

SanCoP 18: “WASH in low- and middle-income countries”

Synopsis

The 18th meeting of the UK's Sanitation Community of Practice was held on Tuesday 27th September 2016 at Loughborough University. The meeting was organised by SanCoP, in partnership with WEDC at Loughborough University, Cranfield University, the London School of Hygiene & Tropical Medicine and the University of Leeds.

The meeting was focussed on responding to the opportunities and challenges raised by the Global Challenge Research Fund (GCRF). While SanCoP events normally focus on Sanitation, an exception was made for this meeting in order to work with the partners detailed above to showcase the broader Water, Sanitation and Hygiene (WASH) research agenda.

The following is a synopsis of each presentation and the ensuing discussions. This synopsis and the presentations are available online at: <http://www.susana.org/en/cop/sancop-uk>.

Many thanks to WEDC at Loughborough University for hosting our event. Thanks to our speakers Eloise Meller, Simon Bibby, Barbara Evans, Sean Tyrrel, Sandy Cairncross, Rebecca Scott, and Jeremy Colin, and our espresso slot presenters, Amita Bhakta, Berta Diaz, Diogo Trajano, Habeeb Muhammad, Darren Shako, Richard Boakye, Mario Peres, and Sadeeq Mohammed.

This synopsis was prepared by the SanCoP coordination team Christine Cambrook and Ben Skelton who can be contacted at sancop.uk@gmail.com.

Introduction by Anne Blenkinsopp– Leader, WEDC

Anne introduced WEDC and the aims of the day, which were to understand the changing funding landscape, to learn from good practice and to network to meet new colleagues and friends.

Session 1 – Research Funders

The Global Challenge Research Fund (GCRF): a new funding opportunity for international development research: the story so far - *Eloise Meller, Senior Policy Manager Research Council UK (presentation via video link).*

Eloise began by explaining that the GCRF was announced in the Autumn Statement 2015 and consisted of £1.5 billion of research funding allocated to meet 3 aims:

1. Address global challenges through disciplinary and interdisciplinary research
2. Strengthening capability for research and innovation, within developing countries and the UK
3. Agile response to emergencies and opportunities

The funds have been allocated to different delivery partners and a significant amount has been allocated for interdisciplinary research. RCUK are developing the strategy for the future investment, which is:

- Systemic – invest in people and research infrastructure
- Transformational – complex, multidimensional challenges needing new insights – particularly suited to interdisciplinary/multidisciplinary approach
- Stretch – areas with strong research base but not focused on developing countries (e.g. energy, which has a strong UK research base that can be applied to a development context)
- Building on strengths – research areas with a strong UK research base, already closely engaged with the challenges faced by developing countries

The strategy is currently being developed based on the UK aid strategy, UN Sustainable Development Goals and partner consultation.

Consultation has been UK focussed thus far but there are plans for global engagement. To date, the consultation has included ‘town meetings’ conducted in summer 2016 which involved receiving feedback from UK academics based on the draft foci of the fund which included agriculture, energy, economic growth. The feedback from these meetings was that the focus should shift to the nexus/intersects of these areas as well as cross cutting areas such as inequality, education, urbanisation etc. Specific examples are the energy-food-water nexus and the links between mental health and conflict. Eloise stressed that the pathways to impact are vital to GCRF and noted the challenge of ensuring that researchers in the global south are placed on an equal footing to UK researchers and that there are co-investigators from developing countries.

Following the town hall meetings, the strategy has been developed into the ‘research agenda for change’ which was summarised as detailed below. The bullet points are intended to be a broad framework over which specific challenges will be developed.

Leave no one behind - Create new knowledge and drive innovation that helps to ensure that everyone across the globe has access to:

- Secure and resilient systems supported by sustainable marine resources and agriculture
- Sustainable health and well being
- Inclusive and equitable quality education
- Clean air, water and sanitation
- Affordable, reliable, sustainable energy

Sustainable economies and societies - Identify new research to meet challenges and opportunities arising from changes in population, technology, consumption and pressure on the environment, specifically:

- Sustainable livelihoods supported by strong foundations for inclusive economic growth and innovation
- Resilience and action on short-term environmental shocks and long-term environmental change
- Sustainable cities and communities
- Sustainable production and consumption e.g. materials and other resources

Support peace and justice - Understand how to strengthen the institutions that underpin peaceful societies, good governance, respect for human rights and rule of law as new insights are needed to help:

- Understand and effectively respond to forced displacement and multiple refugee crises
- Reduce conflict and promote peace, justice and humanitarian action
- Reduce poverty and inequality, including gender inequalities

Eloise again noted that these focus areas are still a work in progress, and explained that pathways to impact will need to be developed through engaging multiple stakeholder with UK academics in a nexus of research, action in developing countries, and innovation and knowledge exchange. Eloise again stressed the need to engage international stakeholders. It is thought that GCRF will be particularly important for the least economically developed countries as this is where the cross-cutting themes are most relevant, although all ODA recipient countries are covered by GCRF. Eloise noted that official development assistance research is classified as Overseas Development Aid (ODA) even if carried out in developing countries, if research is directly and primarily relevant to the challenges faced by developing countries.

Eloise concluded by outlining the next steps for GCRF and upcoming relevant research calls which include:

- Growing research capabilities to meet the challenges faced by developing countries – led by RCUK
- Tackling global challenges through engineering and digital technology research – led by EPSRC
- Networks in vector borne disease – led by BBSRC and MRC

Questions and Discussion

Question - Research quality depends on quality of journals & peer reviewers - how is GCRF addressing this?

Answer - GCRF is currently thinking about how to do peer review for less well researched topics, possibly by taking different approaches e.g. panel meetings, international academics and non-academic users. This is a work in progress and suggestions are welcome.

Question - Is there a stated policy about open access in order to support uptake of research in poorer contexts, and are there some missing links between research and action happening?

Answer - The position on open access is not clear but will be raised within RCUK. In order to address the gap between research and action GCRF plans to engage with overseas partners to develop projects so that research is developed to be relevant to those that need it.

Question - Funding at proposal development stage often needs to allow researchers to meet with in-country partners and to travel to develop the proposal – will these costs be supported?

Answer - These costs should be in the project proposal, GCRF would expect this engagement to happen. The first year of a project would be expected to be proposal development and partnership building, with research to start in the second year.

DFID: funding of WASH research, current and future strategy - *Simon Bibby, WASH Advisor, DFID*

Simon began by outlining DFID's policy of 'Leave no one behind – Understand, Empower and Include', and explained that DFID's Research and Evidence Division (RED) includes a WASH Policy team which incorporates both WASH (water supply, sanitation & hygiene) and water security. Simon is presenting on behalf of Anna Nishwa who heads up the WASH Policy team. The team supports research which deals with:

- Operationally relevant evidence
- Programme effectiveness
- Retrospective analysis of sustainability
- How to deliver better, more cost-effective services
- Urban sanitation value chains
- Maximising nutrition impact

Simon noted that DFID are not looking to fund further studies on the impact of WASH on diarrhoea. He stressed that the water portfolio – water security and wash research to meet SDGs – is a prerequisite for meeting many of the cross-cutting global goals, as well as being a goal in its own right. For example, climate action, gender equality, health and wellbeing, are all influenced by water security and WASH.

The DFID WASH research portfolio includes a lot of programmes which are familiar to many SanCoP members including SHARE, REACH, Transform, UPGro, and WSUP. In addition, there is WASH spend in other RED / policy programmes including the Humanitarian Innovation Fund (HIF), World Bank Water and Sanitation programme, SHINE, Ideas to Impact and M4D Utilities. There is significant ongoing research within DFID including continuation of current programmes:

- SHARE until January 2018
- Transform until 2020
- UPGro until 2021
- REACH until 2021

The proposed pipeline is a spend of £30 million to 2021, which equates to approx. £7.5 million per year. Recent highlights from DFID funded water portfolio research include:

SHARE - Launch of the PLoS Medicine paper “From joint thinking to joint action: A call to action on improving WASH for maternal and new-born health” at LSHTM in London; Development, publication and launch of a practitioner’s toolkit that synthesises existing experience and best practice on gender-based violence related to WASH.

UPGro - Africa Groundwater and Literature Archive published by BGS, bringing together all existing data and information on groundwater (geology, aquifer properties, recharge, groundwater quality, and groundwater management) into a freely accessible and searchable database with profiles for each country; Catalyst project in Ethiopia on low-cost solutions and engineering designs to minimise water impact damage to roads and optimise water runoff to recharge groundwater; won a 2015 Global Road Achievement Award.

REACH - Water secure garment industry in Bangladesh Roundtable with H&M and Primark to launch “observatory” using novel low cost biosensors to map river toxicity and human exposure risk in Dhaka.

TRANSFORM - Unilever Programme officially launched at the United Nations General Assembly (UNGA) by the Secretary of State. A first additional partner, Clinton Foundation (Clinton Giustra Enterprise Partnership CGEP), has joined bringing potential to leverage an additional £5m for the programme. There are 29 million indirect beneficiaries from SHARE research to date (based on quantitative VFM methodology).

Humanitarian Innovation Fund (HIF) - Water, Sanitation and Hygiene (WASH) grant facility has launched five challenges using new innovation management approaches to address specific challenges in humanitarian crises.

Simon then outlined the future expansion of research which is to include:

- expansion of climate energy and water (CEW) portfolio
- taking time to consolidate, scale up and focus on strategic gaps

The scale-up of success is to include the Transform, REACH and UPGro programmes with a proposed pipeline of £10 million. Opportunities will also be explored to integrate water research into other programmes, specifically climate, energy, environment and urban programmes to fill strategic gaps. New programmes will include urban sanitation (umbrella programme including future support to scale up WSUP) and scoping for new innovation programmes on climate change, water security and disasters.

Questions and Discussion

Comment – the epidemiology of health impact measurement is so complex that proxy indicators should be used and still hold well.

Question – From the perspective of a small NGO working on WASH in Sierra Leone, putting research into practice is a struggle, and when monitoring health impacts the reduction in diarrhoea is used. Should this still be used?

Answer – There are so many factors that influence diarrhoea and different types of diarrhoea, the metric alone is not helpful, it may be better to focus on delivering a facility and achieving sustained behaviour change.

Comment – the fact that DFID has influence on research councils and has been included in consultation is very welcomed, and has potential to change the way research is delivered. They should encourage thinking about research availability, and engagement with southern partners etc.

Session 2 - WASH Research Group Presentations - a broad overview of the UK WASH research sector through a range of presentations

Monitoring SDG6 and related University of Leeds research - *Professor Barbara Evans, University of Leeds*

Barbara began by asking ‘Do we still need WASH research?’ and concluded that there is still lots to do in the field. She noted that Millennium Development Goals (MDGs) were hugely influential on the sector as previously there was no strong narrative within which to present development goals. However, we must remember that the fundamental *experience of people* is still extremely important.

Barbara then moved on to discuss the Sustainable Development Goals (SDGs) and explained that the water goal is now much more comprehensive and that sanitation sits within general water goals, which leads to tension with all the interrelated goals. It is now easier now to discuss WASH and nutrition as they are recognised as co-dependent by actors outside of the sector. In general, the SDGs provide lots of useful handles, and enable us to show that there is still an enormous amount to do and a lot of research still needs to be done. The SDGs also help people appreciate the complexities of the challenge. For example, previously it was difficult to build toilets due to environmental health concerns, but now sanitation is recognised as an acceptable and necessary intervention. In addition, transdisciplinary areas are now also accepted as important.

Barbara then outlined the following challenges and opportunities:

New thematic research needed – inequalities in access to improved water and sanitation access are tracked by the Joint Monitoring Programme (JMP) and research is now needed on which *types* of interventions are most appropriate to reduce these inequalities.

Hygiene – there is lots more work to be done on handwashing, for example, what are the most critical hygiene interventions in particular areas?

Drinking water – the SDG target is much more elaborate than it used to be as it requires *safe* drinking water within the home, free of faecal contamination.

Water research – there is need to think about water treatment in different contexts. For example, there is still a real question about ensuring ‘safe’ water, whatever ‘safe’ means. There is a need for reliable water testing kits that are used across the board. We need to know what is going on in terms of dispersed water supplies across large areas, as well as financial research to ensure sustainability (e.g. handpumps in Africa will require monitoring and maintaining for many years to come). To achieve

this people working on water resources, and people working on WASH need to communicate more effectively.

Sanitation – what used to be ‘improved’ sanitation target is now ‘basic’ – under the SDGs, improved sanitation cannot be shared with other households and excreta needs to safely be treated on / off site – however, ‘safe treatment’ has not been clearly defined. Shared sanitation is not considered as improved because there is no evidence / agreement as to what makes a safe, acceptable shared sanitation facility. These research questions are not just technical, but involve systems and administration.

Schools and WASH in Healthcare – there is a lot to do on this topic, and we are not going to solve WASH in healthcare in the next 10 years - currently less than half of African hospitals have a water supply within 500m.

Indicators - we are still very poor at measuring outcomes, especially behavioural outcomes and health outcomes.

Opportunities and challenges – the increased budget from DFID is a signal that everyone has a role to play. Technical developments (building new gizmos) will help! Communicating ideas between disciplines will be very important, but a real challenge. We must also remember that research that helps the global south will help us all.

In conclusion - we still need WASH research!

Questions and Comments:

Question – Monitoring and Evaluation is still very poor, how can we change this?

Answer - More people who are experienced in financial reporting or accountancy should be brought in to strengthen data / tracking on how financial inputs relate to outputs.

Excellence in Water Research – is there a problem? - *Professor Sean Tyrrel, Cranfield Water Science Institute.*

Sean began by asking whether there is an underpinning concern about excellence in WASH research, and more specifically whether there is a tension between ‘excellence’ and the impact of the research. In the context of research council funding ‘excellence’ refers to being able to publish work in top journals and current research can lead to outputs that are very case-study oriented.

Sean explained that interdisciplinary research is demanded of us by both contexts and funders. One concern in trying to achieve this is that in trying to achieve this through bringing in an economist or social scientist to a technical project we end up going down to the lowest common denominator in social science and failing to generate high quality social science results.

Sean also questioned whether WASH research is suitable for top international journals and explained that a result of trying to make it suitable is that we take research apart into its component parts and try and publish in different journals. As academics we want to advance knowledge while having it used in a practical way and taking research apart in this way could hinder this.

Sean argued that the above pitfalls can be avoided through a good project planning process. Research council funding processes must encourage good research which is linked into practical results. The project planning stage should include both basic science and new knowledge and should avoid pigeonholing work as being of a particular type.

Sean then gave an overview of how this approach to project planning relates to current and planned research projects:

Community Water Plus – In collaborative teams covering different types of research organisation, advancing scientific knowledge and the production of excellent papers may not be everyone's top priority?

(A question was asked about the quality of particular journals. Response that using a good review system can improve chances of getting into the right journals and that the top 10% ranking is not the absolute measure of journal quality, but it is the one that the REF system for assessing universities uses. A concern was also raised about open access. Response that RC-funded papers have to be open-access thus widening the potential readership an impact of the research).

Sand Dams – there is a huge research gap in this technology which represents a huge opportunity. We need to look at how UK water utility experience can be brought into this context.

Transformative technologies – an example is the Bill and Melinda Gates funded project developing the off-grid toilet. This raises the question of whether it is necessary for developing countries to go through the same technology advances or steps that have been followed by developed countries, or can they skip levels and jump to something radical? This project team is largely not from a WASH background but rather specialised in design and technology and from the outset this team has been adopting new science regarding faeces research. The project is generating high quality scientific papers in energy and water journals and, while the impact is a long way off, the scientific excellence underpins what will happen in the future.

UV disinfection LEDs – developed in collaboration with Cranfield University – this represents a technology jump – to be deployed at a household level.

Concluding thoughts – the challenges are real, but not insurmountable. Scientifically excellent WASH research has been going on, but we should look at the amount of it – it's possible to do more. Delivering both new science and excellence in WASH research are not incompatible. It is essential that knowledge is transferred throughout the research community, including to early stage researchers and PhD students.

Research in support of sustained hygiene behaviour change - Professor Sandy Cairncross, Environmental Health Group, London School of Hygiene & Tropical Medicine

Sandy focussed on the Sanitation and Hygiene Applied Research for Equity (SHARE) project, which is being delivered by a consortium led by LSHTM. The SHARE project focuses *only* on hygiene and sanitation. The original grant for the project was for £10 million over 5 years, funded by DFID. Following the success of the original contract the project received a 50% extension which led to a second phase.

Sandy explained that diarrhoea rates are very difficult to analyse. While it is true that people with toilets tend to experience low diarrhoea rates, this is not necessarily just because they have toilets - it could also be because they are generally more hygiene-aware people, have better nutrition etc. Sandy also stated that it has been shown that there is only 15% - 50% reduction of diarrhoea rates with provision of water and sanitation. The Gates Foundation has funded various interventions, with some recently reporting low or even absent changes in both health and hygiene behaviours, which demonstrates that problems can persist despite very expensive intervention research programs. Sometimes opportunist programs can be cheaper and more effective.

Sandy summarised one thread followed throughout the SHARE project – *improving the safety of weaning foods*. Most deaths from diarrhoea tend to happen to children under 2 and these children eat different foods from adults. If the first foods that children eat are contaminated, there are hugely detrimental health impacts. Some studies have shown that weaning foods can be more contaminated than drinking water.

In order to design an intervention to tackle this problem the SHARE project first stage was a ‘*proof of concept*’ study which took part in a peri-urban community in Mali. The aim was to do the intervention very thoroughly and look at whether there are ‘bugs in the food’ given to infants.

The project utilised the hazard analysis and critical control points HACCP data analysis method which is commonly used by environmental health officers when monitoring industrial food production. The HACCP method is designed to identify where interventions are best made so was ideal for this study. It was adapted to be used for the domestic production of weaning foods with critical control points defined so that mothers could understand them (for example amount of time required for boiling food).

From this process 3 interventions were recommended:

- Encourage mothers to wash hands with soap before preparing weaning food
- Use water from an improved source
- Reheat food which has been prepared and then stored to boiling temperature

Mothers were given relatively intensive training in these recommendations, with field officers spending around a day with each mother. As a result of this the amount of ‘bugs’ reduced dramatically both one month and 3 months after the intervention, suggesting sustained behaviour change.

Following this the project was replicated in Bangladesh by a different team with the International Centre for Diarrhoeal Research. The households targeted had a low standard of hygiene (for example, keeping livestock in kitchen areas). The results showed a drastic reduction in the amount of ‘bugs in the food’ and subsequent reductions in diarrhoea.

The next stage of the project was a scaled-up intervention across several hundred households in Nepal. Sandy noted the need to look at peoples’ motivations in order to encourage behaviour change, for example status could be more of a driver than health. The research was carried out by a PhD student (Om Prasad Gautam) and with the increased scale the costs were brought down significantly.

Sandy explained that the formative research led to a conceptual, practical result; a way to separate the parts of the kitchen which needed to be hygienic from the areas to which animals had access. Finally, the study in Gambia found reductions of 61% in the prevalence of diarrhoea and a 30% reduction in respiratory infection (children recovering from diarrhoea are much more susceptible to respiratory tract infections). This result has not yet been subject to peer review, but it was the largest reduction in diarrhoea that has been seen in any project across the globe.

The UNICEF office in Gambia are now very interested in this methodology and are considering rolling the programme out, which may then lead to other UNICEF offices adopting the approach. The hope is that eventually, the programme could be adopted to the scale that it becomes an automatic part of schooling.

Questions and comments

Question – The data clearly produced useful information – what was the feedback from the mothers and carers?

Answer - Sandy explained that he wasn’t a supervisor of these PhD students, but he was aware that there had been lively participation from the mothers/carers, with prizes being offered for best kitchen, badges, certification etc. Generally, there was a lot of energy and positivity from people responding. Sandy also noted that behaviour change can be difficult to measure, but one idea which worked well was to pilot behaviour change programmes with 12 households, then ask them what they thought of it around 10 days later. This gives very helpful learning points before bringing it to scale, as people

explain things like ‘my hands smell nice’, ‘I feel clean’ which can be used to improve or market the programme to others.

Question: Do you have any thoughts on the SHINE trial? Did the impact of diarrheal disease reduction also impact on stunting? (This is an intervention trial in Zimbabwe – it has been shown that regular assault by pathogens on a child’s gut makes the child more susceptible to malabsorption and malnutrition).

Answer – Sandy explained that the results aren’t yet in and so we must wait to see the impact, but it is expected that they are significant. The SHINE trial implies that impact on diarrhoea is not the whole story. The rate of secondary respiratory infections following diarrhoea in Ghana is 23% - it is hoped that the study achieves a 30% reduction in this.

Sustainable urban sanitation research - *Rebecca Scott, WEDC, Loughborough University*

Rebecca began by explaining that she would focus on urban sanitation, and commented that while there is a lot of space for new technologies in the sanitation service chain, there is also a lot of space for improving on current operations and systems, with practitioners learning ways to improve on these practices.

Rebecca recapped the challenges of safely managed sanitation within a developing country context, where the majority of people are relying on on-site sanitation systems and services - whether formal or informal (such as emptying by trucks or by hand) - and sewers are a long way off. The MDGs focussed on providing sanitation at household or community level, while the SDGs now emphasise the importance of the safe management of all forms of sanitation systems, whether those be sewered or unsewered systems.

WEDC’s urban sanitation work includes research into containment systems using worm based toilets, as well as the Reinvent the Toilet challenge. Other research considers the stages of the sanitation chain, looking at improvements to faecal sludge management services.

The SPLASH Urban Sanitation Research Programme (2011-2014) included 5 consortia research projects. While each project gave emphasis to different stages of the urban sanitation service chain, across the programme the whole chain was covered. Details can be found from http://splash-era.net/san_res.php

WEDC’s management role includes drawing out synergies and lessons learned for wider dissemination. This identified ways to generate improved demand for facilities and service chain providers, dealing with vulnerabilities at various points in the service chain and identifying challenges of integrating sanitation with water supply. Through this work 4 key themes have emerged around: the enabling environment, demand creation, vulnerability and city-wide planning. The lessons learned on the enabling environment include the progressive realisation of the right to sanitation and the need for access to household finance, enabling households to become active consumers of services. Key knowledge gaps have also been highlighted around the transportation stage of the service chain, cost-effective treatment of faecal sludge, how we enable reliable and realistic financial costs for households, and bringing about long term behaviour change.

Rebecca then outlined research addressing Faecal Sludge Management (FSM) Diagnostic Tools developed with the World Bank, with the aim of reorienting financing towards FSM and redress the balance between FSM and more conventional sewerage systems. Examples of the key components of the diagnostic tools are:

Faecal Waste Flow Diagram (also known as Shit Flow Diagram, SFD) – Rebecca shared an example SFD (developed in a parallel research project funded by The Gates Foundation, working with GIZ, the University of Leeds, CSE and Sandec/Eawag) from Kumasi in Ghana. This represents the flow of faecal waste throughout the city and the percentages which are safely and unsafely managed through the service chain. Emphasis is now being put into enhancing the quality of the data that goes into producing SFDs, to better explain where and how all the data has been gathered – and the underlying assumptions.

City Service Delivery Assessment – this provides an overview of the enabling environment for service provision in a format understandable to city stakeholders, showing visually where the need for investment is.

Service Delivery Action Framework – this helps identify appropriate actions to strengthen the enabling environment for service delivery. It requires that each city starts from its current position, prioritising any critical interventions to protect public health that have not already been achieved, before progressing towards complete, sustainable service chains.

Key lessons from this research relate to the enabling environment for sanitation, affecting - policy and legislation; institutional, regulatory, legal and financial frameworks; drivers of improved faecal sludge management services and planning for incremental change.

Key knowledge gaps remain, affecting the inclusive delivery of effective sanitation facilities, institutional capacity and capability to achieve viable business models, improved emptying and discharge arrangements, as well as technical aspects such as greywater management and appropriate use of transfer stations.

Rebecca concluded by recapping how WASH is key to addressing the global challenges of public and planetary health, requiring us to collaborate with experts in other disciplines such as urbanisation, climate change and health, to tackle such global issues.

Questions and Comments

Question - in the context of GCRF how would the diagnostic tools be framed to the research councils as advancing scientific development?

Answer – the FSM research was not developed for that purpose, but results in more rigorous methodologies in data collection and also looks at technical complexities. For example, we make assumptions about what technologies people are using, and there is research to be done on effectiveness of the technologies actually being used. We also need to understand that urban sanitation is very contextual, and to frame our research in a way that the research councils can understand.

Questions - Are there published works using these frameworks?

Answer – Yes, previous publications are in journals relevant to our sector (see for example, Peal, A, Evans, BE, Blackett, I, Hawkins, P and Heymans, C (2014) Fecal Sludge Management: analytical tools for assessing FSM in cities. *Journal of Water, Sanitation and Hygiene for Development*, 4 (3). pp. 371-383. <http://washdev.iwaponline.com/content/4/3/371>). A further publication is due from the more recently completed work.

Session 3 - WASH ODA-related research: short ‘Espresso’ format presentations

Note that espresso format presentations are 5 minutes each!

WASH for Perimenopausal Women - Hidden Knowledge - Amita Bhakta, WEDC

Amita began by explaining that the Perimenopause is the transition between the reproductive years and the menopause and is often referred to as ‘the change’. It is marked by heavy bleeding during periods, irregular periods, night sweats, hot flushes urinary incontinence. Due to the global aging population more women will now pass through the perimenopause and 76% of them will be living in low income countries by 2030.

The aim of the study is to provide recommendations on how water, sanitation and hygiene needs of perimenopausal women can be met. The specific objectives are to work with perimenopausal women in Ghana to determine their hygiene management needs, determine their water and sanitation needs and to assess how human, social, natural, physical and financial factors influence their water, sanitation and hygiene experiences.

There is very little information on this topic. A key challenge in achieving this is that WASH needs of women during the perimenopause is concealed tacit knowledge, it is known by all women that deal with perimenopause but not recorded in literature and therefore ‘hidden’. In order to find this knowledge phenomenology was used as a means to uncover tacit WASH needs by interviewing women; PhotoVoice was used - women were given cameras to record their experience of secret, private needs; and participatory mapping was used to uncover spatial issues.

The initial findings suggest are that the key needs are:

- *Water* – bathing (due to bleeding, day/night sweats, hot flushes)
- *Sanitation* – latrines, bathing facilities, laundry facilities and drainage and soakaways
- *Hygiene* – heavy periods (MHM, thicker pads, frequent changing) and urinary incontinence management

Questions - How many photo voice participants were there?

Answer – Less than 10, the focus was not in collecting a lot of data, more interested in the depth of the experience.

Maximising the value of human waste derived fertilisers in Madagascar - *Berta Moya Diaz-Aguado, Cranfield*

Berta explained that the research project brings together toilets, compost and food. The project is focused on the Loowatt system (currently being trialed in Madagascar) which converts faeces into energy (biogas) and utilises the digestate. Berta explained that the digestate is a by-product of anaerobic digestion which contains all the nutrients present in the original waste material. Two processes can be used to convert this into fertiliser:

1. Composting
 - Biological aerobic process
 - Nutrient fixation by organic matter
 - Exothermic process that achieves pathogen inactivation
2. Vermicomposting:
 - Organic matter digested by worms
 - Higher micronutrient content

The nutrient composition of the digestate, compost and vermicompost were compared and it was found that while both compost and vermicompost have positive effect on crop growth each has a different effect and uses.

Given this potential use value the next question is are human waste derived fertilisers marketable? The key challenge to finding the right customers to target is that subsistence farmers in peri urban areas have low purchasing power and low connectivity; larger scale farmers that want to export their produce must abide by international regulations; and there are unclear regulations around the use of human waste derived products for agriculture.

Question – Are the different types of compost sequential or do you have to choose one over the other?

Answer - The different types of compost are sequential, but you can derive each one from each part of the process.

Question - Is it socially acceptable to use human waste derived compost on food?

Answer – This differs hugely around the world.

Question – What about the risk of contamination / pathogen transfer?

Answer - Compost is fully pasteurised through being heated during the composting process.

Disinfection of human excreta in emergency settings - *Diogo Trajano, Brighton*

Diogo explained that the aim of the project is to assess current and proposed protocols for disinfection of human excreta in emergency settings, while the specific objective is to develop protocols for disinfection in these settings.

Diogo noted that during the WASH response to the Ebola outbreak, recommendations for how to disinfect excreta before transport / disposal changed. The current recommendation is for chemical disinfection with super chlorination in a bucket for 10-30 mins. A new proposed recommendation by WHO/UNICEF is for physio-chemical disinfections using hydrated lime in a bucket for 30 mins. Both recommendations lack specific information for example the volume/weight of disinfectant or whether the materials should be mixed.

In order to test and improve these recommendations lab experiments were conducted which simulated the conditions of different patients at different stages in the disease. The results showed that the lime disinfection was more effective than the chlorine and the proposed recommendation should therefore be used, and also established specific criteria for concentration of disinfectant.

Question – Is this is for hospitals and clinics? Is this specifically for the people collecting the excreta and first stage treatment before removal?

Answer – Yes it is

Question – Will the new recommendation kill off Ebola?

Answer – The tests simulated the worst case scenario (a less sensitive pathogen) so we are confident it would kill off Ebola.

Intermittent Water Supply: Effective Modelling and Integration of User Behaviour, *Habeeb Muhammad, Leeds*

Habeeb began by defining what is meant by intermittent water supply and the problems associated with it, which are:

- Variable pressure causing increased pipe breaks,

- Low pressure causing poor supply,
- Difficult to simulate (models assume that pipes are fully pressurised)
- Inequality of supply between different consumer groups
- Behavioural issues around users collecting and storing as much water as possible when water is available

The aim of the study is to develop a model to simulate and interpret the interaction of household behaviour with Intermittent Water Supply and its effects on the performance of the water distribution network. A survey was carried out in two states in Nigeria to understand household behaviour in response to intermittent supply. Preliminary results are:

- Storage – all households use storage, including secret underground tanks
- Booster pumps - some people are using booster pumps to redirect the supply and take more
- Lots of complaint about inequality of supply
- People lose hope with the water supply and build boreholes

Question - Is there any kind of market for developing for those who get all the water when it is turned on?

Answer - No, those who do have it tend to give it away for free.

Question - Is there no limit to the storage?

Answer - It is against the rules to have underground storage tanks, but it is very common (one person had 15,000 litres)

Question - Do the people give a different answer to the engineers about when water is supplied?

Answer - Yes, the responses are totally different

Understanding the Historical Development pattern of countries - *Darren Shako, Newcastle*

Darren explained that improving sanitation continues to be a challenge as the underserved population remains high (noting that it has remained at 2.4 billion between 2010 to 2015) and that, even when sanitation services are present, the adequacy of these was in question due to factors such as unreliable supply, poor hygiene etc. For example, in Guyana there is 85% coverage of improved sanitation but adequacy remains a huge issue. This is in spite of multiple global agendas (e.g. the international drinking water and sanitation decade, the millennium Development Goals, International year of sanitation etc.), the development of innovative planning approaches (Darren gave around 20 examples including Participatory rural appraisal (PRA), Participatory hygiene and sanitation transformation (PHAST), Community health clubs (CHCs), The child-to-child (CtC) etc.) and the introduction of new technologies (e.g. pit latrine, ecosan, composting toilet etc.).

Darren argued that a key reason for this was that the influence of a country's historical development pattern on the existing sanitation status and successful improvement interventions has been overlooked. Understanding the history identifies the 'HOW' and 'WHY' to current sanitation status, practices and organisation and allows for the identification of critical institutions that can affect the success and sustainability of sanitation plans and interventions. Many existing sanitation problems are a product of a country's historical development pattern, for example, slavery, colonialism, civil war, natural disaster, housing, religion, national economy, cultural clashes, politics, climate, perception,

attitude and practices. Sanitation improvements strategies would demand holistic approaches, as oppose to the current one-dimensional approaches.

Darren identified the current approach as:

- Commencing from assessment of existing sanitation status – situational analysis
- Disregarding historical development trends that led to current situation
- Failing to identify critical institutions that affected sanitation development

Darren suggested that the approach should also include analysis which:

- Identifies critical events in history that affected sanitation
- Understands the trends in sanitation development.
- Identifies institutions that have and will impact the success and sustainability of sanitation interventions.

Question – We like the principle, going deeper etc. but is there not a problem of endless regression trying to find the ‘original cause’?

Answer – The critical period of history of many countries [with poor sanitation coverage] is not that long, perhaps 100 years, and there are not that many key events which affect sanitation so there is limited risk of this happening.

Comment – I found this interesting, and have also worked in Ghana and agree that looking at what a society has done in the past can influence the most appropriate types of sanitation in the future e.g. if a community has used bucket latrines historically, indoor toilets can work well.

Impacts of climate change on urban WASH - Richard Opoku Boakye, Cranfield

Richard explained that the study is exploring the impacts of climate change in Ghana in 6 urban poor communities, and the communities studied are located across 3 different ecological zones. In these communities there is awareness of climate change, for example people state that “This year in particular, the rains did not come as expected hence maize did not do well” and there are typically great policies in place – however, there is very little implementation of these policies. Richard then gave two examples of the current impact of climate change on WASH in these communities, specifically erosion leading to increased pipe exposure leading to increase in damage to pipes, and increased stormflow leading to an increase in the pollution events from vital drainage networks. Further to this, future impact are likely to be caused by localized flooding (leading to groundwater deterioration, treatment capacity being exceeded, damage to standpipes and boreholes and septic tanks overflowing) and also the reduction in water availability (leading to water shortages/rationing and community exposure to unhygienic conditions).

Richard stated that the way forward to tackle these impacts is to:

- Ensure a common voice for service providers
- Improve savings schemes to ensure maintenance is planned for
- Service providers need to acquire storage tanks on loan and pay over time
- Activities of organizations at the district assembly level should be well documented to prevent repetition of work
- There must be records of all waste tipping vehicles and tipping times

Comment – it is likely that urbanisation is causing the drains not being able to carrying enough water; climate change is not the biggest factor when compared to urbanisation, population growth.

Response – we are not stating that these problems are due to climate change, but that climate change will increase the impact of them all on urban WASH.

A new approach to water safety planning to reduce waterborne disease in semi-arid regions -
Mario Peres, Brighton

Mario began by explaining that 90% of north east Brazil is semi-arid. 23 million people live in the area, of which 40% are in rural areas and new approaches are needed to achieve a reduction in waterborne diseases in these regions. To help achieve this the project undertook a social survey of about 100 households and collected water samples to understand how rural communities use water and where contamination is occurring.

The government has undertaken a programme to build one million water storage systems for families in the area. Mario shared various examples of these, many of which involved large scale rain water collection from both rooftops and ground runoff. The preliminary findings of the survey are that a combination of contaminated sources, inadequate handling of water and lack of maintenance and cleaning is resulting in faecal contamination. Specifically, it seems that while the original sources of water are slightly contaminated the main cause of contamination is when people store the water in their homes.

Biomass as potential adsorbents for the removal of heavy metals from industrial wastewater -
Sadeeq Abubakar Mohammed, Loughborough

Sadeeq began by reminding us that there is no doubt that we are what we eat and this represents a huge concern if our food is contaminated with heavy metals from industrial wastewater, as is the case for many in Nigeria. Often farmers have no choice but to use industrial waste water to irrigate crops, and because the water that comes from these industries is not adequately treated, this means that heavy metals enter the food chain. One of the key reasons this is happening is that the treatment methods for industrial waste water are not adequate.

Sadeeq explained that the aim of the study is therefore to investigate the adsorption potential of readily available carbonised and un-carbonised biomass materials, for the removal of heavy metals which are commonly found in synthetic textile and tannery wastewater in Nigeria. The hope is to find a way for the waste water to be treated cost effectively using commonly available adsorbents.

In order to achieve this the study involved carbonising eggshell, rice husk, coco-peat and lemon peel, as well as bone char and sand, using both hydrothermal carbonisation (HTC) and microwave digester; characterising each adsorbent; carrying out batch and column experiments using the adsorbents; determining the residual concentration of the heavy metals and their percentage adsorption by each adsorbent; and finally evaluating adsorption capacity using Langmuir, Freundlich, and BET isotherms.

The preliminary results showed that of all the biomass materials tested coco-peat performed extremely well as an adsorbent of heavy metals.

Question – How did you choose these novel adsorbents?

Answer – An extensive literature review.

Reflections and Wrap up

The reflection and wrap up session was led by Jeremy Colin who is an independent consultant, working with Oxford Policy Management.

Jeremy began by asking us to focus on how the sort of research we had discussed actually impacts on practice? Research needs to help the industry to be clear on what ‘good practice’ and ‘best practice’ look like, and there are still an alarming number of knowledge gaps – what is best practice is a moving thing. Key gaps are around health impacts, and how useful it is to try to measure health impacts, as well as the link between sanitation and nutrition. Health monitoring could strengthen knowledge about nutrition impacts: is there a need for clearer guidelines on this?

Donors are typically focussed on achievement of outputs, but don’t know enough about how to measure outcomes effectively, for example; are people using facilities which have been provided, are behaviour changes permanent, and so on. There is often a lack of clarity about when and how outcomes are measured.

In recent years, we have seen a shift in what we call ‘results’ and what success means for a programme. Governance was previously very important to funders, but the focus has now shifted to the numbers of recipients of infrastructure, leading to a focus on direct short term results. This raises complex questions about how you design long term programmes if the goal posts move, and how donors measure impact. There can be tension between a short-term focus on recipient numbers vs the long term aims embedded within SDGs. This is also related to assessing value for money - the cost effectiveness of delivering outputs and outcomes in the short term, rather than long term or programme results and outcomes over a lifetime. More knowledge is needed on this.

Jeremy then opened to feedback from the floor and the following points were made and discussed:

Monitoring and Evaluation (M&E):

- There are very few examples of best practice, so is good practice more relevant? M&E should include learning and changing; donors and implementing agencies should be asking “What have we learnt and what have we changed?, what more would we change?”. Learning/change should be one of the programme success indicators because if you haven’t changed your programme when the environment you are working in has changed, there is something going wrong.
- It was emphasised that practitioners don’t need the *best* way to measure a thing, but the *cheapest way to measure it well enough*. We need clarity on what is good enough.
- There is concern that safely managed water as a SDG will prioritise upgrading existing services rather than provision of basic services to unserved communities, as only providing the basic service doesn’t count as safely managed under the SDGs. This is a concern as everyone should have access to basic services before improving existing services for some. For example, a well with mild contamination of the water source is better than no source. We should emphasis the “leave no-one behind” strategy, and basic services are a necessary intermediate step of enormous value. We don’t want to have tiny amounts of perfect services, better to have a lot of good-enough ones.

Research:

- Concern was raised about professional incentives – the idea that publishing in the top journals is the mark of success, but does this cause a strong bias in what is researched? Should journal editors be convened for a serious discussion about what they accept and don’t accept for review, and who they use for peer review? A lot of professional areas operate as rather closed groups – it doesn’t encourage a systematic approach but rather going deeper into the same

fields. In the context of WASH, what are the factors that influence what we study – and how do we reward people that study outside the areas for which are already well rewarded? For example, the dignity aspects of sanitation are under researched and underfunded.

- This network should seek to influence the GCRF research agenda, through articulating / finding channels to communicate with the funders and trigger conversations about research publishing, considering how the agenda works from within the journals.
- There is still a tension between research that is of most use to practitioners, and research which is perceived as academically rich enough, though there are excellent examples of research which achieves both.
- Much research doesn't achieve impact in the field; there is some trickle down but not a lot. How do you know what has an impact? For example, the use of indicator faecal coliforms for water quality can give misleading information; decision makers move forward using flawed data, which means that some sensible water sources are not included in strategies. Research should help decision makers with these types of challenges.
- Research council funding requires a statement of how your research will find its way through to impact. Can we work together to raise our game on these 'pathways to impact'? They should be really credible. We also need to lobby research councils to understand that research methodologies need to be suitable for practitioners to use in the field and that this 'good enough' methodology will need to be used for research. Good enough is actually excellent, and this needs to be communicated to the research councils.
- Open source journals: an NGO representative noted that while they can view lots of journal abstracts, they don't have access to full academic papers, as they are not open source.

Finally, it was agreed that as a community of practice we would identify 3 key things we want to communicate to the GCRF and that this would be achieved through circulating proposed points to all SanCoP members.

It was also agreed that research councils should be invited to all future SanCoP events.