WSUP ADVISORY

Developing an Integrated Urban Sanitation & Hygiene Strategy and Strategic Action Plan for Ethiopia

DRAFT Strategy

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Acronyms

CBE	Community Based Enterprise
CSO	Civil Society Organisation
DMM	Delegated Management Model
FSM	Faecal Sludge Management
GTP II	Growth and Transformation Plan II
HEP	Health Extension Programme
IUSHS	Integrated Urban Sanitation and Hygiene Strategy
IUSHSAP	Integrated Urban Sanitation and Hygiene Strategic Action Plan
M&E	Monitoring & Evaluation
MDG	Millennium Development Goals
MoEPFD	Ministry of Environmental Protection and Forestry Development
MoH	Ministry of Health
MoU	Memorandum of Understanding
MoUDHC	Ministry of Urban Development, Housing and Construction
MoWIE	Ministry of Water, Irrigation and Energy
O&M	Operation and Maintenance
ONWP	ONE WASH Project
RRR	Reduce, Reuse, Recycle
SAP	Strategic Action Plan
SME	Small and Medium Enterprises
SMC	Service Management Contract
DSMC	Service Management Contract
TWG	Technical Working Group
UAP	Universal Access Pan
UNICEF	United Nations Children's Fund
U-WASH	Urban Water, Sanitation and Hygiene
WASH	Water, Sanitation and Hygiene
WSUP	Water and Sanitation for the Urban Poor
PPE	Personal Protective Equipment
CU	Commercial Utility

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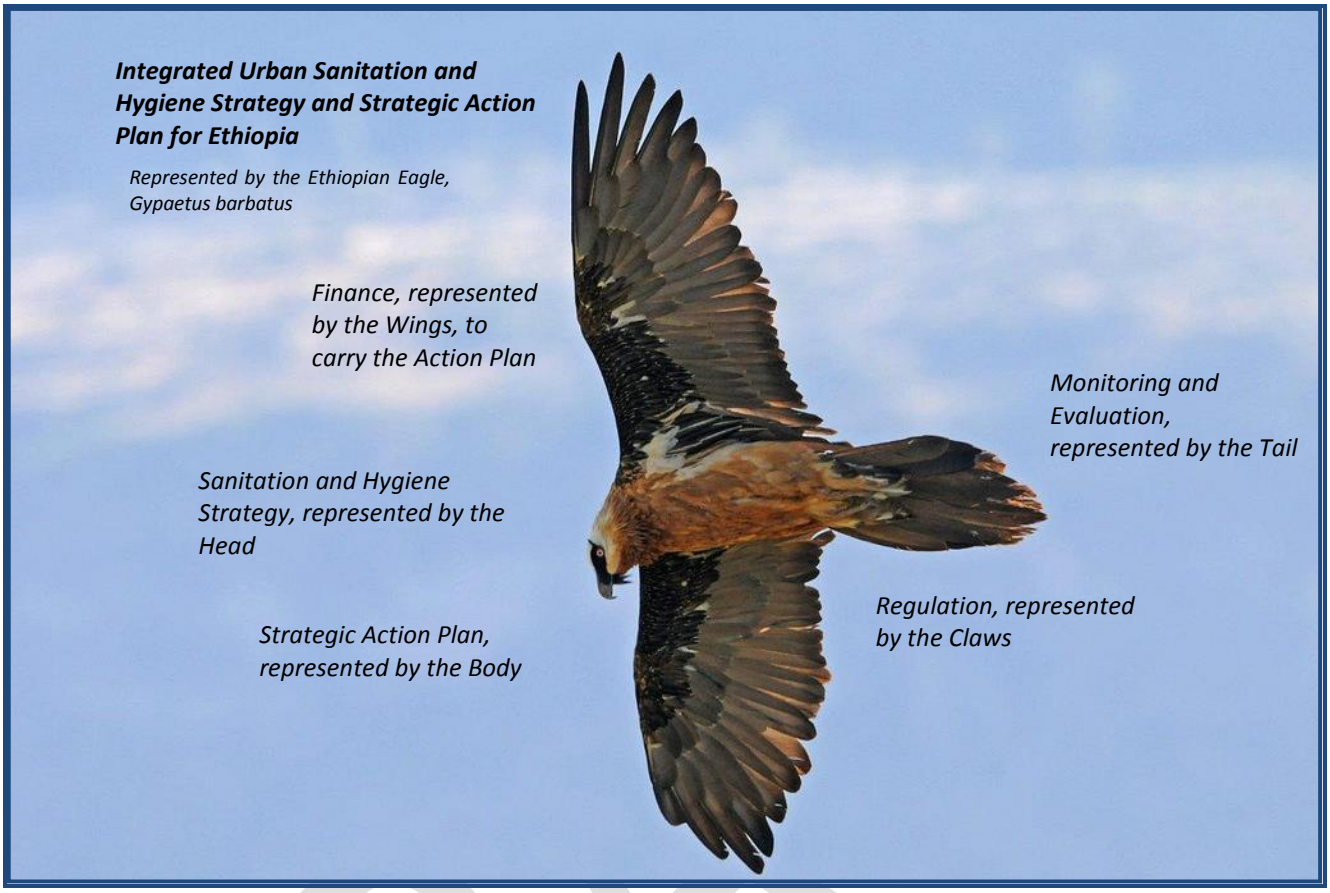

Vision

"Clean and Green Cities with a healthy environment and improved quality of life for the Ethiopian Urban population having adequate sanitation services with a high level of hygiene by 2025."

Mission

"To provide, with minimal impact on the environment, acceptable, affordable and sustainable sanitation services for urban households, informal settlements, institutions and visitors through enhanced urban extension program, committed leadership, accountability, inter-sectoral coordination integrated development , effective performance monitoring and community involvement with a Sector-Wide Approach in financial resource allocation."

Core Values

The core values represent the non-negotiable style in which the Sanitation Sector will provide services. The Sanitation Sector cherishes good governance through applying the following core values abbreviated as **ABBCDEF:**

A-Ability to serve
B-Belief in the collective integrated effort to achieve total sanitation
C- Commitment to a shared responsibility, collaboration and communication at all levels for effective services delivery
D-Discipline of service providers
E-Effort that never stops
F-Faith in the principles of total sanitation

Slogan

Sanitation for all by all - for better urbanization and improved Quality of Life

1 Introduction

There is no quick fix to the problems of urban sanitation in Ethiopia. Funding is obviously necessary but, by itself, will not solve the problems or speed up the process of change.

Urban sanitation features low on the political agendas; similarly, it does not figure high on the priority lists of households, government offices, schools or even health clinics. There appears to be a widespread absence of awareness of the negative impacts and costs of poor sanitation and the benefits of improved sanitation. This has been clearly described in the Situation Analysis and can be witnessed first-hand by inspecting the toilet facilities in many municipal offices, including those responsible for water and sanitation services.

One of the most important tasks of the Strategic Action Plan will be to get landholders, tenants, offices, commercial premises, clinics, schools and other institutions both to understand the need for investment in adequate sanitation facilities and also to motivate them to pay the tariffs and charges needed to operate sustainable sanitation services as they become available.

There has to be a major institutional shift to ensure that "downstream" sanitation chain services are provided, under contract bound conditions, by competent financially sustainable utilities and their delegated operators and contractors.

What follows might be regarded as a radical shift in thinking. However, the reader is urged to follow through the logic and critically appraise the potential for health, environmental and financial benefits and the potential for achieving a significant increase in sustainable sanitation service coverage within a realistic timeframe.

The reader is advised to read the draft ***Situation Analysis*** before reading this ***Strategy,*** since the former provides the background to the many issues around sanitation which the latter is intended to address.

Following this Introduction, ***Section 1,*** the report includes, as ***Section 2***, first a summary and then details of the ten proposed ***Strategy Components***.

Section 3 answers the question as to how these proposed Strategy Components are able to address the immediate task of improving all aspects of poor urban sanitation while ***Section 4*** indicates what a ***Strategic Action Plan***, based on these ten proposed Strategy Components, might look like.

Annex 1 includes an extract of the ***Terms of Reference*** related to this assignment. It is considered that the Situation Analysis and this Strategy adequately meet the requirements of those parts of the Terms of Reference considered to be appropriate at this **Phase 1**. Remaining aspects of the ToR will be addressed during the Integrated Urban Sanitation and Hygiene Strategic Action Plan (IUSHSAP), **Phase 2**.

Annex 2 gives an indication of how institutional change has been triggered in Romania through competition for limited available funding.

Annexes 3 and 4 include draft MOUs which are considered necessary to enable collaboration between those parties sharing the responsibilities and the benefits of the proposals under the IUSHS. *(Provided separately)*

Annex 5 indicates an approach to Decentralised Waste Water Treatment from the University of Gondar; ***Annex 6*** shows some details of a pump developed specifically for manual desludging of pit latrines and cesspits; and ***Annex 7*** indicates a possible approach to small business development.

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2 Components of the Strategy

2.1 Summary

The proposed Integrated Urban Sanitation and Hygiene Strategy (IUSHS) has ten components. These components are intended to run in parallel, but over different time periods, and, although interlinked and all being important to the strategy, can never-the-less be implemented independently so as not impede progress in one component because of slow progress in another.

	Component	***Reason***	***IUSHS Methods***
1	**Raising Sanitation Profile**	Current low priority given to sanitation and hygiene by federal and regional government structures. Low public awareness of impacts, costs and benefits. There is a need to raise sanitation in the minds of all urban citizens, from "slum" dweller to high level decision makers.	Accelerated and improved Urban Health Extension Programme (UHEP), modern advertising techniques, posters, leaflets, school programmes, health publications, social media, radio, TV, mascots, logos, etc. Create "consumer demand" for higher levels of service. Raise status and business skills of sanitation micro-enterprises. Embed the IUSHS as a live and high profile document.
2	**Water and Sanitation Sector Institutional Reform (excluding Solid Waste Management)**	Financially unsustainable sanitation chain operations. Low attention and resources allocated to small towns that have small "voice". Need for financially and technically sustainable water and sanitation operations. Need to share limited skills and resources. Economy of scale.	Cluster water and sanitation utility operations to sub-regional (possibly zonal) level, operating under a Service Management Contract (SMC). SMC to be signed with the "Asset Holders" which could be an "Association of the Municipalities" (*This term is intended to include all other types town administrations that are found in Ethiopia*). Delegate some service provision to private and community based organisations under Delegated Service Management Contracts (DSMC). MOU to be signed at Federal Ministry level in first instance to allow this to go forward through due political process.
3	**Competition for funding**	Funding resources are limited and should go where they will be most effectively used. Funders will invest where money is likely to be used most effectively.	Voluntarily clustered sub-regional utilities submit competent proposals on behalf of all willing (large and small) town utilities in the sub-region.
4	**Capacity building**	To ensure that all sub-regionally voluntarily clustered water and sanitation utilities have equal opportunity to compete for funding.	Multi-region based workshops to explain the process for clustering to regional governments, to zonal administrations, to utilities and to municipalities and Woredas. Presentation of sample SMCs, Key Performance Indicators (KPIs), Master Plans and Funding Applications. In-depth capacity building of short-listed voluntarily clustered water and sanitation utilities.
5	**Technical**	Some of the technical options that	Decentralised waste water treatment plants.

	Component	*Reason*	*IUSHS Methods*
	innovation and development	have been, or are now being, proposed are unproven in the Ethiopian context and need rigorous trialling, monitoring and promotion.	Decentralised high efficiency engineered sludge treatment. Appropriate safe emptying technology for pit latrines, cesspits and septic tanks, taking into account access and affordability. Organic waste composting. Biogas production and use. Treated effluent conveyance systems. Point of use water treatment.
6	**National network for Sharing Best Practice**	Ethiopia is a large country and lessons from institutional change, capacity building, commercial practices need to be shared and discussed.	Strengthen and expand existing Water Utilities Associations at regional and national levels. Best practice includes institutional changes, commercial activities, meeting KPIs as well as technical innovation.
7	**Behaviour Change**	Besides campaigns to raise the profile of sanitation at national level (1) and promotion of services (10), there is the week by week need for activities to promote hygiene practices and better use of available sanitation facilities.	Accelerated and improved Urban Health Extension Programme (UHEP), as well as other programmes (*such as school sanitation and hygiene clubs and Health Development Army*). Create "consumer demand" for higher levels of service. Use modern advertising techniques, posters, leaflets, school programmes, health publications, social media, radio, TV, mascots, logos, etc.
8	**Buildings sanitation facilities**	Pit latrines, cesspits and septic tanks (where allowed) may be undersized and inaccessible to mechanised emptying services. Currently no adopted designs for compact decentralised waste water treatment plants, nor utilisation of solid, liquid and gas generated.	Existing designs and those coming out of innovation work (5 and 6) to be incorporated into Building Codes and imposed by Building Control Departments under municipalities and MOUDHC. The local Water and Sanitation Utility to have an oversight role, since they will be responsible for sludge collection and disposal. MoU to be signed between the various stakeholders involved in facility installations and in use of products (solid, liquid and gas).
9	**Solid Waste Management**	Currently driven by clean streets and job creation but with little attempt at efficiency or cost recovery. Serious environmental and health impact of poor collection and disposal practices.	Raise status and business skills of sanitation micro-enterprises. Rationalise primary collection/ sorting, secondary transport and final engineered disposal into labour/ donkey intensive and vehicle/ machinery intensive contract packages. Micro-enterprises and other companies to bid for contract packages of work. Introduce efficiency measures. Follow and enforce the Ethiopian National Urban Solid Waste Management Standards published in February 2014, where affordable and appropriate.
10	**Promotion of Services**	In order to take commercial and social benefit advantage of the improved levels of service that exist or will be introduced, these	Promote and regulate standard designs of accessible building sanitation facilities. Market sludge disposal services. Raise status and business skills of sanitation micro-enterprises.

	Component	*Reason*	*IUSHS Methods*
		services need to be promoted to customers.	Use of treated effluent for open space greening. Promotion of tap water coupled with quality assurance. Promotion of SWM 3Rs in both the formal and informal sectors.

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2.2 Component 1: Raising Sanitation Profile

This component is listed first since it appears to an outside observer as the one that needs most attention. The emphasis to date has been more on budgets and hardware, with significant outside support. Currently low priority is given to sanitation and hygiene by federal and regional government structures and there is low public awareness of costs and benefits.

Accelerated and improved UHEP will help and is essential for long term grass roots activity, but may not be high enough profile to engender the necessary "culture shift". It will need modern advertising techniques applied to posters, leaflets, school programmes, health publications, social media, radio, TV, mascots, logos, etc.

There will also be a need to create "consumer demand" for higher levels of service and to vigorously market services as they come on line. ***Figure 1*** illustrates a professional and successful approach that has helped to "sell" a viable manual pit latrine emptying service for the last two years in Lusaka, Zambia.

Figure 1: Example of raising the status and business skills of sanitation micro-enterprises: Marketing pit emptying service in Zambia

Embedding the IUSHS and SAP as *live and high profile documents* in the federal and regional governments, such as through animated logos/ mascots (***Figure 2***), TV, radio, posters, will be one way to raise awareness of sanitation issues.

Integrated Urban Sanitation and Hygiene Strategy and Strategic Action Plan for Ethiopia
represented by the Ethiopian eagle or Lammergeier, ***Gypaetus barbatus***

This large bird has a bizarre habit of dropping large bones from high up onto rocky surfaces to break them. The bird then flies down to locate the shattered bones, which it devours. Lammergeiers have favoured bone breaking sites that they use repeatedly. These sites are known as ossuaries. This lovely Ethiopian bird is presumably the "eagle" that killed Greek playwright Aeschylus by dropping a tortoise onto his bald head after supposedly mistaking it for a stone.

The ***Head*** *represents the* ***Strategy***
The ***Body*** *represents the* ***Action Plan*** *that will follow the Strategy*
The ***Wings*** *represent the* ***Finance*** *that will allow the Action Plan to be carried out*
The ***Claws*** *represent the* ***Regulations*** *that will make sure the Action Plan is carried out*
The ***Tail*** *represents the* ***Monitoring, Evaluation*** *and* ***Learning*** *that will follow the Action Plan*
And the ability of this bird to drop heavy bones onto people's heads represents the ***Strength*** *of the Strategy to spur the* ***Policy Makers*** *into motion*

Figure 2: Embedding IUSHS in the minds of policy makers and the media; suggestion from WSUP

Raising status and business skills of sanitation micro-enterprises is extremely important and key to promotion and marketing along the sanitation chain. There are several worldwide examples of this: Sulabh International (see extensive web coverage) is one obvious high profile example. WSUP oversaw a much smaller scale but still impressive transformation of pit latrine emptiers in Kibera slum, Nairobi, from low class illegal night workers, who "had to get drunk" to work in extremely unhealthy and primitive conditions, to a legitimate and respected Community Based Enterprise equipped with pumps, sealed transport, protective equipment, wash facilities and legal disposal points, see ***Box 1*** and ***Annex 6.***

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The emptiers with their short series pump at the Isha transfer station

There has been an interesting transition for the emptiers from a disconnected group of workers competing for work to a connected group. They were also held in low regard by the community and some had developed drinking problems. On my previous visit we had an encounter with a drunk emptier.

By coming together as a CBE (of 25 members – Kara Company) they have stabilized their pricing structure so all members charge the same fee for their work. They have also started to police each other's work as the actions of one *i.e. illegal dumping* reflects badly on them all.

The membership has also given the community a direct point of contact **Kara Company** for emptying services.

Now that they have been given uniforms and Personal Protective Equipment they feel more professional, therefore behave more professionally and feel valued. Drinking at work has now stopped! The uniforms have also been perceived positively by the community making Kara group seem more proficient.

The gulper has improved the speed of their work and also become an item of interest. People are interested to see how it works, and tell their friends/neighbors they have had their latrine emptied with the Gulper.

Box 1: Status of micro-enterprises can assist with raising the profile and importance of sanitation to both customers and service providers; example from Kibera, Nairobi; extracts from WSUP consultant report December 2011

2.3 Component 2: Water and Sanitation Sector Institutional Reform

As illustrated in the WSP slide below, ***Figure 3***, which is general for any country, urban sanitation involves providing sustainable service delivery mechanisms. However, current institutional and contracting arrangements do not provide these mechanisms, as has been thoroughly documented in the Situation Analysis.

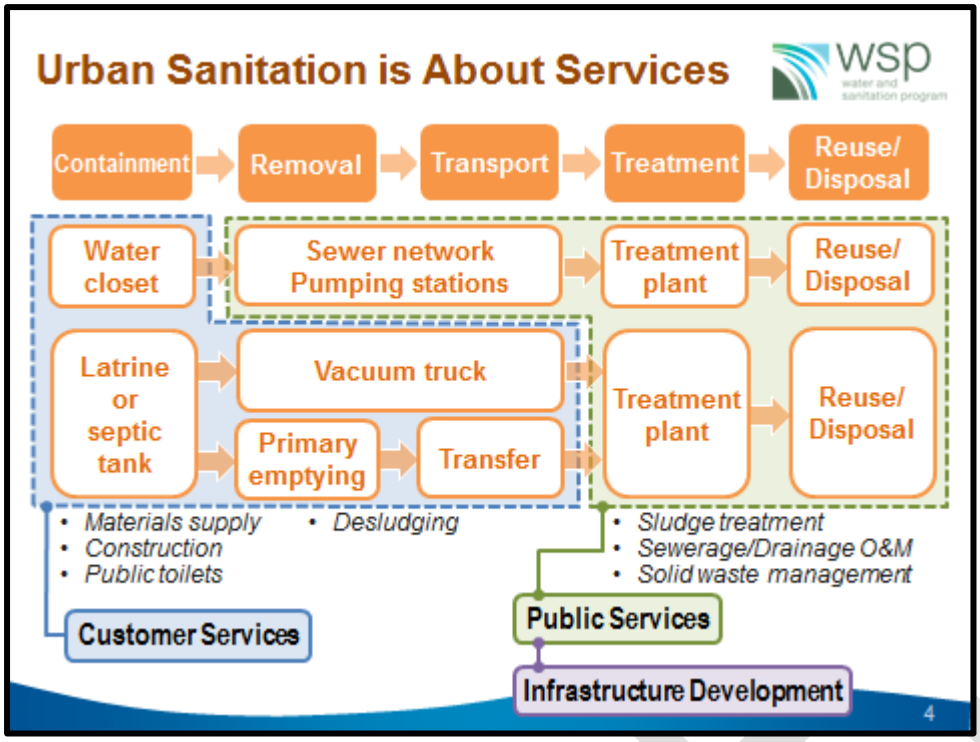

Figure 3: Typical service delivery schematic; WSP

The Ethiopia urban water and sanitation sector would greatly benefit from **Institutional Reform**, informed by many worldwide models, but tailored to suit the specific needs and conditions of Ethiopia.

Such institutional reform could initially be agreed through a MoU between the interested federal ministries, ahead of due political process at both federal and regional levels. A possible MoU to meet this end is including in ***Annex 3***.

It is concluded from the in-depth studies carried out for the Situation Analysis that water, liquid waste and faecal sludge should fall under the responsibilities of competent water and sanitation utilities. This is also understood to be the view of the ministries and many of the utilities themselves.

Solid waste should be handled separately through MOUDHC and municipal structures.

The reason for recommending sector reform, specifically clustering of service delivery, is the benefits that can be accrued from economy of scale and sharing human and physical resources, as illustrated in in ***Figure 4***.

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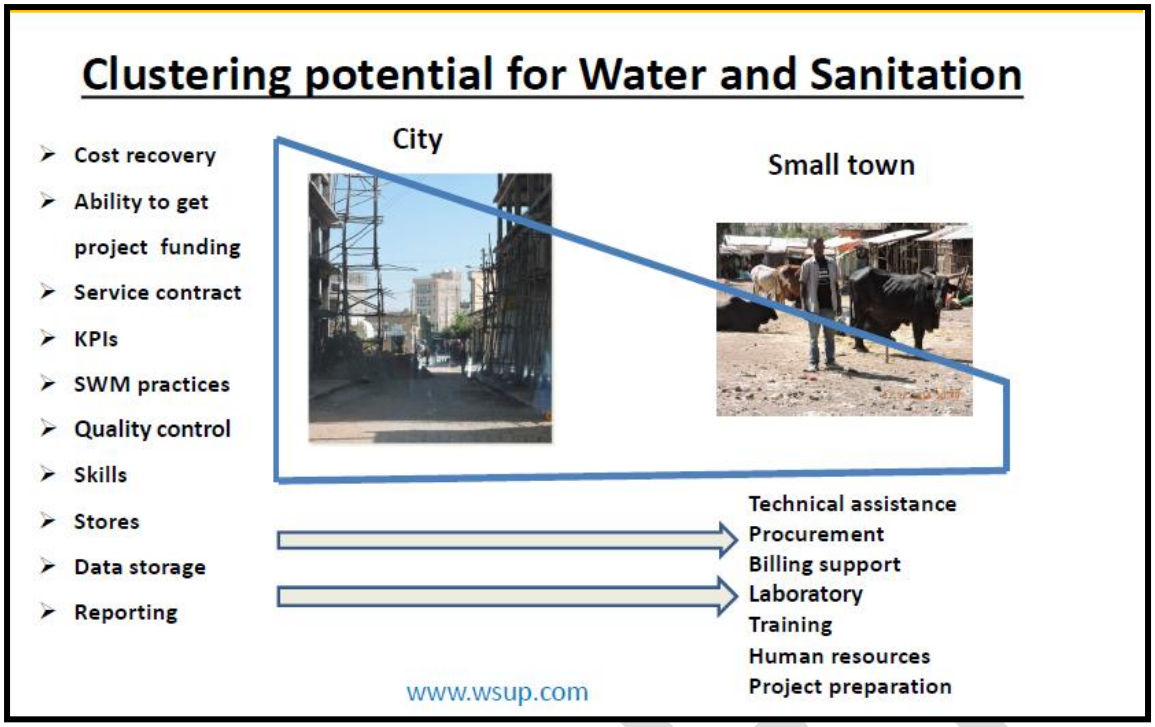

Figure 4: Some advantages from clustering water and sanitation services at regional and sub-regional levels

It is considered that only by sharing skills and resources can the residents of the 866 towns classified as "small" (<20,000 population), ***Figure 5***, and making up over one third of the urban population, ***Figure 6***, receive an adequate level of water, sanitation and hygiene promotion services.

Population Range	No of towns
Small towns (<20,000)	866
Medium towns 20,000<X<50,000	69
Large Towns 50,000<x<100,000	21
Mega Towns 100,000<x<500,000	13
Addis Ababa National Administrative capital	1
Total	970

Figure 5: Number of towns by size category

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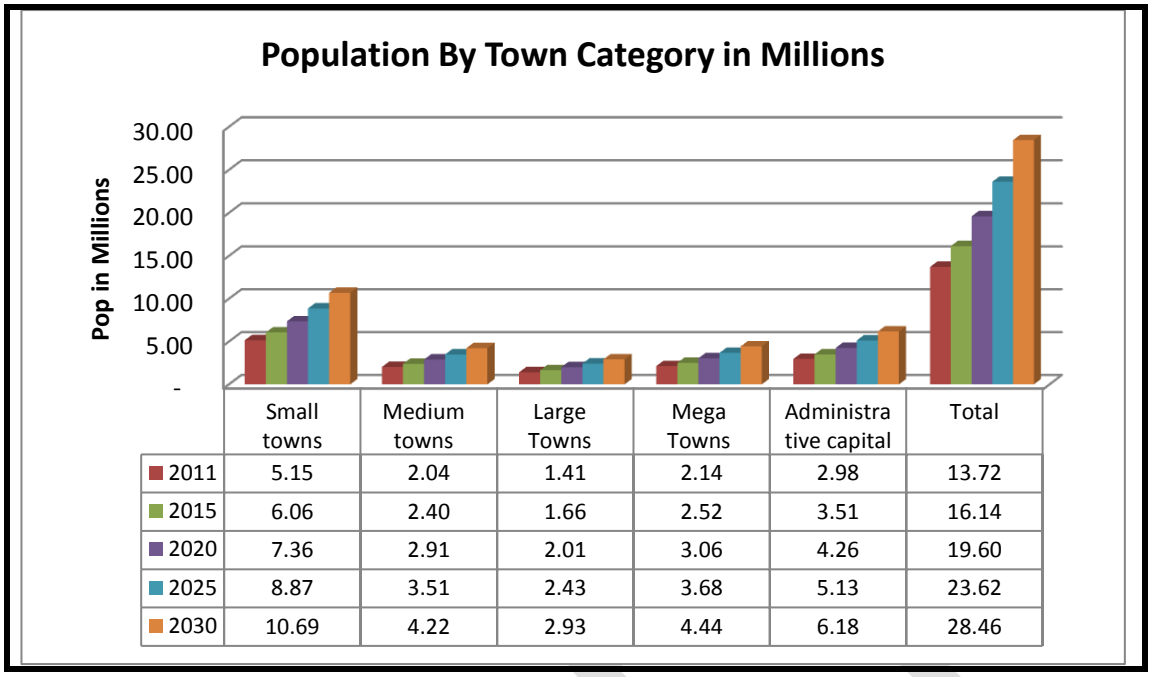
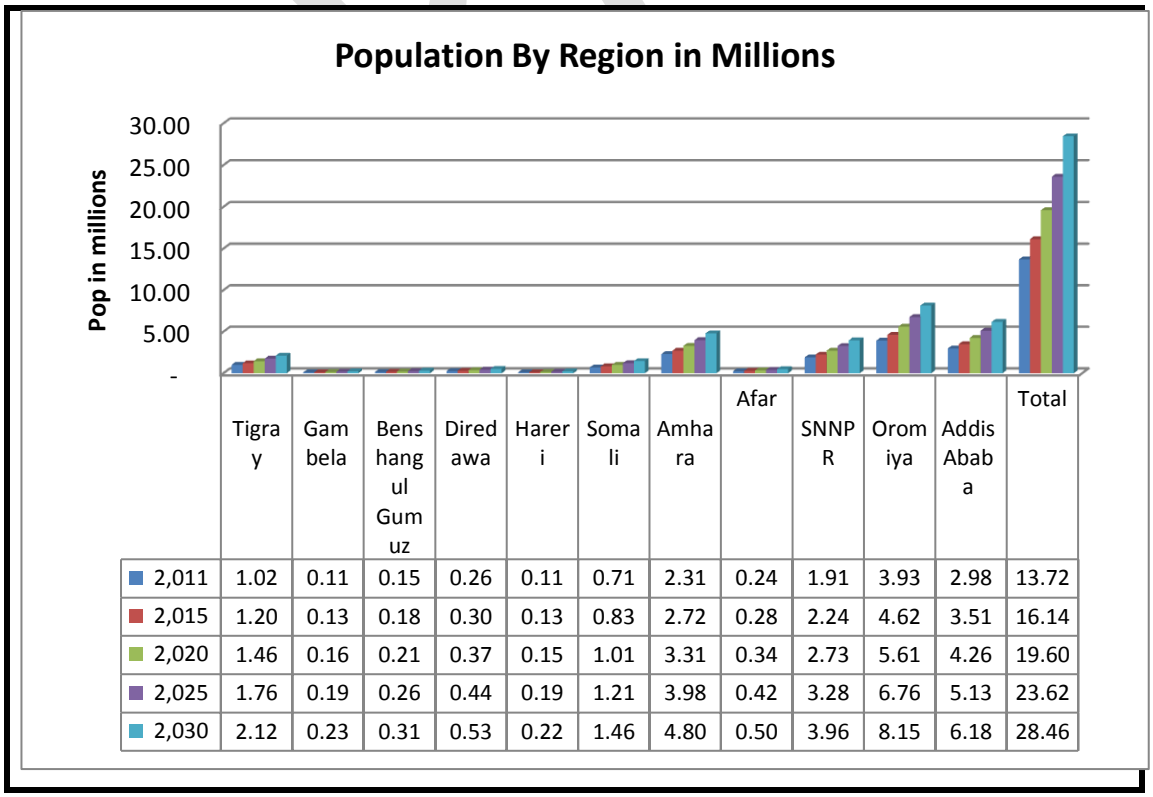


	Small towns	Medium towns	Large Towns	Mega Towns	Administrative capital	Total
2011	5.15	2.04	1.41	2.14	2.98	13.72
2015	6.06	2.40	1.66	2.52	3.51	16.14
2020	7.36	2.91	2.01	3.06	4.26	19.60
2025	8.87	3.51	2.43	3.68	5.13	23.62
2030	10.69	4.22	2.93	4.44	6.18	28.46

Figure 6: Population by town category

Under a possible "water and sanitation sector reform" in Ethiopia we could foresee 40 or more "Regional or Sub-Regional **Commercial** Water and Sanitation **Utilities"** (CU).

Figure 7 illustrates the population distribution by region: Taking a maximum population of around 0.6M, say, per CU at the 2030 horizon, it can be seen that half of the regions (Gambela, Benshangul Gumuz, Dire Dawa, Hareri, and Afar) might each be served by a single CU while the other half would need multiple CUs. Of course, spatial distribution of towns and the state of communication links (such as roads) might limit the practical geographical size of each CU and more than one CU might be required in each of these low population regions.



	Tigray	Gambela	Benshangul Gumuz	Dire dawa	Hareri	Somali	Amhara	Afar	SNNPR	Oromiya	Addis Ababa	Total
2,011	1.02	0.11	0.15	0.26	0.11	0.71	2.31	0.24	1.91	3.93	2.98	13.72
2,015	1.20	0.13	0.18	0.30	0.13	0.83	2.72	0.28	2.24	4.62	3.51	16.14
2,020	1.46	0.16	0.21	0.37	0.15	1.01	3.31	0.34	2.73	5.61	4.26	19.60
2,025	1.76	0.19	0.26	0.44	0.19	1.21	3.98	0.42	3.28	6.76	5.13	23.62
2,030	2.12	0.23	0.31	0.53	0.22	1.46	4.80	0.50	3.96	8.15	6.18	28.46

Figure 7: Urban population distribution by Region

It has been suggested that the existing Zonal delineations (***Figure 8***) might be appropriate Sub-Regional delineations for the more populated Regions (Tigray, Somali, Amhara, SNNPR, Oromiya) which contain a total of 58 zones. However, Zones would probably be too small to benefit from economy of scale and sharing skilled human resources.

Region	*No of zones*	*No of Rural woreda*	*No. of Urban woreda*	*Total woredas*
Tigray	7	18	34	52
Afar	5	2	32	34
Amhara	10	38	129	167
Oromia	18	43	267	310
Somali	9	11	57	68
Ben Gum	3	1	20	21
SNNPR	14	22	135	157
Gambella	3	1	13	14
Harari	NA	6	3	9
AA	NA	116	NA	116
Dire dawa	NA	6	3	9
National		264	693	957

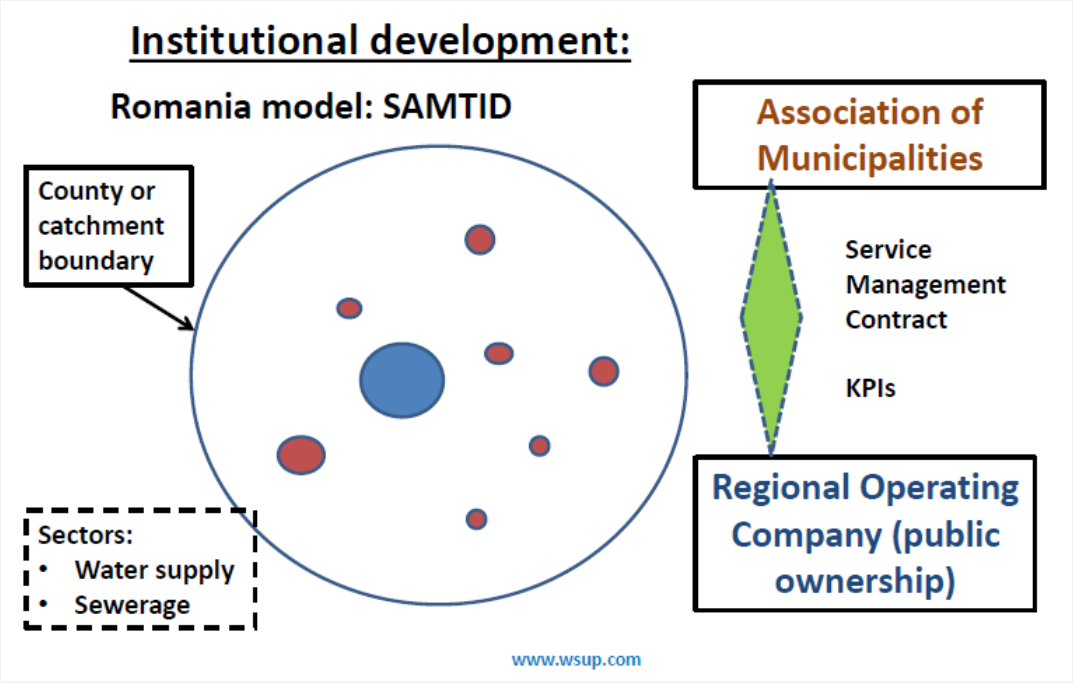
Figure 8: Zones and woredas within each Region

The CUs would be publicly owned and would operate under a **Service Management Contract (SMC)** which includes **Key Performance Indicators (KPI).** The SMC might be signed between each CU and each of 40 or more corresponding **"Associations of Municipalities" (AOM)** as asset holders. Note that the term "AOM" is here intended to include all town administration types.

The principle behind this concept is to have two coherent and distinct parties as signatories to the SMC; one to perform in accordance with the contract terms; the other having the power, integrity and interest to ensure that contractual obligations are fulfilled and that customer service delivery is assured. The contract terms should be such as to ensure sustainable services free of influence from political and commercial interests.

An example from Romania of Regional Operating Companies, applied in the Ethiopia context, is included in ***Box 2***. The Romania SAMTID model is about institutional reform with funding used as a "carrot" for change and this is further detailed in ***Annex 2.***

- Following the SAMTID Romania model[1], for instance (*which has now moved into a second wave*), around 40 regional or sub-regional publically owned commercial utilities (CU) could be formed through a voluntary clustering of towns wishing to benefit from available funding and technical assistance.
- The CUs compete for limited funding (*Govt. and IFI*) which is awarded on various criteria, such as the level of internal collaboration (*ie majority of towns in the region or sub-region signed up*), commitment to institutional reform, ability to put financially sustainable proposals together, etc.
- Each CU has to sign a Service Management Contract (SMC) with (*following the SAMTID model again*) a corresponding "Association of Municipalities" (AOM) (*or perhaps "Association of Town Administrations" in the Ethiopian context*) and is obliged to meet KPIs (*which may in turn be passed to delegated community based or private small and medium sized operations through Delegated Service Management Contracts (DSMC))*
- Under this scenario, there is only one National (*Water, Sewage and Sludge*) Regulator which publishes league tables of CU performance and approves tariffs based on sound financial and technical analysis (*There are many international models for this; see **Figure 14** for example*)
- Terminology is not important, it can be translated into the local frameworks: It is the concept that matters.
- It would need careful blending between the *top-down* One WASH initiative and this *bottom-up* motivated approach. See illustrations as ***Figure 12*** and ***Figure 13***.
- 8-10 years might be a reasonable time scale for such water sector reform to be effected over say 70% of the country



[1] *2006, Richard Wilson, Colin Schoon, Adrian Uifalean, and William Peacock. Institutional change: regionalizing the water business in Romania. Proc of the Institution of Civil Engineers, May 2006, Vol 159, Special Issue.*

Box 2: SAMTID Romania water sector reform model applied to Ethiopia

The CUs would preferably be formed on a **voluntary basis,** initially at least, and would be encouraged to compete for limited funding. The motive here is to encourage local initiatives which will have a better chance of success, meet timescales and make the most of limited funding.

Set against this, of course, is a political desire to **equitably spread development funds geographically and ethnically.** This can be tackled by offering training and capacity building to each and every "fledgling" (*to continue to Eagle mascot idea*) CU to assist them with their reorganisation proposals and associated funding applications.

It should perhaps be emphasized here that the competition would not be based on existing performance but on the potential to perform through improved institutional arrangements and sound physical and financial plans.

Large towns are understood currently to be politically administered by the Zones which fall under the Regional governance structure. Large and medium size towns could be zonal capitals or woreda capitals depending on the region and location. For the smaller towns an extra administrative layer is present. Reference ***Figure 9*** and ***Figure 10*****.**

Under these institutional proposals, the new CUs would be taken out of political arena and would operate, physically and financially ring-fenced, under a Service Management Contract. The only link to the political system would be via this SMC signed, it is proposed, between each CU and a corresponding AOM.

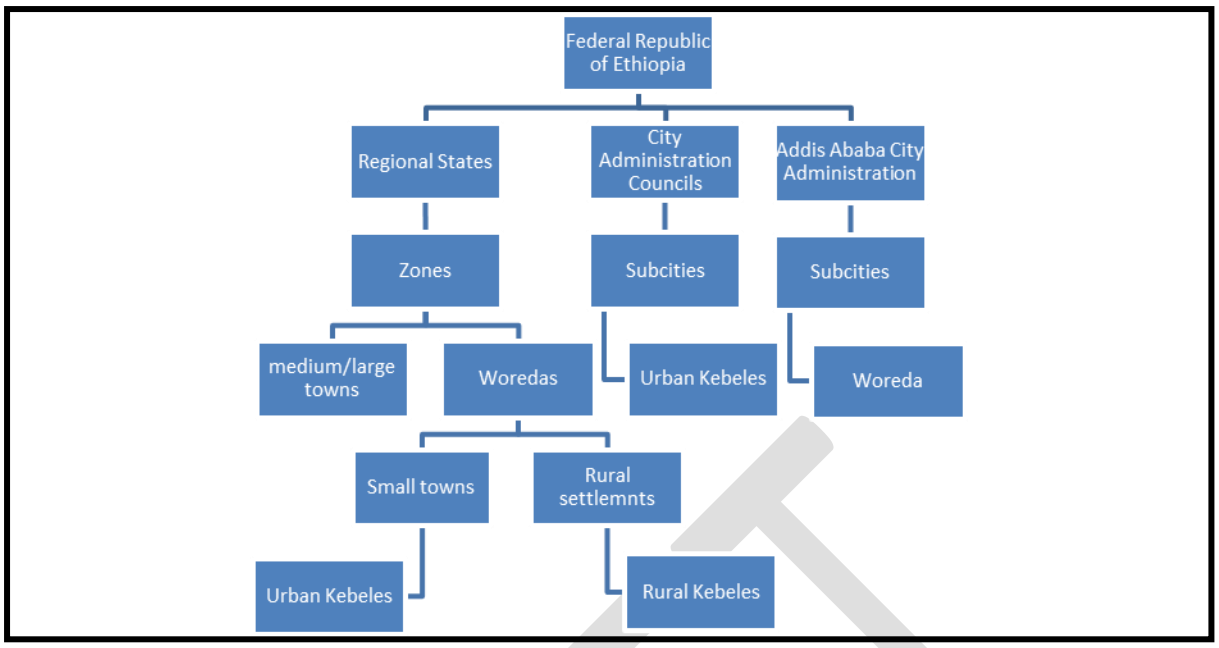


Figure 9: Administrative Structure of Ethiopia

Such an institutional model appears to be compatible with existing ministry mandates (***Figure 10***). The question that needs to be asked next is how does this model fit with the One WASH Implementation Strategy (***Figure 11***), which is predominantly committee based at three weakly linked levels: *Federal WaSH Coordination, Regional WaSH Coordination and Town WaSH Coordination.*

Ministry of Water Irrigation & Energy	Ministry of Health	Ministry of Urban Development & Construction	Ministry of Environment & Forestry
• Sewerage • Liquid waste management • Contracting private sector operators • On-site sewerage	• Promotion of sanitation & hygiene	• Solid waste management • Building standards • Establishing sanitation bodies at regional level • Urban cleaning & beautification	• Municipal, Commercial and Residential Solid waste Management Standards • Liquid waste Effluent Quality • Industrial Waste quality & standard • Enforcement delegated to Ministry of Industry (EIA) and Ministry of Urban Development & Construction (SWM)

Figure 10: National Sanitation Mandates

	Governance & Guidance	Oversight & Management	Programme Implementation	Programme Coordination
Federal	National WASH Steering Committee (W/H/F/E/WRDF/ Development Partners) 4 WASH Sector Working Groups (All Mins/UNICEF/ DP/CSO)	National WASH technical Teams – (W/H/E/FED/Women Youth Children/Nat WASH Coordinator/DPs/CSOs)	MOFED WASH Programme Mgt Units (MOE, MOW, MOH)	National WASH Coordinatio Office MOW/MOE/MOH
Regional	Regional WASH Steering (Committee Bureau Heads H/E/F&ED/invitees)	Regional WASH Technical Team (Water Bureau, H/E/FED/Women Youth/Regional WASH Coordinator/DP/CSO)	BuFED Regional WASH PMUs (MOE, MOW, MOH Water Resource Devt Fund)	Regional WASH Coordinatio Office
Special Zones			Zonal WASH PMUs (MOW, MOH, MOE, ZoFED)	Zonal WASH Coordination Office
City/Town	City/Town WASH Steering Committee		Town City WASH Technical Team (Municipality / Health desk / Education Desk) Town Water Board Town Water Utility	WASH Technical Team
Woreda	Woreda WASH Steering Committee WWT Woreda Cabinet		Woreda WASH team (MOH, MOW, MOE. WoFED Office, Other desks)	Woreda WASH Team

Figure 11: One WASH Implementation Structure *(to be amended)*

It is believed that the proposed institutional strategy does not in fact conflict with the current One WASH approach, illustrated schematically in ***Figure 12***, where a funding basket has been established and where projects are selected on readiness criteria.

It is also considered that the proposed model fits well with the bottom up "demonstration based" model that is more familiar to WSUP, and illustrated schematically in ***Figure 13***.

The proposed Strategy Components listed from ***1*** to ***10*** above fit either into the top down approach or the bottom up approach, or both.

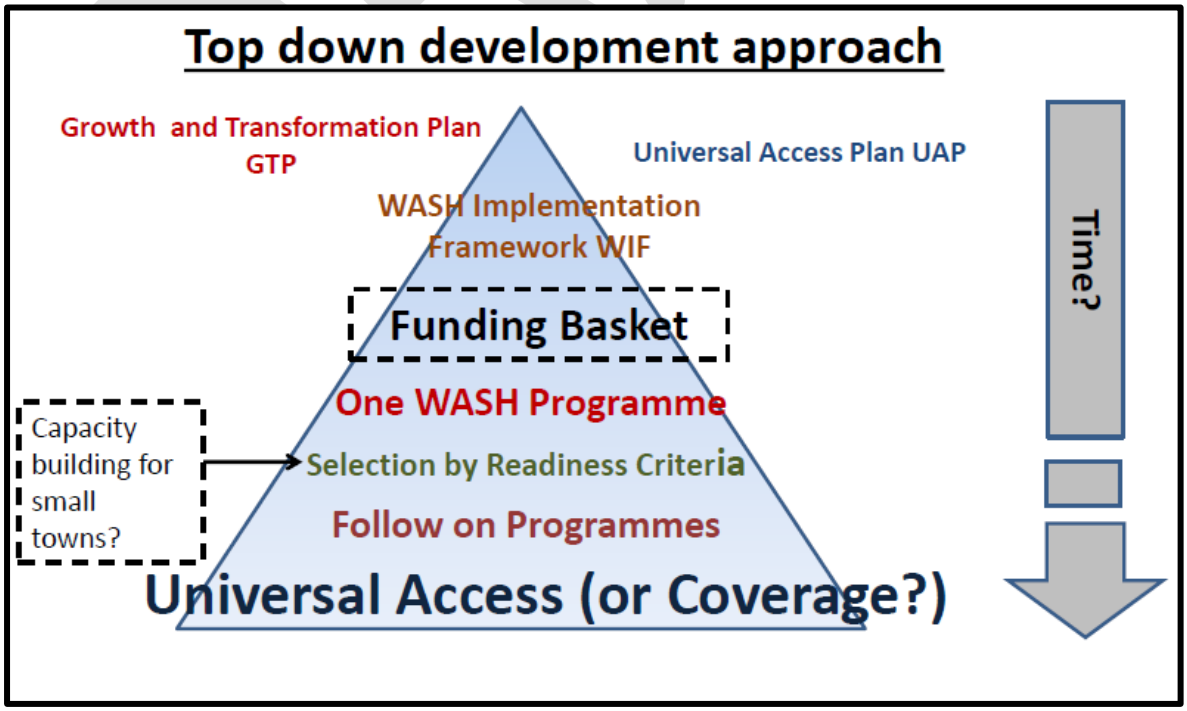


Figure 12: Top-down development approach

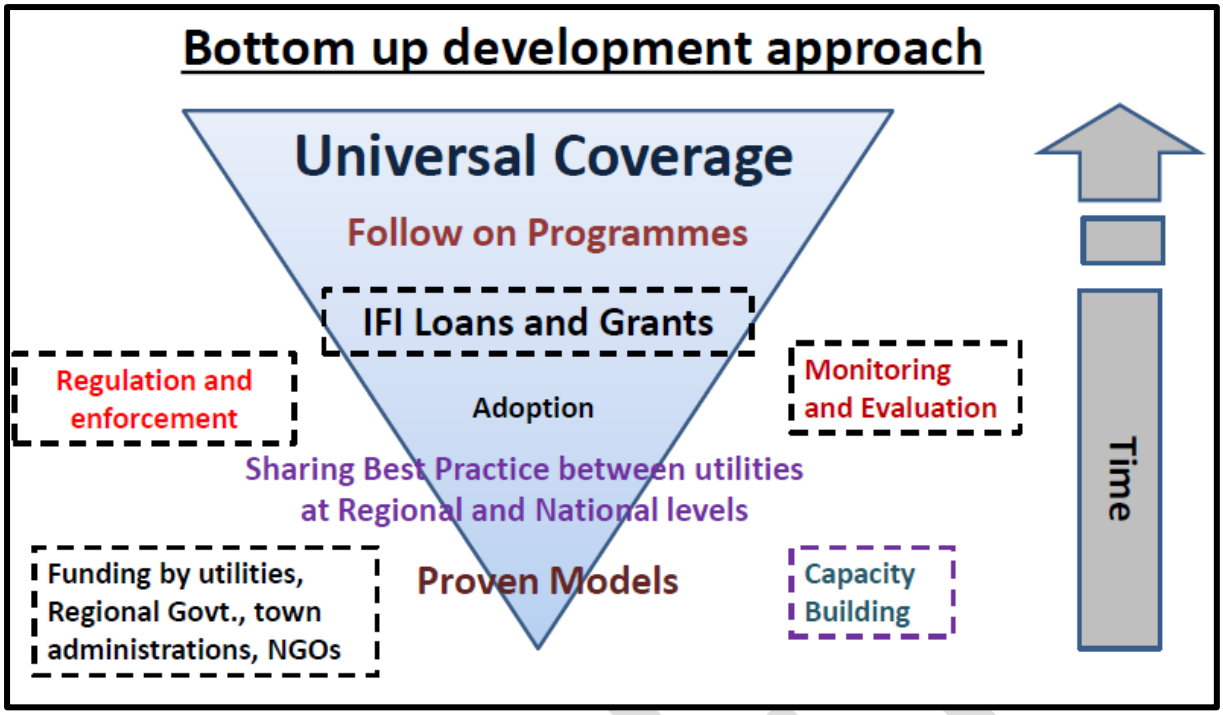


Figure 13: Bottom-up development approach

The CUs would be monitored and financially regulated by a single autonomous **National Regulator** *(supported by Regional sub-offices).* ***Figure 14*** illustrates how the Zambia National Regulator compares the country's 10 commercial utilities: There are only 10 utilities in Zambia since the country population is only around 15M, nearly 5M of whom are concentrated in Lusaka and the Copper Belt cities.

In the Zambia case, the CUs also cover rural as well as urban and their ability to adequately serve the rural customers is questionable. The much higher proportion of rural dwellers in Ethiopia are already better served through the existing Woreda and Kebele structure and it is proposed that only towns, particularly those with mechanical and electrical equipment, would benefit from joining a CU.

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	UFW [%]	Trend	Water Quality [% compliance to number of samples]#	Trend	Metering Ratio [%]	Trend	Water Service Coverage [%]	Trend	Sanitation Coverage* [%]	Trend	Hours of supply	Trend	Staff per 1,000 connections	Trend	Collection efficiency [%]	Trend	O+M Cost coverage collection* [%]	Trend			
LWSC	51	↓	84	↑	50	↑	68	↑	17	↑	16	→	11	↑	73	↓	91	↓	0	3	6
NWSC	38	↑	84	↑	55	↑	85	↑	52	↑	16	→	9	→	63	↓	78	↓	1	5	3
KWSC	46	↑	93	→	32	↑	84	↓	46	↓	15	→	9	↓	68	↓	60	↓	1	2	6
MWSC	42	→	92	↓	46	↑	87	↑	63	↓	17	→	8	↓	89	↑	134	↑	4	4	1
LGWSC	52	↑	76	↑	77	↑	65	↑	25	↑	17	↑	15	↑	73	↑	80	↑	0	3	6
SWSC	40	→	93	→	76	↑	89	↑	53	↑	18	↑	10	→	121	↑	113	↑	5	4	0
CHWSC	50	↑	45	↑	25	↑	58	↑	25	↑	12	↑	16	↓	56	↓	54	↓	0	0	9
NWWSC	31	↑	97	→	100	→	63	↑	5	↑	22	↑	13	↓	88	↑	104	↑	6	1	2
WWSC	47	↓	50	↓	10	↓	57	↑	17	↑	8	→	14	↑	81	↓	71	↓	1	1	7
CWSC	33	↓	70	↑	100	→	79	↑	46	↑	21	↓	11	↑	76	↓	76	↓	3	3	3
Av.	45 (w)	→	82 (s)	↑	51(w)	↑	74.4 (w)	↑	34(w)	↑	16.2 (s)	↑	**		78(w)	↓	80 (w)	↓			

Figure 14: National Regulator report for Zambia 2008/9, award to best performing Water Supply and Sanitation Company (WSC), Overview of Key performance Indicators (KPI)

Parallel to this structure, full-spectrum consumer based "**watchdog**" groups would be needed as a medium for complaints and as a check on inappropriate governance issues. Examples might include "Water Users Association" (Ghana) and "Peoples Voice Structure" as used in some southern regions of Ethiopia.

Until a National Regulator for water and sanitation were formed, the Regulatory function would need to be carried out temporarily by MOWIE.

Each CU would be obliged to follow **national and regional guidelines and regulations** with respect to water abstraction, environmental impact, reduction, recycling and reuse, enforced by an Environmental Protection Agency (*this role understood to be currently under MoEPFD, see **Figure 10***) and/or Regional Government (*possibly through each town Mayors offices*), and maybe also by a separate water abstraction licensing authority (*if or when such a body is formed);* currently MOWEI issues abstraction licences.

It is envisaged that service delivery would benefit from **delegation to private companies and Community Based Enterprises (CBE)**. The CU would invite tenders for delegated operating contracts, which would be controlled by strict delegated service management contracts (DSMC) between the CU and delegated management operator (DMO). The DSMC would include the same Key Performance Indicators (KPI) that will have been applied to the CU by the Regulator and the AOM.

An example of delegated management and regulation from Mozambique is described in the ***Box 3*** below.

The delegated management framework (DMF) has been the signature decentralisation reform in the Mozambican water and sanitation sector. The first round of reforms began in the 1990's through the establishment of FIPAG, the country's asset manager for water in large cities. While this responsibility started

with Maputo in 1997, by 2015, FIPAG has become the asset owner of 27 cities. As part of the second wave of reforms, in 2009, the Mozambican Government (GoM) delegated to AIAS (Administracao de Infrastructuras de Aguas e Saneamiento) the responsibility for asset management of water and sanitation to secondary cities and towns. In 2011, AIAS was given the responsibility for urban sanitation across the country. This DMF model involves the main operator delegating the delivery of water services to smaller operators locally. Maputo's main water utility, Agua de Maputo AdeM, delegates responsibilities of delivery to smaller providers, such as EMA and Maxaka. The model is intended to be applied where there is a strong commercial case, such as where there are areas that are a long way from the distribution centre that would require additional investment. WSUPs work in Maputo in supporting this model has provided evidence that this type of arrangement is a viable approach to water delivery in certain circumstances. There are indications that this strategy is now being scaled up: AdeM has agreed to Maxaka extending its services into unserved areas of Boane in the greater Maputo Area. AIAS is looking at the delegated management of services in towns in Mozambique and has relied on its past work with UNICEF in five small towns in the province of Nampula to test this model out beyond the country's capital. CRA, the National Regulator, has been working with WSUP to establish a better regulatory framework for delegated management. The model of the asset manager being responsible for contractual arrangements within a regulatory framework overseen by the regulator provides the checks and balances for quality control in the decentralization of water and sanitation services to towns.

Box 3; delegated management of WASH services in Mozambique

As described under *Sub-section 2.9, **Component 8***, on *Buildings Sanitation Facilities*, each CU would have an oversight and regulatory function related to installation and monitoring of on-site liquid waste storage and treatment (cesspits, septic tanks, and decentralised waste water treatment plants), *backed by a MOU with counterpart organisations as noted below.*

The ToR for the IUSHS (***Box 4***) opens up the possibility for a "*radical shift*", by which we understand a "*radical institutional shift*". These proposals for formation of sub-regionally based operators and competition for funding is the sort of radical shift that WSUP Advisory believes to be essential for improvement in sanitation and, of course, the water supply essential for health, improved sanitation and revenue generation (*People are more willing to pay for water supply than sanitation services*).

Though the sector Ministries have developed different programs to include urban sanitation in their mandates, very few of them have the opportunity to be partly implemented. There is no adequate budget allocated for urban sanitation and less emphasis is given to sanitation when compared to water supply and other infrastructures. The approach of sanitation management at town level varies from town to town as well as from region to region. There are no clearly defined roles and responsibilities among the different institutions.

Thus addressing urban sanitation is more complex and may require radical shift. Review of policies regulations and institutional responsibilities and putting enforcement mechanisms at different levels are required. In addition, investing in the infrastructures development and improving the urban sanitation management at local level though capacity building and generating revenue for operation and maintenance costs are another aspects to be considered.

Box 4: Extract from the IUSHS ToR

2.4 Component 3: Competition for Funding

Donor funding to the water and sanitation sector has increased in recent years due to increased political attention given to the sector. However, as detailed in the Situation Analysis, Ethiopia currently has limited capacity to absorb even the modest water sector funding that is available. This consistently results in underutilization of funds with unused budgets being claimed back by Federal Government.

It is considered that the proposed water and sanitation sector reforms, outlined above in *Sub-section 2.3, **Component 2***, and the voluntary clustering of municipal utilities will provide a more efficient channel for project funding (including the funding required to achieve restructuring), particularly if the new CUs are supported to compete for funds. The processes of institutional change and capacity

building will take time but it is considered that the medium and long term benefits to the service beneficiaries will be much greater.

The concept of "selection for readiness" under the One WASH programme could be made into a competition for funding based on a level playing field. The idea is that municipal water utilities (and the towns and cities that they serve) which demonstrated initiative to group together on a voluntary, but informed, basis (as described in *Sub-section 2.3, **Component 2***) would be more likely to make good use of limited funds and to lead the way for other potential "clusters" of towns.

Selection criteria for ranking of applicant fledgling CUs would include:

- Willingness to share skills and resources
- Willingness to sign a Service Management Contract, free of political interference
- Willingness to take on full responsibility for all sanitation services (except SWM)
- A clear strategy to serve low income customers and vulnerable groups, and
- Commitment to a clear strategy and timeframe to achieve financially sustainable water and sanitation service delivery

The process of competition and qualification by ability and willingness to reorganise and collaborate will engender funder confidence and may be expected to attract increased investment from both GoE and IFIs.

2.5 Component 4: Capacity Building

In order to ensure that all "fledgling" sub-regionally voluntarily clustered water and sanitation commercial utilities (CUs) have equal opportunity to compete for funding, they will likely need significant assistance in planning institutional and contractual changes and in preparing sound engineering and commercially based funding applications.

As mentioned in *Sub-section 2.3, **Component 2,*** it is also necessary, of course, to ensure the potential to achieve an equitable spread of development funds geographically and ethnically while still maintaining the principle of competition**.** This can be tackled by offering training and capacity building to each and every fledgling CU to assist them with their reorganisation proposals and associated funding applications.

Capacity building might be achieved through:

- Multi-region based workshops to explain the process for clustering to regional governments, to zonal administrations, to utilities and to municipalities and Woredas
- Presentation of sample SMCs, Key Performance Indicators (KPIs), Master Plans and Funding Applications
- In-depth capacity building of short-listed voluntarily clustered water and sanitation utilities
- Feedback on applications and assistance with re-application
- Assistance under the One WASH Implementation Structure**,** ***Figure 11***, to judge the best qualifying applicants
- Assistance to the qualifying applicants to prepare detailed engineering and system designs and plans for structural, management and commercial/ financial changes
- Assistance to the qualifying applicants to execute engineering projects, implement sanitation service provision and to carry out organizational reform
- Strategic groundwater assessments, improved investigation, data bases and monitoring (most towns rely heavily on groundwater sources and many will have no clear idea on

sustainability and the effects of deforestation and climate change on these precious reserves)

It is considered that these capacity building activities will require significant support from external consultants, since many of them may be somewhat new to Ethiopian professionals. However, the initial capacity building will be as much about helping Ethiopian institutions and consultants, to themselves carry out the necessary capacity building, as about direct contact with the fledgling CUs. Possibly "Centres of Excellence" could be established, for instance, at leading universities involved with WaSH.

It has been demonstrated (see example from Mozambique, ***Box 3*** above and example from Zambia below; also there are some limited examples in Ethiopia) that increased operational efficiency and better service to customers can be achieved through delegation of services (as also noted under *Sub-section 2.3, **Component 2***). Very significant capacity building effort is required to form large DM operators, a process that might take 12 months or more but is never-the-less worth it for the high levels of service and customer satisfaction that can result from the effort.

See Zambia example ***Figure 15*** below where water and increasingly sanitation services have been delegated to community based, but commercially operated, Water Trusts since 2000. The Water Trusts each serve between 50,000 to 150,000 customers on a financially sustainable basis.

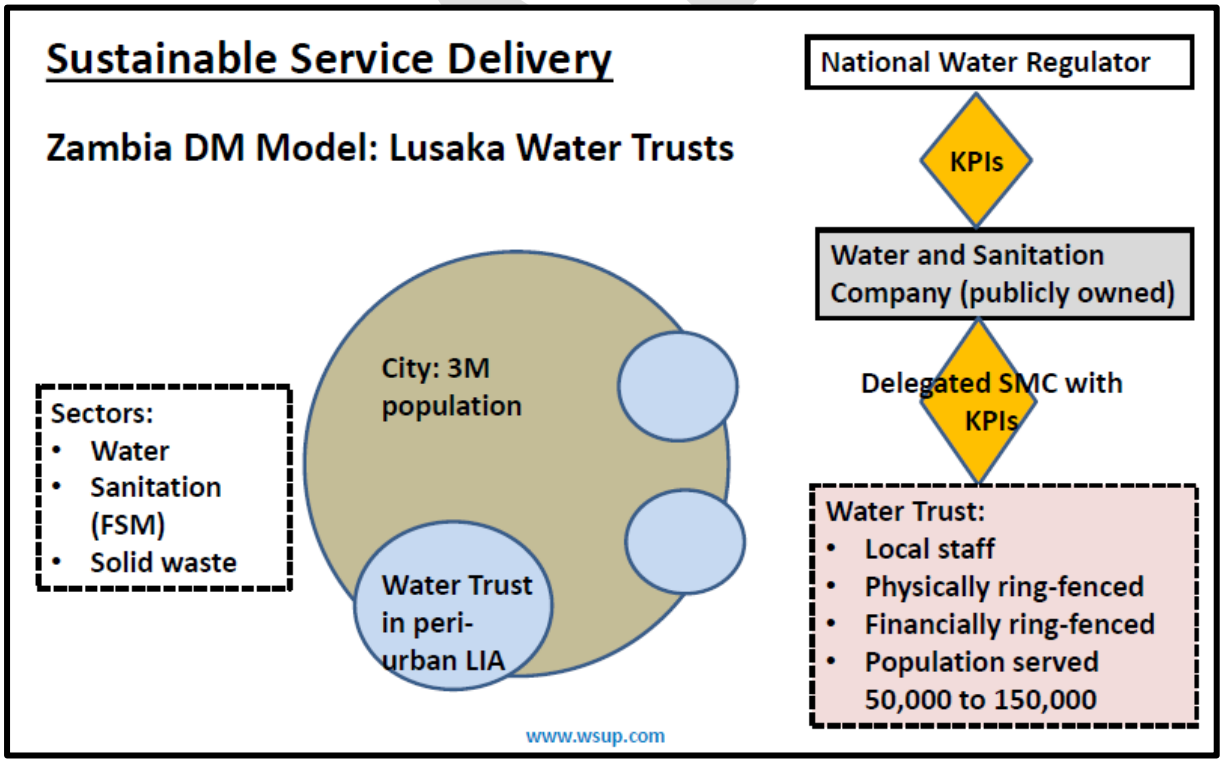

Figure 15: Schematic of delegation of services to ten Water Trusts in Lusaka which together serve a total of around 500,000 customers

2.6 Component 5: Technical Innovation and Development

At the front end of the liquid and sludge sanitation chain are the toilets used by all members of society. It might be assumed that there was not much technical innovation needed since Mr Crapper (reputedly) invented the "water closet" well over one hundred years ago and the subsequent

introduction of low volume pour flush “Asian” toilets. However, Ethiopia has largely ignored, neglected or simply not been able to afford the facilities needed by a significant minority, the “differently-abled”. Similarly, there has been little attention given to gender needs, specifically menstrual hygiene management (MHM).

There would seem to be a need to explore, and evaluate, low cost options for facilities located within private, public, communal, commercial and institutional buildings to cater for gender and vulnerability requirements. Along with access and privacy needs, provision of adequate water supply for sanitation (for washing and flushing) would benefit both consumer groups.

Some of the downstream technical options that have been, or are now being, proposed are unproven in the Ethiopia context and need rigorous trialling, monitoring and promotion. Ethiopia has embarked on an ambitious strategy to build inner city and peri-urban medium rise condominium housing and commercial blocks to replace single storey high density old inner city housing in most large towns and cities. The old housing had poor sanitation infrastructure with reliance on individual unimproved pit latrines and some public and communal toilets.

Unfortunately, the building of “condos” has surged ahead of adequate sanitation provision. Reliance on sealed sewage holding tanks (cesspits) and mechanised transport of the contents to centralised out-of-town treatment centres is considered, as indicated in the Situation Analysis, to be unsustainable.

Conveyance of sewage to centralised sewage treatment plants is the conventional solution, but the technical and financial obstacles to this are high; and failure of this solution to keep apace with development, both formal and informal, has been demonstrated in virtually all African cities. Ethiopian cities and towns are all “water stressed”, for one reason or another, and there is rarely enough water to operate conventional sewerage which relies on a very high water to solids ratio.

Ethiopian planners and policy makers have taken the, perhaps unprecedented, step to explore the possibility of high efficiency small decentralised waste water treatment plants located close to buildings and to explore re-use of liquid, solid and gas products resulting from process.

WSUP Advisory has obtained a proposal from Gondar University to carry out a rigorous evaluation of the living and environmental (including sanitation) conditions related to domestic occupation of condominium developments. The University has also made a proposal to use bio-digesters to treat human waste and produce biogas for economic gain; the Summary of this latter proposal is reproduced as ***Annex 5***. These are excellent starting points and there are understood to be several other Ethiopia initiatives towards decentralised waste water treatment.

For over four years, WSUP and its partners and consultants have been involved with sustainable collection, transport and treatment of pit latrine sludge and safe re-use of solid, liquid and gas products.

However, each country conditions are unique and the time required for technical and operational development should not be underestimated. The sooner this research can start in a country wide approach, making the best use of sharing between professionals and policy makers (such as proposed under *Sub-section 2.7, **Component 6,** Network for Sharing Best Practice*), the more effective will be the Strategy to alleviate the current poor urban sanitation conditions. Such research and development work is an example of the “bottom-up” approach illustrated in ***Figure 13*** above.

Development of decentralised waste water treatment plants, with the associated ambition to provide safe products for re-use, is just one link in the sanitation chain. Other parts of the sanitation chain require equal, if not more, attention.

An immediate and obvious task is how to convey treated liquid effluent from point of production within built up areas to the intended point of use, which will be in green spaces and parks also located within or between built up areas. This throws up some significant technical and land allocation issues related to pumping, pipelines, open conduits, co-use of storm drains, storage, etc. It will also need agreements to be in place, based on unambiguous contractual arrangements, for sharing of costs and benefits between stakeholders. A possible draft MoU to cover the collaboration needed here is included as ***Annex 4.***

Taking settled sludge from such decentralised waste water treatment plants, rather than all liquids and solids required to be removed under the existing cesspit system, can be achieved efficiently and economically by large publically or privately operated vacuum trucks.

However, at the other end of the scale, finding cost effective ways to empty pit latrines (used by the majority of urban residents) and small household (usually leaky) cesspits has not been achieved and, as a general rule, faecal sludge stays in the locality where it is produced and overflows into the environment with consequential significant health and macro-economic impact, as documented in the Situation Analysis.

There is an urgent need to have a "conversation" around the concept of low cost but safe manual pit emptying at the primary collection end of the sanitation chain. This is a subject that meets with some incredibility in Ethiopia, even among sanitation professionals! However, other African countries and, importantly, some IFI investors are seriously looking to scale up manual pit emptying models that have been pioneered and shown to be viable by WSUP and its partners and consultants.

Annex 6 illustrates one technical development that has assisted with manual pit emptying and primary transport technology. The improved "Gulper Mk II" pit sludge pump was developed jointly by an international appropriate technology mechanical engineer, a local Kenya commercial mechanical engineering workshop and, most importantly, by the Nairobi pit emptiers themselves. Having this piece of equipment was the catalyst for a safe, efficient, affordable and profitable micro-enterprise, in fact the same CBE described in ***Box 1*** above.

The Gulper Mk II works well for pit latrines in the environment in which it was developed, that is, a Nairobi inner city slum, and it works well for septic tanks and cesspits. However, it does not work where there is a significant proportion of solid waste thrown into the pit latrine, as is common in Lusaka peri-urban areas for instance. However, the major challenge to introduction of manual pit emptying in Ethiopia will not be technical but will be more related to attitude, based on unfamiliarity. This is why Raising Sanitation profile (*Sub-section 2.2, **Component 1**)* has been put at the top of the list and why it is necessary to use up-beat marketing campaigns, as illustrated by ***Figure 1.***

So, having developed our decentralised waste water treatment system and introduced low cost manual pit emptying and primary transport (possibly a combination and manual and donkey drawn carts) systems, what are we going to do with the faecal sludge? Sludge from the former will be fresh and that from pit latrines will be a mixture of old and fresh faecal matter.

Initial analysis, limited because of lack of data, carried out for the Situation Analysis, indicates that the current practice of taking sludge to a single remote, often "out-of-sight-out-of-mind", location and then, in theory at least, treating the waste for municipal use is not the most financially sustainable approach.

This Strategy promotes the concept of decentralised anaerobic primary sludge treatment, with local use of bio-gas, and well-engineered high efficiency drying beds, located within the towns or around their perimeters. ***Figure 16*** illustrates second stage treatment of pit latrine sludge in Lusaka, Zambia: The raw sludge is first conditioned by anaerobic digestion and then sun and air dried to remove pathogens before sale to the public.

Figure 16: Decentralised pit larine sludge treatment and commercial sales in Lusaka, Zambia

Another, perhaps less obvious, area of technical innovation is water treatment technology aimed at reducing use of bottled water. Plastic bottles appear to pose a significant problem of disposal; they are often separated along the solid waste disposal chain but then piled up without a market for recycling. In Mekele, for instance, the bottled are burnt at the tip in an attempt to reduce valuable site volume, with consequential air pollution and health impact. Rather than try to create a recycling route for plastic bottles, often energy intensive and possibly involving questionable economics (but being aware that the informal plastics collection sector has been reported as profitable; see also SWM, *Sub-section 2.10,* ***Component 9***), the prospect of *reduction* should be explored. Remember the acronym "RRR" (Reduce, Re-use, Recycle)!

There are two approaches that this Strategy promotes to reduce consumption of very expensive and often dubious quality bottled water:

- Treat piped water to a high standard and issue quality control guarantees on the product (tap water) so as to encourage consumer confidence, all as part of service promotion (*Sub-section 2.11, **Component 10**, below*)
- Marketing of household point-of-use diatomaceous earth based "candle" filters.

See ***Box 5*** below as an example of good practice related to both these bullets.

The WSUP Advisory Team Leader was able to save a West Africa mining company around $1M per year in purchase and trucking costs to a remote mine exploration site through installation of adequate water treatment facilities plus point of use pressurized micro-filtration units. So as to gain consumer confidence, bacteriological test results were printed and displayed next to the filtration units. The 500 staff and workers were issued with re-usable water bottles to carry with them.

Box 5, Mine operation water supply, Guinea West Africa

As regards solid waste management, the technologies for operation of large waste disposal sites are well documented and primarily include (a) avoidance of leachate getting into surface and groundwater, (b) regular covering of "cells" with impermeable layer to reduce infiltration and discourage disease vectors (birds, rats, dog, insects, etc.) and (c) health and safety measures. However, this is not simple or cheap and requires professional hydrogeological, hydro-chemical, civil engineering, mechanical engineering and project management inputs and, of course, capital for initial construction and mechanical equipment and a revenue stream to pay for the sustainable maintenance and operations costs.

Where technical innovation might be required is in primary labour intensive collection, transport and temporary storage of solid waste, building on current best practice demonstrated by existing entrepreneurial micro-enterprises. Good examples of SWM best practices include small scale micro enterprises (SMEs) handling SW collection from households to transfer stations in Addis, Bahir Dar, Mekele, Gondar, Wukro, Hawassa and other towns.

2.7 Component 6: National Networks for Sharing Best Practice

Ethiopia is a large country and lessons related to water, sanitation and solid waste on institutional change, Service Management Contracts, meeting KPIs, capacity building, commercial practices and, of course, technical innovation need to be shared and discussed.

It is recommended that existing Water Utilities Associations, at regional and national levels, should be given national and international technical support and assistance towards the costs associated with venues and software for sharing and disseminating best practice.

Similar support could be given to individual, or preferably clustered, municipalities (including all types of town administrations) wishing to share experiences in the field of SWM, including technical knowledge, financial management, 3Rs, waste collection, storage, transport and final disposal, environmental protection and H&S.

2.8 Component 7: Behaviour Change

Besides campaigns to raise the profile of sanitation at national level (*Sub-section 2.2, **Component 1***) and promotion of services through creation of "consumer demand" (*Sub-section 2.11, **Component***

10), there is the week by week need for activities to promote hygiene practices and better use of available sanitation facilities.

Ethiopia has done a tremendous amount to this end through the existing Health Extension Programme under the MOH. As clearly described in the Situation Analysis, this approach has demonstrated appreciable impact in rural areas. However, the Urban Health Extension Programme (UHEP) has not been running for so long and needs to be better supported and possibly re-designed to suit the specific urban circumstances.

It will be necessary to accelerate and improve the UHEP. This process will, of course greatly benefit from creation of "consumer demand" for higher levels of service, to be carried out by the service providers themselves (Sub-section 2.11, ***Component 10***) and the campaigns to raise sanitation profile (*Sub-section 2.2,* ***Component 1***). All three related component (***1***, ***7*** and ***10***) will benefit from modern advertising techniques, posters, leaflets, school programmes, health publications, social media, radio, TV, mascots, logos, etc.

Awareness Creation, Behaviour Change and Promotion of Services

- It is clear that the **Sanitation Profile** needs to be raised at all levels, from policy makers, clinics, schools, commerce, industry to landholders and householders. A modern **media based approach** will be needed for this, organised through MOH, Regional and Municipal Health Centres and through the UHEPs
- MOH clearly has the mandate for this activity (***Figure 10***) and is obviously well qualified. However, sanitation is currently perceived as low priority and **national awareness creation** will need to be very significantly "geared up" and will likely need inputs from outside professional agencies
- Existing **behaviour change activities through UHEPs** need to be strengthened through a "clustered", sharing, approach to achieve **universal best practice** in terms of organisation, monitoring and reporting. The UHEP perhaps needs to be organised, and "clustered", at Regional or Sub-regional level or Zonal levels, to obtain economy of scale and sharing of limited skills and resources. The parallel here is the proposed formation of CUs and AOMs described for water and sanitation services under *Sub-section 2.3,* ***Component 2.***
- Promotion of services should also be carried out by those providing (*and selling*) the services. For instance, cesspit emptying services might best be promoted through CUs and their delegated operators. Collaborative parallel activities by CUs and MOH should be enshrined and reinforced through the signing of suitable Memoranda of Understanding, involving the MOH, individual CUs and perhaps MOWIE, Regional and Zonal authorities and municipal authorities.

Significant segments of town dwellers live in crowded often rented houses where space for building latrine facilities is a major challenge. Facilities that do exist are most of the time full. Such situations force households to use any available open space for defecation. It is not uncommon to observe individuals/households forced to relieve themselves in plastic bags, wrap it up and throw them in open spaces, many times on roads, open ditches and behind buildings. The excreta becomes exposed to flies, pets and people and/or washed away to water bodies increasing the likelihood of disease transmission and unsightly conditions.

Identified issues related to the UHEP include:

- Lack of active community participation in UHEP
- Lack of time for families to participate in the UHEP
- Lack of land/space to construct latrines/seepage pits

- Unclear governance structure for the UHEP
- Lack of regular follow up and reporting mechanisms
- High turnover of UHEP professionals due to low acceptance by Communities

Improving UHEP to bring about sustained behaviour change will therefore include; understanding the day to day performance of the UHEPs and Supervisors, refresher training and capacity building efforts, effective linkage with HDAs, linkage with the private sector, changing visiting hours of UHEPPs to households, addressing issues around availability of land for households to build latrines and cesspit, better training and terms and conditions for UHEPPs, timely reporting and feedback mechanisms, regular M&E and supportive supervision, engagement with school communities in sensitization and follow up of S&H activities in schools, neighbourhoods and communities, engagement with Faith Based Organizations, churches and mosques, to conduct promotional work, involvement of Women and Youth Forums, and use of community Based Organizations such as Idirs (voluntary association of neighbourhoods).

First and foremost, the UHEP would need to be strengthened to illicit behaviour change in communities on the health and environmental consequences of open defection and indiscriminate dumping of solid and liquid waste. In the short and medium term, the major actions that would need to be taken may include:

- Seeking solutions to the problem of space for those that are faced with shortage of land
- Carry out rigorous and consistent promotion through the application of community based approaches, possibly based, for instance, on Community Led Total Sanitation and Hygiene (CLTSH)
- Apply the provisions of the Sanitation Marketing Guideline to improve supply chain to upgrade latrines
- Build Communal Latrines for households living in neighbourhoods who do not have household facilities; and initiate operation and maintenance mechanisms for sustainable and proper management of facilities
- Construct Public Toilets and engage micro-enterprises to manage and run the facilities
- Draft, introduce and enforce by-laws agreed by beneficiary communities
- Engage Youth and Women forums to support and follow up the compliance of individuals
- Engage Community Associations such as Idirs (Voluntary Traditional Association of Communities who live around the same neighborhood) to become fully involved in S&H
- Use school children and teachers to support promotion, sensitization and follow up of proper waste management in their own schools, families and neighborhoods- this has proven to be effective in many areas
- Facilitate soft loan through MFIs to households wishing to upgrade latrine facilities but have problem of finance
- Involve institutions such as prisons, military barracks, etc. to improve management of waste in their respective premises
- Hand in hand with the above, ensure the provision of safe water supply in adequate quantity to households

The recommended action to solve such scenarios requires concerted effort of various sectors including, but not limited to, the following:

- Federal Ministry of Health through the UHEP

- Ministry of Urban Development, Housing and Construction – Beautification and Greenery Agencies; Town/City Administrations
- Ministry of Water, Irrigation and Energy: Water Utilities
- Ministry of Forestry and Environment: Enforcement
- Development Partners
- CBOs, FBOs, NGOs and others

Annex 3 is a possible amended MoU on WaSH Plus that will coordinate the WaSH sector and MoUDHC in order to bring liquid waste management and solid waste management under one umbrella without violating the mandates given to the different ministries.

2.9 Component 8: Buildings Sanitation Facilities

It is the responsibility of property owners to install and maintain all sanitation facilities within the curtilage of the property. These includes:

- Pit latrines; which may be poorly design, undersized, inaccessible, badly maintained and non-compliant with national and/or international definitions of "improved sanitation"
- Poor flush and full flush water closets and pans; which may be poorly designed, poorly constructed and poorly maintained
- Inadequate provision for differently-able people in homes, offices, public buildings, schools, restaurants, communal toilets, public toilets, in fact, just about anywhere, resulting in degradation and humiliation
- Inadequate provision for menstrual hygiene management (MHM) in offices, public buildings, schools, communal toilets, public toilets, etc. resulting in work and school days lost
- Cesspits (either sealed or leaky) and septic tanks (where allowed) which may be poorly design, undersized, inaccessible and non-compliant with national and/or international definitions of "improved sanitation"
- Decentralised waste water treatment plants for which there are currently no adopted designs; nor are there any established designs and arrangements for quality control, conveyance and utilization of the generated solid, liquid and gas products

It is understood that the National Building Codes have just been revised, but not yet published, and our enquiries did not manage to yield an advance copy. It will be part of the Strategic Action Plan, ***IUSHSAP Component 10***, to ensure that all aspects of in-curtilage sanitation provision, as listed above, are incorporated into, or at least noted (since technology development stage for some aspects will take several years) within, the next revision of Building Codes. In addition, supplements or revisions to the Building Codes may be published. Of particular significance will be designs coming out of innovation and networking strategy components (*Sub-section 2.6,* ***Component 5*** and *Sub-section 2.7,* ***Component 6***).

Compliance with the Building Codes will be the responsibility of Building Control Departments falling under MOUDHC, Regional, Zonal, Woreda administrations and individual town administrations/ municipalities (***Figure 10***). MoUDHC currently issues building codes, prepares city master plans and

oversees building controls at all levels from Federal to Woreda levels. Town administrations and municipalities, where they exist, ensure compliance with building codes.

Compliance/non-compliance with both planning controls and building controls is a fertile and traditional territory for corruption in many countries. Since this subject has the potential to sabotage the whole sanitation chain, then this has been discussed in some detail within the Situation Analysis in order to give background to a ***Risk Analysis***. Risk analysis is considered to be an important subject to be covered, as far as possible, under the IUSHSAP.

In order to give some extra leverage to compliance with Building Codes related to sanitation, and to add an additional line of defence against corruption, then it is proposed that existing water and sanitation utilities, as well as the to-be-formed sub-regional CUs, are given a statutory task to inspect and approve all new in-curtilage sanitation facilities before a public water supply is allowed to be connected to the property. This statutory obligation can be included within the SMC between new CUs and the corresponding Association of Municipalities.

Equally, although somewhat more difficult, the utility should be given the mandated powers to cut off the public water supply if, upon repeated inspection and warnings, the property owner (be they private, commercial or institutional) fails to meet minimum standards for provision of facilities or allows sullage and faecal matter to escape beyond his curtilage.

There is a clear need here for a three or more way MOU to be signed between the party with oversight over Building Control (MOUDHC at all government levels), the party with responsibility for sanitation chain (the local water and sanitation utility) and the parties which will have an interest in use of the treated sanitation products (solid, liquid and gas), including the municipalities themselves as well as institutions and the private sector. For instance MOUDHC (***Figure 9***) is also responsible for "Urban Cleaning and Beautification" and will therefore be one of the customers for processed sludge and treated liquid effluent.

Annex 4 is included as a potential MoU that will bring together water utilities and association of municipalities on behalf of beautification and greenery agencies/offices This and other such MoUs will be drafted in the course of the strategic action plan preparation as supplementary coordination tools.

2.10 Component 9: Solid Waste Management

Paramount to a SWM strategy is inclusion of the "3Rs" (Reduce, Reuse, Recycle) as illustrated in ***Figure 17***.

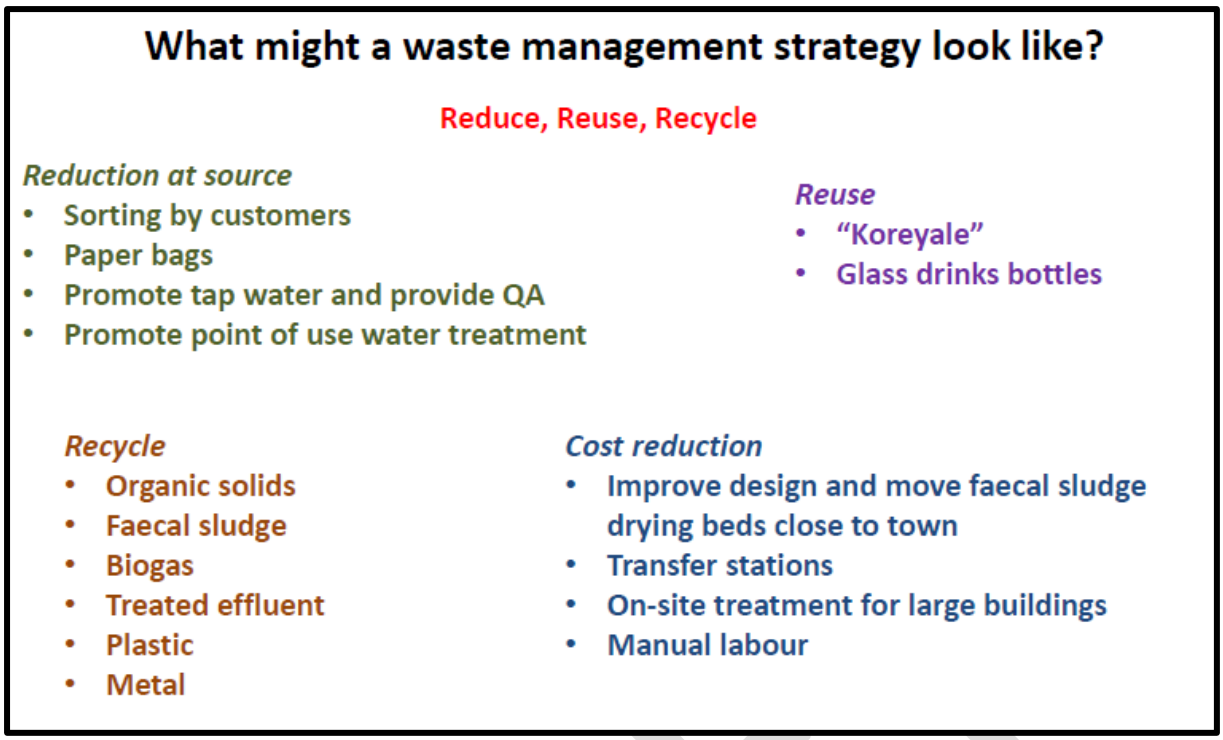

Figure 17: The "3Rs"

Ethiopia has taken this principle seriously, as illustrated by composting of the high organic fraction present in the larger towns (***Figure 18),*** but perhaps at the expense of overall service provision.

Figure 18: Composting of the high organic fraction found in municipal waste from a large town, Bahir Dar

SWM is currently driven by clean streets and job creation but with little attempt at efficiency or cost recovery. Serious environmental and health impacts have been noted resulting from poor collection, transport and disposal practices.

Under this strategy component, and as mentioned also under other strategy components, it will be necessary to:

- Cluster operations so as to better utilize skills and limited resources
- Raise the status and business skills of sanitation micro-enterprises
- Rationalize primary collection/ sorting, secondary transport and final engineered disposal into labour/ donkey intensive and vehicle/ machinery-intensive contract packages
- Require micro-enterprises and other companies to bid for contract packages of work at municipal or sub-regional level
- Follow and enforce the Ethiopian National Urban Solid Waste Management Standards published in February 2014

In addition to the standards published in February 2014, there is a SWM Strategy in Amharic that includes clear vision, mission and objectives. The strategy indicates how proper solid waste management can help in the reduction methane that contributes to reduction of Global Warming. The strategy also indicates the use of SWM army and involvement of all stakeholders for implementing the strategy. The strategy also mentions the roles and responsibilities of stakeholders and calls for efficient and effective SWM based on proven models that could be scaled up.

For final SWM disposal sites there is a requirement for professional hydrogeological, hydro-chemical, civil engineering, mechanical engineering and project management inputs and, of course, capital for initial construction and a revenue stream to pay for the sustainable maintenance and operations costs. The current practice of poor tip site management, at many town and city locations, and even co-tipping of faecal sludges with solid waste, raises very severe environmental and health and safety issues, to be urgently addressed and fast-tracked through the SAP.

Comparison of ***Figure 18*** with ***Figure 19***, which shows a tip site also located outside Bahir Dar, illustrates how attention has laudably been given to the 3Rs while at the same time totally neglecting the bigger picture.

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Figure 19: The "nightmare" tip site at Bahir Dar: Co-tipping of faecal and solid wastes; open burning; smoke; dust; toxic air pollution; biological and toxic surface and groundwater pollution; extreme working conditions; effect on agriculture; effect on nearby and distant village populations

When it comes to the smaller towns which have very limited skills and resources to operate efficient and environmentally friendly SWM systems, then it is considered that, as for water and sanitation services, the sector would benefit from municipal clustering at sub-regional level and contracting out SWM services to sub-regional private or publically owned operators.

- It is envisaged that Municipalities would remain responsible for **primary collection and separation of solid waste to transfer stations**
- Municipalities would also be responsible for **cost recovery** and/or subsidy (*There is currently a conflict between the policies of "job creation" and "cost recovery", since SWM may not be organised in the most cost efficient way)*
- In order to improve cost recovery and value for money, micro-enterprises should be invited to **tender for packages of work** and required to sign contracts
- Secondary transport and final disposal would benefit from Sub-regionally or Zonally organised **delegation to private companies and CBEs**. The delegated operators would tender for contracts and would be controlled by strict **delegated service management contracts** (DSMC) including Key Performance Indicators (KPI). The contracts could be let either by the Association of Municipalities (proposed above in relation to formation of Water and Sanitation CUs*, Sub-section 2.3, **Component 2***) or by individual Municipalities

- Municipalities and delegated operators would be obliged to follow **national and regional guidelines and regulations** with respect to environmental impact, reduction, recycling and reuse, enforced by an Environmental Protection Agency, Regional Government and through town administrations/ municipalities. Currently MoEF at federal level (***Figure 1***), environmental protection offices at regional level town administrations/ municipalities are responsible to follow national and regional guidelines and regulations.
- WSUP-A does not currently see a specific role for a National Regulator for SWM

There is need to acknowledge the significant role being played by the urban informal sector and its place in the urban economy (***Box 6***). Devising SWM chains that fully involve, capacity build and raise status of the informal sector and greatly improving the conditions under which they work will be an essential part of service delivery.

> This study has shown that thousands of individuals in Addis Ababa are dependent on the recovery of plastic materials in order to make a living. Moreover, the activities have shown to be economically profitable and to play an important role in solid waste management. It is argued that a lack of a formal system for the recovery of plastic materials has made it possible for the informal sector to fill the gap that the government does not fill. The governmental ignorance of the informal plastic recovery system has proven to be one of the main difficulties confronting the plastic recovery system. The thesis highlights that it is essential that the government starts to recognize the informal sector and tries to gain their trust and credibility in order to improve the overall solid waste management system in Addis Ababa.

Box 6: Abstract from "The cycle of plastic waste: Analysis on the informal plastic recovery system in Addis Ababa, July 2005, Camilla Louise Bjerkli, Masters Thesis, Norwegian University of Science and Technology, Dept. of Geography

2.11 Component 10: Promotion of Services

In order to take commercial and social benefit advantage of the improved levels of service being offered, these services need to be promoted to customers. The best promoters of any service are the service providers themselves. These providers include the utilities, the asset owning municipalities, contractors, delegated community based enterprises and private micro-enterprises.

For these latter two groups in particular, small community and private enterprises, there needs to be a shift from a, possibly low productivity, "job-creation" concept to involvement of efficient highly motivated entrepreneurs.

WSUP Enterprise staff and consultants have been specialising in this field of WaSH private enterprise support for over three years. An example of its approach to supporting governments to foster growth of new businesses may be seen in ***Annex 7*** attached. How appropriate this particular model might be in the Ethiopia context is not known, but the point is that developing existing businesses or creating new businesses needs a serious and professional approach spread over time and sufficiently resourced.

Supporting the acquisition of appropriate tools and equipment, PPE, and sustainable transport systems (that are appropriate to the journey involved), alongside providing training and support in business development, can be catalytic to provision of an affordable service. One example from Kenya, *Kara Company* micro-enterprise and the *Gulper Mk II,* has already been described under *Sub-section 2.2*, ***Component 1****, Raising Sanitation Profile* and under *Sub-section 2.6*, ***Component 5,*** *Technical Innovation and Development.*

What drives efficiency and improved levels of service will include the human desire to make money to better him/herself. If there is a formula within the SMC that allows staff of the CU to receive a bonus for achieving high KPI scores in water and sanitation provision, then this can be a motivation to sell their organisations services. However, how financial reward for service delivery is managed depends on being able to overcome cultural blocks and expectations and on being able to establish clear procedures for measuring group and individual achievement.

Similarly, if there is a formula within the DSMC that allows staff of the DM contractor or CBE to receive a personal bonus for achieving high delegated KPI scores in water and sanitation provision, then this might also be a motivation to sell their services. However, the main advantage of DM relates to the physical and financial ring-fencing of services and establishing a clear profit motive in order to both promote and deliver services.

Complimentary to promoting and selling sanitation services is the promotion and selling of reliable safe treated mains water. There is generally a greater consumer willingness to pay for a good water supply than for sanitation services: This gives the potential for cross-subsidy from water to sanitation within a utility that is responsible for, and obliged contractually to deliver, both services.

However, most towns in Ethiopia are short of water, either through lack of water resources or through lack of installed capacity, or both. Willingness to pay for water, under these circumstances, may be influenced as much by desperation as by the level of service under offer. Sustainable exploitation of available water resources (supported by hydrogeological capacity building as mentioned under *Capacity Building, Sub-section 2.4,* ***Component 4***) and use of water saving facilities within buildings is considered to be a key activity to achieve adequate, affordable and universal sanitation access.

If decentralised waste water treatment systems are to be installed, then the products (solid, liquid and gas) will need to be marketed. Again, motivated, efficient and well regulated private or community based micro-enterprises, under clear DSMCs, may be best placed to promote and sell these products. Since this activity is part of the sanitation chain, then the DSMCs should be organised through individual CUs a s part of their mandate to deliver water and sanitation services.

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3 How do these proposed Strategy Components affect the immediate task of improving all aspects of poor Urban Sanitation?

3.1 Methodology

The logframe included under ***Sub-section 3.2*** addresses fourteen aspects of sanitation where poor practice and inadequate service levels have been reported or observed:

Low water availability	*Sewage treatment*
Open defecation	*Solid waste generation*
Unimproved pit latrines	*Solid waste collection and transport*
Improved pit latrines	*Solid waste disposal site*
Flush and pour flush to cesspits	*Industrial waste*
Sludge disposal	*Health sector waste*
Sewerage	*Menstrual hygiene waste*

Four categories of impact resulting from these fourteen identified areas of poor sanitation areas are assessed:

Environmental Impact	*Financial Impact*
Health Impact	*Gender and Vulnerability Impact*

The logframe describes the strategic approach to address these fourteen aspects of poor sanitation and to mitigate the impacts. Initiatives already under way in Ethiopia and upon which the SAP might build are also identified.

We then explain, ***Sub-section 3.3***, how ***poor sanitation practice*** and ***inadequate sanitation service levels*** and their ***impacts*** have been addressed under the IUSH Strategy, by cross-referencing back to the ten ***Strategy Components*** previously described in this report.

3.2 Approach to addressing impacts of inadequate sanitation provision

Sanitation aspect	*Environmental Impact*	*Health Impact*	*Financial Impact*	*Gender and Vulnerability Impact*	*Strategic approach to address these impacts*	*Precedent in Ethiopia*
Low water availability	Energy wasted through technical and commercial inefficiencies;	Water washed diseases; Use of alternative, polluted sources;	Low willingness to pay; Insufficient revenue for cost recovery; Loss of income due to time to fetch water from distant sources; High tariffs paid to water vendors; Industrial incapacity; Commercial incapacity, including tourism;	MHM in schools and work places; Loss of female school and work days; Disabled need water flush toilets;	*Cluster water and sanitation utility operations to sub-regional level*[1] to allow professional inputs into *financially and technically sustainable water and sanitation operations*[2] and ability to write applications and justification for capital funding; *Clear contractual and KPI obligations*[14] through service management contract (SMC); Improve "resilience" through support of a *groundwater resources inventory*[11] backed by professional exploration, well logging and long term monitoring; *National network for Sharing Best Practice*[3]; Improvement in service delivery through physically and financially ring-fenced *delegated management models*[4] (DMM);	Water Utility Associations meet at Regional (twice per year) and National levels (once per year); Technical assistance from larger to smaller towns; Inclusion of satellite villages in town supplies; Use of centralised laboratories; Attempts to follow directives on full cost recovery; Hydrogeological data bases (?); it is understood that water utilities collaborate technically at sub-regional level: For instance, in Tigray, there are 3 sub-regions clustered around Mekele, Axum and Alamata. DMM: Included in the MOWIE's mandate is the setting up of contracting arrangements with private operators to enhance urban water distribution and liquid waste removal and transport.
Open defecation	Surface contamination; Pollution of surface and groundwater;	Water, air, food and contact disease transmission;	Those living in "slums" and illegal settlements are not given support services although active members of economy;	Danger to and humiliation of women and vulnerable;	*Improved Urban Health Extension Programme*[5] and reporting; *Creative Awareness and Behaviour Change*[6] on media aimed at users as well as policy makers and agencies;	Reporting and follow up on UHEP in use in larger towns, with good turnaround of failed household "graduates"; For instance, in Gondar, most of the model family graduates haven't reverted owing to the fact that the UHEP is strong due to positive effect of the presence of the oldest public health training centre that expanded to one of the best medical colleges. Only 55 of the model families reverted due to the past few years in

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Sanitation aspect	*Environmental Impact*	*Health Impact*	*Financial Impact*	*Gender and Vulnerability Impact*	*Strategic approach to address these impacts*	*Precedent in Ethiopia*
						Gondar.
Unimproved pit latrines	Poor use practice, lack of vacuum tanker access and high pit emptying costs result in overflow, surface and sub-surface contamination;	Water, air, food and contact disease transmission;	Low level of awareness of relationship between sanitation, health and income that might otherwise lead to household investment and improved construction and use of facilities;	Difficult to maintain cleanliness for MHM and disabled groups;	*Financially sustainable sludge handling service*[7] involving *decentralised high efficiency sludge drying beds*[8] (including sludge recycling), *competitive bidding for contracts*[9]; Improved *Urban Health Extension Programme*[5] and reporting; *Creative Awareness and Behaviour Change*[6]; on media aimed at users as well as policy makers and agencies;	Reporting and follow up on UHEP in use in larger towns, with good turnaround of failed household "graduates";
Improved pit latrines	Lack of vacuum tanker access and high pit emptying costs result in overflow, surface and sub-surface contamination;	Water, air and contact disease transmission;	High emptying costs may result in pits becoming unusable with people staying away from school and work places, thus decreasing human resource capital for financial activity;	Full pit latrines will pose extreme difficulties and may result in OD;	*Financially sustainable sludge handling service*[7] involving primary treatment and *decentralised high efficiency sludge drying beds*[8] and including sludge recycling; *competitive bidding for contracts*[9]; *Improved Urban Health Extension Programme*[5] and reporting; *Creative Awareness and Behaviour Change*[6] in media aimed at users as well as policy makers and agencies; *marketing of sanitation services*[13] by service provider; Low professional cost, but safe, *manual pit emptying services*[20] will need to be introduced;	Reporting and follow up on UHEP in use in larger towns, with good turnaround of failed household "graduates"; A considerable number of households are climbing up the sanitation ladder in Gondar; Wukro and Mekele are also increasing the number of improved latrines;
Flush and pour flush to cesspits	High emptying costs mean that most cesspits are constructed with bottom drains; Rain water used to dilute and flush out; Cesspits, including large ones, left to	Disease vectors in contact with contaminated surface water; direct use of contaminated surface water for street car washing; Use of water from contaminated	High transport costs to remote sludge lagoons/ drying beds; Loss of economic benefit from reuse of treated sludge, liquid effluent and biogas; Contracts awarded without competition or efficiency measures;	Full cesspits and overflowing toilets may pose difficulties and may result in OD;	*Decentralised waste water treatment*[10] systems that can handle low flushing volumes; use *decentralised treated effluent for greening*[12] open spaces; *Financially sustainable sludge handling service*[7] involving primary treatment and *decentralised high efficiency sludge drying beds*[8], including sludge recycling; *competitive bidding for contracts*[9]; *Improved Urban Health Extension Programme*[5] and reporting; *Creative Awareness and Behaviour*	Reporting and follow up on UHEP in use in larger towns, with good turnaround of failed household "graduates"; Studies on conditions in condominium developments and some designs for decentralised waste water treatment from University of Gondar; Chinese proposals for package wastewater treatment systems;

Sanitation aspect	*Environmental Impact*	*Health Impact*	*Financial Impact*	*Gender and Vulnerability Impact*	*Strategic approach to address these impacts*	*Precedent in Ethiopia*
	overflow to open areas and surface water drains; Effect on fresh water ecosystems; surface and sub-surface water contamination;	wells and rivers;			*Change*[6] on media aimed at users as well as policy makers and agencies; *marketing of sanitation services*[13] by service provider;	
Sludge disposal	Pollution of surface and groundwater resulting from poor final sludge disposal; Effect on fresh water ecosystems;	Use of water from contaminated wells and rivers; Possible effects from crops grown with poorly treated sludge;	Loss of work days through ill health; Loss of economic benefit from treated sludge and liquid reuse;	Low income vulnerable scavengers, often children, on solid waste disposal sites seriously affected by the practice of co-tipping sludge and solid waste;	*Financially sustainable sludge handling service*[7] involving primary treatment and *decentralised high efficiency sludge drying beds*[8] , including sludge recycling; *Creative Awareness and Behaviour Change*[6] on media aimed at policy makers and agencies;	Anaerobic digester trials (*Asosa?*); Engineered drying beds (shallow with concrete walls); Kombolcha town in Amhara region has well-engineered sludge drying beds that facilitate 100% pathogen die off in a few weeks, as reported by MoUDHC Urban development project office; The Hawassa sludge drying bed constructed with world bank funding is also well engineered, but is poorly located on top of Tabor hill at the out skirt of the town;
Sewerage	Pollution resulting from blocked and leaky sewers; Effect on fresh water ecosystems;	Use of water from contaminated wells and rivers; Possible effects from crops grown with untreated sewage;	Loss of work days through ill health;		*Clear contractual and KPI obligations*[14] through service management contract (SMC) to maintain sewers;	
Sewage treatment	Pollution resulting from poor treatment; Effect on fresh water	Use of water from contaminated wells and rivers;	Loss of work days through ill health; Loss of economic benefit from treated sludge and liquid		*Clear contractual and KPI obligations*[14] through service management contract (SMC) to maintain sewage treatment;	Waste stabilisation ponds in Gondar, Addis and elsewhere; There are waste stabilization pond systems for treating waste water in universities like Jima, also being used for demonstration and

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Sanitation aspect	*Environmental Impact*	*Health Impact*	*Financial Impact*	*Gender and Vulnerability Impact*	*Strategic approach to address these impacts*	*Precedent in Ethiopia*
	ecosystems;		reuse;			treating waste at the same time;
Solid waste generation	Consumption of resources and energy; Street litter;	Rubbish in drains, particularly where contaminated with sewage, are home for disease vectors;	Imported containers and packaging; Lost revenue from dumping organic and other wastes that have economic value;		*Technical and commercial innovations*[15] to reduce packaging; promotion of mains water for drinking; point of use water treatment; Raise the profile and *learn from small town practices*[19] that generate less waste; Potential *capacity building and formalisation of existing SWM informal sector*[21]*;* ;	There is significant informal collection and recycling system from which a large number of people depend for living; Ethiopia is well known for informal garbage sorters at transfer stations (Charries) and receivers of sorted items like plastic bottles and metal parts (Korealis) in most of the towns; The Korealias are also going around and buying sorted materials from households;
Solid waste collection and transport	Excessive consumption of resources and energy through inefficiencies; Air pollution from exposed transfer stations and open vehicles;	Exposure to pollution by public and particularly workers without PPE;	Cost of operating inefficient systems; Lost revenue from not separating out and recycling organic and other wastes with economic value;	Low income often vulnerable people employed by micro-enterprises on activities with significant H&S risks;	Micro-enterprises and contractor to be involved in *competitive bidding for contracts*[9]*;* application of published *national regulations and standards*[16] on collection, transfer station and transport;	Good practice is being introduced in certain cities where adequate resources have been made available (for instance, Mekele, Gondar);
Solid waste disposal site	Often gross, pollution of air, land and water;	Exposure to pollution by local residents, scavengers and workers, even with PPE; Use of downstream polluted water;	Pollution of land and water affects agricultural return; Pollution of air and water affects health, resulting in lost work days;	Low income often vulnerable people employed by micro-enterprises on activities with significant H&S risks; Scavengers, often children, on solid waste disposal sites seriously affected by the practice of co-tipping sludge and solid waste;	Micro-enterprises and contractor to be involved in *competitive bidding for contracts*[9]*;* application of published *national regulations and standards*[16] on operation of solid waste disposal sites;	Good practice is being introduced in certain cities where adequate resources have been made available; In Addis, a new well designed sanitary land fill site is under construction in Sendafa; a plant for converting methane to CO_2 is installed at Repi disposal site; In Kombolcha, they are levelling, compacting and covering garbage with soil to reduce methane emission; In Bahir Dar and Bishoftu, composting of solid waste is being undertaken;
Industrial	Serious impact on	Serious impact	Lost resources that		Industries to be responsible for all generated	Clustering of industries in industrial

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Sanitation aspect	*Environmental Impact*	*Health Impact*	*Financial Impact*	*Gender and Vulnerability Impact*	*Strategic approach to address these impacts*	*Precedent in Ethiopia*
waste	ecosystems if allowed into the environment;	on health if allowed into the environment;	are likely to have economic value if not reduced, recycled or reused;		waste on a *polluter pays principle*[17];	parks where waste can potentially be co-treated; Some tanneries in Addis had some form of waste treatment system in the form varying from lagoons to activated sludge treatment at the time of their establishment; Most of these units have however stopped service a long time ago;
Health sector waste	Serious impact if allowed into the environment;	Serious impact on health if allowed into the environment;			application of published *national regulations and standards*[16] on collection and treatment of health sector waste;	Most of the hospitals and many health centres have incinerators, placenta pits and ash pits for hazardous health care waste; They use septic tanks or cesspits from where de-sludging takes place;
Menstrual hygiene waste				Lack of facilities in schools and public and communal toilets;	Introduction of *gender and vulnerability hardware and software*[18] in schools and public and communal toilets, such as wheelchair access, wash facilities and MHW disposal;	The use of reusable and affordable pads was introduced in southern region woredas like Halaba by UNICEF and SNV, yielding impressive results of reduction in drop out girls around 2012;

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3.3 Cross reference of the "Approach to addressing impacts of inadequate sanitation provision" (Sub-section 3.2) with the ten "Strategy Components" (Section 2)

Approach to addressing impacts	***Component of the Strategy where this will be covered***	***Commentary***
[1] *Cluster water and sanitation utility operations to sub-regional level*	***2*** Water and Sanitation Sector Institutional Reform; ***4*** Capacity building;	It is considered that this will work better, in the early stages at least, for clustering to be voluntary between municipalities within a Zone or similar sized area joining forces to carry through the required institutional reform and in order to jointly access development funds
[2] *Financially and technically sustainable water and sanitation operations*	***2*** Water and Sanitation Sector Institutional Reform; ***3*** Competition for funding; ***4*** Capacity Building; ***5*** Technical Innovation and Development;	Water and sanitation utilities need to be clustered to include small, medium and large towns to make services available to all urban residents. Competition for funding and KPI ranking will help deliver affordable and acceptable levels of service
[3] *National network for Sharing Best Practice*	***2*** Water and Sanitation Sector Institutional Reform; ***4*** Capacity building; ***5*** Technical Innovation and Development; ***6*** National Network for Sharing Best Practice;	Technical innovation and institutional change usually involves "2 steps forward, 1 step back". These change processes will be easier, quicker and cheaper if experience and lessons are shared on a regular basis. This should be an ideal platform to share monitoring and evaluation (M&E) project reports
[4] *Delegated management models*	***2*** Water and Sanitation Sector Institutional Reform; ***4*** Capacity building;	Large utilities often find it easier to deliver services by delegating ring-fenced operations through Delegated Service Management Contracts which also pass on KPIs. Significant targets, from NRW reduction to customer satisfaction and willingness to pay, can be reached, with clear advantages over direct services.
[5] *Improved Urban Health Extension Programme*	***1*** Raising Sanitation Profile; ***4*** Capacity building; ***6*** National Network for Sharing Best Practice; ***7*** Behaviour Change; ***8*** Buildings Sanitation Facilities; ***10*** Promotion of Services;	Improvements to the effectiveness of the UHEP is one of the main foundations to the Strategy. Training of HEWs and HDA on sanitation marketing , solid and liquid waste management and allocation of adequate budget for logistics and IEC materials can considerably help in the improvement. The link with micro finance institutes will help in providing soft loans for households that are sensitized to climb up the sanitation ladder.
[6] *Creative Awareness and Behaviour Change*	***1*** Raising Sanitation Profile; ***6*** National Network for Sharing Best Practice; ***7*** Behaviour Change; ***8*** Buildings Sanitation Facilities; ***10*** Promotion of Services;	It will need more that an improved UHEP to raise the profile of sanitation throughout the country. It will also need extensive and intensive campaigning through all available channels

Approach to addressing impacts	*Component of the Strategy where this will be covered*	*Commentary*
[7] *Financially sustainable sludge handling service* Note: WSUP Advisory International Consultants, including our consultants from other Africa countries, have implemented manual pit emptying and monitored successful operations for over 4 years	***1*** Raising Sanitation Profile; ***5*** Technical Innovation and Development; ***6*** National Network for Sharing Best Practice; 8 Buildings Sanitation Facilities;	Providing an affordable faecal sludge service is key to shifting liquid waste from overflowing pit latrines and cesspits. This may involve manual (Item[20] below) as well as mechanical pit emptying technology. The subject may have to get high exposure as part of sanitation profile-raising to overcome countrywide "mental blocks" to manual pit emptying
[8] *Decentralised high efficiency sludge drying beds*	***5*** Technical Innovation and Development; ***6*** National Network for Sharing Best Practice;	This will be an integral component of providing affordable faecal sludge services and generating revenue from product sales
[9] *Competitive bidding for contracts*	***2*** Water and Sanitation Sector Institutional Reform; ***4*** Capacity building; ***9*** Solid Waste Management; ***10*** Promotion of Services;	This should be straightforward for commercial operators but will need careful handling and capacity building to get micro-enterprises to become cost effective entities
[10] *Decentralised waste water treatment*	***2*** Water and Sanitation Sector Institutional Reform; ***5*** Technical Innovation and Development; ***6*** National Network for Sharing Best Practice; ***8*** Buildings Sanitation Facilities;	This is an area which is currently lacking research and experience; realistic development times need to be allowed. Needs collaborative agreements or MOUs between facility installers, facility users, regulators and downstream utilisers of products. The suggested MoU, ***Annex 4***, between Utilities and the Beautification and Greenery Agency could be used as a sample for the time being. A formal agreement between say Addis Ababa Water Supply and Sewerage Authority and facility installers could be signed once the compact units prove to be acceptable in Addis Ababa (as was suggested by officials during the advertisement workshop by a Chinese company).
[11] *Groundwater resources inventory*	***4*** Capacity building;	Water supply is not specifically addressed in this Strategy. However, it is listed here as water is critical for sanitation and most of the medium and small towns rely entirely on groundwater.
[12] *Decentralised treated effluent for greening*	***4*** Capacity building; ***5*** Technical Innovation and Development; ***6*** National Network for Sharing Best Practice; ***8*** Buildings Sanitation Facilities;	This is listed separately from "*Decentralised waste water treatment*[10]*"* above since this is more about ensuring safety and conveying the treated effluent from place of production to place of use. As above, this will need collaborative agreements or MOUs between facility installers, facility users, regulators and downstream utilisers of products. As stated above, the suggested MoU, ***Annex 4***, between Utilities and the Beautification and Greenery Agency could be used as a sample for the time being.
[13] *Marketing of sanitation service*	***1*** Raising Sanitation Profile; ***7*** Behaviour	There is little point providing services without having determined a need beforehand

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Approach to addressing impacts	***Component of the Strategy where this will be covered***	***Commentary***
	Change; ***8*** Buildings Sanitation Facilities; ***10*** Promotion of Services;	and without the utility actively selling the service once it is available. Demand for services can also be generated through both behaviour change activities and countrywide raising of the sanitation profile
[14] *Clear contractual and KPI obligations*	***2*** Water and Sanitation Sector Institutional Reform;	It is essential that utilities, even though publicly owned, are obliged to fulfill their contractual obligations and to achieve good Key Performance Indicator (KPI) results
[15] *Technical and commercial innovations*	***4*** Capacity building; ***5*** Technical Innovation and Development; ***6*** National Network for Sharing Best Practice; ***9*** Solid Waste Management; ***10*** Promotion of Services;	New technical and commercial ways to deliver affordable and acceptable levels of service are vital: Innovation is needed in water supply since this a clear revenue earner which can be used to subsidise sanitation; Innovation in sanitation technology is essential in this neglected field and in the face of rapid municipal development, including high rise, commercial and industrial
[16] *National regulations and standards*	***2*** Water and Sanitation Sector Institutional Reform; ***9*** Solid Waste Management;	Regulation of water and sanitation is proposed to be via sub-regional utilities reporting to a single National Regulator on KPIs and financial performance and contractually bound to an Association of Municipalities as asset owners for delivery of services. SWM services should comply with the February 2014 National Urban Waste Management Standards; The NUSWMS is written under the flag of the "Urban Governance and Decentralization Programme" and places responsibility on regional and local public authorities to comply. Currently within regional and local public authorities are the environmental protection offices that regulate national regulations and standards.
[17] *Polluter pays principle*	***1*** Raising Sanitation Profile; ***2*** Water and Sanitation Sector Institutional Reform; ***9*** Solid Waste Management;	This is a difficult one to tackle in a developing industrial nation where profit is often perceived to depend on cutting corners, creating environmental and health impacts, sometimes facilitated by corrupt practices. However, well regulated industrial countries have proven the opposite in that it is actually profitable to reduce, reuse, recycle the majority of by-product streams; *although of course they are faced with heavy disposal costs and penalties that have not yet been introduced or are not effectively applied in Ethiopia*
[18] *Gender and vulnerability hardware and software*	***1*** Raising Sanitation Profile; **5** Technical Innovation and Development; ***8*** Buildings Sanitation Facilities; ***10*** Promotion of Services;	It is essential that public, communal, commercial and institutional sanitation facilities are retro-fitted with adequate wheelchair access and MHM disposal systems and privacy space

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Approach to addressing impacts	***Component of the Strategy where this will be covered***	***Commentary***
[19] *Learn from small town practices*	***1*** Raising Sanitation Profile; ***2*** Water and Sanitation Sector Institutional Reform; ***9*** Solid Waste Management;	The smaller towns produce little waste so what lessons can be learnt from the way waste is either not generated or has easy recycle and reuse routes? As a general rule, relative affluence creates relatively more waste, but does it have to?
[20] *Manual pit emptying services*	***5*** Technical Innovation and Development; ***4*** Capacity building; ***7*** Behaviour Change; ***8*** Buildings Sanitation Facilities; ***10*** Promotion of Services;	This is not a popular subject in Ethiopia but it has been found in Asia and other parts of Africa to be the only practical option from cost and access perspective. Needs serious consideration, perhaps assisted by exchange visits
[21] *Capacity building and formalization of existing SWM informal sector*	***4*** Capacity building; ***7*** Behaviour Change; ***10*** Promotion of Services; ***9*** Solid Waste Management;	It is reported that a thriving informal SWM sector operates in "commercially viable" manner in spite of, rather because of, government control and intervention. So any capacity building should be at grass routes level and should aim to improve but not kill the informal sector with too much regulation and control.

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4 Integrated Urban Sanitation and Hygiene Strategic Action Plan (IUSHSAP)

It is worth thinking about what the IUSHSAP might look like time-wise based on the Strategy described above. ***Figure 20*** indicates an order of magnitude of time required to roll out each component. It will be the main objective of the IUHSSAP activity to clearly define (1) the activities to be taken under each component, (2) to arrive at broad costs involved with each component, (3) to assess risks and (4) to set up a Monitoring and Evaluation (M&E) framework.

The proposed Integrated Urban Sanitation and Hygiene Strategy (IUSHS) has ten components which will be implemented under the IUHSAP. As stated in ***Sub-section 2.1***, these components are intended to run in parallel, but over different time periods, and, although interlinked and all being important to the strategy, can never-the-less be implemented independently so as not impede progress in one component because of slow progress in another.

International, Ethiopian and other African consultants available to WSUP Advisory have sufficient experience and knowledge to confidently translate the Strategy into a realistic and cost effective IUSHSAP.

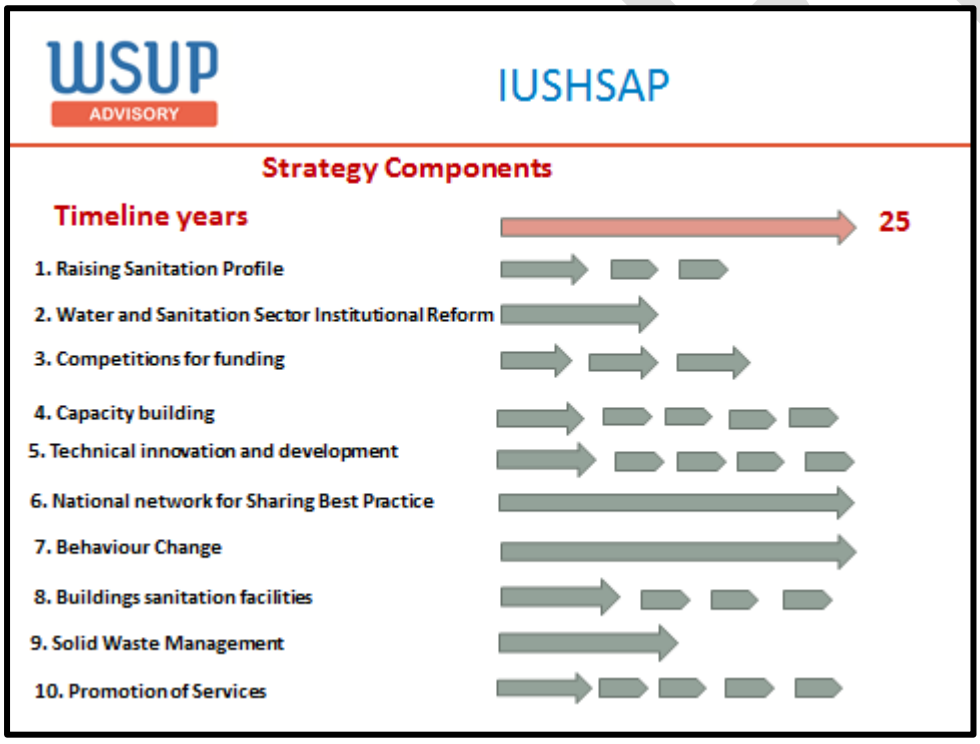

Figure 20: Components of the Strategy that, although interlinked, can never-the-less be rolled out as separate activities

Annex 1: ToR Extracts

The overall aim of developing an Integrated Urban Sanitation and Hygiene Strategy is to have in place a well-structured and comprehensive policy document to guide the sector towards the achievements of the development targets set in the MDG and post MDG agenda, and line with the Growth and Transformation Plan II. This will require the definition on an enabling environment, creation of required capacity and identification of standards for infrastructures and service delivery facilities.

In developing the IUSHS and the Strategic Action Plan, the Consultant shall take into consideration and propose required arrangements for the identified bottlenecks currently undermining the low level of sanitation services in urban contexts:

- Low priority given to sanitation by the community and institutions
- Fragmentation of responsibilities and weak coordination among the different sectors Weak regulatory mechanism and lack of accountability
- Limited resources allocated for construction of sanitation facilities and related operation and maintenance activities
- Lack of proper sanitation and hygiene promotion strategies and absence of appropriate tools and materials
- Absence of adaptable and appropriate technologies and no experience in reusing and recycling
- Low and even absence of private sector participation
- Poor management of medical wastes in most of the health institutions
- Poor land planning
- Lack of integrated sanitation master plans at town level
- Lack of allocation of relevant human resource with adequate capacity and the required institutional arrangement
- Lack of enforcement and implementation of existing policies, proclamations, regulations and guidelines

In defining the different components of the IUSHS, the Consultant shall:

a) Clearly identify thematic areas (liquid wastes, solid wastes…) and provide clear definition for key terminologies
b) Define categories of services and specific implementation arrangements to be delivered in different urban contexts - in line with the current categorization of towns in the Country

c) Define different inclusive urban sanitation "service delivery packages" with special focus to low income areas (peripheral areas, condominium, slums…) and outline how these packages will be developed[1]
d) Define sanitation and hygiene promotion strategies to strengthen the existing UHEP
e) Review and update the existing building code for domestic, public and commercial
f) Define and incorporate in the IUSHS internationally accepted quality standards for treatment and disposal of different categories of waste.

The Consultant is requested to develop the Strategy in line with the following steps:

a) Identification of key evidence based challenges and provide strategic recommendations/guiding principles to develop the Strategy, looking at Human resources development, strengthening existing systems (i.e UHEWs[2]), introducing new approaches (i.e. private sector and CSO involvement, technology innovations) and special focus for most vulnerable groups (poorest, women and children, people with disabilities). For each challenge, the Consultant shall analyze and assess:
   - its significance and impact;
   - its possibility of being addressed or changed; and
   - the Institutional capacity of lead institutions to avert the challenge or change
b) Definition of a comprehensive IUSHS road-map which includes:
   - Key milestones in the short / medium / long term
   - Sector standards and M&E framework. M&E framework that includes periodic evaluation mechanisms to assess the achievement of the set milestones (with particular regard to equity, value for money, accountability and sustainability of the services provided).
   - Financial requirements to implement the Strategy (including emergency related interventions) for each milestone
   - Appropriate consideration of cross-cutting issues (gender, environment, resilience)
c) Definition of a sound approach to involve private sector and CSO organizations in urban sanitation service delivery

[1]The definition of implementation manuals for these packages is not part of this assignment
[2] Particular effort shall be devoted in defining key activities to improve the role of the Urban Health Extension Workers, in close collaboration with the relevant department within the Ministry of Health

d) Preparation of the draft Strategy to be finalized based on the comments provided by stakeholders

e) Facilitate consultative and validation workshop[3]

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[3] The role of the Consultant is limited in facilitating the workshops and provide required guidance and contents for the discussion. Costs related to the organization of the workshop and related logistics will be borne by other organizations and therefore not be included in the proposal.

Annex 2: Institutional change in Romania

Romania Small and Medium Town Institutional Development SAMTID Programme

Institutional Context

Programme Objectives and Design

Institutional development is crucial to the achievement of the SAMTID programme objectives, which can be expressed as;

- improvement of water services, and the achievement of progress towards the self-sustainability of those services, through reorganisation to maximise cost-effectiveness and minimise the effect of political influences;
- initiation of the provision of services on a regional basis in order to recognise the requirements of the EU Water Framework Directive and in anticipation of future EU cohesion funding that will be regionally targeted.

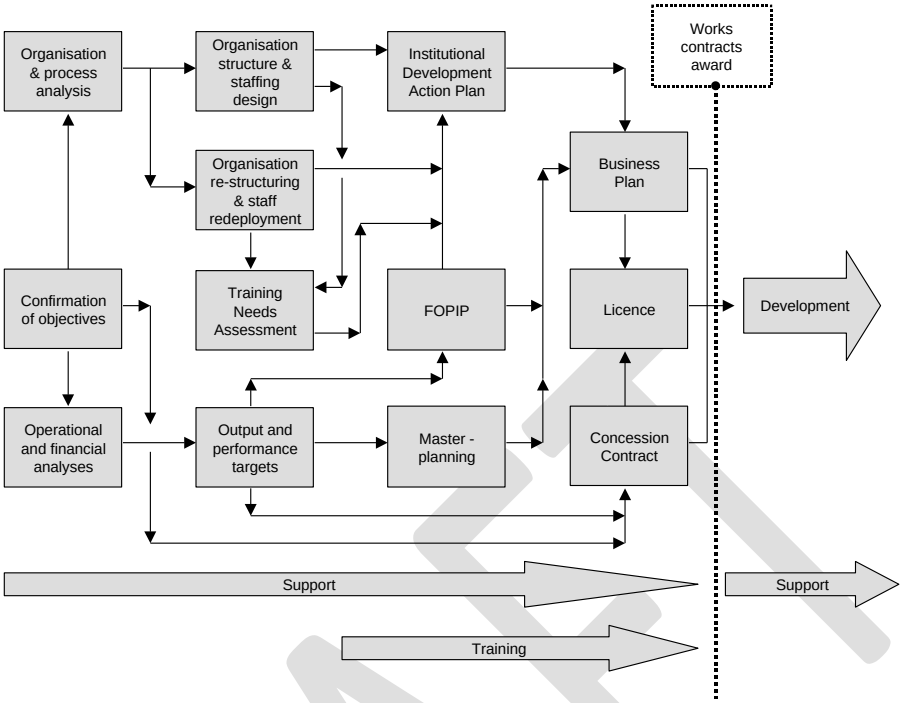
The key institutional development factors at this stage of the programme are;

- the formation of Associations of Municipalities (AoMs) by groups of local authorities, in order to jointly represent their interests as the owners of water services assets and the entities legally responsible for the provision of services;
- the replacement of small existing operators and municipal departments by one Regional Operating Company (ROC) for each AoM, in order to enable the achievement of economies of scale;
- on-going support from the consultants in the establishment and development of the AoMs and ROCs, and for the development of capacity in other entities involved.

Projects within the SAMTID programme differ radically from ISPA projects in that the main focus of the former is on institutional change in order to achieve service and financial improvement, whilst in the latter case focus is generally on capital work to improve environmental performance.

In this respect SAMTID and ISPA can be seen as complementary programmes. Despite this, it appears that the general design of the SAMTID programme up to feasibility stage has been heavily influenced by ISPA experience, in the sense that the initial emphasis has been on investment needs. Institutional change and organisational development will be supported by technical assistance in the period between feasibility review and the commencement of works contracts, and beyond. The assessment of feasibility at this stage must rest particularly on the agreement of the overall framework, on the establishment of an AoM and on the commitment and realistic plans for the formation of an ROC.

The support in institutional development is to be provided to the appropriate entities at all levels. At the local level an illustration of the process is given in Figure below for the assistance proposed for the development of an ROC. The draft terms of reference for the support are provided in Annex B.



Institutional Development Support Process

The main entities and their roles in SAMTID are summarised in Table below.

Table: Main SAMTID entities and roles

Entity	Role in SAMTID
At programme (central government) level	
Ministry of Administration and Interior	• SAMTID programme, planning, co-ordination and implementation, monitoring and evaluation. • management of project and loan funding through Project Co-ordinating unit (PCU)
Ministry of Public Finance	• guarantor for loans • assess and agree on level of public debt of borrowers • approve each project for external loan
Ministry of European Integration	• contracting authority for grant component of the programme • paying agency for grant (Phare) component: works, equipment supplies and supervisor contracts
EC Delegation in Romania	• sign Financial Memorandum on behalf of EC • endorse all contracts signed under Phare • monitor adequate use of procurement procedures
International Financial Institutions	• potential co-financiers – EIB and EBRD
Ministry of Transport, Constructions and Tourism	• appraise and approve technical and economical indicators of each project
Ministry of Environment and Water	• appraise environmental studies of projects and issue

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Table: Main SAMTID entities and roles

Entity	Role in SAMTID
	environmental permits
National Regulatory Authority (ANRSC)	• assess and licence operators, endorse concession contracts and tariff proposals, monitor contract performance
Loan Administration Bank	• commercial bank to be contracted for payments from loan and for debt collection
At project (local government) level	
Regional Development Agencies (RDA)	• promotion of awareness of SAMTID, and pre-selection of projects • monitoring and reporting according to agreement with MEI
Local authorities	• Municipalities - Final beneficiaries and owners of the investment • County Council – end borrower on behalf of municipalities
Associations of Municipalities (AoM)	• promoters of projects, and will establish MSU • agree concession contract terms; monitor performance • endorse contract payment certificates • ensure collection of fees for debt service • strategic planning on behalf of asset • establish MSU
Licensed Operators (ROC)	• develop operational effectiveness and efficiencies • establish PIU to work with MSU for SAMTID works implementation, agree concession contract targets, implement FOPIP • generate fees for 1) debt service and repayment and 2) contributions to Maintenance Repair and Development fund managed by AoM as owners of the assets

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Annex 3: Draft Memorandum of Understanding I

Annex 3 is a possible amended MoU on WaSH Plus that will coordinate the WaSH sector and MoUDCH in order to bring liquid waste management and solid waste management under one umbrella without violating the mandates given to the different ministries.

See separate draft document

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Annex 4: Draft Memorandum of Understanding II

Annex 4 could be the mini MoU that will bring water utilities association and association municipalities on behalf of beautification and greenery agencies/offices together. This and other MoUs to be prepared in the course of the strategic action plan preparation will be supplementary coordination tools.

See separate draft document

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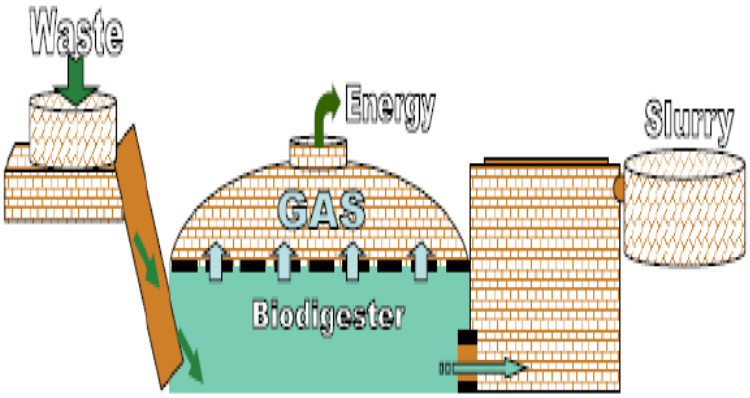
Annex 5: Decentralised Waste Water Treatment, University of Gondar Proposal

USING BIOGAS TECHNOLOGY TO SOLVE PIT LATRINE WASTE DISPOSAL PROBLEMS AND BIOMASS INDOOR AIR POLUTION



Zemichael Gizaw [1], Mulat G/hiwot[2], Bikes Destaw [3], Solomon Mesfin[4]

1. Department of Environmental and Occupational Health and Safety, University of Gondar (BSc in Environmental Health science, MPHealth)
2. Department of Environmental and Occupational Health and Safety, University of Gondar (BSc in Environmental Health science, MSc in Environmental Technology)
3. Department of Environmental and Occupational Health and Safety, University of Gondar (RS, BSc in Environmental Health science, MPH)
4. Department of mechanical engineering, school of Technology, University of Gondar

Project proposal submitted to research and community service core process (RCSCP)

University of Gondar

Collage of medicine and health science

Institute of public health

March, 2014

Gondar – Ethiopia

EXECUTIVE SUMMARY

Project title: using biogas technology to solve pit latrine waste disposal problems and biomass indoor air pollution

Objectives:

General objective

The main purpose of this project is to solve human waste disposal problems and biomass indoor air pollution in hospitals, schools, prisons, slather houses, small scale cattle framings.

Specific objectives

- ✓ To utilize human and animal wastes for energy production
- ✓ To utilize human and animal wastes as organic fertilizers
- ✓ To reduce the volume of human and animal wastes
- ✓ To Integrate energy production and waste treatment
- ✓ To produce clean and inexpensive renewable cooking fuel
- ✓ To eliminate toxic wood and coal smoke in the kitchen area

Activities of the project:

The following major activities will be conducted to achieve the desired objectives:

I. Capacity study

- ☞ Determine the volume of wastes
- ☞ Waste characterization

II. Constructing of the plant

- ☞ Experience sharing
- ☞ Determine the best design model
- ☞ Calculating the digestion chamber volume
- ☞ Calculate the amount of construction materials needed
- ☞ Purchasing of the required materials and recruitment of masons, plumbers and daily laborers
- ☞ *Selecting the construction site*
- ☞ Excavating the pit
- ☞ Building of the inlet pit or mixcer
- ☞ Building of base (foundation) of the digester

- Building of the wall of the digester from block and brick masonry and plastering
- Building of the out let system
- Installation of gas pipe lines and fixtures
- Site filling

III. Awareness improvement program

Project area/site

Gondar town

Project period or duration

This project will implement from April to December, 2014. Once the plants are properly installed and tested its capacity and functionality, the plants will be handover to each organization. But, the project team will extend their supervision and consultancy.

Project status: New

Beneficiaries: Targeted organizations and their customers or clients are the primary beneficiaries of the project. If this project is replicated for other organization and communities, the entire communities and our country are also benefited.

Project owner/holder

Zemichael gizaw, Mulat G/hiwot and Bikes Destaw

Project implementation:

The project will be implemented based on the work plan. If it is granted, the planned activities will implement in their chronological order. The first plant will construct in Gondar University teaching hospital. The technical parts, efficiency, capacity and sustainability of the plant will be evaluated. If the plant is fully functional without any difficulties, the project will replicate for schools, prisons, slaughter houses and mall scale cattle farming.

Monitoring and evaluation:

The project will be monitored and evaluated by observing, measuring and comparing the planned activities with the performed one. If activities are not running based on their plan necessary modification will be made. The overall progress of the project will be monitored and evaluated by input, process, output, out come and impact indicators.

Project funding organization:

The total fund of the project will be covered by Gondar University. If external funders are

available, we will communicate them.

Total project costs (directly funded): 250,513.70 Ethiopian birr.

Assumptions:

Hence sustainable waste management as well as waste prevention and reduction have become major political and public health priorities, this project idea will easily verified and funded by funders.

The energy efficiency of biogas is affected by different factors especially by the nature off wastes, volume of wastes, whether conditions and composition of human and animal wastes. If the above mentioned factors are not solved, the project will not be sustained enough. Therefore, to avoid resource wastage (time man and finance), the capacity of wastes to produce energy will be assessed by calculating the waste generation rate and waste characterization (know type, nature and composition of wastes).And if wastes have continues capacity to produce energy; the project will implemented as the plan.

Project Risks: fire accident will emerge if the gas is properly controlled.

Contact persons:

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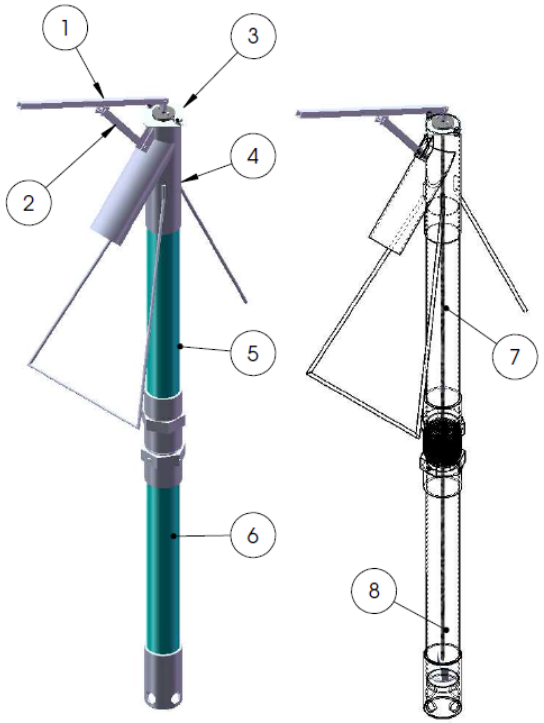
   Tell = +251913348400
   E mail –zemichael12@gmail.com
   Department of environmental and occupational health and safety
   University of Gond

Annex 6: Manual Pit Emptying Technology



The Gulper Pump
This pump was originally designed and developed by Steve Sugden from London School of Hygiene and Tropical Medicine and marketed as the Poo Pump by Oxfam. Partners in Development and Ethikwini Municipality in South Africa further developed the pump design.

This document is produced as a design guide for Water and Sanitation for the Urban Poor to assist fabricators with the production of good quality robust gulpers.

This is only a design guide, dimensions and material choices will have to be changed and adapted to suit locally available materials and manufacturing processes. Additionally the design may be changed to better suit local pits, i.e. it ma be lengthened (or shortened), the legs and stand may be altered etc.

NOTE
Pump Weight (based on PVC and steel used as per this design)= 15kg

Nylock Nuts to be used to secure bolts throughout pump.

No.	Assembly	Material	Comments
1	Pump Lever	Mild Steel	Painted
2	Con Rod	Mild Steel	Painted
3	Top Cap Assm	Mild Steel and Nylon	Plastic and Metal Assembly
4	Pump Outlet Assm	Mild Steel	Painted
5	Middle PVC Pipe	100mm PVC Pipe and Fittings	PVC Assembly
6	Bottom PVC Pipe	100mm PVC Pipe and Fittings	PVC Assembly
7	Top Pump Rod	Mild Steel	Painted
8	Bottom Foot Valve	Mild Steel	Painted

	NAME	DATE
DRAWN	MO	Aug 10
CHECKED		
ENG APPR.		

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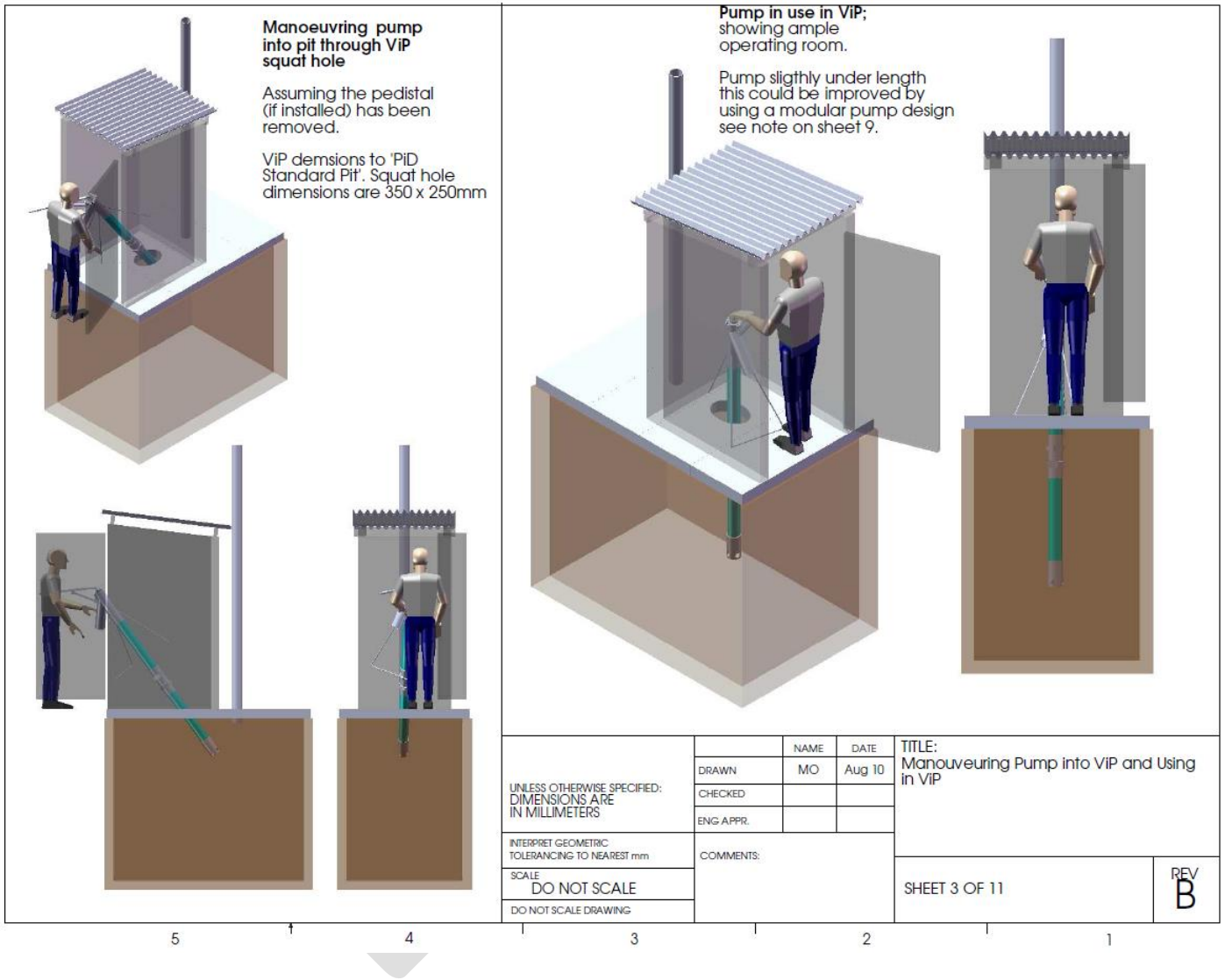
Manoeuvring pump into pit through ViP squat hole
Assuming the pedistal (if installed) has been removed.
ViP demsions to 'PiD Standard Pit'. Squat hole dimensions are 350 x 250mm
Pump in use in ViP; showing ample operating room.
Pump sligthly under length this could be improved by using a modular pump design see note on sheet 9.
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Annex 7: WSUP Enterprise Approach to Small Business Development

MANUAL – OVERVIEW & SUMMARY

Developing collaborative projects with government stakeholders to foster growth of new businesses

For WSUP Enterprises

Submission Date: September 5th, 2014

Author: Dan Fink

Location: Boston, MA, USA

E-mail: daniel.jason.fink@gmail.com

Developing collaborative projects with gov't stakeholders to foster growth of new businesses

MANUAL OBJECTIVE & VALUE

OBJECTIVE	This manual provides a structured approach to launching a new business by providing principles and templates for articulating the business model, iterating it prior to piloting and developing collaborative projects that leverage the resources of government stakeholders to foster growth.
VALUE CREATED FOR PUMPAWAY ZAMBIA	This approach was used to structure the launch of PumpAway Zambia, a pit latrine emptying service piloting in the depressed communities of Lusaka. Through the process, we were able to focus the business model on minimizing total cost and optimizing payment schedule. We were also able to identify and pursue the development of many collaborative projects with government stakeholders, including one which uses volunteers from the utility, ministry of health and city council as a sales force for the pit emptying service.

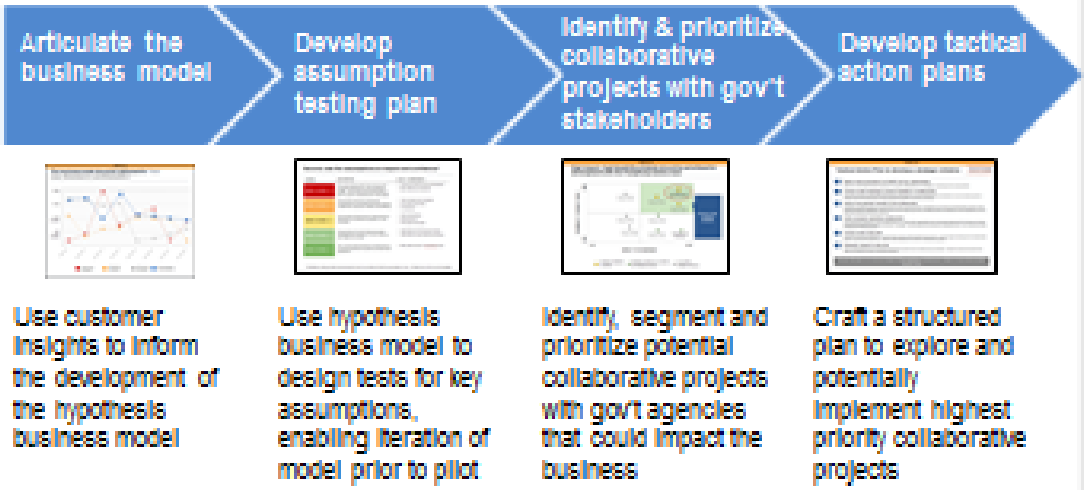
FOUR COMPONENTS OF THE MANUAL

COMPONENT	DESCRIPTION	
SUMMARY	*Brief explanation of the process including descriptions of each step and call outs of important principles and templates*	
DIRECTIONS & TIPS	*Detailed notes, directions and tips to guide execution of the process*	
TEMPLATES	*Set of templates [referenced by the above Directions and Tips] to be completed throughout the execution of the process*	
PUMPAWAY ZAMBIA EXAMPLE	*Example of the output of the process for PumpAway Zambia with call-outs describing key takeaways and points*	

SUMMARY [1 OF 2]

Articulating/Testing a Business Model & Developing Collaborative Projects with Gov't Stakeholders

PROCESS OVERVIEW:



STEP:

STEP 1: ARTICULATE THE BUSINESS MODEL

Develop detailed customer insights to define the problem in the eyes of the customer. Assess competitive alternatives to identify on which dimensions they excel and identify the 'trade-offs' upon which your offering will compete. Use these trade-offs to design your initial business model.

KEY PRINCIPLES

- ✓ Embrace the business trade-offs, the customer needs on which your business model excels AND performs poorly
  - Ensure that trade-offs are deeply rooted in customer insights . For instance, determine how important total cost v. quality is for the customer. Optimize for what is most important.
- ✓ Use the trade-offs to design the initial business model. For instance, if total cost is highest priority, slash features or portions of the offering to craft the lowest cost offering

KEY TEMPLATES

Align on a performance map that indicates the business model trade-offs and depicts alternative options. P. 13*

Use the trade-offs in the performance map to make decisions about how to structure the hypothesis business model. P. 15-7*

*Page numbers listed refer to the file name: Directions & Tips Document

SUMMARY [2 OF 2]

Articulating/Testing a Business Model & Developing Collaborative Projects with Gov't Stakeholders

THE STEPS (cont)

STEP 2: DEVELOP ASSUMPTION TESTING PLAN

Use hypothesis business model to identify the assumptions that need to be true for it to be successful (e.g., customers will purchase a partial empty offering). Rate and design tests for these assumptions. (e.g. acquire customer sign ups for a partial empty offering). Categorize the tests into an assumption testing plan, that can be executed to structure iteration prior to launch of a large scale pilot.

KEY PRINCIPLES

- ✓**Brainstorm assumptions/ tests first, categorize and refine later**
- ✓**Don't over-engineer the tests**; they should be simple and involve as little risk as possible (e.g., pitch the offering to ten customers and acquire their commitment to purchase)

KEY TEMPLATE

Align on an assumption testing plan with your team, that increases your confidence in the highest impact assumptions, first P. 28*

STEP 3: IDENTIFY & PRIORITIZE COLLABORATIVE PROJECTS W/ GOV'T STAKEH'S

Use government stakeholder maps and an assumption testing plan as stimuli to generate ideas for potential collaborative projects with gov't stakeholders (e.g. sanitation tax incentives, bulk pricing for vacuum trucks). These collaborations will segment into operational projects v. strategic initiatives. Strategic initiatives can be further prioritized.

KEY PRINCIPLES

- ✓**Understanding objectives, capabilities and activities of gov't agencies reveals how you might use their resources**
- ✓**Classify each collaborative project by type to determine how and when to pursue them**

KEY TEMPLATES

Correlate operational projects to your launch plan P. 34*

Prioritize strategic initiatives by impact and feasibility P. 36*

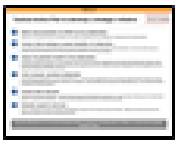
STEP 4: DEVELOP TACTICAL ACTION PLANS

For high priority strategic initiatives, structure a tactical action plan that guides their exploration and potential implementation. To increase chances of success, you should understand the value propositions and the potential objections of gov't agencies.

KEY PRINCIPLES

- ✓**Commit to explore the collaboration, not implement it**, by designing points of failure into your tactical action plan
- ✓**Regularly re-assess the impact and feasibility of the collaboration** to ensure that it is worth your time

KEY TEMPLATES



A tactical action plan that guides the pursuit of the collaborative project P. 38*

*Page numbers listed refer to the file name: Directions & Tips Document

Annex 8: READING LIST

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