakeholder mapping	Stakeholder mapping summaries of CAWST interactions with clients in Peru and Nepal.	Understanding of interactions between CAWST and clients in Peru and Nepal.
Documented review of literature, and strengths and limitations of various existing evaluation concepts	We have documented strengths and limitations of 22 existing evaluation concepts (Appendix A).	Each evaluation method has different attributes including ease of understanding, range of applicability, complexity of application. No single tool is best in all situations, and different tools are useful in different contexts.
A framework for practitioners to measure and analyze the impacts of education and training applicable to the two case studies	We developed a draft framework, based on the Kirkpatrick four levels of learning evaluation (Appendix B). An interview protocol was developed to guide data collection for each of the four levels. The interview protocol and data collection methods were tested during the Nepal and Peru case studies and modified based on data analysis and feedback from other researchers and practitioners from the Learning Exchange meetings (Appendix C & D).	The four levels of the Kirkpatrick framework were effective in capturing short and long term outcomes and impacts of CAWST's evaluation and training activities in Peru and Nepal, capturing new information and filling a gap in CAWST's existing measuring and reporting processes. The improvements that were made to the interview protocol will improve the effectiveness of the evaluation methodology for future applications.
Evaluation of CAWST's education and training activities in Peru and Nepal using this framework	We completed case studies in Nepal and Peru using the Kirkpatrick framework. Interview was the primary method of data collection with 12 interviews conducted in Peru and 18 interviews in Nepal. Interviews were transcribed and the results were analyzed to investigate the impacts of	Specific findings differed between the case studies in Peru and Nepal; however, comparison of the two case studies resulted in identification of common themes. Generally, participants are satisfied with the education materials and training workshops delivered by CAWST and its local partner organizations. The education posters and training

<b><i>Original Expected Outputs</i></b>	<b><i>Details of Completed Outputs</i></b>	<b><i>Major Finding/Result</i></b>
	CAWST's education and training activities in Peru and Nepal (Appendix E).	manuals are effective, contain plenty of illustrations, are easy to use, and are written at an appropriate technical level. However, many interviewees recommended that more follow-up visits and support from CAWST and its local partners is needed. They are also unaware of updated and new training and education materials available from CAWST. Some workshop participants have not implemented water and sanitation projects due to lack of funding, or because the technologies learned from the training were determined to be not appropriate for their project sites.
Disseminated research findings through e-conferences, technical newsletters, seminars, and Learning Exchanges	<p>We have shared the findings of this research through two Learning Exchanges, one based in Calgary with CAWST staff, and the second in Nepal with CAWST project partners (see Appendix F for presentation details and notes).</p> <p>We have also submitted a paper to share the findings at the 37<sup>th</sup> WEDC conference (Appendix G).</p> <p>Additionally, we plan to share findings through seminars, e-conferences, and technical newsletters, using other sources of funding.</p> <p>We will also develop education and training materials, to assist other capacity building and training organizations to evaluate the effectiveness of their work, using other sources of funding.</p>	<p>Sharing the preliminary research findings with CAWST staff and project partners provided new perspectives and feedback which was used to recommend improvements to the evaluation framework, develop an action plan for CAWST to improve education and training services in Peru and Nepal and to identify future research opportunities.</p> <p>Disseminating findings to assist other capacity building organizations in evaluation of their education and training activities has the potential to build on the research completed here and provide benefits to a range of capacity development organizations. CAWST's clients in Haiti, Afghanistan, Ethiopia, Nepal, India and Honduras have expressed interest in learning from CAWST on how to evaluate their education and training activities.</p>

## 6. Project Outcomes

Outcomes achieved throughout the project are included in Table 3. A description of the elements of the project design which contributed to the outcome and the lessons learned are included alongside each outcome.

The project outcomes generally align with the planned outcomes, and there was not significant deviation from the project proposal. A significant factor in the overall success of the project was a thorough project planning phase, which included a realistic timeframe and expectations for each of the project partners. Another important element of the project design was a focus on the importance of communicating the research findings to CAWST staff, project partners and the wider sector. This led to wide dissemination of research findings, identification of a diverse set of opportunities for future research and improved capacities of a wide range of stakeholders in evaluation of education and training activities.

**Table 3: Project Outcomes Table**

<i><b>Outcome</b></i>	<i><b>What Contributed</b></i>	<i><b>Lessons Learnt</b></i>
Increased capacity of all project partners to conduct evaluations of education and training	Capacity of all project stakeholders was increased due to involvement of staff from CAWST, MRU, and CAWST's local partners in Peru and Nepal during all stages of the project, including development of the evaluation framework, case studies and identification of strengths and weaknesses of the methodology.	Different ideas came from each of the project partners, leading to valuable findings.
Strengthened collaboration and knowledge sharing among Canadian institutions and counterparts in Peru and Nepal	Two Canadian organizations (CAWST and MRU) collaborated and learned in partnership with CAWST's partners in Peru and Nepal (AguaSAN and ENPHO). All organizations were involved for the duration of the project, resulting in significant collaboration. Knowledge and research findings were shared through presentations at the CAWST Learning Exchange in Calgary, the Learning Exchange hosted by CAWST's partner in Nepal, and a research seminar at MRU.	The project resulted in valuable relationship-building between partners, with benefits which will extend past project boundaries.
Increased contribution of Canadian collaborative research and knowledge to policy and practice of development sectors	Findings were shared through the development sector through presentations at the CAWST Learning Exchange in Calgary, the Learning Exchange hosted by CAWST's partner in Nepal, and at the 37 <sup>th</sup> WEDC Conference in Vietnam.	Canadian research and knowledge can add to global development sector policy and practice.
Improved capacity of Canadian institutions to	Two Canadian organizations (CAWST and MRU), collaborated and learned improved	More collaboration and lesson sharing can



<b><i>Outcome</i></b>	<b><i>What Contributed</i></b>	<b><i>Lessons Learnt</i></b>
share lessons, and to improve their operations and strategies to maximize impacts, cost-effectiveness, and sustainability	methods for evaluating the impact of education and training activities. Improved capacity for sharing lessons within Canada was achieved through presentations at the CAWST Learning Exchange in Calgary and at a research seminar at MRU.	promote improved practices.
Project outcomes have and will continue to serve as pedagogical materials at MRU and CAWST	Focus on communication of findings as a key project objective, and sharing of knowledge and research findings through presentations at the CAWST Learning Exchange in Calgary, the Learning Exchange hosted by CAWST's partner in Nepal, and a research seminar at MRU. CAWST will start a new service in late 2014 to support WASH organizations to evaluate their education and training.	Recognizing the importance of communicating research findings from the start can result in better dissemination of new knowledge.
Improved understanding of the added-values of education and training in water and sanitation.	Case study evaluations of CAWST's education and training activities in Peru and Nepal.	Impacts are diverse and sometimes unexpected. Evaluation methodologies should enable capture of a broad range of impacts.
Improved understanding of the impacts of education and training activities in Peru and Nepal, strengths and weaknesses in CAWST's education/training approach, and an action plan for improvement	Case study evaluations of CAWST's education and training activities in Peru and Nepal.	The evaluation framework addressed a gap in CAWST's current evaluation systems and enabled new recommendations to be determined.
Increased understanding of future research needs in order to build on the research findings and continue to improve knowledge	Discussion of results and future research needs with CAWST staff and by project team.	There is value to building on the evaluation framework through additional research.
Improved understanding in CAWST field staff and project partners in the value of evaluating education and training	Communication of results to CAWST field staff and project partners.	Improved evaluation practices can result from increased understanding of the purposes of evaluation.

## **7. Overall Assessment and Recommendations**

This section summarizes the overall project findings including the achievement of research objectives, impacts and recommendations of CAWST's education and training activities in Peru and Nepal. It also recommends a framework for evaluation of education and training activities, describes opportunities for future research and discusses the overall value of the project.

### ***Achievement of research objectives***

We have achieved the overall research objective: to design an evaluative framework to assist capacity builders in the water and sanitation sector to capture and interpret the results of their education and training activities, and to assist them to understand how they can maximize their positive impacts.

The project focused on how education and training by CAWST has directly impacted the participants/recipients and their organizations over time. We decided that the impacts on the broader communities where these participants and organizations operate are a lesser priority. This is because the impacts on the communities are influenced by multiple factors, many of which are outside the control of the education and training organization, such that there may be little that education and training organization can do or change.

Collaboration between CAWST, MRU, BVC and CAWST's partners in Peru and Nepal (AguaSAN and ENPHO) was extremely valuable in achieving the research objectives and also in building relationships between Canadian institutions and overseas partners.

### ***Impacts of CAWST's education and training activities in Peru and Nepal***

The project produced new insights related to the impacts of CAWST's education and training activities in Peru and Nepal, and hence an improved understanding of the added-value of education and training in water and sanitation.

Specific findings differed between the case studies in Peru and Nepal; however, comparison of the two case studies enabled common themes to be identified. Generally, participants were satisfied with the education materials and training workshops delivered by CAWST and its local partner organizations. The education posters and training manuals are effective, contain plenty of illustrations, are easy to use, and are written at an appropriate technical level. However, many interviewees recommended more follow-up visits and support from CAWST and its local partners is needed. They were also unaware of updated and new training and education materials available from CAWST. Some workshop participants had not implemented water and sanitation projects due to lack of funding, or stated that the technologies learned from the training were inappropriate for their project sites.

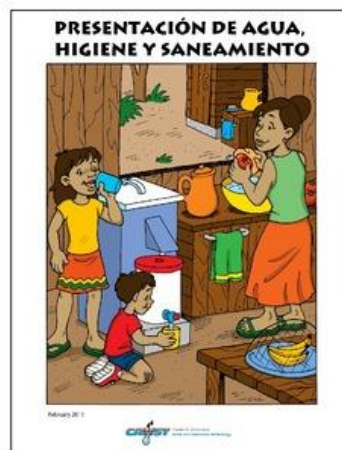
Table 4 summarizes the major findings and recommendations, showing which are relevant to Nepal, Peru or both. It is interesting to note the similar and different issues arising in each of the two case studies.

**Table 4: Comparison of Findings from Case Studies in Nepal and Peru**

<i><b>Finding</b></i>	<i><b>Recommendation</b></i>	<i><b>Nepal</b></i>	<i><b>Peru</b></i>
Majority of interviewees reacted positively to CAWST training and consulting support.	CAWST should continue its general approach to training and consulting.	✓	✓
Consulting support visits and feedback are irregular or not provided often enough.	CAWST should review its processes for providing ongoing assistance to clients.	✓	✓
Technology transfer can be improved through CAWST clients collaborating more locally.	CAWST should link organizations or community members together.	✓	
Knowledge transfer in technical skills was rated very highly, but challenges were reported in organizational capacity, business management & human resources.	CAWST should tailor services to better transfer knowledge in these areas to compliment the technical learning.	✓	
Clients would like assistance in methods of monitoring and evaluation.	CAWST should mentor clients in methods of monitoring and evaluation.	✓	
CAWST could reach more people by making more use of web technology.	CAWST should integrate online services to reach more clients, more often.		✓
Institutional arrangements between CAWST and clients are sometimes confusing.	Review process for selection of CAWST's clients and partners, and formalize arrangements.		✓
Clients have challenges in communication with donors and community members.	CAWST should focus on developing client's capacity in stakeholder communication.		✓
CAWST could profile the service environment in which the training takes place.	CAWST should identify complementary services (e.g., public health services) and link these to the training program.		✓



Technicians constructing filters in a factory in Nepal



Posters used for community education in Peru

### ***Development of an evaluation framework***

The evaluation framework we developed is a customization of Kirkpatrick's four levels of learning evaluation. Through the process of completing the case studies in Peru and Nepal we identified strengths and weaknesses in the evaluation methodology, and opportunities for it to be applied to other capacity building organizations. Figure 1 shows the framework we developed as a result of the project.

The blue shaded area represents what the literature would suggest is the common process flow for water and sanitation interventions in developing countries. It moves from curriculum and materials development and delivery through to practice changes and finally established clean water/sanitation services.

The full diagram has been developed out of the findings of this project, and reflects CAWST's theory of change. The systems map shows an expanded system inclusive of internal feedback points and evaluation steps, and recognizes the iterative nature of water/sanitation education and intervention.

Through this study, we identified new links and connections throughout the chain of activities which impact the effectiveness of the education and training activities, the transfer of technical knowledge, and the sustainability of the activities. These are represented by the purple font in Figure 1.

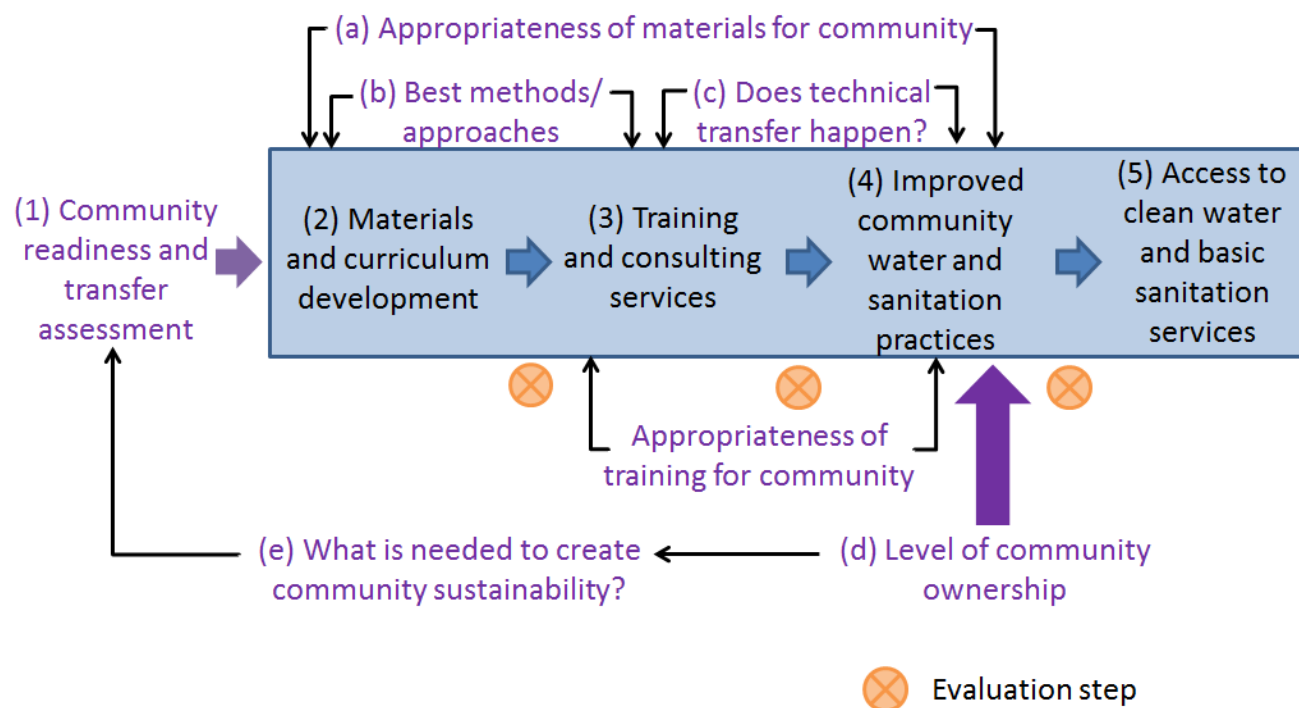
Elements of evaluation are required throughout the chain of activities in order to undertake a comprehensive evaluation of an education and training program. These different evaluation elements can be combined to learn about the overall impacts of the education and training activities.

Each step in the framework is described below:

- (1) Community readiness and transfer assessment: This is a step taken by the intervening organization (such as CAWST) prior to selecting the community where the intervention and training will take place. This step would be inclusive of:
  - a. Assessing the internal capacities of the community
  - b. Assessing the placement and capacities of NGOs and community organizations
  - c. Understanding the roles of community leaders, elders, mothers, funders, government and other local stakeholders
  - d. Assessing the willingness of a community to take on ownership of a project
- (2) Materials and curriculum development: This is a step that can remain largely unchanged from current activities. It is important that all materials and content are modified in response to the information gathered in Step 1, above, and other factors such as culture or religion.
- (3) Training and consulting services: The transfer of technical information depends on the level of engagement and the amount of practice and reinforcement of core skills that are

provided as part of the training. Consulting services provide intermittent support to field practitioners and leaders to enable the continuance of the implementation of the project.

- (4) Improved community water and sanitation practices: The outcome remains unchanged for the most part. Additional elements that enhance this outcome would include:
  - a. The consistency of practice between individual sites or organizations in the community.
  - b. The engagement of community leaders, elders, mothers, funders, government etc. in supporting behaviour changes and systems (e.g., water delivery systems) changes.
  - c. Consistency or inconsistencies with cultural practices or belief systems that support improved hygiene, sanitation and clean water.
- (5) Access to clean water and basic sanitation: This step is largely unchanged, however, equity and inclusion are dimensions of access that need to be addressed. For example, are there individuals or organizations that are intentionally excluded from access due to gender, caste, age? Are the most vulnerable populations gaining access to improved services?
- (a) Appropriateness of materials for community: This step explicitly addresses the fit between materials and curriculum and a particular community setting. Information from Step 1 is essential to determining appropriateness. Implied is the ability and willingness to change materials to be more appropriate.
- (b) Best methods/approaches: Based on the findings in Step 1, community-specific methods and approaches are to be developed and implemented.
- (c) Does technical transfer happen: Fundamentally the question of whether or not the technical information has moved from “paper” to “practice” has to be answered. If practice opportunities are provided, for example, what kinds of skills need reinforcement, for how long? The evaluation here would be focused on a “mastery” or “competency” model, i.e., can the community build and sustain the water or sanitation technology?
- (d) Level of community ownership: The community has to be active owners of the water or sanitation system that they are implementing. If the community does not move to a point of ownership, the likelihood that the system will be longstanding is low.
- (e) What is needed to create community stability: Community ownership over the long-term is dependent on the stability of the capacity of key stakeholders. If a crucial supporter leaves or withdraws their support, or if there are economic or political changes, stability may be challenged. Some thought needs to be given to considering responses to unsettling situations that may detract from the community’s capacity to sustain the water or sanitation system.



**Figure 1: Systems Map: Evaluation of Education and Training Activities**

A key strength of the proposed framework is that it fills a gap in CAWST's existing monitoring and evaluation processes by providing rich, qualitative information on the impacts of CAWST's education and training work. In particular, the interview responses demonstrated changes in CAWST's client's competencies (such as learning about effective training techniques), in contrast to focusing on quantitative results only (such as the number of filters implemented). New impacts of CAWST's education and training activities and new opportunities for CAWST to improve were captured. These new findings provided ideas for future research and analysis of CAWST's work.

For future evaluation events, additional sources of data, alongside semi-structured interviews, can be used to make the evaluation more comprehensive. This could include systematic measures to monitor post-training (e.g., 6-month) installation and compliance records; analysis of post workshop evaluation questionnaires; analysis of historical client data records; baseline information about the organization to enable comparison of the behaviour; results from the technology transfer; and records of the CAWST competency validation process to show staff behavior changes over time. This would add more rigour and systematic aspects to the assessment, reduce the reliance on interviewee 'self-reporting', and add completeness.

There is potential for other capacity building organizations to apply the proposed evaluation framework to evaluate their own education and training activities. Modifications to the framework would be required to ensure its relevance for different contexts. This also has the potential to foster more collaboration and communication amongst WASH capacity development organizations, and lead to improved ability to evaluate education and training activities and improve throughout the sector.

### ***Opportunities for future research***

We identified several opportunities for future research as a result of this study, and these are listed below. They relate both to specific learning from the case study results, as well as opportunities to better understand the impacts of education and training activities on communities:

- Clarify how the gain in technical and management knowledge by governments and NGOs will contribute towards improved living, working and cultural conditions (e.g., health and livelihood) in communities.
- Investigate what practical ways educators and trainers can use to increase their impacts in the communities, such as strategically selecting training workshop participants, and supporting participants to obtain financial resources to implement projects.
- Investigate the contribution of community roles (particularly women and community health promoters) in technology transfer and implementation of HWTS projects.
- Investigate the critical elements for success in CAWST's clients, to assist with CAWST's strategic selection of communities and clients to work with. For example, what qualities in CAWST's clients have consistently resulted in successful technology transfer and results and what qualities have consistently led to poor results?
- Evaluate the educational experience of CAWST's training activities, including how workshop activities and key learnings are remembered by participants after the learning event. How could CAWST provide better follow up support to clients, including personal and remote communications and materials or tools to prompt recollection of key points?
- Methods for collaboration with other NGOs working in WASH. How can CAWST both foster more collaboration between our client organizations (so that they can better support and learn from each other), and how can CAWST also collaborate with more NGOs to broaden impacts?



### ***Overall project value***

This study has addressed a key problem faced by capacity building organizations – a lack of clarity on how the results of education and training in water and sanitation can be effectively measured and evaluated. Currently, methods used by capacity development organizations in the water and sanitation sector are ad-hoc and inconsistent, and often only focus on assessment of outputs, rather than including an evaluation of outcomes or impacts. The project outputs, outcomes, findings and opportunities for future research show that this project has produced significant value in assisting organizations to understand and evaluate the impacts of their education and training activities and improve their services. This has been achieved through a mixture of academic review, development of an evaluation framework, field-based case studies and communication of findings. We believe this represents excellent value for the level of investment provided by IDRC. As well as investment from IDRC, CAWST has contributed a total of approximately \$50,000 in research time, reflecting CAWST's commitment to this project. Further research is needed to build on the findings of this study and to provide added value.

We are very satisfied with both the financial and technical support we have received from IDRC, and would be very interested to discuss how IDRC can continue to support our future research in this field.

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## **Appendix A: Literature Review**

# Summary of Evaluation Frameworks & Tools

DRAFT, APRIL 22<sup>nd</sup> 2013



# INTRODUCTION

## WHAT IS EVALUATION?

Evaluation is a process that critically examines a program. It involves collecting and analyzing information about a program's activities, characteristics, and outcomes. Its purpose is to make judgments about a program, to improve its effectiveness, and/or to inform programming decisions (Patton, 1987).

## WHY EVALUATING A PROGRAM/PROJECT IS IMPORTANT

Evaluations can:

1. *Improve program design and implementation.*

It is important to periodically assess and adapt the activities to ensure they are as effective as they can be. Evaluation can help to identify areas for improvement and ultimately help to realize the program's goals more efficiently.

2. *Demonstrate program impact.*

Evaluation enables the program's success or progress to be demonstrated. The information collected allows program managers to better communicate the program's impact to others, which is critical for public relations, staff morale, and attracting and retaining support from current and potential funders.

## CHARACTERISTICS OF A GOOD EVALUATION

- *Good evaluation is tailored to the program and builds on existing evaluation knowledge and resources.*

Evaluation should be crafted to address the specific goals and objectives of the program.

- *Good evaluation is inclusive.*

It ensures that diverse viewpoints are taken into account and that results are as complete and unbiased as possible. Input should be sought from all of those involved and affected by the evaluation.

- *Good evaluation is honest.*

Evaluation results are likely to suggest that the program has strengths as well as limitations.

- *Good evaluation is replicable and its methods are as rigorous as circumstances allow.*

A good evaluation is one that is likely to be replicable, meaning that someone else should be able to conduct the same evaluation and get similar results. The higher the quality of the evaluation design, its data collection methods and its data analysis, the more accurate its conclusions and the more confident others will be in its findings.

## BENEFITS OF CONDUCTING EVALUATIONS

The benefits of conducting evaluations include:

- Evaluation supports accountability,
- builds capacity,
- supports communication, e.g., by providing a historical record or current description,

- raises the status of the policy or program,
- increases understanding, e.g., intended and unintended results of the policy or program,
- provides insight on why a program or policy is or isn't successful and how to address challenges,
- provides information for decision making,
- increases improvement, e.g., of processes, activities, outcomes.

## CHALLENGES OF CONDUCTING EVALUATIONS

- *context*: pressure from external forces to conduct only certain types of evaluations or use one method over another; a culture that does not value evaluation or views performance management as adequate to fulfill evaluation purposes
- *resources*: lack of time, funding, energy, personnel, skills
- *measurement*: inappropriate indicators; emphasis on one kind of measurement over another such as exclusive use of quantitative measures or exclusive use of qualitative measures; the easily measured drives policy or program decisions rather than the program purpose driving what gets measured
- *data collection and analysis*: inappropriate, inaccurate or insufficient data; misinterpretation of data; failing to take into account non-program variables when assessing program outcomes
- *sensitivity*: cultural and other kinds of insensitivity when dealing with evaluation participants
- *imbalance*: only outcome evaluations are conducted or only process evaluations; long term outcomes are ignored; focus is on deficits with assets ignored; financial costs are emphasized over human costs; not all stakeholder groups have the same opportunity to participate
- *participation*: engaging stakeholders; only leaders from various stakeholder groups participate
- *follow up*: evaluation results are ignored
- *planning*: insufficient thought is given to issues such as design, methods, stakeholder participation
- *power*: managers have more power than front line workers; staff have more power than program participants; some program participants may have more power than others due to factors such as class, gender, age, race
- *complexity*: e.g., when multiple sites are involved

## WHEN NOT TO CONDUCT AN EVALUATION

- when the program is unstable, unpredictable, and has no consistent routine
- when those involved cannot agree about what the program is trying to achieve
- when a funder or manager refuses to include important and central issues in the evaluation

## STEPS TO GUIDE EVALUATION

1. clarify your Program: e.g., define goals, population of interest, outcome objectives, activities, measurable indicators
2. engage Stakeholders
3. assess Resources for the Evaluation: e.g., staff, funding
4. design the Evaluation: e.g., select evaluation type and framework, consider ethical issues and confidentiality

5. determine appropriate methods of measurement and procedures
6. develop work plan, budget and timeline for evaluation
7. collect the data using agreed-upon methods and procedures
8. process and analyze the data
9. interpret and disseminate the results
10. take action

#### **PHASES AND COMPONENTS OF A SYSTEM APPROACH TO CONDUCT EVALUATION**

The following figure represents the phases and component of a system approach for conducting evaluations:

1. Phase 1: Program analysis and “evaluability” assessment
2. Phase 2: Evaluation design
3. Phase 3: Evaluation methodology development
4. Phase 4: Implementation and administration
5. Phase 5: Communication of evaluation findings



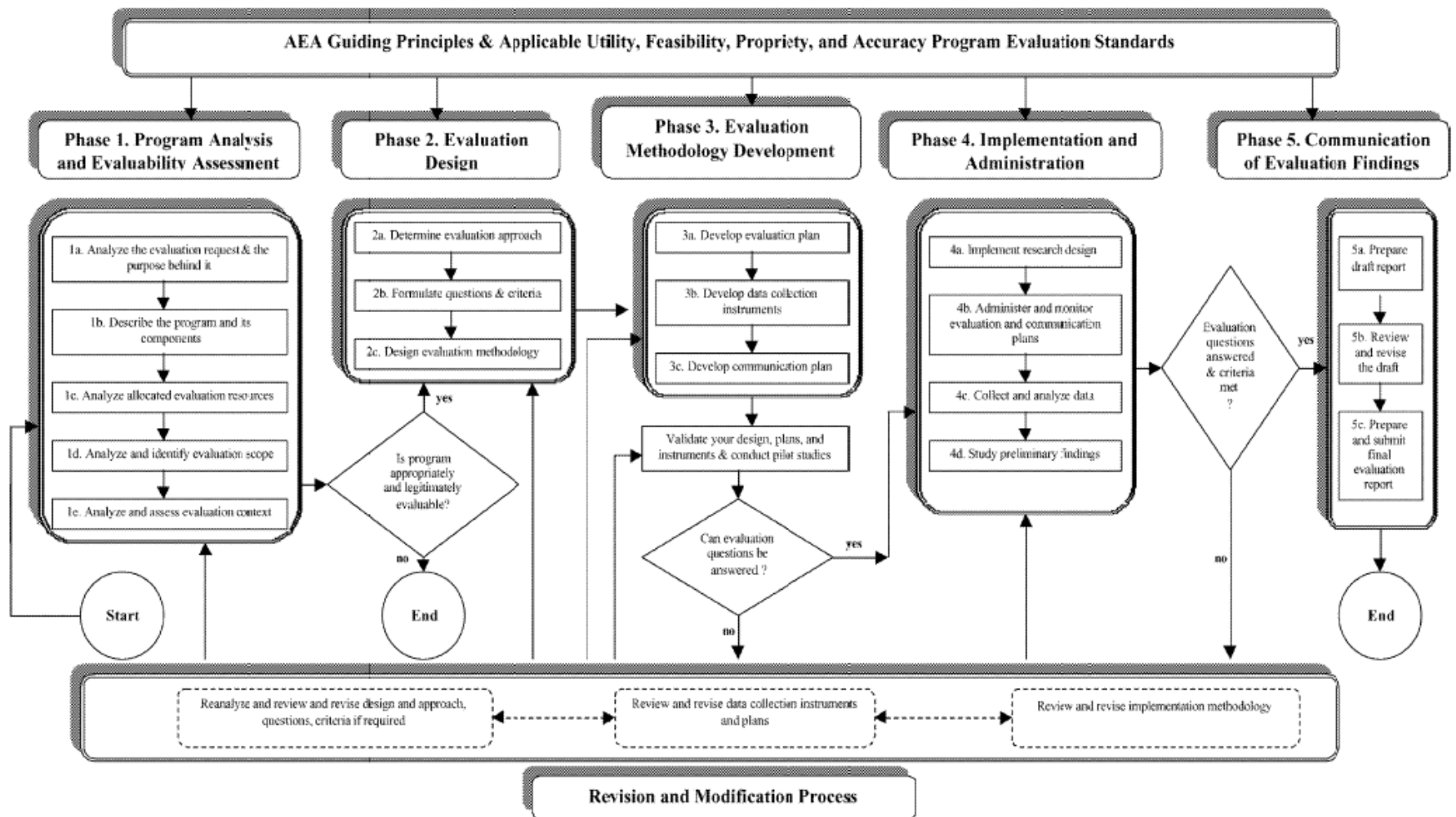


Figure 1. The Phases and Components of a Systems Approach to Conducting Program Evaluation.

## LIST OF EVALUATION APPROACHES/ TOOLS

1. LOGIC MODEL  
The evaluation is guided by the program theory, e.g., the logical relationship between all parts.
2. OUTCOME MAPPING  
Provides a framework to collect data on immediate, basic changes that lead to longer, more transformative change, and allows for the plausible assessment of the initiative's contribution to results via 'boundary partners'.
3. BALANCE SCORE CARD  
This approach is based on four linked areas: financial, customer, business process, learning and growth.
4. NINE STEPS TO SUCCESS  
This is a disciplined, practical approach to developing a strategic planning and management system based on the balanced scorecard.
5. MOST SIGNIFICANT CHANGE  
Collects and analyzes personal accounts of change, includes processes for learning about what changes are most valued by individuals and groups.
6. RANDOM CONTROLLED TRIALS  
An approach that produces an estimate of the impact of an intervention by comparing results between a randomly assigned groups and experimental group or groups.
7. CONTRIBUTION ANALYSIS  
An approach for assessing the evidence for claims that an intervention has contributed to observed outcomes and impacts.
8. SPLASH AND RIPPLE  
This is another way of presenting Outcome Measurement.
9. LADDER OF CHANGE  
The ladder of change is a quick, easy and informal evaluation and assessment tool that provides feedback about the impact or change brought about by an event, activity, project or decision.
10. APPRECIATE INQUIRY  
A participatory approach that focuses on existing strengths rather than deficiencies – evaluation users identify instances of good practice and ways of increasing their frequency.
11. CASE STUDY  
A research design that focuses on understanding a project in its context, which can use a combination of qualitative and quantitative data.
12. CRITICAL SYSTEM HEURISTICS  
An approach used to surface, elaborate, and critically consider boundary judgments, that is, the ways in which people/groups decide what is relevant to the system of interest.
13. DEVELOPMENTAL EVALUATION  
An approach appropriate for evaluations of adaptive and emergent interventions, such as social change initiatives or projects operating in complex and uncertain environments.
14. HORIZONTAL EVALUTION  
Combines self-assessment by local participants and external review by peers.
15. INNOVATION HISTORY

A way to jointly develop an agreed narrative of how an innovation was developed, including key contributors and processes, to inform future innovation efforts.

16. INSTITUTIONAL STORIES

An approach for creating a narrative that records key points about how institutional arrangements have evolved over time and have created and contributed to more effective ways to achieve project or program goals.

17. PARTICIPATORY EVALUATION

A range of approaches that engage stakeholders (especially intended beneficiaries) in conducting the evaluation and /or making decisions about the evaluation.

18. PARTICIPATORY RURAL APPRAISAL

Enables locals to analyze their own situation and develop a common perspective on natural resource management and agriculture at village level. (Recently has been named as Participatory Learning for Action (PLA)).

19. POSITIVE DEVIANCE

Involves intended evaluation users in identifying 'outliers' (those with exceptionally good outcomes) and understanding how they have achieved these.

20. SOCIAL RETURN OR INVESTMENT

Identifies a broad range of social outcomes, not only the direct outcomes for the intended beneficiaries of an intervention.

21. UTILIZATION FOCUSED EVALUATION

Uses the intended uses of the evaluation by its primary intended users to guide decisions about how an evaluation should be conducted.

## SUMMARY OF EVALUATION FRAMEWORK/TOOLS

### 1. LOGIC MODEL

#### 1.1. Definition

A logic model (also known as a logical framework, theory of change, or program matrix) is a tool used to evaluate the effectiveness of a program. Logic models are usually a graphical depiction of the logical relationships between the resources, activities, outputs and outcomes of a program. While there are many ways in which logic models can be presented, the underlying purpose of constructing a logic model is to assess the "if-then" (causal) relationships between the elements of the program; if the resources are available for a program, then the activities can be implemented; if the activities are implemented successfully then certain outputs and outcomes can be expected.

Logic models are most often used in the evaluation stage of a program, they can, however, be used during planning and implementation.

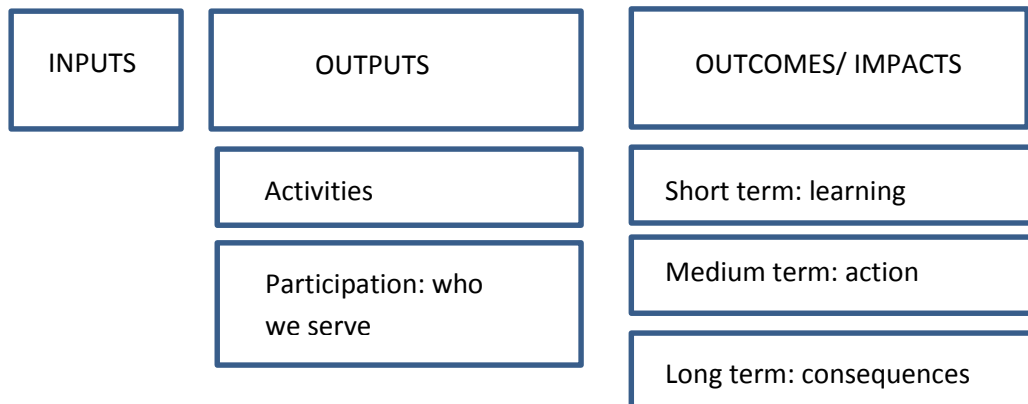
The main components of this tool are:



Outcomes can be more specific and be classified as:

Immediate Outcomes → Intermediate Outcomes → Ultimate outcome  
(short term) (medium term) (long term, by the end of the program)

The Program Action Logic Model has the following components:



### 1.2. Strengths

- Encourages a greater understanding of the fundamental mechanisms of the program.
- Decrease the chances of negative results.
- Increases dialogue among a variety of stakeholders and clarifies underlying assumptions.
- Performance measurements can be drawn from any of the steps.
- It measures final results, providing guidance on how and why things are done in a specific way.

### 1.3. Limitations

- Requires upfront reflection time to identify underlying theories and links between processes, activities and outcomes
- Might not include all important aspects of a program
- It may emphasize the quantitative over the qualitative (Walden and Baxter 2001)
- Lessons learned normally show up after a couple years after the implementation, therefore, they are not applicable to the current program.

## 2. OUTCOME MAPPING

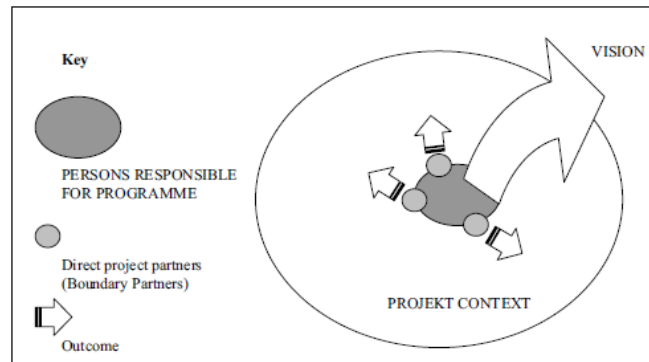
### 2.1. Definition

Outcome mapping is a project progress measurement system designed by IDRC. It differs from traditional metrics in that it does not focus on measuring deliverables and its effects on primary beneficiaries but on behavioural change exhibited by secondary beneficiaries. The outcome mapping process consists of a lengthy design phase followed by a cyclic record-keeping phase. Outcome mapping is intended primarily for charitable projects.

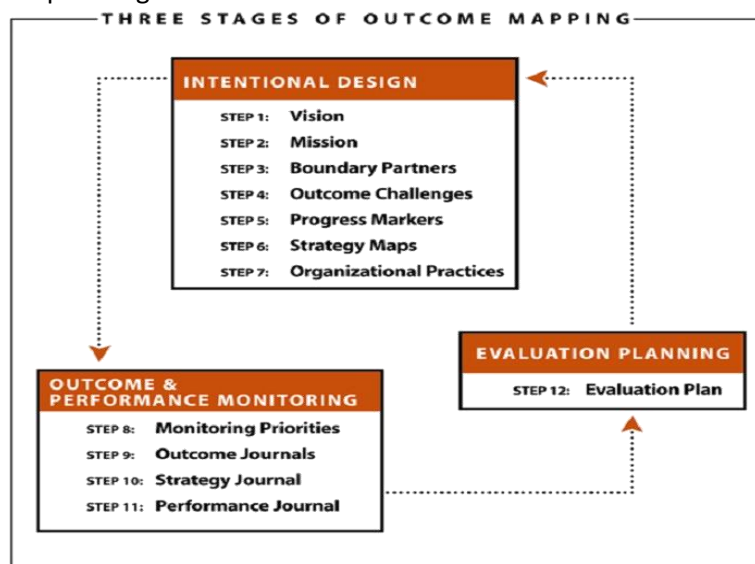
The key difference between outcome mapping and most other project evaluation systems is its approach to the problem in attributing change due to a project. This problem/situation occurs because a project's direct influence over a community only lasts for as long as the project is running, and

developing agencies can have difficulty in attributing resultant change in those communities directly to the actions of the project itself.

The concept of outcome mapping can be explained through the following figure:



Outcome mapping integrates three stages: intentional design, outcome and performance monitoring, and evaluation planning:



## 2.2. Strengths

- Specific tool developed for non-profit organizations working in the development world
- Measures indirect impact of the program
- Focuses on behavioral change, not deliverables

## 2.3. Limitations

- Contains more anecdotal information, and therefore is not a valid method for all donors.

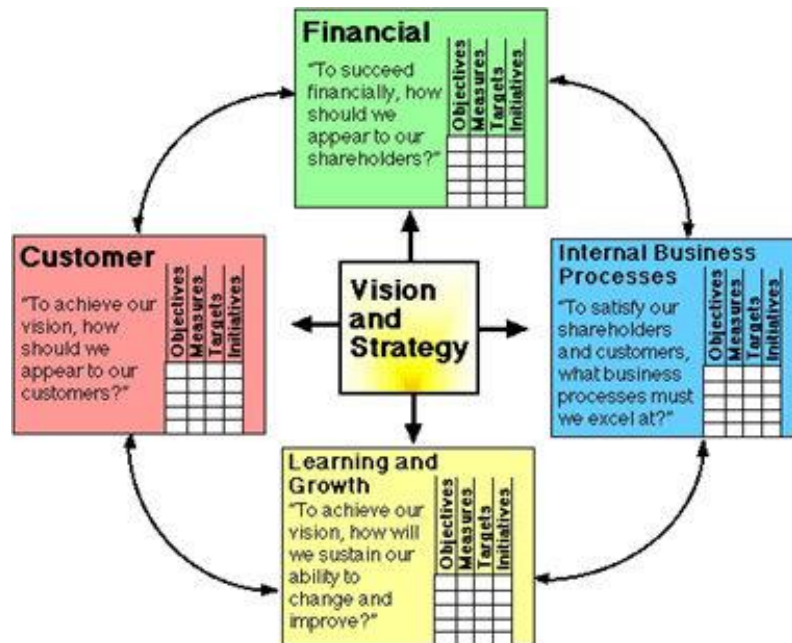
For further information: <http://www.outcomemapping.ca/>

### 3. BALANCED SCORE-CARD

#### 3.1. Definition

The balanced scorecard is a strategic planning and management system that is used extensively in business and industry, government, and non-profit organizations worldwide to align business activities to the vision and strategy of the organization, improve internal and external communications, and monitor organization performance against strategic goals.

The balanced scorecard suggests that we view the organization from four perspectives and to develop metrics, collect data and analyze it relative to each of these perspectives: learning and growth, customer, financial, and internal business processes.



#### 3.2. Strengths

- Systematic
- Increased clarity and consensus around strategy
- Increases alignment between strategic objectives and actions

#### 3.3. Limitations

- Top-down approach
- Possibility of faulty assumptions leading to negative results if a causal link between the perspectives is assumed



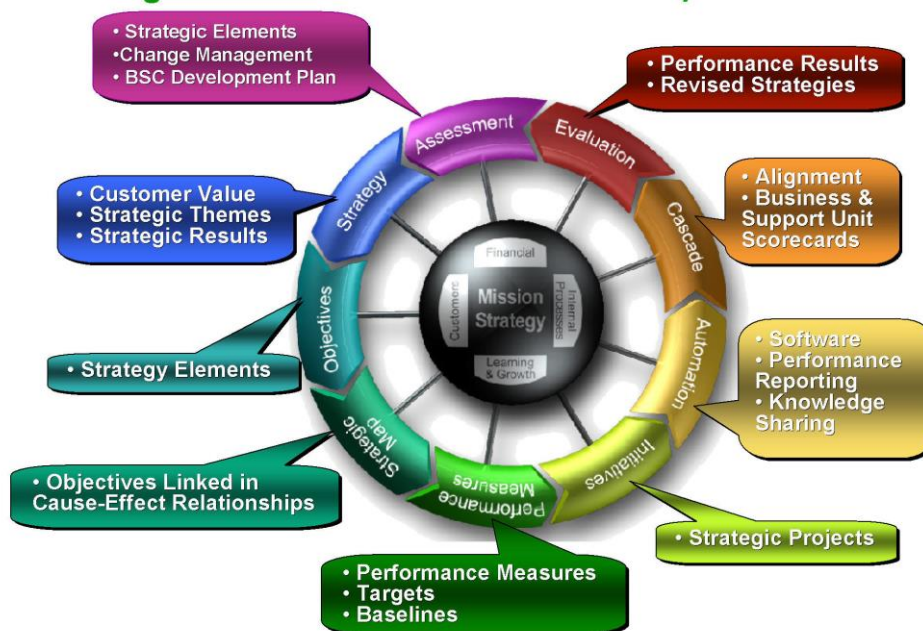
## 4. NINE STEPS TO SUCCESS

### 4.1. Definition

Nine steps to success is a disciplined, practical approach to developing a strategic planning and management system based on the balanced scorecard. Training is an integral part of the framework, as are coaching, change management, and problem solving. Emphasis is placed on “teaching clients to fish, not handing them a fish” so the scorecard system can be sustained.

A key benefit of using a disciplined framework is that it gives organizations a way to ‘connect the dots’ between the various components of strategic planning and management, meaning that there will be a visible connection between the projects and programs that people are working on, the measurements being used to track success, the strategic objectives the organization is trying to accomplish, and the mission, vision and strategy of the organization.

### Building & Implementing A Strategic Management System Using The Balanced Scorecard: *Nine Steps To Success*™



For further information: [www.balancedscorecard.org](http://www.balancedscorecard.org)

## **5. MOST SIGNIFICANT CHANGE**

### **5.1. Definition**

Most significant change is a form of participatory monitoring and evaluation. It is participatory because many project stakeholders are involved both in deciding the sorts of change to be recorded and in analyzing the data. It is a form of monitoring because it occurs throughout the program cycle and provides information to help people manage the program. It contributes to evaluation because it provides data on impact and outcomes that can be used to help assess the performance of the program as a whole.

The process involves the collection of significant change (SC) stories emanating from the field level and the systematic selection of the most significant of these stories by panels of designated stakeholders or staff. The designated staff and stakeholders are initially involved by 'searching' for project impact. Once changes have been captured, various people sit down together, read the stories aloud and have regular and often in-depth discussions about the value of these reported changes. When the technique is implemented successfully, whole teams of people begin to focus their attention on program impact.

The implementation of this technique has ten steps: 1) How to start and raise interest; 2) Defining the domains of change; 3) Defining the reporting period; 4) Collecting SC stories; 5) Selecting the most significant of the stories; 6) Feeding back the results of the selection process; 7) Verification of stories; 8) Quantification; 9) Secondary analysis and meta-monitoring; and 10) Revising the system.

The types of programs that can be suitable for using this approach are: complex programs that produce diverse and emergent outcomes; large programs with numerous organizational layers; programs focused on social change; participatory programs designed with repeated contact between field staff and participants; programs struggling with conventional monitoring systems; or programs that provide highly customised services to a small number of beneficiaries.

### **5.2. Strengths**

- Focuses on learning, not just accountability
- Participatory
- Can help staff to improve their capabilities in capturing and analyzing the impact of their work

### **5.3. Limitations**

- There are other less time consuming tools to achieve the same objectives
- Based on stories, not every single person at the community participates in the process
- May lead to socially desirable stories by the community members
- If the community members don't understand the concept of significant change, results might not be representative

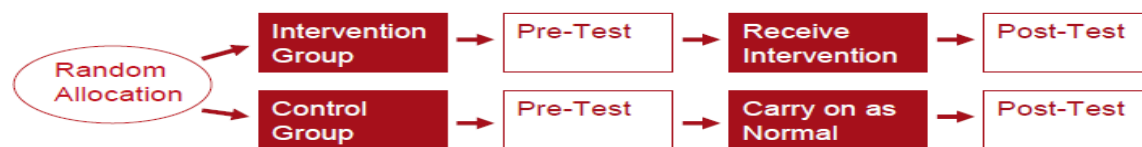
More information: <http://groups.yahoo.com/group/mostsignificantchanges>.

## 6. **RANDOM CONTROLLED TRIALS**

### 6.1. Definition

A random controlled trial (RCT) (or randomized comparative trial) is a specific type of scientific experiment, and the gold standard for a clinical trial. RCTs are often used to test the efficacy and/or effectiveness of various types of medical intervention within a patient population.

However, this medical approach has been used in education research (Conolly, 2009). The basic scheme of this approach is the following:



### 6.2. Strengths

- Adds to the validity of the statistical tests used to demonstrate significance
- Tends to produce groups that are similar in terms of both known and unknown prognostic factors

### 6.3. Limitations

- External validity of the results might be limited
- Expensive and time consuming
- Difficulty in preventing uncommon unexpected outcomes
- Difficulty in studying outcomes in the long term
- Subject to statistical error

## 7. **CONTRIBUTION ANALYSIS**

### 7.1. Definition

Contribution Analysis is an approach for assessing causal questions and inferring causality in real-life program evaluations, however, it is not an approach for comprehensive evaluation. It offers a step-by-step approach designed to help managers, researchers, and policymakers arrive at conclusions about the contribution their program has made (or is currently making) to particular outcomes. This approach considers six steps to create a credible contribution story:

- Step 1:** Set out the attribution problem to be addressed
- Step 2:** Develop a theory of change and risks to it
- Step 3:** Gather the existing evidence on the theory of change
- ➔ **Step 4:** Assemble and assess the contribution story, and challenges to it
- Step 5:** Seek out additional evidence
- └ **Step 6:** Revise and strengthen the contribution story

## 7.2. Strengths

- Offers an approach designed to reduce uncertainty about the contribution the intervention is making to the observed results through an increased understanding of why the observed results have occurred (or not!) and the roles played by the intervention and other internal and external factors
- Particularly useful in situations where the program is not experimental
- Helps to confirm a theory of change

## 7.3. Limitations

- The report from a contribution analysis is not a definitive proof

# 8. ***SPLASH AND RIPPLE***

## 8.1. Definition

Splash and ripple is another way of presenting Outcome Measurement.



The rock is like a material Input, the person holding the rock is like a human resource Input, dropping the rock is the Activity, the Splash is the output, and the ripple is the Outcome and Impact. The boundaries of the pond represent the geographic and population boundaries of a project.

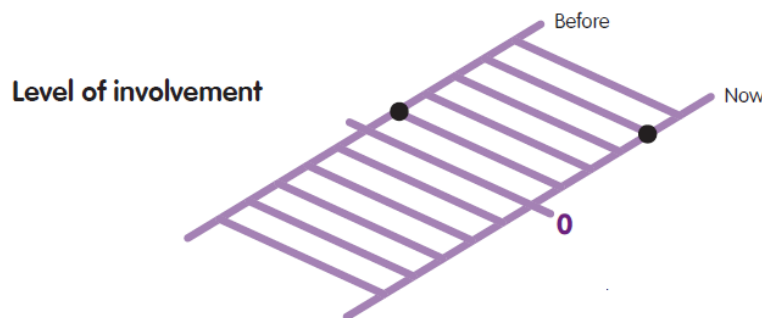
There are five guiding ideas associated to this image: 1) time; 2) spread effect or reach; 3) control; 4) context; and 5) Learning and Improvement.

## **9. LADDER OF CHANGE**

### **9.1. Definition**

The Ladder of Change is a quick, easy and informal evaluation and assessment tool that provides feedback about the impact or change brought about by an event, activity, project or decision. Ladders are useful ways to imagine scales and make comparisons between different points in time (e.g., before and after). This method is particularly helpful for making qualitative assessments of changes that are difficult to measure in other ways, for example, capturing information about changing attitudes, degrees of co-operation, or feelings of success.

Each single ladder represents one particular indicator or criteria. Scores can be used to generate quantitative values against the indicators. Often the greatest value of this tool is the information and debate that comes from the group discussion fixing the scales and choosing personal levels of difference.



### **9.2. Strengths**

- Quick and easy to do
- Very visual method that shows results to everyone
- Can convey qualitative information using numbers (i.e., quantitative measures)

### **9.3. Limitations**

- Some people may find this method simplistic
- Qualitative information may be misrepresented as 'quantitative scores'

## **10. APPRECIATIVE INQUIRY**

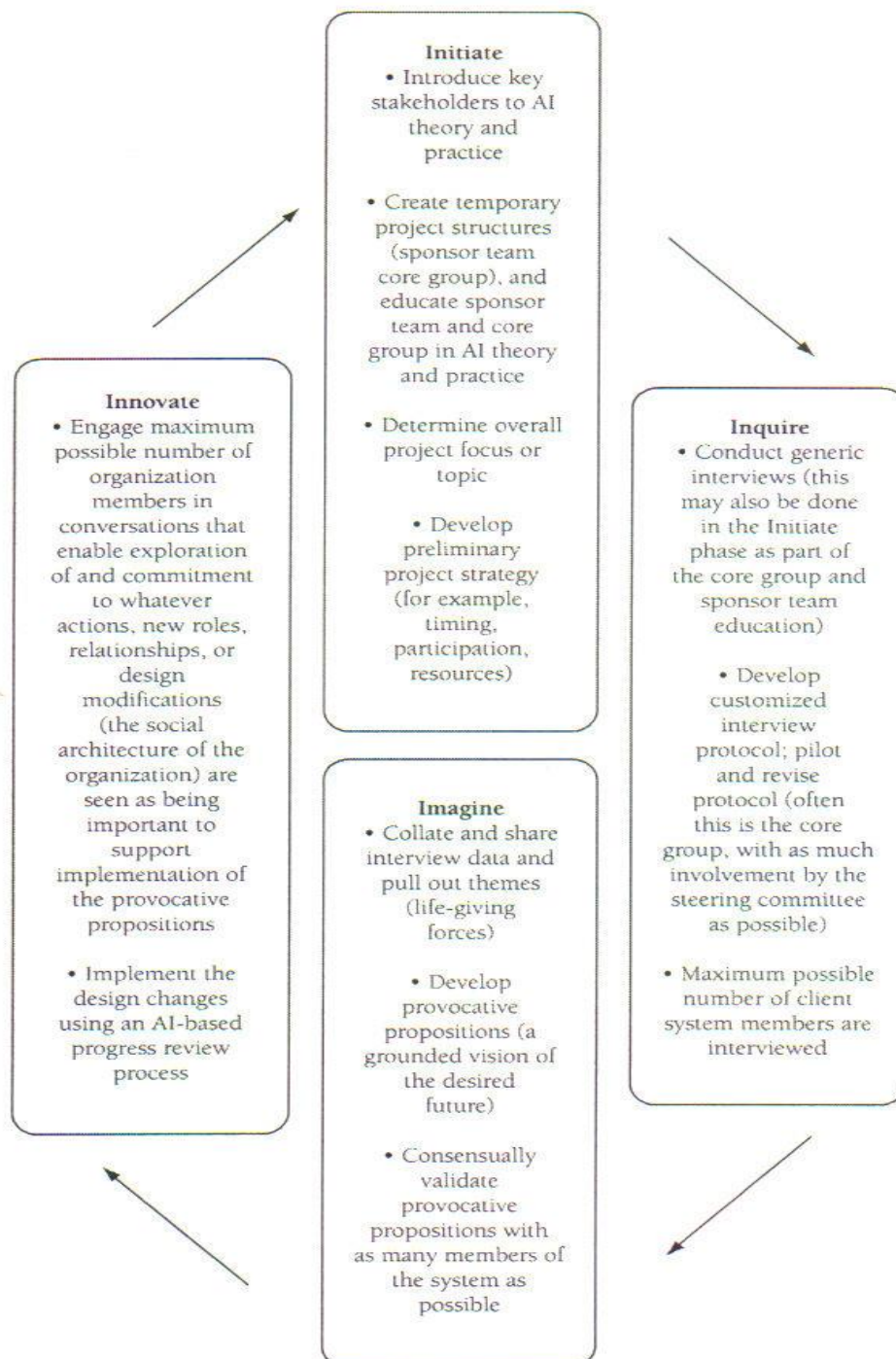
### **10.1. Definition**

Appreciative Inquiry (AI) looks at organizational issues, challenges, and concerns in a significantly different way. Instead of focusing on problems, organizational members first discover what is working particularly well in their organization. Then, instead of analyzing possible causes and solutions, they envision what it might be like if "the best of what is" occurred more frequently. Here participants

engage in a dialogue concerning what is needed, in terms of both tasks and resources, to bring about the desired future.

The AI model contains four main steps: i) Discovery (appreciate); ii) Dream (envision results); iii) Design (co-construct the future); and iv) Destiny (sustain the change).

The following scheme is an example of how the Appreciative Inquiry model works:



### 10.2. Strengths

- Increases evaluation participation
- Increases use of results
- Builds learning and change capacity
- Supports and strengthens good performance

### 10.3. Limitations

- A debate exists regarding whether AI avoids addressing challenges
- Not always appropriate
- Requires a special skill set to carry out well
- Program staff are more likely to be included than clients, increasing the power gap

## ***11.CASE STUDY***

### 11.1. Definition

Case Study is a method of learning about a complex instance, based on comprehensive understanding of that instance obtained by extensive description and analysis on the instance taken as a whole and in its context.

Case studies can be particularly useful for understanding how different elements fit together and how different elements (implementation, context, and other factors) have produced the observed impacts.

There are different types of case studies, which can be used for different purposes in evaluation. There are six different types of case study: illustrative, exploratory, critical instance, program implementation, program effects, and cumulative.

### 11.2. Strengths

- The six types of case studies cover a wide range of evaluation questions

### 11.3. Limitations

- They are not designed for answering the question 'How often does something happen?'

## ***12.CRITICAL SYSTEM HEURISTICS***

### 12.1. Definition

Critical System Heuristics (CSH) provides a framework of questions about a program including what is (and what ought to be), its purpose and its source of legitimacy, and who are (and who ought to be) its intended beneficiaries.

CSH is concerned not only with purposive evaluation, where the system or project has a predefined goal and the focus lies in evaluating the means of reaching it, but also more broadly with purposeful evaluation, where both the means and the ends become subjects of inquiry.

The CSH toolbox is composed of twelve 'boundary questions' designed to outline and provoke thought about boundary judgments that determine situational framings.

#### Sources of Motivation

1. Who is (ought to be) the **client**? That is, whose interests are (should be) served?
2. What is (ought to be) the **purpose**? That is, what are (should be) the consequences?
3. What is (ought to be) the **measure of improvement**? That is, how can (should) we determine that the consequences, taken together, constitute an improvement?

#### Sources of Power

4. Who is (ought to be) the **decision-maker**? That is, who is (should be) in a position to change the measure of improvement?
5. What **resources** are (ought to be) controlled by the decision-maker? That is, what conditions of success can (should) those involved control?
6. What conditions are (ought to be) part of the **decision environment**? That is, what conditions can (should) the decision-maker *not* control (e.g., from the viewpoint of those not involved)?

#### Sources of Knowledge

7. Who is (ought to be) considered a **professional**? That is, who is (should be) involved as an expert, e.g., as a researcher, planner or consultant?
8. What **expertise** is (ought to be) consulted? That is, what counts (should count) as relevant knowledge?
9. What or who is (ought to be) assumed to be the **guarantor of success**? That is, where do (should) those involved seek some guarantee that improvement will be achieved - for example, consensus among experts, the involvement of stakeholders, the experience and intuition of those involved, political support?

#### Sources of Legitimation

10. Who is (ought to be) **witness** to the interests of those affected but not involved? That is, who is (should be) treated as a legitimate stakeholder, and who argues (should argue) the case of those stakeholders who cannot speak for themselves, including future generations and non-human nature?
11. What secures (ought to secure) the **emancipation** of those affected from the premises and promises of those involved? That is, where does (should) legitimacy lie?
12. What **worldview** is (ought to be) determining? That is, what different visions of 'improvement' are (ought to be) considered, and how are they (should they be) reconciled?



## 13. DEVELOPMENTAL EVALUATION

### 13.1. Definition

Developmental Evaluation (DE) is an evaluation approach that can assist social innovators develop social change initiatives in complex or uncertain environments. DE originators liken their approach to the role of research and development in the private sector product development process because it facilitates real-time, or close to real-time, feedback to program staff thus facilitating a continuous development loop.

The differences between traditional evaluation and Developmental Evaluation are:

Traditional evaluation	Developmental evaluation
<b>Purpose:</b> Supports improvement, summative tests and accountability	<b>Purpose:</b> Supports development of innovation and adaptation in dynamic environments
<b>Roles &amp; relationships:</b> Positioned as an outsider to assure independence and objectivity	<b>Roles &amp; relationships:</b> Positioned as an internal team function integrated into the process of gathering and interpreting data, framing issues, surfacing and testing model developments
<b>Accountability:</b> Focused on external authorities and funders based on explicit and pre-ordinate criteria	<b>Accountability:</b> Centered on the innovators' values and commitment to make a difference
<b>Options:</b> Rigorously options-focused, traditional research and disciplinary standards of quality dominate	<b>Options:</b> Utilization focused: options are chosen in service to developmental use
<b>Measurement:</b> Measure performance and success against pre-determined goals and SMART outcomes	<b>Measurement:</b> Develops measures and tracking mechanisms quickly as outcomes emerge; measures can change during the evaluation as the process unfolds
<b>Evaluation results:</b> Detailed formal reports; validated best practices, generalizable across time and space. Can engender fear of failure	<b>Evaluation results:</b> Rapid, real time feedback; diverse, user-friendly forms of feedback. Evaluation aims to nurture learning
<b>Complexity &amp; uncertainty:</b> Evaluator tries to control design implementation and the evaluation process	<b>Complexity &amp; uncertainty:</b> Learning to respond to lack of control; staying in touch with what's unfolding and responding accordingly
<b>Standards:</b> Methodological competence and commitment to rigor, independence; credibility with external authorities and funders; analytical and critical thinking	<b>Standards:</b> Methodological flexibility eclecticism, and adaptability; systems thinking; creative and critical thinking balanced; high tolerance for ambiguity; open and agile; teamwork and people skills; able to facilitate rigorous evidence-based perspectives

## **14. HORIZONTAL EVALUATION**

### **14.1. Definition**

Horizontal Evaluation is a flexible evaluation method that combines self-assessment and external review by peers. The involvement of peers neutralizes the lopsided power relations that prevail in traditional external evaluations, creating a more favourable atmosphere for learning and improvement.

The central element of a Horizontal Evaluation is a workshop that brings together a group of 'local participants' who are developing a new Research and Development (R&D) methodology and a group of 'visitors' or 'peers' who are also interested in the methodology. The workshop combines presentations about the methodology with field visits, small group work, and plenary discussions. It elicits and compares the perceptions of the two groups concerning the strengths and weaknesses of the methodology; it provides practical suggestions for improvement, which may often be put to use immediately; it promotes social learning among the different groups involved; and it stimulates further experimentation with and development of the methodology in other settings.

### **14.2. Strengths**

- Overcomes the lack of clear outcomes and lack of follow up that typically results from mere site visits
- Overcomes traditional 'external expert-led' evaluations that limit participation and learning and may result in poorly implemented recommendations
- Flexible in that it can be applied in a range of settings and a range of evaluations including fairly complex R&D methodologies
- Facilitates the sharing of information, experiences and knowledge, interactive learning
- Facilitates the building of trust and sense of community
- Promotes ownership of results that in turn encourages the adoption of corrective action needed to improve R&D methodologies
- Creates the conditions for the adaptation and wider use of the R&D technologies being evaluated
- Enjoyable for participants who, as part of the process, learn a great deal in a dynamic yet structured environment
- Local participants accept critical feedback and observations more easily from peers than from external evaluators
- Fosters social learning, as local participants and visitors are actively engaged throughout the review process, which guides analysis and synthesis and generates new knowledge and proposals for action;
- Stimulates experimentation with and further development of the methodology in other locations
- Can be used in conjunction with a more traditional external evaluation to generate additional information and insights

## ***15. INNOVATION HISTORY***

### **15.1. Definition**

Preparing an 'Innovation History' is an option for recording and reflecting on an innovation process. People who have been involved in the innovation jointly construct a detailed written account (sometimes referred to as a 'learning history') based on their recollections and on available documents. The process of preparing this history stimulates discussion, reflection and learning among stakeholders. Subsequent planning, drawing on the innovation history, can (i) build on the lessons learned, (ii) inform a shared vision, (iii) act as a catalyst for change, and (iv) improve future performance. An Innovation History is developed in stages. Based on the initial detailed account of the innovation process, more concise informational products can be prepared that summarize the innovation process for internal use. Products designed for wider dissemination of findings can help external parties build upon and expand their knowledge and understanding about how innovations are brought about. Such products may include public awareness materials, policy briefs, and articles in professional journals. They may be based on the study of an individual case or on reviews that compare and contrast experiences across several cases.

## ***16. INSTITUTIONAL HISTORIES***

### **16.1. Definition**

An Institutional History (IH) is a narrative that records key points about how institutional arrangements – new ways of working – have evolved over time and have created and contributed to more effective ways to achieve project or program goals. An IH is generated and recorded in a collaborative way by scientists, farmers, and other stakeholders. A key intention behind Institutional Histories is to introduce institutional factors into the legitimate narrative of success and failure in research organizations.

Histories can be written by using interviews and 'writeshops' to construct a timeline, gain a clear understanding of roles and relationships, enquire into what triggers successful innovations, and reflect on failures. Lessons drawn from this analysis can be used to improve performance. The dialogue that is promoted between the actors during the preparation of institutional histories can promote learning and capacity building.

## ***17. PARTICIPATORY EVALUATION***

### **17.1. Definition**

Participatory Evaluation is an approach to program evaluation. It provides for the active involvement of those with a stake in the program: providers, partners, beneficiaries, and any other interested parties. All involved decide how to frame the questions used to evaluate the program, and all decide how to measure outcomes and impact. It is often used in international development.

## 17.2. Strengths

- Identify locally relevant questions
- Improve program performance
- Empower participants
- Builds capacity
- Develop leaders and build teams
- Sustain organizational learning and growth

## 17.3. Limitations

- Time and commitment of all involved
- Resource-intensive during evaluation
- Conflict resolution may be needed

<b>Differences Between Participatory and Conventional Evaluation</b>		
	<b>Participatory</b>	<b>Conventional</b>
<b>Who drives the evaluation?</b>	Community residents, project staff and other stakeholders	Funders and program managers
<b>Who determines indicators of program progress?</b>	Members of community groups, project staff and other stakeholders; evaluator	Professional evaluators and outside experts
<b>Who is responsible for data collection, analysis and preparing final reports?</b>	Shared responsibility of evaluator and participating stakeholders	Professional evaluators and outside experts
<b>What is the role of the local evaluator?</b>	Coach, facilitator, negotiator, "critical friend"	Expert, leader
<b>When is this type of evaluation most useful?</b>	When: <ul style="list-style-type: none"><li>• there are questions about program implementation difficulties</li><li>• there are questions about program effects on beneficiaries</li><li>• information is wanted on a stakeholder's knowledge of a program or views of progress</li></ul>	When: <ul style="list-style-type: none"><li>• there is a need for independent judgment</li><li>• specialized information is needed that only experts can provide</li><li>• program indicators are standardized, rather than particular to a program</li></ul>
<b>What are the costs?</b>	<ul style="list-style-type: none"><li>• Time, energy and commitment from local residents, project staff and other stakeholders</li><li>• Coordination of many players</li><li>• Training, skills development and support for key players</li><li>• Potential for conflict</li></ul>	<ul style="list-style-type: none"><li>• Consultant and expert fees</li><li>• Loss of critical information that only stakeholders can provide</li></ul>
<b>What are the benefits?</b>	<ul style="list-style-type: none"><li>• Local knowledge</li><li>• Verification of information from key players (validity)</li><li>• Builds knowledge, skills and relationships among community residents and other stakeholders</li></ul>	<ul style="list-style-type: none"><li>• Independent judgment</li><li>• Standardized indicators allow comparison with other research findings</li></ul>

## 18. PARTICIPATORY RURAL APPRAISAL

### 18.1. Definition

Participatory Rural Appraisal (PRA), recently renamed Participatory Learning for Action (PLA), is a methodological approach that is used to enable locals to analyze their own situation and to develop a common perspective on natural resource management and agriculture at village level.

It is an approach used by non-governmental organizations (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programs.

Some of the most common techniques that can be used are:

- Group dynamics, e.g., learning contracts, role reversals, feedback sessions
- Sampling, e.g., transect walks, wealth ranking, social mapping
- Interviewing, e.g., focus group discussions, semi-structured interviews, triangulation
- Visualization e.g., Venn diagrams, matrix scoring, timelines

## ***19. POSITIVE DEVIANCE***

### **19.1. Definition**

Positive Deviance (PD) refers to a behavioral and social change approach which is premised on the observation that in any context, certain individuals confronting similar challenges, constraints, and resource deprivations to their peers, will employ uncommon but successful behaviors or strategies which enable them to find better solutions. Through the study of these individuals— subjects referred to as “positive deviants” - the PD approach suggests that innovative solutions to such challenges may be identified and refined from their outlying behavior.

In applying the PD approach, an investigator must first obtain an invitation from the community in question requesting their aid in addressing a problem they have collectively identified as important.

Once this invitation is obtained, it is the investigator’s task to work as a facilitator in guiding community members through the four “Ds” of PD: Define, Determine, Discover, Design, and Discern.

### **19.2. Limitations**

- Time consuming
- Requires a skilled facilitator
- Non-traditional tool, might not be accepted by all donors

## ***20. SOCIAL RETURN OR INVESTMENT***

### **20.1. Definition**

Social Return on Investment (SROI) is a systematic way of incorporating social, environmental, economic, and other values into decision-making processes. By helping reveal the economic value of social and environmental outcomes, it creates a holistic perspective on whether a development project or social business or enterprise is beneficial and profitable. This perspective opens up new opportunities and forms the basis for innovative initiatives that genuinely contribute to positive social change and

poverty reduction for all. SROI balances *proving* and *improving*, or addresses the paradox between accountability and learning, by placing the perspectives of the different stakeholders at the center of the evaluation process.

There are different components that are followed (not necessarily in a linear or chronological order) which collectively constitute the SROI approach: i) defining the boundaries (objective and scope), ii) identification and selection of key stakeholders, iii) developing the business plan/theory of change, iv) Identifying inputs and results, v) valuation, vi) calculation, vii) narratives, and viii) verification.

## 20.2. Strengths

- Can be integrated in existing M&E approaches and does not need be an add-on activity. In fact, the approach could guide a participatory development model, with reflection and learning as consistent ingredients.
- Has the capacity to create awareness of mutual interdependence and, as such, develops collective ownership and commitment.
- Leads to mind-shifts, for example, from a perception of cost (with consequently negative associations) to the realisations that they should be seen as investments with clear results benefitting the community, individuals and households.
- Rather than positioning initiatives within imperatives such as profit maximisation and neoliberal economic growth, SROI allows actors to create opportunities to more directly address the creation and measurement of social value

## 21. UTILIZATION-FOCUSED EVALUATION

### 21.1. Definition

Rather than a focus on general and abstract users and uses, Utilization-Focused Evaluation (UFE) is focused on real and specific users and uses. The evaluator's job is not to make decisions independently of the intended users, but rather to facilitate decision making amongst the people who will use the findings of the evaluation.

UFE can be used for different types of evaluation (formative, summative, process, impact) and it can use different research designs and types of data.

The UFE framework can be used in a variety of ways depending on the context and the needs of the situation. The seventeen steps of this framework are:

1. Assess and build program and organizational readiness for utilization-focused evaluation.
2. Assess and enhance evaluator readiness and competence to undertake a utilization-focused evaluation.
3. Identify, organize, and engage primary intended users: the personal factor.
4. Situation analysis conducted jointly with primary intended users.
5. Identify and prioritize primary intended uses by determining priority purposes.

6. Consider and build-in process uses if and as appropriate.
7. Focus priority evaluation questions.
8. Check that fundamental areas for evaluation inquiry are being adequately addressed: implementation, outcomes, and attribution questions.
9. Determine what intervention model or theory of change is being evaluated.
10. Negotiate appropriate methods to generate credible findings that support intended use by intended users.
11. Make sure intended users understand potential methods and controversies and their implications.
12. Simulate use of findings: evaluation's equivalent of a dress rehearsal.
13. Gather data with ongoing attention to use.
14. Organize and present the data for interpretation and use by primary intended users: analysis, interpretation, judgment, and recommendations.
15. Prepare an evaluation report to facilitate use and disseminate significant findings to expand influence.
16. Follow up with primary intended users to facilitate and enhance use.
17. Meta-evaluation of use: be accountable, learn, and improve.

#### 21.2. Strengths

- Pragmatic and flexible
- Increases chances evaluation results will be followed up on

#### 21.3. Limitations

- May decrease role of groups other than primary users

## SUMMARY

This document is a brief summary of some of the many tools that existing for conducting program evaluations. There is not a perfect approach for all situations; every method has its own strengths and limitations. The method for evaluation has to be selected depending on the objectives of the evaluation. Often two or more approaches are combined in order to achieve those objectives. The recommendation for this study is that no matter the approach selected, the ultimate goals should be clear and time is expense on understanding and accomplishing them rather than looking the perfect tool for evaluation.

Independently of the approach selected for conducting an evaluation, it is important to mention the level of accuracy to be achieved with the program. Conducting interviews with stakeholders is a valuable way of getting first-hand information about the program; it is also a participatory way of including all the key figures of the program. However, this procedure of getting information is not always accurate enough. In order to confirm the data collected, there are other ways to gather information about the program, such as reviewing program documentation or visiting communities where the program has been implemented. This will allow the researchers to increase their confidence on the results obtained from this evaluation.

It is recommended that research projects consider these alternate sources of information to ensure their veracity.

The approaches described in this paper can be classified in different ways, but it seems that those that are result-focused might be a good start point for doing this evaluation research. These types of approaches consider the inputs that are needed to produce certain outputs in order to reach certain outcomes, and have a defined impact on the communities where the program is being implemented.



## **Appendix B: Evaluation Systems Map**

## **Systems Map: Evaluation of education and training activities**

The evaluation framework that we developed is a customization of Kirkpatrick's four levels of learning evaluation. Through the process of applying the framework to case studies in Peru and Nepal, we identified strengths, weaknesses, and opportunities for the framework to be scaled up, and opportunities for it to be applied to other capacity building organizations.

The evaluation framework we developed is a customization of Kirkpatrick's four levels of learning evaluation. Through the process of completing the case studies in Peru and Nepal we identified strengths and weaknesses in the evaluation methodology, and opportunities for it to be applied to other capacity building organizations. Figure 1 shows the framework we developed as a result of the project.

The blue shaded area represents what the literature would suggest is the common process flow for water and sanitation interventions in developing countries. It moves from curriculum and materials development and delivery through to practice changes and established clean water/sanitation services.

The full diagram has been developed out of the findings of this project, and reflects CAWST's theory of change. The systems map shows an expanded system inclusive of internal feedback points and evaluation steps, and recognizes the iterative nature of water/sanitation education and intervention.

Through this study we identified new links and connections throughout the chain of activities, which impact the effectiveness of the education and training activities, the transfer of technical knowledge, and the sustainability of the activities. These are represented by purple font in Figure 1.

Elements of evaluation are required throughout the chain of activities in order to undertake a comprehensive evaluation of an education and training program. These different evaluation elements can be combined to learn about the overall impacts of the education and training activities.

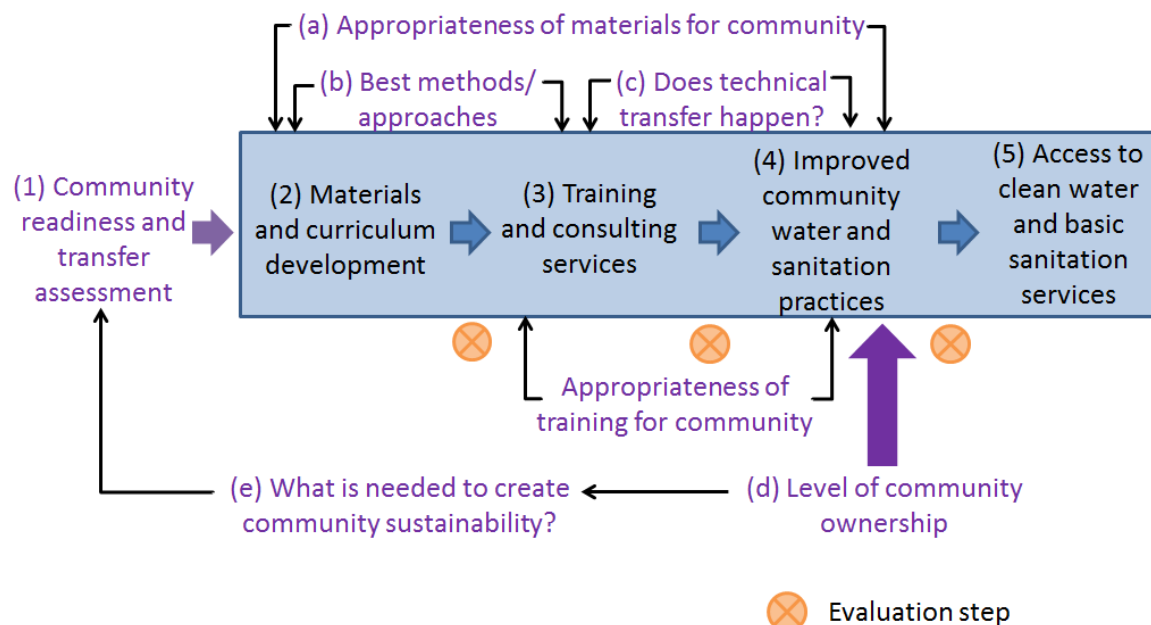
Each step in the framework is described below:

- (1) Community readiness and transfer assessment: This is a step taken by the intervening organization (such as CAWST) prior to selecting the community where the intervention and training will take place. This step would include:
  - a. Assessing the internal capacities of the community.
  - b. Assessing the placement and capacities of NGOs and community organizations.

- c. The roles of community leaders, elders, mothers, funders, government and other local stakeholders.
  - d. Assessing the willingness of a community to take ownership of a project.
- (2) Materials and curriculum development: This is a step that can remain largely unchanged from current activities. It is important that all materials and content are modified in response to the information gathered in Step 1 above, and other factors such as culture or religion.
- (3) Training and consulting services: The transfer of technical information depends on the level of engagement and the amount of practice and reinforcement of core skills that are provided as part of the training. Consulting services provide intermittent support to field practitioners and leaders to enable the continuance of the implementation of the project.
- (4) Improved community water and sanitation practices: The outcome remains unchanged for the most part. Additional elements that enhance this outcome include:
  - a. The consistency of practice between individual sites or organizations in the community.
  - b. The engagement of community leaders, elders, mothers, funders, government etc. in supporting behaviour changes and systems (e.g., water delivery systems) changes.
  - c. Consistency or inconsistencies with cultural practices or belief systems that support improved hygiene, sanitation and clean water.
- (5) Access to clean water and basic sanitation: This step is largely unchanged however; equity and inclusion are dimensions of access that need to be addressed. For example, are there individuals or organizations that are intentionally excluded from access due to gender, caste, age? Are the most vulnerable populations gaining access to improved services?
- (a) Appropriateness of materials for community: This step explicitly addresses the fit between materials and curriculum and a particular community setting. Information from Step 1 is essential to determining appropriateness. Implied is the ability and willingness to change materials to be more appropriate.
- (b) Best methods/approaches: Based on the findings in Step 1, community-specific methods and approaches are developed and implemented.
- (c) Does technical transfer happen: Fundamentally, the question of whether or not the technical information has moved from “paper” to “practice” has to be answered. If practice opportunities are provided, for example, what kinds of skills need reinforcement, and for

how long? The evaluation here would be focused on a “mastery” or “competency” model, i.e., can the community build and sustain the water or sanitation technology?

- (d) Level of community ownership: The community has to be active owners of the water or sanitation system that they are implementing. If the community does not move to a point of ownership, the likelihood that the system will be longstanding is low.
- (e) What is needed to create community stability: Community ownership over the long-term is dependent on the stability of the capacity of key stakeholders. If a crucial supporter leaves or withdraws their support, or if there are economic or political changes, stability may be challenged. Some thought needs to be given to considering responses to unsettling situations that may detract from the community’s capacity to sustain the water or sanitation system.



**Figure 1: Systems Map: Evaluation of education and training activities**

A key strength of the proposed framework is that it fills a gap in CAWST’s existing monitoring and evaluation processes by providing rich, qualitative information on the impacts of CAWST’s education and training work. In particular, the interview responses demonstrated changes in CAWST’s client’s competencies (such as learning about effective training techniques) in contrast to focusing on quantitative results only (such as the number of filters implemented). New impacts of CAWST’s education and training activities and new opportunities for CAWST to improve were also captured. These new findings provided ideas for future research and analysis of CAWST’s work.

For future evaluations, additional sources of data, alongside semi-structured interviews, can be used to make the evaluation more comprehensive. This could include systematic measures to monitor post-training (e.g. 6-month); installation and compliance records; analysis of post workshop evaluation questionnaires; analysis of historical client data records; baseline information about the organization to enable comparison of the behaviour; results from the technology transfer; and records of the CAWST competency validation process to show staff behavior changes over time. This would add more rigour and systematic aspects to the assessment, reduce the reliance on interviewee 'self-reporting', and add completeness.

There is potential for other capacity building organizations to apply the proposed evaluation framework to evaluate their own education and training activities. Modifications to the framework would be required to ensure its relevance for different contexts. This also has the potential to foster more collaboration and communication amongst WASH capacity development organizations, and lead to improved ability to evaluate education and training activities and improve throughout the sector.

## **Appendix C: Data Sources for Future Evaluations**

## Evaluation of education and training: Additional data sources

Following review of 22 evaluation processes, an evaluation methodology was developed to evaluate CAWST's education and training activities in Peru and Nepal. The evaluation method was based on Kirkpatrick's four levels of evaluation, and consisted of semi-structured interviews as the primary method of data collection.

Through the process of evaluating the two case studies, opportunities were identified to make the evaluation methodology more robust and comprehensive by including additional sources of data. Including a mixture of data sources, including primary and secondary sources, can add more rigour to the evaluation by enabling validation of different sources, reduce the reliance on interviewee 'self-reporting', and add completeness to the evaluation.

Additional data sources that could be used in evaluations of CAWST's programs in the future are shown below. While there is a trade-off between the comprehensiveness of the evaluation and the time and resources required to complete it, care has been taken to keep the resource requirements light by making use of existing data sources.

The data sources that are available will vary for each type of evaluation. The table below shows data sources that would be useful for the purpose of evaluating the impacts of CAWST's educational and training activities to their Water Expertise and Training (WET) Centres. These are clients with whom CAWST has been involved for a long time, has had substantial involvement with, and has a large amount of existing data over time related to their organizational results. (The methodology would be less comprehensive if less historical data were available.)

Kirkpatrick Level	Data Sources	Comments/Rationale
<b>Reaction</b> <i>How did participants respond to the training?</i>	Workshop participant feedback forms	Existing data collected by CAWST. Can be analyzed for all participants in a particular region/organization to show a representative indication of reaction. Also completed at the time of training, when participants may remember more specific points.
	Semi-structured interviews	As per the revised interview protocol (below). The interview purpose is to provide rich qualitative data and impacts outside those previously understood. However, the interview relies on self-reporting so it is important to cross check with other data sources.
<b>Learning</b> <i>To what extent did the participant's</i>	Semi structured interviews	As above
	Records of competency validation process to show	CAWST's competency validation process shows a record of an individual's capacities

<i>experience change in knowledge, skills, and attitudes as a result of the training?</i>	learning in individuals	(knowledge and behaviour) over the time that they are involved with CAWST. For clients who have participated in competency validation, this can show specific and verified changes over time.
	Observation of workplace interactions to validate interview responses	Observing the interviewee undertaking some daily tasks can assist in validating the interview responses. This can enable the interviewee to demonstrate their knowledge and skills, rather than self-reporting only.
<b>Behaviour</b> <i>Can changes be observed in the participant's behaviour as a result of training?</i>	Semi structured interviews	As above
	Records of competency validation process, showing behaviour change in individuals	As above
	Observation of workplace interactions to validate interview responses	As above
<b>Results</b> <i>How have organizational outcomes changed as a result of the training program?</i>	Semi structured interviews	As above
	Observation of how the organization is running day-to-day to validate interview responses	Observing how the organization runs on a daily basis can assist in validating the interview responses. The interactions between staff members, management of tasks, and planning processes are examples of the aspects to be observed.
	Organizational records of project activities and outputs, to analyze changes over time (e.g., number of trainings conducted by organization, number of HWT technologies implemented, funding sources, results of action research projects)	Existing data collected by CAWST. This can show the level of scale-up, or changes to the organization over the time that it has been involved with CAWST. This can add a quantitative aspect to the organizational changes, to complement qualitative interview and observational data.



## **Appendix D: Interview Protocol**

# **Interview Protocol: Evaluating the impacts of education and training activities in water and sanitation technology**

## **Interviewee selection**

The evaluation is influenced by the selection of interviewees. In order to evaluate the impacts of CAWST's education and training activities to individuals and organizations, it should be clear what services they have received in the past.

Major factors that may influence the evaluation include:

- Level of interaction between the interviewee and CAWST (i.e., number of workshops attended, number of consulting support visits, number of years involved)
- Profession of interviewees (e.g., community health promoters, NGO field workers, NGO managers, entrepreneurs or technical staff)
- Level of activity and number of WASH projects that the interviewee has been involved with following on from training/consulting support from CAWST

If the intention of the evaluation is to assess the overall impacts of CAWST's training and education activities, then interviewees should be selected to show diversity in these characteristics.

However, if the intention of the evaluation is to investigate specific aspects of CAWST's programs or clients, then the interviewee selection should be different. For example, it may be useful to investigate CAWST's most active clients to analyze trends in what their involvement with CAWST has been like, and learn what has influenced them to become so active. Similarly, it could be useful to investigate CAWST clients who have had a lot of interaction with CAWST, but have not implemented many projects to learn why this has occurred.

## **Interview introduction**

*Explain interview purpose:*

We are interested in understanding how CAWST's education and training activities have contributed to changes in your work in water and sanitation.

We'd like to talk about four main things:

- (1) Your reactions to the education/training activities you've been involved with
- (2) The sorts of things you have learned
- (3) Any changes the education/training has caused in the way you do your work
- (4) The results of any changes in your work

This will help us to understand what CAWST is doing well and what we can do better to support you. This is a safe time for you to give any positive or negative feedback for CAWST, and any suggestions you have for CAWST. We are interested in your personal experiences, and also the experiences of your organization as a whole.

*Mention interview duration, recording, confidentiality.*

## **Background**

- How would you describe the type of work you/your organization does in water and sanitation?
- What are some examples of projects that you do?
- How long have you/your organization been doing water and sanitation projects?
- How did you/your organization first become involved with CAWST?

## **Reaction:**

Which CAWST training workshops have you/your organization attended?

- ☐ Community Health Promotion
- ☐ Low Cost Sanitation
- ☐ Household Rainwater Harvesting
- ☐ Household Water Treatment and Safe Storage
- ☐ Biosand Filter
- ☐ Drinking Water Quality Testing
- ☐ Project Planning
- ☐ Monitoring and Evaluation
- ☐ Effective Facilitation Skills for Trainers
- ☐ Other (specify): \_\_\_\_\_

Think back to when you/your organization attended the training. What did you think of it?

*After listening to their initial reaction, prompt the following topics (if not covered already):*

- Was the training what you were expecting it to be, or different to what you were expecting? In what way?
- What did you think of the facilitator?
- What did you think of the content?
- What did you think of the training materials (posters, manuals)?
- How about the length of the training?

What could have made the training better, or more useful, to you?

Which consulting support service(s) have you/your organization received from CAWST?

- ☐ Email support
- ☐ Phone support
- ☐ Personal visit to your office
- ☐ Personal visit to your field sites

☐ Other (specify): \_\_\_\_\_

What topic areas were discussed in the consulting support?

- ☐ Technical, including water, sanitation and hygiene
- ☐ Project implementation or project management
- ☐ Financial or accounting
- ☐ Institutional strategy or governance issues
- ☐ Stakeholders relationship issues
- ☐ Other (specify): \_\_\_\_\_

What did you think of the consulting support services? How useful or not useful were they to you/your organization in moving the water, sanitation or hygiene project forward in your community?

What could make the consulting support services better or more useful to you/your organization in implementing a water, sanitation or hygiene project?

For the rest of the questions, I'd like to you to please think about ALL of the interactions you/your organization has had with CAWST (training and consulting support), and the combined effect of those interactions on your work and your organization.

We want to try to understand the changes to your work and in your organization before you started interacting with CAWST, and after. So when you are answering please try to think back to how things were before you heard of CAWST, and compare that with how things are now.

### **Learning:**

Did you/your organization learn anything new from your interactions with CAWST (both training and consulting support activities)? If yes, please describe some examples.

*After listening to their answer, prompt knowledge, skills, and attitudes (if not covered already):*

- What are some other examples of new facts or ideas that were learned?
- What are some other examples of different ways of doing things that were learned?
- What are some examples of changes to attitudes (how you think about things)?

What was your greatest learning or most surprising learning coming out of your work with CAWST?

What could have helped you/your organization to learn more new things from CAWST (both training and consulting support activities)?

**Behaviour:**

Have you/your organization been able to use any of the new things that you learned in your work? How did you use it? Please describe any changes that have happened in your work as a result of the training or support from CAWST.

Do you/your organization approach things differently, or in the same way as before? Please describe some examples.

What could help you/your organization to use more new things that you have learned in your work?

**Results:**

Did you get the results you were expecting from the project with CAWST? What was your expectation and what was the result?

Are there any changes in the types of water and sanitation projects that you/your organization implements as a result of your involvement with CAWST? Can you describe some examples?

Are there any changes in the ways in which you/your organization implement water and sanitation projects as a result of your involvement with CAWST? Can you describe some examples?

How do you think you/your organization would be different now if you hadn't ever been involved with CAWST?

Do you think the changes to you/your organization are resulting in any difference in how your projects impact the communities where you work? Please describe any.

Can you describe the biggest current challenges that affect how you/your organization implements water and sanitation projects?

Are there any ways that CAWST could support you/your organization better to overcome these challenges?

**Summary/Close:**

Thank you for your time, the discussion that we've had has been really interesting and useful for me.

What other comments, stories or ideas you'd like to share with me?

What questions do you have for me?

**Examples of question probes:**

*Question probes should be used whenever the interviewer wants more information on a particular topic or interview question. These can be used to make sure that all Kirkpatrick levels are covered well.*

**Examples:**

- Could you please tell me more about...
- I'm not quite sure I understood ...Could you tell me about that some more?
- I'm not certain what you mean by... Could you give me some examples?
- Could you tell me more about your thinking on that?
- You mentioned....Could you tell me more about that? What stands out in your mind about that?
- This is what I thought I heard...Did I understand you correctly?
- So what I hear you saying is..."
- Can you give me an example of...
- What makes you feel that way?
- What are some of your reasons for liking it?
- You just told me about.... I'd also like to know about....

(E. Taylor-Powell, L. Camino, 2006, <http://www.uwex.edu/ces/pdande/resources/index.html>)

## **Appendix E: Case Study Report**

# **Evaluation of Education and Training in Water and Sanitation Technology: Case Study Report**

## **Project Background and Research Objectives**

One of the most significant constraints to effective and sustainable water and sanitation provision is the “lack of capacity at the local level” (WHO, 2010); however, there is significant uncertainty in how the efforts of capacity builders should be measured and effective ways in which they can be improved (Brown, et al., 2001).

The Institute of NonProfit Studies at Mount Royal University (MRU), the Centre for Affordable Water and Sanitation Technology (CAWST), and two organizations which have been trained by CAWST (Equidad y desarrollo (EDES) in Peru and Environment and Public Health Organization (ENPHO) in Nepal) have collaborated through a research project to address this issue.

The objective of the project was to design an evaluative framework to assist capacity builders in the water and sanitation sector to capture and interpret the results of their education and training activities, and to assist them to understand how they can maximize their positive impacts.

The project is being conducted in several stages. Stakeholder mapping was undertaken, followed by the development of a framework for evaluating CAWST’s activities as an NGO educator and technical trainer in water and sanitation knowledge. The framework was then applied to two case studies to evaluate the impact of CAWST’s training activities with EDES in Peru and ENPHO in Nepal.

This report presents and analyzes the findings of the evaluation of CAWST’s education and training activities in Peru and Nepal. A comparison of the two case studies is included, followed by recommendations for CAWST to improve their education and training activities, and recommendations for improvements to the evaluation framework.



## **Case Study 1: Evaluation of CAWST's Education and Training Activities in Peru**

CAWST is a Canadian non-profit organization established in 2001 and focused on the principle that clean water changes lives. CAWST transfers knowledge and skills to organizations and individuals in developing countries through education, training and consulting services (CAWST, 2013).

CAWST first visited Peru in 2005, and has since delivered a range of training workshops and consulting support services to local clients over a total of twelve visits. CAWST has developed a network of clients and collaborators in Peru, which include grassroots organizations, international NGOs, research institutions and universities. In 2011 CAWST identified the potential to develop a WET Centre with EDES, a local organization that CAWST had formed a close relationship with through providing support to their biosand filter (BSF) implementation projects. EDES's focus on capacity development in order to deliver sustainable household water treatment (HWT) projects was a key reason for its selection as a potential future WET Centre. EDES has recently restructured into a new organization (AguaSAN), and this restructure as well as funding complications has delayed the development of a WET Centre. However, both organizations are working toward this in the future.

This case study investigates the effectiveness of CAWST's training and consulting support services in Peru to EDES/AguaSAN and other local clients.

### ***Methodology***

Following a review of a range of approaches to evaluation, an evaluation framework was devised for this investigation. The framework follows Kirkpatrick's evaluation methodology for assessing the effectiveness of learning processes (1994, 1975, 1959). The methodology consists of four steps:

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

In May 2013 the evaluation team travelled to Peru to conduct semi-structured interviews with individuals who had participated in CAWST's training and consulting support activities. A total of twelve interviews were undertaken during the evaluation period, using an interview outline which had been developed based on Kirkpatrick's methodology. The interviewees comprised staff members from a range of organizations, including Rotary, IPC, EDES/AguaSAN, 27 de Junio, Aynimundo, as well as three community health promoters (CHPs).

All interviews were conducted in person and were recorded with the permission of the interviewees. The interviews were conducted in Spanish and translated by CAWST staff.

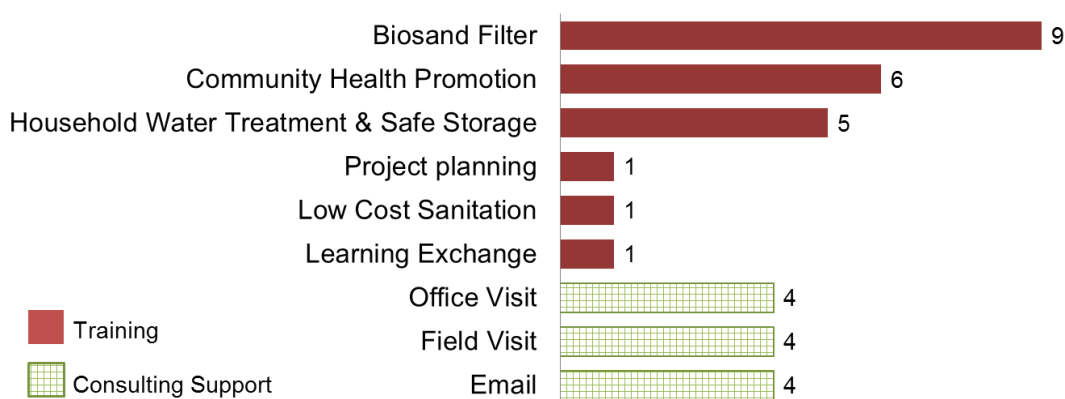
A limitation of the evaluation methodology is the reliance on self-reporting of the interviewee's learning, behaviour and results. This does not enable an objective comparison of the participant's

knowledge and behaviour before and after the interactions with CAWST. Also, the interviews were conducted by a CAWST staff member, so this may have caused a bias toward reporting positive reactions, behaviour and results in favour of negative outcomes.

The following section summarizes the results from the interviews.

## Results and Discussion

The interviewees had participated in a range of CAWST's training programs, and had experienced different consulting support activities, as shown in Figure . The BSF training was the most commonly attended workshop with nine out of the twelve interviewees having attended. CHP and HWTS workshops were also commonly attended, and consulting support activities included office visits, field visits, and email support.



**Figure 1: Training events and consulting support activities experienced by interviewees in Peru**

The following subsections discuss interviewees' reactions, learning, behaviour changes and their perceived results from their involvement with CAWST's training and consulting support activities.

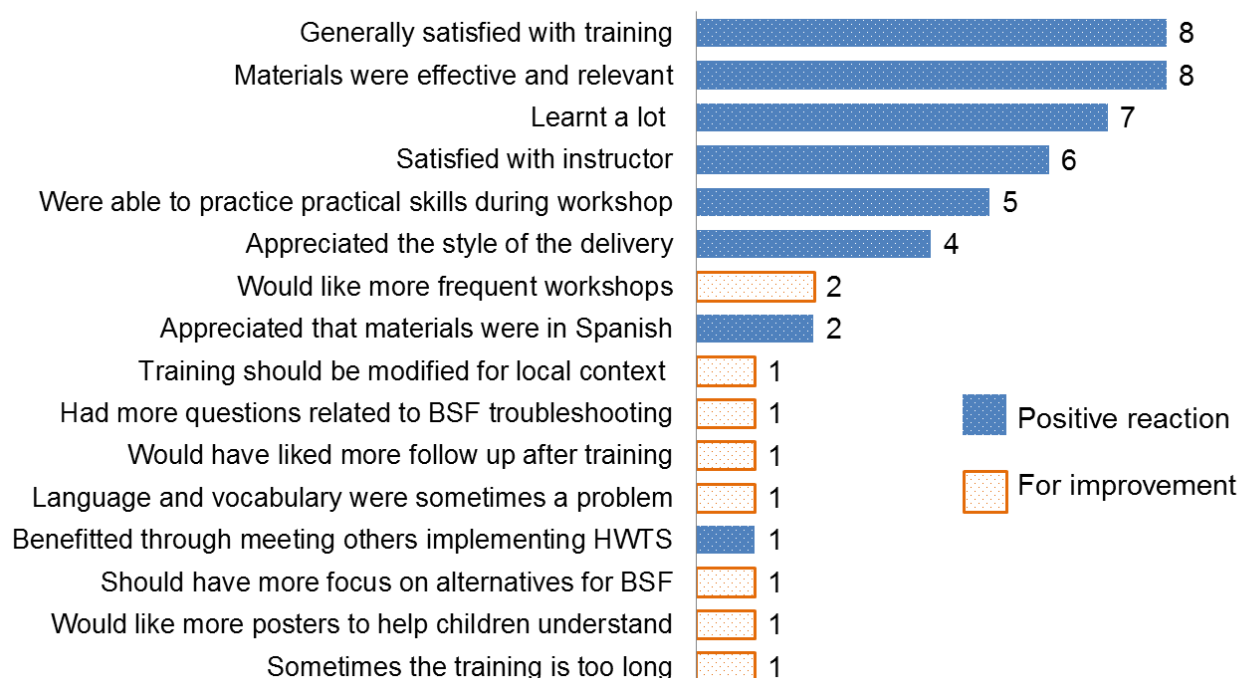
### Reaction (Kirkpatrick Level 1)

Figure 2 and Figure 3 show the most common responses when interviewees were asked to describe their reaction to the content and delivery of the training and consulting support activities. In both cases, a majority of the interviewees expressed general satisfaction with the training or consulting support. None of the interviewees stated that they were dissatisfied with the quality of CAWST's services.

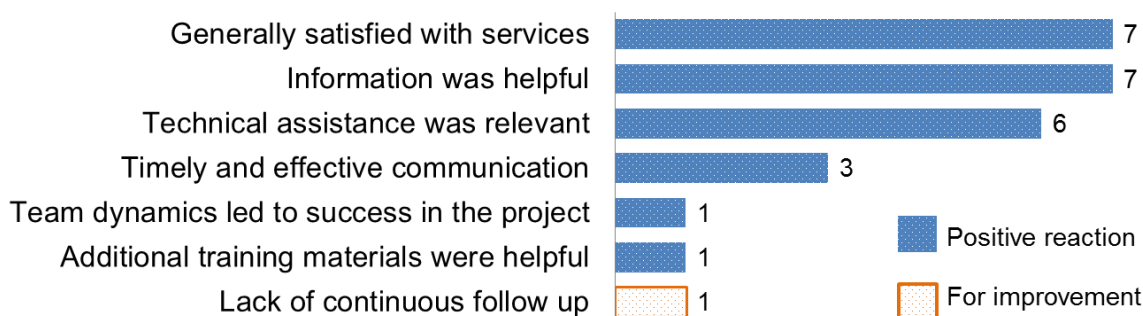
In response to the training activities, eight of the interviewees stated that they found the training materials to be effective and relevant, seven stated that they 'learnt a lot', and six mentioned they were satisfied with the workshop facilitator. Interviewees also described that they appreciated the style of the workshop delivery and were able to practice practical skills during the workshops. For example, one interviewee stated *"I appreciated the style of the delivery; we could later communicate the things we learned to other people the same way that we were trained."* Two interviewees stated that they would benefit from more frequent workshops, and other areas for improvement included modification of the

training for the local context, BSF troubleshooting, better follow up, and confusion caused by different language/vocabulary.

The most common responses related to consulting support were that the information provided by CAWST was helpful and relevant and that the communication with CAWST was timely and effective. One interviewee stated: *“Whenever we wanted to communicate with CAWST, they replied promptly. The level of information was useful and helped us with specific problems we had.”* As an area for improvement, one interviewee stated that the services could be improved by better follow up support.



**Figure 2: Reaction to training in Peru**



**Figure 3: Reaction to consulting support in Peru**

## Learning (Kirkpatrick Level 2)

Each of the interviewees was asked to describe what they had learnt as a result of CAWST's training or consulting support activities. Figure 4 shows the responses, categorized to reflect changes in the participant's knowledge, skills or attitudes. The most common responses were new knowledge about BSF technology and new skills to manufacture the BSF. Their responses are to be expected, considering that the BSF was the most commonly attended training activity for the interviewees. Many of the interviewees had little or no experience in BSF knowledge prior to the interactions with CAWST. Many interviewees also reported that they had learned new knowledge related to water, sanitation, hygiene, water quality testing, and diseases transmission.

As well as skills to manufacture the BSF, interviewees reported that they learnt how to transmit new knowledge to their communities. For example, one interviewee stated: *"I learnt how to get to the recipients, the way to treat them. Many times the recipients have a different socio-cultural background from a technician, so we need to know how to speak to them in a way they understand."*

Interviewees reported shifts in attitude following interaction with CAWST, including increased confidence, the importance of safe water and hygiene, the importance of relationships, and training in delivering sustainable water, sanitation, and hygiene (WASH) projects. One interviewee explained their increased confidence as follows: *"At the beginning, I was afraid of leading workshops. In time I overcame this fear and my performance improved."*

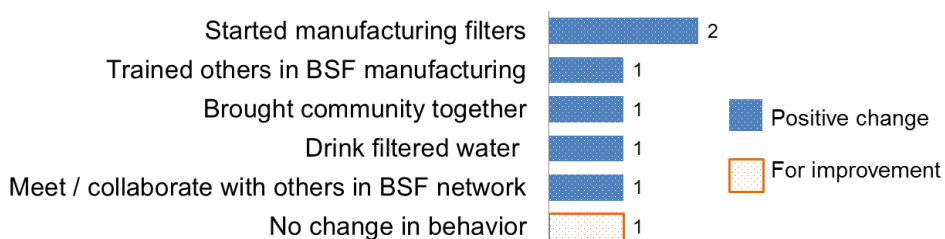


**Figure 4: Knowledge, skills and attitude learnings as a result of the training or consulting support services in Peru**

### Behaviour (Kirkpatrick Level 3)

The third step in Kirkpatrick's methodology evaluates behaviour change as a result of the learning process as summarized below in Figure 5. This level was not covered comprehensively during the interviews, resulting in an overall low number of responses. Two interviewees stated that they have started manufacturing filters, and one each stated that they had trained others, that the project had brought the community together, that they drink filtered water, or that they had met with others in the BSF network. For example, one interviewee stated: *"People use the filtered water to drink and wash the vegetables. They are also more concerned as regards health and hygiene, and they grow some plants and vegetables now."*

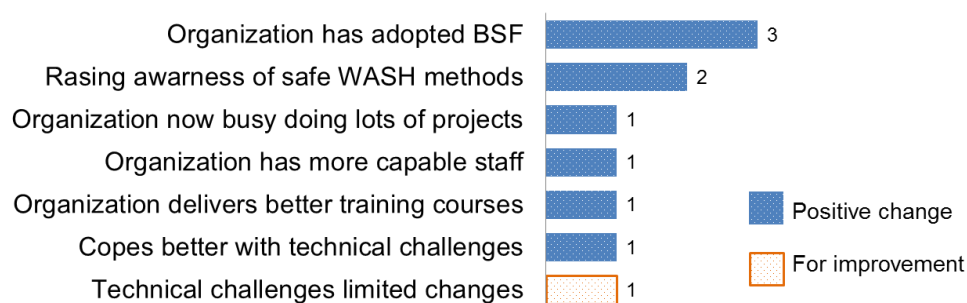
Only one interviewee stated that they had made no change to behaviours, and they said: *"We've met lots of CAWST people. We appreciate it, but nothing's changed."* This participant was the only one from their organization to have attended a BSF training, and was having trouble engaging others in their organization to take action.



**Figure 5: Changes in behaviour as a result of the training/consulting support activities in Peru**

### Results (Kirkpatrick Level 4)

Figure 6 shows organizational and community level changes which resulted from the training or consulting support, as reported by the interviewees. The most common result was adoption of the BSF by the individual or organization, and two interviewees had also begun raising awareness of WASH methods.



**Figure 6: Changes in organizational performance as a result of the training/consulting activities in Peru**

The interviewees provided feedback on the overall strengths and weaknesses of CAWST's approach to technology transfer, and these are listed below.

## Strengths

- The most important impact is that people have clean water now. One interviewee stated: *“The effect can be seen in those mothers who have used the filter, especially those with small children; they have saved money, they don’t need to boil their water any more nor to buy medicines.”*
- There are fewer diseases in the community now, for example: *“There has been improvement in the quality of the water due to the implementation of the biosand filter and the reduction of diseases such as diarrhea and bronchitis. There are fewer diseases in general.”*
- The community members have all taken the training.
- The involvement with CAWST was valuable in taking the project to scale.
- The program generated social capital, which was an important benefit to the community.
- CAWST can share its global experience to advise on what technologies and methods could work in Peru.
- It is great that the CHPs are willing to work in the communities.
- People change their behavior when they see how the filters work.
- The community members want to participate in the projects.
- Community members who are using the filters save time and money, and have better hygiene practices. One interviewee stated: *“We were living with a water of very poor quality until CAWST arrived with the filters. The best that could happen is the arrival of the filter because we were a lot of years waiting.”*
- The information about how to manufacture, use and maintain the BSF was provided in an effective way.
- CAWST has already thought of manuals which help us in fixing any problems with the filters.

## Areas for Improvement

- It would be useful if CAWST can give more advice related to costing for the manufacture of the BSF.
- It would be useful to clarify our relationship with CAWST more clearly.
- It can be difficult to convince people of the use and benefits of the BSF, and to get a community to support it.
- Sometimes the technical information is difficult for people to understand.
- More follow up and regular contact would improve technology transfer. One interviewee stated: *“It would be good to have more workshops in order to update the community and remind them to use the filters, because in some cases they started using them at the beginning but now they are not.”*
- Lack of motivation in CHPs because they are not receiving any compensation for their work. One interviewee stated: *“There are few people who just work for enthusiasm and love to the community.”*
- An earlier connection with CAWST may have helped with more capacity building.
- Donors are willing to pay for the BSF, but not for the training.
- It is difficult to change the perspectives of community members.

- Scaling up our organization is a major challenge, especially looking for funds.
- The BSF must be accepted by the government in order for it to be successfully implemented.
- CAWST could reach more people by making use of web technology for trainings in remote areas. *“Of course, the quality of face-to-face training is incomparable, but more efforts could be applied to make the most of the web and exchange and update the experience.”*
- There is a challenge in reaching dispersed populations, and those are the ones that can benefit the most from CAWST's advice.
- Lack of ability to get government support limits the areas in which we can work.
- More time should be taken for the training, so that all questions can be brought up and answered.
- Not all of the community members are using the filters. More training or a commitment from families to use the filter may help.
- It would help if a manual could be provided to all end users.
- Time is wasted every time staff changes happen in the organization.
- Would like more access to workshops.

## ***Recommendations***

The interviews provided useful information related to the reaction, learning, behaviour and results of CAWST's training and consulting support activities in Peru. They showed that CAWST's technology transfer approach has successfully developed the capacity of the interviewees in water, sanitation and hygiene knowledge and technology implementation. Challenges and barriers to effective technology transfer were also identified throughout the interviews. A summary of recommendations are provided in Table 1. It is recommended that:

- CAWST should continue its general approach to training and consulting support in order to transfer technical knowledge to WASH workers and community members. The overwhelming majority of interviewees reacted positively to CAWST's training and consulting services, and all but one had learnt and applied new knowledge and skills in their communities.
- CAWST should review its processes for providing ongoing assistance and follow-ups in communities to ensure consistency in its approach. Some interviewees reported regular follow ups, while others had difficulty communicating with and getting assistance from CAWST when needed.
- CAWST has the opportunity to improve the technology transfer by integrating virtual training (VWET) to reach remote populations.
- CAWST should more clearly define its relationships with clients to provide clear expectations and reduce confusion.
- CAWST's clients in Peru reported a range of challenges related to stakeholder communication, most commonly related to engaging communities and donors. To help their clients overcome this, CAWST should focus on and share communication tools and techniques.

**Table 1: Summary of Findings and Recommendations for Peru**

<b>Finding</b>	<b>Recommendation</b>
Majority of interviewees reacted positively to CAWST training and consulting support services.	CAWST should continue its general approach to training and consulting support activities.
Consulting support visits are sometimes irregular or not provided often enough, and clients would like more feedback from CAWST.	CAWST should review its processes for providing ongoing assistance and regular feedback to clients to ensure consistency in its approach.
CAWST could reach more people by making use of web technology for trainings in remote areas.	CAWST should integrate the VWET services to reach more clients and to provide support between in-country visits.
Institutional arrangements between CAWST and clients are sometimes confusing and unclear.	Review process for selection of CAWST's clients and partners, and clarify how clients would like to formalize arrangements.
Clients have challenges related to communication with both donors and community members.	CAWST should focus on developing client's capacity in stakeholder communication.

## ***Conclusions***

This study has demonstrated the use of the Kirkpatrick methodology for evaluation of learning processes to investigate the impacts resulting from CAWST's technology transfer activities with EDES/AguaSAN and other organizations in Peru. Twelve interviews were conducted with staff from NGOs and community health promoters who have participated in CAWST's training or consulting support services.

The evaluation found that CAWST's approach to technology transfer, through training and consulting support services, has produced positive outcomes in each of the four steps of Kirkpatrick's evaluation methodology (reaction, learning, behaviour and results). A majority of interviewees reacted positively to CAWST's services, with the relevance and effectiveness of the information provided, believing they learnt a lot, and liking the facilitators being the most commonly noted positive reactions. The most commonly noted negative reactions were a lack of ongoing support and workshops not being frequent enough. Interviewees learned significant new knowledge, new skills and changed attitudes as a result of CAWST's training and consulting support services. Many interviewees had no knowledge of the BSF and other household water and sanitation technologies prior to interactions with CAWST, and described that they learned the knowledge and skills to use and manufacture the BSF as well as other aspects of water, sanitation and hygiene knowledge. Interviewees reported a range of results, including adoption of the BSF and raising awareness of WASH knowledge.

It is recommended that CAWST continue its general approach to training and consulting support in Peru. In order to deliver better technical knowledge transfer, CAWST should: develop more consistent processes for community follow up support; integrate virtual WET Centre services; clarify partnership arrangements more thoroughly; and increase its focus on development of stakeholder communication capacity in its clients.



The results from this case study should be compared with results from other studies to determine which strengths and weaknesses relate specifically to CAWST's clients in Peru, and which relate to CAWST's other programs. Additionally, the evaluation process should be compared with other case studies in order to assess how well the framework performed in assessing technology transfer and to identify improvements for future evaluations.

## **Case Study 2: Evaluation of CAWST's education and training activities in Nepal**

CAWST is a Canadian non-profit organization established in 2001 and focused on the principle that clean water changes lives. CAWST transfers knowledge and skills to organizations and individuals in developing countries through education, training and consulting services (CAWST, 2013).

ENPHO is CAWST's principle partner in Nepal. ENPHO is a service-oriented national non-governmental organization, established in 1990, that envisages contributing to sustainable community development by combining research and action through integrated programs in the areas of environment and public health.

CAWST have been conducting training activities with ENPHO in Nepal on water, sanitation and hygiene knowledge since 2004. In 2005, ENPHO was selected to become one of CAWST's Water Expertise and Training (WET) Centres, due to the alignment of vision and mission of the two organizations. Over the past nine years, CAWST has visited ENPHO with over 30 education, training and consulting support visits, with input from fifteen different CAWST staff members (CAWST, 2013).

ENPHO is considered a suitable case study for this evaluation due to their comprehensive and long term interactions with CAWST.

### ***Methodology***

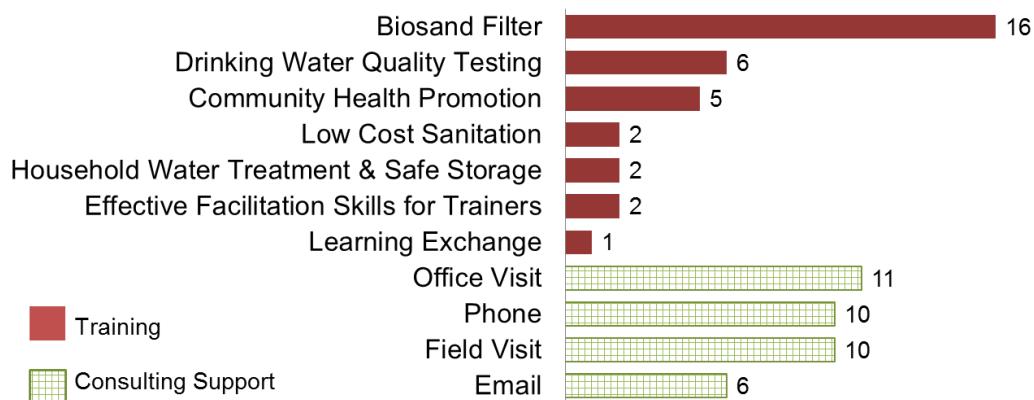
In September 2013 the evaluation team travelled to Nepal to conduct semi-structured interviews with individuals who had participated in CAWST's training and consulting support activities. A total of eighteen interviews were undertaken during the evaluation period, using an interview outline which had been developed based on Kirkpatrick's methodology. The interviewees comprised staff members from a range of organizations including ENPHO, Practical Action, Nepal Red Cross, UN Habitat, Annapurna Post, Department of Water Supply and Sewerage Pokhara, Pokhara Engineering College, Choice Nepal, and the Gurkha Welfare Society. Additionally, two community health promoters and four local biosand filter (BSF) entrepreneurs were interviewed. All interviews were conducted in person, and were recorded with the permission of the interviewees. The interviews were either conducted in English or in Nepali with the aid of a translator.

A limitation of the evaluation methodology is the reliance on self-reporting of the interviewee's learning, behaviour and results. This does not enable an objective comparison of the participant's knowledge and behaviour before and after the interactions with CAWST. Also, the interviews were conducted by a CAWST staff member, so this may have caused a bias toward reporting positive reactions, behaviour and results in favour of negative outcomes.

The following section summarizes the results from the interviews.

## Results and Discussion

The interviewees had participated in a range of CAWST's training programs, and had experienced different consulting support activities, as shown in Figure 7. The biosand filter (BSF) training was the most commonly attended workshop with sixteen out of the eighteen interviewees having attended. The majority of interviewees had also experienced some form of ongoing support from CAWST, with visits to their office or field sites and phone communication the most common methods.



**Figure 7: Training events and consulting support activities experienced by interviewees in Nepal**

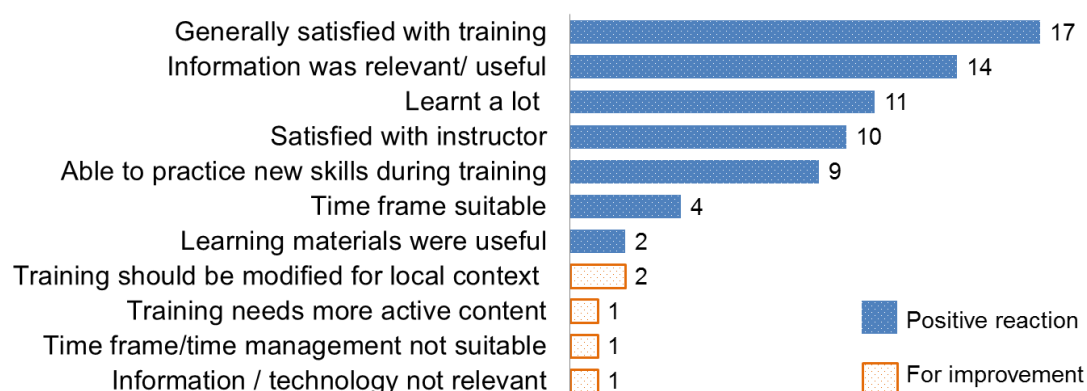
The following sub-sections discuss interviewees' reactions, learning, behaviour changes and their perceived results from their involvement with CAWST's training and consulting support activities.

### *Reaction (Kirkpatrick Level 1)*

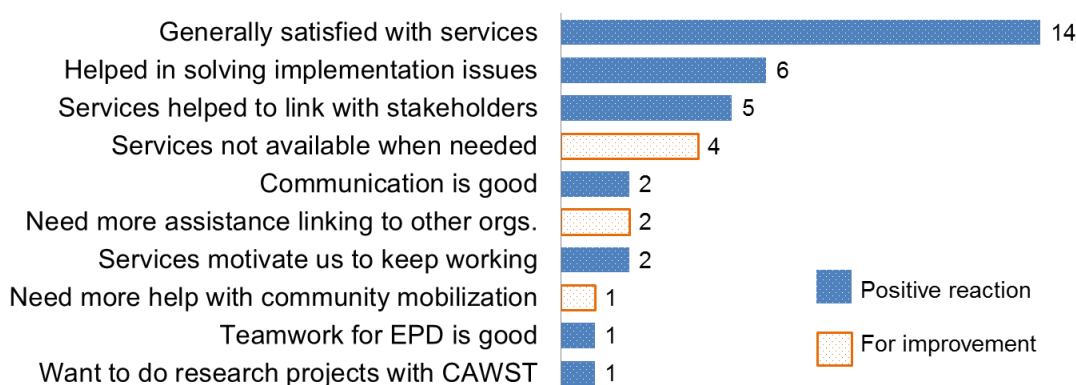
Figure 8 and Figure 9 show the most common responses when interviewees were asked to describe their reaction to the content and delivery of the training and consulting support activities. In both cases, almost all of the interviewees expressed general satisfaction with the training or consulting support. None of the interviewees stated that they were dissatisfied with the quality of CAWST's services.

In response to the training activities, fourteen of the interviewees stated that they found the information useful and relevant for their work, while one interviewee did not find the information relevant. Nine of the interviewees stated they liked the participatory methods used in the training, and were able to practice the new skills within the workshop; however, one stated there should be more participatory content. Over half of the interviewees also stated that they 'learnt a lot' from the training, and that they were satisfied with the instructor. In particular, the interviewees noted the participatory style of the instructors, and liked that there were 'a lot of chances to ask questions'. Four interviewees said the timeframe and length of the training was suitable; however, one stated that time management during the training should be improved. Two interviewees stated that the training needs to be modified to better address the local context, specifically for sustainable sanitation practices and translations for the Nepali language.

The most common responses related to consulting support were that CAWST had helped them in solving issues with implementation of BSF projects (including technical support, manufacturing, and distribution logistics). Several interviewees mentioned that they are able to maintain and repair filters as result of the support. Another frequent response was that CAWST has assisted in linking the interviewees and their organizations with stakeholders including clients, community groups, and other NGOs. Additionally, one interviewee described the process of Education Program Development (EPD) in collaboration with CAWST as ‘fantastic’, and said it enables good teamwork. The most common negative reaction, stated by four of the interviewees, was that the consulting support was not available often enough or when needed.



**Figure 8: Reaction to training in Nepal**



**Figure 9: Reaction to consulting support in Nepal**

#### *Learning (Kirkpatrick Level 2)*

Each of the interviewees was asked to describe what they had learnt as a result of CAWST’s training or consulting support activities. Figure 20 shows the responses, categorized to reflect changes in the participant’s knowledge, skills or attitudes. The most common responses were the acquisition of new knowledge about BSF technology and new skills to manufacture the BSF. This is expected, considering

that the BSF was the most commonly attended training activity for the interviewees. Many of the interviewees had little or no experience with BSF knowledge prior to the interactions with CAWST.

Many interviewees also reported that they had learned new knowledge related to water, sanitation, hygiene, and diseases transmission. Examples include: *‘the need to build a proper toilet, clean cooking area and clean water source’*, *‘the biosand filter can clean water’*, *‘there are different bacteria in the water, which cause diseases like diarrhoea. People will be sick when water is not properly filtered’*.

Eleven of the interviewees stated that they have learnt how to manufacture BSFs, three of them learnt how to maintain and repair the BSF, and two each had stated that they had learned how to promote health in the community and how to provide technical support to their clients or communities. One ENPHO staff member described how they had learnt new skills in a participatory way, throughout their interactions with CAWST: *“I learned through exposure by handling the program, the training and action research. I also got a chance to build up myself. I got a chance to change the way I do things from the traditional way to a new way.”*

The most common shifts in attitude following interaction with CAWST was motivation to implement the BSF, confidence in sharing knowledge in their communities, and the belief that knowledge about safe water should be shared to others. One interviewee stated that the training had shown her that *“women can also do something for the community, not just men”*, another stated *“every time someone from CAWST or ENPHO visit my motivation goes up”*.



**Figure 20: Knowledge, skills and attitude learnings as a result of the training or consulting support services in Nepal**

### Behaviour (Kirkpatrick Level 3)

The third step in Kirkpatrick's methodology evaluates behaviour change as a result of the learning process. All but one of the interviewees stated they had made changes following CAWST's training or consulting support services. Figure 1 shows the ways in which the interviewees reported making changes. Six of the interviewees started manufacturing filters, five have trained others in BSF manufacturing and five have set up BSF manufacturing businesses. These represent filter entrepreneurs or community groups which were not implementing BSF prior to their interactions with CAWST. Three interviewees also stated that they deliver better quality training in communities as a result of the training/consulting support.

For the interviewee who reported no change in behaviour following the BSF training with CAWST, the main reasons were that he *"did not consider the BSF to be appropriate for the villages where we work, it is too heavy to transport, and too complicated to use for people in remote areas."*



**Figure 11: Changes in behaviour as a result of the training/consulting support activities in Nepal**

### Results (Kirkpatrick Level 4)

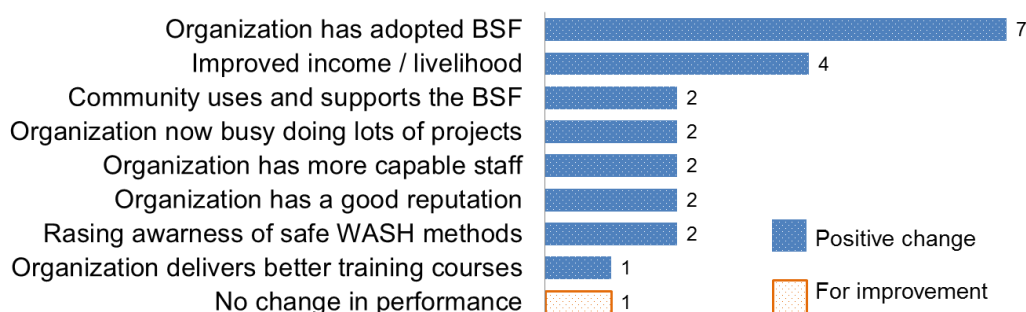
Figure 32 shows organizational and community level changes which resulted from the training or consulting support, as reported by the interviewees. All but one of the interviewee's reported at least one change resulting from the interactions with CAWST. The most common result was adoption of the BSF by the individual or organization. For some interviewees, this involved adding the BSF to a range of technologies which they already implemented, and for others this involved setting up a BSF enterprise in their community. In total, the interviewees reported having manufactured and distributed 2050 BSFs since interacting with CAWST, a majority of which were reported by filter entrepreneurs.

Four of the interviewees reported improved incomes/livelihoods following the development of successful BSF enterprises. One filter entrepreneur stated that *"Because of the filters my life has changed. If we earn money then obviously our life changes. My previous house was in slum and wasn't*

*nice but now I have built a new house which is better, now I can afford my daughter's education, who is studying in boarding (private) school in class 11". Another stated that "people appreciate what I am doing is good for the community by promoting safe water, so my reputation has improved". Conversely, one of the filter entrepreneurs had not been successful in marketing or selling the filters, stating: 'I spent 40,000 rupees (roughly \$400) to build a small space behind my home for filter construction. I thought many people would come to my village and want to pay to buy filters from him, but I have sold only three filters so far.'*

One interviewee described how his organization is now raising awareness of WASH practices: *"As part of the school BSF project, I trained 22 teachers and school committees. I was able to convince the participants by showing them videos clips and valuable information regarding the biosand filter and water sanitation, which I from CAWST's training workshop."*

The interviewees have had a range of experiences implementing projects in communities, with differing levels of success. The following example of a successful community story from one of the interviewees was given by a community health promoter: *"The community members like the taste and smell of the water. Local untreated water is smelly and has color from high iron content. Filtered water is not smelly, has no iron, and is very clear. The taste is very good. Most of the 70 filters in the community are in use. We have a meeting regarding the use of the filter once in a month."* Conversely, another interviewee stated the following challenge to enabling community impacts: *"As a young woman from the village, I have no such authority, and can't influence the community as well as ENPHO/CAWST can do. Some people don't listen to my instructions and are not using the BSF."* Several interviewees stated that the results in their organizations had been limited by access to resources to implement the filters, or lack of ability to invest in community projects.



**Figure 32: Changes in organizational performance as a result of the training/consulting activities in Nepal**

The interviewees provided feedback on the overall strengths and weaknesses of CAWST's approach to technology transfer, and these are listed below.

#### Strengths

- The training is clear and understandable. For example, one interviewee stated: *'Following the training we can manufacture filters without confusion'.*

- The follow-up support has been helpful. One interviewee mentioned: *"I am surprised that CAWST took time and follow up with training workshop participants. Foreign NGOs seldom come back and follow up. CAWST is an exception."*
- CAWST has provided assistance in talking with the community and creating demand for filters. One interviewee stated that: *'Now the community is aware that after drinking water from the filter their children are not getting sick anymore. Before when they used to drink water from the stream directly their children frequently used to become sick.'*
- Donation of filter moulds made it possible for local entrepreneurs to set up filter businesses.
- CAWST provides skills in marketing and promotion of the filters.
- CAWST's approach to the partnership enables us to be flexible and bring our own ideas, so we can both learn from each other.
- We agree with the intent and objectives of the partnership with CAWST.
- CAWST is unique in its focus on capacity building, other organizations are not assisting us with this.
- CAWST's approach has evolved and improved over time.

#### *Areas for Improvement*

- Would like more assistance in connecting and learning from other BSF implementers.
- We would benefit from more regular visits, follow-ups or training by CAWST.
- Would like more assistance understanding the overall health of a community.
- There is negative perception of BSF in some communities, caused by lack of knowledge about BSF. Examples of issues that were mentioned include that community members have perceived that the *'water is too cold'*, *'the filtered water is not safe as it causes cancer'*, or *'it is hard to convince people to use the BSF'*.
- Implementation is challenging due to lack of understanding of WASH principles in communities.
- Organizational arrangements between ENPHO and CAWST need to be clarified.
- Human resources issues and capacity is a challenge to implementation.
- CAWST needs to be flexible and make sure it recognizes the different needs in each of their WET Centres.
- Cost of BSF is too high to be feasible in poor communities.
- Lack of proper tools such as transport and training equipment, promotional materials and water quality testing kits create implementation challenges. One BSF entrepreneur stated: *'I have no vehicle, no time, and no budget to do promotion. Nobody is helping me. I am alone. The filter is heavy to carry.'*
- More focus on baseline studies is needed to target communities better.
- More visits from CAWST management would improve the partnership.
- Need assistance understanding the impacts of our work in the communities, and how to improve them.
- Would like more feedback from CAWST. One interviewee stated: *'I'm not sure what CAWST is thinking about how well ENPHO is doing, because we are not getting clear feedback from you. When we compare ourselves to other WET Centres we are doing well. But it would be good for you to give us more feedback.'*



## ***Recommendations***

The interviews provided useful information related to the reaction, learning, behaviour, and results of CAWST's training and consulting support activities in Nepal. They showed that CAWST's technology transfer approach has successfully developed the capacity of the interviewees in water, sanitation, and hygiene knowledge and technology implementation. Challenges and barriers to effective technology transfer were also identified throughout the interviews. A summary of recommendations are provided in Table 2. It is recommended that:

- CAWST should continue its general approach to training and consulting support in order to transfer technical knowledge to WASH workers and community members. The overwhelming majority of interviewees reacted positively to CAWST's training and consulting services, and all but one had learnt and applied new knowledge and skills in their communities.
- CAWST should review its processes for providing ongoing assistance and follow-ups in communities to ensure consistency in its approach. Some interviewees reported regular follow-ups, while others had difficulty communicating with and getting assistance from CAWST when needed.
- CAWST has the opportunity to improve the technology transfer by linking organizations or community members together so that they can collaborate and learn from each other. This can strengthen local support networks so BSF implementers can learn from common experiences.
- Most interviewees were comfortable with the technical skills and knowledge that had been transferred by CAWST. However, many reported challenges in organizational capacity, business management, human resources and logistics, which prevented successful implementation of their knowledge in communities. CAWST should consider how it can better transfer knowledge in these areas to compliment the technical learning.

**Table 2: Summary of Findings and Recommendations in Nepal**

<b>Finding</b>	<b>Recommendation</b>
Majority of interviewees reacted positively to CAWST training and consulting support services.	CAWST should continue its general approach to training and consulting support activities.
Consulting support visits are sometimes irregular or not provided often enough, and clients would like more feedback from CAWST.	CAWST should review its processes for providing ongoing assistance and regular feedback to clients to ensure consistency in its approach.
Technology transfer can be improved through CAWST clients collaborating more locally and learning from each other.	CAWST should link organizations or community members together so that they can collaborate and learn from each other.
Knowledge transfer in technical skills was rated very highly by interviewees, however many reported challenges in organizational capacity, business management, human resources and logistics, which prevented successful implementation of their knowledge in communities.	CAWST should tailor services to better transfer knowledge in organizational capacity, business management, human resources and logistics areas to compliment the technical learning.
Clients would like assistance in methods of monitoring and evaluation.	CAWST should mentor clients in methods of monitoring and evaluation.

## ***Conclusions***

This study has demonstrated the use of the Kirkpatrick methodology for evaluation of learning processes to investigate the impacts resulting from CAWST's technology transfer activities with ENPHO, an indigenous NGO in Nepal. Eighteen interviews were conducted with staff from a range of NGOs, local entrepreneurs, and community health promoters who have participated in CAWST's training or received consulting support services.

The evaluation found that CAWST's approach to technology transfer, through training and consulting support services, has produced positive outcomes in each of the four steps of Kirkpatrick's evaluation methodology (reaction, learning, behaviour and results). An overwhelming majority of interviewees reacted positively to CAWST's services, with the relevance and usefulness of the information provided, the participatory style of learning and good instructors being the most commonly noted positive reactions. The most commonly noted negative reaction was a lack of ongoing support when needed. Interviewees learned significant new knowledge, new skills, and changed attitudes as a result of CAWST's training and consulting support services. Many interviewees had no knowledge of the BSF and other household water and sanitation technologies prior to interactions with CAWST, and described that they learned the knowledge and skills to use, manufacture, distribute, market, maintain, and repair the BSF. All but one of the interviewees stated that they have changed some aspect of their behaviour following from interactions with CAWST. As a result of the interactions with CAWST, seven of the interviewees stated that their organization has implemented the BSF, reporting a combined total of 2050 BSF delivered to communities. Interviewees reported a range of other results, including improved income for filter entrepreneurs, better community knowledge, and better quality of training delivered by their organization.

It is recommended that CAWST continue its general approach to training and consulting support in Nepal. In order to deliver better technical knowledge transfer, CAWST should: develop more consistent processes for community follow up support; link organizations to foster collaboration and knowledge sharing; and increase its focus on complimentary knowledge and skills (such as business management, human resources, logistics) in parallel to technical knowledge.

The results from this case study should be compared with results from other studies to determine which strengths and weaknesses relate specifically to ENPHO and which relate to CAWST's other programs. Additionally, the evaluation process should be compared with other case studies in order to assess how well the framework performed in assessing technology transfer, and to identify improvements for future evaluations.

## Comparison of Peru and Nepal Case Studies

The two case studies were compared to investigate similarities and differences in the findings from the two countries, as well as to identify improvements to the evaluation methodology.

Table 3 shows a summary of the main findings and recommendations from Nepal and Peru. For both studies, interviewees reacted positively to CAWST's training and consulting support services. They did, however, state that CAWST could improve by providing regular follow-up support to clients. For the Nepal study, opportunities for improvement included linking implementing organizations together, focusing on organizational capacity, business management, human resources and logistics capacity, and mentoring on methods of monitoring and evaluation. For Peru, the major opportunities for CAWST were to improve integrating virtual services, reviewing client partnership arrangements, and by focusing on building capacity in communication with stakeholders.

**Table 3: Comparison of Findings from Case studies in Nepal and Peru**

Finding	Recommendation	Nepal	Peru
Majority of interviewees reacted positively to CAWST training and consulting support services.	CAWST should continue its general approach to training and consulting support activities.	✓	✓
Consulting support visits are sometimes irregular or not provided often enough, and clients would like more feedback from CAWST.	CAWST should review its processes for providing ongoing assistance and regular feedback to clients to ensure consistency in its approach.	✓	✓
Technology transfer can improve through CAWST clients collaborating more locally and learning from each other.	CAWST should link organizations and community members together so that they can collaborate and learn from each other.	✓	
Knowledge transfer in technical skills was rated highly, however, there were challenges in organizational capacity, business management, human resources, and logistics, which prevented successful implementation.	CAWST should tailor services to better transfer knowledge in organizational capacity, business management, human resources, and logistics areas to compliment the technical learning.	✓	
Clients would like assistance in methods of monitoring and evaluation.	CAWST should mentor clients in methods of monitoring and evaluation.	✓	
CAWST could reach more people by making use of web technology for trainings in remote areas.	CAWST should integrate the VWET services to reach more clients and to provide support between in-country visits.		✓
Institutional arrangements between CAWST and clients are sometimes confusing and unclear.	Review process for selection of CAWST's clients and partners, and clarify how clients would like to formalize arrangements.		✓

Clients have challenges related to communication with both donors and community members.	CAWST should focus on developing client's capacity in stakeholder communication.		✓
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### ***Comparison of the methods used for the case studies***

The same semi-structured interview protocol was used for both case studies; however, some changes were made to the methodology following on from the first set of interviews in Peru. These changes were related to the style of questioning and also the selection of interview candidates. Questions were asked in a more open ended style, and a greater effort was made to cover all four levels of the Kirkpatrick framework. The changes resulted in more comprehensive interview responses for the Nepal interviews. Additionally, the interview team was well known to the interviewees in Nepal, and because of this, they believe the responses were more open and honest than for the Peru interviews. A larger number of participants (eighteen in Nepal as compared with twelve in Peru) also resulted in more comprehensive results for the Nepal case study.

## **Analysis of the Evaluation Methodology**

The following sections discuss the advantages and disadvantages of the evaluation methodology. It should be noted that the strengths and limitations of any evaluation methodology are highly dependent on the objectives of an assessment and the purpose for which the results are to be used. For example, the most useful style of information for CAWST to understand its impacts and learn internally is not necessarily the same type of information required by donors to assess the value of CAWST's work.

### ***Strengths of the evaluation framework:***

The four levels of the Kirkpatrick framework provided qualitative information on the effectiveness (L1), outcomes (L2 and L3) and impacts (L4) of CAWST's work in Peru and Nepal. The information was useful because it fills a gap in CAWST's existing monitoring and evaluation framework. CAWST conducts an annual survey which evaluates seven quantitative Key Performance Indicators (KPIs). The KPIs are:

- Number of people impacted by CAWST's clients
- Number of people reached using CAWST's education materials
- Number of implementing clients
- Number of community-based organizations working with clients
- Revenue
- Financial reserve
- Cost per person impacted

The KPIs provide quantitative data on the outputs, outcomes, and impacts of CAWST's work. They do not, however, capture the wide range of qualitative impacts which CAWST's education and training work contributes to. The interview responses filled this gap through demonstrating the changes in CAWST's clients competencies (such as learning about effective training techniques), in contrast to focusing on quantitative results only (such as the number of filters implemented). For example, stories related to innovative ways in which clients have used technical knowledge show impacts of CAWST's work which have not previously been captured. The new perspectives provided ideas for future research and analysis of CAWST's work.

Another advantage was that completing two case studies enabled lessons to be learned following on from the first interviews in Peru and improvements implemented for the second interviews in Nepal.

### ***Limitations of the evaluation framework:***

While the interviews provided useful information and rich stories describing impacts from CAWST's training and consulting services, there are several ways in which the interview process could be improved. Areas for improvement include:

- Ensuring more questions are open ended and eliminating leading questions.
- More comprehensive coverage of all four levels of Kirkpatrick methodology. In some interviews, one or more Kirkpatrick levels were not covered.

- A strategy related to interviewee selection. The interviewee selection, such as whether it is random, focused on diversity, or targeted for specific groups, affects how the analysis should be carried out.

As well as changes to the style of interviews, there are opportunities to include more sources of data which are already collected by CAWST as part of their programs, alongside the interviews. This modification could add more rigour and systematic aspects to the assessment, reduce the reliance on interviewee 'self-reporting' and add completeness to the framework. The following sources should be considered:

- Post workshop evaluation questionnaires.
- Client survey data.
- Baseline information about client organizations.
- Records of CAWSTs services to each client
- Records of the CAWST competency validation process.

The interview results showed a wide range of responses and changes resulting from CAWST's work in Nepal and Peru. However, if the research was focused on a more specific objective the results could be used for more targeted recommendations. This could be achieved by designing the framework with more constrained variables, such as type of training attended, profession of interviewee or timeframe of services from CAWST.

## Opportunities for Future Research

Several opportunities for future research were identified as a result of this study. They relate both to the specific information from interview results as well as opportunities for improvement of the research methodology.

In order to scale up the evaluation, the Kirkpatrick methodology could be integrated into CAWST's annual client survey. This would enable qualitative information to be captured from all of CAWST's clients who respond to the survey. This would enable a wider range of impacts to be captured in order for CAWST to gain a deeper understanding of the impacts of its education and training programs. Another way to scale up the evaluation would be to extend the framework to other CAWST clients and countries through similar in-country case studies.

Topics for future research, as a result of the findings, include:

- Investigation of the contribution of community roles (particularly women and community health promoters) in technology transfer and implementation of HWTS projects.
- Investigation of the critical elements for success in CAWST's clients, to assist with CAWST's strategic selection of communities and clients to work with. For example, what qualities in CAWST's clients have consistently resulted in successful technology transfer and results, and what qualities have consistently led to poor results?
- Evaluation of the educational experience of CAWST's training activities, including how workshop activities and key learnings are remembered by participants after the learning event. How could CAWST provide better follow up support to clients, including personal and remote communications and materials or tools to prompt recollection of key points?
- Methods for collaboration with other NGOs working in WASH. How can CAWST both foster more collaboration between our client organizations (so that they can better support and learn from each other), and how can CAWST also collaborate with more NGOs to broaden impacts?

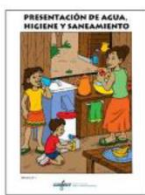
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## **Appendix F: CAWST Learning Exchange Presentation and WET NET Learning Exchange Presentation**

## Evaluation of Education and Training in Water and Sanitation in Peru and Nepal



CAWST & Mount Royal University



## Study purpose

- To explore the diversity of results and impacts of CAWST's education and training activities in Peru and Nepal
- Learn about the strength and challenges applicable for CAWST
- Develop a framework that WET Centres may use to measure the results of its education and training.

## Specifics of study

Investigators	3 CAWST staff 2 professors at Mount Royal University
When	November 2012 to April 2014 including 2 weeks field work in Peru, and 3 weeks field work in Nepal.
Primary audience	CAWST
Secondary audience	WET Centres & other WASH capacity builders
Cost	\$25,000 consulting fee to University \$10,000 hard cost 600 person-hour of CAWST staff time
Outputs	In-depth interviews and stories Relationship building with interviewees

## Evaluation tools reviewed

- Logic Model
- Outcome Mapping
- Balanced Score-Card
- Nine Steps to Success
- Most significant Change
- Random Controlled Trials
- Contribution Analysis
- Splash and Ripple
- Ladder of Change
- Appreciative Inquiry
- Case Study
- Kirkpatrick Method
- Critical System Heuristics
- Developmental Evaluation
- Horizontal Evaluation
- Innovation History
- Institutional Histories
- Participatory Evaluation
- Participatory Rural Appraisal
- Positive Deviance
- Social Return on Investment
- Utilization-Focused Evaluation

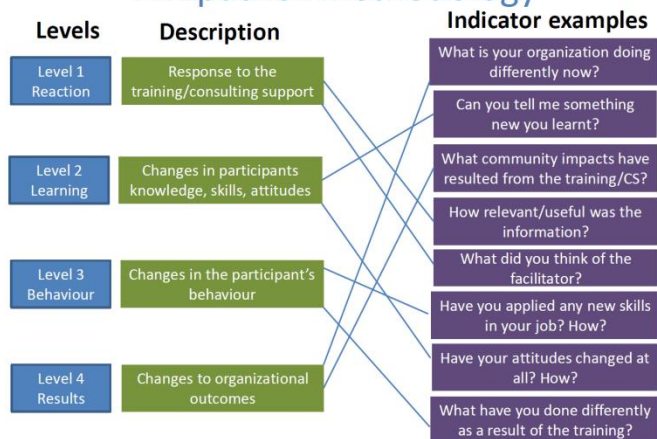
## Evaluation tools chosen

- Logic Model
- Outcome Mapping
- Balanced Score-Card
- Nine Steps to Success
- Most significant Change
- Random Controlled Trials
- Contribution Analysis
- Splash and Ripple
- Ladder of Change
- Appreciative Inquiry
- Case Study
- **Kirkpatrick Method**
- Critical System Heuristics
- Developmental Evaluation
- Horizontal Evaluation
- Innovation History
- Institutional Histories
- Participatory Evaluation
- Participatory Rural Appraisal
- Positive Deviance
- Social Return on Investment
- Utilization-Focused Evaluation

## What is Kirkpatrick method?

- Developed in the 1970s by Kirkpatrick
- Method for training organizations to evaluate the short and long term impacts of training

## Kirkpatrick methodology



## Case study 1 - Peru

- CAWST first visit in 2005
- 12 visits in total by CAWST 2005-2013
- Training workshops, consulting visits, business development

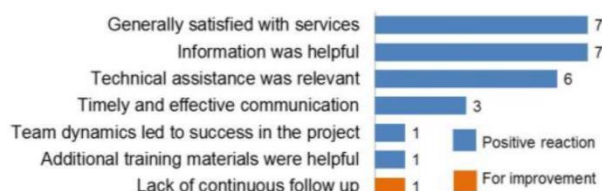


- For this study, interviewed 12 people who has attended CAWST training 5 years ago, including
- NGO staff, community health workers, community leaders, filter technicians, and funders

### Level 1: Reaction to Training: Peru



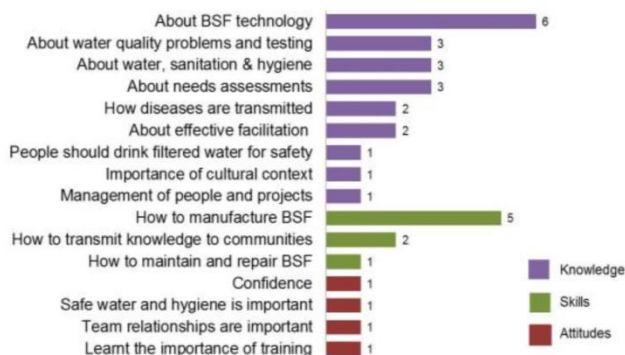
### Level 1: Reaction to Consulting Support: Peru



### Level 1: Reaction - Peru

- "Whenever we wanted to communicate with CAWST, they replied promptly. The level of information was useful and helped us with specific problems we had."
- "I appreciated the style of the delivery, we could later communicate the things we learned to other people the same way that we were trained."
- "CAWST and EDES staff should visit us more often to maintain relationships."

### Level 2: Learning - Peru



## Level 2: Learning - Peru

- *"I learnt how to get to the recipients, the way to treat them. Many times the recipients have a different socio-cultural background from a technician, so we need to know how to speak to them in a way they understand."*
- *"At the beginning, I was afraid of leading workshops. In time I overcame this fear and my performance improved."*

## Level 3: Behaviour - Peru

- *"Although I'm not working in this sector anymore, the facilitation skills I learnt are useful in my new job."*
- *"We've met lots of CAWST people. We appreciate it, but nothing's changed."*

## Level 4: Results - Peru

- *"We were living with a water of very poor quality until CAWST arrived with the filters."*
- *"It would be good to have more workshops in order to update the community and remind them to use the filters. In some cases they started using them at the beginning but now they are not."*

## Level 3: Behaviour: Peru



## Level 4: Results - Peru



## Barriers to greater impacts - Peru

### Related to CAWST (training organization)

- Pricing of BSF is confusing
- Technical information can be difficult for people to understand
- It would help if a manual could be provided to all end users
- More follow up needed

### Related to local situation (outside CAWST control)

- CHPs are not motivated because they are not receiving any compensation
- Donors are willing to pay for the BSF, but not for the training
- Without government support/approval, there is a limit in where we can work.
- Time is wasted every time staff changes happen in the organization

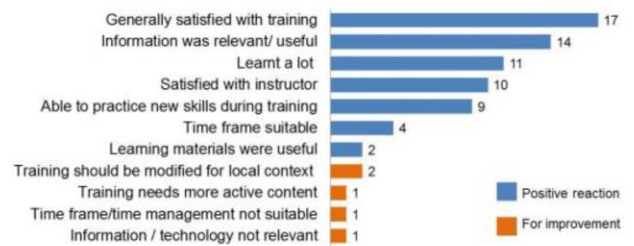


## Case study 2 - Nepal

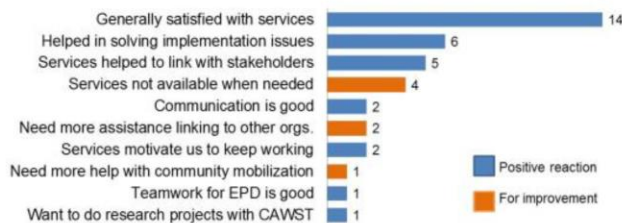
- CAWST first visit in 2004
- 30+ visits in total by 15 CAWST staff 2005-2013
- Training workshops, consulting visits, education program development, action research, business development.
- For this evaluation, interviewed 18 people who has attended CAWST training 5 years ago, including
- NGO staff, community health workers, community leaders, filter technicians, entrepreneurs, funders, government officials, professors, journalists.



## Level 1: Reaction to Training - Nepal



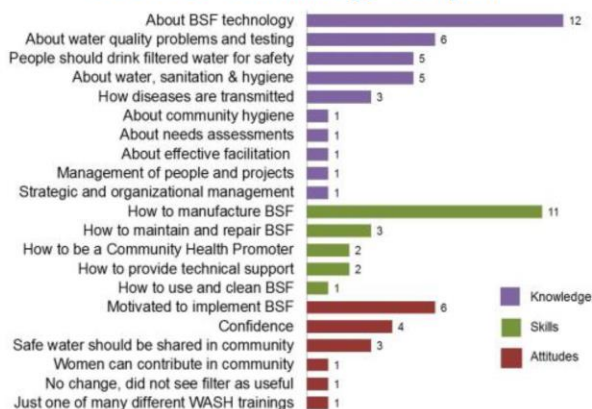
## Level 1: Reaction to Consulting Support - Nepal



## Level 1: Reaction - Nepal

- “CAWST should be flexible; the approach that is working in Africa may not work in Nepal as there are several cultural differences. We got a message that the WET Centre in Zambia was the model that we were meant to follow”
- “I have been to many water and sanitation workshops as a Journalist, I cannot remember the one from CAWST specifically.”

## Level 2: Learning - Nepal



## Level 2: Learning - Nepal

- “I learnt that women can also do something for the community, not just men”
- “Every time someone from CAWST or ENPHO visit us, my motivation goes up”

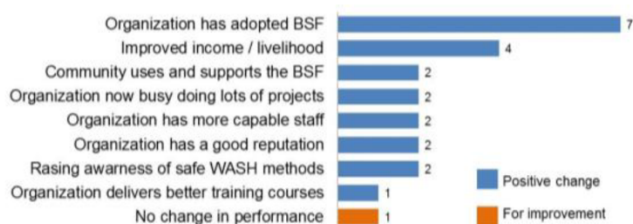
## Level 3: Behaviour - Nepal



## Level 3: Behaviour - Nepal

- “I did not consider the BSF to be appropriate for the village where we work, it is too heavy to transport and complicated for people to use in remote areas”
- “I took the BSF concept and applied it to a gravity flow water supply scheme. I used sand and gravel to prevent leaves and dirt from clogging the system intake.”

## Level 4: Results - Nepal



## Level 4: Results - Nepal

- “Because of the filters I am earning money and my life has changed. My previous house was in a slum and wasn’t nice but now I have built a new house which is better, now I can afford my daughter’s education, she is studying in class 11”
- “I spent 40,000 rupees (\$400 US) to build a small space behind my house for filter construction. I thought many people would come to my village and want to buy the filters, but I have sold only 3 so far.”

## Barriers - Nepal

### Related to CAWST (training organization):

- Need more training and regular follow ups
- Want more feedback from CAWST
- Need to clarify relationship with CAWST

### Related to local conditions (outside of CAWST control)

- Some communities have negative perception of BSF
- Lack of understanding of BSF
- BSF too expensive
- Human resources problems
- Want to be connected to other orgs



## Compare results in 2 countries

Finding	Recommendation	Nepal	Peru
Positive impression on CAWST training and consulting support	CAWST should continue its general approach to training and consulting.	✓	✓
Consulting support visits and feedback are irregular and inadequate	Review process in providing ongoing assistance to clients.	✓	✓
Technology transfer can be improved through CAWST clients collaborating more locally.	CAWST should act as a hub, linking organizations together.	✓	
Knowledge transfer in technical skills was rated very highly, but challenges were reported in organizational capacity, business management & human resources.	CAWST should consider how to support non-technical areas: by CAWST or by other organizations	✓	

## Compare results in 2 countries

Finding	Recommendation	Nepal	Peru
Clients would like assistance in methods of monitoring and evaluation.	Improve capacity of CAWST to support clients in M&E	✓	
CAWST could reach more people by making more use of web technology.	Accelerate the Virtual WET Centre program		✓
Institutional arrangements between CAWST and clients are sometimes confusing.	Clarify roles and responsibilities, and communicate the arrangements clearly		✓
Clients have challenges in communication with donors and community members.	Support client's capacity in stakeholder communication.		✓

## Overall learning in 2 countries

### Learning #1:

- CAWST can control how the workshop or consulting support is delivered,
- But behaviour and results at community level is influenced by many other factors.

### The question is:

- should CAWST pre-select organizations and communities where the conditions are favourable?
- Or should CAWST work in difficult situation with incompetent clients and organizations, because they need the most help?

## Overall learning in 2 countries

### Learning #2:

- In almost all cases, workshop participants will do something after taking the training, for example:
  - talk to supervisors about the BSF
  - apply facilitation skills learned in own work
  - write funding proposals to implement BSF
  - Start community clean up, dig rubbish pits

### The challenge is:

- Currently we only measure how many filters built
- Yet we generally don't capture and report other outcomes
- Should we?

## Overall learning in 2 countries

### Learning #3:

- In-depth interviews provided plenty of highly valuable, qualitative information, which can't be obtained from a paper survey
- Obtained excellent testimonials, stories
- Significantly enhanced relationships with clients

### The challenge is:

- Effort intensive to interview every clients every year
- What is the right balance?

## Learning Objectives

## Evaluation of Education and Training in Water and Sanitation

Mount Royal University and CAWST  
17<sup>th</sup> Jan 2014

- Learn Kirkpatrick's model in evaluating education and training
- Learn about the strength and areas of improvements in CAWST's education and training in Nepal and Peru
- Share different ways to improve our education and training activities.

## Research Question

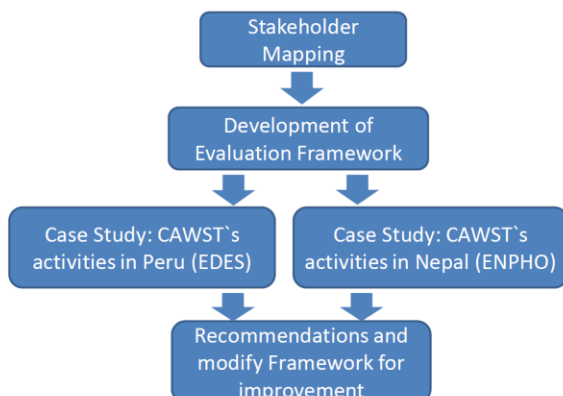
How can we evaluate capacity development?



## Objectives

- To design an evaluative framework to assist capacity builders in the water and sanitation sector to capture and interpret the results of their education and training activities, and;
- To assist them to understand how they can maximize their positive impacts.

## Project Outline



## Evaluation Frameworks

- Logic Model
- Outcome Mapping
- Balanced Score-Card
- Nine Steps to Success
- Most significant Change
- Random Controlled Trials
- Contribution Analysis
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## Evaluation Frameworks

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## Kirkpatrick Methodology

CATEGORY	DESCRIPTION	INDICATORS
Behaviour	Changes in participants knowledge, skills, attitudes	Have your attitudes changed at all? How? What did you think of the facilitator?
Learning	Changes to organizational outcomes	Have you applied any new skills in your job? How? Can you tell me something new you learnt?
Reaction	Changes in the participant's behaviour	What have you done differently as a result of the training? What is your organization doing differently now?
Results	Response to the training/consulting support	How relevant/useful was the information? What community impacts have resulted from the training/CS?

## Kirkpatrick Methodology

CATEGORY	DESCRIPTION	INDICATORS
L1	Reaction	Response to the training/consulting support
L2	Learning	Changes in participants knowledge, skills, attitudes
L3	Behaviour	Changes in the participant's behaviour
L4	Results	Changes to organizational outcomes

## Case Studies

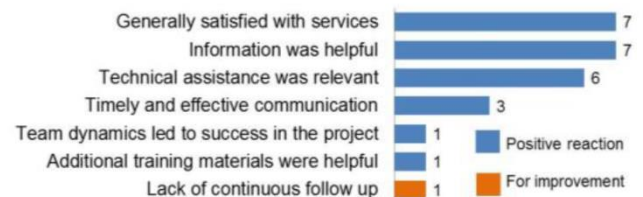
- Case Study 1: Peru (EDES/AguaSAN)
  - CAWST first workshops in Peru in 2005, have supported EDES/AguaSAN with BSF implementation
  - 12 interviews: AguaSAN, local NGOs, CHPs
- Case Study 2: Nepal (ENPHO)
  - CAWST conducting training since 2004, selected as a WET Centre in 2005
  - 18 interviews : ENPHO, local NGOs, CHPs, BSF entrepreneurs



## Level 1: Reaction to Training: Peru



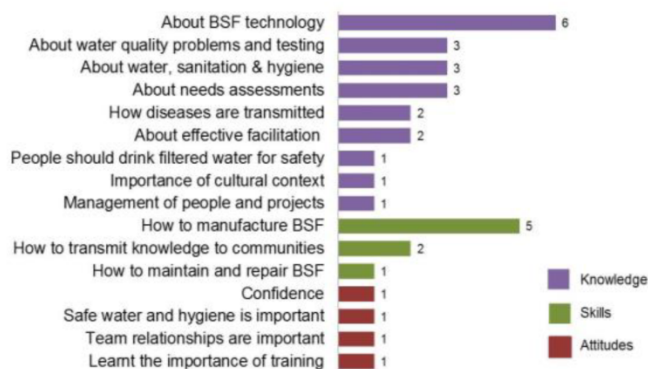
## Level 1: Reaction to Consulting Support: Peru



## Level 1: Reaction - Peru

- *“Whenever we wanted to communicate with CAWST, they replied promptly. The level of information was useful and helped us with specific problems we had.”*
- *“I appreciated the style of the delivery, we could later communicate the things we learned to other people the same way that we were trained.”*

## Level 2: Learning - Peru



## Level 2: Learning - Peru

- *“I learnt how to get to the recipients, the way to treat them. Many times the recipients have a different socio-cultural background from a technician, so we need to know how to speak to them in a way they understand.”*
- *“At the beginning, I was afraid of leading workshops. In time I overcame this fear and my performance improved.”*

## Level 3: Behaviour: Peru



## Level 3: Behaviour - Peru

- *“People use the filtered water to drink and wash the vegetables. They are also more concerned as regards health and hygiene, and they grow some plants and vegetables now.”*
- *“We’ve met lots of CAWST people. We appreciate it, but nothing’s changed.”*

## Level 4: Results - Peru



## Level 4: Results - Peru

- *"We were living with a water of very poor quality until CAWST arrived with the filters. The best that could happen is the arrival of the filter because we were a lot of years waiting."*
- *"It would be good to have more workshops in order to update the community and remind them to use the filters, because in some cases they started using them at the beginning but now they are not."*

## Barriers to Effective Technology Transfer: Peru

### Technical & Implementation Barriers:

- Pricing of BSF is confusing
- Technical information can be difficult for people to understand
- More follow up needed
- There is a challenge in CAWST reaching dispersed populations
- It would help if a manual could be provided to all end users

### Community Related:

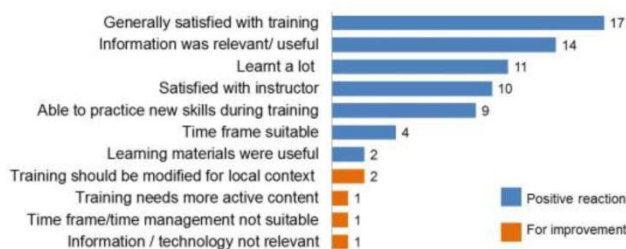
- Lack of motivation in CHPs because they are not receiving any compensation
- It is difficult to change the perspectives of community members
- Lack of ability to get Government support limits the areas where we can work
- Not all of the community members are using the filters.

### Organizational:

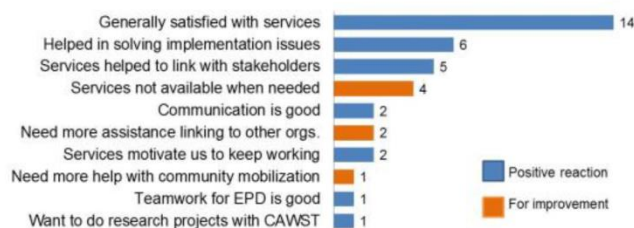
- Want to clarify our relationship with CAWST more clearly
- Donors are willing to pay for the BSF, but not for the training
- Scaling up our organization is a major challenge
- Time is wasted every time staff changes happen in the organization

## Clarifications so far?

## Level 1: Reaction to Training - Nepal



## Level 1: Reaction to Consulting Support - Nepal

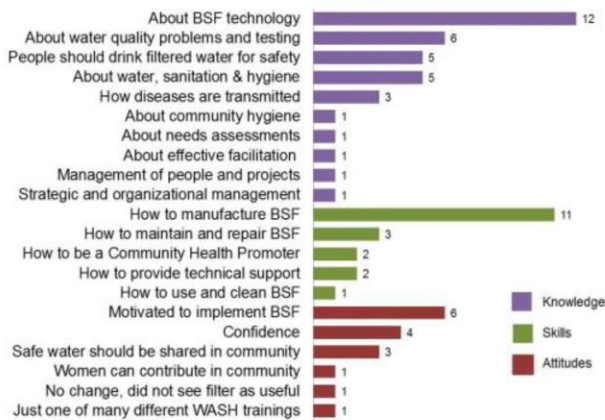


## Level 1: Reaction - Nepal

- *"CAWST should be flexible; the approach that is working in Africa may not work in Nepal as there are several cultural differences. We got a message that the WET Centre in Zambia was the model that we were meant to follow"*
- *"I have been to many water and sanitation workshops as a Journalist, I cannot remember the one from CAWST specifically."*



## Level 2: Learning - Nepal



## Level 2: Learning - Nepal

- “I learnt that women can also do something for the community, not just men”
- “Every time someone from CAWST or ENPHO visit us, my motivation goes up”

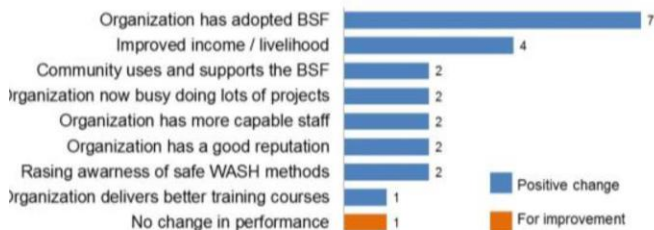
## Level 3: Behaviour - Nepal



## Level 3: Behaviour - Nepal

- “I did not consider the BSF to be appropriate for the village where we work, it is too heavy to transport and complicated for people to use in remote areas”
- “I took the BSF concept and applied it to a gravity flow water supply scheme. I used sand and gravel to prevent leaves and dirt from clogging the system intake.”

## Level 4: Results - Nepal



## Level 4: Results - Nepal

- “Because of the filters I am earning money and my life has changed. My previous house was in a slum and wasn’t nice but now I have built a new house which is better, now I can afford my daughter’s education, she is studying in class 11”
- “I spent 40,000 rupees (\$400 US) to build a small space behind my house for filter construction. I thought many people would come to my village and want to buy the filters, but I have sold only 3 so far.”

## Barriers to Effective Technology Transfer - Nepal

### Technical & Implementation Barriers:

- Need more regular follow ups
- More frequent training

### Community Related:

- Some communities have negative perception of BSF
- Lack of understanding of BSF
- BSF too expensive
- Baseline studies needed to target communities better

### Organizational:

- CAWST/ENPHO arrangements need to be clarified
- Human resources problems
- Want more feedback from CAWST
- We want to understand the impacts of our work better
- Want to be connected to other orgs

## Thoughts and Recommendations??

### What do these results mean?

- For Education Program Development?
- For Training and Consulting?
- For Communications, Fund Development, Business Services?
- For Research Learning?
- For ENPHO and AguaSan?

## Thoughts and Recommendations??

- How could the evaluation framework be improved?

## Preliminary Recommendations

Finding	Recommendation
Interviewees reacted positively to CAWST training and consulting support services.	Continue general approach to training and consulting support activities.
Consulting support visits are sometimes irregular or not provided often enough, and clients would like more feedback from CAWST.	Review processes for providing ongoing assistance and regular feedback to clients.
Technology transfer can be improved through CAWST clients collaborating more locally and learning from each other.	Link organizations or community members together.
Interviewees reported challenges in organizational capacity, business management, human resources and logistics	Tailor services to fill gaps in organizational capacity, business management, human resources and logistics areas.
Clients would like assistance in methods of monitoring and evaluation.	Provide services to clients in methods of monitoring and evaluation.

## Next Steps

- Integrate your ideas into the recommendations
- Compare and contrast results from the two case studies
- Develop final report
- Communicate final results – Next Learning Exchange

## **Appendix G: Conference Paper Submitted to 37<sup>th</sup> WEDC Conference**

37<sup>th</sup> WEDC International Conference, Hanoi, Vietnam, 2014

SUSTAINABLE WATER AND SANITATION SERVICES  
FOR ALL IN A FAST CHANGING WORLD

**Evaluation of education and training in water and  
sanitation technology: Case studies in Nepal and Peru**

*T.K.K. Ngai, B. Coff, E. Manzano, K. Seel, P. Elson (Canada)*

REFEREED PAPER

*A significant constraint to effective and sustainable water and sanitation provision is the “lack of capacity at the local level” (WHO, 2010), however there is uncertainty in how the efforts of capacity builders should be measured, and improved (Brown, et al., 2001). The Centre for Affordable Water and Sanitation Technology (CAWST) and the Institute of Non-profit Studies at Mount Royal University (MRU) has collaborated to address this issue. An evaluative framework, based on the Kirkpatrick model (Kirkpatrick, D.L. & Kirkpatrick, J.D., 2006) was developed to assist capacity builders in the water and sanitation sector to capture and interpret the results of their education and training activities. The framework was applied to evaluate CAWST’s training activities in Peru and Nepal. The findings provide new perspectives on the impacts of CAWST’s work, and provide insight into how the framework can be valuable to other capacity building organizations.*

**Research Problem**

One of the most significant constraints to effective and sustainable water and sanitation provision is the “lack of capacity at the local level” (WHO, 2010). Many countries do not have adequate human resources to skillfully plan and implement the delivery of water and sanitation services, especially to the most vulnerable populations (WHO, 2010). Infrastructure built, quickly becomes non-functional (Montgomery, et al., 2009). A recent study which investigated human resources capacity gaps in the water and sanitation sector in fifteen countries, showed significant overall shortages in technically qualified staff including engineering and social development professions (IWA, 2013). Recognizing this challenge, universities, vocational schools, private consultants, and experienced NGOs are offering education and training activities (i.e. capacity building activities) to upgrade the technical and management capacities of governments and non-governmental organizations (NGOs) responsible for water and sanitation provision.

However, questions are increasingly raised on the effectiveness of these efforts, with evidence that many governments and NGOs aren’t getting the education and skills needed (IWA, 2011). A global review of more than 100 leading capacity builders in the water and sanitation sector found that only one third measure their results (Ngai et al, 2013). Among these, the methods used are often ad-hoc and deploy prescriptive criteria to assess only whether outputs are achieved (e.g. the number of people trained), rather than outcomes or impacts. It is often unclear whether the capacities of governments and NGOs have actually increased, whether communities received clean water and sanitation, and whether health and well-being has indeed improved (Broughton & Hampshire, 1997; Cracknell, 2000).

The Centre for Affordable Water and Sanitation Technology (CAWST) and the Institute of Non-profit Studies at Mount Royal University (MRU) has collaborated to address this research problem.

**Objectives**

The objective of this study was to design and trial an evaluative framework to assist capacity builders in the water and sanitation sector in capturing and interpreting their results, and in understanding how to maximise their positive impacts. CAWST is a non-profit organization that provides training and consulting to organizations that work directly with populations in developing countries who lack access to clean water and basic sanitation (CAWST, 2013). CAWST provides education, technical training and



consulting services to hundreds of organizations, improving their capacities to deliver water and sanitation programs locally. CAWST doesn't implement any water, sanitation or hygiene (WASH) projects or construct infrastructure in the field. Instead, we engage, educate, and empower organizations operating locally to implement projects. These client organizations may include governments, UN-agencies, INGOs, local NGOs, community groups, and individuals. CAWST's services include training workshops, education materials, consulting support and visits and experience exchanges. Since CAWST's inception in 2001, CAWST has conducted approximately 870 education and training visits to clients in 46 countries.

## Methodology

A review of over 20 different evaluation methodologies was undertaken to develop an appropriate framework for evaluating the impacts of education and training activities in the water and sanitation sector. The framework that was developed is a customization of the Kirkpatrick's four levels of learning evaluation (Kirkpatrick, D.L. & Kirkpatrick, J.D. 2006). Kirkpatrick's evaluation tool was selected as it was considered simple, easy to understand, easy to apply, and relevant to the way CAWST and its worldwide partner organizations provide education and training services. Kirkpatrick's methodology consists of four sections; (1) Reaction: How did participants respond to the training? (2) Learning: To what extent did the participants experience changes in knowledge, skills, attitudes as a result of the training? (3) Behavior: Can changes be observed in the participant's behaviour as a result of training? (4) Results: How have organizational outcomes changed as a result of the training program?

In each of the Kirkpatrick sections, a number of questions and discussion points relevant to CAWST's activities were developed, and they formed the basis of an interview protocol. The interview protocol was approved by the Mount Royal University Human Research Ethics Board on 1<sup>st</sup> March 2013.

Each interviewee was asked about what training or consulting experiences they have had with CAWST, their reaction to their experiences, what they have learned, how they have applied learning to their work, and what CAWST can do to better support them. For example, for Kirkpatrick level 1 the interviewees were asked questions on the theme of "What did you think of the training?". For level 2 the participants were asked "Did you learn anything about the training, and if so, what did you learn?". For Kirkpatrick level 3, questions "Has anything changed in your behavior since receiving the education services?" were asked, and for Level 4, the interviewees were asked "Are there any changes in your organization as a result of the changes, and if so, please explain them?". The interview questions were purposely open ended to gain an understanding of the interviewee's perception of the reaction, learning, behavior change, and results without introducing pre-conceived notions from the interviewer. The interviews were conducted in a semi structured manner. An interview outline and example questions were developed but the interview questions were adapted to each individual discussion.

The framework was applied to evaluate the impact of CAWST's education and training activities in Peru and Nepal. The following sections provide details of each of the case studies.

**Case Study 1: Peru:** CAWST first visited Peru in 2005, and has since delivered around 40 training workshops and consulting support services to over 100 local individuals over a total of 12 visits. In September 2013, CAWST and MRU researchers travelled to Peru to conduct semi-structured interviews with 12 individuals who had participated in CAWST's training and consulting support activities 5 years ago. The 12 interviewees comprised staff members from a range of organizations, including local NGOs, international NGOs, community groups, community health promoters and local leaders. Following the interviews in Peru, the evaluation team made some modifications to the way in which interview questions were asked and how interviewees were selected, in order to gain more comprehensive results for the second case study in Nepal. For example, in Peru, for some interviews, not all of the 4 levels in the Kirkpatrick model were covered thoroughly. For Nepal, questions were asked in a more open ended style, and a greater effort was made to cover all four levels of the Kirkpatrick framework. **Case Study 2: Nepal:** CAWST have been conducting training activities in Nepal on water, sanitation and hygiene knowledge since 2004. Over the past 9 years, there were more than 30 visits by 15 CAWST staff (CAWST, 2013), conducting over 50 training workshops and consulting support activities, to over 140 individuals from various organizations. In September 2013, the evaluation team travelled to Nepal to conduct semi-structured interviews with 18 individuals who had participated in CAWST's training and consulting support activities. The 18 interviewees comprised staff members from a range of organizations, including local NGOs, international NGOs, governments, technical college, community groups, community health promoters, newspaper journalists and local entrepreneurs.



Many of the interviewees had first received training from CAWST over five years ago. The findings for each case study were compiled and discussed with CAWST and MRU staff. Results were then compared to develop recommendations for CAWST to improve its education and training activities, as well as to identify the strengths and weaknesses of the evaluation methodology.

## Results and Discussion

The interview results from each case study were aggregated and summarized to show major findings for each of the four Kirkpatrick levels (reaction, learning, behavior, results). As well as aggregated results, individual stories and comments were compiled to reflect diversity in the responses. The results of the two case studies, as well as a comparison of the major findings are shown below.

The intention of the following discussion is to indicate the type of data that was captured for the two case studies, in order to analyze how useful the evaluation framework was in assisting a capacity building organization (CAWST) in understanding their impacts and improving. From this, improvements to the evaluation framework are identified.

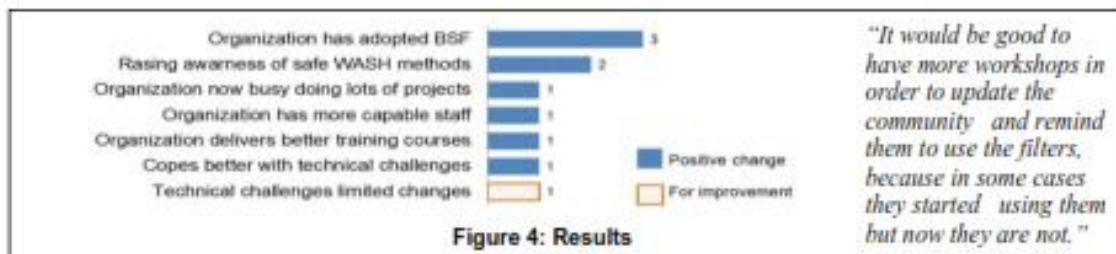
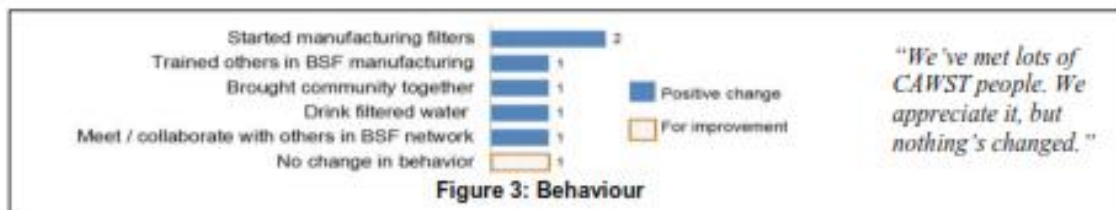
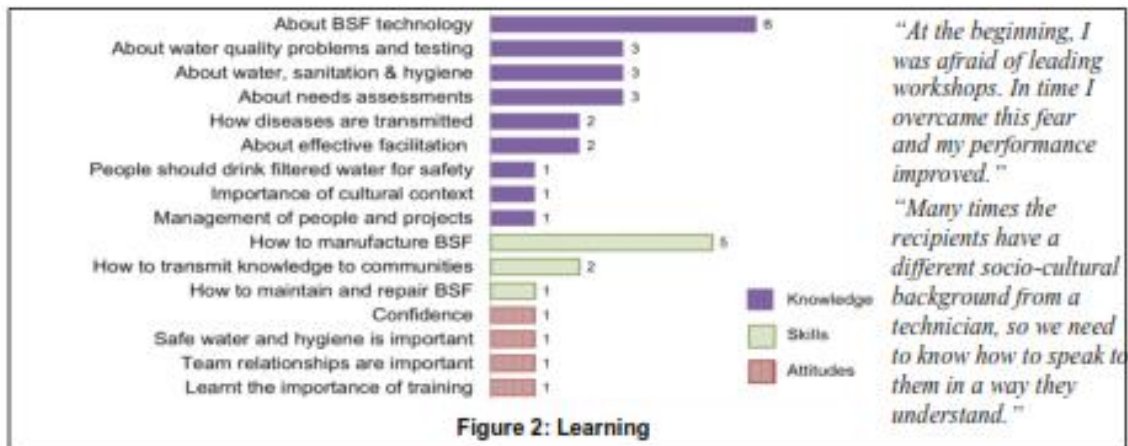
**Case Study 1: Peru:** Figures 1 – 4 show the results summarized for each of the four levels of the Kirkpatrick model for Peru. Accompanying each table are quotes from interview transcripts of the 12 interviewees, which have been selected as they demonstrate an interesting or different perspective on the impacts of CAWST's education and training activities. For organizational learning, there is value in both the aggregated results, as well as the specific examples of impacts provided by the quotes. The graphs represent topics that were brought up by the interviewees, rather than yes/no responses to particular questions.

The graphs were created from the interview transcripts. Responses from the open ended questions were compiled, and common themes were grouped together. The graphs represent common responses, rather than whether an interviewee agreed or disagreed to certain aspects of the training. For example, for Figure 1 the interviewees were asked questions similar to, "What did you think of the training?". Eight people responded with comments that reflected that they were generally satisfied with the training, such as "the training was good", "I liked the training", "I enjoyed the training". Only one person mentioned that they thought the training was too long as part of their answer.

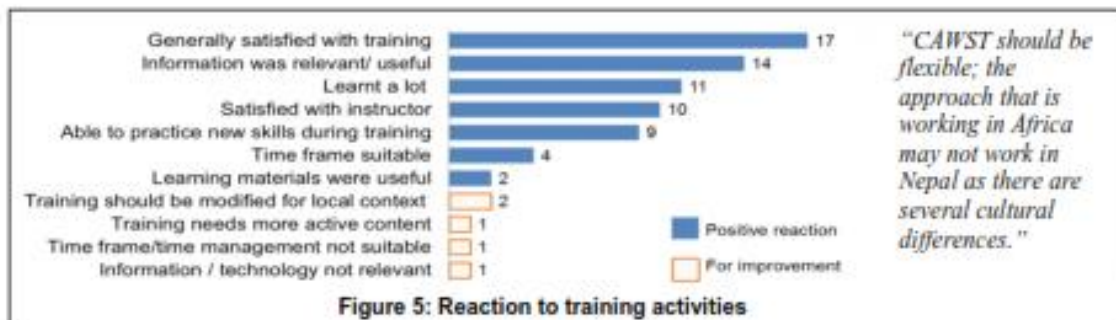
The graphs also reflect the most common topics raised by participants and whether those topics were positive or negative. In Figure 1, the most commonly raised topics were positive, indicating high level of participant satisfaction with the training.

Within the figures, HWTS is used to abbreviate Household Water Treatment and Safe storage, and BSF is used to abbreviate BSF.

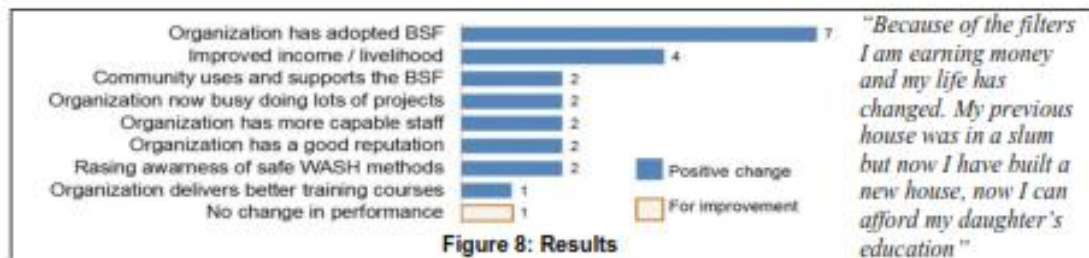
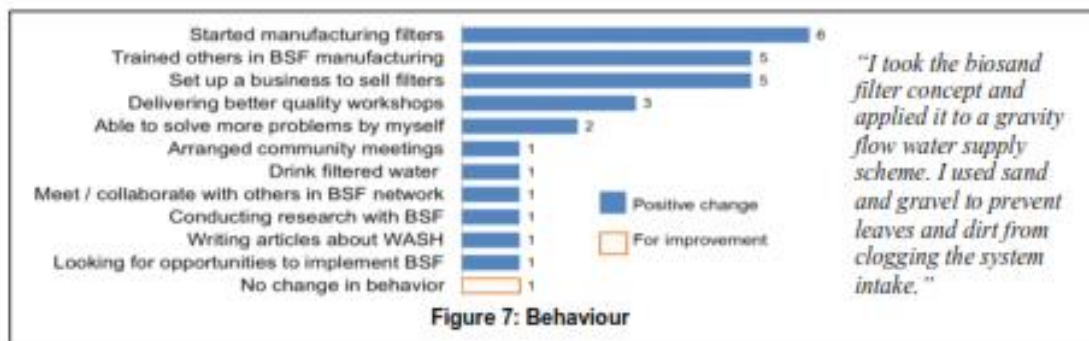
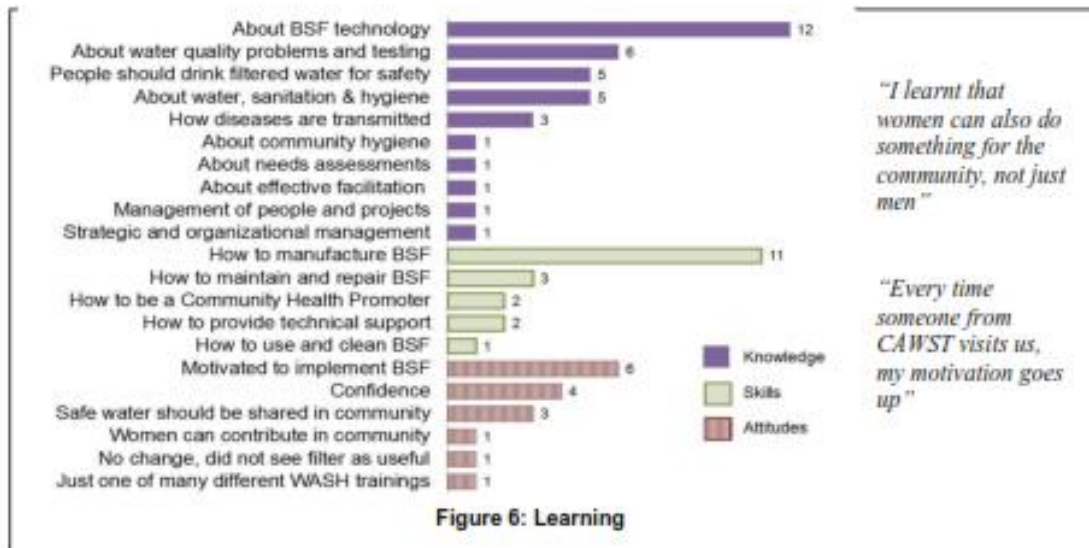




**Case Study 2: Nepal:** Figures 5 – 8 show the results summarized for each of the four levels of the Kirkpatrick model for Nepal as well as relevant quotes from the 18 interviewees. As discussed in the methodology section, the interview process was refined between the case study in Peru and Nepal, resulting in more comprehensive results for the Nepal case study.







**Discussion:** Specific findings differed between the case studies in Peru and Nepal; however comparison of the two case studies enabled common themes to be identified. Generally, participants were satisfied with the education materials and training workshops delivered by CAWST and its local partner organizations. The education posters and training manuals are effective, contain plenty of illustrations, are easy to use, and are written at an appropriate technical level. However, many interviewees recommended that more follow-up visits and support from CAWST and its local partners is needed. They were also unaware of updated and new training and education materials available from CAWST. Some workshop participants had not implemented water and sanitation projects due to lack of funding, or stated that the technologies learned from the training were determined to be not appropriate for their project sites.

Table 1 summarizes the major findings and recommendations, showing which are relevant to Nepal, Peru or both. It is interesting to note the similar and different issues arising in each of the two case studies.

Table 1. Comparison of Findings from Case studies in Nepal and Peru			
Finding	Recommendation	Nepal	Peru
Majority of interviewees reacted positively to CAWST training and consulting support.	CAWST should continue its general approach to training and consulting support.	✓	✓
Consulting support visits and feedback are irregular or not provided often enough.	CAWST should review its processes for providing ongoing assistance to clients.	✓	✓
Technology transfer can be improved through CAWST clients collaborating more locally.	CAWST should link organizations or community members together.	✓	
Knowledge transfer in technical skills was rated very highly, but challenges were reported in organizational capacity, business management & human resources.	CAWST should tailor services to better transfer knowledge in these areas to compliment the technical learning.	✓	
Clients would like assistance in methods of monitoring and evaluation.	CAWST should mentor clients in methods of monitoring and evaluation.	✓	
CAWST could reach more people by making more use of web technology.	CAWST should integrate online services to reach more clients, more often.		✓
Institutional arrangements between CAWST and their partner organizations are sometimes confusing.	Review process for selection of CAWST's clients and partners, and formalize arrangements.		✓
Clients have challenges in communication with donors and community members.	CAWST should focus on developing client's capacity in stakeholder communication.		✓

#### *Analysis of evaluation methodology and opportunities for future research:*

A key strength of the Kirkpatrick framework is that it filled a gap in CAWST's existing monitoring and evaluation processes, by providing rich, qualitative information on the impacts of CAWST's education and training work. In particular, the interview responses demonstrated changes in CAWST's client's competencies (such as learning about effective training techniques), in contrast to focusing on quantitative results only (such as the number of filters implemented). New impacts of CAWST's education and training activities and new opportunities for CAWST to improve were captured. These new findings provided ideas for future research and analysis of CAWST's work.

There is an opportunity to make the evaluation framework more robust and comprehensive by including additional sources of data for the evaluation, alongside the interviews. This could include analysis of post workshop evaluation questionnaires, analysis of historical client data records, baseline information about the organization to enable comparison of the behaviour and results from the technology transfer, and records of the CAWST competency validation process to show staff behaviour changes over time. This would add more rigour and systematic aspects to the assessment, reduce the reliance on interviewee 'self-reporting' and add completeness to the framework. There is also potential to scale up the study by integrating the Kirkpatrick methodology to other elements of CAWST's monitoring and evaluation systems (such as through CAWST's annual client survey).

#### *Use of the framework by other capacity building organizations:*

There is potential for other capacity building organizations to learn from this study and apply the proposed evaluation framework to evaluate their own education and training activities. Modifications to the framework would be required to ensure that it is relevant for different contexts, and to increase the resource efficiency of the evaluation. This has potential to foster more collaboration and communication amongst WASH capacity development organizations, and also improve how education and training activities are evaluated throughout the sector.

## **Conclusion**

CAWST and the Institute of Non-profit Studies at MRU have designed an evaluative framework to assist capacity builders in the water and sanitation sector in capturing and interpreting their results, and understanding how to maximise their positive impacts. By applying the framework to case studies of CAWST's training activities in Peru and Nepal, the framework was found to capture new information on the impacts of CAWST's training activities and fill a gap in CAWST's existing monitoring and evaluation processes. The findings demonstrate changes in CAWST's client's competencies (such as learning about



effective training techniques), in contrast to focusing on quantitative results only (such as the number of filters implemented). There is potential for the framework to be modified, scaled up and applied to assist other capacity building organizations in capturing and interpreting the impacts of their education and training activities.

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### Acknowledgements

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