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**WATER, SANITATION AND HYGIENE SERVICES BEYOND 2015:
IMPROVING ACCESS AND SUSTAINABILITY**

**Sharing water, sanitation and hygiene knowledge
through online spaces**

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The Centre for Affordable Water and Sanitation Technology (CAWST) began expanding its services to online spaces in 2012 with a water, sanitation, and hygiene (WASH) Resources website where CAWST training materials are freely available for downloading, and a Biosand Filter Knowledge Base. This has led to an increase in WASH practitioners who have been able to use our resources and receive remote consulting support. We are currently working to expand our online services to include a Household Water Treatment Knowledge Base and an e-Library. The key challenge faced by CAWST has been the time required to support these services, both technically and with client support. CAWST has increased its team in order to address this challenge.

Increased global internet connectivity

Access to the internet in the developing world has grown 475% since 2005. Globally, it is estimated that there are now over 1.9 billion individuals who are using the internet (ITU, 2014). In addition to the increase in connections, higher bandwidth speeds provide for easier access to bandwidth heavy resources such as videos, live streaming and large documents. In Africa, mobile broadband increased 40% in 2014 alone. Social networks, such as Facebook, originally designed for non-professional interaction, are being used by professionals in the water, sanitation, and hygiene (WASH) sector in developing countries to stay connected and increase their knowledge. There is an opportunity to engage these practitioners through online tools and support them day-to-day in building their knowledge and skills, help them troubleshoot, overcome technical challenges and initiate or expand their initiatives.

Online sharing of WASH knowledge

CAWST's main provision of technical support and capacity building activities is through its field staff: 12 International Technical Advisors and 3 International Education and Training Advisors. On one hand, CAWST is faced with a challenge as to how to expand its services to reach more clients with its materials, given the limited number of staff. For the past decade, the Centre for Affordable Water and Sanitation Technology (CAWST), has been providing water, sanitation, and hygiene (WASH) education and training resources through the distribution of technical manuals and educational tools such as posters, games, and technical fact sheets. These had been distributed ad-hoc through a basic website and via email to individuals from 500 WASH organisations worldwide. However, it isn't possible to visit every country or reach every WASH practitioner who would like to access our services. On the other hand, there are enough international staff to provide a challenge as to how to ensure that consistent technical recommendations are provided by our staff to our clients, especially given that subsequent client visits may be by a different staff member.

To address these dual challenges, CAWST developed two online spaces. The first was a resource-sharing space (<http://resources.cawst.org>) developed in late 2012 with the goal of further increasing CAWST's reach and facilitating the distribution of its WASH education and training resources. CAWST's repository contains over 1,300 resources including technical manuals, factsheets, posters and games designed for WASH practitioners to increase their own knowledge in WASH and train others. The online platform also

includes over 600 resources for trainers including lesson plans and trainer guides in English, French and Spanish. The materials are distributed under the Creative Common license “by attribution” to facilitate their dissemination and adaptation. This online space now serves over 5,800 registered users from 3,000 organizations in 183 countries.

The second space was launched in 2013. It is an online Biosand Filter Knowledge Base (www.biosandfilter.info). This knowledgebase collects the responses of our staff to technical questions about the biosand filter; summarizes research papers; provides information about case studies, evaluations, action research, projects, and experiences of our clients; and provides an online forum for biosand filter practitioners. The knowledgebase now serves over 1,000 registered users from 68 countries. In a 2014 user survey, it was found that approximately two-thirds of these users were WASH practitioners or managers, while one-third of users were students, researchers, or interested members of the public. The same survey found that 42% of users reported using the online Biosand Filter Knowledge base to help initiate a biosand filter project, 35% to improve the quality of their project, and 30% to train others (technicians and households).

In addition to extending our reach and being able to serve more clients, these online spaces have been key to ensuring consistency in the technical recommendations provided by our staff to our clients by giving staff access to standardized answers to frequently asked questions which they can then customize to their client’s situation, summaries of the most up to date research, and field access to all of CAWST’s training materials. Furthermore, access to a central technical repository of information has increased the organization’s efficiency in providing technical support. It is estimated that over 150 staff hours are saved each month due to these online spaces.

The significant uptake of these online services by WASH sector practitioners in developing countries prompted CAWST to provide further online capacity building services, and CAWST started to produce webinar-style online training sessions in 2014. Webinar-style online training sessions have provided a very cost-effective way for CAWST provide on-going technical support and updates to its clients globally: from addressing key issues, common to a broad range of clients, to providing guidance on how to effectively use a new education and training resource. Up to January 2015, 540 people from 73 countries had participated in these sessions. In a recent webinar on biosand filter sand, 139 of 200 (70%) registrants identified themselves as practitioners, 32 (16%) as students or researchers, and the remaining 29 (15%) identified themselves as neither. Feedback collected from attendees after these sessions has indicated a growing interest for more online training sessions.

By combining online training sessions (webinars) with a knowledge base and the WASH Education and Training Resources space, users are provided with a wide range of complementary knowledge tools that they can access on-demand. Feedback from CAWST’s clients also shows that the availability of online resources provides for continued learning and deeper learning opportunities after in-person workshops and on-site consulting support.

Planned expansion of online platforms

CAWST is presently working on expanding its online services to include two new spaces:

Household Water Treatment Knowledge Base

WASH and health practitioners are increasingly engaging in Household Water Treatment (HWT) initiatives, particularly with the growing focus on the quality of drinking water. HWT sector knowledge is currently being shared through a wide range of blog updates, research papers, training sessions and reports. Practitioners, researchers, policy makers and funders don’t have a central online hub to find practical and relevant information that can support them in understanding, implementing or supporting HWT initiatives. It is intended that this knowledge base, while providing detailed technical information and case studies about key technologies, will not be limited to the technologies. It will provide additional information of use to implementers, such as implementation strategies, information about willingness-to-pay studies, etc.

WASH e-Library

WASH knowledge is diffused online through a variety of content updates such as reports, research papers, educational resources, technical briefs, field notes, blog updates, news articles, forum discussions and other electronic updates from a broad range of players in the WASH sector (practitioners, researchers, policy makers). This online platform will aggregate content from a combination of existing online repositories of WASH knowledge and keyword-based scholar web search results. New repositories can be added to the

aggregator programmatically through meta-data mapping. Individual content pieces can also be added manually. Content will be automatically pre-organized based on its meta-data (where it exists) and keyword identification (using frequency and weighting). However, the organization of content will also be managed through manual high-grading and relevancy flagging. The relevancy of knowledge and updates can be different for different audiences (researchers vs. practitioners). A crowd-sourced approach to content tagging allows for further organization of content. More in-depth “bottom line” commentary to popular items can also help practitioners interpret more complex knowledge pieces.

WASH e-Library

A WASH e-Library is currently under development by CAWST to provide a “one stop shop” for WASH practitioners and researchers.

The challenge

There is an exponential increase of electronic information online that captures WASH sector knowledge and experience, found in online repositories, themed libraries, research papers, grey literature, news and blog updates. The challenge lies in accessing and organizing this information efficiently and providing expert perspective on the various topics rather than relying on general search engine results listing. Existing repositories require manual research, aggregation and organization of information, which is time consuming and doesn't always provide a value-add to the user. Users will tend to resort back to using global search engines that favour search engine optimized websites over content that may be truly relevant to the user.

The solution

A “one stop shop” online platform where the user can find all possible insight on a WASH subject without the need to browse between libraries and websites. This platform continuously and automatically aggregates and organizes any WASH information published on the web. The knowledge manager and expert contributors can focus on high grading and adding value to the content items rather than spending time seeking and inputting them. The content is further tagged and rated by users, increasing the value-add and relevancy for other users.

Challenges and lessons learnt

Since the launch of these online tools, CAWST has learnt valuable lessons in the provision of online support.

Staff time

The key challenge faced in starting to provide online services is in regards to the amount of staff time required. This staff time takes several forms.

Web developers

Providing online products and services does not only require the work of a web developer at one point in time, but requires consistent support to address updates, troubleshooting, and bugs. Although we were able to develop these tools in 2012 and 2013, we did not have sufficient internal capacity to maintain, update, and expand the services, given the specialized skill set and time required. As a result, in 2014 and 2015 we needed to add web developers to our team.

New clients

A second considerable need for staff time is in supporting the large number of new clients. In the case of CAWST's online spaces, we have chosen to include a live chat during our regular office hours for the two existing resource spaces and we also solicit questions from users. With the large uptake of these online services, these require a considerable amount of employee time. We receive an average of 3.6 chats per day of various lengths; from simple requests for directions to resources on the website to more in-depth project consulting. Initially, the answering of questions from the website apart from the chat was somewhat informal, with several staff being notified when a question was submitted but no one staff member assigned

to handling this communication. We have found, however, that as the number of user responses increased, the problem developed of sometimes having clients receive multiple independent responses from different staff, while many other questions were left unanswered. We have needed to create a clearer chain of responsibility to address the questions submitted by online clients, and have developed a “gatekeeper” system where one person has the responsibility of either responding to the client, or of forwarding the question to a particular staff member with the relevant expertise to take on the responsibility of answering the question.

Online training

A third need for staff time is with the online training. Webinars require more time to develop and present than other types of in-person presentations, and work best when a team of staff work together. Because we re-use the webinar presentations and translate them, the staff member creating the webinar must develop a more complete script than is usually necessary, or even advisable, for giving a normal presentation. The best practices for developing webinar slides and delivering webinars are quite different from in-person deliveries, and discovering some of these differences has required some learning on the side of our staff along with some trial-and-error. For example, we have discovered that it is important to have a dedicated team member separate from the presenter assigned to answering questions and comments on the “chat” during the webinar delivery. It is also necessary to do a complete practice run, with other staff, in order to ensure that there are no technical issues in the presentation, such as incompatibilities with the software or equipment problems. In addition, after each webinar there is a peak in e-mail technical inquiries to the staff members who facilitated the session, requiring several hours of work to address well. An average one-hour webinar takes 40 to 60 staff hours to produce, deliver, and follow-up with.

Best practices for online spaces

Simple user interface

With a large collection of content to navigate, it is critical to have a simple, easy-to-use user interface where users can quickly and independently find the information or resource that will best meet their need. We have found that many users rely on the live chat feature of the website to find what they are looking for. This is not the most effective use of staff time. As a result we are presently re-working the user interfaces of our online spaces, including a clearer organizational structure, the use of “high-grading” to ensure that the most recent and relevant materials are always at the top of the page, and an improvement to the search tool.

We have found that researchers and practitioners using our resources are looking for different types and depths of information. Our online resources have information of interest to both groups. However, our priority audience is practitioners. As such, our user interface and content organization is designed for this group. However, because of the simplicity of the user interface, it is easy for researchers to identify the content that is of greatest interest to them (e.g. research papers or literature summaries) and content potentially of lesser interest (e.g. list of steel mould producers by country). For the Biosand Filter Knowledge Base we are piloting a “Researcher” page in 2015 with targeted information about designing experiments and suggested research topics.

User contributions

At present, we have had limited use of the web features inviting user contributions. Most users of the online spaces are looking for answers and do not return to share their lessons learned. We have found that it is necessary to have a team of content managers who can request the sharing of specific information. When directly asked a specific question, it is easier for users to share their knowledge and experiences.

Agile system design

Using an ‘Agile’ approach to web system development has allowed for flexibility in responding to user needs and feedback. Agile software development promotes adaptive planning, evolutionary development, early delivery, continuous improvement, and encourages rapid and flexible response to change (Beck et al, 2001). The WASH Education and Training online space and Biosand Filter Knowledge Base were designed with basic navigation and functionality using a very flexible development platform to accommodate for the likely changes resulting from user feedback. Continuous system updates were done to the live system in

parallel to the development of plans for more significant layout & navigation changes. The Live Chat tool and internal users' feedback provided the main source of information to evolve the online spaces.

Conclusions

By expanding our services to include online spaces, including a WASH Resources website, a Biosand Filter Knowledge Base, and webinars, CAWST has successfully been able to increase its reach to WASH practitioners. Over the next year, CAWST intends to expand its online services to include a Household Water Treatment Knowledgebase and a WASH eLibrary.

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