

Supporting service delivery and business innovation through TAF application

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Abstract/Summary

The Technology Applicability Framework (TAF) is a participatory, decision support tool for assessing the sustainability, scalability and relevance of water, sanitation and hygiene (WASH) technologies in a specific context. After 2013 when WASHTech project had ended the TAF has been promoted widely and applied without much external support in different contexts to a wide range of WASH technologies and service delivery models. Experiences show that the TAF is very much appreciated as a comprehensive framework which supports transparency and accountability. However as the TAF is a generic tool it needs contextualisation for each application. Being quite a complex tool the application of the TAF needs sufficient resources and capacities for proper preparation and facilitation to achieve expected outcomes. More cases and follow up are needed to further develop the tool for business development and to assess its impact on innovation in the WASH sector.

Introduction

Numerous blockages stand in the way of WASH technologies reaching their full potential and being taken to scale. Whilst some technologies are widely used, others languish in a zone of endless piloting. Weak feedback loops between service users and implementers mean that problems can persist for decades without any resolution. Implementers can sometimes hold very different views about the merits of a particular technology to the people who use them as part of a service. This means that changes are necessary to improve a technology can go unimplemented for long periods of time. The overall result is poor service levels for users.

Progress towards universal access for water and sanitation in rural areas of developing countries will only be feasible through a mix of sustainable service delivery approaches and technologies which fit a specific context. Still there are huge challenges in progress towards universal access which come from limited availability and scalability of proven or new technologies.

Introducing a technology in a market or an area requires significant financial resources and engagement of many actors with different agendas, many activities need to be coordinated and accomplished such as market research. The process of introduction and scaling up of WASH technologies in a specific context can be described by an S-shaped curve which passes three key phases (see Figure 1, Olschewski and Casey 2013).

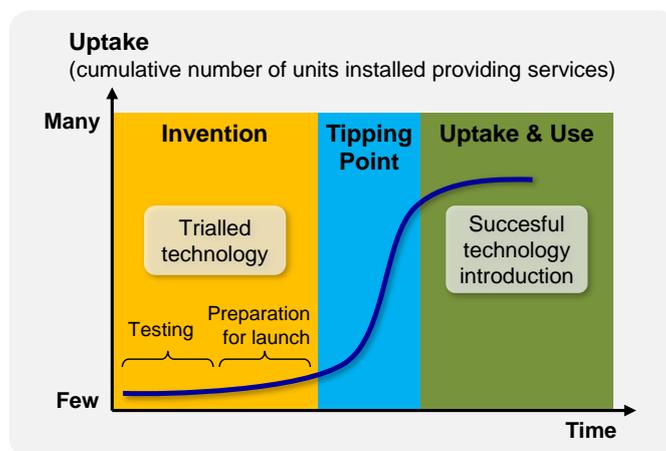


Figure 1: Phases of uptake of technology over time

One particular concern is the fact that in the beginning of the introduction process there will be only costs e.g. for

piloting, but little or no revenues. This will lead to a “valley of death” (see figure 2).

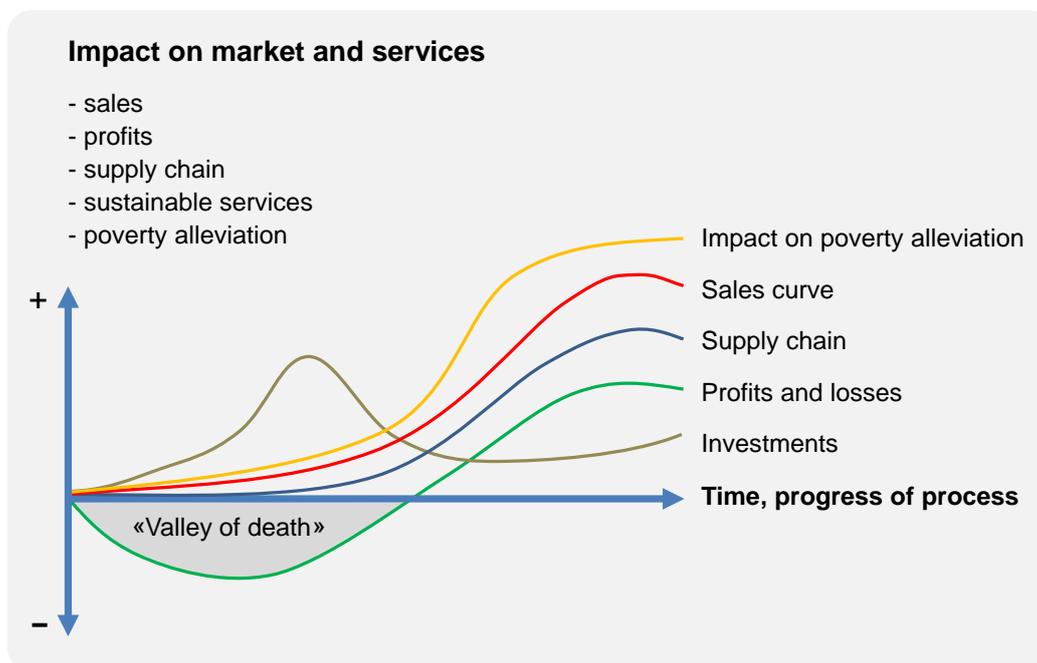


Figure 2: Introduction of technologies and the “Valley of death”

Therefore for any institution interested to introduce a WASH technology it is vital to know as early as possible if a specific WASH technology might be applicable and scalable in a certain context or not and what to do for supporting further scaling up. However so far there was no such tool which provides a simple and efficient assessment of applicability and scalability of a WASH technology in a specific context, which considers the service delivery approach, its scalability and involves users, technology developers, technology promoters, government and academia in assessments (Schweitzer et al, 2014). To fill this gap the Technology Applicability Framework (TAF) was developed as part of the WASHTech project in 2013 and promoted through knowledge networks and social media, e.g. webinars. The TAF is linked to a generic guidance tool, the Technology Introduction Process (TIP), which is based on the concept of “technology road mapping” (Moehrle et al 2013). Both tools are available and later uploaded in the public domain (www.washtechologies.net).

Since the end of WASHTech project in December 2013 several organisations have applied the TAF to various WASH technologies in different cultural contexts, most of them without much external support. This paper discusses the performance and uptake of the TAF so far, some findings on applicability and potential for supporting business development for WASH services and gives an outlook on potential developments of the TAF.

Context, aims and activities undertaken

The TAF is a participatory decision support tool for assessing applicability and scalability of WASH technologies in specific contexts (Olschewski & Casey 2013). The TAF uses a comprehensive set of 18 indicators to capture the factors describing applicability of a technology, the potential for sustainable services as well as factors needed to be in place for taking the technology and service to scale. The 18 indicators cover six sustainability dimensions and the perspectives of three key actor groups involved in technology introduction (see figure 3).

Perspective / Sustainability Dimension	User / buyer 	Producer / provider 	Regulator investor facilitator 
Social 	(1) Demand for the technology	(2) Need for promotion and market research	(3) Need for behavioural change and social marketing
Economic 	(4) Affordability	(5) Profitability	(6) Supportive Financial Mechanisms
Environmental 	(7) Potential for benefits or negative impacts for user	(8) Potential for local production of product or spares	(9) Potential for negative impacts or benefits for natural resources on a larger scale
Legal, institutional, organisational 	(10) Legal structures for management of technology and accountability	(11) Legal regulation and requirements for registration of producers	(12) Alignment with national strategies and validation procedures
Skill and knowledge 	(13) Skill set of user or operator to manage technology including O&M	(14) Level of technical and business skills needed	(15) Sector capacity for validation, introduction of technologies and follow up
Technological 	(16) Reliability of technology and user satisfaction	(17) Viable supply chains for product, spares and services	(18) Support mechanisms for upscaling technology

Figure 3: TAF indicators using 18 indicators in 3 perspectives

Between 2014-2016 feedback on more than 15 TAF applications were received from 10 different institutions:

On water related technologies:

Technology	Focus of Service delivery approach	Region	Institution/contact
Handpump water meter	To be defined	Uganda	Appropriate Technology Centre (ATC) Uganda
Household Water treatment	Business	India	Tara India / Antenna Technologies Geneva
India Mark Pump	Community	South Sudan	IRC
Household water filter	Household	Nicaragua	WaterAid Nicaragua
Rope Pump	Household	Nicaragua	WaterAid Nicaragua
Community supply using handpump, diesel engine with piped scheme or solar powered piped scheme	Community	Tanzania	WaterAid Tanzania
Planning WASH services ¹	Community	Tanzania	WaterAid Tanzania/Government of Tanzania
BluePump	Community	Kenya	Oxford University UK

¹ . In Tanzania the TAF is a voluntary planning tool featured in the Project Implementation Manual for the Water and Sanitation Development Programme II. A training of trainers was provided for more than 30 regional water officers of the Ministry including NGO partners.

On sanitation related technologies:

Technology	Focus of Service delivery approach	Region	Institution/contact
Biofil toilet	Business	Ghana	Biofilcom/TREND
Desludging device	Business	Zimbabwe	Welthungerhilfe / IRC
DEWAT System	Community	Afghanistan	GIZ
Pour flush latrine	Community	Nicaragua	WaterAid Nicaragua
VIP latrine	Business	Tanzania	WaterAid Tanzania

On technologies outside the WASH sector and service approaches:

Focus	Focus of Service delivery approach	Region	Institution/contact
Reconstruction of housing	Emergency	Philippines	Welthungerhilfe
Self-supply as service delivery approach	Community	Sierra Leone	Technical University of Cologne / Wuppertal Institute
Biogas digester	Community	Colombia	Technical University of Cologne

For most of the case studies some documentation of the result of the evaluation is available and shared through the web resource www.washtechologies.net. Unfortunately there is only little information available on the process of TAF application or on how results were used afterwards. Each TAF application and results are very context specific, e.g. different technologies and stages of development were considered, there are different levels of capacities in the sector to apply the TAF and not all application are well documented in terms of meta data. Despite all these limitations some findings should be shared which might inform those who consider applying the TAF in future.

Main results and lessons learnt

Conceptual and strategic aspects:

- The TAF is a decision support tool. TAF users should therefore understand well what questions they want to ask and if the TAF is the right tool to answer these questions. However apart from thematic answers one key benefit of the TAF is that as a process it triggers exchange, discussion and learning between everyone involved in introduction, management, financing and use of technology.
- Due to the qualitative methodology it provides a qualitative result, which should be fleshed up with some semi-quantitative data. The results should allow well grounded "YES", "NO" or "YES IF" decisions on how a technology can support sustainable service delivery. The TAF is not designed to allow directly the selection of technologies and it is not supposed to be an evaluation tool for programmes or projects.
- The TAF is designed as a generic tool, therefore it should not be taken and applied “just from the shelf” without any customization. The challenge is that many organisations are pressed for time and have resource constraints meaning they might push hard to reduce upfront preparation. There is the risk that the quality of findings and trust in the methodology will be compromised if adequate efforts are not made to customise the tool up front.
- For each TAF application sufficient upfront preparation and contextualisation through skilled and experienced personnel are needed. In particular it is key to have a strong, experienced facilitator who will lead through the entire process from preparation up to facilitation of the workshop.
- The TAF concept offers a flexible framework which can be further developed to different technologies and purposes such as for monitoring of programmes (Nicaragua) or assessment of various ICT tools. More organisations are interested in developing specific tools based on the TAF methodology, e.g. for promoting ICT (by IRC) or for supporting the scaling up of technologies (GIZ).
- As the TAF requires a certain level of capacity, skills and facilitation. Sufficient time and appropriate selection of facilitators are needed to get the best out of site visits and workshops. If language skills (English) and capacities within the sector are weak such as in parts of South Sudan, applying the TAF becomes a major challenge and needs particular preparation and support e.g. translation of materials into local languages. However where there are sufficient resources and already a certain level of understanding, the TAF becomes a standard process and can be applied without major external support such as in Nicaragua.
- The TAF uses a joint workshop for the scoring involving all stakeholders as a catalytic moment in the process. This approach works in many social economic and cultural contexts. However in India due to cultural norms (not all people are allowed to sit in the same meeting. Therefore the workshop had to be split up in a series of

workshops which made exchange and learning more challenging. In Nicaragua, when assessing sanitation, participants split up into gender specific groups to discuss sensitive issues separately. In Afghanistan the TAF application was split into three workshops because of unavailability of personal due to the time of year and security concerns.

- Almost all users of the TAF appreciated the exchange and joint learning which was created through the process, e.g. in Nicaragua where the TAF combined for the first time technology assessment and participation of users, NGOs, service providers and government agencies.
- One of the key indicators for all assessments is “affordability” (indicator no4). Experiences show that is a challenge to collect valid data to figure out the lifecycle cost components. However in many cases “affordability” is an issue, which is relevant considering the SDG targets.
- The scoring is based on qualitative scoring questions which should be answered in the workshop. Some workshops managed to apply scores even with no hard facts, other groups struggled and were looking for more “objective” methods. As the indicators are limited to keep the TAF manageable they are somehow aggregated and need qualitative data. Therefore there is a limit on how far a participatory process doing scoring can be designed in a more transparent process. In Tanzania participants struggled to give “red” scores e.g. to indicators at government perspective as this would mean that the own staff would score its own government as “red”. This story shows that apart from “thematic “discussions and exchange the process of going through the steps of the TAF by all participants together triggers joint learning and strengthens accountability which is a very valuable achievement as well.
- So far there were too few TAF applications in one country to assess the impact of the TAF on the level of innovation and the capacity within the sector of that country.

Operational aspects:

- As the TAF is a participatory tool and most of its benefits are generated through the open discussion of issues and on accountability, it is key to have a strong independent facilitator, who can lead through the entire TAF process. This person needs strong facilitation and social mobilisation skills as well as some background in the area of WASH technologies and services delivery. She/he needs good language skills to translate the wording and concept of the TAF into any local languages. The facilitator must also ensure that technology/service users participate in the discussion. In Nicaragua the preparation process went a step further as the TAF questionnaires have been translated in a local language (Misquito) considering local socio-cultural context. The facilitator needs to be an experienced and respected person as she/he has to deal with strong voices that might interfere with the discussion and bring in a hidden agenda. For big group workshops such as for the training of 35 Regional Water Officers in Tanzania on TAF two facilitators were involved.
- Upfront preparation for the TAF, e.g. data collection on the lifecycle cost of the technology and facilitation of the process need time and resources and is a precondition for a meaningful TAF process.
- Rough cost figures for one TAF application can be estimated based on several TAF applications which were conducted in different contexts: Once the team applying the TAF is acquainted with the TAF methodology and context one TAF application takes about 6-8 working days in total including preparation, field trip for data collection and for the workshop with the local team. Out of the 6-8 days at least 2 days are needed for contextualisation of questionnaires and desk research (data reported from Nicaragua and Kenya). Average costs for transport venue, per diem of participants are about US\$ 2,000.

The costs for preparation and facilitation might increase up to US\$3-5,000 if team members are not familiar with the methodology and need more time and support for contextualisation and preparation. If producer or retailer is not present in the region, there might be additional costs to bring them into the region for the workshop. However even under these conditions the costs for applying the TAF are still small compared to much higher opportunity costs if one considers the costs e.g. for one borehole and handpump which are installed in vain of about US\$15,000.

In contexts where the local private sector should fund the TAF application e.g. in Ghana if a private business wants to launch a new product this investment can be a major hurdle. Here donors could come in to support joint learning and innovation.

Potential of TAF for informing design of business development process:

- In the TAF framework scalability of technologies and related services and business aspects are not presented explicitly in one single indicator, but reflected in various indicators. The key indicators for scaling up can be found in the column of “producer/provider”, but also in the two other columns as all actors influence the

scaling up process. Based on the experiences so far the most important factors apart from those in 2nd column for producer include No 1, 3, 4, 6, 11, 15, 16 and 18.

- Looking at the components of the Business Canvas Model (www.businessmodelgeneration.com), a widely used framework for describing business concepts, the TAF indicators cover all aspects which are used within the Canvas approach. However the TAF is designed for decision making in an early phase of technology introduction and business development (planning and feasibility stage). Therefore for supporting the uptake of technologies in later stages it is necessary to further develop and apply more specific tools.

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Conclusions and Recommendations

The TAF has been applied by various institutions and there plans to further establish it for monitoring and supporting scaling up of services. Users appreciate the TAF to be a robust and flexible tool for assessing applicability and scalability of technologies. Challenges for TAF applications include the need to invest sufficient time and resources in upfront preparation and contextualisation of the tool. It is necessary to use an experienced and independent facilitator and have at least one participant who is well informed about the technology under review. In some countries the TAF has become a monitoring tool for routine appraisal of technologies.

Further research could explore the usefulness of the TAF in shaping business models for different technologies. When the TAF is used better efforts must be made to document experiences, particularly in relation to impact sustainability of services at a sector level and on innovation.

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