

OpenWASH evaluation 2019

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Executive Summary

OpenWASH is an international Open University programme that provides learning resources for the water, sanitation and hygiene (WASH) sector in Ethiopia. The initial project (2014-2016), in partnership with UNICEF and World Vision Ethiopia, produced five OpenWASH modules and a Trainers' Handbook. A sixth module was produced in 2018 in partnership with WaterAid Ethiopia.

Since 2016, the original five modules have been piloted in selected Ethiopian colleges and used by other training organisations. The purpose of this evaluation project was to assess the impact of OpenWASH on colleges and other users in Ethiopia. It also aimed to identify possible future activities to extend the use of OpenWASH and maximise its value for all potential users.

The main activities were undertaken during a visit to Ethiopia in early 2019. Staff from four colleges and two other training providers were interviewed to collect data on their use of the modules and the effects of OpenWASH on their teaching.

The interviews revealed that OpenWASH has been highly successful and had a positive impact on WASH teaching and training in Ethiopia. All current users are enthusiastic about the modules and value the added dimension and innovation that OpenWASH has provided.

There is considerable scope for expanding the use of OpenWASH by wider dissemination to more colleges and to other potential users.

The report concludes with a set of recommendations for possible future activities to further develop the impact of OpenWASH in Ethiopia. The recommendations are:

1. Expand use of OpenWASH to other colleges
2. Provide more Training of Trainer events
3. Clarify links between OpenWASH and Occupational Standards
4. Promote use of *Count me in! Inclusive WASH in Ethiopia*
5. Organise an OpenWASH publicity event
6. Establish an OpenWASH user network
7. Complete translation work.

The recommendations include some suggestions for possible implementation.

1 Introduction

OpenWASH is an international Open University programme that provides learning resources for the water, sanitation and hygiene (WASH) sector in Ethiopia. The initial project (2014-2016) was supported by eSTeEM and managed by the OU International Development Office (IDO).

OpenWASH was the main capacity building component of a wider development programme in Ethiopia called One WASH Plus. In partnership with UNICEF and World Vision Ethiopia, and with funding of approximately £400,000 from UK Aid, five OpenWASH modules and a Trainers' Handbook were published in 2016. A sixth module was produced in July 2018 in partnership with, and funded by, WaterAid Ethiopia. (All OpenWASH materials are freely available to anyone as open educational resources (OERs) from the OpenLearn Create website <http://www.open.edu/openlearncreate/openwash>.)

Since 2016, the original five OpenWASH modules have been piloted in selected Ethiopian colleges and also used by other training organisations but feedback from the users has been limited. OpenWASH was not included in the formal evaluation of One WASH Plus undertaken by IRC WASH (Netherlands) and there has been little opportunity to assess the impact of OpenWASH and its value for the colleges and other users. This 'OpenWASH evaluation 2019' project aims to fill that gap.

2 Context

The OpenWASH modules and Trainers' Handbook were principally designed to support curriculum development in Ethiopian technical and health science colleges. These colleges are required to teach an outcome-based curriculum, that is, they are only allowed to teach subjects that lead to specified employment as defined by the Ethiopian Occupational Standards (OS). This was a known constraint on use of the modules in the initial implementation phase but in 2018 a new OS for 'Water Supply and Sanitation' was introduced that was informed by OpenWASH and therefore more congruent with module content and approach.

In the pilot phase of One WASH Plus, eight colleges were selected to trial the OpenWASH modules in four regions of Ethiopia (Amhara, Oromia, Tigray, Somali). Four were Technical Vocational, Educational and Training Colleges (TVETCs) teaching water-related subjects and four were Health Science (HS) colleges. (Nationally there are nine water TVETCs and 20+ HS colleges; all operate under the Federal TVET system.) The pilot colleges were provided with a small number of printed copies of the modules (in English) and their staff were invited to attend a week-long Training of Trainers event in July 2016 organised by World Vision Ethiopia (WVE).

Since that time, some data on student numbers had been provided by WVE and showed a positive trend but collecting meaningful information about use of the modules remotely proved to be very difficult. This led to a visit to Ethiopia in June 2017 by Pam Furniss (OpenWASH Academic Director) and Ellen Scott (IDO Senior Project Manager) when some preliminary investigation at one of the pilot colleges was undertaken¹. Discussions during this visit also revealed that the modules were being

¹ Furniss, P. (2017) OpenWASH evaluation and development: Ethiopia and Uganda, June 2017. Available at <http://www.open.ac.uk/about/teaching-and-learning/esteem/projects/themes/stem-distance-learning-overseas-markets/exploring-global-potential-wash-distance>

used by the Ethiopian Water Technology Institute (EWTI), a government-funded institute with responsibility for training TVETC staff, and Jhpiego, an international NGO working on the capacity-building component of Growth Through Nutrition, which is part of a major programme called Feed the Future Ethiopia. The outcomes from the 2017 visit were very positive but limited in scope therefore a more rigorous investigation was needed leading to the proposal for this research.

In a separate development, the quality and potential of OpenWASH learning resources were recognised by WaterAid Ethiopia who commissioned a sixth module, *Count me in! Inclusive WASH in Ethiopia*. This module was published in July 2018 with a primary intended audience of staff of WaterAid and their partner organisations and potential to reach colleges, national and regional government staff and others in the WASH sector.

In accordance with the Open University's code of practice, this research was submitted for ethical review and was approved by the Human Research Ethics Committee (HREC) (Reference number HREC/3090/Furniss).

3 Aim and objectives

The aim of the project was to evaluate the impact of OpenWASH in Ethiopia. Impact evaluation of educational material is always a challenge because the effects may not be realised for many years, long after the learners have ended their studies. They may have developed key skills, acquired relevant knowledge, use more effective methods and generally be better at their jobs but this is almost impossible to assess and link back to their earlier learning. For OpenWASH, the ultimate goal is to improve the quality of training and education so that WASH services become more effective and sustainable and lead to improved health and well-being. It is not feasible to attempt assessment of these long-term aims so this research focuses on the more immediate impact on the current users of the OpenWASH resources and on opportunities to expand their use. The project objectives were to:

- Collect quantitative and qualitative data on the use of OpenWASH modules since launch in 2016
- Identify/clarify any constraints on use of the modules and investigate possible ways to overcome them
- Assess the potential for expansion and future use of all OpenWASH resources
- Gather evidence to inform strategic planning for OpenWASH in collaboration with partner organisations.

4 Activities

The research consisted of a series of semi-structured interviews with OpenWASH users undertaken during a visit to Ethiopia in January/February 2019. With support from UNICEF, visits were arranged to four of the colleges that had been involved in the OpenWASH pilot. It was not possible to visit the other pilot colleges for logistical reasons (distance and political unrest in some locations). The other known OpenWASH users, EWTI and Jhpiego, were also interviewed.

All interviewees were contacted in advance and sent a briefing note to explain the purpose of our visit. Appendix 1 shows the briefing note for colleges, which was varied slightly for the other users. Interviews were requested with staff who were personally using the modules in their teaching (Table 1). All interviews were recorded and later transcribed.

Table 1 Interviews with OpenWASH users

<i>Colleges</i>	<i>Job title of interviewee*</i>
Woliso Polytechnic TVET College, Oromia	Senior WASH Trainer
Bahir Dar Polytechnic TVET College, Amhara	WASH Instructor
Bahir Dar Health Science College, Amhara	Environmental Health Officer
Dr Tewolde Health Science College, Mekelle, Tigray	WASH Coordinator
<i>Other users</i>	
Ethiopian Water Technology Institute, Addis Ababa	Director, Water Technology Education and Training Directorate
Jhpiego	WASH Education and Training Advisor

*Names are not used in accordance with HREC confidentiality requirements.

Questionnaires based on the interview questions were sent by email to the pilot colleges where visits had not been possible (listed below) but there were no replies. This confirmed the underlying assumption that personal contact was necessary to gather information.

- Maychew Water and Sanitation College, Tigray
- Jijiga Polytechnic, Somali
- Jijiga Health Science College, Somali
- (Shashemene Health Science College, Oromia is no longer operating)

Plans for informal discussions with students to gain their perspective were abandoned due to feasibility issues, particularly the impractical requirements specified to comply with HREC regulations.

5 Findings

The interview questions (see Appendix 2) were divided into four main sections:

- Background information
- Using OpenWASH modules
- Methods of teaching
- Your experience of OpenWASH.

These headings, augmented with some additional topics that emerged during the interviews, are used in the following sub-sections.

5.1 Background information

Total student numbers in the four colleges ranged from 1500 to 9000 of whom just a few hundred were studying WASH-related subjects. In the water colleges, WASH training was linked to the new

Occupational Standard (OS) for Water Supply and Sanitation and to the OS for Irrigation and Drainage Design and Construction. In the health science colleges, the students were studying WASH as part of the training package for health extension workers or environmental health technicians.

All colleges reported that numbers of WASH students were increasing year on year. Table 2 shows the reported numbers for the current and following academic years. (Note some courses do not follow the standard academic year.)

Table 2 WASH student numbers

	<i>Current WASH students (2018/19)</i>	<i>WASH students expected for next academic year</i>
Woliso Polytechnic	120	300
Bahir Dar Polytechnic	320	500
Bahir Dar HSC	400	more than 400
Dr Tewolde HSC	260	480

Three of the college interviewees had personally attended the OpenWASH Training of Trainers (ToT) event in 2016 and the fourth (Bahir Dar Polytechnic) knew of it from his colleagues. They all reported that the ToT was very important and without it they would not have known about OpenWASH. EWTI and Jhpiego had not been participants in the pilot and had only learned about OpenWASH by chance. As the official national training body for TVETC staff teaching WASH subjects the omission of EWTI from the One WASH Plus pilot programme was particularly regrettable.

EWTI provide 13 different WASH-related training programmes for staff of water TVETCs, water utilities, Regional Water Bureaus, Ministry of Water, public enterprises and others. Most of their courses are short (between 2 and 8 weeks) and delivered face-to-face and repeated at least four times a year. EWTI also reported increasing demand year on year, increasing from 490 trained in 2016 to 973 in 2018. For 2019, they plan to train more than 1000 people within their government-funded programme for TVETC staff and in-service water sector professionals. They also have plans for other on-demand training courses which could take the total numbers to more than 1500.

Jhpiego, as partners in Growth Through Nutrition, are responsible for pre-service education in targeted colleges and universities across four Ethiopian regional states. Their focus is on the links between WASH and nutrition and they aim to ensure professionals are equipped with WASH competencies that can help solve nutrition problems in Ethiopia. They also work with teaching institutions on staff capacity building, curriculum strengthening, and improving the quality of education.

Jhpiego started using OpenWASH in 2016 and for the period to February 2019 had run their training programme for water TVETC staff four times in three locations with approximately 24 people in each cohort. In total 94 college instructors received the training in that time with more planned for the future. The Growth Through Nutrition project is operating in Amhara, Tigray, Oromia and SNNPR and the first three cohorts were staff from colleges in these regions. Three of these four colleges were also participants in the OpenWASH pilot; the exception was Hawassa Polytechnic, SNNPR. Almost all WASH staff in these four colleges have completed the Jhpiego training. The most recent training

event also involved staff from the other five water colleges in Kombolcha, Amhara; Assela, Oromia; Assosa, Benishangul Gumuz; Melka Werer, Afar; and Jijiga, Somali (which was in the OpenWASH pilot).

All interviewees commented on the recent significant change in OS and the positive step of describing Water Supply and Sanitation as a separate occupation. Previously water was included in the construction sector with separate OS for water supply, water distribution, water treatment etc.; sanitation and wastewater management were omitted. The change had transformed the programme of study and greatly increased the opportunities to use OpenWASH in their teaching and training. Further extension to integrate solid waste management and wider environmental issues such as climate resilience into the OS was foreseen by some interviewees. However, hygiene continues to be generally seen as part of the health curriculum, a division perpetuated by the separation of technical water colleges and health science colleges.

5.2 Using OpenWASH modules

The titles of the five original modules are:

- Module 1 Ethiopia’s One WASH National Programme
- Module 2 WASH: Context and Environment
- Module 3 Urban Water Supply
- Module 4 Urban Sanitation and Solid Waste Management
- Module 5 Urban WASH: Working with People.

Each module consists of 15 study sessions. They were designed for flexibility so teaching could be based on separate modules or selected sessions according to the needs of the users. Interviewees were asked which of the modules and sessions they had used. Responses are shown in Table 3.

Table 3 OpenWASH modules and study sessions (SS) used

	<i>Module 1</i>	<i>Module 2</i>	<i>Module 3</i>	<i>Module 4</i>	<i>Module 5</i>
Woliso Poly	all SS	SS 1,4,7	all SS	SS 1,2,3	all SS
Bahir Dar Poly	all SS	some SS	all SS	all SS	all SS
Bahir Dar HSC	not used	SS 1,2,3,4,7,8	not used	all SS	SS 1,5,6,9,10,11,12
Dr Tewelde HSC	all SS	all SS	all SS	all SS	some SS
EWTI	not used	not used	not used	all SS	not used
Jhpiego	SS 1,2,4,5,6,7,9	SS 4,7,8,15	SS 1,2,3,4,5,8,10,11	SS 1,2,4,5,6,8,10,11	some SS

Table 3 shows significant variations but overall demonstrates that all study sessions from all five modules were used by one or more respondents and no redundant topics or study sessions were identified. Each user selected modules and study sessions that corresponded to the syllabus they were teaching. One interviewee commented ‘all modules are very crucial for our teaching and learning process’. Another said ‘the modules are very well organised and useful to conduct any

WASH-related training in different contexts. Almost all the study sessions are very crucial for the development of a qualified human taskforce in the sector.'

All the college interviewees referred to the Occupational Standards (OS) and the need to select content from the modules that corresponded to the Units of Competence specified in the OS. (Each OS is divided into five levels, each defined by a set of Units of Competence (UoC).) The new OS for Water Supply and Sanitation had enabled them to use more of OpenWASH in their teaching. One of them said 'OpenWASH is a good fit to the OS; it is new, updated knowledge we can use'. Another interviewee had been a member of the group that developed the new OS on behalf of the Federal TVET Agency and reported they had referred to OpenWASH in their process and consciously incorporated OpenWASH content into some of the specifications. He was particularly enthusiastic about the modules and described himself as an 'OpenWASH ambassador'. He predicted that use of OpenWASH would increase in future with growing awareness of the new OS and as further OS developments took place.

EWTI only used Module 4 because subjects from the other modules were already available from other providers and they did not want to duplicate. For Jhpiego, their strategic aim of capacity building for staff of teaching institutions led to selecting modules and sessions that provided updating in the competencies defined in the new OS. Jhpiego had also contributed to the OS development process and supported the integration of WASH subjects. They used OpenWASH modules by adapting selected content to suit their own programme of study designed to fit their focus on nutrition. Although they worked with both water TVETCs and health colleges, they only used OpenWASH resources for training water college staff.

Taking each of the modules in turn:

Module 1 on the One WASH National Programme (OWNP) was 'important for the Ethiopian water industry'. Jhpiego, for example, use this module to 'introduce key concepts of the OWP especially its importance, guiding principles, components, pillars and stakeholders'. Module 1 was described as the 'essential basis for the others'.

Module 2 was used more selectively than the others but also described as 'very important'. This module provides teaching on the scientific and technical environmental context of WASH which is currently not emphasised in the work-focused competencies of the OS. However, pollution, climate change, climate resilience and population growth were recognised as topics with growing importance that could be incorporated in OS in future. Of the study sessions selected by users the most popular were SS1 (Human interactions with the environment), SS4 (The water cycle and sources of water), SS7 (Pollution: types, sources and characteristics) and SS8 (Pollution: effects, prevention and control).

Module 3 was widely used as the one most closely aligned with the existing water TVET curriculum. It was praised for several reasons including that it starts with clear explanations of the problems and the links between water and public health before going on to describe solutions. Some respondents questioned the focus on urban water supply (as opposed to rural) which had been defined by the scope of the wider One WASH Plus programme. Several asked for more teaching related to rural supply because the majority of Ethiopians still live in rural settings, although it was acknowledged

that the urban emphasis makes the module more relevant for water utilities and reflects increasing urbanisation.

Module 4 on liquid and solid waste management was very popular and highly praised by all interviewees because it filled a significant gap in their curriculum. Waste management in general was acknowledged as a neglected area in Ethiopia and the cause of significant environmental problems but it is only recently getting any attention. It had not been part of the trainers’ learning when they themselves were students so they welcomed new resources to help them develop their teaching in this area. With the new OS, sanitation and wastewater management are now part of the curriculum but solid waste management and the links between liquid and solid waste are still neglected topics. EWTI found Module 4 particularly valuable to fill this gap in learning resources for their in-service training courses. The interviewee reported that trainees were aware of the problem of solid waste but did not know how to manage it and said that studying Module 4 was ‘opening our eyes’. It was reported that no university, college or institute was currently providing training in solid waste management and EWTI were keen to become a centre of excellence in this field.

Module 5 focuses on softer skills and was also widely used by the colleges. It was reported there are ‘three UoCs in the new OS that directly relate to this module’. Jhpiego had recently presented a ‘Trainers’ skill gap’ training based on Module 5 for all nine water TVETCs.

In addition to their main teaching programmes, both water TVET colleges reported using OpenWASH modules for community outreach work. They ran short training courses for their local communities to raise awareness on topics such as handwashing and problems caused by open defecation. Bahir Dar Polytechnic used parts of Modules 3 and 5 to develop training materials for these courses. At Woliso Polytechnic, a recent short course had been attended by more than 100 people. They had also run awareness creation workshops jointly with the Water and Health Zonal Offices using Modules 2, 3 and 5. Woliso also reported positive appreciation of the modules by the students who had joined an ‘OpenWASH Club’. This had been organised and run by students of the previous year and they hoped to establish the club again when the next cohort of students arrived.

In another conversation we also learned that Modules 3, 4 and 5 were being used at the Federal Ministry of Health by the Hygiene and Environmental Health Directorate to update the curriculum for Health Extension Workers but it was not possible to obtain any details of this work.

5.3 Access to OpenWASH resources

In 2016, colleges in the pilot had received 14 colour-printed copies of each module and the Trainers’ Handbook. The original project had included plans for more but budget constraints restricted the number of copies. They had also been given soft copies of the modules on flashdrives at the ToT event. Questions about access to the modules revealed that colleges had different customs and practice for managing the copies and making them available to students and staff (Table 4).

Table 4 Availability of modules to college staff and students

	<i>Printed copies</i>	<i>Soft copy/online access</i>
Woliso Poly	OpenWASH modules were shelved in the library and available for staff and students but for reference only; not to	Interviewee was aware of online versions but staff use soft copy (flashdrive) for lesson preparation. Students could not access online

	be removed. Appeared to be well thumbed.	because not enough computers in the college (even staff had to share).
Bahir Dar Poly	Stored on a low and inaccessible shelf inside a locked room in the library. Theoretically available on request for use in the library. Copies did not appear to have been used at all.	Use flashdrive for lesson preparation. Interviewee did not know modules were available online. No internet connection on site.
Bahir Dar HSC	Shelved in the library. Available for students and staff to use in the library.	Use flashdrive for lesson preparation. Interviewee was aware of online versions. No internet access for students.
Dr Tewolde HSC	Students are issued with printed copies for duration of their course but they have to share in groups. Between courses, copies are stored by the college and issued to next years' student groups.	Use flashdrive for lesson preparation. Interviewee was aware of online versions, including the downloadable pdf and Word versions. Students do not access online because no internet access and not enough computers anyway.

Although most (but not all) college interviewees were aware that OpenWASH resources were also available as OERs, none of them used the online versions. For staff, this was usually because using the flashdrive was easier and internet access was not reliable. For students, the main problem was lack of computers. In some colleges this was also the case for staff who had to share a laptop with colleagues.

When asked if they would like more printed copies for their students, responses were mixed. Woliso did not want more because their library regulations would not allow students to borrow copies even if they were available. On the other hand, Dr Tewolde college would like to have enough copies for each student to have their own set to take away and read at home. They would be issued to students for the duration of their course and returned at the end to be re-issued to following groups of students. Dr Tewolde reported that students had asked for more copies and there would be no problems of issuing or storing modules. Between those extremes, Bahir Dar Polytechnic said a few more copies would be welcome but not essential. Students would not be allowed to keep them and they did not have capacity or mechanism within the college to give them out and collect in at the end of the course. Bahir Dar HS college were close to Dr Tewolde's position and would also like more printed copies so they could issue them to students for the duration of their course. The variations in response to this question indicate that colleges should be consulted individually about their needs and wants if there were plans to provide more printed copies of the modules.

Woliso's priority was to create an e-library accessible to students but this is dependent on procuring computers and related resources. The need for more IT equipment was also cited by the other colleges and was clearly a significant constraint on teaching activities.

EWTI and Jhpiego interviewees had accessed OpenWASH online and taken advantage of the OER status to download copies for their own purposes. Access for trainees was not an issue for Jhpiego because they used OpenWASH selectively to prepare their own training materials. EWTI recognised

that OpenWASH 'is good for self-learning' because anyone can learn from reading the modules with no need for a tutor. They would like to be able to give colour-printed copies to their trainees so they can take them back to their workplace for reference although many trainees did take away flashdrive copies of the module and Powerpoint slides.

5.4 Methods of teaching using OpenWASH

All interviewees are using the modules as the basis for face-to-face teaching/training sessions. There have been no reports of anyone using OpenWASH in any other way (e.g. distance, self-managed, or work-based team learning). Advice on these and other ways of using the modules are included in the Trainers' Handbook but there is no mechanism to track these potential activities.

In the colleges, OpenWASH is used to contribute to teaching of theory in the TVET system's prescribed training methodology of 70% practical and 30% theory. The general method of using OpenWASH is to prepare handouts and Powerpoint slides by copying and pasting from the modules, with some modifications as necessary. Lessons are designed around these materials with group discussions and class exercises as well as practical lessons and site visits.

The handouts are photocopied in black and white. Colour copying and printing is generally not available so quality, especially of diagrams and photos, is reduced, which is a significant drawback.

At Woliso, the cost of photocopying for all students limited the numbers of handouts they could provide so students are encouraged to look at the modules in the library for further details. Students at Dr Tewolde college could use the shared modules issued to them if they needed to. At the other colleges, students could also refer to the modules if they were accessible.

Colleges varied in how much they made use of the study session (SS) structure. Woliso and Dr Tewolde used the study sessions to define their lessons. Woliso reported a maximum of four hours teaching time for one SS, which is more than the designed two hours per SS but would include class discussions and activities. Bahir Dar Polytechnic said they picked out relevant sections for their lesson plans and did not necessarily use one SS per lesson.

Dr Tewolde college also used more innovative teaching methods such as role play and drama. For example, to teach hygienic handwashing, two students could be briefed to prepare a short drama. They leave the class for a few minutes then return to present the procedure to their classmates which triggers discussion. This makes learning fun and helps the students understand and remember.

Of the two non-college users, EWTI have provided the Module 4 training course 10 or 11 times and they reported that their methods have evolved and improved over that time. Most courses are run from their new campus in Addis Ababa but they also provide face-to-face courses in regional centres. Their courses start with a pre-test of trainees to assess prior knowledge and based on this and trainees' expectations they set goals and make session plans for the course. Trainees are given a photocopy (black and white) of OpenWASH study sessions, complete and unaltered. EWTI trainers use Powerpoint slides based on the module followed by group discussions. Trainees who are current WASH practitioners are encouraged to present their own case studies and experiences which are integrated into the sessions. EWTI also organise field trips, for example, to Addis Ababa's wastewater treatment plant or sanitary landfill site.

The Jhpiego training consists of a six-day face-to-face course divided into three parts: theory, practical and field visits. For the theory component, they have developed their own presentations and handouts compiled from OpenWASH and other sources. Sometimes they used study sessions in their entirety or may extract sections that are relevant to nutrition and child development. They are planning further updates in response to the new OS and expect to make more use of OpenWASH in future.

All users reported making use of the Self-Assessment Questions (SAQs) in their teaching. They were used as prompts for group discussions and also used for written assignments. In some cases, the style of questions used in SAQs had been adopted for creation of new questions. In-text questions were also mentioned by some as useful triggers for discussion.

5.5 Trainers' Handbook

Respondents were asked if they were aware of the Trainers' Handbook and if they had used it for lesson planning. It was previously known that the Handbook had not been featured at the ToT event although colleges in the pilot had received printed copies.

Woliso and Dr Tewolde colleges said they found the Handbook to be very helpful and referred to it when planning lessons. Interviewees at both Bahir Dar colleges were not previously aware there was a Trainers' Handbook although one of them said he had looked at it for the first time the day before we met and would now make use of it.

EWTI and Jhpiego did not use the Handbook because they both have their own training operational guidelines and teaching methodology.

5.6 Translations

The original project included plans for translation of the modules into the local languages of the four regions involved in the One WASH Plus programme, Amharic, Oromiffa, Tigrigna and Somali. Unfortunately the translation met with significant difficulties and this component of the project was never completed satisfactorily. In Ethiopia it is mandatory for post-16 education to be conducted in English but standards of comprehension are known to be variable so asking about the need for translated modules was a key question.

At Woliso, the response was that translation is not very important because the curriculum, assessments and OS are all in English. Some trainers use local language (Oromiffa) in class to help students understand but they do not need full translations. However, there could be benefits if some sections were translated so they could be used more easily in their community outreach work.

In Bahir Dar the local language is Amharic. Both Polytechnic and HS college teach in English but occasionally use Amharic for conversation in class. They said translated modules would be helpful and if available, they would keep a few printed copies in the library for students to use to aid understanding.

The response from Dr Tewolde was similar. They teach in English in accordance with national policy but may speak Tigrigna in class, if needed, to explain. Translated printed modules would be helpful to support students who do not have good English but they pointed out that if translations were available they could only be used for reference because teaching must be in English.

Jhpiego are providing training for college instructors so again the medium for instruction has to be English although they sometimes speak in Amharic. Similarly, at EWTI the language for instruction is English but this does cause problems for some so again, Amharic is sometimes used in classroom sessions and discussions. However, the trainees come from all over Ethiopia and not all are Amharic-speakers so translation into major local languages would be helpful, especially Oromiffa, as well as Amharic. If available, they would give out copies of translated versions to trainees.

Overall there are mixed opinions on translations which could be summed up as nice to have rather than need to have.

5.7 Experiences of using OpenWASH

The final section of interview questions aimed to elicit personal reflections and opinions about OpenWASH and its value to respondents' teaching.

All interviewees, without exception, were full of praise for OpenWASH. Comments included: 'beyond good', 'very important', 'very helpful', and 'very necessary'. One said 'the modules have helped me to improve my teaching and learning process' and another that 'if there were more OpenWASH modules, I'd be happy to have them'.

They particularly liked:

- integration of water, sanitation and hygiene as one subject and the links made between topics e.g. between liquid and solid waste management and environmental impacts.
- relevance to the Ethiopian context and use of Ethiopian examples and images
- well-written and easy to understand (although English was a problem for some students)
- clear and consistent structure of study sessions including Learning Outcomes, SAQs, numbered sections etc.
- attractive and interesting presentation with lots of pictures, which students liked and helped their learning.

Other positive comments included appreciation of the list of references with links to original websites which one interviewee had used to find and download source material to further inform his teaching. He also valued the fact that OpenWASH is open access, available for all to share and communicate with others.

The added value of OpenWASH since the revision of the OS has already been discussed and this comment was repeated again when asking for personal opinions of the modules. OpenWASH has filled gaps in the resources available to instructors in both water and health programmes and supported them by providing new teaching materials. Jhpiego commented that the college staff they trained mainly had backgrounds in construction and engineering and lacked knowledge of WASH so OpenWASH made it possible for them to provide the new courses.

Interviewees reported that their students/trainees liked the modules but they did not have any formal data about OpenWASH. Most respondents routinely collected feedback at the end of their courses but this was not specific to OpenWASH because it was embedded within their study programmes. (As noted in Section 4, it was not possible to speak directly to students in this research project.) Most of the colleges also undertook some sort of tracer study of their students after they left to track their employment but again this was not linked to OpenWASH. Woliso suggested the

possibility of comparing results of tracer studies since the introduction of OpenWASH with earlier cohorts to see if there was any identifiable difference in outcomes for students.

Interviewees were also asked about any problems or drawbacks with the modules but even when prompted with possible flaws, they did not agree. For example, they did not consider the modules are too long (each one is approximately 200 A4 pages in print). Neither did they consider that becoming out of date was a problem. They commented that the science has not changed and although national WASH policy has just been revised, the principles and strategy are still the same.

5.8 New OpenWASH module: *Count me in! Inclusive WASH in Ethiopia*

This module has the same format as the original set but is shorter with five study sessions covering issues of gender equality and equitable access to WASH services for people with disabilities and other disadvantaged groups. All interviewees were given colour-printed and soft copies of *Count me in!* during our visit. None had previously been aware of the module and all greeted it with enthusiasm.

Gender equality and inclusion have high priority in national policy in Ethiopia. In the TVET system there is a new focus on gender-sensitive training which presents challenges for the teaching staff, not least because they are predominantly male (all six interviewees were men). They recognised that this module would provide valuable support for curriculum development in this area and filled a gap in resources available to them. Again, the requirement to only teach to OS specifications was mentioned. At present, gender and inclusion are referred to in several Units of Competence (UoC) but no single UoC is directly focused on these issues.

Jhpiego commented that it was impossible to separate gender and WASH and *Count me in!* could be very helpful for them. They already have a pedagogical skills training course called 'Gender responsive effective teaching skills training' and want to make their technical training gender responsive as well so could foresee ways to use the new module in their programme. The interviewee commented the new module could be the basis of a very useful course for pre-service training in WASH and other sectors.

6 Requests and suggestions from interviewees

Several ideas for future developments emerged during the interviews and are listed here. Some have been developed into recommendations to share with OpenWASH partners and are incorporated in the final section of this report. The suggestions from interviewees included:

- 6.1 More and repeated training for college trainers on use of OpenWASH, both for existing and new staff.
- 6.2 Training on how best to use the modules and development of pedagogic skills.
- 6.3 Table or checklist that matched module contents with OS Units of Competence to facilitate use of OpenWASH.
- 6.4 More coverage of rural WASH (or a table/checklist that identified sections of OpenWASH relevant for rural settings).
- 6.5 More effective collaboration between the ministries who each have responsibility for different parts of WASH i.e. water, health, urban development; perhaps this could be facilitated by development partners.

- 6.6 Better communication among all WASH sector stakeholders in Ethiopia to achieve more collaboration and coordination including sharing information on best practice across health and water sectors.
- 6.7 Greater use of forums and platforms to disseminate information on OpenWASH among existing and future users, for example potential users in agriculture, nutrition and in universities.
- 6.8 More computers and resources for colleges to establish e-library facilities for OpenWASH and other learning resources.
- 6.9 Resources to enable short refresher training courses for current health professionals (including nurses, midwives, and others) who qualified before WASH was included in the health curriculum and lack knowledge of environmental impacts of poor sanitation and waste disposal.
- 6.10 Provide training on sanitation and solid waste management for city mayors, managers of utilities and others.
- 6.11 Additional material on CLTSH facilitation and other behaviour change methods.
- 6.12 Additional material on sustainable design and construction, especially engineering aspects.

7 Conclusions and recommendations

All the evidence from this research indicates that OpenWASH has been highly successful and had a positive impact on WASH teaching and training in Ethiopia. All current users are enthusiastic about the modules and value the added dimension and innovation that OpenWASH has provided. They have made use of all sessions of all modules and benefitted from the flexible design enabling them to select the parts that are relevant for their curricula and integrate them into their teaching.

Use of OpenWASH to date has been partly limited by the scope of the original One WASH pilot and by the constraints of the TVET system and lack of alignment with Ethiopian OS, although this latter problem has been partially resolved with the new OS for Water Supply and Sanitation.

There is considerable scope for expanding the use of OpenWASH by wider dissemination to more colleges and to other potential users. The new module *Count me in!* presents additional opportunities to increase awareness and broaden the impact of OpenWASH by providing new training in the WASH sector, and beyond.

Evidence from this research has been used to support seven recommendations for future actions that are listed below with some suggestions for implementation. Implementation will depend on adequate resourcing although some are easier quick wins and more attainable than others.

These recommendations have been shared with OpenWASH stakeholders including UNICEF Ethiopia, the key strategic partner. It should be noted that some requests from the colleges (Section 6 above), such as additional computers and resources to enable them to set up an e-library, are fundamental to their success and progress but are beyond the scope of this project.

Recommendation 1: Expand use of OpenWASH to other colleges

Water TVET colleges: Of the nine water colleges in Ethiopia only four were involved in the pilot. The other five have learned a little about OpenWASH from EWTI and Jhpiego but this exposure

has been limited and they have not had the benefit of attending an OpenWASH Training of Trainers event. OpenWASH should be promoted in water TVET colleges in Hawassa, SNNPR; Kombolcha, Amhara; Assela, Oromia; Assosa, Benishangul-Gumuz; and Melka Werer, Afar.

Health Science colleges: Only three health colleges were involved in the pilot but there are more than 20 in the country as a whole. Enthusiastic feedback about the value of OpenWASH for their training of environmental health technicians, nurses, midwives and others is evidence of the potential in the health sector. Use of OpenWASH should be encouraged and developed in all Health Science colleges.

Making progress with this recommendation requires support from all key stakeholders and in particular needs engagement and approval by the Federal Ministry and Water, Irrigation and Energy, Federal Ministry of Health and the Federal TVET Agency. As well as appropriate training (see Recommendation 2), resource requirements include all colleges to be provided with soft copy of OpenWASH materials on flashdrive and some hard copies of the six modules printed in colour. It is recommended that colleges are consulted about how many copies they would need.

Recommendation 2: Provide more Training of Trainer events

The need for more training was a clear message from interviewees. Many remarked that one ToT event was not enough and that regular events were needed for new staff and for refresher training. It is recommended that the design of any future ToT events should include pedagogical training as well as briefing on the OpenWASH module contents; greater use could be made of the Trainers' Handbook. Trainers could also be introduced to the new *Count me in!* module and also be encouraged to adapt the modules for community outreach work.

This is linked to Recommendation 1 because expansion to other colleges would naturally require appropriate training for their instructors. ToT events could be delivered by current providers (EWTI and Jhpiego), or by college staff who are already familiar with the OpenWASH modules. WaterAid Ethiopia should also be involved in training associated with *Count me in! Inclusive WASH in Ethiopia*.

Recommendation 3: Clarify links between OpenWASH and Occupational Standards

Introduction of the new OS in 2018 allowed colleges to include some of the OpenWASH material in their teaching but the connections between Units of Competence in the OS and specific study sessions in OpenWASH are not always immediately obvious.

Links could be clarified by mapping OpenWASH module content against the new OS and creating an easy-to-understand reference document for college instructors that identifies which parts of OpenWASH relate to which OS Units of Competence. Mapping could be extended in future if OS developments covered other parts of OpenWASH, for example solid waste management and issues of gender and inclusion. A similar mapping process could be used to clarify which sections of the existing modules are relevant for rural WASH.

This work could be undertaken as desk-based research by a consultant who is familiar with OpenWASH content and with the details of the relevant Occupational Standards. The output would be extremely useful to trainers and could be achieved with relatively low resource input.

Recommendation 4: Promote use of *Count me in! Inclusive WASH in Ethiopia*

The new OpenWASH module was introduced to some WASH sector stakeholders at WaterAid Ethiopia's launch event in January 2019 but not all were present. To support WaterAid Ethiopia in their promotional activities, use of *Count me in!* could be further encouraged in the following ways:

- TVET and HS colleges could incorporate teaching from the module into existing courses or, if new OS were developed, use it as the basis of new courses.
- EWTI (and other training organisations) could use the module for in-service training targeted at current water office and bureau staff to raise their awareness of issues of equity and inclusion and ensure they incorporate this knowledge into their daily practice.
- Organisations involved in WASH could use it for their own staff development e.g. UNICEF, NGOs and others.
- The Federal Ministry of Labour and Social Affairs have responsibility for disability issues and could use the module for training their staff and partners
- Universities and teacher training colleges could be introduced to the module so that awareness of equity and inclusion in WASH becomes embedded in their teaching as well.

Recommendation 5: Organise an OpenWASH publicity event

Awareness of OpenWASH beyond the colleges involved in the pilot is limited. EWTI and Jhpiego had learned of it from informal conversations with friends and colleagues. Even in the pilot colleges, some staff were not aware of the full range of OpenWASH resources and their online availability. It is now nearly three years since the original publication date but not too late to organise an event to bring OpenWASH resources to the attention of the wider WASH sector and stakeholders. To be cost-effective and increase the number of people contacted, the publicity could be linked to an existing WASH event such as the regular Multi Stakeholder Forums.

Recommendation 6: Establish an OpenWASH user network

Several respondents commented on the need for better communications about OpenWASH among current users and within the wider WASH sector. Some excellent examples of innovative and creative teaching using the modules were reported but apparently not shared with others. Current users could share experiences for using the modules and develop best practice for teaching with OpenWASH providing peer support to each other and ideas to new users, both within and across sectors. Nominating an OpenWASH team leader or OpenWASH champion in each college could be encouraged.

The user network could be initiated at a publicity or ToT event and developed and supported afterwards by online forums, email or social media, as appropriate and agreed by the participants.

Recommendation 7: Complete translation work

The modules have already been partially translated into selected Ethiopian languages but some sections are missing. The interviews indicated that translations were not essential but it should be noted that completion could be a relatively small task. Translated modules could be published on the OpenWASH website at no cost and be available for free download. The recommendation

therefore is to assess more precisely how much further work is needed to complete good quality translations and then identify sources of funding for completion of the translation work, especially for the Amharic versions (demand for the other languages needs further investigation). The work to assess the remaining translation requirements would need someone familiar with WASH terminology as well as good language skills.

There are obvious interconnections between some of these seven recommendations and although presented separately here, there are opportunities for combination and integration that could lead to increased cost effectiveness. Given the success demonstrated by this research and the popularity of OpenWASH among users, we are hopeful that the benefits will outweigh the costs and at least some of these potential developments will be implemented.

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Appendix 1 Briefing Note for colleges

Introduction

We are seeking your cooperation for a project to evaluate the use and effectiveness of the OpenWASH modules. You may recall that in October 2016 you received printed copies of the OpenWASH modules for use in your teaching programmes. We would now like to find out more about how the modules have been used and to evaluate the impact of the OpenWASH programme. We would also like to investigate the potential for extending use of the modules in Ethiopia and identify opportunities and constraints for their use in the future.

The principal researcher for this project is Pam Furniss. If you have any questions or concerns about the project at any time, please contact Pam or Ellen Scott (contact details below).

Background

The original OpenWASH learning resources were produced as part of the OneWASH programme in partnership between UNICEF, World Vision Ethiopia (WVE) and The Open University UK. Five Modules and a Trainers' Handbook were published in 2016. The module titles² are:

- *Ethiopia's One WASH National Programme*
- *WASH: Context and Environment*
- *Urban Water Supply*
- *Urban Sanitation and Solid Waste Management*
- *Urban WASH: Working with People.*

For the pilot programme, WVE distributed a small number of copies of the modules, printed in English, to selected TVET and Health Science Colleges in Amhara, Tigray, Oromia and Somali regions. The modules are also available online.

Your college was one of seven that participated in the pilot of the OpenWASH modules. To evaluate the outcomes of the OpenWASH programme, we would like to collect quantitative and qualitative data about use of OpenWASH from you and other users.

Visit and interviews

To gather the information, we would like to visit your college and conduct interviews with staff members.

Date of visit: to be arranged as convenient but a date in late January or February 2019 is proposed.

Duration of visit: estimated to be between 0.5 and 1 day, to be agreed with participants

Personnel to be interviewed: We would like to interview staff members who have direct experience of using OpenWASH modules for teaching. If more than one person, we would interview 2 or 3 together.

Interviewer(s): Interviews will be conducted by Pam Furniss, Academic Director of OpenWASH with support from UNICEF staff. Pam is a Senior Lecturer in Environmental Systems at The Open

² In July 2018, an additional OpenWASH module titled *Count me in! Inclusive WASH in Ethiopia* covering equity and inclusion in WASH was produced in partnership with WaterAid.

University UK. She was leader of the team of 15 Ethiopian WASH expert authors and five Open University academics who designed, developed, wrote and produced the OpenWASH modules.

Interview questions: The semi-structured interview with staff will include questions on:

- Background information: about the college, numbers of students, etc.
- OpenWASH modules: which modules have been used, why, for which of your courses, links to EOS etc.
- Methods of teaching: how have OpenWASH modules been used in lessons.
- Language and delivery: translations, printed or online, number of copies, etc.
- Module content and structure: what works well, what works less well, interest in the new module, etc.
- Your experience of using OpenWASH.

Use of data: The results from the interviews will be collated and used to provide evidence for an evaluation report on OpenWASH. Copies of the evaluation report will be made available to all participants. We plan to use the evaluation report as the basis for publication in an appropriate academic journal.

Informed consent: All individuals who agree to participate in this study will be asked to sign a consent form. Please note that the identity of participants will not be revealed without permission. Any comments from individuals used in the report or articles will be anonymised.

Conclusion

We believe that evaluation of OpenWASH will enable us to identify possible pathways for improvement and ways to extend the use and value of the programme throughout Ethiopia. We would be very grateful if you would agree to participate in this study so that your experiences as pioneers can bring benefits to others.

December 2018

(This research project has been reviewed by, and received a favourable opinion, from The Open University Human Research Ethics Committee - HREC reference number: 3090.)

Appendix 2 Interview questions

	<i>Questions for colleges</i>	<i>Questions for other users</i>
	<i>Section 1: Background information</i>	<i>Section 1: Background information</i>
1	Name of college	Name of organisation
2	Your name(s) and position(s)	Your name(s) and position(s)
3	Did you attend the OpenWASH ToT workshop held in Saro Maya Hotel, Addis Ababa in July 2016?	What training does your organisation provide? Number and types of courses.
4	How many students currently attend your college (all subjects)?	Who is the training designed for?
5	How many students are currently studying subjects related to water, sanitation and hygiene (WASH)? (and at what level)	How many training courses do you run (all subjects)?
6	How many students are you expecting to study WASH subjects in the next academic year?	How many people have taken your training courses in the past year (all subjects)?
7	How many teaching staff are there at your college (all subjects)?	How many people are you expecting to train with you in the coming year (all subjects)?
8	How many staff teach WASH subjects in your college?	How many staff teach WASH subjects in your organisation?
	<i>Section 2: Using OpenWASH modules</i>	<i>Section 2: Using OpenWASH modules</i>
9	Which of the OW modules have you used? 1 Ethiopia's One WASH National Programme 2 WASH: Context and Environment 3 Urban Water Supply 4 Urban Sanitation and Solid Waste Management 5 Urban WASH: Working with People.	Which of the OW modules have you used? 1 Ethiopia's One WASH National Programme 2 WASH: Context and Environment 3 Urban Water Supply 4 Urban Sanitation and Solid Waste Management 5 Urban WASH: Working with People.
10	Have you used the whole module or selected study sessions (SS)? Which SS? Why did you choose that module/those SS?	Have you used the whole module or selected study sessions (SS)? Which SS? Why did you choose that module/those SS?
11	In what type of course/training have you used the OpenWASH modules? e.g. for courses linked to EOS (specify which EOS); level; optional additional training for senior students etc.	In what type of course/training have you used the OpenWASH modules? e.g. for courses linked to EOS (specify which EOS); level; optional additional training for senior students etc.
12	How many students have already been taught using the modules? (numbers per term/year/course) And how many planned for next academic year?	How many trainees have already been taught using the OW modules? (numbers per term/year/course) And how many planned for next academic year?
13	Are you planning to use any other module in future? Or SS? If yes, which? And why?	Are you planning to use any other module in future? Or SS? If yes, which? And why?

14	Would you be interested in using the new <i>Count me in!</i> module in your teaching? Why/why not?	Would you be interested in using the new <i>Count me in!</i> module in your training? Why/why not?
	<i>Section 3: Methods of teaching</i>	<i>Section 3: Methods of teaching</i>
15	Describe the way you use the modules e.g. how long is one lesson? do you use one SS per lesson?	Describe the way you use the modules e.g. how long is one lesson? do you use one SS per lesson?
16	Do you give photocopied handouts to students? Use powerpoint slides?	Do you give photocopied handouts to trainees? Use powerpoint slides?
17	Do you have to translate the module contents into [local language] so students can understand?	Do you have to translate the module contents into [local language] so trainees can understand?
18	If you had more printed copies (in English), would you give them out to students? If yes, to use/return each lesson OR keep for the duration of the course OR keep for ever? How many copies would you need?	If you had more printed copies (in English), would you give them out to trainees? If yes, to use/return each lesson OR keep for the duration of the course OR keep for ever? How many copies would you need?
19	If you had printed copies in [local language], would you give them out to students? If yes, to use/return each lesson OR keep for the duration of the course OR keep for ever? How many copies would you need?	If you had printed copies in [local language], would you give them out to trainees? If yes, to use/return each lesson OR keep for the duration of the course OR keep for ever? How many copies would you need?
20	Do you combine module teaching with practical work/group activities? If yes, what/how?	Do you combine module training with practical work/group activities? If yes, what/how?
21	Have you devised your own assessment questions or tasks based on OpenWASH material? If yes, what?	Have you devised your own assessment questions or tasks based on OpenWASH material? If yes, what?
22	Have you used the Trainers' Handbook to help with lesson planning? How/why not?	Have you used the Trainers' Handbook to help with lesson planning? How/why not?
23	Do you use the online versions of the modules? Do students use the online versions?	Do you use the online versions of the modules? Do trainees use the online versions?
	<i>Section 4: Your experience of OpenWASH</i>	<i>Section 4: Your experience of OpenWASH</i>
24	What do you like about the OW modules? What aspects work well for you? For example <ul style="list-style-type: none"> • relevant for Ethiopia • coverage and integration of topics (w, s and h) • fill a gap in our curriculum • well-written with clear descriptions • consistent study session structure • in-text questions and SAQs • interesting for students Any other good points?	What do you like about the OW modules? What aspects work well for you? For example <ul style="list-style-type: none"> • relevant for Ethiopia • coverage and integration of topics (w, s and h) • fill a gap in our curriculum • well-written with clear descriptions • consistent study session structure • in-text questions and SAQs • interesting for students Any other good points?
25	Do you have any problems with the modules? Reasons for not using them? (Consider each of the 5 modules.) For example	Do you have any problems with the modules? Reasons for not using them? (Consider each of the 5 modules.) For example

	<ul style="list-style-type: none"> • not relevant to subjects we teach • do not correspond to Ethiopian OS • out of date • too long/too much reading • not available in our local language • not enough printed copies • students cannot access online versions <p>Any other problems?</p>	<ul style="list-style-type: none"> • not relevant to subjects we teach • do not correspond to Ethiopian OS • out of date • too long/too much reading • not available in our local language • not enough printed copies • trainees cannot access online versions <p>Any other problems?</p>
26	<p>Can you think of ways to improve your experience of using OpenWASH? Is there anything that would make it easier for you to use the modules?</p>	<p>Can you think of ways to improve your experience of using OpenWASH? Is there anything that would make it easier for you to use the modules?</p>
27	<p>Can you think of ways to improve the learning experience of students using OpenWASH?</p>	<p>Can you think of ways to improve the learning experience of trainees using OpenWASH?</p>
28	<p>Do you get feedback from your students? Do they enjoy using the OpenWASH modules?</p>	<p>Do you get feedback from your trainees? Do they enjoy using the OpenWASH modules?</p>
29	<p>Are you able to track what happens to your students after they leave? eg what jobs they get.</p>	<p>Are you able to track what happens to your trainees after the training? eg what jobs/promotion they get.</p>
30	<p>Any other comments or suggestions or questions on any aspect of OW?</p>	<p>Any other comments or suggestions or questions on any aspect of OW?</p>