

WASHTech



Framework for Technology Introduction Process – The TIP Guide

A report produced by Skat Foundation, Switzerland

November 2013



Water, Sanitation and Hygiene Technologies (WASHTech) is a project of the European Commission's 7th Framework Programme in Africa



Suggested citation:

Olschewski, A.: 2013: Framework for Technology Introduction Process - The TIP Guide, Skat Foundation

Water, Sanitation and Hygiene Technologies

WASHTech, November 2013

Last updated: 14.11.2013

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To download this report or related WASHTech documents please visit: www.washtechnologies.net

The **Water, Sanitation and Hygiene Technologies (WASHTech)** was a three-year action research initiative that aimed to facilitate cost-effective investments in technologies for sustainable water, sanitation and hygiene services (WASH). Through action research and the development of a set of methodological tools and participatory approaches, WASHTech embedded the practice of multi-stakeholder learning, sharing and collaboration – instilling individual and collective ownership and responsibility for sustainable WASH services.

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This publication is the result of research funded by the European Union Seventh Framework Programme FP7-Africa-2010, under Grant Agreement Number 266200.

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Glossary

Within WASHTech some terms are used in a way which could differ slightly from how they are used in other publications. Therefore a glossary is added here.

Actor	Type of stakeholder, e.g. user of technology, national government, local NGOs or private sector.
Assessment	Method used to develop full understanding of the sustainable use of a technology, readiness of applicability and its impacts. The result of the assessment serves as basis for informed decision-making.
Context	Describes the geographic and socio-economic set-up that the technology should be introduced in.
Cost model	The way capital expenditure (CapEx) and operation and maintenance costs (OpEx) are covered and specific roles in a technology introduction process are distributed.
Guidance	A guidance document includes a description of a procedure which is based on best practice and which is widely accepted as standard to achieve a defined goal. However, a guidance document is not a rule that needs to be strictly followed.
Host institution	Institution at national level to safeguard the institutional memory and lead and follow up the further application of the TIP in that country.
Innovation	A process to develop or introduce something new. Innovation processes are usually embedded in manifold institutions.
Introduction	Describes measures and the process to take an invention to scale. So far, the introduction process has often been rather unsystematic.
Invention	The phase in which something new is developed or tested.
Market-based approach	Cost model in which no subsidies are provided, neither for CapEx nor for OpEx.
Role	Describes a specific set of tasks an actor should undertake, e.g. regulation is the task of the government.
Successful	Successful technologies have been taken up to scale (scalability) and have a positive impact fostering sustainability.
Sustainable	A dynamic or status which is balanced concerning ecological, economic and social aspects and impacts and allows future generations to develop in the long term.
Tasks	Specific activities an actor should accomplish according to his or her role.
Technical function	The technical function behind a technology is the job that a technology is supposed to do. E.g. the technical function of a handpump is lifting water.

Technology	Single technical components which are used to serve a specific purpose. Technologies might work as standalone technologies or might be part of a technical system.
TIP	The Technology Introduction Process (TIP) is a guidance document to offer a systematic description of the introduction process.
Uptake	The act of taking up or accepting something on offer, or the extent of this. E.g. the uptake of the rope pump in the first two years of its introduction in a district was roughly 100 units.
Validation	Formal process to assess applicability and scalability of technology in a country and to give formal approval for wider use.

Acknowledgements

This report was written in collaboration with all WASHTech consortium partners:

- WaterAid UK and WaterAid country offices in Ghana, Uganda and Burkina Faso,
- WSA (ex CREPA) in Burkina Faso,
- KNUST and TREND in Ghana,
- IRC WASHTech Team in the Netherlands,
- NETWAS in Uganda, and
- Cranfield University, in the United Kingdom.

This publication is the result of research funded by the European Union's Seventh Framework Programme, FP7-Africa-2010 under Grant Agreement Number 266200.

Disclaimer

The TIP as available in electronic form on the resource base www.washtechnologies.net was developed drawing on the experiences of the country partners from Burkina Faso, Ghana and Uganda. It was also reviewed by the WASHTech partners. The tool is accessible in the public domain. It is designed in a way that every TIP user can customize it to her or his needs.

No liability is accepted if a technology has passed the TAF assessment with a positive result and has been introduced in accordance with a procedure based on the TIP but the uptake level is still below the expected level of performance.

Abbreviations

CapEx	Capital Investment Expenditures
CapManEx	Capital Maintenance Expenditures
CLTS	Community Led Total Sanitation
INGO	International Non-governmental Organizations
JMP	Joint Monitoring Programme of WHO/UNICEF
MDG	Millennium Development Goals
M&E	Monitoring and Evaluation
NGO	Non-governmental Organization
O&M	Operation and Maintenance
OpEx	Operation and Maintenance Expenditures
TAF	Technology Applicability Framework
TIP	Technology Introduction Process
WASH	Water Supply, Sanitation and Hygiene

Executive Summary

This report outlines the research process that was followed to develop two tools that are useful for the WASH sector: the Technology Applicability Framework (TAF) and the Technology Introduction Process (TIP). The TAF is applied to validate different technology options considered for a given context, and to thus assess possible blockages to their sustainability and scalability. The TAF, therefore, assists the local sector stakeholders to find solutions to overcome the stumbling blocks hindering provision of lasting services. The TIP is a guidance document to be used to steer the multi-stakeholder-coordinated initiation of a specific WASH technology towards a local WASH service that lasts.

Rationale

WASH practitioners can draw upon a number of different technology options when delivering water supply, sanitation and hygiene services. There are many different types of pumps, different ways of powering pumping, different latrines and different hand-washing facilities. At the same time, there is a serious challenge facing producers, practitioners, communities, governments and development partners whereby the services introduced struggle to remain in operation or perform optimally for sufficient lengths of time to truly meet user needs. Broken down pumps, semi-functional piped schemes and abandoned latrines are all too common.

The WASH sector is currently faced with a situation where lessons learned in pilots are not widely transferred. There is little or no feedback from communities to producers and implementers of some widely used WASH technologies, which means that user difficulties persist for long periods without being resolved. Many countries do not have policies or standards in place for assessment and uptake of new WASH technologies, resulting in arbitrary adoption of options that are not fit for purpose, too expensive for users to pay for, not scalable and inadequately supported at local level. Technologies that look like a good idea on paper and in marketing campaigns in developed countries can be promoted for a long time before it becomes clear that they lack relevance or practical application on the ground. The lack of guidance has led to a set of negative consequences which include:

- introduction of technologies and services that do not meet user needs;
- introduction of technologies that look like a good idea on paper and in marketing campaigns in developed countries but lack relevance or practical application on the ground;
- introduction of technologies in an arbitrary way, with poor consideration of criteria likely to impact on success;
- introduction of technologies that are too expensive for users to pay for;
- introduction of technologies that cannot be adequately supported in the local context, resulting in breakdown and failure;
- introduction of technologies that are not scalable because of multiple barriers to their uptake;
- misdiagnosis of reasons for failure with good technologies dismissed as sub-standard;
- assumptions being made about certain technologies that are rarely corroborated or that are not true but are perpetuated as myths;
- aggressive promotion of technologies that are not appropriate;
- overwhelming of government institutions or support agencies with technologies that are at such a basic stage of development that they are not yet fit for purpose.

To address this gap, the TAF and TIP were developed and applied within the EU-funded action research project WASHTech. The TAF and the findings from its testing have been described in detail in a separate document, in the Research Report.

Technology Introduction Process

The Technology Introduction Process (TIP) is a guidance document on technology introduction. The TIP gives guidance for countries on how to develop country-based technology validation and introduction guidelines and how to apply them so that the sector can learn and develop in terms of innovation.

The TIP provides generic information on actors involved in the introduction process and on key tasks in each phase of the process. For each application, the generic tasks need to be contextualized to the country-specific conditions. The TIP proposes steps for the development and application of country-specific guidelines, for the institutional set-up and options and for funding of the process and its follow up.

In all three WASHTech partner countries, Burkina Faso, Ghana and Uganda, the TIP has been used to support the sector in developing country specific guidelines for technology introduction.

The TAF and the TIP are designed as complementary tools. The TAF can be used as a validation tool for WASH technologies. During the introduction of a technology, the TAF can also serve as a monitoring tool to follow up the performance of an introduction process over time.

Resource Base

The TAF and TIP are provided in the public domain. All relevant documents and additional information on TAF and TIP including Q/A service will be available on www.washtechnologies.net, hosted by the Rural Water Supply Network (RWSN).

1 Rationale of project

Water Sanitation and Hygiene (WASH) practitioners can draw upon a number of different technology options when delivering water supply, sanitation and hygiene promotion services. There are many different types of pumps, different ways of powering pumping, different latrines and different hand-washing facilities. At the same time, there is a serious challenge facing practitioners, communities, governments and development partners whereby the services introduced struggle to remain in operation or perform optimally for sufficient lengths of time to truly meet user needs. Broken down pumps, semi-functional piped schemes and abandoned latrines are only all too common. Low functionality and poor service levels might be attributed not only to poor-quality technologies, but also to the wrong choice of technologies or the poor level of introduction.

The literature accessible presents and reflects different concepts on the technology uptake process and discusses various success factors for technology uptake and service provision. However, there is no applicable and tested tool which systematically combines the assessment of WASH technologies with the process of sustainable technology introduction and provision of lasting services. The EU research project FP7 / WASHTech seeks to address these challenges through research on an innovative process for (1) assessing the potential and sustainability of a wide range of new technologies, and for (2) designing successful strategies for scaling up. The WASHTech project objective is to strengthen sector capacity to make cost-effective investment in new technologies, through research and the development of a framework which assesses the potential of new technologies introduced into innovative de-centralized systems.

The introduction of new technologies for the WASH sector is very context-dependent, since a wide range of factors influence the process and might determine the success of a technology. In many developing countries, there are neither formal procedures for validation of WASH technologies nor clear guidelines on how to introduce WASH technologies. However, key actors in the sector express a clear demand for guidelines and tools for validation and for the introduction of technologies.

In order to capture the different aspects and interests in the development of the tools, WASHTech deliberately involved all partners, including those situated within the African countries, in the development and testing of the tools. WASHTech has strived to provide the necessary tools, establish the understanding of roles of actors involved and increase capacity in the countries in assessing and validating technologies.

In a separate document, the WASHTech Research Report (Olschewski and Casey 2013), the rationale of the project and details on two tools which have been developed and tested, including details on the research methodology, have been documented. The Research Report mainly focused on the Technology Applicability Framework (TAF). This report concentrates on the complementary tool, the Technology Introduction Process (TIP).

2 Need for guidance for validation and introduction

Over decades, NGOs, government institutions and international institutions have introduced various WASH technologies to provide better water and sanitation-related services in developing countries. Very often, only little understanding was available at government level but also at the level of producers, implementing NGOs and development partners on concepts, requirements and good practices for introducing technologies. Too long, the link between technologies and lasting services was neglected in the design of projects and in the design for technology introduction. Thus, all too often, technologies broke down and infrastructure was abandoned, and investment became ineffective.

With respect to validation or to systematic guidance for the introduction of WASH technology, hardly any formal procedures are in place or followed in developing countries. In some countries, such as Ghana, a number of informal procedures are known which are followed. In most cases, these procedures are not properly documented, so that they are not transparent and actors in the sector are often not aware of them.

The inexistence of formal validation procedures favours the risk that technologies and the approach for their introduction may not sufficiently consider key aspects and requirements for sustainable services and uptake. Additionally, unclear procedures may prevent investors and private sectors from investing in WASH technology and business development. The lack of guidelines and of mechanisms to share experiences and to follow up technology introductions limits the opportunity for the sector to learn as a sector and to trigger innovation regarding products and services, and it has a negative impact on collaboration between actors.

Nowadays, key actors at national level in developing countries have realized that adequate procedures are frequently missing and express a clear need for robust and transparent procedures for validation of a technology and for guidance in the process of technology introduction. Apart from actors within the government, the private sector and development partners are also very interested as they rely on reliable procedures to further develop their programmes and business-related activities and investments.

Developing and applying guidelines for technology introduction not only addresses regulatory topics such as approval and validation of technologies or quality control of spares. By also involving producers, providers and the user community in the design and follow up of the introduction phase, this process will strengthen accountability and governance too and should trigger sharing of experiences, hence fostering capacity development, embedding of shared learning and innovation (Lundvall et al. 2009; Andrews et al. 2012).

3 Key principles of WASH technology introduction

3.1 Approaches for technology introduction

Technology introduction is not a new topic and not only a hot topic for the WASH sector. Other sectors, particularly agriculture, started much earlier with the development of conceptual models and approaches for product development, marketing, promotion and introduction of products from which the WASH sector could benefit (Heierli 2000, Heierli 2007, Heierli 2008, Mikhail and Yoder 2008, Rogers 2003). The technology roadmapping approach was introduced to foster innovation in the classical industry sector (Phaal 2009a/b). All these approaches have at least one key aspect in common: matching the supply of products with the demand of potential clients to assure lasting services at an adequate level of service.

In the case of the so-called **supply-driven approaches**, it is usually the producer and provider who put a lot of effort into the development and promotion of a specific product. In the past, government bodies or development partners were often also pushing to introduce a specific WASH technology and related services. The supply-driven approach may be promoted with or without business-related intentions. For example, a market-based, supply-driven approach takes place when a private company promotes a water filter for household water treatment by applying intensive methods such as advertising, offering giveaways, etc.

There are also so-called **demand-responsive approaches** where products and the way to introduce them are developed starting from the needs of the target population. In some cases, the product will even be developed together with the target users.

For very sensitive technologies, including those in the sanitation area, an extra effort through community sensitization and sanitation marketing is needed to overcome cultural barriers and to stimulate demand. In particular, in more rural communities in the beginning of an uptake process, first movers and champions such as women's groups are particularly addressed to start the mobilization process, so that followers can see and assess the potential benefit of the technology for their own households and join.

In all cases, the socio-economic context of the target population is one of the key factors that determines the success of the introduction and influences the dynamics of the uptake. A comprehensive assessment of the applicability and scalability of WASH technologies is provided through the Technology Applicability Framework (TAF) (Olschewski and Casey, 2013).

3.2 Cost models used

As WASH deals with basic needs and human rights, the way essential services should be provided is the subject of political discussions and decisions. In particular for people in the rural settings, investing in WASH technologies is a major challenge. Often, there are households that cannot afford to purchase or to properly maintain infrastructures for WASH services. Frequently, issues around affordability, subsidies and sustainability have been neglected in the design of WASH programmes. Therefore, the approach to introducing WASH technologies needs careful design and follow up to ensure success and to avoid exclusion of parts of the target population. A technology introduction process will also trigger many activities and investments on the side of government, producers and facilitators. Thus sufficient capacities and resources and procedures need to be in place to carefully assess the potential of the sustainability of a technology introduction, to support promising efforts and to allow cost-effective investments.

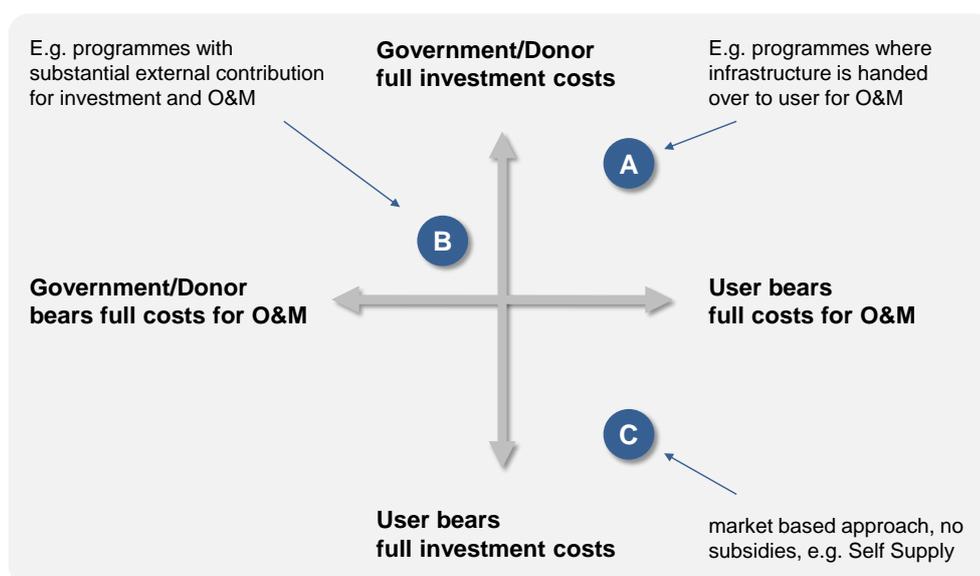
A wide range of approaches have been followed to introduce WASH technologies and to provide lasting services. These service delivery approaches apply different cost models. So far, there is no clear evidence and no general rule on how to link the introduction of specific WASH technologies with a particular cost

model. Different context conditions (e.g. socio-economic context, cultural preferences, institutional capacities in place, available funds) might ask for different cost models.

The introduction process depends on the technology itself, but also on factors within the wider context, such as the institutional and legal set-up. In particular, the introduction approach is linked to the financial and funding framework which defines who will pay for the life cycle-cost components, especially for the investment costs (CapEx) and which actor will bear or contribute to the costs for operation and maintenance (OpEx) or the costs for major repairs (CapManEx) ¹.

Many different cost models are used for the introduction of WASH technologies. Three often used models are described in Figure 1.

Figure 1: Cost models often used for WASH technology introduction



A) Capital-Subsidy Model

In this model, almost all capital investment costs for WASH infrastructures are subsidized, but the costs for operation and maintenance should be covered by the users themselves. Subsidies go to the buyers of a technology, but not to the producer. This is a common model for capital-intensive infrastructure that is, impossible or highly improbable, for the end user to afford, but where on-going operations and maintenance costs are covered wholly or partially by the end user through an on-demand purchase or a regular tariff. While this approach reduces the drain on public funds, tariffs for water and sanitation services rarely cover the full lifecycle costs (including Capital Maintenance Expenditure (CapManEx) and direct and indirect support costs. For a long time, a subsidized model for the introduction of technologies has been used, and it still is predominant.

B) 100% Subsidy Model

In this model, it is the public sector or the donors that assume full responsibility for the technology introduction, its upfront capital costs, on-going minor (OpEx) and major maintenance costs (CapManEx) and support costs. Such an approach can allow for efficiencies through national standardization, supply chains, training, and quality control, but also requires healthy public finances and a competent government

¹ For more details on the life cycle costs and definition of cost components, please see: <http://www.washcost.org>

structure at all levels. However, long-term sustainability of this model has to be assessed carefully. Nowadays, cost model B is not often used, except in situations which are close to an emergency.

C) Zero Subsidy

In a zero-subsidy approach, all costs are covered by the users. This approach bears the hope of increasing ownership and accountability, to avoid the problems associated with donor-dependence, weak public finances or institutions and sustainability issues. Here, the role of the state is mainly focused on creating a suitable environment for market creation, e.g. through stimulation of demand and developing capacities of local business, but also through monitoring and controlling quality of products and level of services. In the so-called market-based approach, the technologies and services are provided through the private sector on a commercial basis. The users are clients and not beneficiaries. All products are provided through a private sector-based supply chain.

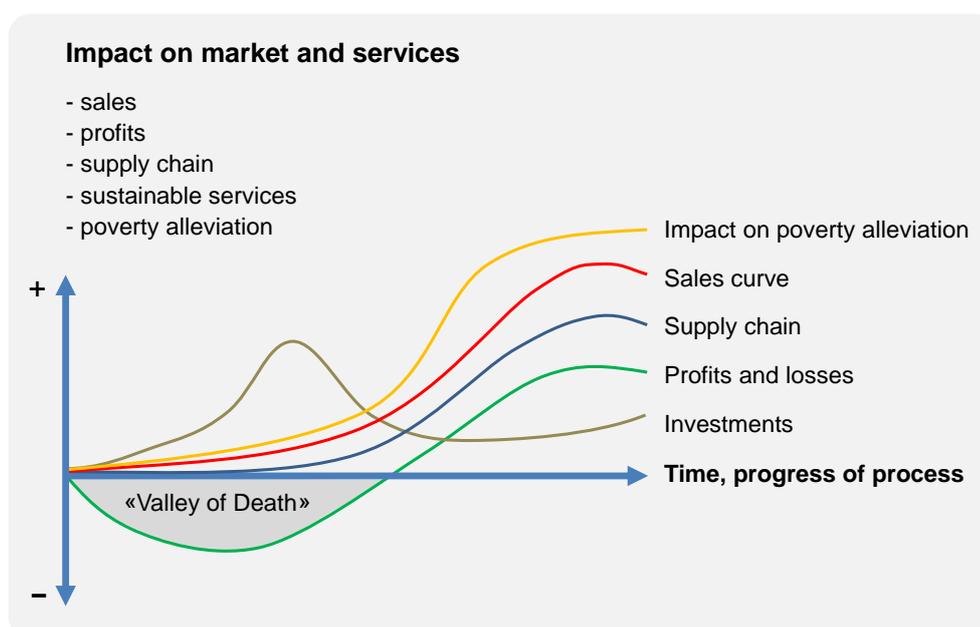
Nowadays, many sanitation technologies are promoted following a market-based approach (e.g. Heierli 2008, WSP 2011). However, the private sector also provides more and more water-related technologies, e.g. for self supply, for filters for household water treatment or for providing water for productive and domestic use (multiple use of water).

In reality, all cost models can be found, although models A and C are prominent.

3.3 Key aspects within the introduction process

Based on the various experiences from different fields of technology introduction, a common picture of the dynamics throughout the uptake process of new technologies was identified. As shown in Figure 2, technologies that were taken up followed an S-shaped curve (see red curve). The dynamic indicates a slow uptake in the beginning and a steeper uptake after a certain time, followed by a plateau when market saturation is reached. However there are many examples where introduction failed and efforts ended in the “Valley of Death”, which refers to the period in the beginning of the introduction process when the expenditures increase and there is still no or very little revenue. The resulting gap can be substantial and cause a risk for the entire process if there is not sufficient funding. If the “Valley of Death” cannot be properly funded, introduction won’t succeed.

Figure 2: Uptake, costs and impact during technology introduction



From the experiences as presented in Figure 2, several issues need to be highlighted, such as:

- The time till uptake is significant and usually takes years. Over this period, many different actors will be involved, such as producers, users, governments, or NGOs. Often, as the process develops, their roles and level of engagement may change.
- In the beginning, quite some time and investment is needed to allow for piloting and testing and to prepare for the launch. In most cases, there will hardly be any uptake and revenue. This is exactly the time when continuous efforts are needed to pass the “Valley of Death”. Reliable and long-term funding is needed to allow continuation of the process.
- Although investments might be high in the early stages of the introduction process, only small impacts, e.g. on poverty alleviation, may be measured. Careful communication and some quick results to show are required for support to continue within the target population and other actors involved.
- In the case of a market-based approach, this dynamic means that profits can only be generated after a long time. Sufficient seed money is needed to overcome the “Valley of Death”. Careful consideration of risks and planning of mitigation measures are needed to prevent a collapse of the private entity.

The introduction of new WASH technologies which are supposed to provide lasting services is very different from the introduction of many other products. Additionally, investment in and use of WASH technologies is culturally very sensitive and context-dependent. In many contexts, climbing up the WASH ladder is linked to increasing the social status. However, detailed surveys are needed to assess willingness and ability to pay and preparedness to care for operation and maintenance.

Many soft factors influence the dynamic of the uptake and might determine the overall success of a technology introduction. The process may be easier if the new technology is increasing social status or even allows income to be generated, e.g. from using urine as fertilizer in gardens. In particular, introducing sanitation technologies is often about changing attitudes around very sensitive issues such as acceptance and social habits and attitudes, e.g. if facilities will be shared.

In some cases, the introduction of new WASH technologies will go hand in hand with a change in the way users have to pay for WASH services, as WASH services were sometimes free of charge but are now becoming a paid service to assure sustainability. Increasing willingness to pay will be key when users are required to pay for operation and maintenance costs where they did not have to pay for these services in the past.

Today, actors in the field of WASH technology introduction express a clear need for a better understanding of the key elements and driving forces behind successful technology introduction which will result in introducing lasting services. More detailed and systematic documentation of experiences and analysis of the findings are required. Many governments are confronted with the situation that several technologies in different stages of development are being introduced in different areas of a country simultaneously. Therefore, WASH sectors at national level need clear guidance and agreed mechanisms on how to plan and steer these processes and to follow up the different activities around these technology introductions in the most effective and efficient but also transparent way.

4 The Technology Introduction Process

4.1 Scope of the TIP

The TIP is a **management tool** for guidance of technology introduction processes, actors' roles and responsibilities. The overall **objective** of the TIP is to support the actors of the WASH sector in designing and planning their country-specific guidelines for validation and technology introduction. It provides a generic description of roles and tasks of key actors in the introduction process. The TIP considers all phases of the Project Management Cycle, such as preparing, planning, managing, monitoring or analyzing a specific uptake approach. So far, there is no evidence that one introduction approach and one cost model exist that are most promising for all water or sanitation related technologies, or for all contexts. There is no silver bullet solution for technology introduction. However the TIP can provide a comprehensive basis for an informed choice of a cost model in combination with the results from TAF application. Within the WASHTech project, the TIP was used in Burkina Faso, Ghana and Uganda, as a basis for and guidance to the further development of existing elements and procedures towards proper country-specific guidelines for technology introduction and validation in each of the three countries. Setting out from the analysis of good practice and the experiences from the application of the TIP in these countries, it offers a set of inputs to support the sector in developing and establishing their country-specific guidelines for technology introduction. These elements include:

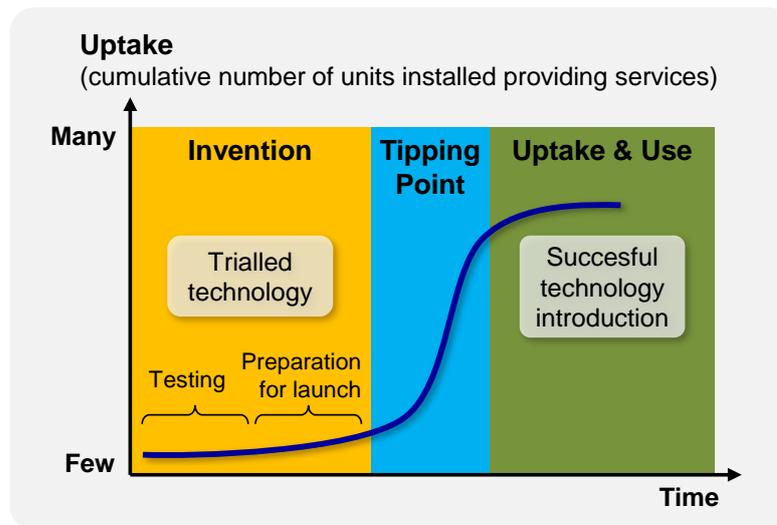
- **Components** of the TIP – key phases, actors, roles and tasks: For each of the key phases which determine the introduction process, the TIP describes the roles and tasks of the actors involved.
- **Process of developing the country-specific guidelines:** The TIP describes a stepwise procedure and key issues which need to be discussed and decided during the process of developing and approving the country-specific guidelines.
- **Application and adaption** of guidelines through an iterative process: once the guidelines are approved, a mechanism needs to be in place to share experiences, to learn as a sector and to trigger innovation.

This report also highlights how to use the results of the TAF in the design of particular introduction processes. The Annex provides building blocks which support the sector in developing country-specific guidelines, e.g. Annex 1 presents the flow of developing and applying the guidelines once they are approved.

4.2 Key phases for technology introduction

The TIP follows the concept of distinguishing and characterizing the introduction process with three major phases: the **invention phase, the phase of the tipping point and phase of uptake and use (Figure 3)**. The background of this concept is based on various experiences from product introduction applying market-based approaches (Heierli 2000, 2007, 2008) and additional literature on innovation in developing countries (Douthwaite 2002, Rogers 2003, Danert 2003).

Figure 3: Key phases of technology introduction



The key phases can be summarized as follows:

- The **invention** phase involves research, development of prototypes, assessing feasibility, testing and piloting on a wider scale and the preparation for the wider launch. The invention phase includes two sub-phases:
 - **testing** and
 - **preparing for launch.**

Testing includes the development of a new technology or the adaptation of an existing one, its piloting and assessment of feasibility. Feasibility should be assessed comprehensively to capture key issues for introduction right from the onset. This is the moment when the TAF comes in as a methodology for assessing applicability and scalability of the technology in that particular context. The results of the TAF assessment provide relevant inputs for a better design and management of the introduction process. In this sub-phase, the focus of activities is on improving performance and costs of the technology, aligning it with national strategies and developing a viable business case for it. Additional market research may be needed to improve feasibility of the technology and its introduction.

If, after testing, the feasibility and the potential are proven, the decision might be taken to introduce the technology on a larger scale, e.g. through promotion in a national WASH programme. Preparatory work is undertaken to **prepare the launching** of the technology on a larger scale. At this stage, major efforts are made to set up mechanisms for quality control, training of target users, and marketing and promotion, establishing production capacity and viable supply chains, and capacity development of the supply chain to follow up introduction. In this phase, a “big kick” could perhaps be organized to support promotion, e.g. a specific event to create visibility and demand. Complementary efforts such as demand creation through social marketing can be undertaken. Apart from the producer, many other actors will be involved in supporting the uptake and giving guidance including the government as a regulator, or local NGOs to facilitate the uptake process.

- The **tipping point** is the phase at which the technology is widely taken up. Many units are produced, purchased and installed. Production capacity and viable and efficient supply chains are further strengthened. Sufficient resources for proper after-sales follow up are provided. Specific marketing measures might be needed, including promotion. Product quality control is required and effective support and mitigation measures including monitoring are needed to keep up and to further improve performance of the technology and of the introduction process. In order to cope with the increasing

demand, new strategic alliances between the producer and new actors might be needed, e.g. with other private sector businesses to assure sufficient funding for the investments in the extension of production, of service provision and marketing.

- The third phase is called **uptake and use**. It is when a steady number of individuals or communities continue to use this technology and get adequate services. If services are no longer adequate, or if cheaper products are available providing a sufficient similar service, there might be a need for a re-launch of the technology. A re-launch could include its being re-designed. It could also include a re-design of the introduction process, such as focusing promotion efforts towards new user groups or combined activities.

4.3 Key actors and their roles

A thorough understanding of the formal roles, connections and driving interests of the actors involved is essential for the design and management of the introduction process and for anticipating the reactions of actors. As a starting point, a mapping of **actors** involved in the introduction process should be done considering the key roles in the technology introduction process:

- **national government, e.g. Ministry for Water, Ministry of Health**
- **TIP host (to assure accountability, it should be within government)**
- **Private sector at national level**
- **Private sector at local level, such as local retailers, pump mechanics or service providers**
- **User of technologies; e.g. water user committees or, for more complex technologies, the system operator**
- **Local government**
- **Inventor of the technology**
- **Investor/Development partner**
- **NGO**
- **Academia, research**
- **Other actors, e.g. microfinance institutions**

The **list of actors** has to be adapted to the country-specific situation and to the type of technology to be introduced, e.g. for sanitation, different actors might be involved compared to water-related technologies. For specific phases and activities, the list has to be extended to include representatives from the media but also local leaders. Annex 2 provides more thoughts on actors and their roles.

The **roles** should clearly describe a defined range and type of tasks. Roles are defined specifically with respect to responsibility and accountability and not necessarily to one institution. The key roles in technology introduction are as follows:

- **Regulator at national and local level,**
- **Developer of technology / inventor of technology,**
- **Producer,**
- **Provider including service provider,**
- **Users (household members, communities or institutions or even operators for complex technologies)**

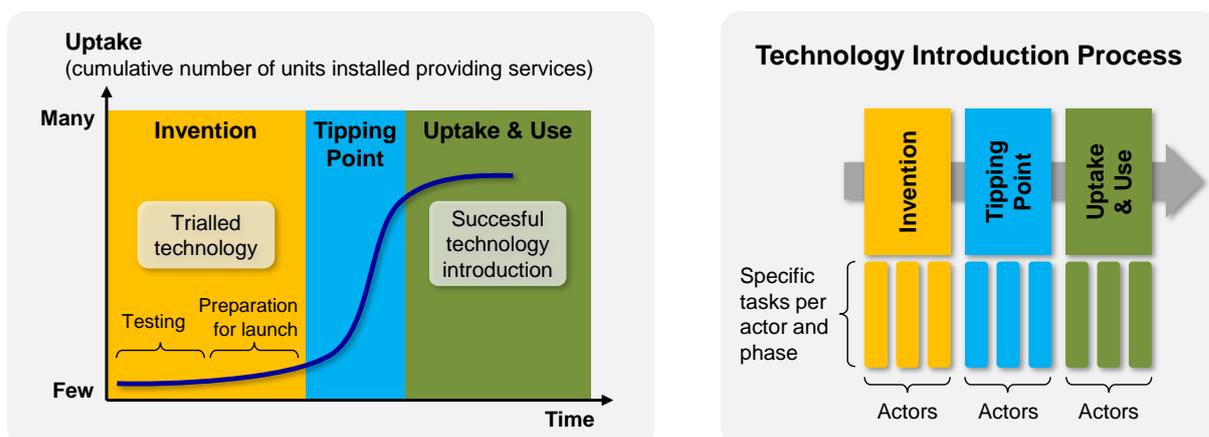
- Investor in the introduction process,
- Facilitator of introduction process,
- Research & development organizations,
- lead of the introduction process

Some roles are clearly always linked to one specific actor, e.g. the regulator is at government level. However, depending on the level of decentralization, some of the regulatory work may be assigned to the national level, while other activities are delegated to the local level. Further roles can be assigned to different or to several actors who might not be defined at the beginning. For example, the role of an investor can be taken on by external donors, government or NGOs or a joint effort involving a number of actors. In the case of Self Supply, as an example of the zero subsidy approach, the investors in capital expenditures are the households themselves, whereas investment in the process may come from a development partner or from the government. Within the introduction process, there might also be an organization which will take on several roles, e.g. an NGO being the inventor, investor and the provider of a technology.

4.4 Tasks of actors in key phases

By allocating specific **tasks** to actors, their role in the introduction process will be defined. Actors become accountable for their responsibilities and activities. The TIP provides a **generic description** of the tasks related to WASH technology introduction. In the TIP, particular focus is put on the roles of actors involved in the introduction process in order to assure a precise allocation of the tasks to the actors. The description of tasks is based on the concept of key phases of the introduction process (Figure 4). In the process of developing the country-specific guidelines, the actors and their tasks will be specified for activities in the three key phases: **invention phase, tipping point and the uptake and use**.

Figure 4: Actors' involvement in phases of the Technology Introduction Process



The tasks of an actor may change from phase to phase. Additionally, the kinds of tasks may differ considerably within one phase, as there may be tasks that are related to a more strategic level, such as policy development or regulation, or to a more operational level, such as supply chain and quality control.

In order to give clear guidance for all actors involved in the introduction process and to strengthen accountability, it is important to define in the very beginning which roles are relevant in each phase of the introduction process and which institutional entity or actor should take over or lead these roles. In a second step, the tasks related to these roles should be define and agreed.

No matter which cost model and approach is followed for the introduction of WASH technologies, a wide range of tasks are required to drive an introduction successfully as a sector. To give proper instruction, the TIP provides a **generic description of key tasks** which are presented in tables for each phase, in the so-called TIP Matrix. The collection of tasks is based on an analysis of many case studies. To support the user of the TIP in translating the generic description of tasks into the contextualized definition of tasks, the generic set of tasks is grouped into five different levels (Figure 5). These five levels characterize the activities and indicate the capacities and resources needed to accomplish these tasks (see similar approach for technology roadmaps, Phaal 2009a and 2009b, Goffin and Mitchell 2010).

Table 1: Structure of TIP Matrix: Tasks of actors per key phases

Phase:	Phase 1A	Phase 1B	Phase 2	Phase 3
Level:	Initial Steps and Testing	Preparing Launch	Tipping Point	Uptake & Use
Level A: Strategic focus	Tasks..	Tasks..	Tasks...	Tasks..
Level B: Operational focus	Tasks..	Tasks..	Tasks..	Tasks..
Level C: Technology development	Tasks..	Tasks..	Tasks..	Tasks..
Level D: Innovation in the sector	Tasks..	Tasks..	Tasks..	Tasks..
Level E: Leading the introduction process	Tasks..	Tasks..	Tasks..	Tasks..

The characteristics of the tasks in the five levels can be described as the following:

- At **“Level A - Strategic focus”**, all tasks should be considered that deal with the issue to be solved and the need for this particular technology, with its alignment with national strategies, policies related to the WASH issue to be solved, quality control of technologies and enforcing standards. At this level too, tasks related to communication, awareness raising and promotion are considered.
- At **“Level B – Operational focus”**, the tasks deal with the concrete aspects of how the technology will be produced and supplied to the clients or beneficiaries, issues around setting up viable supply chains, and the need for capacity development of providers and users to properly operate and handle the technology. Accompanying measures, such as for promotion and demand creation, are part of these tasks. A comprehensive assessment of the applicability and scalability should be conducted using the TAF methodology.
- At **“Level C - Technology development”**, the tasks focus on developing a prototype and testing and piloting it so that it can be ready to use. In the development of the technology, key aspects captured in the TAF should be considered, such as acceptance and costs, but also customer satisfaction. In Annex 3, the links to relevant issues and indicators of the TAF are highlighted with bold numbers.
- **“Level D - Innovation in the sector”** considers that a successful introduction of WASH technologies also depends on sufficient capacities within the sector with respect to knowhow of technologies and mechanisms for coordination of actors but of established processes for learning, documentation and sharing within the sector as well. All these aspects are key requirements for innovation which allow progress in the sector. The tasks at this level are to assure that these processes are in place and are followed up.

- At “**Level E – Leading the introduction process**”, the tasks focus on properly leading the introduction process in terms of management, coordination and information of actors involved. In some countries, the lead in the process might shift from one actor to another, e.g. from the developer in the piloting phase to the government e.g. once the technology has successfully passed the TAF and a mechanism has been identified to take the technology to scale, e.g. through a national programme.

The five levels are proposed as an “**aide memoire**” to help the actors to allocate properly the tasks required during the process of developing the country-specific guidelines. The order of the levels has nothing to do with priorities or sequences in implementation. It is merely meant to distinguish tasks and highlight them.

In Annex 3, a **generic TIP Matrix** is presented which describes key tasks per phase at all five levels in each of the phases. Through the process of allocation of specific tasks to specific actors, as proposed in the TIP Matrix, a discussion will be triggered around responsibilities and capacities and the understanding strengthened among the actors involved with respect to the different roles, the interdependencies between actors, key obstacles and, in particular, the implications of applying different cost models. The five levels should help to better characterize the respective tasks related to the different roles and phases and to find the entity which is best suited to take on the role in this specific introduction process.

However, it is up to the countries to follow this structure or rather to summarize all levels when it comes to the documentation of tasks and their allocation to specific actors in the different phases in their specific guidelines. A very practical way to allocate tasks to actors is to **first define the actors involved** and in a **next step to allocate the tasks to these actors** in the various phases of the introduction process.

Based on hypothetical examples, the generic TIP Matrix has been further developed for two specific cases following two different cost models, a model with **subsidized capital investments** and a for a **market-based approach**, which is also applicable to the context of **Self Supply**. In these two examples, two different WASH technologies are considered, one for a water-related and one for a sanitation technology. These two specific TIP matrixes have been used in the three countries as inputs to discuss the concept of the TIP and to further develop the country-specific guidelines. However, the matrixes have not been consolidated as the competences are organized differently in each country. The two specific examples of TIP matrixes and the country specific guidelines are accessible through www.washtechologies.net.

5 Developing country-specific guidelines

5.1 Building on existing procedures and experiences

The development and introduction of formal procedures for validation and introduction of WASH technologies should build on existing experiences and capacities in the sector and should be embedded in established procedures.

The starting point to develop or to revise guidelines for technology introduction or validation might differ from country to country. Depending on the context in each country, e.g. whether a guideline for introduction is already in place or not, but also on the technology to be introduced, or the type of cost model selected, the tasks listed in the TIP matrix need to be further adapted and then allocated to specific actors in the sector.

5.2 Stepwise process for developing guidelines

In most cases, the process of developing guidelines for validation and technology introduction will develop step by step (see Annex 1). Key steps include:

I. Kick-off and preparation

This phase will include the establishment of a working group and a steering committee. The steering committee should comprise members of all relevant stakeholder groups in the sector. A work plan for the development of the guidelines should be developed taking into consideration the level of formal or informal procedures existing and known in the WASH sector. The **objectives and scope of the guidelines** and a work plan should be approved by the steering committee as “TOR” for the working group developing the details. The next steps should be organized as workshops with work in between accomplished by the working group or the members it has appointed.

II. Draft Concept

In the first step, a mapping of key actors in the process of validation and introduction and of their roles is carried out. Based on this mapping, in the second step, particular tasks are defined and assigned to these actors. As a basis for this work, the generic description of tasks as documented in the TIP Matrix can be used. The draft concept of the county specific guidelines should be developed by and discussed in the working group and presented to the steering committee. Setting out from the feedback on the draft guidelines, options for funding particular work packages related to the introduction process should also be developed. Above all, ideas should be generated that show how the activities of the working group and the steering committee can be funded, especially in the testing phase, but also beyond it.

III. Final Concept and approval

The final document presenting the country-specific guidelines will be **approved** by the steering committee. Depending on country-specific legislation, the procedures for approval might be rather informal, through practice in the sector, or more formal, through a ministerial decree. In many cases, an outright legislation of the guideline might not be possible in the short term. However, through the adoption of the guideline by a high-level body of the sector, such as the sector working group in Uganda or by the technical committee in Ghana, the guidelines are sufficiently acknowledged and approved. After development and approval, they will be **communicated** to the actors, maybe through a particular information event, e.g. information sessions at high-level sector events.

The proper **timing of steps** in the process, e.g. workshops, depends very much on its existing capacities and structures in the sector. In the three countries Burkina Faso, Ghana and Uganda, the country-specific guidelines were developed and approved by the sector within 3-6 months.

5.3 Iterative development

The guidelines will be the product of a process involving many actors. Complex issues need to be discussed, interfaces identified and competences defined. Once the guidelines have been approved and introduced in the first phase, their usefulness should be followed up and reviewed. As the socio-economic and legal environment might change, adjustments may be needed at some point. Therefore, the guidelines should be looked at as a “living document” (see Annex 4). This means that to a certain extent, they will be further developed in a somehow iterative process. However due to the formal act of approval, each and every approved version should be implemented and enforced.

5.4 Institutional set-up and funding required

For the process of the development, application and review of guidelines, a dedicated and defined institutional set-up is needed which determines the involvement of specific actors as well as the allocation of financial resources.

- In the process of **developing the guidelines**, the lead for the process should be at government level. For practical reasons, a **working group** should be established that does the footwork to work out the guidelines and organize consultation with key actors. A **steering committee** should be established at high level to guide the process and finally approve the product and the guidelines. Members of the steering committee should include representatives of the ministries for water and sanitation and finance or trade, members of the government agency responsible for standardization and quality control of products, and members of the private sector.
- For the **application of the guideline**, i.e. in the case of a concrete **introduction process** of a specific technology, a specific task force should be established that takes on the tasks as defined in the guidelines.

In all cases, the activities related to the introduction process and the delivery of the tasks defined need sufficient funding. There are different options to fund the tasks of the actors involved in technology introduction, such as through using funds from the regular budgets or putting up an obligation for the product developer or for the investor to at least fund the tasks in the pilot phase. Here, the guidelines offer a valid and valuable basis to define TOR for the actors involved. Other options to finance introduction could include the idea to establish a “WASH Innovation Fund” at national level, e.g. for sanitation technologies (see Annex 5). There could also be the case where funding is provided entirely through private sources.

5.5 Applying the TIP as a trigger for innovation

Each introduction process should be managed as a project (Annex 1) including a proper monitoring of the progress. The task force which should be set up for each introduction is responsible for planning and managing the process and for monitoring progress made in technology introduction in each of the three phases.

The proper documentation of experiences from each introduction process, a regular exchange within the task force groups and the embedding of the findings in the relevant institution in the WASH technology sector offers the potential to the sector to systematize and foster a process of **networking, shared learning** and **innovation**.

A mechanism or a body such as the “WASH innovation platform” should be established at national level to follow up introduction processes and capture, document and share experiences over a longer period. This body should be in charge of following up performance of the guidelines in terms of effectiveness and efficiency. It should also monitor progress in the sector regarding its effect on sharing, learning and innovation.

6 Linkages between TAF and TIP

The TAF and the TIP are designed as complementary tools and at the same time the TAF is embedded within the TIP as key step in an early phase of an introduction process.

The TAF is a decision-support tool for the WASH sector to comprehensively assess the applicability and the scalability of a specific WASH technology in a specific context. The TAF is a participatory process and should be applied in the **testing** phase, the very first phase of introduction, to provide a comprehensive feasibility assessment and **validate** the technology. In this respect, the TAF should be used as a validation tool. The TAF can be applied to new technologies or to already existing technologies which should be further scaled up.

Once the technology has successfully passed the TAF, it can be taken up to a wider scale if any actors are interested in and dedicated to investing in this technology (see Annex 1). The results of the TAF assessment can then be used in various phases of the introduction process to improve its design. In the generic TIP Matrix as shown in Annex 3, the figures listed in bold in the table show the indicators and aspects which should be considered in detail, e.g. for defining specific mitigation measures to improve progress in uptake. In this respect, the TAF can also be used as a proper monitoring tool in the introduction process.

More details on how to use the TAF results are available through www.washtechologies.net.

References

- Andrews Matt et al 2012: Escaping capability trap through problem-driven iterative adaptation (PDIA); working papers 299, Center for Global Development.
- Danert Kerstin 2003: Technology Transfer for Development: Insights from the introduction of low cost well drilling technology in Uganda; PhD Thesis at Cranfield University at Silsoe.
- Douthwaite Boru 2002: Enabling Innovation – A practical guide to understanding and fostering technological change; Zed Books, London.
- Goffin Keith and Mitchell Rick 2010: Innovation Management: Strategy and Implementation Using the Pentathlon Framework; 2nd edition, palgrave macmillan.
- Heierli Urs 2000: Poverty Alleviation as a Business; Report supported by SDC.
<http://www.poverty.ch/documents/poverty.pdf>
- Heierli Urs 2007: Ending poverty with water control and market access; report supported by SDC.
http://www.poverty.ch/documents/water_control.pdf
- Heierli Urs, 2008: Marketing Safe Water; Report supported by SDC.
<http://www.poverty.ch/documents/Safewater.pdf>
- Lundvall Bengt Ake et al 2009: Handbook of Innovation Systems and Developing Countries: Building Domestic Capabilities in a Global Setting; Edgar Publishers.
- Mikhail, M. and Yoder, R. 2008: Multiple use water services implementation ion Nepal and India - experiences and lessons for scale up; IDE.
- Olschewski André and Casey Vincent: 2013: Technology Applicability Framework and Technology Introduction Process - Research Report; Skat Foundation/WaterAid. For access: www.washtechnologies.net.
- Phaal R. and Muller, G. 2009a: An architectural framework for roadmapping: toward visual strategy; in Technological Forecasting & Social Change 76 (2009), 39-49.
- Phaal R., Sullivan E.O, Routley M., Ford S., and D. Probert 2009b: A framework for mapping industrial emergence; Technological Forecasting & Social Change 78 (2011) 217-230.
- WSP 2011: Sanitation Markets for the bottom of the pyramid;
<http://www.wsp.org/sites/wsp.org/files/publications/WSP-Sanitation-Markets-Bottom-Pyramid-Peru.pdf>; viewed 1.2.2012

Annexes

Annex 1: Flow Chart – Developing and applying the guidelines and role of the TAF

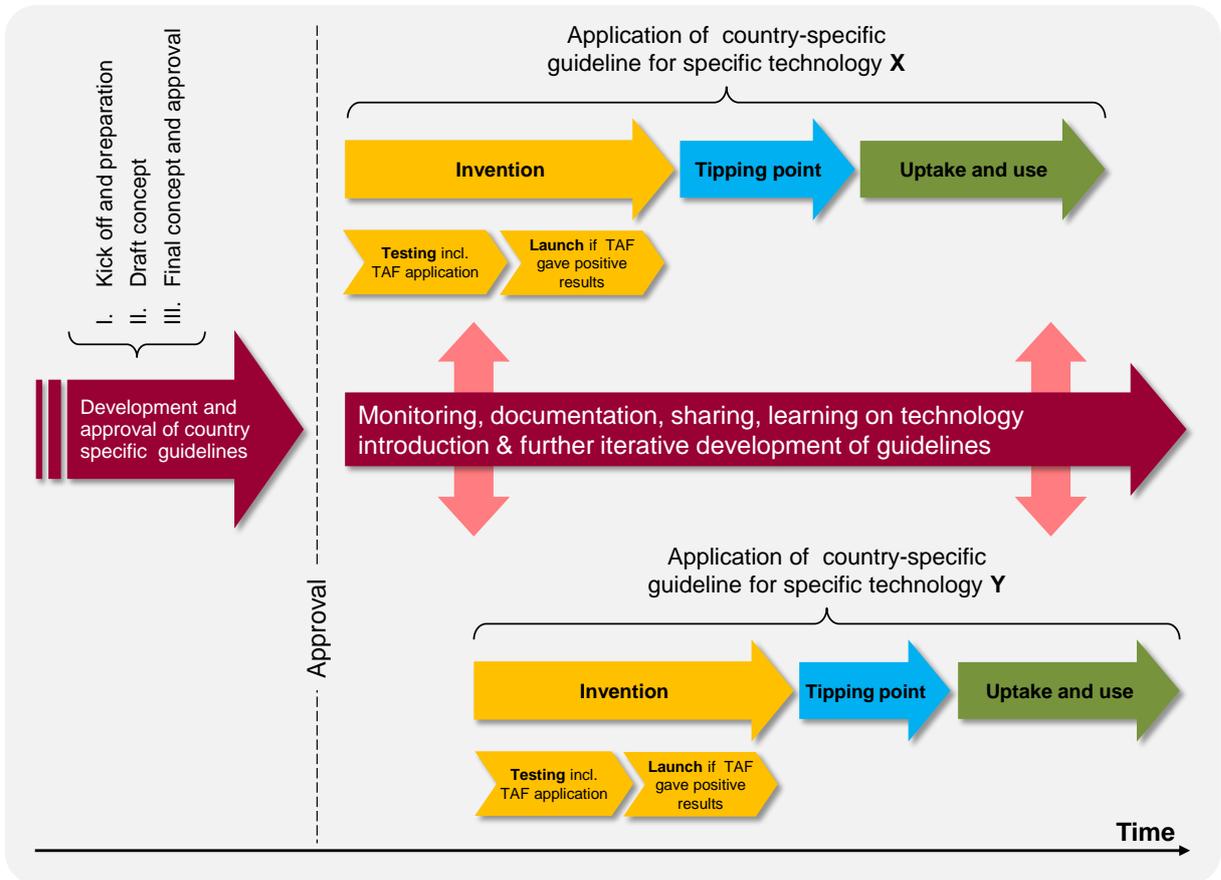
Annex 2: Actors and roles

Annex 3: Generic TIP Matrix

Annex 4: Stepwise application of the TIP Process

Annex 5: Options for funding WASH technology introduction and innovation

Annex 1: Flow Chart – Developing and applying the guidelines and role of the TAF



Annex 2: Actors and roles

In the TIP, the relevant roles are considered as follows:

- **User/Buyer, user community: e.g. households, communities or institutions**, who are using and / or purchasing a technology and sometimes invest their own financial resources in purchasing it (e.g. in a market-based approach). For complex technologies, the user could also be an operator, e.g. for small piped schemes using solar powered pumps. The focus of WASH technology introduction is to assure sustainable service delivery for WASH and thus a long-term contribution to fighting poverty and improving health. However, any intervention should be mindful that households might have different priorities in terms of investing their scarce cash resources in WASH products. There might be aspects such as social status or cultural values that could positively or negatively affect technology uptake. If the service is provided by an operator, this role also has to be allocated to the operator. In many cases, individuals and households will buy goods and spares such as rope from a shop or pay a private service provider for latrine emptying. This supply chain interface with the end user is critical for successful uptake.

- **Producers and/or Providers**: are product owners and produce and/or provide products and spares for markets through their supply chain. They also offer services. In some cases, an NGO can be a provider of a technology as well.

They need to be able to produce the technology to the required specification, ensure the quality of the product and provide it in sufficient quantities, at the right time, and to the right place to match demand. Pricing has to be appropriate. Apart from production, a viable supply chain is needed to make products, spares and services available to satisfy demand. In some self-supply and CLTS examples, the producer will be the user.

In some cases too, the innovator who has actually invented the technology is located in the country.

- **Regulator at national level and at local level**: the ultimate authority for WASH issues in the country. In general, government institutions take on the role of the regulator. The regulator defines and approves laws, regulations and bylaws, sets out rules such as the validation process and is responsible for the enforcement of laws and regulations. Depending on the level of decentralization, some roles and tasks may also be delegated to decentralized levels. A strong national government can have the power to enable a technology, or technology type, to be taken to scale through a number of tools: e.g. policy, regulations, short-listing for national programmes, national standards, quality control, government procurement policy and tenders and contracts and WASH programmes, information, sensitization, monitoring and evaluation, and funding.
- **Host and lead of the introduction process**: institution which drives the process and is interested in taking introduction forward. It could be a private sector business, but also some other actor within the sector. It is intended that in each country an organization (such as the Community Water & Sanitation Agency in Ghana and the Appropriate Technology Centre in Uganda) take ownership of the technology introduction process and of the TIP. As the process owner, such an organization will provide advice to those wanting to use the TAF and TIP and keep a record of assessments done in their countries. The TAF/TIP hosts should be government institutions.
- **Local government**: Local government has direct contact with end WASH users, facilitators, producers and supply chains and is thus an important uptake mechanism, either indirectly through promotion, coordination, monitoring and evaluation, or directly through local WASH services and implementation programmes. With ongoing decentralization processes, procurement is being shifted more and more from national to local government level.

- **Investor:** here, the entity which invests in the development and introduction of a product. Taking any technology to scale requires investing in time, human resources and financing - even for zero subsidy solutions. Investors can be commercial investors, governments, bi-lateral and multi-lateral development partners, NGOs and private grant-giving trusts. They will have their own mandate and objectives, and commonly they have restricted funding time-horizons. The investor can be an NGO which provides financial resources and the technology itself as well as capacity to promote it.

The investor can also be a development partner providing mainly financial support, relying on local NGOs to take on the tasks of promoting the technology.

- **Facilitator:** supports the introduction process on the ground between the different actors involved by facilitating the interlinkages and contacts, most often between regulator, inventor, and investor. Frequently, the role of the facilitator is taken on by a local NGO. A Facilitator is an organization or network that can help manage the relationships between all the partners above, and bring in specialist expertise and lessons learned from similar technology introduction programmes elsewhere in the world.
- **Research & Development:** develop prototypes and are often involved in piloting and testing. Initially, they have access to specific technical and cost data. The research and development of a technology is essential, but it is on-going through the whole uptake process. Initially, it is likely to be done by an external organisation but over time, it needs to be transferred within the manufacturing, retailing, and service provision process.

Annex 3: Generic TIP Matrix

Phase	Phase 1A: Invention / Preparation, initial steps	Phase 1B: Invention - Preparing Launching	Phase 2: Tipping Point	Phase 3: Uptake and use
Level A: Strategic focus	<ul style="list-style-type: none"> Assessing WASH user needs and target market (screening, 1) Market trends WASH Policies, e.g. on subsidies, equity and inclusion, pro poor support (3, 6, 16) WASH programme and monitoring Standards/Control (10, 11, 12) Monitoring market trends / research (15) Identifying areas for piloting; formal representation of user community where piloting will take place Funding of piloting and further steps for introduction 	<ul style="list-style-type: none"> Evidence of meeting user demand Linking with national programmes (if appropriate) (12) Formal recognition / validation of technology by an official body. (12) Establishing procedures and capacities for quality control and legal compliance (10, 11, 12) Allocation of sufficient capacities and resources to support capacity development, launching and follow up on all levels (5, 18) Linking with relevant institutions, coordination, information Establishing affordable funding mechanisms for the poor (6) 	<ul style="list-style-type: none"> Further sensitisation and demand creation Assuring capacities and resources to support on-going following up (18) Monitoring quality of products, services and construction and impacts of using that technology (10, 11) Enforcing standards (12) Reviewing hindrances, e.g. regulations, improving access to innovation programmes and affordable funding (8) 	<ul style="list-style-type: none"> Responsibility for M&E. Monitoring quality of products, services and construction (12, 15) Enforcing standards (12) Documentation of process Links to research and education institution (15, 18)
Level B: Operational focus	<ul style="list-style-type: none"> Piloting of technology (screening) Feasibility assessment (1-18) Assessing capacities and skills Exchange with partners on results of feasibility study Assessing need and options for market creation, marketing & promotion (1, 2, 3, 6) Draft business model for product, O&M, supply chain incl. Equity and Inclusion 	<ul style="list-style-type: none"> Clear concept of product, target market, supply chain, promotion, O&M and follow up (incl. 1, 2, 3, 4, 5, 6, 8, 16, 17) Building up production and supply chain, e.g. with local partners (8) Capacity development and establishing structures for O&M, sustainable business, and external support (13, 14) Monitoring of quality, performance and user feedback. 	<ul style="list-style-type: none"> Refining sensitisation and demand creation Monitoring of quality, performance and user feedback. Optimizing production capacities, product quality and supply chain logistics Training of producer and supply chain and user on 	<ul style="list-style-type: none"> Improve quality and efficiency of supply chain logistics. Maintain value for each supply chain link while keep end user costs down. Funding of on-going promotion (5, 6) Follow up training of user and supply chain
Level C: Technology development	<ul style="list-style-type: none"> Market research on needs, requirements, substitutes, market drivers (screening, 5) Identify knowledge gaps (Screening, incl. 2, 4, 5, 16) Product development preferably with users (16, 17) Funding and resources for product 	<ul style="list-style-type: none"> Improving technology "fit to use" based also on feedback from early users (16) Introducing Quality assurance in production (12) Support to producers and providers in preparing launching and for improving quality and performance of technology 	<ul style="list-style-type: none"> Extending added value of technology Developing skills of producer / supply chain for further expansion and product development (13, 14) Support for R&D and 	<ul style="list-style-type: none"> Customer and supply chain feedback to drive next design evolution (16, 17)
Level D: Innovation in the sector	<ul style="list-style-type: none"> Establishing and fostering exchange and learning e.g. through WASH innovation platform Defining innovation policy and monitoring system (15) Setting up system for knowledge capture Documentation and sharing 	<ul style="list-style-type: none"> Responsibilities for further uptake, quality control, M&E and documentation. (15) Capacity development and resources for innovation (15, 18) Embedding of lessons learned (18) 	<ul style="list-style-type: none"> Capture of lessons learned from successes and failures of launch (15) Embedding of lessons learned (15) 	<ul style="list-style-type: none"> Policy dialogue on innovation Link with academia and research (15) Adapting procedures according to capacities of actors involved (14, 15)
Level E: Introduction process	<ul style="list-style-type: none"> Providing leadership for introduction process Planning and managing the introduction process, defining institutional roles, setting up M&E System Identification of champions (15) 	<ul style="list-style-type: none"> Review of roles, plans, mandates, monitoring of introduction process (15) Identify synergies, allies, drivers Verify choice of cost model Action plans and budgets to support 	<ul style="list-style-type: none"> Review of roles, mandates, monitoring of GTI process, identify and fill gaps Support funding mechanisms to reach poorest households (6) 	<ul style="list-style-type: none"> Monitoring of introduction process, identify and fill gaps (15) Further horizontal expansion into surrounding geographical areas.

Annex 4: Stepwise application of the guideline

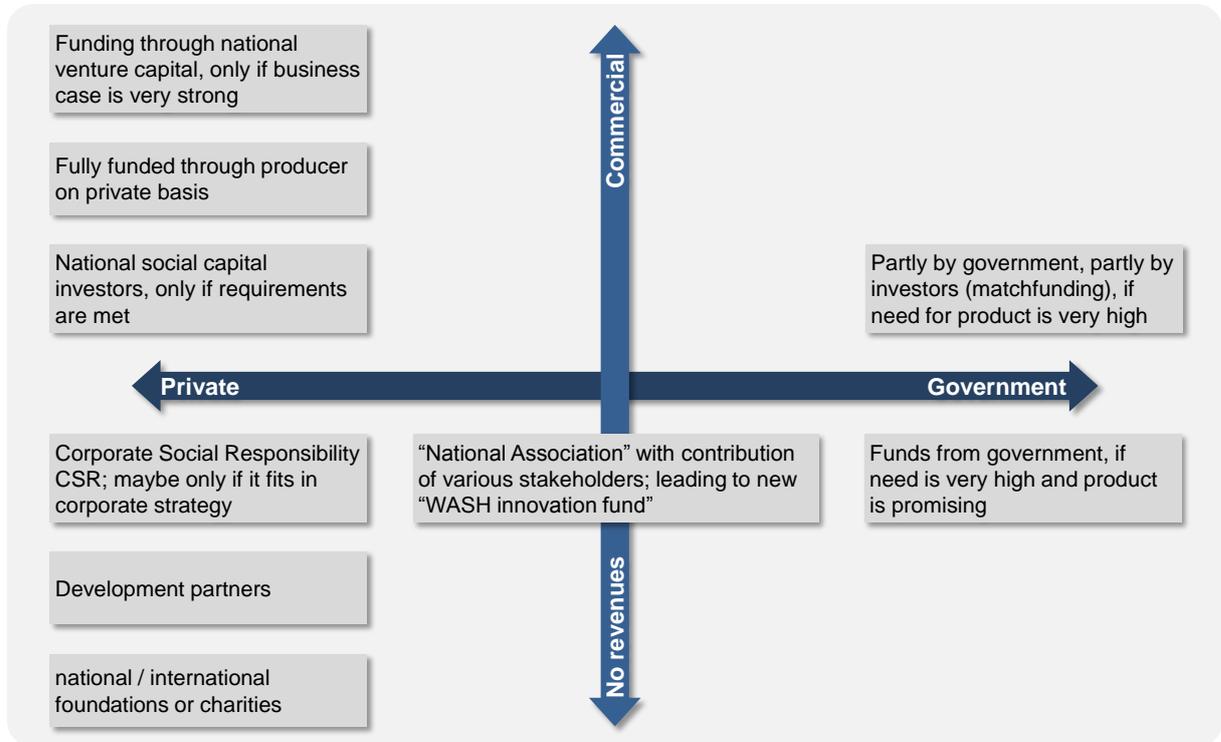
The table below presents a general procedure on how a technology introduction process could be designed. However, it is the country-specific guidelines which have been developed and approved in the sector that will ultimately define the steps and institutional set-up for each specific technology introduction process.

Key Phase	Focus, activities, decisions
Phase 1a: Testing	1. Establishment of a specific TIP core group
	The host of the guidelines – for reasons of accountability it is highly recommended that this be a government institution – invites relevant actors to form a core working group for the specific technology introduction process.
	2. Update of technology and context-related information
	If a TAF assessment of the technology has already been done, the results for the specific technology will be shared and discussed in the working group. In particular, the validity of assumptions and conditions will be assessed. If there has been no TAF assessment so far, more information on the technology and its performance, e.g. as documented in case studies, should be collected and shared within the working group. For this step, the producer/inventor should provide relevant information.
	3. Decision to continue with the introduction process for a specific technology introduction
	Based on the information, the working group should prepare a decision on whether the introduction should receive further formal support. In a series of workshops in the extended TIP working group, a sound basis for the decision should be developed, using the TAF results as well. The workshop should also include a review of the assumptions, achievements and an update of the work plan. Viable options on how to fund the planned activities should be identified.
Phase 1b: Launch	4. Information and mobilization of a wider TIP working group
	Allocation of resources; training of participants on use of guideline.
	5. Workshop 1: Planning of process and development of draft Introduction Plan
	Application of the generic TIP Matrix to specific case within the wider working group, considering TAF results, capacities and experiences in the sector.
Phase 2: Tipping Point	6. Workshop 2: Assessing piloting and feasibility
	Considering results from TAF and all piloting efforts; clarification of need and value-added, requirements and limits of technology (e.g. domestic, productive, community), its market potential, viable cost model, needs for O&M, for market creation and for specific promotion measures; identification of potential partners for the introduction, e.g. projects. Estimation of funding needed for next steps and options for funding of introduction; maybe signing MoU between relevant partners involved.
Phase 3: Uptake and use	7. Workshop 3: Preparing launch
	Definition of specific tasks, revision of draft work plan, in particular related to a mix of marketing elements (market, user, technology, promotion, supply chain, costs); linking with additional strategic partners; building up capacities for production, supply chain, promotion and O&M.
Phase 2: Tipping Point	8. Workshop 4: Passing tipping point towards uptake
	Monitoring and evaluation of uptake process, revision of work plan.
Phase 3: Uptake and use	9. Follow-up of uptake
	Detailed market research on user satisfaction, substitute products and options to improve performance of uptake process, e.g. through re-launch.

The exact timing of steps and workshops depends on various aspects such as the capacities of the sector, specific contextual aspects such as the financial capacity of the inventor or the level of political support for that technology.

Annex 5: Options for funding WASH technology introduction and innovation

(list is not exhaustive, more appropriate options might exist, country led selection of option)



Who is involved in WASHTech?

WASHTech is a consortium research project comprising national and international NGOs, academic institutes and training centres in Africa and Europe.

WASHTech in Africa is spearheaded by the following institutions:

In Burkina Faso:

- Water and Sanitation for Africa (WSA) (formerly known as CREPA), Burkina Faso
- WaterAid Burkina Faso

In Ghana:

- Training, Research and Networking for Development (TREND), Ghana
- Kwame Nkrumah University of Science and Technology (KNUST), Ghana
- WaterAid Ghana

In Uganda:

- Network for Water and Sanitation (NETWAS), Uganda
- WaterAid Uganda

European partners include:

- IRC International Water and Sanitation Centre (The Netherlands)
- Cranfield University (United Kingdom)
- Skat Foundation (Switzerland)
- WaterAid (United Kingdom)

WASHTech is coordinated by the IRC International Water and Sanitation Centre in The Hague.



The Water, Sanitation and Hygiene Technologies (WASHTech) is a project of the European Commission's 7th Framework Programme in Africa



This publication is the result of research funded by the European Union Seventh Framework Programme FP7-Africa-2010, under Grant Agreement Number 266200.