WASHTech*TAF

Technology Applicability Framework

User Manual

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Glossary

Terms

To fully support the application of the TAF, a proper understanding of terms and terminology is needed:

Actor:	A person or organisation that has a role in enabling or hindering the uptake and use of the technology being assessed e.g. user of technology, national government, local NGOs or private sector.
Context:	Describes situation the technology is being introduced in, which is generally a complex mix of imprecisely known and dynamic factors, which include: physical environment and processes (landscape, climate, soils, geology, rivers, lakes, groundwater, wetlands, wildlife, vegetation); economic and demographic situation and trends; social, cultural, linguistic, ethnic, gender values and behaviours; political situation and history.
Cost Model:	The way capital expenditure (CapEx) and operation and maintenance costs (OpEx) for minor repairs are covered and specific roles in a technology introduction process are distributed. E.g. a market based approach is a cost model in which no direct cash subsidies are provided. The term CapManEx describes costs for major repairs.
Host:	Government institution at national level in charge of following up the use of the TAF; in most cases appointed by Ministry responsible for Water and Sanitation.
Innovation:	A process to develop or introduce something new.
Introduction:	Describes measures and the process to take a new technology to scale. The introduction process is often rather unsystematic. The guide for the Technology Introduction Process (TIP) is a guidance document to offer a systematic description of the introduction process.
Invention:	Is a new device, method or process. The invention phase is when the invention happens.
Perspectives:	In the TAF assessment the specific views and perspectives of three key stakeholder groups will be highlighted: user/buyer of a technology, the producer/provider and the regulator, donor or facilitator of the introduction. If needed more perspectives can be added e.g. to split users according to gender.
Product:	Is the combination of elements composed of the technology itself and other marketing elements, such as its price and the promotion or the place.
Roles:	Describes a specific set of tasks an actor should undertake, e.g. regulation is the role of government.
Scoring Workshop	An event where Actors are taken through the TAF scoring exercise of the technology and the context in which it is to be, or has been, applied.
Sustainability dimension:	Six areas which are key for sustainability: social, economic, environmental, organisational - institutional - legal, skills and knowhow and technological.
Tasks:	Specific activities an actor should accomplish according to his or her role.
Technology:	Single component or a combination of technical components, which are used to serve a specific purpose and to provide a service. Technologies might work as standalone technologies or compose a system. In the TAF the term technology is also used for a product, which is the combination of technical and marketing elements.

Uptake: The act of taking up or accepting something on offer, or the rate of this. E.g. the uptake of the rope pump in the first two years of its introduction in a district was 100 units.

Acronyms

CapEx	Capital Expenditure
CapManEx	Capital Maintenance Expenditure: major repairs or replacement of equipment
OpEx	Operational Expenditure
TAF	Technology Applicability Framework
TIP	Technology Introduction Process
WASH	Water, Sanitation & Hygiene

Acknowledgements

TAF Version 1

The Technology Applicability Framework (TAF) was developed by the WASHTech project, which was a 3 year FP7/EU funded action research project (2011-2013). The WASHTech consortium consisted of IRC WASH (Netherlands), WaterAid (UK, Ghana, Burkina Faso and Uganda); Cranfield University (UK); Skat Foundation (Switzerland); WSA (Burkina Faso); TREND (Ghana); KNUST (Ghana) and NETWAS (Uganda). The TAF was tested in 18 assessments of 13 WASH technologies in three countries (Uganda, Burkina Faso and Ghana) in three rounds. In the process of testing of the TAF all partners contributed substantially to its development and of its methodology. The lead author was André Olschewski of Skat Foundation.

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Following its launch, the TAF has been used many times in countries ranging from Nicaragua, to Afghanistan, to Nepal, to the Democratic Republic of Congo, and by a range of organisations, including by WaterAid, IRC WASH, GIZ, Skat Foundation, Water Mission, University of Technology Sydney and many more. With feedback from these users and with the kind financial support of World Vision Switzerland and Skat Consulting Ltd, this updated version of the TAF methodology has been developed. The aim is to build on the strengths of approach while addressing issues raised by users. While this update was begun by André Olschewski, the lead author of this manual is Sean Furey of Skat Foundation. The author thanks all those who provided invaluable guidance and encouragement, any errors or omissions remain the author's own.

The WASHTech-TAF is an on-going open-source collaboration made possible through the Rural Water Supply Network (RWSN) and the Sustainable Sanitation Alliance (SuSanA).

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Quick Start

What is WASHTech-TAF?

It is a tried-and-tested way of helping organisations improve their understanding of whether a technology that is designed to tackle a Water, Sanitation and Hygiene (WASH) problem will work in a particular context. This improved understanding can be used to support decisions on:

1. Whether or not to invest or support the introduction of Technology X in Context Y
2. Whether or not to continue to invest, support or approve the introduction of Technology X in Context Y
3. Is Technology X ready to scale-up? And what are context-sensitive factors that may play a major role in the success or failure of widespread promotion and uptake?

Who is this manual for and when should it be used?

- Innovators looking to test how well their product fits their target market and who want to identify opportunities and bottlenecks.
- Governments, Investors and Development Partners who want a standardised way to assessing WASH technologies that are presented to them for support and/or approval.
- Evaluators looking to assess the performance of a given technology within whatever project, programme, policy or organisation that they are evaluating.
- Researchers looking to understand the role of a specific technology as a research question in itself or as part of a wider question on Water, Sanitation and Hygiene interventions.

Why is it needed?

According to the Joint Monitoring Programme of WHO and UNICEF, in 2017: 3-in-10 people worldwide, or 2.1 billion, lack access to safe, readily available water at home, and 6 in 10, or 4.5 billion, lack safely managed sanitation[1]. To achieve the Sustainable Development Goals[2] 6.1 and 6.2 on universal access to safe water and sanitation, and to make the Humans Rights to Water and Sanitation real for all[3].

However, over many decades there have been many failures to develop or transfer technologies to where there is need. This has generally happened because there was not enough understanding of the context in which the technology would be used, or no clear route to support a successful pilot project to achieve impact at scale.

How does it work

The main change is that the WASHTech-TAF now has two modes of use:

[1] https://washdata.org/
[2] http://www.un.org/sustainabledevelopment/water-and-sanitation/
[3] http://www.righttowater.info/

and how is this version different from Version 1?

Mode 1: Participatory Fieldwork-Workshop Assessment is an evolution of Version 1 with some minor adjustments. It is designed as a participatory tool that follows a stepwise process. It uses specific questionnaires for screening and field questionnaires for the assessment. Information needed is collected through desk studies and field visits. All relevant actors are involved in the collection of data and in the generation and discussion of results. This allows these actors - such as representatives from national and local government and users of the technology – to bring in and share their views and concerns.

Mode 1 requires good preparation, sufficient time and a highly competent facilitator to guide the participatory process.

Mode 2: Expert Panel Assessment is new to this version. It is designed to be more of checklist to guide expert panels, or working groups, to help them assess applications put in front of them in a desk analysis or technical assessment meeting. An example could be a major organisation that is looking to incorporate innovation into its WASH programmes but needs an efficient and systematic way of assessing proposals put to them by innovators, suppliers, NGOs or researchers.

Mode 2 requires relevant technical experts and well-collated and well-presented information and evidence.

What are the limitations of the TAF?

The TAF is designed to assess a single WASH technology (e.g. a pump) which is or will be used to provide WASH services in a district or region. However the TAF can also be used to assess complex systems such as a piped supply with tanks, pipes and taps. For this, prior to the TAF assessment of a system, the system boundaries for the assessment have to be defined properly.

The TAF is designed as an assessment tool for a single WASH technology in a specific context, not as a selection tool which selects between various technologies.

Can the TAF be used for non-WASH technologies?

Yes. This methodology can be adapted to a range of uses. The focus on WASH technologies evolved from the needs and interests of sector.

Overview: TAF Methodology

Mode 1:
Participatory Fieldwork/Workshop

Overview of Mode 1

Stepwise procedure for application of the TAF

This TAF Manual provides guidance on how to apply the TAF in practice following a stepwise process.

What is the objective of the assessment in your particular case?

Depending on the objective of your TAF application (e.g. assessing a new technology, evaluation of an existing technology) and on existing country specific procedures, the design of the TAF application process needs to be adapted, e.g. having one or more days for field visits. However in all cases, all four steps must be incorporated in the adapted methodology.

Preparation	**1. Analysis of the objective of the assessment** (in particular technology, context, experiences so far, need, partners) by lead organisation e.g. Ministry at national or regional level **2. Setting up a study team**
TAF Step ❶	**3. Screening, mostly desk work**
TAF Step ❷	**4. Preparation of field work**; in particular contextualisation of questionnaires (srrening and assessment) , collection of data on Life Cycle Costs (e.g. for indicator 4); familiarisation with technology and services, training of study team on use of TAF, logistics; orientation of partners on TAF process and agenda **5. Formal orientation; c**urtesy visits to local authorities at district and village level and to partners; refining of schedule, translator of local languages if needed; training of local staff on use of TAF **6. Field visits**: interveiws and data collection using Focus Group Discussion, bilateral interviews, with randomly chosen households and site visits **7. Processing and validation** of data collected; triangulation of data form different sources; in small group **8. Scoring workshop (1-2- days)**; attended by all relevan tasctors including from community; Moderated by an experienced and independent facilitator
TAF Step ❸	**9. Presentation of all results** (From screening, field visits and scoring workshop)
TAF Step ❹	**10. Interpretation of result**s; agreement of next steps in the workshop setting AND documentation

For an assessment of existing technologies in a specific context the scoring workshop should take place at district level. This implies that data processing and validation has to be done in the field prior to the workshop and that additional participants for the Scoring Workshop, e.g. from national level have to travel to the district to attend the workshop.

In particular for an assessment of a new technology that might need validation from a central body, a scoring workshop at national level might be more appropriate. If the

user voice cannot be presented there directly, it need to be represented indirectly, through a trusted person and based on consolidated data on paper. Having the workshop at national level would offer the opportunity for participants to come in and bring in new ideas and thoughts which may not possible if organized at district level.

In all cases, you need to ensure that **users of the technology are adequately involved in the process and that they** can bring in their perspectives and voices into the Scoring Workshop.

One-Pager to read before entering a Mode 1 TAF assessment

What is the rationale of this assessment?

To prepare the TAF assessment, go through the general questions, such as:

- What is the purpose of the assessment: assessing a new technology or an existing one? Who is interested in this assessment?
- What is the WASH related issue to be solved with this technology?
- What are the experiences with this technology or similar ones regarding the level of service provided in your region or district?
- What is the context you want to look at?

Resources needed

The TAF is a 4-step process, which includes field work. All relevant actors should be involved in the field work and in the scoring workshop. There should be sufficient resources to do all four steps properly. It costs (in Sub-Saharan Africa) around US$ 2-3,000 per assessment of one technology per district and needs about 7- 8 working days' time including upfront preparation (see Annex 7 & 8).

What happens in the field?

TAF fieldwork typically takes 3 days:

- Day 1: Introduction of the TAF process to stakeholders and agreeing objectives.
- Day 2: Field work to visit technology and context being evaluated and verification of data
- Day 3: in a workshop presenting data from field, Scoring of technology/service using the TAF and formulating recommendations for sustainability/scalability

What happens before going to the field?

Preparatory work prior to going to the field (needs two to three days):

1. Identifying which technology you want to focus on and the objectives of this assessment. This task is done by the study team, comprising the host and selected experts
4. Setting up of field visit team (could include members of study team)
5. Screening (= Step of TAF), mostly done as desk study
6. Identifying the district/communities you wish to evaluate the technology in
7. Agreeing participation of district staff and use of district headquarters for the training and the scoring exercise
8. Inviting relevant people to use the TAF with: producers and local providers of the technology (private sector and NGOs), local and national government staff, other NGOs, donors. Make it clear if it is not a formal evaluation of an organisation or project, and if it is, make it clear who and what is being evaluated and for what.
9. Gather as relevant data and evidence and put them into a format that participants can easily understand, e.g. posters with maps and graphs.

Where should the scoring workshop be held?

The scoring workshop usually takes place at the district/local government headquarters with permission and participation of the district staff. This allows users to participate directly in scoring workshop.

How many

A field visit team for one assessment is composed of 3-4 people with strong expertise in

people will be involved?

research and community mobilization, one person for documentation, a driver, and a translator for local languages if needed. The scoring workshop participants will include more stakeholders (up to 10—15 people). You may wish to invite some or all to the field visit as all.

Composition of a team?

When building teams, aspects such as experience with this technology (water, sanitation, hygiene) and working in that region should be considered. The members of the field visit team should be selected so that they can provide a strong, independent facilitation of the process and workshops as well as a secretariat.

Step 1: Screening

I. Purpose of the screening

The purpose of the screening is to assure a cost effective assessment of a technology which has the potential to be feasible and reasonable in a specific context. The screening helps to reject technologies which are not suitable in a particular context, e.g. latrines where the groundwater level is high and the area is often flooded.

Basic assumptions

The screening in the TAF is designed to be applied for a specific context at local level. The result of the screening is therefore valid only for the context considered and a reasonable period of time.

For screening it must be clear which specific technology should be assessed and which specific context has to be considered. In general a screening should always be applied, even if the technology is already in use within that context. During the field visit it is important to verify on the ground if the technology identified on the ground is really the technology to be assessed, if it is part of a system of various components and how to define reasonable boundaries for the assessment.

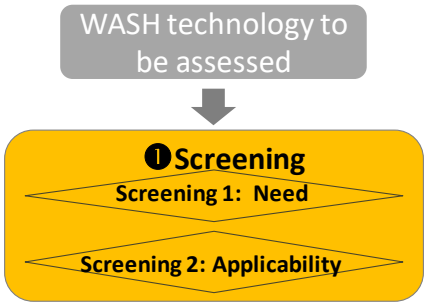
Expected result of the screening

Based on the results of the screening, the TAF user will decide on whether the time and other resources should be dedicated to a proper assessment or rather to rethinking the usefulness of this technology in this context. Information collected in the screening will feed into the overall interpretation of the results in step 4.

II. How does the screening work?

The screening is based on a simple-to-use questionnaire, the so called screening sheets. The screening sheets include all questions to support the user in the decision making for the screening. Two key criteria are used for the screening, the need for this particular technology in the area being considered and the applicability of the technology in this area. Additional information will be collected on acceptance and on the way the technology is supposed to be introduced.

The screening sheets also collect information about the specific context the technology should be introduced in, the purpose the technology should fulfil, e.g. the level of service.



Choosing the right screening sheet

Annex 2 provides tailor made screening sheets for "Water Lifting Technologies", (e.g. pumps) and for "Latrines" (e.g. VIP) For other technologies or even systems, the screening sheets need to be adapted, but should focus on yes/no 'show-stopper' questions. For example, if there is a physical/environmental reason that means that the technology will not work at all in the chosen context then there is no point in taking the assessment further.

Who does the screening?

A study team composed of representatives of the host institution of the TAF and selected experts will accomplish the screening.

Data and time needed for screening

The information needed to answer the relevant screening questions should be available or accessible for professionals at national and district level. Field visits should not be necessary to answer the screening questions, thus filling out the screening sheets can be done as desk work. The time needed to do the screening is approximately half a working day.

Step 2: Assessment

I. Purpose of the Assessment

The Technology Applicability Framework (TAF) is a decision support tool on the applicability, scalability and sustainability of a specific WASH technology to provide lasting services in a specific context and on the readiness for its introduction. The TAF assesses not only the technology but also if key elements for a successful introduction of this technology are in place to assure that lasting services can be provided. The concept of the TAF allows the user to identify areas of risks and of opportunities and to define specific measures to support the technology introduction process. The TAF can be used to identify requirements and challenges of a specific cost model which has been chosen as basis for the introduction process.

Expected outputs

The main output of this assessment step is a graphical profile, supported additional comments. The result of the TAF assessment can support the decision making to "Go", "No-go" or "Go (under certain conditions)" for the introduction of the technology being considered. The results should be documented in a final assessment report.

II. How does the assessment work in general?

A successful introduction of a WASH technology is only realistic if an enabling environment is established and all key actors are supportive and able to fulfil their roles.

6 sustainability dimensions

To ensure sustainable services provided by WASH technologies, six sustainability dimensions should be considered: social, economic, environmental, institutional and legal, skills and knowhow and the technical dimension.

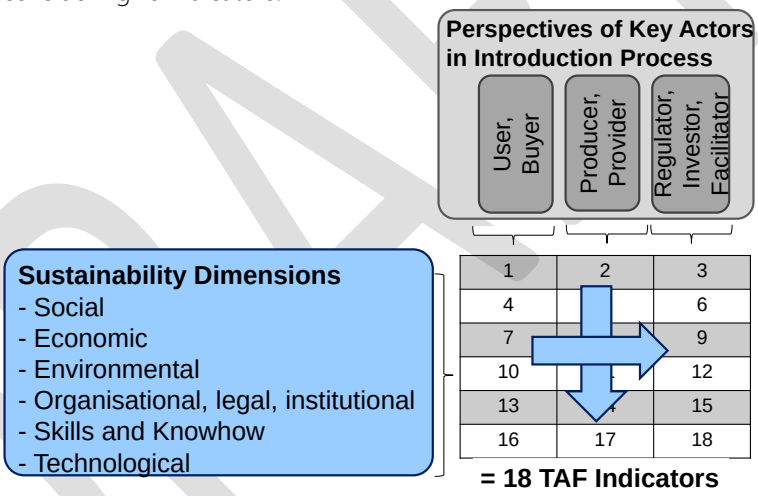
Perspectives of 3 key actors

In the TAF methodology the **perspectives of key actors** in the introduction process are considered explicitly in order to highlight their roles and needs in the introduction process. To capture the most relevant priorities of the key actors in the technology introduction process, the six sustainability dimensions are explicitly assessed from the perspective of the

1. Technology **user or buyer,** the user can be the household or community using e.g. a latrine or even an operator in charge of providing services,
10. Technology **producer or provider** (retailer of products such as spares, service provider related to the technology itself),
11. **Regulator** of the WASH sector, **investor** in the introduction process **or facilitator** of the introduction process.

TAF assessment based on 18 indicators

In the TAF the assessment of WASH technologies is based on a set of **questions** considering 18 indicators.



III. How does the assessment work in detail?

1. Analysing the objective of the assessment

For each TAF application the host should analyse the particular objective of the assessment and define the tasks and the data needed accordingly, and identify potential partners to form the Study Team, the Field Visit Team and the Workshop Team. The Study Team supports conducting the TAF assessment process, the Field Visit Team is in charge of collecting field data in a neutral way, the Workshop Team is responsible for bringing in all relevant views in the scoring. The composition of team members should reflect the relevant topics for this assessment. Maybe members from other sectors (e.g. health, agriculture) should be included. All team members should be provided with sufficient documentation and should be comfortable with the TAF methodology and the concept of the addressing questions focused around the sustainability dimensions and different perspectives. This needs time for discussion and training within the group.

2. Choose Perspectives

As noted above, the TAF uses 3 Perspectives, which in general are:

12. Technology **user** or **buyer**
13. Technology producer or provider
14. **Regulator** of the WASH sector, **investor** in the introduction process or **facilitator** of the introduction process.

With some technologies the User is not the Buyer (and this can often be part of the sustainability problem).

Decisions should be made whether the TAF assessment should:

- Connect the Buyer with Perspective 1 (User) or Perspective 3 (Regulator/Investor/Facilitator) or a separate Perspective 4;
- Include more perspectives, not included in those above. For example, female WASH technology users could be specifically targeted by the assessment.

Be aware that every additional perspective adds 6 more Sustainability Scoring Questions. It is therefore recommended to choose the highest priority 3 perspectives to prevent the process becoming too complex and time-consuming.

3. Choose Scoring Questions

A **Scoring Question** should be a clear, single question that can be answered by the scoring rules (see below). Any Scoring Question will be a simplification therefore it is important to choose questions for each Perspective and Sustainability Dimension that is:

- Relevant to the technology;
- Relevant to the Perspective and the Sustainability Dimension;
- Can be answered by a mix of objective evidence and Actor subjective inputs.

Sometimes the complexity of the issue means that it is easier to have a series of Guiding Questions around which to structure the discussion with the Actors – however, feedback from earlier TAF versions was that Guiding Questions often added layers of complexity that were difficult to reconcile into a single scoring answer.

While data and evidence is good, choosing a Scoring Question around available data and evidence does not necessarily mean that you are asking the most important question.

Suggested Scoring Questions for different technology types can be found in the Annexes.

4. Determine data needs

The data needed to answer the chosen questions have to be carefully determined. Subgroups of interviewees should be identified which could be interviewed separately to collect the data.

5. Develop field questionnaires

For each sub-group specific questionnaires should be developed. Prior to the field visit. Double checking of data could be useful to allow triangulation. **The language should be customized to the local context.**

Specific cost data needs to be collected, checked and processed using the simple cost tool (see Annex 6) prior to going to the field and approaching users for the interviews. Field visits also should allow for a verification of results from screening, dependencies of technology and services on other components, and boundaries and assumptions for the assessment.

6. Prepare realistic schedule, data sheets, timing of assessment

A realistic schedule is developed based on a careful selection of sites and direct contacts and pre-information of all local actors involved. The timing should consider aspects of rainy season, activities of farmers i the field or cultural events. The schedule should allow some flexibility in terms of timing. At this stage, the composition of the team should be reviewed again.

7. Organizing logistics for field visit and data collection

This should include formal orientation of representatives at district and local level

8. Training of all actors involved, including local focal people

It is important to ensure that everyone involved is reasonably comfortable with what the TAF is, how it works and what the specific goals of this assessment is. This can be done in a separate briefing meeting beforehand or as part of the introductory briefing. Time invested in sensitising the actor will be rewarded in the Scoring Workshop.

9. Field visit, data collection, pre-analysis and verification

The key methods for data collection are Focus Group Discussions (FGD). Based on prepared field questionnaires, FGDs are performed with all key groups in the community incl. local leaders, women groups, and disabled persons. Bilateral interviews with heads of households of the user community should be performed as a means for verifying results of FDGs. The total number of these face-to-face interviews per technology and region should not be less than 20 interviews. The households should be selected randomly. After each day of data collection the field visit group should verify the collected data before starting for the next day.

10. Assessment based on TAF guiding and scoring questions Scoring system in the TAF

The scoring in the TAF follows a workshop based procedure with involvement of all relevant actors if possible. The scoring workshop uses the validated data from the field as a basis for the assessment. If prepared properly the scoring workshop takes not more than one day if it is an assessment of one technology applied in one region. However to allow for a good discussion of findings it works well to split up the workshop and do the workshop in two days.

The scoring in a workshop

To start the scoring workshop, a short wrap-up of the field visit should be provided by the workshop facilitator. Additionally sufficient time should be dedicated to give a short introduction in the TAF methodology and the objective of this assessment as actors will also participate who are not familiar with the TAF methodology. In the TAF methodology a score will be given for each indicator using the traffic light system. It is important to highlight that scoring is not about criticizing particular individuals or organisations. It should focus on a constructive discussion and to agree on a result for the assessment.

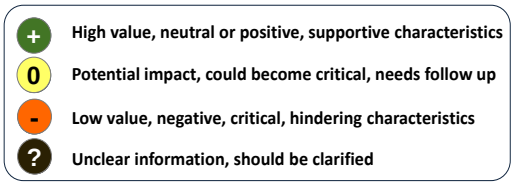
Prior to the scoring

Prior to the workshop, the data from the field visits need to be verified. The verified data are then presented to the workshop team for approval. In the next step communication rules for the scoring workshop are explained and agreed. In a further step the rules for deciding on a score should be discussed and agreed prior to the

scoring.

Scoring rules in the TAF

In the TAF an adapted "Traffic light" system is proposed as scoring rule:



Scoring should be done along dimensions to better focus on one dimension. However, scoring can also be done separately, in the group according to the perspectives and results shared and discussed later in the workshop group. To support the process of deciding on a score using the traffic light system, and to add further information for interpretation an intermediate step can be introduced. For example, numbers between 1-5 can be used to allow more differentiation in the interpretation of field data.

Handling conflicting scoring

To enable the participatory process and the sharing of different views on issues it is highly recommended to do the scoring in the entire workshop group. This ensures consistency in the methodology of scoring and transparency on information and perceptions. However in some cases, there might be concerns that some participants could dominate the discussion. There are different options to deal with strong opinions in the scoring workshop:

- Splitting up in subgroups in a first round and deciding in the workshop group in a second round. If the groups decide to split up in sub groups, mostly, it has to be assured that in each group there is the same procedure of discussion and the scoring methodology is adhered to.
- Another approach to soften eloquent speakers is to ask for scoring by each of the participants, ask for evidence if reasonable and after that to open the discussion for the floor.
- Anonymous voting could be another valid approach for scoring in case there are huge power imbalances and strong speakers.

Strong facilitation needed

In all cases it is important to have a strong, skilled and neutral facilitator who assures that communication rules are followed.

Step 3: Presentation of Results

❶Screening

Step ❶ "Screening" provides general information about the context the technology is supposed to be applied in, but in particular, the results include:

- the assessment of the need to introduce the technology in the context considered;
- the assessment of the applicability of this technology in this context.

Screening sheet

Especially for complex technologies such as sand dams, it should be checked if scientific recommendations concerning e.g. the proper siting and construction of the technology have been considered adequately.

Relevant information on acceptance and on dependencies of this technology on other technical components should also be reflected in the screening. All results, issues and questions should be documented on the specific screening sheet used for the specific technology.

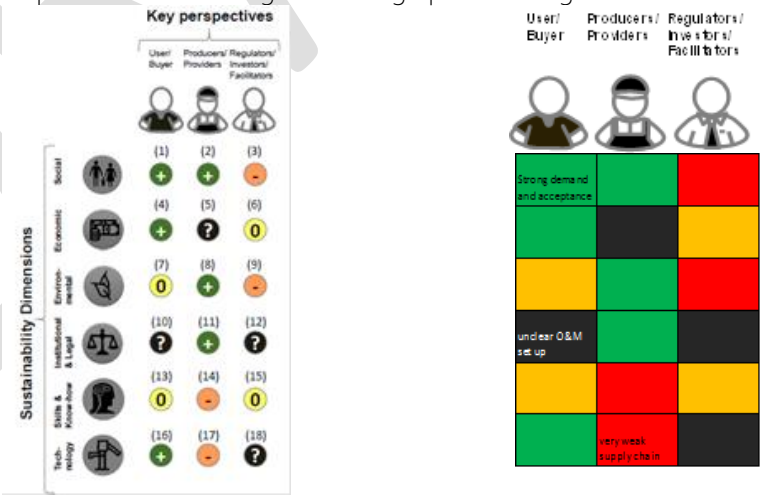
❷Assessment

After the field visits the data collected should be verified and presented in the scoring workshop for approval prior to the scoring. A compilation of the approved field data should be included in the presentation of the assessment as an annex.

Verified field data

Presenting the 18 scores in a graphical profile

The resulting 18 scores of the TAF assessment (see Annex 1) will be presented according to their numbers in a graphical TAF profile. The figure below shows on the left side an example of a TAF profile (left). On the right side, an example of an annotated profile is added using the same graphical arrangement of indicators.



Additional information for scoring

Nuances which came up during the discussion in the scoring workshop, such as different or conflicting views of stakeholders on one issue, should be captured to support the interpretation of the profile. As an example, additional information, such as in text or as figures used to provide additional information during the scoring can be presented in an annotated profile. To allow a more differentiated scoring also scores e.g. 1-5 could be included added as additional information.

Step 4: Interpretation of Results

❶Screening

The interpretation of the "Screening" step is straightforward. **Results of the screening are very context specific and not applicable to other regions without detailed analysis.**

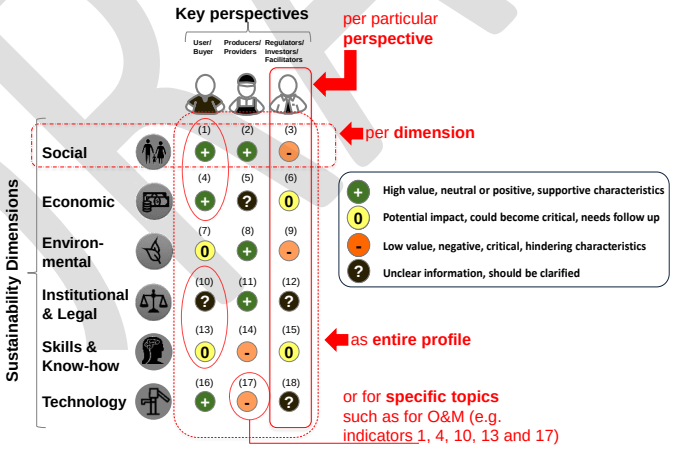
❷Assessment

Information on the scope of technology use, the mode of introduction and the boundaries defined for the assessment or impressions and information from the field visits are crucial inputs for Step ❷ and the interpretation of the results. Questions which came up during the screening (Step ❶) should be clarified during the assessment in Step ❷. The results of Step ❷ are interpreted based on the graphical profile, on the comments coming up during the field visit and the discussion but also on additional comments received during the screening and field visits.

Interpretation of graphical profile

The graphical profile offers various entry points and supports a comprehensive interpretation:

- Per row focusing on a specific sustainability dimension
- Per column focusing on a specific perspective
- Comprehensively as an entire profile
- Additionally specific thematic interpretation is possible with respect to cross cutting topics such as O&M (Annex 5).



Result of TAF assessment

These entry points allow to identify areas of high risk and to define appropriate mitigation measures, e.g. to improve the design of the introduction process. The result of the TAF assessment can support the decision making to "Go", "NOT-GO" or "GO under certain conditions for the technology being considered". It also indicates the bottlenecks e.g. concerning the service level provided by this technology and the introduction process. The TAF process can also trigger discussion and negotiation if there are actors willing to take the technology further.

Conclusion and comprehensive

A comprehensive synthesis of the discussion of the results and of the detailed interpretation including the nuances in the process is documented in a Final

documentation of the results and process

Assessment Report. The report should elaborate on the process of the TAF testing, participation of the different actors, the atmosphere in the scoring workshop but also on the particular technology, e.g. photos or drawings, the TAF profile. Annex 4 provides a list of minimum information which should be provided in the Final Assessment Report. As a four page summary document of the Final Assessment Report a technology brief informs the sector on the results of this assessment (see Annex 4).

Results of the TAF assessment are very context specific and not applicable to other regions without detailed analysis.

Mode 2:
Expert Panel Assessment

Overview of Mode 2

What is the "Mode 2: Expert Panel Assessment"?

This Mode of the WASHTech-TAF was developed in response to requests for a simplified version of the methodology. It is anticipated that this Mode will be used for assessing new technologies rather than evaluating the performance of existing ones.

The aim of this Mode is to provide a straightforward and transferrable peer-review framework for assessing whether a technology is ready to be scaled-up and where support can be targeted.

This Mode can also be used as a classroom teaching/workshop exercise.

Example 1: A WASH programme in country "X" has had some success and improved access to safe water and improved sanitation, but faces sustainability challenges: existing systems are failing as quickly as new ones are built. The programme managers are approached by an organisation who has been piloting a smart monitoring

Example 2: A bi-lateral agency wants to support innovation that can help progress towards the SDGs: they have an open call and receive submissions from dozens of NGOs, Universities and private companies. They need an efficient and transparent way to identify the most promising ideas which their organisation can support effectively, and provide useful feedback that will allow parties to learn and improve.

Therefore it is presumed that the way that this Mode of the TAF will be used is that an innovator or technology provider will apply to you with their idea and you will undertake this Mode of TAF assessment by:

1. Undertaking Screening of their idea (submitted as a concise concept note or Expression of Interest) to decide whether to proceed further with the assessment;
2. To request that the applicant submitted a detail proposal that provides you with specific information in relation to the sustainability dimensions and perspectives
3. Assemble a face-to-face meeting or virtual meeting of relevant experts and/or key stakeholders.
4. Make a decision on whether or not to support the proposal and what form that support should take.

Mode 1 or Mode 2 assessment?

Wherever possible, a Mode 1 Fieldwork/Workshop assessment should be undertaken because it will provide conclusions that are closer:

- to the needs and perspectives of end users, especially the most vulnerable and marginalised;
- to the physical realities of how that technology might work (or not) in a specific environment.

Mode 2 should be considered as more of a high-level screening tool to inform policy decisions (for example national handpump standardisation policy) or to as a gateway to scaling-up support within a large programme or investment.

Ideally, Applicants to a Mode 2 Expert Panel Assessment would present findings from one or more Mode 1 Participatory Field/Workshop assessments.

Where can I find relevant Experts?

For this Mode of the TAF to work it is important that you involve the right mix of relevant technical and geographic specialists to advise you. Whether you need to remunerate such experts will depend on how much time you expect them to commit and whether you expect them attend a face-to-face meeting.

Suitable experts can usually be found through relevant professional networks:

- Rural Water Supply Network (RWSN)
- Sustainable Sanitation Alliance (SuSanA)
- Household Water Treatment & Safe Storage Network (HWTSSN)
- Water Integrity Network (WIN)
- International Water Association (IWA)
- The Water Network

Step 1: Screening

I. Purpose of the screening

The purpose of the screening is to assure a cost effective assessment of a technology which has the potential to be feasible and reasonable in a specific context and within the mandate or scope of the organisation undertaking the assessment.
The screening helps to reject technologies which are not suitable in a particular context, e.g. latrines where the groundwater level is high and the area is often flooded, or that don't fit with a programme scope, e.g. a household WASH technology in a programme of strengthening water utility asset management.

Basic assumptions

The screening in the Mode 2: Expert Panel TAF is designed to be applied for a national or organisational context. The result of the screening is therefore valid only for the context considered and a reasonable period of time. Because it is more high-level and generalised than a Mode 1: Participatory Fieldwork-Workshop TAF it is much more generalised and less well tuned to local context. If a Technology that is assessed under Mode 2 is judged to be a good fit in a particular country, then you should think seriously about undertaking Mode 1 TAF assessments at a more local level – especially in larger, more heterogeneous countries.

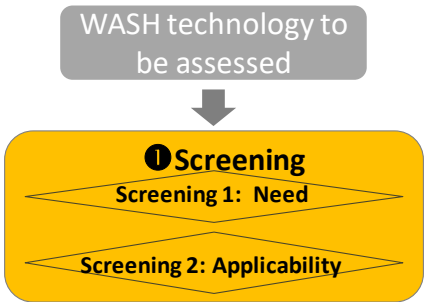
For screening it must be clear which specific technology should be assessed and which specific context has to be considered. In general a screening should always be applied, even if the technology is already in use within that context or programme. If it is part of a system of various components and the try define reasonable boundaries for the assessment.

Expected result of the screening

Based on the results of the screening, the TAF user will decide on whether the time and other resources should be dedicated to a proper assessment or rather to rethinking the usefulness of this technology in this context. Information collected in the screening will feed into the overall interpretation of the results in step 4.

II. How does the screening work?

The screening is based on a simple-to-use questionnaire, the so called screening sheets. The screening sheets include all questions to support the user in the decision making for the screening. Two key criteria are used for the screening, the need for this particular technology in the area being considered and the applicability of the technology in this area. Additional information will be collected on acceptance and on the way the technology is supposed to be introduced.
The screening sheets also collect information about the specific context and programme the technology should be introduced in, the purpose the technology should fulfil, e.g. the level of service.



1. Set the goals and boundaries of your TAF assessment

The Expert Panel Assessment TAF can be used for a range of purposes but the following guidance focuses on an open WASH technology innovation process where Applicants to pitch an idea to an organisation that is in a position to provide financial and/or mentoring support. An example of this is the USAID Development Innovation Ventures (DIV) – see Box 1.

The first step, as the Assessor, is set clearly define what goals you want to achieve for your organisation, the principles you follow and the wider WASH sector goals (namely SDG 6.1 and 6.2, and the Human Rights to Water & Sanitation). Equally important is to define the boundaries of what innovations you are willing to assess and support

Box 1: USAID Development Innovation Ventures (DIV) – aims and boundaries[4]

DIV's aim is to *"create a portfolio of innovations across sectors that improves the lives of millions of the poor around the world, especially individuals in extreme poverty and other vulnerable groups."*

DIV Core Principles:

- **Evidence:** DIV is designed to help find, test, and transition to scale the most effective innovations, and encourages the use of rigorous testing methods.
- **Cost-Effectiveness:** DIV seeks innovations that deliver more development impact per dollar than other ways of achieving the same development goals.
- **Pathways to Scale**: The ultimate goal of DIV is to support solutions that scale sustainably to reach millions of people in the developing world within a decade. Solutions must have a potential pathway to scale.

Projects that are not a good fit to DIV:

- Development interventions with limited potential to scale and poor demonstration of cost-effectiveness and impact (e.g., building schools, constructing orphanages)
- Basic scientific research (e.g., laboratory research of a prototype with no field testing; pharmaceutical testing before full regulatory approvals)
- Innovations on a private sector path to scale that lack a "base-of-the-pyramid" customer focus and are unlikely to lead to significant development impacts for the poor (e.g., e-commerce platforms in a developing country

[4] www.usaid.gov/sites/default/files/documents/15396/DIV_APS_OAA-16-000006.pdf (accessed 20.12.2017)

with a growing middle class)
- Planning or diagnostic tools, which typically are difficult to link directly to measurable development impacts
- Innovations that are applicable only in very limited contexts, limiting their scale potential
- Intermediaries with an indirect impact on development outcomes (e.g., incubators, accelerators, start-up bootcamps, conveners)
- Innovations with a very attenuated theory of change

2. Prepare and follow a realistic assessment schedule

Develop a realistic timetable for the assessment process to give sufficient time for:

1. Advertising the opportunity (e.g. a WASH Technology Innovation Challenge)
2. Deadline for Screening-Stage submissions
3. Screening of Submissions and invitation to those who pass to submit more details and supporting evidence
4. Deadline for Assessment Stage submissions
5. Checking submissions and gathering additional evidence and information needed for the Assessment
6. Sending out detailed proposals to Expert Panel members with sufficient time for them to review and prepare questions and comments.
7. Convene a face-to-face or virtual meeting where the Applicants make their pitch to the Expert Panel.
8. Opportunity for Expert Panel to discuss their conclusions and recommendations for whether support should be given and what form that support should take.
9. Notification to Applicant and negotiation of agreements/contracts.

3. Communicate clearly (1) your goals and boundaries; and (2) the process for Applicants and Assessors to follow.

For the Applicant, making a submission will be a significant time and cost commitment, therefore there needs to be clear guidelines on how the assessment process will work, including:

- typical timescales.
- clear expectations on how much detail and supporting evidence should be provided;
- what a successful outcome looks like in terms of support from and further obligations to Assessor.

4. Undertake the screening

Choosing the right screening sheet

Annex 2 provides tailor made screening sheets for "Water Lifting Technologies", (e.g. pumps) and for "Latrines" (e.g. VIP) For other technologies or even systems, the screening sheets need to be adapted, but should focus on yes/no 'show-stopper' questions. For example, if there is a physical/environmental reason that means that the technology will not work at all in the chosen context then there is no point in taking the assessment further.

Who does the screening?

The Screening should be done by an experienced WASH expert who has sufficient

experience and understanding of the type of the technology, context and the assessing organisation. Having access to a pool of experts at this stage for second opinions and additional data and information is also an advantage.

Data and time needed for screening

The burden of effort should be on the applicant and so the primary source of information should from them. However, you should collate as much relevant information as they can to test and triangulate with what is submitted.

5. Communicate the screening decision to the Applicants

If the concept note passes the screening, then provide the Applicant with clear guidance on what level of detail and supporting information they should provide for the Assessment stage, deadlines and timescales.

Step 2: Assessment

I. Purpose of the Assessment

The Technology Applicability Framework (TAF) is a decision support tool on the applicability, scalability and sustainability of a specific WASH technology to provide lasting services in a specific context and on the readiness for its introduction. The TAF assesses not only the technology but also if key elements for a successful introduction of this technology are in place to assure that lasting services can be provided. The concept of the TAF allows the user to identify areas of risks and of opportunities and to define specific measures to support the technology introduction process. The TAF can be used to identify requirements and challenges of a specific cost model which has been chosen as basis for the introduction process.

Expected outputs

The main output of this assessment step is a graphical profile, supported additional comments. The result of the TAF assessment can support the decision making to "Go", "No-go" or "Go (under certain conditions)" for supporting the Applicant to introduce the technology in the context being considered. The results should be documented in a final assessment report.

II. How does the assessment work in general?

A successful introduction of a WASH technology is only realistic if an enabling environment is established and all key actors are supportive and able to fulfil their roles.

6 sustainability dimensions

To ensure sustainable services provided by WASH technologies, six sustainability dimensions should be considered: social, economic, environmental, institutional and legal, skills and knowhow and the technical dimension.

Perspectives of 4 key actors

In the TAF methodology the **perspectives of key actors** in the introduction process are considered explicitly in order to highlight their roles and needs in the introduction process. To capture the most relevant priorities of the key actors in the technology introduction process, the six sustainability dimensions are explicitly assessed from the perspective of the

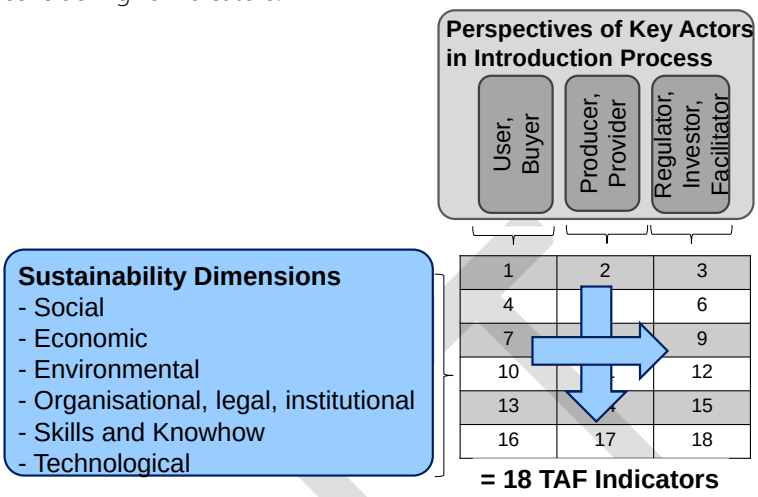
1. Technology **user or buyer,** the user can be the household or community using e.g. a latrine or even an operator in charge of providing services,
2. Technology **producer or provider** (retailer of products such as spares, service provider related to the technology itself),
3. **Regulator** of the WASH sector.
4. **Your** organisation as the **investor and/or facilitator**

The TAF-Expert Panel splits the third perspective, because it is important to consider how well the Applicant's proposal fits into your portfolio or mandate. This will nearly always be a different perspective from Government regulator in the country where the technology is to be introduced (even if both the Assessor and the Regulator are

both government organisations).

TAF assessment based on 18 indicators

In the TAF the assessment of WASH technologies is based on a set of questions considering 18 indicators.



III. How does the assessment work in detail?

3. Choose Perspectives

As noted above, the Mode 2 TAF uses 4 Perspectives, which in general are:

1. Technology user or buyer;
2. Technology producer or provider: in an innovation challenge, this will be the Applicant;
3. Regulator of the WASH sector.
4. Your organisation as the investor and/or facilitator

With some technologies the User is not the Buyer (and this can often be part of the sustainability problem).

Decisions should be made whether the TAF assessment should:

- have Perspective 3 as the Assessor organisation, or another major regulator, facilitator or investor (such as the national government of the country where the Technology is to be applied)
- Connect the Buyer with Perspective 1 (User), Perspective 3 (Regulator), or Perspective 4 (Investor/Facilitator) or a separate Perspective 4;
- Include more perspectives, not included in those above. For example, female WASH technology users could be specifically targeted by the assessment.

Be aware that every additional perspective adds 6 more Sustainability Scoring Questions. It is therefore recommended to choose the highest priority 3 perspectives to prevent the process becoming too complex and time-consuming.

Unlike Mode 1, which involves a wider group of Actors, the Expert Panel Assessment will comprise relevant experts who may or may not be representative of all the Perspectives. The Panel members will be required to empathise with the chosen Perspectives and role-play in the Assessment Meeting can help.

4. Choose Scoring Questions

A **Scoring Question** should be a clear, single question that can be answered by the scoring rules (see below). Any Scoring Question will be a simplification therefore it is important to choose questions for each Perspective and Sustainability Dimension that is:

- Relevant to the technology;
- Relevant to the Perspective and the Sustainability Dimension;
- Can be answered by a mix of objective evidence and Actor subjective inputs.

Sometimes the complexity of the issue means that it is easier to have a series of Guiding Questions around which to structure the discussion with the Actors – however, feedback from earlier TAF versions was that Guiding Questions often added layers of complexity that were difficult to reconcile into a single scoring answer.

While data and evidence is good, choosing a Scoring Question around available data and evidence does not necessarily mean that you are asking the most important question.

Suggested Scoring Questions for different technology types can be found in the Annexes.

5. Define additional assessment criteria

It is important not to make the assessment process too complex, however, if the not all principles or assessment criteria are captured in the Perspective/Sustainable Criteria matrix then it may be necessary add criteria specific to your competition, such as:

- Completion of eligibility and due diligence;
- Compliance with Assessor organisational policies, such as gender equality, intellectual property, environmental compliance;
- Closeness of fit to the your organisational objectives.

6. Determine data needs

The data needed to answer the chosen questions have to be carefully determined. The Applicants should put forward the necessary data to support their case, but the Assessors should think more broadly and be prepared the challenge the evidence put forward, including what has not been included and the underlying assumptions in any data sets or research studies.

7. Develop questionnaires

For each sub-group specific questionnaires should be developed. Prior to the field visit. Double checking of data could be useful to allow triangulation. **The language should be customized to the local context.**

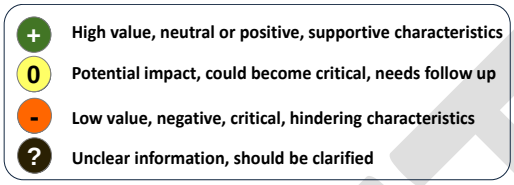
Specific cost data needs to be collected, checked and processed using the simple cost tool (see Annex 6).

8. Assessment based on TAF guiding and scoring questions

The scoring in the TAF can be done flexibly, based on the availability of the Experts, either through meetings or written feedback. The Assessor – you - and each Expert should come up with their own Scores, and further questions.

Scoring rules in the TAF

In the TAF an adapted "Traffic light" system is proposed as scoring rule:



Scoring should be done along dimensions to better focus on one dimension. However, scoring can also be done separately, in the group according to the perspectives and results shared and discussed later in the workshop group. To support the process of deciding on a score using the traffic light system, and to add further information for interpretation an intermediate step can be introduced. For example, numbers between 1-5 can be used to allow more differentiation in the interpretation of field data.

9. The Expert Panel Meeting

The Expert Panel Meeting can be face-to-face or online, whichever is most practical for the Applicants, you and the Panel Experts. A suggested agenda would be:

- Introductions
- Applicants make their 'pitch' presentation (should be short, e.g. 10 minutes)
- Cross-examination of Applicants by the Assessor and Panel Experts.

Rather than go through every single score it may be more efficient if you and Panel Experts compare their scores and questions agree beforehand which areas to focus questioning – i.e. the biggest risks and concerns, or doubts over the claims put forward by the applicant.

Step 3: Presentation of Results

❶Screening

Step ❶ "Screening" provides general information about the context the technology is supposed to be applied in, but in particular, the results include:

- the assessment of the need to introduce the technology in the context considered;
- how well the technology fits to the programme, competition or call;
- the assessment of the applicability of this technology in this context.

Screening sheet

Relevant information on acceptance and on dependencies of this technology on other technical components should also be reflected in the screening. All results, issues and questions should be documented on the specific screening sheet used for the specific technology.

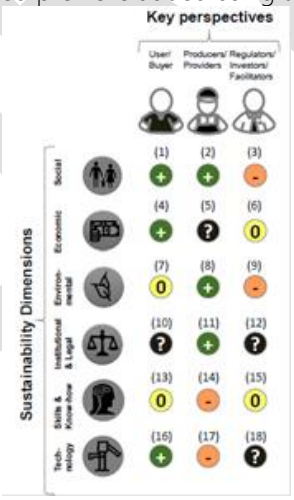
❷Assessment

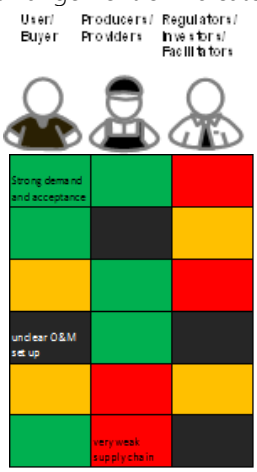
Expert-reviewed evidence

After the Expert Panel meeting, you, as the Assessor, should bring everything together into a consolidated score card. It may be that not all the questions were satisfactorily answered in the Expert Panel Meeting and you request further evidence. You will then need to make a decision on whether any re-submissions justify convening another meeting or if you are able to come to a decision.

Presenting the 18 scores in a graphical profile

The resulting 18 scores of the TAF assessment (see Annex 1) will be presented according to their numbers in a graphical TAF profile. The figure below shows on the left side an example of a TAF profile (left). On the right side, an example of an annotated profile is added using the same graphical arrangement of indicators.





Additional information for scoring

Nuances which came up during the discussion in the Expert Panel Meeting, such as different or conflicting views of stakeholders on one issue, should be captured to support the interpretation of the profile. As an example, additional information, such as in text or as figures used to provide additional information during the scoring can be presented in an annotated profile. To allow a more differentiated scoring also scores e.g. 1-5 could be included added as additional information.

Step 4: Interpretation of Results

❶Screening

The interpretation of the "Screening" step is straightforward and should you should be able to provide clear feedback to the Applicant why their submission did not progress to the Assessment stage.

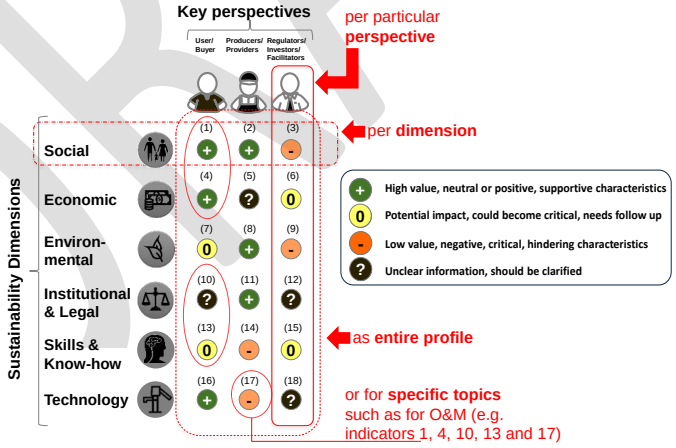
❷Assessment

Information on the scope of technology use, the mode of introduction and the boundaries defined for the assessment or impressions and information from the **Expert Panel Meeting** are crucial inputs for Step ❷ and the interpretation of the results. Questions which came up during the screening (Step ❶) should be clarified during the assessment in Step ❷. The results of Step ❷ are interpreted based on the graphical profile, on the comments coming up during the Expert Panel Meeting and any additional correspondence and meetings.

Interpretation of graphical profile

The **graphical profile** offers various entry points and supports a comprehensive interpretation:

- Per row focusing on a specific **sustainability dimension**
- Per column focusing on a **specific perspective**
- Comprehensively as an **entire profile**
- Additionally specific thematic interpretation is possible with respect to **cross cutting topics** such as O&M (Annex 5).



Result of TAF assessment

These entry points allow to **identify areas of high risk** and to define appropriate **mitigation measures**, e.g. to improve the design of the introduction process. The **result of the TAF assessment** can support the decision making to "Go", "NOT-GO" or "GO under certain conditions for the technology being considered". It also indicates the bottlenecks e.g. concerning the service level provided by this technology and the introduction process. The TAF process can also trigger discussion and negotiation if there are actors willing to take the technology further.

Conclusion and comprehensive documentation of the results and process

A comprehensive synthesis of the discussion of the results and of the detailed interpretation including the nuances in the process is documented in a Final Assessment Report. The report should elaborate on the process of the TAF testing, participation of the different actors, the atmosphere in the scoring workshop but also on the particular technology, e.g. photos or drawings, the TAF profile. Annex 4 provides a list of minimum information which should be provided in the Final Assessment Report. A four page summary document of the Final Assessment Report a technology brief informs the sector on the results of this assessment (see Annex 4).

Results of the TAF assessment are context specific and not applicable to other regions or innovation support programmes without detailed analysis.

Next steps

What to do with a completed TAF assessment

Well done! You have hopefully now successfully completed a TAF assessment. What happens now depends on your relationship to the technology and the context that you have just assessed, and how favourable the outcome was.

If conditions look favourable to pilot or scale-up the technology then further guidance can be found in the **"Framework for Technology Introduction Process – The TIP Guide"** (Olschewski, A., Skat Foundation, 2013)[5]

If the results were not good then the course of action will depend on where the strengths and weaknesses were and whether they can be addressed, either through design improvements to the technology itself, or trying to change some of the contextual conditions, or by trying it in a different context where there may be a better fit.

For a Mode 2: Expert Panel Assessment, the next stage will probably be a period of negotiation around an agreement between the Applicant and Assessor organisations on financing and future possible stages of assessment and support (for example: Box 2).

Box 2: **USAID Development Innovation Ventures (DIV) – Stages of Financing** [6]

- **Stage 1 Proof-of-Concept/Field Testing** – Awards within an approximate range of $25,000 to $150,000 (up to 3 years)
- **Stage 2 Testing and Positioning for Scale** – Awards within an approximate range of $150,000 to $1,500,000 (up to 3 years)
- **Stage 3 Transitioning Proven Solutions to Scale** – Awards within an approximate range of $1,500,000 to $15,000,000 (up to 5 years)

Good luck!

You can find resources and case studies on the washtechnologies.net website – please share your own experiences and help the WASH community build up a store of experiences that can help future innovations achieve their potential and to take use one step closer to universal access to safe water, sanitation and hygiene services.

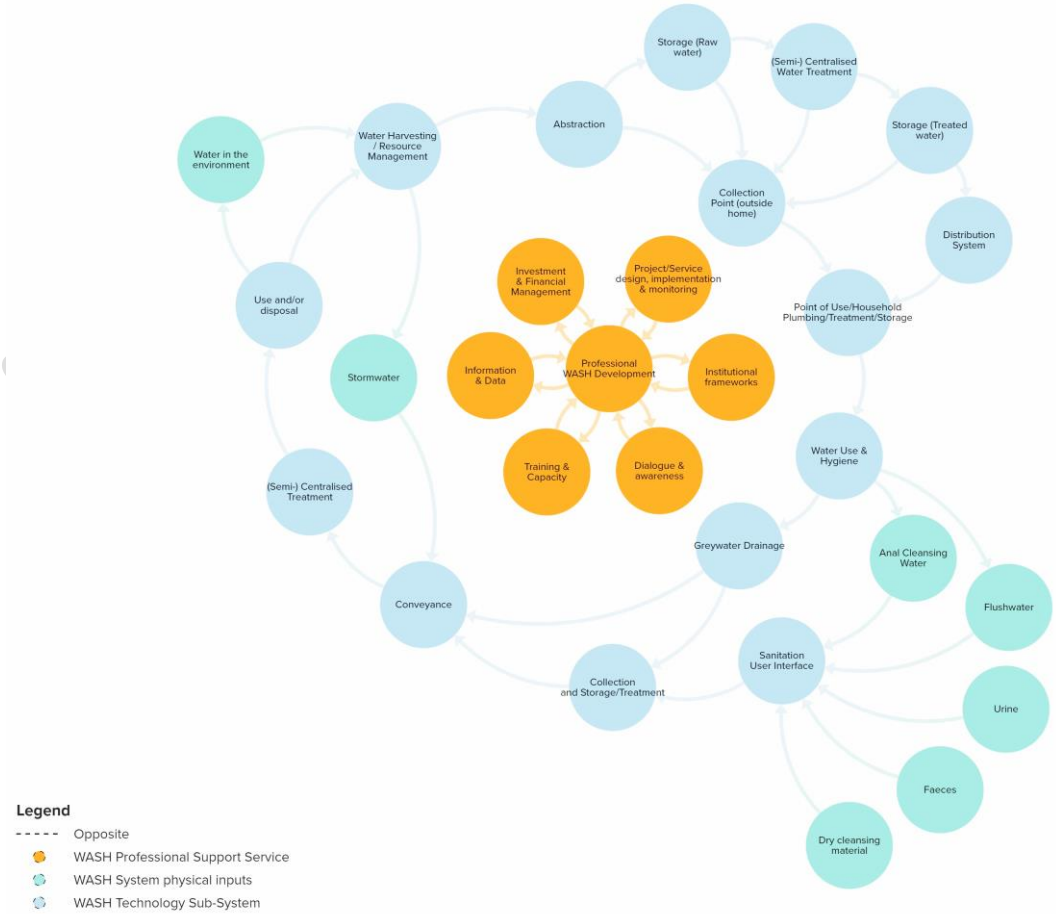
[5] http://rural-water-supply.net/_ressources/documents/default/1-546-2-1387451252.pdf
[6] https://www.usaid.gov/div/model (accessed 20.12.2017)

Annex 1: WASH Technology Systems

The Figure below gives a generalised overview of common components in a WASH system, based around the main cycle from water source, water supply system, to point of use, to treatment and disposal. In the centre are the six main elements of WASH professionalism that support the whole system. Technology plays an important role in each sub-system of the WASH cycle and the professional support services. However, technology is just one part of a many bigger systems, both environmental ecosystems and human governance and organisation.

Therefore any TAF assessment should be mindful of the larger system of interdependent elements and that no technology solves a problem totally, and quite often creates new challenges for each one addressed. Furthermore, as with any change, introducing a technology will create winners and losers, and those who stand lose are likely to resist the introduction of something that threatens their livelihoods – for example introducing household piped water systems in an urban area will likely threaten water vendors who have make a living, however meagre, from the opportunity created by the lack of reliable, affordable water supply system.

Figure 1: System Overview of WASH systems[7]



[7] Developed with reference to "Compendium of Sanitation Systems and Technologies" Second Edition, Eawag 2014, and "Professional Water Well Drilling: A UNICEF Guidance Note", Skat Foundation, 2016

Annex 2: The 18 TAF Indicators

Perspective / Sustainability Dimension	User/ Buyer	Producer/ Provider	Regulator/ Investor/ Facilitator
Social	(1) Demand for the technology	(20 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) Life cycle impacts of product and 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
Skills & 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.
Technical	(16) Reliability of technology and user satisfaction	(17) Viable supply and value chains for product, spares and services	(18) Support mechanisms for upscaling technology

Annex 3: Example Screening Sheets

Annex 3.1: Screening Questions – Water Lifting (Abstraction sub-system)

Specific Technology/Product:	
Technical Function(s):	Water Lifting

IDENTIFICATION

Please provide some basic information on how the technology was introduced and where to get further information.

1	How was the technology introduced?	☐ government or donor subsidized ☐ no government or donor subsidies ☐ Other: ……
2	What is the name of the initiative or project under which the technology was introduced?	
3	If the introduction of this technology will be subsidised, what proportion of subsidy has been provided relative to overall cost of introduction or relative cost per unit without subsidies?	
4	Provide details on where and how the technology will be installed, the purpose it should serve incl. the service level intended, and why in particular this technology will be adopted in this place?	
5	Name of contact person responsible for the TAF application and address and contacts of the institutions she/he is working for:	Name of person: …… Name of institution: …… Contacts: ……

CONTEXT

Please provide basic information on the area, the socio-economic context and the current situation with respect to WASH issues in the area the technology was or is planned to be introduced in.

1	Where is the project area for which the specific technology is being assessed?	Country: …… Province/Region: …… District: …… Village: …… GPS coordinates (if available): ……
2	Which type of socio-economic area dominates?	☐ Hamlets / communes ☐ Villages ☐ Small Towns ☐ Urban ☐ others:
3	What is the WASH status in the area	

	(coverage/access figures), and which are the key issues with respect to water and hygiene in this region? Please also indicate coverage for water supply in the respective country based on JMP data or national statistics: http://www.wssinfo.org/	
4	Have this technology or substitutes been used before in the project area?	☐ Yes → we call it "Existing" technology ☐ No → we called it "New" technology

NEED

Please provide basic information on the need to introduce this particular technology in this context. *Need* is used here as an objective perception of a situation that is not adequate and needs to be changed.

1	What is the main type of water source from which people are currently getting water? (e.g. directly from river, lake or pond [surface water], piped water with tap stand, springs, open shallow well, borehole/dug well with handpump, rainwater).	In **dry** season For households: …… For communities: …… For institutions: …… In **rainy** season For households: …… For communities: …… For institutions: ……
2	For what purposes are the main water sources used. Please indicate details known so far.	☐ Drinking Water ☐ Household use (washing, bathing) ☐ Sensitive productive use: e.g. beer or food production) ☐ Normal productive use: (crop or livestock watering) ☐ Other: ……
3	What is the current status, and which **issues** exist in terms of the main water sources used for domestic and productive supply and related water supply infrastructures?	☐ Quantity – daily shortage ☐ Quantity – seasonal shortage ☐ Walking distance ☐ Quality: bacteriology. ☐ Quality (turbidity, salinity, other): …… ☐ Time to queue ☐ Low functionality ☐ Other: ……
4	Which are the key problems that this specific technology could solve ? Please indicate details known so far.	☐ Increase reliability ☐ Closer to home ☐ Improve quality of water ☐ Increase quantity ☐ Lower costs for water ☐ Others: ……
5	Which user group is the technology intended for? Please indicate details known at the **level of service needed**.	☐ Household ☐ Community ☐ Institutional ☐ Others: ……

6	Does this technology provide the level of service needed in terms of technical capacity?	☐ Yes ☐ No Comments: ……
7	Has a clear need or even demand been expressed to improve the situation with respect to water supply or hygiene in this region? Is water supply a top priority? Which are the main water uses that would benefit from this solution?	By potential users: ☐ Yes ☐ No Comments: …… By authorities and external experts: ☐ Yes ☐ No Comments: ……
	Please answer the Screening Question: **Can this technology contribute substantially to satisfying this NEED?**	☐ Yes ☐ No Comments: ……

APPLICABILITY

Please provide basic information allowing an assessment of whether the technology can be applied at all, e.g. if the physical conditions in the area allow its application. It is important to consider the specific purpose the technology should fulfil. For new and complex technologies, it should be assessed if recommendations based on scientific evidence have been applied in this context.

1	Is there sufficient groundwater in the area or water in a storage tank (if fixed on a tank) throughout the year to deliver sufficient water for the technology to function properly?	☐ Yes ☐ No Comments: ……
2	At what depth is the groundwater usually found in the region during the dry season? Please indicate in [metres] below surface.	By end of dry season: .....m By end of rainy season: .....m
3	Can the proposed type of technology access water and lift it from this depth?	☐ Yes always ☐ Only in rainy season / when water table is high ☐ No, never Comments/Questions: ……
4	Does this technology produce sufficient yield for the intended purpose of the user group and the intended service level?	☐ Yes ☐ No Comments: ……
5	Does this technology offer potential for multiple uses? If so, which?	☐ Yes ☐ No Comments: ……
	Check performance of selected water-lifting device technologies using the following references: ➢ UNICEF Technology Information Package: http://artplatform.unicef.org/wash/UNICEF_WASH_Technology_web.pdf ➢ Erich Baumann 2011: Low Cost Hand Pumps, RWSN Fieldnote No 2011-3: http://www.rural-water-supply.net/en/resources/details/307 ➢ For information on WASH technologies in general: www.akvopedia.org	
6	Based on scientific evidence and good practice, are key requirements for this technology met in this particular context?	☐ Yes, fully ☐ Only partly or no: Comments: ……
7	**In general: Is this proposed technology**	☐ Yes → technology is part of a system:

	part of a system comprising various components? If so, which other components, e.g. treatment, pipes, tank, wells, electricity, back-up diesel generator, others, are needed?	Which types of elements need to be in place? ……. ☐ Yes, and all components needed are working ☐ Yes, but some components needed are not in place or not working properly. Comments: …… ☐ No, no other components are needed.
8	Are there issues within the target user group with respect to **acceptance** and **equity and inclusion** to use the technology, e.g. if sources are shared?	☐ Yes ☐ No Comments: ……..
	Please answer the Screening Question: Is this technology APPLICABLE in the context?	☐ Yes, fully ☐ Only with major improvements: ☐ No Comments: ……..

Annex 3.2: Screening Questions: Latrine (Sanitation User-Interface/Collection & Storage sub-systems)

Specific Technology / Product:	
Technical Function(s):	User interface, collection and storage, treatment

IDENTIFICATION

Please provide basic information on how the technology was introduced and where to get further information.

1	How was the technology introduced?	☐ government or donor subsidized ☐ no government or donor subsidies ☐ Other: ……
2	What is the name of the initiative or project under which the technology was introduced?	
3	If the introduction of this technology will be subsidized, what proportion of subsidy will be provided relative to overall cost of introduction or relative cost per unit without subsidies?	
4	Provide details on where and how the technology will be installed, the purpose it should serve, and why in particular this technology will be adopted in this place.	
5	Name of contact person responsible for the TAF application and address and contacts of the institutions she/he is working for:	Name of person: …… Name of institution: …… Contacts: ……

CONTEXT

Please provide basic information about the area, the socio-economic context and the current situation with respect to WASH issues in the area the technology was or is planned to be introduced.

1	Where is the project area for which the specific technology is being assessed?	Country: Province/Region: District: Village: GPS coordinates (if available):
2	Which type of socio-economic area dominates?	☐ Hamlets / communes ☐ Villages ☐ Small towns ☐ Urban ☐ Others:
3	What is the WASH status in the area, and which are the key issues with respect to water, sanitation and hygiene in this region? Please also indicate coverage for sanitation in the respective country based on JMP data or national statistics: http://www.wssinfo.org/	

4	Have this technology or substitutes been used in the project area before?	☐ Yes → we call it "Existing" technology ☐ No → we called it "New" technology

NEED

Please provide basic information about the need to introduce this particular technology in this context. *Need* is used here as an objective perception of a situation that is not adequate and needs to be changed.

1	Of what **type is the main sanitation practice** currently used?	For households: …… For communities: …… Comments: ……
2	What is the current **status and** which **issues** exist in terms of the existing sanitation and hygiene situation and related sanitation infrastructure? Please indicate details known so far.	☐ No latrines ☐ No use of latrines and open defecation ☐ Poor hygiene in or around latrines ☐ No hand-washing ☐ Lack of faecal sludge treatment ☐ Lack of safe and sanitary disposal of waste ☐ Poor maintenance of infrastructure ☐ Others: ……
3	Which are the **key problems this technology could solve**?	☐ Safe collection of faeces and urine ☐ Safe treatment of faeces and urine ☐ Safe disposal of faeces and urine ☐ Reducing health risks around settlements ☐ Contributing to nutrition cycle ☐ Others: ……
4	Which **user group** is the new technology intended for?	☐ Household ☐ Community ☐ Institutions, e.g. schools ☐ Others: ……
5	Does this technology provide the level of service needed in terms of technical capacity?	☐ Yes ☐ No Comments: ……
6	Is there a clear need or even demand expressed to improve the situation with respect to sanitation and hygiene in this region? Is sanitation and hygiene a top priority?	Perspective of potential users: ☐ Yes ☐ No Comments: …… Perspective of authorities and external experts: ☐ Yes ☐ No Comments: ……
	Based on the above-mentioned information, please answer the Screening Question: **Can this technology substantially contribute to satisfying this NEED?**	☐ Yes ☐ No Comments: ……

APPLICABILITY

Please provide basic information allowing to assess if the technology can be applied at all, e.g. if the physical or climate conditions in the area allow for an application of this technology. It is important to consider the specific purpose the technology should fulfil. For new and complex technologies, it should be assessed if recommendations based on scientific evidence have been applied in this context.

1	What is highest level of groundwater below surface? Is the groundwater table always deeper than 2 m from lowest point of infrastructure (e.g. bottom of pit latrine)?	Highest level of groundwater below surface: .....[m] ☐ Yes ☐ No Comments: ……
2	Are there risks of floods of the area?	☐ Yes ☐ No Comments: ……
3	Is the common distance between latrines and the next buildings frequently used by people more than 10 m?	☐ Yes ☐ No Comments: ……
4	Is the common distance between sanitation facilities and the next groundwater well more than 30m?	☐ Yes ☐ No Comments: ……
5	How are faeces and urine collected / disposed / treated in the **current** system?	☐ Within the unit / no removal ☐ Within the unit WITH removal ☐ Needs septic tank or sewage ☐ Reuse of faeces / urine is foreseen ☐ Other: ……
6	**In general:** **Is this technology part of a system which is composed of various components?** If so, which other systems are needed? E.g. pipes, tank, wells, sewerage, electricity, back-up diesel generator, others For information on requirements for this WASH technology: www.akvopedia.org	☐ Yes → technology is part of a system: Which elements need to be in place:…… ☐ Yes, and all components needed are working. ☐ Yes, but other components needed are not in place or not working properly. Comments: …… ☐ No, no other components are needed.
7	Based on scientific evidence and good practice, are key requirements for this technology met in this particular context?	☐ Yes, fully ☐ Only partly or no: Comments: ……
8	If the toilet is water-borne, are there water sources in the region/area that provide **sufficient** water throughout the year for the purpose?	☐ Yes ☐ Most of the year ☐ No, or seldom
9	**Acceptance**: Are there cultural habits and traditions which do not allow the use or maintenance of this technology or exclude some of the community members?	☐ Yes ☐ No Comments: ……

10	**Acceptance**: Are there cultural habits which are in conflict with reuse of treated faeces or urine in agriculture or home gardens?	☐ Yes ☐ No Comments: ……
	Please answer the Screening Question: **Is this technology APPLICABLE in the context?**	☐ Yes, fully ☐ Only with major improvements: ☐ No Comments: ……

Annex 4: Assessment Questions – to be completed

Annex 4.1: Assessment Questions//Water Supply//Evaluation of an existing technology

Perspective/ Sustainability Dimension	Questions to consider including in your survey	Explanation
User/Buyer Social	Do the majority of users express a strong demand for the improved service level provided by this technology?	Strongly expressed demand is vital to get good prospects for sustainability.
	Do users express demand for an alternative technology or product?	Users may express a preference for another product or technology if it is inferior to the technology being assessed
	Will this technology genuinely satisfy the demands and expectations of the majority and access requirements of target users? What is distance to facility? Are there many people who will not benefit?	The likelihood of a technology being sustainable will only be good if it genuinely meets the needs and expectations of target users.
	Do all users in the target region accept this technology with respect to taboos, cultural, social and religious habits and traditions? What would be possible barriers or conflict areas?	Cultural and social acceptance is essential for sustainable uptake. If a technology is viewed as inferior for any reason, it may not be accepted.
	Which groups within the population cannot use /are excluded from using this technology, for example disabled persons, the older or the very poor?	Inclusive, equitable service levels should be a high priority. Information on technology options is key.
	Do potential users express their willingness to invest in the CapEx of this technology and its introduction? Have they contributed to the CapEx of any other water service before? If not, why would they be willing this time?	The full capital cost of this technology and its introduction needs to be worked out BEFORE putting this question to users, so that an informed discussion can take place!
	Are users willing to carry out regular upkeep activities and to pay for O&M (OpEx) on a regular basis? Are they willing to pay for major rehabilitation (CapManEx) if the water service breaks down? Have they contributed to OpEx or CapManEx before? If not, why will they be willing this time?	The full O&M cost of this technology, as well as the cost of major rehabilitation, needs to be worked out BEFORE putting this question to users so that an informed discussion can take place!

Perspective/ Sustainability Dimension	Questions to consider including in your survey	Explanation
	Is there a strong demand from target users for the services provided by this water technology AND a willingness to pay for CapEx, OpEx and CapManEx?	Target users must express a real need or demand for the services provided by a technology if management challenges are going to be overcome in the future. Cultural taboos can cause users to reject a technology. If users feel a technology is inferior, they may reject it. If users are unwilling to invest in a technology or pay for its operation and maintenance, prospects for sustainability will be undermined.
User		

Annex 5: Minimum information for Final Assessment Report and Example of Technology Brief

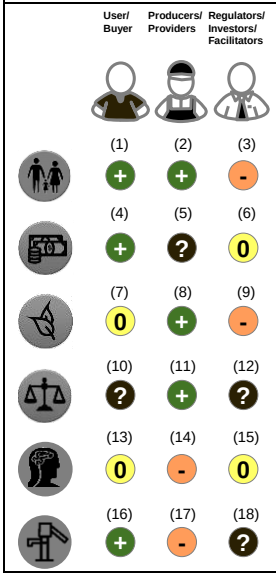
Background on technology and context to be considered

- Name of technology, producers and information on costs (include picture or drawing showing how it works)
- Regional geographical and socio-economic context
- Experiences with this technology in the area so far
- WASH issue to solve, intended level of service for households/community
- Contact person / implementing organization
- Assessment date

Screening Results

- Need: Is there evidence of a need which can be satisfied if this technology is introduced in this context?
- Applicability: Is this technology applicable in this physical context? Have scientific recommendations been properly considered in the application of the technology?
- Acceptance: Are there issues of acceptance with regard to this technology?
- Technology - System: In this context, does this technology depend on other technical elements to perform? How did the field visit team define the boundaries for the assessment?

F results: screening, field visits, graphical profile, maybe including annotated profile	**Comprehensive interpretation of all results:** **Per Dimension**: key issues are discussed per each of the 6 dimensions **Further discussion could focus on** **- Perspective**: key issues and high risk areas per perspective **- Risks:** Are there "no go" or high risk areas which hinder further introduction in the short term or long term? Do possible mitigation measures exist? Do all key actors involved share the conclusion including relevance and priority? Do they have the willingness and resources to overcome these risks and to implement mitigation measures? **- Affordability:** Are costs for CapEX, OpEx and CapManEx affordable for users? Are there mechanisms in place to access service for those who cannot afford the costs? Are tariffs paid sufficient to keep the system operational in the long term? **- O&M**: Is O&M done regularly? Within the user group are there sufficient knowhow and skills available to do proper O&M? Is sufficient funding available for appropriate O&M? **- Technology specific feedback**: Is the technology performing and providing services as expected? Are there concrete ideas on how to improve the technology or its performance? **- Introduction Process**: Is the introduction progressing well? Which cost model has been considered for the introduction? Which are the key issues for the introduction considering the cost model applied?

Recommendation for sustainability of this technology and its services / Next steps

Is there a potential for this technology to be introduced in this context to provide lasting services? If yes, what should be considered in the design of the introduction process (e.g. actors, roles, resources, cost model)? Who is responsible for working out these steps? Who could be the "champion" in the introduction process? If currently there are issues or **little potential** for this technology in this particular context, how could the **technology** or the **introduction process** be improved? Which measures are needed and who is interested in taking on these tasks? Is there a potential for this technology in a different context?

Comments on TAF process, e.g. on

Who were team members, who was involved in field visits, who participated in the scoring? Have all 4 steps of the TAF process been executed including the Screening? Have there been conflicting opinions during the scoring process? What were the issues? Which procedure was followed to get to the final scoring? How has the "user" perspective been represented in the scoring?

Annex 6: Thematic Interpretation of Graphical Profiles

For the interpretation of graphical profiles it could be necessary to focus on some specific themes in detail, such as "operation and maintenance" (upper part), or "supporting introduction process" (lower part). As there is not a single indicator for some themes the TAF user should consider and focus on a selected group of indicators which are relevant for this theme (encircled indicators).

(to be completed)

Annex 7: Cost Tool for TAF (developed by KNUST, Ghana)

Based on the experiences from the WASHCost project (www.washcost.org., a simplified MS EXCEL based tool was developed by the WASHTech partner "KNUST", Ghana to calculate cost figures which are needed to ask particular guiding questions of cost related indicators, especially for TAF indicators 1, 4 and 5 as one input information for the scoring process.

The simple-to-use tool helps the TAF user to calculate costs figures for operation and maintenance (minor repairs) OpEx and for Capital Maintenance costs (CapManEx) before going to the field and putting the questions to the user to answer. Initial input data can be generated by asking facilitating or implementing institutions, from local pump mechanics or operators in charge of O&M, or by using reliable benchmarks from the region.

After the interview with the users, the calculation should be updated and verified. The tool (version August 2013 and updated versions) with instructions on how to use it including examples can be downloaded from www.washtechnologies.net.

ANNEX 8: Cost breakdown for applying the TAF – Mode 1

The cost estimation for applying the TAF on one technology in one area is about **US$ 2-3,000** and based on assumptions as following

1) The members of the Study team know the TAF methodology already.
2) The TAF has a host that has its own vehicles so no need for vehicle hire but still a need for a driver.
3) Only two people are required to facilitate the use of the TAF: a lead facilitator and an annotator.
4) The producer/provider is likely to be a non district participant not residing in the district.
5) TAF takes three days to apply - 1 day introduction to district, 1 day in field, 3rd day scoring (as the scoring workshop could be quite intensive, it could be an option to split the workshop in two half days: 1.half day: introduction in TAF methodology/presentation of validated data; 2nd half day: scoring and discussion of results); splitting up could add a lot in terms of focus and active participation; the additional costs are minor.
6) Two travel days to and from the district are required.
7) A non-district participant from central government or a regional support body will most likely take part.
8) All other participants will be based in the district.
9) Allowances for non-district participants is $60-$80 per day
10) Allowances for district participants is $10 per day
11) TAF facilitators are each paid a salary of $100 per day.
12) Fuel to location is $100
13) Fuel from location is $100
14) Fuel whilst on location is $50
15) TAF assessments take place at district headquarters at no cost

Example: The budget for implementing the TAF with 6 district level participants would therefore be:

» Fuel = $250
» Salary of TAF facilitators and driver (5 days) = $1,100
» Allowances for 5 non district participants (including driver) (3 days) = 5 X $80 X 3 = $1,200
» Allowances for 6 district based participants (3 days) = 6 x $10 = $60 x 3 = $180
» Materials = $50
» Fuel for second district based vehicle = $60
» Miscellaneous = $50

The total costs for one TAF application are about US$ 2-3'000 (even if the workshop is split up in two half day sessions). This is an example; the real costs for your TAF application should be calculated based **on real unit cost figures.**

ANNEX 9: Practical information for preparing a TAF application

The information listed below are general hints based on a series of TAF testing, however for each TAF application the order and focus of these tasks should be revised to fit to the context.

Preparation

- Understanding motivation for doing a TAF assessment, the scope needed, expectations; learning about technology, services and issues prevailing in that context.
- Team building along information as described on pages 5 and 6
- Acquainting with TAF documents; if translation is needed considered sufficient time for translation and training before departure to the field
- Customizing of indicator sheets
- Definition of roles in the field team, in particular who is facilitator, who is rapporteur taking notes of all inputs incl. photos
- Logistics:
  - vehicle, accommodation, cash for paying per diem of participants
  - Other material: flip chart paper, marker, tape, printed icons for dimensions, perspectives and traffic light symbols for scoring, digital camera
  - sufficient hard copies of 1 pager with TAF matrix as handout, of Manual and **customized** indicator sheets
- If supplier/producer is based in capital city and will not attend the scoring workshop, an interview should be organized in advance
- Screening should be done for any assessment as it also serves as verification. The results considered in the final interpretation.

Day 1 in the field:

- Courtesy visit to authorities and with local WASH officers from local government; discussion of schedule; interview with regulator perspective (local regulator)
- Meeting with local implementing partners and briefing on TAF, technology, schedule of TAF application, logistics, people to visit

Day 2 in the field:

- Field visit to communities; interview with focus groups (in particular community government, water user committees, households, women, men, elderly and with local supplier if available)
- Maybe start validation of field data

Day 3/4 in the field:

- Validation of field data
- Scoring workshop with all participants: agenda should include
  - ▶ Introduction / Rationale of the TAF application
  - ▶ Introduction in TAF methodology, presentation of all questions of indicator sheets, results of Step ?

Screening

▶ Presentation of validated data, scoring and interpretation

Optional: splitting up the day for scoring in two half days. The first half day could be in the afternoon of Day 3. It would focus on introduction of the TAF methodology; results from Step Screening and presentation of validated data from interviews

Optional additional day in the field:

If the scoring workshop has been split up in two half days:, the 2nd half day should include:

▶ Focus on scoring

▶ Interpretation and discussion of results

▶ Next steps and wrap up