Visit report for eSTEeM

OpenWASH evaluation and development:
Ethiopia and Uganda, June 2017

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Executive Summary

This report describes a visit to Ethiopia and Uganda, 18-29 June 2017, to evaluate progress in the use of OpenWASH modules and explore opportunities for further developments. The visit was undertaken by Pam Furniss, Senior Lecturer in Environmental Systems, STEM Faculty, supported by eSTEeM and Ellen Scott, Senior Project Manager in the International Development Office.

In Ethiopia, as part of the original One WASH Plus programme with UNICEF and World Vision, the modules have been used at pilot scale in colleges in four regions. The number of students participating in the pilots has trebled in the past six months. The modules have also been used for in-service training of WASH professionals.

The process of developing new Occupational Standards (OS) that are linked to the OpenWASH modules has started. Expansion in colleges will become possible once these OS are approved. This will be further aided by the availability of the translated local language versions. Although only selected parts have been used so far, feedback on the module content is extremely positive both in terms of quality and relevance for meeting capacity building needs. Some systematic research to assess the effectiveness of the modules would be valuable.

More work is needed to increase the number of printed copies of the modules available to colleges and other users. Other opportunities for further activity in Ethiopia are also identified.

In Uganda, our visit was hosted by WaterAid. The proposal to adapt the OpenWASH modules for Uganda was welcomed by the key stakeholders, notably the Ministry for Water and Environment. The next steps are to sign a MoU and develop a proposal and funding bid. The first phase will be adaptation of selected priority areas from the existing modules.

Overall, the visit was extremely positive and several opportunities for further work were identified. The challenge now is to develop bids that will appeal to funders.

1 Introduction

The production of the OpenWASH learning resources was completed in early 2016. Since that time the modules have been used in Ethiopia both within the remit of the original project and by other users. We have also received expressions of interest in adapting the modules for other countries, of which Uganda has greatest potential. Ellen Scott (Senior Project Manager, OU International Development Office) and I visited Ethiopia (19th to 23rd June) and Uganda (24th to 30th June) to learn more about how the OpenWASH modules are being used and could be used in future.

The purpose of the visit was:

- in Ethiopia, to evaluate progress with OpenWASH implementation, identify impacts and explore opportunities for wider use and development of OpenWASH resources
- in Uganda, to develop the proposal for OpenWASH resources to be used by the new national Water Resources Institute.

This is a report of discussions with project partners, OpenWASH users and other stakeholders during our trip. It starts with a brief summary of the OpenWASH project to date and then divides into two main sections for Ethiopia and Uganda, each with their own conclusions and suggestions for further developments. The report ends with a brief overall conclusion. The complete list of meetings is included as Appendix 1.

2 Background

OpenWASH began in 2011 as an eSTEeM project to explore the potential for water, sanitation and hygiene (WASH) education and training using distance learning techniques at a global scale. The initial proposal was adapted to suit a call to support WASH capacity building in Ethiopia as part of a DfID-funded, UNICEF-led programme called One WASH Plus. In September 2014, we entered into a partnership agreement with UNICEF and World Vision Ethiopia. The OU component of the One WASH Plus programme received funding of over $600,000 to produce five modules and a Trainers' Handbook. The primary purpose of the modules was to support curriculum development and delivery in under-staffed and under-resourced Technical Vocational Education and Training (TVET) Colleges in Ethiopia.

The five modules were written by an authoring team of 15 Ethiopian WASH experts and five members of Open University academic staff, with project management and support from the International Development Office, and production by LTS Corporate. The modules were completed and approved by Ethiopian Federal Ministries by January 2016 and published online as Open Educational Resources in April 2016.

The One WASH Plus programme has a specific focus on small towns and takes an innovative integrated approach to WASH service delivery. The wider programme includes construction of new water and sanitation infrastructure, development of management and institutional arrangements, and seeks to influence policy and support capacity development locally and nationally (IRC, 2017)[1].

[1] IRC (2017) WASH services in small towns: Midline report for quasi-randomised control trial to assess impacts of the ONEWASH Plus programme. https://www.ircwash.org/resources/wash-services-small-towns-mid-line-report-quasi-randomised-control-trial-assess-impacts (accessed 10 July 2017)

Eight small towns in four Ethiopian regions (Amhara, Tigray, Oromia and Somali) were selected for the first phase of the One WASH Plus programme. These have been the focus for new water supply and sanitation systems.

The urban focus of One WASH Plus is reflected in the OpenWASH module content. The module titles are:

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.

The modules are supported by the OpenWASH Trainers' Handbook which provides guidance on use of the modules in a variety of teaching and learning contexts.

3 Ethiopia

Prior to our visit, meetings had been arranged with our original project partners, UNICEF and WVE, with the Ethiopia Water Technology Institute (EWTI) and with other key stakeholders. Further meetings were arranged during the visit in response to suggestions (see Appendix 1). The following sections focus primarily on the discussions with current and potential users of the OpenWASH modules.

3.1 Pilot implementation in TVET and Health Science Colleges

In the partnership agreement with UNICEF and World Vision Ethiopia (WVE), responsibility for implementation of the OpenWASH modules lay with WVE. This involved piloting in selected TVET and Health Science (HS) Colleges in the four regions of One WASH Plus. It is worth noting that, although in the same regions, the colleges are not located in the eight small towns.

In July 2016, WVE conducted a week-long Training of Trainers' (ToT) workshop, provided by a consortium of five of the original OpenWASH authors. This was attended by 21 members of staff from eight TVET and HS Colleges.

OpenWASH budget plans included provision for translation of the modules into the four relevant regional Ethiopian languages and printing of the modules in both English and local languages. Ideally each student would have a full set of modules but budget constraints within the pilot meant this was not possible. In practice, only 14 sets of the modules, printed in English, have been distributed to each of the selected colleges.

We were aware, before our visit, that translation had been delayed. (Subsequently, we have learned that translation into the four languages was completed in July 2017 but there is no budget left for printing.) We were also aware, and had been since the outset, that the introduction of new curriculum into colleges is closely linked to defined employment opportunities and regulated by the system of Ethiopian Occupational Standards (OS) and the Federal TVET Agency. Colleges are required to teach to meet the competencies defined by OS but there were no existing OS directly relevant to the integrated and innovative content of the OpenWASH modules.

In spite of these constraints, a programme of pilot implementation started in the autumn of 2016. The colleges and number of students involved are shown in Table 1. We were told that implementation in the Health Science colleges had not yet started because 'the existing curriculum was under revision by the Federal TVET Agency'.

Table 1 Reported student numbers in TVET and Health Science Colleges, ***January 2017***

Region	**College**	**No. of students involved so far**			**No. of students planned for January 2017**		
		Male	Female	Total	Male	Female	Total
Amhara	Bahir Dar Poly Technic College	115	226	341			
	Bahir Dar Health Science College	not yet started					
Tigray	Maychew Water & Sanitation College	18	19	37			
	Dr Tewolde Health Science College	not yet started					
Oromia	Woliso Poly Technic College				61	67	128
	Shashemene Health Science College	not yet started					
Somali	Jijiga Poly Technic College				112	100	212
	Jijiga Health Science College	not yet started					
		Total involved		**378**	**Total planned**		**340**

Table 2 has the latest data and shows that by July 2017, the numbers of students who had been involved in training had almost trebled with a further cohort planned for the start of the next academic year in September.

Table 2 Reported student numbers in TVET and Health Science Colleges, ***July 2017***

Region	**College**	**No. of students involved so far**			**No. of students planned for September 2017**		
		Male	Female	Total	Male	Female	Total
Amhara	Bahir Dar Poly Technic College	210	268	478			
	Bahir Dar Health Science College	14	86	100			
Tigray	Maychew Water & Sanitation College	18	19	37			
	Dr Tewolde Health Science College	not yet started					
Oromia	Woliso Poly Technic College	41	39	80			500
	Shashemene Health Science College	not yet started					
Somali	Jijiga Poly Technic College	211	199	410	112	100	212
	Jijiga Health Science College	not yet started					
		Total involved		**1105**	**Total planned**		**712**

3.2 Woliso Poly Technic College

The distance to most colleges was too great for travel within the limited time available during our trip but we were able to visit Woliso Poly Technic College, about 110 km from Addis Ababa, in Oromia Region.

Mesay Aklilu (lead trainer) and Fantu Shitaye (Vice Dean) reported:

- Three trainers (from staff of 15) attended the ToT event in Addis in July 2016. They were provided with soft copies of the five modules and Trainers' Handbook. Following the training, they prepared an Action Plan for implementation in their college.
- The Trainers' Handbook had been useful for guidance on methods and for planning content and assessment.
- The college had only 14 hard copies of each module, supplied by WVE. These were kept in the library and available for reference only (Figure 1). Trainers can 'book out' the modules but students can only read in situ.

Figure 1 OpenWASH modules in Woliso Poly Technic College library

- The first phase of training had used two of the modules: *Ethiopia's One WASH National Programme* and *Urban Water Supply*, selected as the most relevant to their needs. Trainers selected five Study Sessions (SS) from each of these two modules. They prepared student handouts and PowerPoint slides based on module content including SAQs and Answers. Their learning design also used group discussions and home assignments.
- Training on these ten SS took place over a three-week period from January 6th to 30th 2017. Five members of staff were involved - the three who had received training and also the Dean and Vice Dean.
- Planned numbers of 128 students (see Table 1) had been reduced to 80 because some had found jobs or had other training. The students were Levels 2- 4 i.e. more senior, and had volunteered for the additional OpenWASH classes.
- Teaching had been in English; the translated versions in Oromiffa language are needed and will aid understanding.
- Feedback on module content was very positive. They were pleased to have been included in the pilot and enthusiastic about incorporating OpenWASH into their curriculum.
- Their existing curriculum focused on water supply only; they recognised gaps that OpenWASH could fill e.g. sanitation.
- Plans for phase 2 in the coming academic year (2017/18) are currently being developed (copy of the Action Plan will be sent to us). They intend to:
  - Provide OpenWASH training for the other 12 staff trainers
  - Roll out OpenWASH to new intake (approx. 400 new WASH students per year)
  - Provide training to ex-students / graduates.

- The college was desperately short of equipment e.g. photocopiers, printers, as well as other resources.

Short courses (2-3 months)/ CPD /'on the job training' for professionals were suggested. TVETCs see this as part of their mission to address skills gap but financially it is a challenge e.g. no funding and uncertainty who would pay. Certification would be expected.

3.2.1 Feedback from Woliso students

We also met seven of the students who had volunteered for the phase 1 OpenWASH training (Figure 2). Age range: 18-22. They were unsure of future employment but their aspirations included such roles as water supply technician, lecturer in water, water distribution, irrigation development, staff of regional or woreda water offices.

They said the OpenWASH materials were interesting and they had enjoyed their studies (though possibly unlikely they'd say otherwise under the circumstances). They were eager for more training with OpenWASH and more at higher level to equip them with specific skills e.g. to calculate sewer capacity/pump capacity. They wanted practical/field work to accompany the theoretical knowledge. They also asked for a certificate of completion as evidence of their studies, which perhaps the college, with WVE, could provide.

Their wish for higher level training was not surprising but is beyond the scope of OpenWASH which is expressly designed to provide foundation level knowledge and skills that can be built on with additional training to support specific occupations. The college commented that when Occupational Standards based on the modules have been approved (see Section 3.5), then they will be able to provide the practical training/demonstrations to accompany the modules.

Figure 2 OpenWASH students, Woliso Poly technic College

3.3 Ethiopian Water Technology Institute (EWTI)

EWTI are the named education and training provider for the Ethiopian OneWASH National Programme and have been allocated a significant part of the training budget. They were not involved in the original OpenWASH project but attended the Validation Workshop in October 2015 where they expressed interest in using the modules.

We heard from Zewdu Assefa, Education and Training Director, (Figure 3, on the right) in early 2017 that they had recently completed a first cycle of training using the OpenWASH modules.

Figure 3 Ethiopian Water Technology Institute

EWTI was established three years ago as an autonomous organisation under MoWIE. They receive government funding as part of the OWNP and some funding for TVET support from OneWASH. They have 150 employees and currently run 13 courses, provided on demand, to fill skills gaps of water professionals. The training is free. Participants receive a Certificate of Completion.

EWTI's mission is:
'To realize nationwide rapid development in the water sector through capacity building, research and study for technology transfer, specialized laboratory and competence service that improve the sector's overall implementation capacity.'

Their mandate is to provide:
1) training - currently just provide short term training but have a plan to deliver diplomas and degrees.

2) research - they currently have limited research experience among EWTI staff and are looking to build partnerships to improve this.

3) specialised lab service. Currently some water testing is carried out in Ethiopia but facilities do not exist for all tests. They plan to build a new specialized lab facility in 2-3 years and also need capacity development for water analysis.

4) support for TVET water colleges (9 water colleges out of total 250 public TVET colleges).

They have incorporated OpenWASH into their training schedule and reported the following:

- So far, they have used only Module 4 *Urban sanitation and solid waste management*, selected in response to requests from the sector for training in sanitation and solid waste management. The latter is getting increasing attention due to impacts of solid waste e.g. on rivers, flooding, health.

- They used all of M4 but divided into 2 groups: 1) liquid waste (sanitation) and 2) solid waste management (SWM). They used SS 1-3 for both then split the middle ones SS 4-6 liquid waste and SS 7-11 SWM, then both groups used the final SS 12-15.
- Used the SS to create their own PowerPoints. Each trainee had their own bound photocopy (B&W) of all of M4 to keep. Downloaded from OU website.
- Training courses had run twice in Addis in past 6 months with 15 and 20 trainees respectively. Face-to-face training over 3 days for 6 SS at 5 hours a day (15 hours for 6 SS) including peer to peer learning, group discussions, presentations.
- Trainees were experienced WASH staff from several regions (Oromia, Amhara, Tigray) who had practical experience but lacked theoretical background. For SWM they were from municipalities e.g. staff of Addis Ababa Solid Waste Management Agency who operate new sanitary landfill, with leachate treatment.
- EWTI's teaching model included reporting back from trainees, recap on each day in their own words, and opportunities to present their own experiences to the group. The second round of training also included visits to water/waste treatment and landfill sites.
- They had also incorporated videos, suggested by trainees, mostly from YouTube e.g. US examples of garbage trucks. EWTI plan to include these added experiences into their future training.
- Training courses had scored highly on feedback forms from trainees.
- EWTI had not been invited to the ToT event in July 2016 as the focus of that training had been for TVETC staff. They had developed their own plans using the materials downloaded from the OU website. They had downloaded 4 of the 5 modules but had overlooked the Trainers' Handbook and Module 2 *WASH: Context and environment*.

EWTI staff identified a number of gaps in the resources/curriculum available to them some of which are beyond the scope of OpenWASH but others may be available in existing OU materials or could be considered for future developments (see Section 3.8). Gaps identified were:

- Operation sheets i.e. design and build details e.g. for septic tank, water lines, sewage conveyance, soakaway pit, oxidation ponds etc.
- Practical/fieldwork to complement the modules.
- Schematic diagram of wastewater treatment from start to finish
- Lab procedures (low tech) for water and wastewater analysis: physical, biological and chemical e.g. BOD and COD
- Table of different types of industrial waste
- Assessment procedures for sanitation condition
- Software tools (on CD) for management decision making for liquid and solid waste management
- Staff training on research methods.

3.4 Jhpiego

Jhpiego, a US-based NGO, are part of an ongoing (2016-2021) US Aid-funded project called Growth through Nutrition, led by Save the Children. This is a multi-sectoral nutrition and WASH project designed to improve maternal and child nutrition. Jhpiego's role in the project is capacity building to

strengthen nutrition and WASH pre-service education. They are supporting several TVETCs, universities and health and agricultural colleges in four regions (Amhara, Tigray, Oromia and SNNPR).

In March 2017 they undertook a baseline survey of trainers' skills in health, water and agriculture colleges which identified that WASH was lacking from the TVET curriculum. (Their baseline report is not yet completed.)

They are working with EWTI and trying to encourage them to have one strong central resource of materials from which they can train different audiences. However they themselves are also providing training for TVET trainers.

They have used OpenWASH in combination with other resources for a 5-day training course. The first training with 24 participants was at Shashemene in May and the second, with 21, was in progress in Awassa. The lead trainer was therefore out of the office but we hope to get feedback on their use of OpenWASH soon. They are planning more courses in future.

The TVETCs involved to date include Woliso, Bahir Dar, Maychew, Shashemene and Hawassa. The first four of these are also involved in the OneWASH programme (see Tables 1 and 2). Some staff had apparently been on both the WVE ToT and the Jhpiego training.

Their model is to customise training from a range of resources of which OpenWASH is just one component. At present they have mostly used Module 1 and may use other modules in future.

They also identified lab skills for water analysis as a gap to be filled. This had emerged from a competency baseline survey of TVETCs completed at the end of May.

There is no evident career path yet for WASH (or nutrition). It was suggested that MoWIE should take the initiative on job creation/development.

3.5 Occupational Standards

Mesay Aklilu, lead trainer at Woliso Poly Technic College, reported on ongoing discussions at national level about development of Occupational Standards (OS) linked to the OpenWASH modules. The consultation committee has approximately 50 members: four from TVETCs including himself for Woliso and representatives from colleges in Hawassa (SNNPR), Maychew (Tigray) and Assela (Oromia); Jhpiego and other NGOs; MoWIE; EWTI; Ethiopia Water Construction Enterprise; Design and Construction Enterprise and the Federal TVET Agency, who are responsible for OS approval.

TVETCs are pushing for a new national model curriculum. Mesay reported that Module 1, *Ethiopia's OneWASH National Programme* (all 15 sessions) has already been included in the new OS. In future they will try to integrate all the other OpenWASH modules into the OS with one Unit of Competency for each module. He said OpenWASH is a 'great success' at national level and the content is 'very important'.

Development of OS and Units of Competence and the current revision by the Federal TVET Agency were also mentioned in other conversations. At Jhpiego we heard that two Units of Competence (at Level 2 and Level 3) have been written and that previously separate water divisions (supply, treatment, distribution) have now been brought together and renamed as WASH.

As yet it's been difficult to get further details about the OS but we are pursuing and hope these will arrive soon.

3.6 OpenWASH future users and other stakeholders

Sam Godfrey, UNICEF WASH Chief, reported that he intended to use the modules at a regional UNICEF staff development event in October 2017 to be attended by 21 WASH Chiefs of countries in UNICEF's East and South Africa Region. The aim is to raise awareness among colleagues of urban WASH issues. He is planning to use the Ethiopia versions but was interested in the prospect of a country-neutral version that could be adapted for any country.

WaterAid were not part of the original project however Bethlehem Mengistu, Country Director, saw the potential for using the modules. We also discussed the possibility of creating a new module on Equity and Inclusion, based on existing WaterAid training materials, which had been part of the original 2012 OpenWASH plan. Discussions are ongoing.

Abera Endeshaw (OpenWASH author and co-ordinator of ToT and translation) reported that at the recent Multi-Stakeholder Forum (MSF) he had brought OpenWASH to the attention of Ethiopian WASH stakeholders. MSF is an annual national WASH event at which priorities are set for the WASH sector. Abera also expressed the view that environmental issues more generally were a coming trend so Module 2 *WASH: Context and environment* will become increasingly relevant.

We also had informative discussions with other stakeholders (see Appendix 1) about the current circumstances in Ethiopia and the opportunities and constraints for OpenWASH.

3.7 Conclusions from Ethiopia

1. We were pleased to learn of growing numbers of students in TVETCs and HSCs using the modules as part of the pilot implementation of the original programme. The visit to Woliso and discussions with staff and students were very positive and informative. If possible, we would like to be able to gather data from all the colleges about their use of the modules and undertake some systematic evaluation among staff and students.
2. It was also good to hear from EWTI about their in-service training of WASH professionals. This was outside the original OneWASH plus programme although use for CPD was always part of our plan. We had previously been unaware that Jhpiego had also used the modules for TVET training so that was welcome news. Overall, the number of people who have used the modules so far is small but is growing, which is encouraging. Some systematic evaluation of OpenWASH from the experiences of these other users would also be valuable.
3. Overall, feedback on module content was very positive, which was gratifying. Some additional material and gaps were identified with potential for adapting existing modules or creating new ones based on the same model. These are recorded in Section 3.8.
4. Although we were aware that the budget for printing had always been limited, it was very disappointing to learn that so few copies had been printed in English and that there was no budget for printing in local languages. The translated versions will be made available on the OU's OpenLearn website but online-only versions places restrictions on their use.

   The modules are designed and written with the premise that students will have their own copy, printed in colour, and it is a considerable constraint on their value as learning resources if this is not possible. Provision of adequate numbers of printed copies is vital for the colleges which have limited resources and unreliable access to the internet.

5. News that Occupational Standards directly linked to the modules were under development was extremely good news. We were always aware that approved OS were essential for adoption into the TVET curriculum so this is a critical hurdle to overcome if the modules are to be used more widely in Ethiopia. We have so far been unsuccessful in finding out details of the OS but hope that further information will soon be available.

6. OpenWASH is part of the overall One WASH Plus programme but we recognise that it is an adjunct to the core activities and is different in a number of ways. Geographically, the colleges where OpenWASH modules are being piloted are not in the eight towns of One WASH Plus and therefore separated from the main locations. Other components of One WASH Plus, in particular the infrastructure development and provision of new WASH services, understandably have high priority and are also easier to assess. It is unfortunate that OpenWASH has not been included in the overall monitoring and evaluation of the programme. However, we recognise that evaluating the impact of education and training is very difficult because the benefits will only be realised at some unknown future time when the effect of better knowledge and skills of WASH workers begins to make a difference to project success and sustainability.

7. To date, as far as we are aware, use of the OpenWASH modules has been limited to parts of Modules 1 (Woliso and Jhpiego), 3 (Woliso) and 4 (EWTI). It is good to see this flexible and adaptive use of the modules and the limited use is understandable given current, acknowledged constraints (e.g. lack of OS specification) but obviously use of the full OpenWASH curriculum is desirable.

8. The duration of study time appears to be significantly greater than the notional 2 hours per study session for independent study that was envisaged. It was not possible to investigate the reasons for this but it could be a consequence of the adaptation of the modules for face-to-face teaching and inclusion of additional activities such as group discussions. Another likely cause is the necessity of teaching only in English and it will be interesting to monitor changes in practice once the translated versions are available.

9. EWTI have a key role to play and we would like to support them in their endeavour to provide appropriate WASH training and education across the sector. They have an important continuing role in training staff from TVET and HS colleges as well as providing in-service training and updating for WASH sector staff. It is more efficient for them to provide centralised training for colleges throughout Ethiopia than separate training for individual colleges. EWTI were not included in the initial ToT and it would be helpful if they were invited to any repeat events, if these take place in future.

10. Although there was some evidence of use of OpenWASH outside the One WASH Plus programme (e.g. Jhpiego), we were told by several people that awareness among stakeholders outside the programme is limited. For example, we were told there is a general lack of awareness of OpenWASH in the regions, e.g. bureaus of water, health, education. Investment in OpenWASH was worthwhile because of its potential for wider use not just in the eight towns in four regions but for colleges and other users throughout Ethiopia. The challenge for the future is to reach these other potential users.

11. The end of the One WASH Plus programme is approaching and it will be complete by the end of 2018. The future life of OpenWASH and any associated developments from it will depend on continuing management and promotion within Ethiopia. The mechanisms and process for this are not yet clear but the view was expressed to us that UNICEF have a key role to play.
12. The plan to use OpenWASH at a workshop for UNICEF WASH chiefs from Eastern and Southern Africa was extremely good news. This will bring OpenWASH to the attention of influential people in countries where we are hoping to promote the adaptation of OpenWASH - see Uganda section below.
13. The idea of a sector-wide approach and 'one family of WASH' is not yet fully embedded across Ethiopian institutions. For example, solid waste management is not 'owned' by any sector and there is a persistent belief that sanitation is part of health and not related to water. As integration of WASH is a central principle of OpenWASH, we believe that adoption of OpenWASH could encourage better coordination within the sector. Sharing experiences of using the OpenWASH modules among training providers, pooling of resources and better co-ordination would be beneficial and could contribute to development of communities of practice.
14. There is a widely-held assumption that training can only be provided by face-to-face teaching. The idea of independent self-managed study and/or supported distance learning is not generally recognised as a feasible model for learning. This could limit some potential uses of the modules.
15. Looking ahead, there was perceived uncertainty about the future following the Brexit decision and US election, and the associated threat of loss of international aid. The effect of these two events could inhibit decision making and commitments to future funding.

3.8 Potential further developments and next steps (Ethiopia)

As a result of the discussions during our visit, several opportunities for further work present themselves. Some are directly related to extending the use of the existing modules, some are suggestions for adapting or enhancing the module materials and others are proposals for new materials to fill identified gaps. These would all require additional resources - both financial and human - but the size and scale of the proposals varies considerably.

Feasibility assessment, budget setting and fund raising for these proposals is the next phase of the project.

3.8.1 Printing the modules in English and local languages

Providing print copies is the first priority for additional resources and a clear focus for fund raising. The value of the modules is severely compromised by the lack of printed copies. Furthermore, the considerable cost and effort of the translation process cannot be justified if print copies are not available. The print run numbers required in each language will need to be determined and facilities for storage and distribution taken into account, both now and into the future. The need for print copies and fundraising effort will be discussed with original partners UNICEF and World Vision.

3.8.2 Monitoring and evaluation of OpenWASH

Several of the Conclusions above point to the need for some systematic monitoring and evaluation of the OpenWASH resources. This would involve all the TVET and HS colleges participating in the pilot as well as other users. Research questions to be addressed would be linked to pedagogic methods, responses from staff and students, as well as future employment prospects etc. There may be potential to develop a research proposal in collaboration with EWTI, which would also contribute to their staff development needs in research methodology.

3.8.3 Promotional activities

Another recurring theme from our discussions was the need to raise awareness of OpenWASH throughout the WASH sector. Ethiopia has nine regions and only four are involved in the pilot plus there are many other potential users. An awareness programme could involve:

- Promotional event with UNICEF in 2018 (linked to the One WASH Plus programme)
- Presentation of sets of printed modules to regional bureaus, as part of the event.
- Presentation of sets of printed modules to other TVET and HS colleges, universities etc.
- Provide tablets or memory sticks with pre-loaded copies of the OpenWASH modules as promotional materials (avoids the problems of internet access).
- Ensure links to OpenWASH are included on relevant Ethiopian websites.
- Maintain network of contacts including OpenWASH author team and keep up to date with progress and developments in use of OpenWASH.

3.8.4 Reconfigure existing OpenWASH content

This group of proposals are alternative ways of presenting the existing material to facilitate use of the modules for specific audiences and purposes outside the original project:

- ***Emergency WASH:*** Emergency situations e.g. recent drought in Ethiopia, are very high on national and international agendas. Emergencies are covered by several SS across the OpenWASH modules. These could be brought together with some top and tail material to create a short module on Emergency WASH.
- ***Rural WASH Guidance Note***: OpenWASH has an urban focus because this was the priority for One WASH Plus but much of the content of the modules is equally relevant to rural areas. Several correspondents commented that the vast majority of Ethiopians still live in rural areas so the need for learning resources with relevance to rural settings was just as great as urban. The Guidance Note would be an additional resource for trainers that directed them to the Study Sessions most relevant to rural WASH.
- ***Continuing Professional Development (CPD) Guidance Note:*** Based on the existing short section in the Trainers' Handbook, this Guidance Note would provide a more detailed model for CPD training that could be further developed by TVETCs for short in-service training courses for WASH sector employees, both public and private.

3.8.5 Additional resources to enhance existing OpenWASH content

These are suggestions for materials and resources that would provide enrichment for the existing modules and extend the learning outcomes:

- ***Video recommendations:*** Compile a list of links that could be used to support teaching of existing modules/selected study sessions. Using existing OU AV resources and videos available on YouTube.
- ***Practical activities/ fieldwork recommendations:*** suggestions for activities, to be adapted by users for their local contexts, that could complement existing modules/selected study sessions.
- ***Wastewater treatment schematic diagram***: may already exist within OU module materials or be available free online. Could be provided as an additional online resource.
- ***Industrial waste types and characteristics*** (data table): may already exist within OU module materials or be available free online. Could be provided as an additional online resource.

3.8.6 New material developed using OpenWASH template

These are suggested topics for new modules. Note they are not necessarily the same size (15 SS) as the existing modules; some would be considerably shorter. Development of these proposals would involve in-country experts working with us to develop module content.

- ***Laboratory procedures module***: covering general lab skills and water and wastewater analytical techniques using low-tech equipment. Using existing published guidelines for tests (physical, chemical and microbiological) e.g. TDS, BOD, COD, MPN. Possibly with OpenSTEM lab?
- ***Research methods module***: introductory level including need for evidence-based research. Possible adaptation of existing OU material.
- ***Faecal sludge management (urban):*** high priority in urban WASH and is covered briefly in Module 4 but could be expanded with additional Study Session(s).
- ***Equity and inclusion module***: potential for partnership with WaterAid to adapt their existing online training for staff into an OpenWASH-style module, designed for print to increase accessibility.

3.8.7 Module updating

Inevitably, over time, some content of the modules will need updating. It would be possible to undertake a scoping exercise to identify sections vulnerable to dating problems and produce amended sections as required and/or produce new editions of the modules. This is a longer term proposition.

4 Uganda

Adapting OpenWASH resources for use in countries other than Ethiopia has been a longstanding aim for the project. The basic curriculum for WASH training and education that forms the core of the modules is relevant in many parts of the world. Adaptation would require removal of the Ethiopian context, examples and references and replacing it with similar material relevant to other countries. The first phase is extracting Ethiopia from the modules to create a country-neutral spine and the second phase, involving in-country partners, is to put new flesh back on the bones.

We have been in discussion with WaterAid Uganda since last autumn about the possibility of using OpenWASH resources in support of the new Water Resources Institute (WRI). The institute is a government-led initiative, opening in July 2017, that aims to improve education and training at all levels of the WASH sector. WRI has premises in Entebbe with space for training but as yet has no staff. WaterAid are one of several partner organisations working with government departments to get the WRI off the ground.

We are very grateful to Francis Musinguzi (WaterAid Country Director) and Spera Atuhairwe (Head of Strategic Partnerships) who kindly hosted our visit (Figure 4). We started with a presentation to 17 members of WaterAid Uganda staff and continued with meetings with key stakeholders in the WASH sector (see Appendix 1). The purpose was partly fact-finding, to learn more about their roles and the needs and priorities in the sector, and partly to introduce them to OpenWASH and assess their opinion of its potential for Uganda. We were also looking to identify potential contributors for the revised modules. In addition to the presentation, we provided a briefing note that explained the purpose of our visit and shared a few examples of study sessions that were annotated to indicate where Ethiopian content could be removed and replaced with equivalent Ugandan material.

Figure 4 With Francis Musinguzi and Spera Atuhairwe, WaterAid Uganda

4.1 Ministry of Water and Environment (MWE)

Key leaders and decision makers from the Ministry including Aaron Kabirizi (Director of Water Development) and Callist Tindimugaya (Commissioner Planning and Regulation) were present to learn more about The Open University and our development work and specifically about OpenWASH

and the proposed adaptation for Uganda. Their response was extremely positive and there was general support for the proposal. Points made included:

- OpenWASH offers a 'quick-win' for resourcing the new institute.
- The modules already exist therefore development costs will be considerably less than for new resources.
- Rural WASH is also very important. Despite the urban focus, much of the OpenWASH module content is also relevant to rural areas and/or can be adapted/augmented. Irrigation was identified as a current gap in OpenWASH.
- Approval and endorsement of the multi-disciplinary, integrated approach to WASH.
- Approval and endorsement of the foundation level of OpenWASH which can provide basis for other developments.
- MWE have staff and other contacts who could contribute as authors to provide Uganda-relevant material.
- Proposal should include a piloting phase that can be scaled up.

Conclusions from the meeting were that:

- A Memorandum of Understanding should be developed by OU, WaterAid and MWE.
- MWE personnel will comment on priority areas from among the existing Modules and Study Sessions. This is needed to specify the scope of a first phase for development that will form part of a proposal and funding bid.

4.2 National Water and Sewerage Corporation (NWSC)

NWSC, often referred to as National Water, is a national public utility owned by the Ugandan government that provides water and sewerage services in urban areas. Urban expansion and SDG6 targets create challenging conditions for NWSC to meet the demand for new and sustainable services.

They welcomed the opportunity offered by adapted versions of the OpenWASH modules and were supportive of the proposal. They also agreed that an integrated 'not just water' approach was welcome.

They have a Training Centre and already offer some vocational training for their own staff and hire facilities to others. OpenWASH modules could provide a valuable additional resource that could be used selectively according to training needs.

4.3 UWASNET

Ugandan Water and Sanitation NGO Network (UWASNET) is an information hub and coordinating body for all WASH NGOs in Uganda. It has 260 member organisations. UWASNET have training facilities and offer a 'one stop shop' for resources for their members.

Doreen Kabasindi Wandera, Executive Director, supported the general idea of OpenWASH. She suggested a list of current key topics and problem areas that need attention. Many of these are already included in various places in the existing OpenWASH modules, notably Module 1.

4.4 Water for people

Water for people is a US-based INGO who focus on WASH in schools, health centres and households. They are involved with the consultation process for the WRI and a strategic partner of WaterAid.

Cate Zziwa Nimanya, Country Director, endorsed the systemic approach and foundation level of OpenWASH. Also liked the inclusion of case studies in the teaching. Cate was asked to provide feedback on priority topics from the existing modules and study sessions.

4.5 Other stakeholders

Professor Edward Kirumira of Makerere University, who is influential nationally and internationally, also endorsed the principle of OpenWASH and the proposed collaboration. He offered his help and that of the University to conceptualise the development of the Ugandan modules and we will continue to involve him in the process.

Prakash Ramsal, UNICEF WASH Chief for Uganda, was not previously aware of OpenWASH and was cautiously encouraging, subject to ministry approval. He made helpful suggestions about the need to clearly identify the target audience, indicated that urban WASH is not promoted in Uganda, and suggested presenting the proposition, once developed, to their monthly meeting with Development Partners.

Stephen Omoit and Godfrey Andama of the Ugandan Drilling Contractors Association represented the private sector. Our discussion with them provided interesting information about the practical issues they face. Several of their stories could make valuable case studies in the revised modules. They identified the need for greater awareness of the realities of drilling for groundwater among their clients. In the existing modules, borehole drilling is not covered in detail so this has been included as a suggested new topic (see Section 4.7).

Dieter Anders, Head of Programmes at GIZ, (German development agency) expressed the only slightly negative view we heard during our entire visit. His doubts were principally associated with the need for the Water Resources Institute and he was sceptical about the need for OpenWASH. He thought this would simply replicate what already existed and that training needs were already met. He remains to be convinced that the WRI will identify and fill gaps (to which OpenWASH can contribute). This was not a view shared by others.

4.6 Conclusions from Uganda

1. Responses to the proposal to adapt OpenWASH for Uganda were almost universally positive. The enthusiasm from the Ministry was very encouraging and we are delighted to be working with WaterAid to develop the proposition.
2. Rather than start with a large scale (and higher cost) proposal, we agreed that a more limited initial phase is preferable. The scale, scope and schedule can be designed to meet priority needs and then developed in subsequent phases.
3. We are looking forward to receive responses from MWE and other stakeholders about their choice of priority topics identified from the existing modules and study sessions.
4. We realise that the title of Module 1, *Ethiopia's One WASH National Programme,* implies that it is only relevant to Ethiopia. However, a surprising amount of its content is in fact

equally relevant to other countries, including Uganda. It should not be excluded from consideration for adaptation.

5. In Uganda the teaching and learning has to be relevant for rural settings as well as urban so this will need to be reflected in the process of adapting the modules. The existing Ethiopian modules have an urban focus but much of the module content is equally relevant to rural areas.
6. There is a need for 'quick wins' to support the newly-created Water Resources Institute. Adaptation of the existing modules is more likely to achieve this goal than creation of new resources. Nonetheless, some suggestions for additional topics and resources are listed below in Section 4.7.
7. The principle of including Ugandan WASH experts in the module development process was welcomed and several 'in principle' offers to contribute were made.

4.7 Potential further developments and next steps (Uganda)

The first steps towards signing a MoU with WaterAid and MWE have been taken and we hope to conclude that process soon.

Development of the proposal and funding bid can begin once we have received indication of priority topics from MWE and other stakeholders.

As noted above, adaptation of part or all existing modules rather than creation of new is preferable but suggested additional resources and new topics are listed below. Note that some of these coincide with suggestions in Ethiopia so there may be possible cost savings should these proposals be taken forward.

- ***Practical activities/ fieldwork recommendations:*** to complement existing modules/selected study sessions.
- ***Summary 'flash' cards:*** based on selected content to be used as teaching aids in schools, with community groups etc.
- ***Research methods module***: introductory level including need for evidence-based research. Possible adaptation of existing OU material.
- ***Irrigation module***: for rural areas, expanded from existing modules 2 and 4.
- ***Integrated Water Resources Management module:*** introduction to IWRM - approach, principles and key elements.
- ***Environmental Impact Assessment module:*** introduction to EIA - approach, principles, and key elements.
- ***Borehole drilling module:*** to aid understanding of the science and technology relevant to accessing groundwater in rural areas (not a how-to-do-it engineering manual).

5 Overall conclusion

I would like to thank eSTEeM for providing the opportunity to make this very positive and worthwhile trip (and also IDO for their support). Ellen and I were made most welcome in both countries, we had a packed schedule of valuable meetings, and everybody was impressed with the content and quality of the OpenWASH modules.

In Ethiopia, progress with use of the modules is slowly being made and the trend is definitely upwards. The development of new Occupational Standards linked to the modules is absolutely critical to future expansion in colleges and it is very encouraging to know that this process has begun. We are keen to participate in any activity that can promote the use of OpenWASH and bring it the attention of other audiences and will look for opportunities to contribute in some way to monitoring and evaluation of the modules.

In Uganda, the prospect of a collaborative partnership with WaterAid and others to adapt the existing OpenWASH modules is looking very promising. With such positive support, we are very hopeful that a MoU can soon be agreed and we can move forward with the proposal and funding bid in the near future.

We look forward to continuing to build on the relationships made before and during this trip to support developments and create new opportunities for OpenWASH. The challenge now is to prepare proposals and bids that will appeal to funding bodies and enable us to move forward with one or more of the opportunities we have identified.

Appendix 1 Meetings in Ethiopia and Uganda

Ethiopia	
UNICEF	Sam Godfrey, Chief of WASH Michele Paba, Urban WASH specialist Rahel Kaba, Urban WASH specialist
World Vision Ethiopia	(Abraham Asmare, WASH Director) Abiyou Worku, Urban WASH Project Manager
Woliso Poly Technic College	Fantu Shitaye, Vice Dean Mesay Aklilu, Lead WASH Trainer and member of Occupational Standards consultative group
Ethiopian Water Technology Institute	Zenebe Garedew, Director General Zewdu Assefa, Education and Training Director Hailemichael Agdew, Engineering Technical Director Daniel, Trainer
Coffey Consultants/Tetra Tech	Abera Endeshaw, OpenWASH author and trainer
COWASH	Arto Suominen, Chief Technical Advisor
Jhpiego	Mesfin Goji, ENGINE PSE Team Leader (Kefyalew Muleta)
WaterAid Ethiopia	Bethlehem Mengistu, Country Director
IRC WASH	John Butterworth, Country Director
SNV	(Michael Negash, Project Manager, USAID Transform WASH)
Uganda	
WaterAid Uganda	Francis Musinguzi, Country Director Spera Atuhairwe, Head of Strategic Partnerships Solomon Kyeyune
Ministry of Water and Environment	Dr Callist Tindimugaya, Commissioner Planning and Regulation Aaron M. Kabirizi, Director, Directorate of Water Development Joseph Epitu, Asst Commissioner, Sector Capacity Development Ian Arebahona, Principal Engineer Grace Katuramu, Consultant Julia Kamara
National Water and Sewerage Corporation	(Dr Rose Kaggwa, Director External Services) Sonko Kiwanuka, Senior Manager, Projects Allan Kaford, Principal Engineer
UWASNET	Doreen Kabasindi Wandera, Exec Director Josephine Mugala, Engineer
Makerere University, WaSo Project	Prof Edward Kirumira, Prof of Sociology, Principal, College of Humanities and Soc Sciences, WaSo Project Leader
UNICEF	Prakash Ramsal, Chief of WASH
Water for People	Cate Zziwa Nimanya, Country Director
Uganda Drilling Contractors' Association	Stephen Omoit, Board Member Godfrey Andama, General Manager
GIZ	Dieter Anders, Head of Programmes