Wastewater Management and Decentralised Wastewater Treatment Systems (DEWATS) in Lao PDR

National Workshop

6-7 October 2014

Vientiane, Lao PDR

Proceedings of the

National Workshop

On

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Contents

BACKGROUND....4
SCOPE OF THE WORKSHOP AND OBJECTIVES....5
DAY 1 PROCEEDINGS....6
Session 1: Opening and Overview and Current State of DEWATS in the region and in Lao PDR....6
Session 2: Taking a stock on wastewater management and sanitation practices in Lao PDR: challenges, barriers, policies and solutions for DEWATS....7
Session 3: Effective policy frameworks: vision, objectives of wastewater treatment systems and sustainable sanitation services....7
Session 4: Technical solutions, innovations, financial sustainability, viability and co-benefits from DEWATS....7
Session 5: Group discussions and presentation of findings....8
DAY TWO PROCEEDINGS....11
Session 1: Potential institutional frameworks for DEWATS in Lao PDR....11
Session 2: Continued Discussions....14
ANNEXURE....16
Annex 1: Agenda....16
Annex 2: List of Participants....19
Annex3: Presentation on Overview on national vision on wastewater management strategy and national policies on opportunities for decentralised wastewater treatment services....21
Annex 4: Presentation on the practice of Decentralised Wastewater Treatment Solutions (DEWATS) in Laos....35
Annex 5: Presentation iintroducing the MoU between Department of Housing and Urban Planning, Ministry of Public Works and Transport and BORDA for promoting DEWATS in Lao PDR....40
Annex 6: Presentation on effective policy frameworks in South East Asia and Regional Policy Guidelines on DEWATS & socio-economic impacts....46
Annex 7: Presentation on enabling policy analysis on DEWATS and faecal sludge management in three countries, good business models from the region....70

Annex 8: Presentation on experience of DEWATS projects in Lao PDR by BORDA 97

Annex 9: Presentation on an innovative public-private management scheme for decentralised sanitation 103

Annex 10: Presentation on sustainable financing frameworks for DEWATS and Regional Guidelines on DEWATS 109

Annex 11: Presentation on a community-based DEWATS in Sansay Town, Attapeu 117

BACKGROUND

By 2011, the population of the Asian and Pacific region without access to safe drinking water was halved from the 1990 level, but the sanitation-related component of the target is still far from being achieved. [1]10.3 million people in Cambodia, 2.9 million in Lao PDR and nearly 21.8 million people in Vietnam did not have access to improved sanitation[2]. The lack of sanitation and wastewater treatment leads to faecal contamination of fresh water sources endangering the health of the population at large. According to a WHO report[3] , diarrhoeal disease is cited as the second leading contributor to the Global disease burden causing a loss of 72.8 million Disability Adjusted life years (DALYs). Improving sanitation and hygiene are front line actions that can prevent diarrhoeal and other water related (including water borne and water washed) diseases.

In addition, studies conducted by the World Bank Water and Sanitation Programme[4] show that Cambodia, Lao PDR and Vietnam suffer an annual economic loss of $450 million, $193 million and $780 million respectively. These losses are accounted for by direct health impacts, costs for accessing clean drinking water, additional time to access unimproved sanitation and tourism losses.

Improved sanitation and wastewater management is crucial to maintain water security. It can bring significant benefits to poor communities, particularly women and ensure the health of eco-systems and local populations. Lack of awareness amongst policy makers and the relatively high costs of sewage collection and treatment often deter investments.

In this context, UNESCAP and UN-Habitat are implementing a joint project to address the fast-growing problem of untreated wastewater through promotion of Decentralised Wastewater Treatment Systems (DEWATS). DEWATS provides an appropriate and low-cost solution in many situations in the rapidly urbanising areas of developing countries where other systems are not suitable. DEWATS also provides a great business opportunity and community empowerment.

The project is implemented in Lao PDR, Cambodia and Vietnam and is focusing on building the capacity of policy makers and planners for better wastewater management through regional and national level policy studies and workshops. It will also establish or strengthen existing institutions, which can function as a regional resource centre or referral point for expertise on

[1] ESCAP, 2013, Statistical Yearbook
[2] WHO-UNICEF Joint Monitoring Report: Progress on Sanitation and Drinking Water 2010 update in 2008
[3] WHO, 2008, The *global burden of disease: 2004 update.* Geneva, World Health Organisation
[4] WSP, 2009, Economic Impacts of Sanitation in South East Asia. Jakarta (cite references)

DEWATS. Promotional materials and a guidance manual for policy makers and planners will be developed and widely disseminated in 2014-16.

The Ministry of Public Works and Transport with support from UNESCAP and UN-HABITAT is organising the national work shop in Lao PDR to take stock of the current situation and to enhance existing strategies and policies with mechanisms of implementation and the roadmaps to enable sustainable sanitation and wastewater treatment systems/services in Lao PDR.

This workshop is sensitising policy makers and planners of Lao PDR in finding sustainable wastewater management approaches through sharing the national and regional level policy studies and practices within the joint UNESCAP and UN-HABITAT project on "Strengthening capacity of policymakers in South-East Asia to promote policies and developing plans for improved wastewater treatment and reuse in urban and peri-urban areas", implemented in Lao PDR, Cambodia and Viet Nam.

SCOPE OF THE WORKSHOP AND OBJECTIVES

The overarching goal of the national workshop is to discuss the national strategy on wastewater treatment systems and sustainable sanitation services in Lao PDR and to enhance knowledge and awareness of policy makers, local government officials and other experts on DEWATS amongst urban and peri-urban communities. The specific objectives are:

1. To review and discuss challenges and barriers, as well as institutional, technical, financial policies and solutions on wastewater treatment and reuse in the country;
2. To assess the situation and efforts on enabling policy for DEWATS and future programming in Lao PDR;
3. To summarise on DEWATS policy papers, sustainable financing strategy, work plan and future cooperation.

The workshop takes stock of the country challenges, policy and practices of wastewater management and sanitation in Lao PDR, presented by National Officials and experts in and out country and identifies appropriate approaches, solutions, enabling policies and implementation strategies.

DAY 1 PROCEEDINGS

Session 1: Opening and Overview and Current State of DEWATS in the region and in Lao PDR

Mr. Khamthavy Thaiphachanh welcomed all participants and opened the workshop. Mr. Avi Sarkar then added some welcoming remarks and gave a brief overview of the workshop objectives. He highlighted the key focus of the workshop as to discuss wastewater management in Lao PDR, mainly under the aegis of the ongoing ESCAP/UN-Habitat project with the aim of strengthening policy makers. About 3 million people in Laos don't have access to sanitation but for wastewater management the number would be much higher. Mr. Sarkar expressed his gratitude to Mr Khamthavy for his dynamic leadership and for his idea of holding the workshop on October 6, which is World Habitat Day. He thanked Mr Khamthavy and other higher Ministry officials, ESCAP, BORDA and the other international organisations represented, for their contributions to wastewater management in Lao PDR.

Following Mr. Sarkar's remarks, Mr. Hongpeng Liu joined Mr. Khamthavy and Mr. Sarkar in welcoming participants. Mr. Liu spoke of increasing disparities between urban and rural areas, and between the rich and poor, noting that the majority of those without sanitation are poor people. The current joint project of UN-Habitat and ESCAP aims to contribute to regional efforts to enhance the review of policies and strategies on sanitation and to mobilise communities to improve sanitation and hygiene practices. Mr. Liu reminded participants of the Regional Policy Workshop of Stakeholders on DEWATS in SEA, which was held in Bangkok in March. Since then ESCAP has prepared two documents. These are a *Background Policy Study on Wastewater Management and Sanitation in Cambodia, Lao PDR and Viet Nam* and a *Policy Guidance Manual on Decentralised Wastewater Treatment Systems* to guide policy framework and projects to address the challenges to promoting DEWATS. One such challenge is that water charges are very low in Laos and other developing countries. It is challenging for government to balance investment and affordability for vulnerable groups and this is one reason for the policy study. Mr. Liu advised participants that the draft of the policy guidance manual would be circulated for feedback so that it can be improved.

Mr. Liu explained that another component under this project is to strengthen a regional centre of excellence on DEWATS. AIT (the Asian Institute of Technology) has been identified as the Regional Centre on DEWATS and will be a key partner in providing policy and planning advice as well as advice on technical, environmental, financial, social and operational aspects of DEWATS. Mr. Liu introduced Dr. Thammarat Koottatep from AIT who was present at the workshop. Mr. Liu concluded his remarks by expressing his appreciation for the invitation to the workshop and his confidence in the useful contribution of the workshop to national and regional efforts in wastewater treatment.

Session 2: Taking a stock on wastewater management and sanitation practices in Lao PDR: challenges, barriers, policies and solutions for DEWATS

To begin the second session, Mr. Noupheuak Virabouth gave an overview of the national vision on wastewater management strategy and national policies on opportunities for decentralised wastewater treatment services (see Annex 3). Beginning with an overview of Laos' development context, Mr Noupheuak went on to provide details of sanitation coverage in Laos, completed projects and current wastewater issues. Mr. Noupheuak then gave an explanation of the wastewater management strategy and opportunities for DEWATS.

The second presentation was given by Mr. Bounthong Keohanam and focussed on DEWATS in Laos and the activities carried out under a MoU between DHUP and BORDA. A road show undertaken in 2014 by a team from DHUP and BORDA resulted in significant interest from the provinces and a number of requests for technical assistance with DEWATS projects. See Annex 4 for Mr. Keohanam's presentation.

In the final presentation of Session 2, Mr. Alex Campbell elaborated on BORDA's work and its presence in Laos (Annex 5). Mr. Campbell concluded his presentation by looking at ten potential DEWATS projects in 2015 in Laos and the future opportunities for DEWATS in Laos.

Session 3: Effective policy frameworks: vision, objectives of wastewater treatment systems and sustainable sanitation services.

The first presentation of Session 3 was given by Ms. Aida Karazhanova, who spoke on effective policy frameworks for wastewater management in South East Asia (Annex 6). Ms. Karazhanova gave an overview of sanitation covering such aspects as the Sustainable Development Goals (SDGs), household water security and Integrated Water Resources Management. She then looked at ten different policy focus areas for DEWATS.

Ms. Karazhanova's presentation was followed by Dr. Thammarat Koottatep and Dr. Suthirat Kittipongvises' presentation on effective policy analysis on DEWATS and faecal sludge management, and good business models from the region (Annex 7). The presentation looked at regulatory frameworks for DEWATS in Thailand, Vietnam and Cambodia, considered key challenges and made recommendations. The focus then turned to a business model for faecal sludge management, with a good practice case study from Thailand.

Session 4: Technical solutions, innovations, financial sustainability, viability and co-benefits from DEWATS

A number of stakeholders shared their experience of implementing DEWATS in Laos. A presentation by BORDA (Annex 8) explained BORDA's approach to DEWATS, gave an overview of the DEWATS that BORDA has implemented in Laos and concluded with lessons learned through BORDA's experience.

GRET shared their experience with decentralised wastewater management managed through a public private partnership (see Annex 9). Various steps of the implementation process were shared, along with challenges and lessons learned.

The third presentation of Session 4 was given by Mr. Christoffer Larsson and focussed on sustainable financing for DEWATS (Annex 10).

In the final presentation of Session 4, Mr. Buahom Sengkhamyong shared UN-Habitat's approach to DEWATS (see Annex 11). UN-Habitat has applied their experience in the MEK-WATSAN water and sanitation initiative to DEWATS with a key feature being the emphasis on community participation.

Session 5: Group discussions and presentation of findings

Group discussions were based on the following format:

> Our National Vision:
> Hygienic lives ensured for the urban population by 2020
>
> Our Mission:
> Support increased access to sustainable facilities and service in urban areas
>
> Assignment for discussions:
>
> 1. Please list the challenges to achieve the vision
> 2. Please cluster/group them based on institutional, technical, financial
> 3. How to create demand from people to have access
> 4. Please turn the challenges into targets (short-medium and long-term)
> 5. How to implement?
>   a. List the drivers (institutions, policy, regulation, service provider)
>   b. List the source of funding (government, donor, private, microfinance, loans etc.) and financing strategy
>   c. List technologies

Participants were divided into three discussion groups and the results of the interactive discussions are presented are summarised below:

1. Challenges to achieve the vision:

- Most schools have no access to toilets
- There is no drainage system in some markets
- No treatment of wastewater before it drains to a river or field
- Lack of policy and law

- Technology is not upgraded
- Lack of budget and awareness
- Lack of capacity building for staff

2. Clustering the needs:

Institutional Needs:	**Technical Needs:**	**Financial Needs:**
• Need for a clear institutional framework, with clear responsibility of each institution (Central, province, district and village level). • Coordination Mechanisms: • Development of the policy and law for DEWATS • Capacity building plan for staff and build up the awareness among human resources • Build up experience on DEWATS, as it is new to Laos • Enforcement mechanism for technical standards • Attract funding	• Matching technology with demand • Upgrading to improved technology/ Technology is not upgraded • Capacity building • Harmonise/complete sanitation value chain • Quality assurance • Warranty after sell service • Most schools have no access to toilets • There is no drainage system in some markets • No treatment of wastewater before it drains to a river or field	• Funding for project administration, including surveying, design, supervision and monitoring • Investment for construction • Funding for Operation and Maintenance (willingness to connect and pay) • Proper tariff system • Increase the budget and awareness

3. How to create demand from people:

Formulate and share the national vision through national campaigns and community initiatives towards: **"Every Household has to access improved sanitation by 2030".**
The planning, implementation and evaluation should include the following points, through a specified timeframe:

- Creating Standards
- Need to establish 4 laboratories (in the North 1; at central 2 and in the South 1)
- Develop the data collection and database
- Develop the national standard for the implementation of activities
- Budget planning
- Awareness raising, training, formation of staffs
- Financial mechanism

4. Setting up the Targets:

Short Term	Medium Term	Long Term
• Awareness campaign – promotion to local authorities, Ministry, inform on objectives; • Capacity building – of staff, local staff, and also community; • Demonstration project; • Improvement of legal framework; • Clarify key focal point – which Ministry will be the focal point to lead on sanitation? • Policy formulation • Identify target area – which provinces, which districts will we focus on to improve sanitation and wastewater treatment? • Resource mobilisation • Start implementation the pilots	• Scale up DEWATS projects to smaller towns and emerging towns, schools, hospitals, markets, bus stations, institutional premises • Scaling up implementation, including Operation and Maintenance trainings, enabling conditions for PPP • PPP/PSP – motivation and incentive • Promoting more PPP/ • Increased knowledge and awareness	• Bigger towns where a centralised system is not financially viable • Monitoring and Evaluation after upscaling, to see outcomes • Dissemination of information from project implementation • Three top cities: 1. Xiengneun in Luang Prabang 2. Phine in Savannakhet 3. Sanxay in Attapeu

5. How to implement:

Technological choices should be based on mixed system of both centralised and decentralised, as well as in using the on-site technology.

Concerned Ministries	Drivers	Funding Sources
• MONRE • Ministry of Public Works and Transport • Ministry of Public Health • UDA; VUDDA • Public Works Sectors (NGO) • Private Sector • Ministry of Energy • Ministry of Industry	The main drivers are: • Knowledge/Awareness in central government – institutional, policy, regulatory reform • Knowledge/Awareness in community There is a need for reforming: • Institutions • Policies • Regulations • Sanitation Marketing including the understanding of the supply chain	• Incentive/Loan • Government • Private Industries • Donors – domestic and (International Contribution) • Community participation/contribution – " in-kind – in cash"

The day's proceedings were wrapped up by Mr. Liu before Mr. Khamthavy gave some closing remarks in which he thanked the participants for their contributions. He noted the value in meeting together to share the wealth of experience possessed by the participants and looked forward to continued fruitful discussion on the second day of the meeting.

DAY TWO PROCEEDINGS

Session 1: Potential institutional frameworks for DEWATS in Lao PDR

Mr. Hongpeng Liu introduced the session with an observation, based on water and sanitation work, that institutional arrangements are the key to success. At the government level there are many different Ministries involved. In Laos these Ministries include MPWT, MAF, Finance, Education and Science and Technology. How should an institutional framework be set up so that it is effective? All stakeholders need to be brought on board, including financial stakeholders, NGOs and communities. In Laos there is already a coordinating mechanism but all the members are high officials and busy so they can't meet every month. Therefore a working group might be a good way and senior officials could review its work. There is also the question of how to provide technical support. Technology needs to be modified to local conditions. So there are three levels: a coordinating group, a working group and a technical group. Financing is important and so banks and the financial sector could be involved. We need to think about how to mobilise finance. PPP is one possible solution but it is important to set up an effective policy framework. For DEWATS, the private sector is not very competitive in the market. Mr. Liu asked for ideas from other participants.

Mr. Arnaud Vontobel shared that GRET has recently discussed the idea of a working group. The thinking is that now is a good time to gather together actors at Ministry level to share experiences as different actors have complementary experiences e.g. BORDA with DEWATS and GRET with Hin Heup and faecal sludge management in Vientiane. There is perhaps a need to work on a ToR for the working group. Hopefully there are more actors who will join.

It was then shared that BORDA has an action plan which includes looking at a working group. It was suggested that, with the momentum from this workshop, it might be a good time to develop a ToR. There is a growing interest in urban sanitation, with the French Red Cross and a Japanese NGO both expressing interest. It may be helpful initially for stakeholders to present their current activities and their ideas for future activity. The working group could be a learning platform and a coordination platform.

Mr. Avi Sarkar noted that there is a very structured working group in place. The Ministry of Health also has a water and sanitation working group which mainly focuses on rural areas.

Mr. Khamthavy Thaiphachanh clarified the current situation with regard to sector working groups. There is an infrastructure working group which meets every six months before the

Round Table. Under the infrastructure working group, the Ministry established sub-sector working groups including urban water supply, wastewater and urban infrastructure. For this subsector, there needs to be a six monthly meeting organised. If all the sub sectors had meetings every month it would be very difficult as there are so many sub-sectors.

Mr. Khamthavy suggested that a special time could perhaps be organised to discuss a particular topic. Previously only ADB and the World Bank were involved but nowadays there are many development partners involved with each sector. Mr. Khamthavy agreed that it's a good idea to organise a meeting but also to organise a technical group. He put forward the possibility of organising a three monthly meeting for water supply. The Minister tried to put water supply and wastewater into the same meeting but perhaps they are different topics. The Ministry needs to prepare everything before the coordination meetings, which involves sitting with development partners and sharing lessons learned. Maybe a special meeting can be organised for the project. ADB tried to assist by hiring an expert to work with DHUP on this. Previously there has been talk but there has not been anyone to do an action plan so it has just been talk. An action plan needs to be developed and implemented. Mr. Khamthavy agreed that a technical group would be very useful.

Mr. Sarkar gave the example of Cambodia where two parallel working groups are operating under different Ministries. Mr. Sarkar reiterated the emphasis on good coordination in the sector and the importance of not duplicating what others are doing. The UN can contribute in its role of bringing stakeholders together like a catalyst in a chemical reaction.

Continuing with his explanation, Mr. Khamthavy explained that there is already a TWG in water and sanitation and there is now a working group, of which DHUP is a member, in the Ministry of Health. The Ministry of Health set up a policy on sanitation. Sometimes water and sanitation are separate and the different sub sectors don't always work smoothly. The responsibility of each organisation is not written in detail. Many development partners can help as support is still needed from outside.

Carrying on with the theme of coordination between Ministries, Mr. Sarkar advocated high-level representation on the Ministry of Health working group as there seemed to be a bias towards the rural sector. Mr. Sarkar noted that it would be good to have the urban challenges represented. Mr. Buahom Sengkhamyong named five actors. MPWT has responsibilities under PM Decree 37. MONRE, the Ministry of Health, the Ministry of Industry and the Ministry of Mining also have responsibilities. The Master Plan is very general and there are difficulties at the sub Master Plan level. There is a need for the five Ministries to sit together.

Based on DHUP's long experience in the working group, it was then noted that the rural water sector is under MOH, while urban water is under MPWT. Similarly, rural sanitation is under MOH and urban sanitation is under MPWT. The point was made in relation to Decision 57 that the rural/urban divide is

relative rather than being absolute. Rural areas today will become urban areas tomorrow and when a town grows from rural to urban, there needs to be an upgrading of services.

Speaking of VUDAA's experience with two DEWATS in Vientiane, Mr. Khamphet shared a need to study more about the process. It is good if the private sector is involved but there is perhaps a disincentive to invest because the investor can't collect money from people. In reality, DEWATS are not easy to implement. In Vientiane one is not yet finished and people are not paying for the service of the other one. We have to think about policy and make a standard for permitted construction. There needs to be a system for industry. DEWATS is perhaps difficult for communities in cities and more needs to be invested. Mr. Khamphet was uncertain of the sustainability of city DEWATS as people may not pay. He speculated that DEWATS might be better in small urban areas and new towns as opposed to cities.

Representatives from GRET and WTA spoke of a proposed initiative for a faecal sludge system for about fifty companies who dump sludge. The key thing is to set up a finance mechanism and incentives for the companies to use the system. There is a need to identify a site not too far from the city so that trucks will use it. They will pay a fee at the site. The companies already pay a tax when they dump sludge. The suggestion is to initially work with a PPP management system with the option of authorities taking over the management when they have more capacity and resources. In the existing system in Hin Heup there are problems with not enough households being connected. GRET wants to work on this further and find solutions. Mr. Sarkar reminded the participants of the example of a Thai operator making 50 million baht per annum and also the value in diversifying into other ventures.

Representatives from BORDA explained some of the issues with the DEWATS in Thong Khan Kham. The project was implemented with JICA and in cooperation with PTI. After the official handover, the appointed operator moved away from the area and was no longer involved with the operation. BORDA communicated with PTI and with DPWT, who said they had not been involved in the situation. The system has now been running for two years with no operator. This case highlights the need to clearly define responsibilities for the period after the project has finished. Maybe VUDAA could be involved. BORDA typically has a CA for 6 months to a year so someone is needed to take responsibility after that time so that the community is not left to operate the system on their own. Mr. Buahom commented that the JICA Master Plan has not yet been approved. There is a need for urban planning rules to be followed and for projects to be handed over to local authorities.

Mr. Tobias Möller then shared with the participants that Kristianstad University came to Vientiane three years ago to look at sanitation. The first phase involving workshops was a success; however, funding did not eventuate for the second, concept validation phase. There is still interest from the university in this potential project. The university is looking at diversification in sanitation and is working with SuSanA and AIT. Perhaps this should be shifted to Luang Prabang. Mr Möller felt that a TWG would be very beneficial for urban sanitation as there are different approaches from those taken in rural sanitation.

Session 2: Continued Discussions

In the second session, Mr. Alex Campbell spoke of the need for a secretariat for working groups in order for the group to be effective. This is a lesson learned in Cambodia where there was a wish to move towards a more thematic focus of meetings. With regard to lack of payment, the same problems had occurred in Cambodia and Indonesia. A lesson learned was that connection fees should be avoided at all costs but a monthly fee is not unreasonable. People are willing to pay but payment needs to be enforced.

Regarding institutional arrangements, Mr. Christoffer Larsson noted that when responsibility is spread over lots of entities, no one is responsible. Maybe a national entity for sanitation could be set up. Mr. Larsson also spoke of the need for leverage to ensure that responsibilities are carried out. Under PPP management payment to the private partner can be conditional on specified actions being completed. A third point concerned the need to plan for DEWATS locations as there are land issues involved.

Regarding institutional set up, Dr. Thammarat Koottatep pointed out that it is illogical to have a central body to manage a decentralised system. Instead, he suggested trying to encourage an enabling environment. There are different contexts throughout the country. Perhaps some resourcing could be provided to help people.

Ms. Aida Karazhanova raised a number of points. She pointed out that there are not enough laboratories to carry out effective analysis. She then encouraged innovation and working at the village level and reiterated her request for inputs into the regional guidelines. With regard to finance, Ms. Karazhanova brought up the idea of a fund that would not be project-based and could be used for such things as microfinance. She expressed the hope that this might be strategically developed. Continuing with finance, Mr. Larsson raised the idea of green taxes on activities such as discharging pollutants into groundwater.

Once participants had all given their inputs, the question was asked as to how ESCAP and UN-Habitat can contribute. Mr. Sarkar noted that the new Vice-Minister is encouraging UN agencies to come together on joint projects and these joint projects could perhaps include other entities such as BORDA and LIRE.

A representative from DHUP suggested that, in the short term, capacity building and pilot projects would be helpful, as well as finance for workshops and trainings. Mr. Möller expressed his appreciation for this workshop. BORDA is dominated by technical people and is unable to reach the policy level. Mr. Möller suggested that for aspects such as PPP, ESCAP and UN-Habitat might be able to work as intermediaries between BORDA/DHUP and ADB or the World Bank. Mr. Campbell put forward that ESCAP and UN-Habitat could provide technical inputs to move the strategy along. It would also be useful to analyse the existing institutional framework for strengths and weaknesses. Dr. Thammarat suggested linking DEWATS initiatives with faecal sludge management. There is also an opportunity to assist the Government with coordination.

Mr. Khamthavy gave some background to DEWATS in Laos. In 2005 Mr. Khamthavy went to Indonesia where he met BORDA. Wastewater management needed to go off-site and it needed to be low-cost. From Mr. Khamthavy's point of view, DEWATS was appropriate. He therefore invited BORDA to implement in Laos. He is also happy with ESCAP and UN-Habitat's assistance. It was good that over the two days the participants had been able to understand one another, know about neighbouring countries, sit together and discuss and the comments made will be very useful. As for ESCAP and UN-Habitat's contribution, there is a need to complete the policy guidance for DEWATS systems in the region because then the document can be shown to other organisations. Mr. Khamthavy appreciated that ESCAP and UN-Habitat are international agencies that can assist with policy and a roadmap. He commended their way of advising as they can go step by step through the process. With assistance from UN-Habitat and ESCAP, wastewater management can go ahead.

In wrapping up, Mr. Liu noted that the ESCAP mandate is to respond to requests from countries and ESCAP is keen to work with UN-Habitat and BORDA.

In his closing remarks, Mr. Khamthavy expressed his thanks to ESCAP, particularly to Mr. Liu and Ms. Karazhanova. He also thanked UN-Habitat, Mr. Sarkar, Dr. Thammarat and the other participants for their contributions and he voiced his confidence that we can move forward with good solutions. Mr. Khamthavy wished all the participants happiness, success in life and prosperity.

ANNEXURE

Annex 1: Agenda

AGENDA:

National Workshop on "Wastewater Management and Decentralised Wastewater Treatment Systems (DEWATS) in Lao PDR"

Day 1: Monday, 6th October 2014

Time	Programme Item	Responsible/Speaker
ALL PARTICIPANTS		
08:30	Registration	Rashmi Hotel, Vientiane
Session 1: Opening and Overview and Current State of DEWATS in the region and in Lao PDR **Facilitator: UN-Habitat**		
09:00	Welcome and Opening Statement	Mr. Khamthavy Thaiphachanh, DG DHUP, MPWT
09:10	Welcome Remarks Overview on workshop objectives, expected outcomes and impacts	Mr. Avi Sarkar, Regional Chief Technical Advisor, UN-Habitat
09:20	Welcome Remarks	Mr. Hongpeng Liu, Chief of ESWRS/EDD, ESCAP
Session 2. Taking a stock on waste water management and sanitation practices in Lao PDR: challenges, barriers, policies and solutions for DEWATS **Facilitator: DHUP**		
09:30	Overview on national vision on wastewater management strategy and national policies on opportunities for decentralised wastewater treatment services	Mr. Noupheuak Virabouth, DDG DHUP, MPWT
10:00 – 10:15	**Coffee Break**	
10:15 – 10:35	The practice of Decentralised Wastewater Treatment Solutions(DEWATS) in Laos	Mr. Bounthong Keohanam, Director of Urban Development Division (DHUP), MPWT
10:35 – 10:50	Introduction the MoU between Department of Housing and Urban Planning, Ministry of Public Works and Transport and BORDA for promoting DEWATS in Lao PDR	Mr. Alex Vivat Campbell, Mekong Countries Coordinator, BORDA
Session 3.Effective policy frameworks: vision, objectives of **wastewater treatment systems and sustainable sanitation services. Group discussions.** **Facilitator: ESCAP**		
10:50		Ms. Aida Karazhanova, ESWRS/EDD, ESCAP
11:10-11:40	Enabling policy analysis on DEWATS and faecal sludge management in three countries, good business models from the region	Dr. Thammarat Koottatep, Asian Institute of Technology (AIT)/Dr. Dr. Suthirat Kittipongvises, Chulalongkorn University
11:40-12:30	Group /Plenary Discussions	Facilitator: ESCAP

12:30-13:30 **Lunch**		
Session 4. Technical solutions, innovations, financial sustainability, viability and co-benefits from DEWATS **Facilitator: DHUP**		
13:30-14:30	Experience of DEWATS projects in Lao PDR: ▪ BORDA ▪ GRET ▪ LIRE	BORDA/GRET/LIRE
14:30	Sustainable Financing Frameworks for DEWATS Regional Guidelines on DEWATS	Mr. Christoffer Larsson, Consultant, ESCAP
14:45	Launching DEWATS in Lao PDR	Mr. Buahom Sengkhamyong, Country Chief Technical Advisor, UN-Habitat
15:00 – 15:15 **Coffee Break**		
Session 5. National strategy and implementation arrangements for wastewater treatment systems, DEWATS and sustainable sanitation services **Facilitator: ESCAP**		
15:15	Group/Plenary discussion (using flip charts, laptops)	Facilitator: ESCAP
16:10	Presentation of the group findings from Session 3, 4,5 and summary by facilitator	Facilitator: DHUP
16:40	Wrap-up	UN-Habitat/ESCAP
17:00	Closing Remarks	Mr. Khamthavy Thaiphachanh, DG DHUP

Day 2: Tuesday, 7th October 2014

Time	Programme Item	Responsible/Speaker
Round Table Meeting: DHUP/UN-Habitat/ESCAP/AIT/BORDA/GRET/LIRE		
Venue: Rashmi Hotel, Vientiane		
Facilitator: DHUP/UN-Habitat		
09:00	Welcome and Summary on the 1st day Workshop	Mr. Khamthavy Thaiphachanh, DG DHUP, MPWT
09:20	World Habitat's day 2014: "**Voice from Slums**"	DHUP/UN-Habitat
09:30-10:00	Discussion on: • Potential institutional frameworks for DEWATS in Lao PDR	All Participants
10:00 – 10:15	**Coffee Break**	
10:15-11:30	Continuous the discussion on: • Technical Solutions and Innovations on DEWATS and, • PPP on DEWATS	All Participants
11:30-11:45	Wrap-up	UN-Habitat/ESCAP
11:45-12:00	Closing Remarks	Mr. Khamthavy Thaiphachanh, DG DHUP, MPWT
12:00 **Lunch** (Closure of National Workshop)		

NOTE: Participants are mainly from the Government, UN Agencies, International Organizations (Development partners), NGOs, Academia and other stakeholders.

There will be around 41 people from The Govt Officials and other stakeholders as follow:

1. Ministry of Public Works and Transport (19);
2. Ministry of Natural Resource and Environment (2);
3. Vientiane Urban Development Administration Authority (1);
4. Asian Institute of Technology (1), Chulalongkorn University(1);
5. Development partners: ADB (1), WSP(1), JICA (1), KOICA (1);
6. UN Agencies: ESCAP (3), UN-Habitat (5), and
7. NGOs: BORDA (3), GRET (1), LIRE (1)

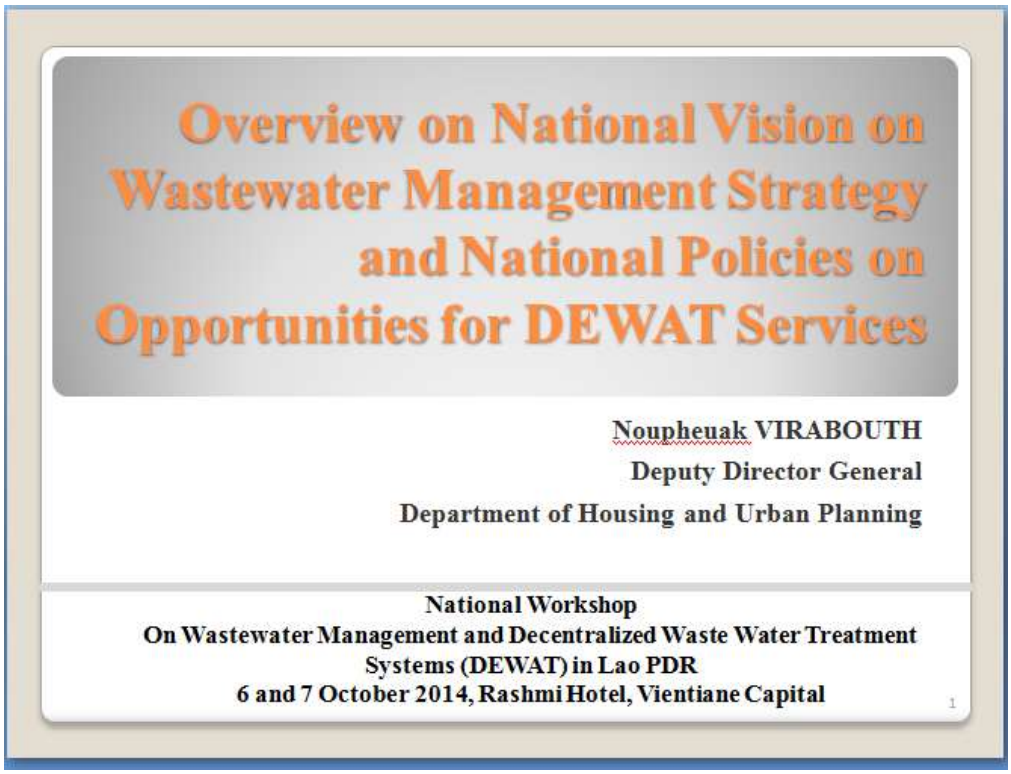
Annex 2: List of Participants

List of Participants:
National Workshop
"On Wastewater Management and Decentralised Waste Water Treatment Systems (DEWATS) in Lao PDR"
6th October 2014
(Venue: Rashmi Hotel, Vientiane Lao PDR)

No.	Name	Position	Organization
Department of Housing and Urban Planning, MPWT			
1	Mr. Khamthavy Thayphachanh	Director General	Department of Housing and Urban Planning
2	Mr. Noupheuak Virabouth	Deputy Director General	Department of Housing and Urban Planning
3	Mr. Phouthasene Akhavong	Deputy Director General	Department of Housing and Urban Planning
Ministry of Public Works and Transport			
4	Mr. Visalatha Vouthichan Thadeth	Cabinet Office	Ministry of Public Works and Transport
5	Ms. Daophet Siliphokha	Department of Planning	Ministry of Public Works and Transport
Department of Urban Development Division			
6	Mr. Bounthong Keohanam	Director of Urban Development Division	Department of Housing and Urban Planning
7	Mr. Vorachith Douangchanh	Coordinator	Department of Housing and Urban Planning
8	Mr. Phouthasom Suthavong	Deputy Director of UDD	Department of Housing and Urban Planning
9	Mr. Bounpathom Souvannamethy	Technician	Department of Housing and Urban Planning
10	Mr.Sompong Louangleuxai	Technician	Department of Housing and Urban Planning
Department of Water Supply Division/Urban Planning/Financial and Planning Divisions			
11	Mr. Khanthone Vorachith	Director of Water Supply Division	Department of Housing and Urban Planning
12	Mr. Lonechanh Xangchouboulom	Urban Planning Officer	Department of Housing and Urban Planning
13	Ms. Visaphone Inthilath	Deputy Director of Housing Division	Department of Housing and Urban Planning
14	Dr. Saysavanh Phongsavanh	Assistant of Director General	Department of Housing and Urban Planning
15	Mr.Soulisack Phonthachack	Director of Planning Division	Department of Planning
Implementing Partner (Attapeu Province)			
16	Mr. Sounnakhone Keoviengkham	Deputy Director	Department of PWT Attapeu
17	Mr. Keovixien Sixanon	Director of water supply utility	Water supply Attapeu
International organization			
18	Mr. Kayasith	PO	JICA
19	Mr. Alex Vivat Campbell	Mekong Countries Coordinator	BORDA

20	Mr. Tobias Roland Möller	Project Coordinator	BORDA
21	Mr. Bounchan Khamphilayvong	Technical Coordinator	BORDA
22	Mr. Bounma Thor	Project Officer	BORDA
23	Mr. Chanhsouk Simai	MIREP Deputy Manager	GRET
24	Mr. Arnaud Vontobel		GRET
Vientiane Department of Public Works and Transport			
25	Mr. Bounchanh Keosithamma	Deputy Director General	Vientiane Capital DPWT
26	Mr. Pinthong Saleumsay	Technical Officer	Department of Water Resources
27	Mr. Khammone Chommanivong	Water Environmental Division	Vientiane Capital DPWT
Public Works and Transport Institute			
28	Mr. Chantala Phimmachack		Public Works and Transport Institute
29	Mr. Tingphet Lohapaseoth		Public Works and Transport Institute
Vientiane Urban Development Administration Authority			
30	Mr.Khamphet		Vientiane Urban Development Administration Authority
Ministry of Natural Resource and Environment (MONRE)			
31	Ms. Sindavieng	Technical Staff	Ministry of Natural Resource and Environment
UN-Habitat			
32	Mr. Avi Sarkar	Regional Chief Technical Advisor, South-East Asia Urban Basic Services Branch	UN-Habitat
33	Mr. Buahom Sengkhamyong	Country Chief Technical Advisor	UN-Habitat
34	Mr. Khamphong Chaysavang	National Officer	UN-Habitat
35	Vilaysouk Ounvongsai	Admin and Finance Officer	UN-Habitat
36	Ms. Heather Robertson	Consultant	UN-Habitat
ESCAP and AIT			
37	Mr. Hongpeng Liu	Chief of ESWRS/EDD	UN-ESCAP
38	Ms. Aida Karazhanova	Economic Affairs Officer	UN-ESCAP
39	Mr. Christoffer Larsson	Consultant	UN-ESCAP
AIT and Environmental Research Institute, Chulalongkorn University			
40	Dr. Thammarat Koottatep	Asian Institute of Technology (AIT)	Asian Institute of Technology (AIT)
41	Dr. Suthirat Kittipongvises	Environmental Research Institute	Chulalongkorn University

Annex3: Presentation on Overview on national vision on wastewater management strategy and national policies on opportunities for decentralised wastewater treatment services.



Lao Country Overview

3

Our Ambition

- Graduate from the UN list of Least Developed Countries (LDC) by 2020;
  - The National Growth and Poverty Eradication Strategy (NGPES) 2004 is central to the national development agenda;
  - The Lao PDR's long-term national development goal is to be achieved through sustained equitable economic growth, while safeguarding the country's social, cultural, economic and political identity;
  - Achieve MDGs (including poverty reduction).

* The wastewater management is an important factor in reaching the targets defined in the NGPES

4

Population and Urbanization

- The population of Lao PDR increased by about one million in very 10 years;
  - With a growth rate of 2%, the population will be 6.9 million by 2015, 8 million by 2020 and 10 million by 2030.
  - Presently, urban population is about 1,780,000 inhabitants and
  - It is estimated that by the year 2020 the urban population will be about 2.5 million inhabitants representing 33% of the total population.

5

Our Policy on Wastewater Management

- We recognize that: sustainable access to wastewater facilities is fundamental to achieve several MDGs targets, and to endure development and economic growth for the country; and Access to basic wastewater facilities is necessary for the health, well being and dignity of the population.
- Decision No 37/PM of 1999 has an objective defining the policy of the Government of the Lao PDR on management and development of water supply sector … aiming at concentration of all efforts for the effective and sustainable financing, development, and management of water supply and wastewater management systems in urban and rural areas throughout the country.

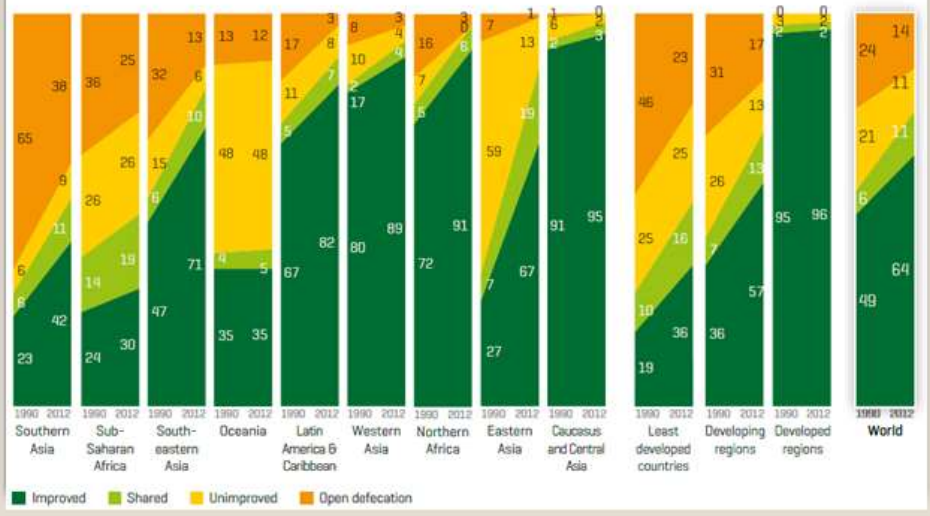
6

Overview of the Situation of Wastewater Management in Laos

7

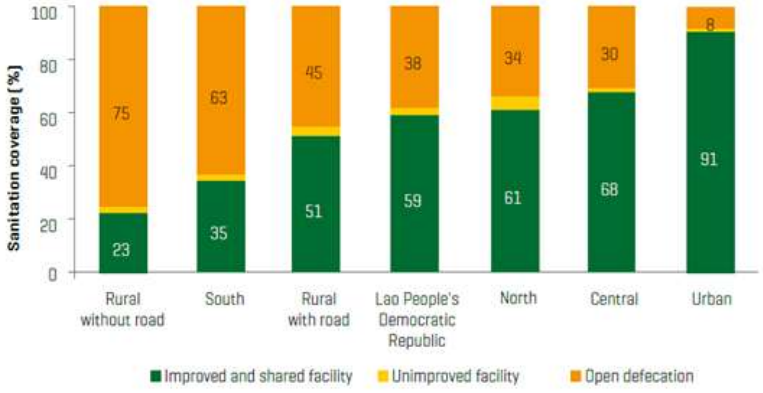
Sanitation coverage trends (%) by MDG regions, 1990–2012

Fourteen per cent of the global population, or one billion people, practise open defecation



Sanitation coverage by geographic region, Lao PDR, 2011–2012

Sanitation coverage in rural areas with road access is twice that in rural areas without road access in Lao People's Democratic Republic



Source: Lao People's Democratic Republic Social Indicator Survey, 2011–2012

Use of Sanitation Facilities in Laos

Year	Population (x 1000)	Percentage urban population	USE OF SANITATION FACILITIES (percentage of population)[20]												Progress towards MDG target[21]
			URBAN				RURAL				TOTAL				
			Improved	Unimproved			Improved	Unimproved			Improved	Unimproved			
				Shared	Other unimproved	Open defecation		Shared	Other unimproved	Open defecation		Shared	Other unimproved	Open defecation	
1990	4 245	15	-	-	-	-	-	-	-	-	-	-	-	-	
2000	5 388	22	66	3	8	23	17	1	9	73	28	1	9	62	Met target
2012	6 646	35	90	4	2	4	50	1	7	42	65	2	4	29	

Source: Progress on Drinking Water and Sanitation 2014 Update

10

Current Wastewater handling Practices in Laos

- Current wastewater handling in most urban areas in Lao PDR entails an on-site disposal system of human waste, black water, without treatment or with poorly functioning treatment;
- Wastewater facilities (latrines and septic tanks) tend to be poorly maintained, and with an insufficient drainage system;
- Untreated black water from households are often emptied directly into public drains or the urban environment (roadside, paddy fields, wetlands etc);
- Decentralized Watewater Treatment System (DEWATS) has recently been introduced to Laos.

11

Completed Sanitation Projects

- The That Luang wastewater treatment system (lagoon) built in 1993, (not successful);
- Septage Management under ADB Loan 1525-LAO(SF) Secondary Towns Urban Development: Septage loan established, desludging vehicles procured, but no provision for depositing septic tank sludge made.
- Urban Sanitation Marketing Campaign in 2008
- Water Supply and Sanitation Sector Projects
- Community-based Water Supply and Sanitation Projects.

12

Some Studies on Sanitation and Capacity Building on DEWATS

- The Mater Plan of Drainage and Sewerage System for UDAA Luang Prabang;
- Water Supply and Wastewater Management Master Plans for Xay, Pakxan, Thakek, Kaysone Phomvihane and Pakse towns;
- The Master Plan of Water Environment Management in Vientiane Capital;
- Promoting Improved Sanitation Leading to Economic, Environmental, Health and Social Progress in Lao PDR: Capacity Building, Dissemination of Information, Public involvement, and Fund raising;
- Background Policy Study on Wastewater Management and Sanitation in Cambodia, Lao PDR and Viet Nam PR.

13

Introduction of DEWAT to Laos

- Community-based sanitation service for the Staff Dormitory Residence in Sokpaluang Campus of the Faculty of Engineering, NUOL
- DEWATS for Thongkankham Village (1), Khualuang Primary School & Temple (2) and Agriculture & Forestry College LuangPrabang (3);
- DEWATS & Desludging Service for HinHeup Town;
- DEWATS in Phousay and Mixay villages of Sanxay district, Attapeu Province.

14

Key Issues (1/2)

- Inadequate legal framework and unclear institutional responsibilities;
- The access to "normal" toilet facilities is relatively good, but it is assumed that maintenance is poor;
- Many schools lack sufficient toilets;
- Public markets often have poor or none toilet facilities;
- Wastewater from domestic areas, hospitals, industrial operations are discharged directly to cities drains, lakes, rivers etc without any treatment;

15

Key Issues (2/2)

- The hygienic situation is worsened by flooding in many urban areas;
- Lack of access and monitoring of wastewater services;
- Lack of awareness among communities and authorities on the benefits of improved wastewater;
- Lack of capacity among public institutions to manage the wastewater sector;
- Financing mechanisms are not examined and financial sustainability is at risk; and
- Poor wastewater conditions will become a major drawback in order to encourage investment and tourism activities.

16

Overview of the Wastewater Management Strategy

17

Our Vision and Mission

Our vision is that:

"Hygienic lives ensured for the urban population by 2020"

Our mission is:

"supporting increased access to sustainable wastewater facilities and services in urban areas"

18

Objectives of the Strategy

- to ensure environmental protection and mitigate impacts from wastewater on the environment;
- to ensure health protection and appropriate wastewater services to the urban population;
- to guide future urban investment and development of wastewater services in terms of:
  - legal and institutional framework
  - improvement of the capacity of central/local governments to provide and sustain urban wastewater services
  - application of appropriate and affordable technologies
- to ensure financial sustainability in the wastewater sector.

19

Programs 1 & 2

- Program 1: Institutional and Legal reforms
  - Activity: Present legal and institutional framework reforms
- Program 2: Urban Wastewater Improvement
  - Activity: Wastewater investments (first and second priority towns coordinated with water supply investments)

20

Programs 3 & 4

- Program 3: Urban Wastewater Management
  - Activity: Develop urban wastewater management in terms of financial mechanisms, review potential and limitations of PSP and decision making models
- Program 4: Wastewater Sector Monitoring
  - Activity: MDG monitoring practices (Analysis of local interpretation of various toilet facilities, Training of data collectors)

21

Programs 5 - 8

- Program 5: Communication Strategy and Awareness Raising
  - Activity: Communication and awareness raising
- Program 6: Technical Guidelines
  - Activity: Technical guidelines
- Program 7: Capacity Building
  - Activity: Training needs assessment within key sectors at national, provincial and district levels.
- Program 8: Wastewater Treatment
  - Activity: Treatment facilities

22

Funding Requirement to 2020

Category	2011-15	2016-20	Total
	U$ millions	U$ millions	U$ millions
Central authorities	770,000	20,000	790,000
Vientiane Capital City	23,488,000	3,900,000	27,388,000
Secondary Towns	16,605,000	3,900,000	20,505,000
Provincial Capitals	15,519,000	1,730,000	17,249,000
District Centers	32,083,000	4,732,000	36,815,000
Emerging Small Towns	42,000	8,000	50,000
Total	**88,507,000**	**14,290,000**	**102,797,000**

23

Funding Gap

- The sanitation sector is heavily dependent on donor support,
- The level of private sector contribution is difficult to determine but is evidently very low;
- Most urban investment studies have focused on capital intensive, centralized wastewater systems and did not consider modular development;
- The cost of building an improved latrine is currently high, making it unaffordable to most low income households; and
- Urban sanitation not integrated into the multi-annual investment planning cycle as part of urban development plans;

25

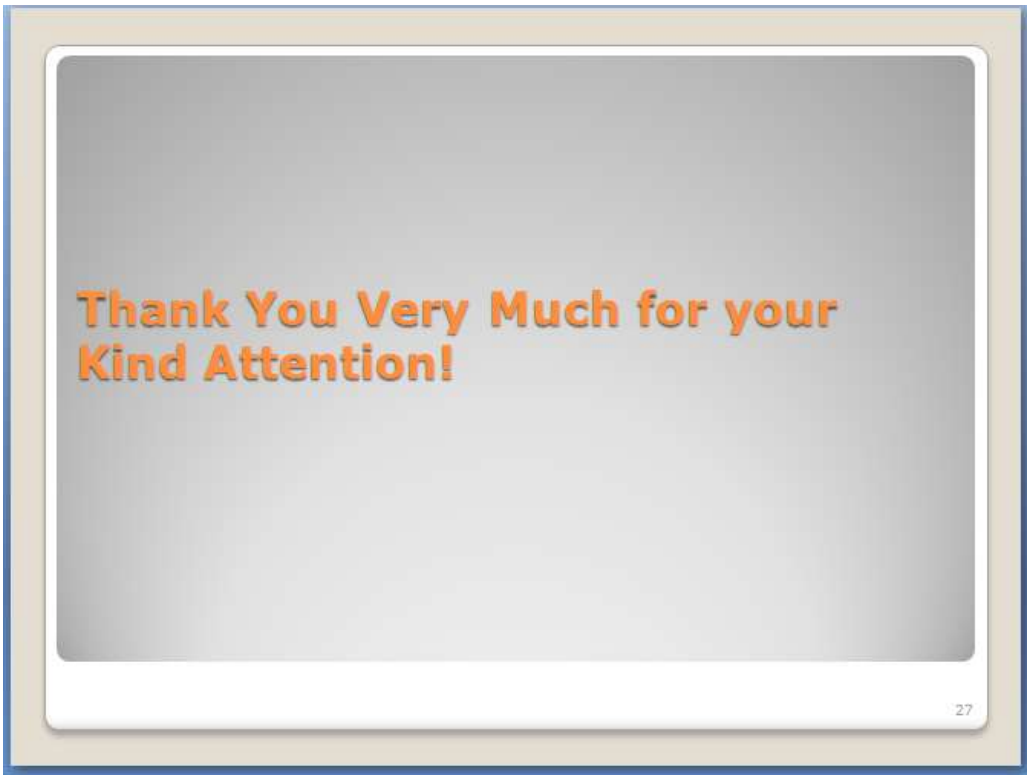
Opportunities for DEWAT Services

24

Opportunities

- The Government has recent experiences from institutional reforms of the water supply sector;
- Institutional framework is currently under development;
- There are concerns and commitment from the Government to improve the wastewater situation in the country;
- Potential to scale up DEWATS demonstration projects in peri-urban areas due to financing partnerships between national, provincial and commune level, NGOs and other funders.
- Potential to raise household demand for DEWATS with promotion, technical support and attractive financing options.

26


Thank You Very Much for your Kind Attention!
27

Annex 4: Presentation on the practice of Decentralised Wastewater Treatment Solutions (DEWATS) in Laos

The Practice of Decentralized Wastewater Treatment Solutions (DEWATS) in Lao PDR

Presented by: **Bounthong Keohanam**

Director of Urban Development Division

Department of Housing and Urban Planning

Overview of Wastewater Treatment in Laos

- Expanding of urban areas, lead to increase in number of population, water consumption (Vientiane Capital, Secondary towns, Small towns, and Village clusters) and standard toilets (septic tanks, pour flush latrines)
- Wastewater discharges directly into public areas, roadside drains, canals, streams, and rivers without proper treatment
- To solve the problem of untreated wastewater discharged into public areas, the DHUP is seeking technique that is suitable and available at present (low cost, no energy required, can use local materials, energy recovery, easy to operate and maintain, environmental friendly that can be met the national environmental standards)
- The DHUP, MPWT has finally found the proper techniques "DEWATS-Decentralized Wastewater Treatment Solutions" for wastewater treatment that matches our goal.
- The MOU between DHUP-MPWT and BORDA have been signed to support these techniques that can be used in every region of the country.

MOU between DHUP and BORDA for DEWATS

- The Memorandum of Understanding (MOU) were signed by DHUP (Department of Housing and Urban Planning) and BORDA (Bremen Overseas Research & Development Association) for a period of about 3 years (2nd February 2013 to 31st December 2015 for promoting improved sanitation leading to economic, environmental, health and social progress in the Lao PDR

Objectives

- **Objective 1:** Capacity building
- **Objective 2:** Dissemination of information
- **Objective 3:** Cooperation in planning and implementation
- **Objective 4:** Supporting the planning of BORDA sanitation service packages within participative, demand response, multi-stakeholder framework
- **Objective 5:** Supporting the implementation of BORDA sanitation service packages through the cooperation partners
- **Objective 6:** Training the target groups on management as well as operation and maintenance of the service packages
- **Objective 7:** Monitoring the implemented projects after commissioning in conformity with the established national development policies of the government

Activities

- On 19th June 2013, DHUP held together with BORDA an *inception meeting* to promote improved sanitation leading to economic, environmental, health and social progress in Lao PDR
- From 2nd to 7th July 2013, DG of DHUP and some DHUP's Staffs went to Indonesia for visiting the Southeast Asia BORDA's Headquarter in Jogjakarta, to meet with the MPWT and attended the INDOWATER 2013 Expo & Forum in Jakarta

Activities (Cont'd)

- On 29th July 2013, held a workshop at the ministry level on the management, operation & maintenance requirements
- On 7th to 8th August 2013, visited the DEWATS at Theun-Hinboun Hydro-Power Company, in Khounkham District, Bolikhamxay province
- On 27th June 2014, held on-the-job training for DEWATS in Operation and Maintenance, and site visit to DEWATS construction site at NAPPA (National Academy of Politics and Public Administration), ThaNgone Village, Xaythany District, Vientiane Capital.

DEWATS Roadshow

- **The purpose of roadshow is to disseminate the information on technique of DEWATS which is an alternative to wastewater treatment facilities available for the Lao PDR to key persons of provinces, especially the policy makers, technicians and staffs of departments concerned at provincial level.**
- The technical team from DHUP and Lao BORDA went to provinces for DEWATS Roadshow as follows:
  - From 1st to 8th June 2014: Oudomxay, Luangnamtha and Bokeo provinces
  - From 6th to 11th July 2014: Xiengkhouang and Houaphan provinces
  - From 3rd to 10th August 2014: Saravane, Xekong and Attapeu provinces
  - From 7th to 14th September 2014: Vientiane, Luangprabang and Sayaboury provinces
- **From these Roadshows, some requests from provinces were sent to DHUP asking for the technical assistance, especially the data collection, survey, design of DEWATS systems for their provincial hospitals, schools etc.**

Requests from provinces

Requests	Date	From	Comments of Director General of DHUP	Project's Details		
				Name	Location	Donor
				DEWATS construction Project	Khoualuang Village, Chanthabouly Dis., VC	
				DEWATS construction Project	Engineering Faculty, National University of Lao PDR	
Request for approval of the project for waste water treatment station	7/6/13	National Academy of Politics and Public Administration	Agreed in principle in selecting DEWATS	Project for DEWATS construction	Thongone vil., Xaithany Dis., Vientiane C.	Office of NAPPA
Request for DEWATS technical assistance	24/7/13	Department of Water Resources, MONRE	Agreed in principle in selecting DEWATS	Project for DEWATS construction	Himtid vil., Hinheup Dis., Vientiane C.	GIZ Thai
Request for DEWATS technical assistance	21/7/14	Bokeo provincial hospital	LBDA should cooperate with Lao BORDA to help such a hospital	Project for DEWATS construction	Bokeo provincial hospital	ADB, Thai Government

Requests from provinces (Cont'd)

Requests	Date	From	Comments of Director General of DHUP	Projects Details		
				Name	Location	Donor
Request for a consultant team and Lao BORDA technicians	1/7/14	DPWT of Bolieo Province	UDD should lead the Lao BORDA team to study and cooperate the survey and design	Project for DEWATS construction	Provincial hospital and 2 schools	ADB, Thai Government support for hospital
Request DHUP to collect data, carry out survey and design DEWATS	12/9/14	DPWT of Xiengkhouang province	UDD should study and cooperate with DPWT about its implementation	Project for DEWATS construction	DPWT Xiengkhouang province	NA
Request for a team to study, design & construct DEWATS	19/9/14	Luangprabang provincial hospital	UDD should study and cooperate with the Lao BORDA team about this	Project for DEWATS construction	Luangprabang provincial hospital	NA
Request for DEWATS technical assistance to Phieng District, Seyaboury provincial hospital	30/9/14	Seyaboury provincial DPWT	UDD should cooperate with Lao BORDA to help district hospital, Phieng District, Seyaboury Province	Project for DEWATS construction	Phieng District, Seyaboury province	
				DEWATS construction Project	Sanxay Dis., Attapeu Province	UN-HABITAT
				DEWATS construction Project	Xepian Hydropower, Paksong Dis., Champasak P.	

Annex 5: Presentation iintroducing the MoU between Department of Housing and Urban Planning, Ministry of Public Works and Transport and BORDA for promoting DEWATS in Lao PDR

1) BORDA Overview

Bremen Overseas Research & Development Association

- Founded in1977
- Works in 5 regions – SEA, SA, Southern Africa, Sth America & Afghanistan
- Supported directly by the German Government (BMZ)
- Overall Goal SEA: To improve living conditions and social structures of low-income, disadvantaged communities in densely populated urban and peri-urban areas

- Developed DEWATS service packages since 1994
- Globally more than 2000 DEWATS implemented
- 1000 of these are in Indonesia since 2003 (SANIMAS)

BORDA SEA Network

1) BORDA Overview

DEWATS Service Packages

- Community Based Sanitation
- School Based Sanitation
- Sanitation for Hospitals
- Sanitation for Prisons
- Sanitation for Real Estate
- Sludge Treatment Plants
- AgroClean/SME
- Emergency Sanitation
- Health Impact Evaluations (HIE)
- Sanitation Mapping

- All DEWATS Packages supported by Technical Quality Management System (QMS)
- Institutional / Social aspects supported by SOP

2) Cooperation History in Lao PDR

Cooperation with Local NGO

- Start: since 2009
- Partner: Lao Institute for Renewable Energy (LIRE)
- Focus: Staff/Partner capacity building, promotion of DEWATS, developing partnership on DEWATS
- Pilots: 7 pilot plants together with MPWT, Japanese International Cooperation Agency (JICA), Theun Hinboun Power Company (THPS), and National University of Laos (NUoL) and others

BORDA Laos Project Office

- Start: MoU signed in January 2013 (3 years)
- Partner: Ministry of Public Works and Transport, Department of Housing and Urban Planning
- Objective: Promotion of improved public health and reduction of organic pollution for the benefit of Lao people and nation
- Scope: Promotion, capacity building, implementation and dissemination of DEWATS for schools, communities, hospitals, hotels, real estate, and small and medium enterprises

DEWATS THPC: 1,000 Households connected to DEWATS by BORDA

Signing Ceremony of the MoU on January 31, 2013

3) Memorandum of Understanding & Action Plan 2013-15

Objectives of MoU	Activities of Action Plan
1) Dissemination of DEWATS information	:: Workshops, training on the job
2) Capacity building on DEWATS	:: National conference, public hearings
3) Cooperation in planning and implementation	:: Identify existing structures, capacity building, involvement of beneficiaries, explore co-management
4) Supporting DEWATS framework (participative, demand-responsive, multi-stakeholder)	:: Participation of authorities, establishment of transparent selection process, exploration of private public partnership models, creation of incentives
5) Acquisition of cooperation partners	:: Allocation of state budget & bi-/multilateral funds, joint proposals & acquisitions of partners, contribution of beneficiaries
6) Management, operation & maintenance	:: Workshop on ministry level, workshops and trainings of local authorities, training for beneficiaries
7) Monitoring conformity nat. frameworks	:: Alignment of DEWATS implementation with national policies, support in execution of legal frameworks, realization of sustainable project implementations

"National Workshop on Wastewater Management and Decentralized Wastewater Treatment Systems (DEWATS) in Lao PDR"
Promoting DEWATS by BORDA in Lao PDR
BORDA Laos
Mr. Alexander Campbell
Country Representative
Vientiane, October 8, 2014

4) Activities in 2013-14

Dissemination of Information and Capacity Building

Inception seminar (2013), 56 participants
> Cooperation, Draft WW Strategy, DEWATS general

Technical workshop (2013), 26 participants
> Social and technical interventions, study tour, field trips

O&M workshop (2014), 42 participants
> O&M requirements and co-management approach

DHUP-BORDA DEWATS roadshow (2014), 15 prov., 464 participants
> Update for LA on wastewater management strategy with DEWATS by BORDA

Coop. Planning and Implementation

Identification and cap. build. in existing structures
> Participation | GoL networking | in-house-training

Strengthening network, acquisition of partners
> Promotion of establishment of technical working group

Strong involvement of beneficiaries and local authorities
> Promotion of Co-management

DHUP at 10th Water Expo in Indonesia


DHUP DS Mr. Khamthavy promotes DEWATS by BORDA


Explaining construction on-site

4) Activities in 2013-14 (continued)

Supporting DEWATS Framework

Increased participation of from local authorities (LA)
> Request of support from DHUP-BORDA cooperation from Bokeo, Louangphrabang, Saravan, Xaignabouri, and Xianghoang

Involvement of CA and LA in preparation and supervision
> In-house training for technical staff of Urban Development Division in SOP and QMS of DEWATS by BORDA

Acquisition of Cooperation Partners

Request for state budget for management of DHUP-BORDA coop.

Cooperation with Ministry of Health
> Survey of sanitation in provincial hospitals

MoA with National University of Laos
> Including knowledge about DEWATS into annual curriculum

MoA with Gret
> Development of hygiene, sanitation, wastewater treatment

MoA with Kristianstad University Sweden (HKR) (City Blues)
> Climate Compatible Development in Vientiane

DEWATS Coordinator Mr. Viraphith at DHUP-BORDA Roadshow

Pre-FS at hospitals reveal need for improved sanitation

"National Workshop on Wastewater Management and Decentralized Waste Water Treatment Systems (DEWATS) in Lao PDR"
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BORDA
BORDA Laos
Mr. Alexander Campbell
Country Representative
Vientiane, October 8, 2014

4) Activities in 2013-14 (continued)

2014 Completed DEWATS Implementations:

- 2 x CBS: Mixay & Phouxay villages, Attapheu Province (UN-Habitat Supported)
- Resan: NAPA University, Vientiane Capital
- Resan: Hydropower workers village, Champasak province

5) Future Cooperation in 2015 and Beyond

10 x potential DEWATS projects in 2015:

- 2 x CBS (Xam Neua & Luang Prabang)
- 2 x SBS (Bokeo)
- 3 x Hospitals (Bokeo, Sayaboury, Xiengkhouang)
- 3 x Resan (School, Hydropower & NGO Dormitories)

Future Cooperation Opportunities:

Development of next MoU with DHUP – broaden scope and depth of cooperation

Multiple players in the sector: UNESCAP, UN-Habitat, ADB, GRET, City Blues, LIRE etc etc Develop/identify mutually beneficial roles and responsibilities based on individual capacities inline with DHUP's national strategy/approach for sector-wide development

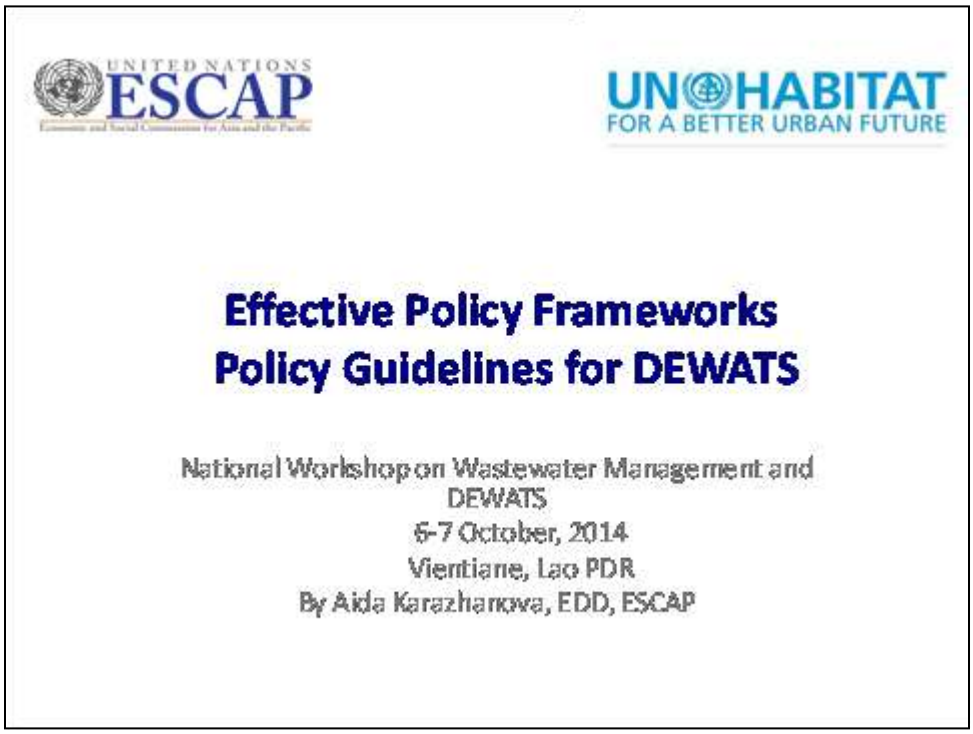
"National Workshop on Wastewater Management and Decentralized Waste Water Treatment Systems (DEWATS) in Lao PDR"
Promoting DEWAT II by BORDA in Lao PDR
BORDA
BORDA Laos
Mr. Alex Viwat Campbell
Country Representative
Vientiane, October 8, 2014

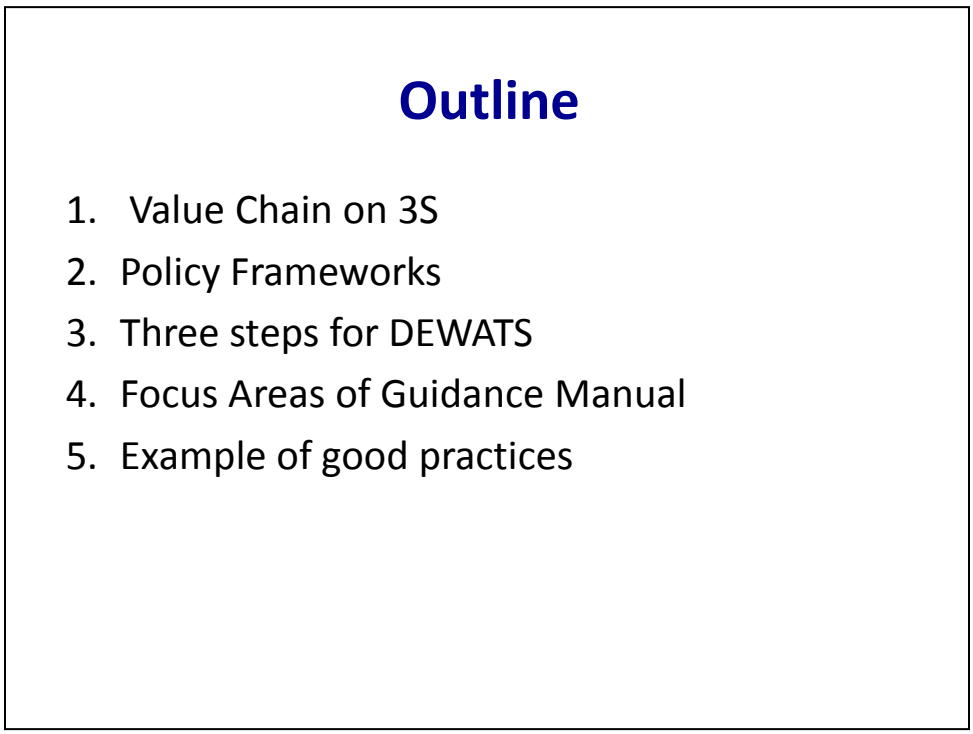
Thank you for your attention!

Alex Viwat Campbell
Email : campbell@borda-sea.org
Website : www.borda-sea.org

BORDA is funded by:
BMZ Federal Ministry for Economic Cooperation and Development

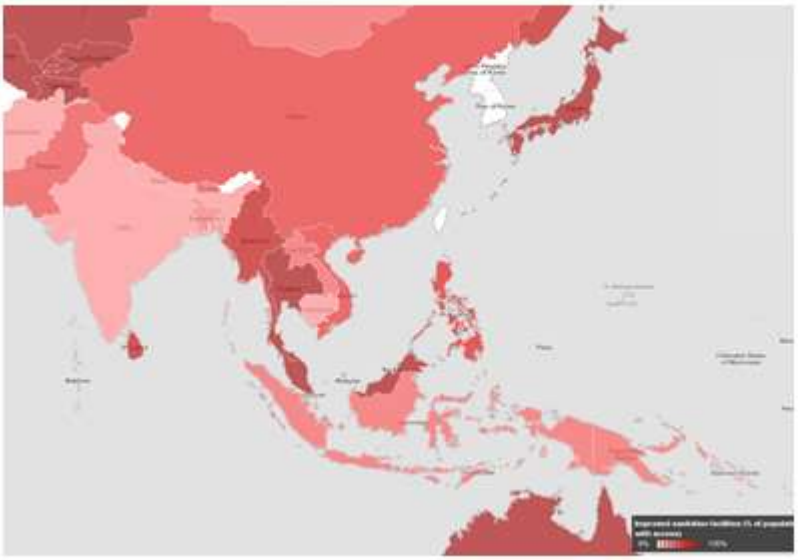
Annex 6: Presentation on effective policy frameworks in South East Asia and Regional Policy Guidelines on DEWATS & socio-economic impacts



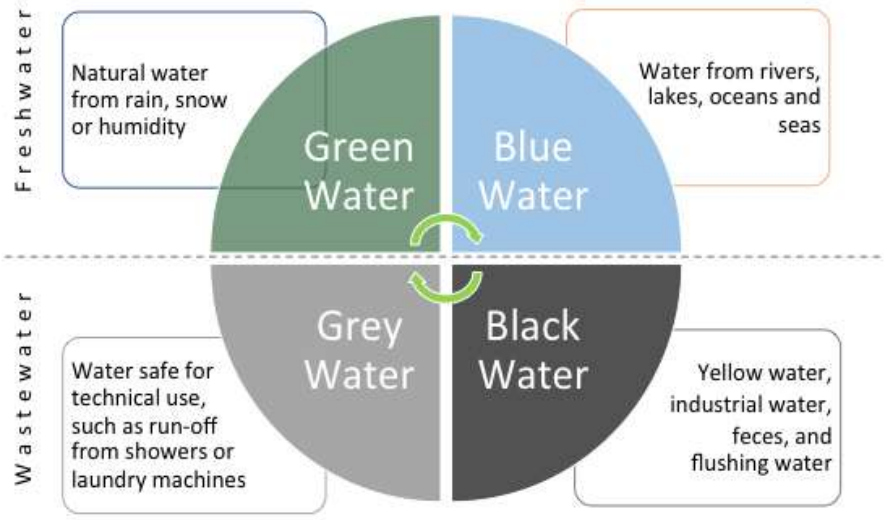


UNITED NATIONS ESCAP

The Lack of Sustainable Sanitation Services (3S)



What is Wastewater?



Targets- SDG Goal 6. Ensure availability &sustainable management of water &sanitation for all

6.1 by 2030, achieve universal and equitable access to safe and affordable drinking water for all;

6.2 by 2030, achieve access to adequate and equitable sanitation and hygiene for all, and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations;

6.3 by 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and increasing recycling and safe reuse by x% globally;

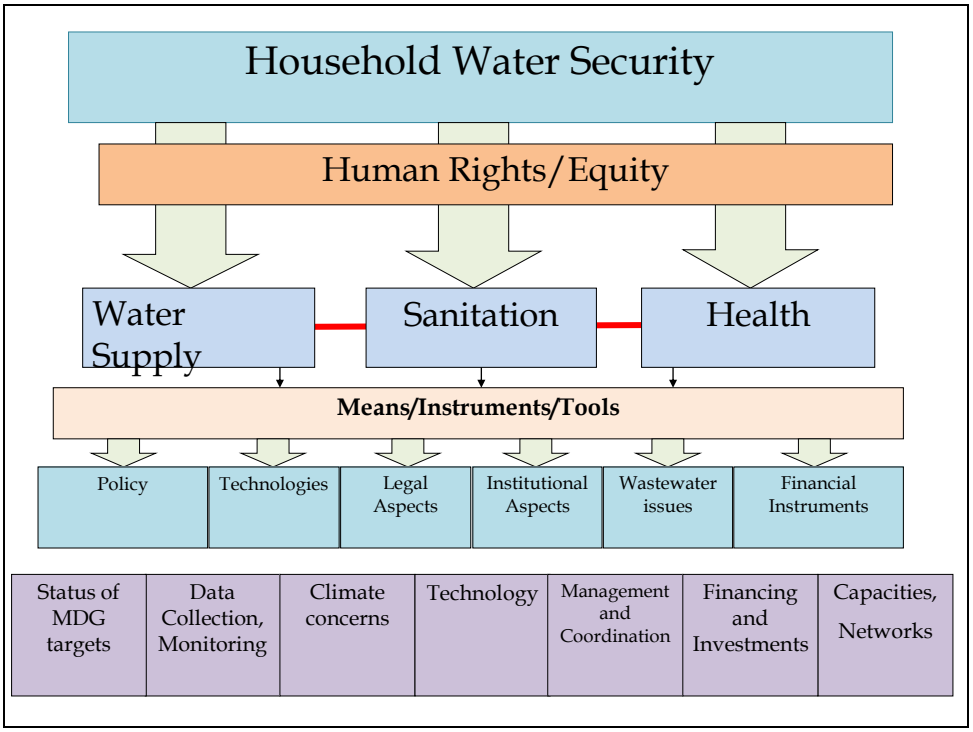
6.4 by 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity, and substantially reduce the number of people suffering from water scarcity;

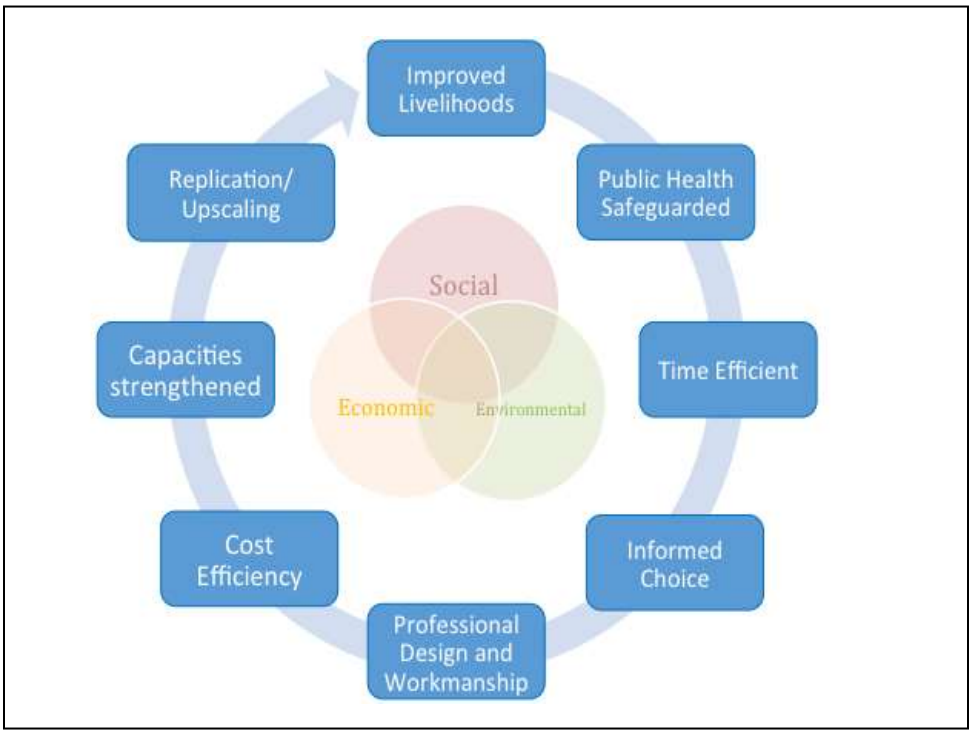
6.5 by 2030 implement integrated water resources management at all levels, including through transboundary cooperation as appropriate;

6.6 by 2030 protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes;

6.a by 2030, expand international cooperation and capacity-building support to developing countries in water and sanitation related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies;

6.b support and strengthen the participation of local communities for improving water and sanitation management.


Household Water Security
Human Rights/Equity
Water Supply
Sanitation
Health
Means/Instruments/Tools
Policy
Technologies
Legal Aspects
Institutional Aspects
Wastewater issues
Financial Instruments
Status of MDG targets
Data Collection, Monitoring
Climate concerns
Technology
Management and Coordination
Financing and Investments
Capacities, Networks

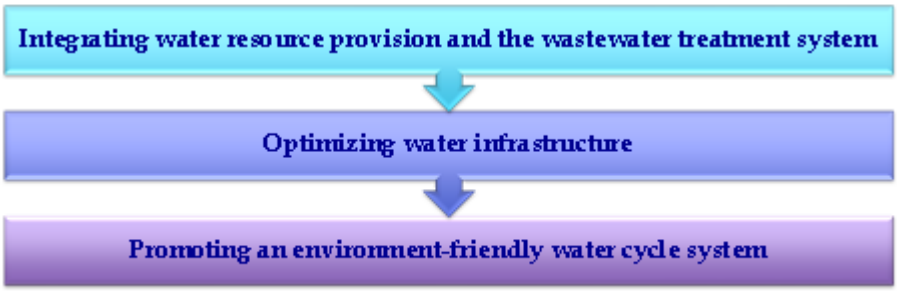

Improved Livelihoods
Public Health Safeguarded
Time Efficient
Informed Choice
Professional Design and Workmanship
Cost Efficiency
Capacities strengthened
Replication/ Upscaling
Social
Economic
Environmental

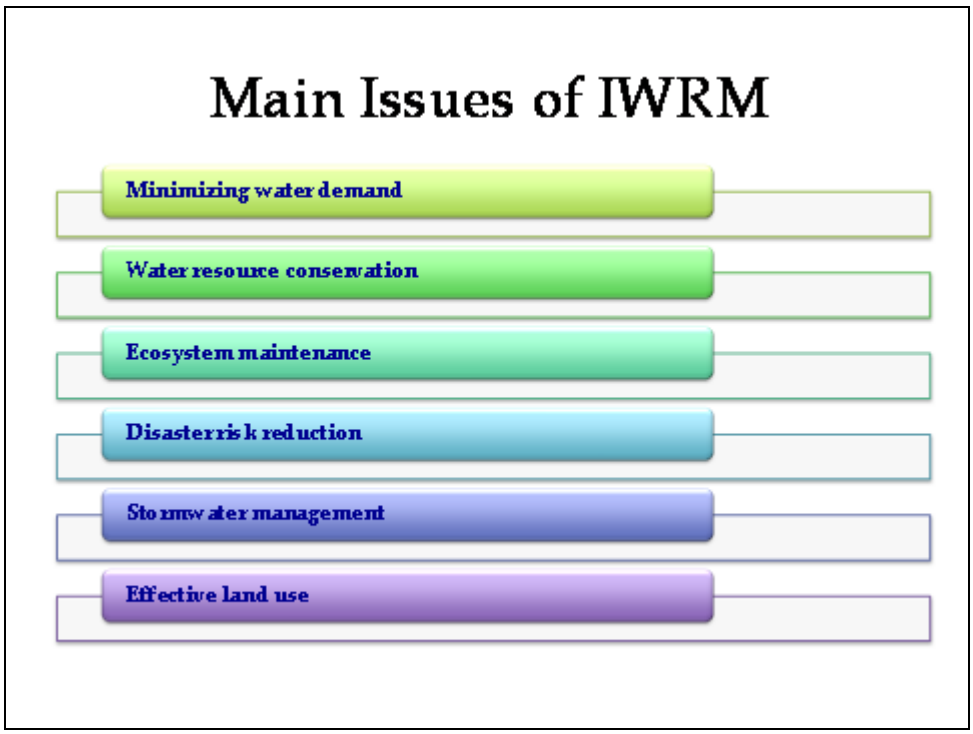
Policy Instruments: Low Carbon Green Growth Roadmap, ESCAP, 2012

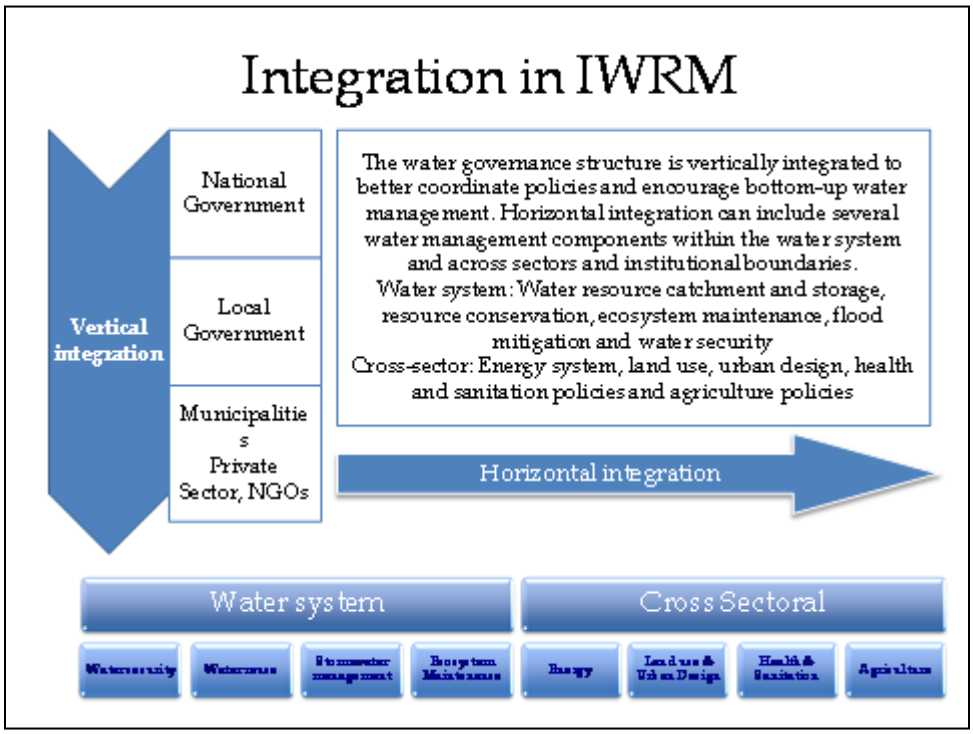
Category	Subcategory	Description
Economic instruments	Water pricing	Increase of block tarrifs, providing subsidies to the lower-income households, etc.
Governance structures	Integrated water resource management	1. Integrating water resource provision and a wastewater treatment system 2. Optimizing water infrastructure 3. Promoting an environment-friendly water cycle system
	Distributed wastewater management system	Has 3 main objectives: 1. Public health improvement 2. energy and water conservation 3. environmental protection Helps to avoid water losses and save energy consumption, has low-cost and site-specific opportunities
	Reuse and recycling	Minimizes freshwater demand and reduce wastewater treatment needs. The following treatment technologies can be used: membranes, wetlands, sand filters and waste stabilizing ponds.
	Low impact development (LID)	Local and decentralized measures, mitigate development impacts to land, water and air by: mimicking natural drainage, using small-scale practices, managing stormwater at the source, using simple and natural practices and making landscape and infrastructure multifunctional

Integrated Water Resources Management

- Process for coordinating the development and management of water, land and related resources in a way that maximizes economic and social welfare equitably, without compromising the sustainability of vital ecosystems and the environment
- Objective: to overcome sector-based policy fragmentation and inefficient governance structures and thus achieve more compact water infrastructure in an ecologically and economically efficient manner
- Critical objectives:



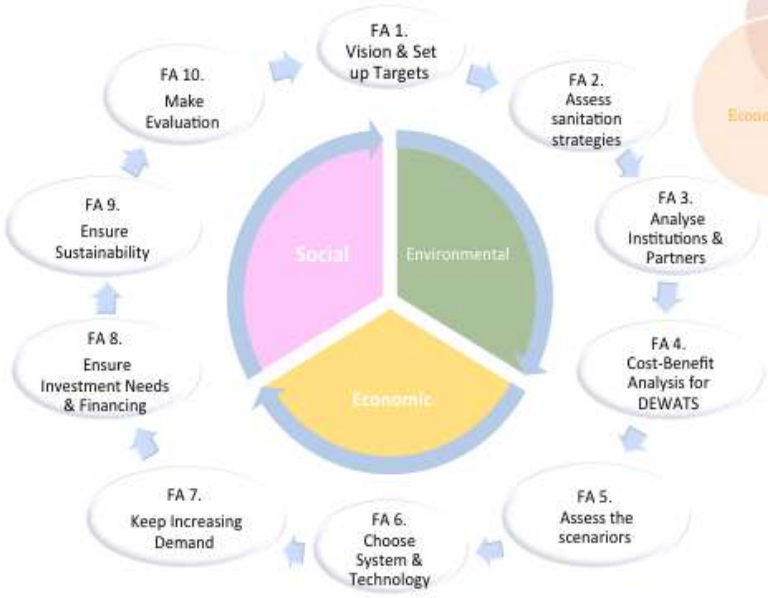

Main Issues of IWRM
Minimizing water demand
Water resource conservation
Ecosystem maintenance
Disaster risk reduction
Stormwater management
Effective land use

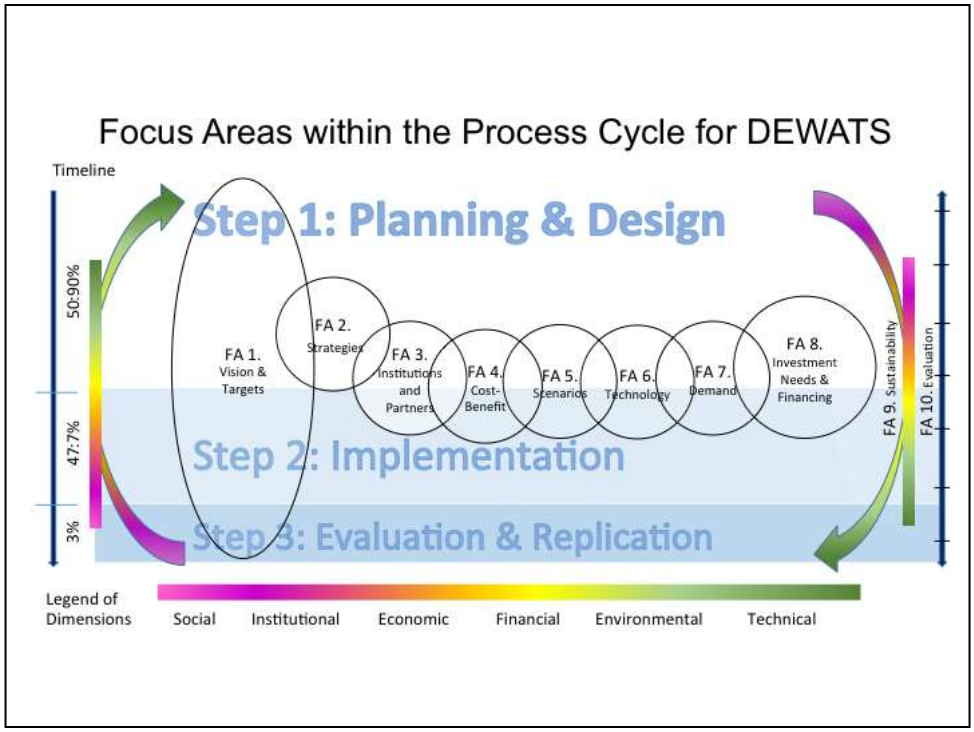

Integration in IWRM
Vertical integration
National Government
Local Government
Municipalities
Private Sector, NGOs
The water governance structure is vertically integrated to better coordinate policies and encourage bottom-up water management. Horizontal integration can include several water management components within the water system and across sectors and institutional boundaries.
Water system: Water resource catchment and storage, resource conservation, ecosystem maintenance, flood mitigation and water security
Cross-sector: Energy system, land use, urban design, health and sanitation policies and agriculture policies
Horizontal integration
Water system
Cross Sectoral

The Way Forward For Policy Makers

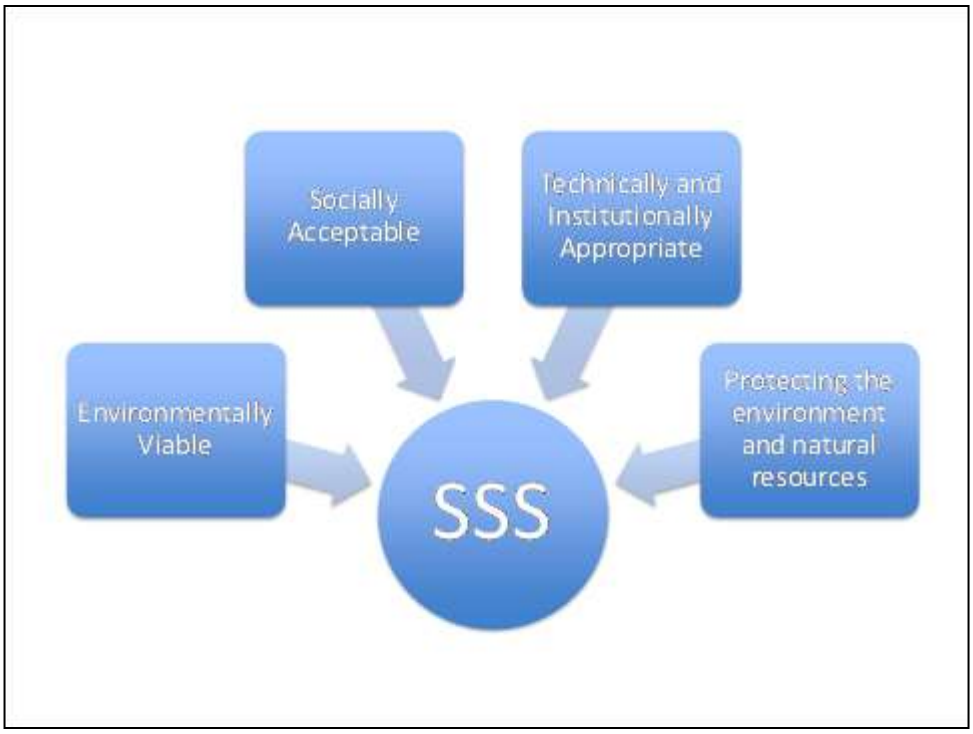
- Institutional and Legal Policy Leverage
  - ✓Establishing a coordinating mechanism to address water and sanitation questions
  - ✓Raising awareness and improving understanding of benefits of water supply and sanitation
  - ✓Establishing simple, independent and transparent regulatory environments

POLICY FOCUS AREAS for DEWATS



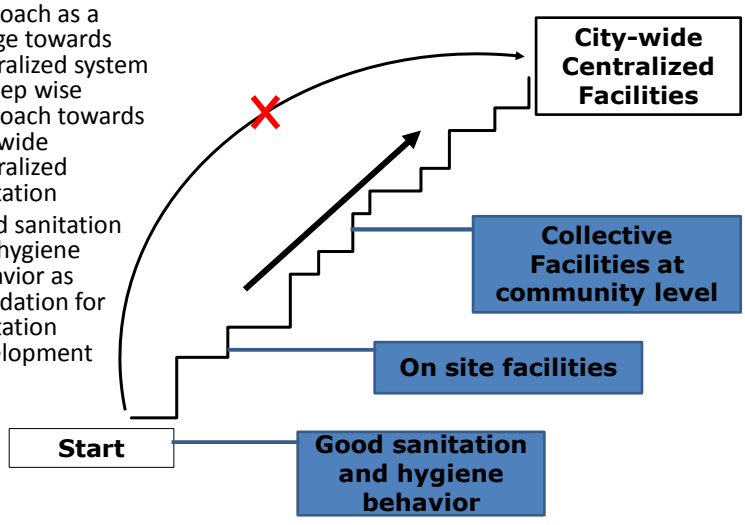


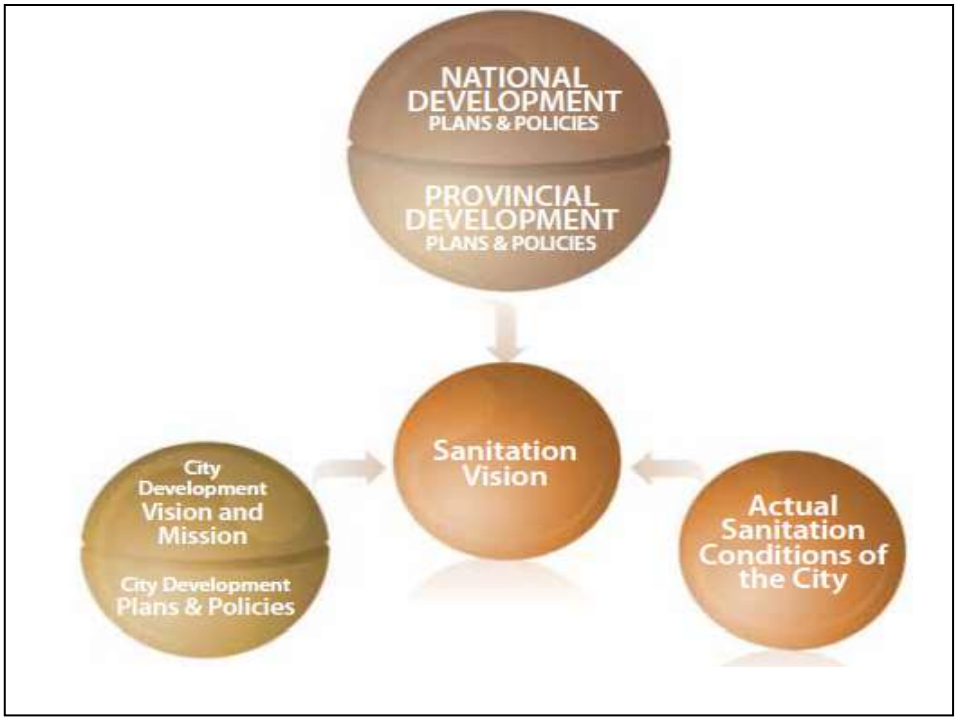
FOCUS AREA 1:
VISION AND SET UP TARGETS

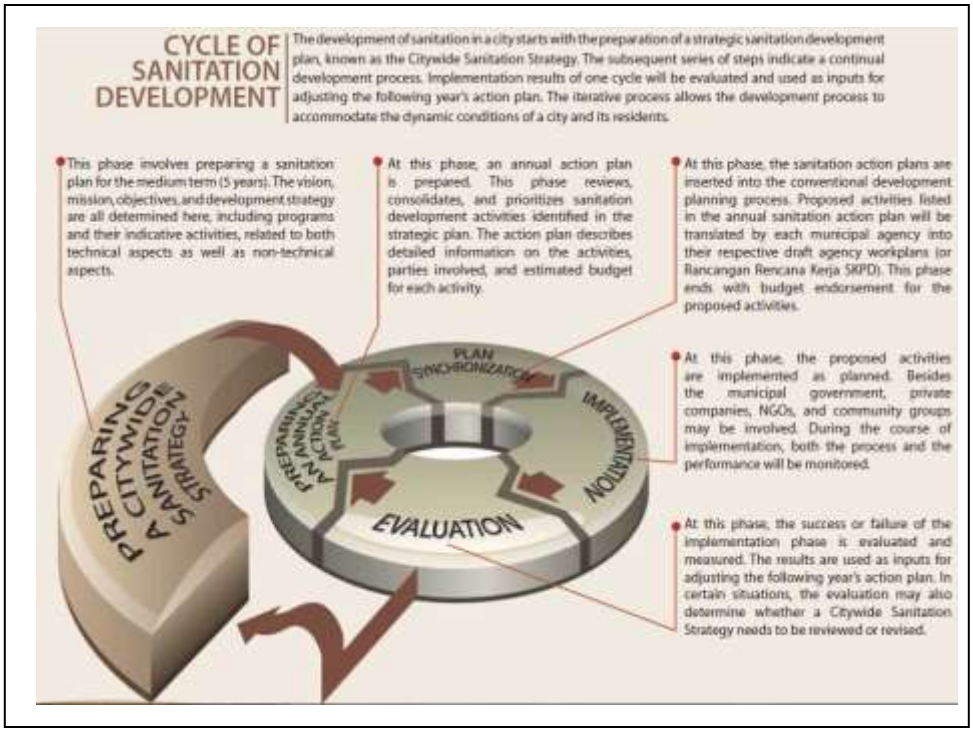


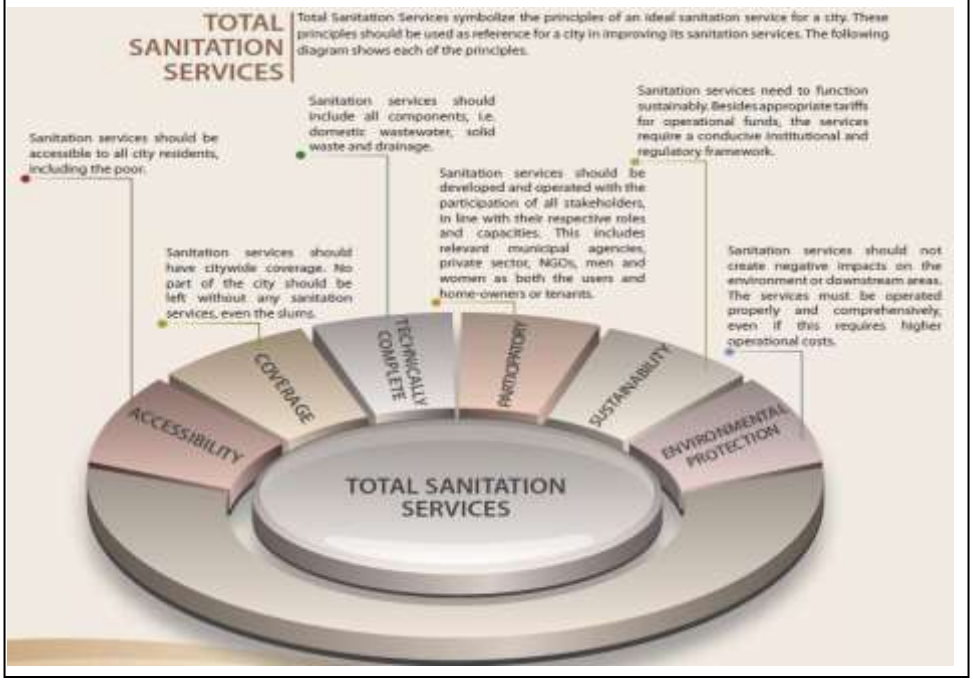
Sanitation Ladder

- Decentralized approach as a bridge towards centralized system → step wise approach towards city-wide centralized sanitation
- Good sanitation and hygiene behavior as foundation for sanitation development




NATIONAL DEVELOPMENT PLANS & POLICIES
PROVINCIAL DEVELOPMENT PLANS & POLICIES
Sanitation Vision
City Development Vision and Mission
City Development Plans & Policies
Actual Sanitation Conditions of the City


CYCLE OF SANITATION DEVELOPMENT
The development of sanitation in a city starts with the preparation of a strategic sanitation development plan, known as the Citywide Sanitation Strategy. The subsequent series of steps indicate a continual development process. Implementation results of one cycle will be evaluated and used as inputs for adjusting the following year's action plan. The iterative process allows the development process to accommodate the dynamic conditions of a city and its residents.
This phase involves preparing a sanitation plan for the medium term (5 years). The vision, mission, objectives, and development strategy are all determined here, including programs and their indicative activities, related to both technical aspects as well as non-technical aspects.
At this phase, an annual action plan is prepared. This phase reviews, consolidates, and prioritizes sanitation development activities identified in the strategic plan. The action plan describes detailed information on the activities, parties involved, and estimated budget for each activity.
At this phase, the sanitation action plans are inserted into the conventional development planning process. Proposed activities listed in the annual sanitation action plan will be translated by each municipal agency into their respective draft agency workplans (or Rancangan Rencana Kerja SKPD). This phase ends with budget endorsement for the proposed activities.
PREPARING A CITYWIDE SANITATION STRATEGY
PREPARING ANNUAL ACTION PLAN
PLAN SYNCHRONIZATION
IMPLEMENTATION
EVALUATION
At this phase, the proposed activities are implemented as planned. Besides the municipal government, private companies, NGOs, and community groups may be involved. During the course of implementation, both the process and the performance will be monitored.
At this phase, the success or failure of the implementation phase is evaluated and measured. The results are used as inputs for adjusting the following year's action plan. In certain situations, the evaluation may also determine whether a Citywide Sanitation Strategy needs to be reviewed or revised.



FOCUS AREA 2:
ASSESS SANITATION STRATEGIES AND SOCIO-ECONOMIC IMPACTS OF DEWATS

Assessments

- Quantitative assessment
- Cost-efficiency and cost-effectiveness
- Cost-benefit analysis
- Environmental benefit assessments
- Assessment of economic incentives and cost recovery
  - Fee and tariff-based measures, subsidies
  - Economic instruments: ww tariffs, pollution charges ("polluter pays")
  - Cost recovery
  - Discharge permits

FOCUS AREA 3
ANALYSE INSTITUTIONS AND PARTNERS

UNITED NATIONS ESCAP

The Way Forward

- Institutional and Legal Policy Leverage
  - ✓Establishing a coordinating mechanism to address water and sanitation questions
  - ✓Raising awareness and improving understanding of benefits of water supply and sanitation
  - ✓Establishing simple, independent and transparent regulatory environments

FOCUS AREA 4
ANALYSE COSTS AND BENEFITS

Benefits of DEWATS

Economic **Social** **Environmental**

Photo credit: BORDA

28

FOCUS AREA 5
ANALYSE DEWATS STRATEGIC FUTURE

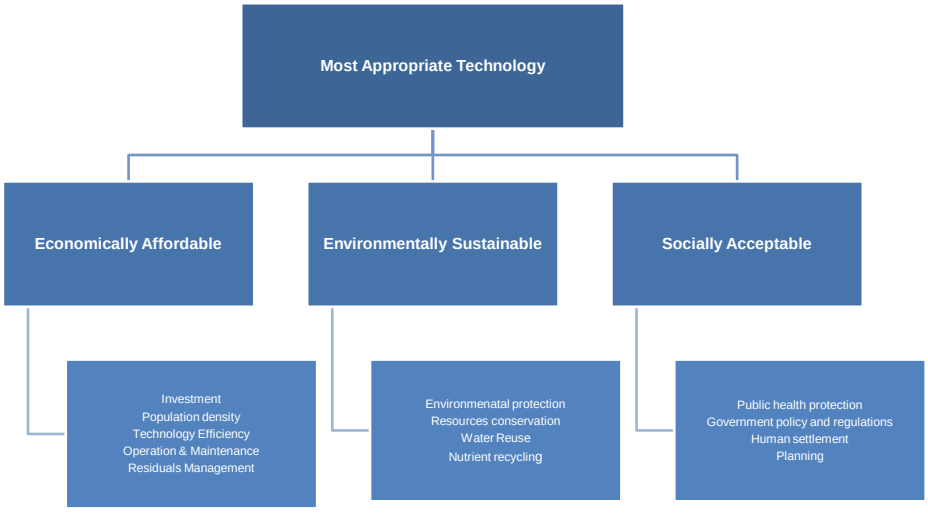
Assess Strategic Future of DEWATS

1. Sanitation mapping
2. Scenarios for DEWATS
3. Cost benefit of scenarios
4. Stakeholder consultation of scenarios
5. Setting prices for wastewater services

Price Aspects:

- Affordability
- Fairness and equity
- Transparency and feasibility
- Political acceptability
- Designing and enforcing of cost-recovery
- Subsides
- Revenues from water tariffs..

FOCUS AREA 6
CHOOSE THE TECHNOLOGY SYSTEM



- Ref case studies and examples within Presentation on 5P for 3S examples

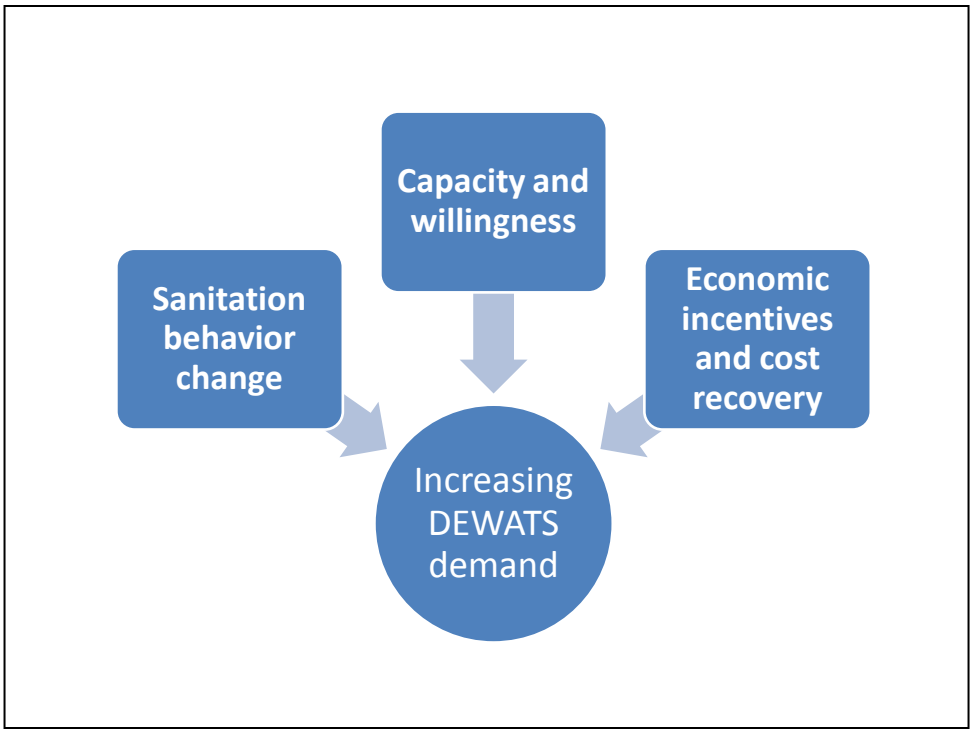
- Biogas in Cambodia:

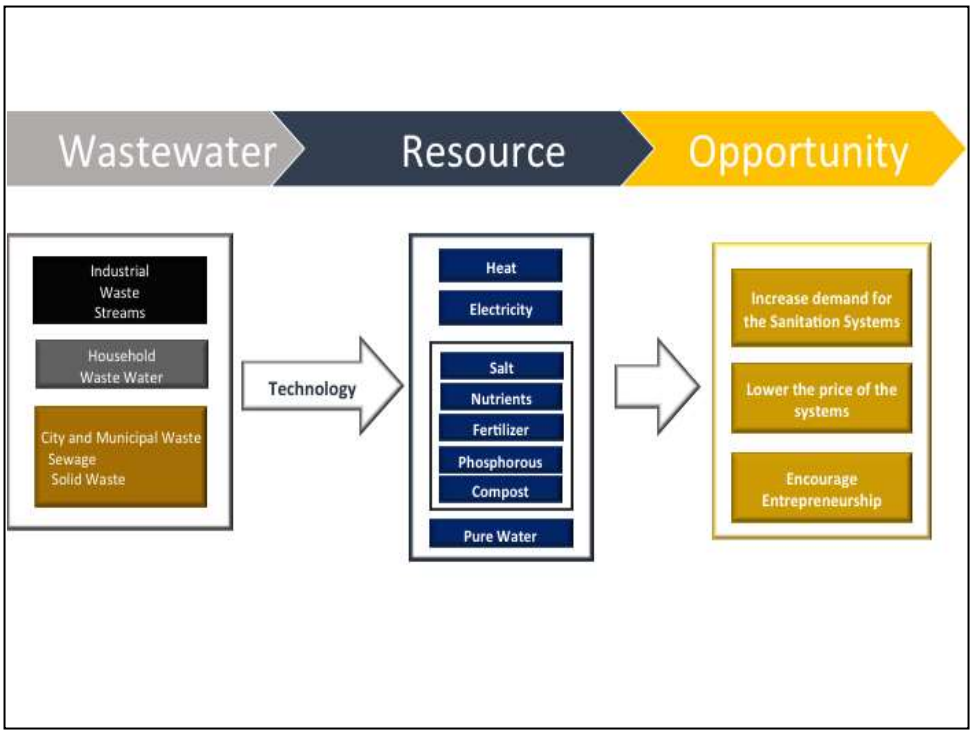
https://www.youtube.com/watch?v=ZKdruWBlHck&feature=youtu.be

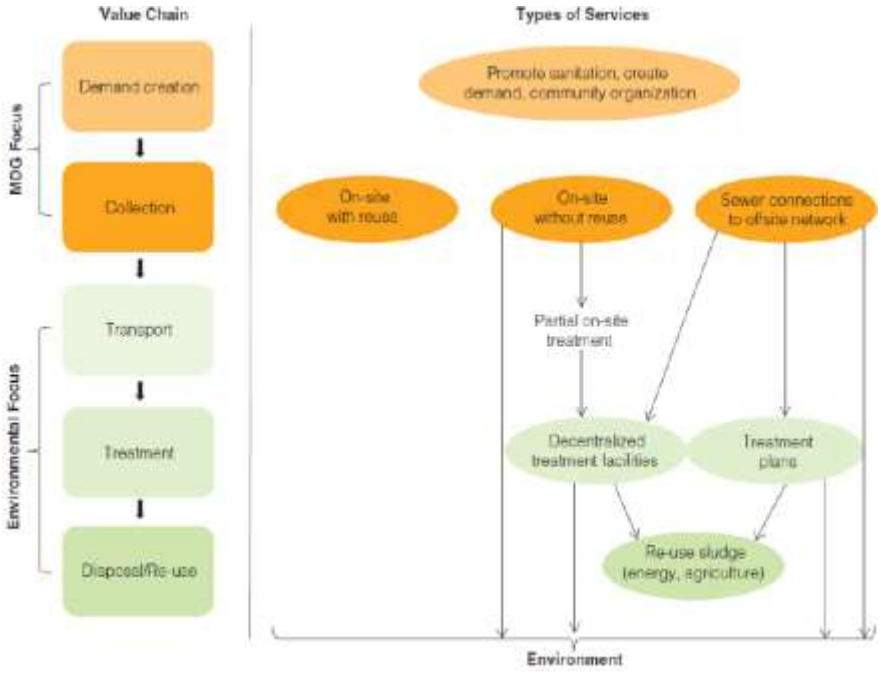
- Phosphorus

http://vimeo.com/13365354

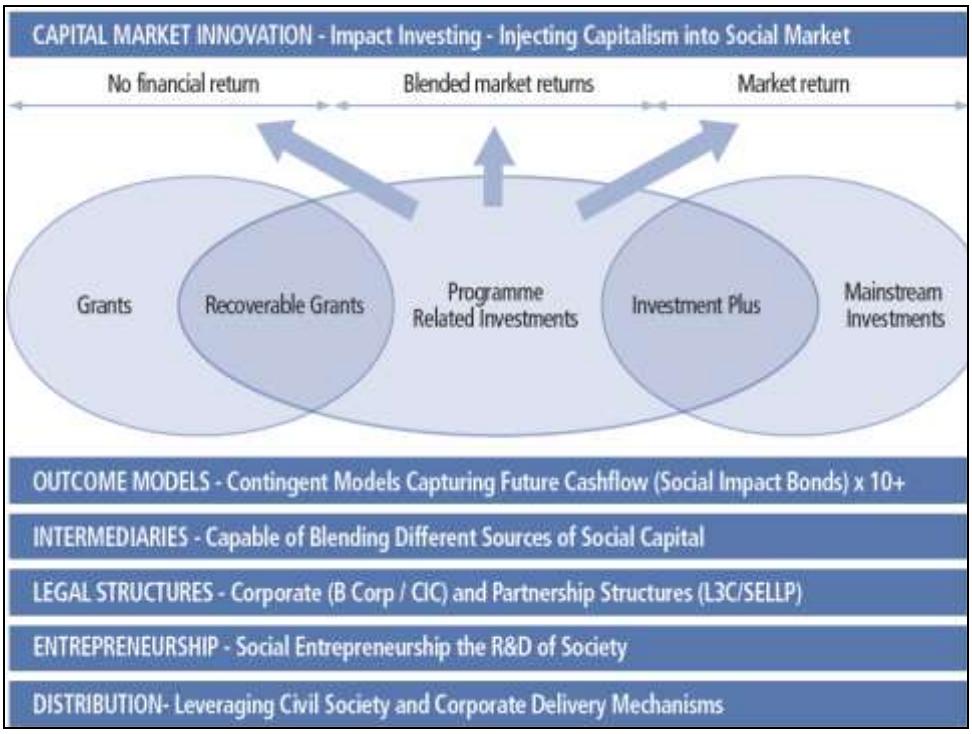
FOCUS AREA 7
KEEP INCREASING DEMAND FOR DEWATS

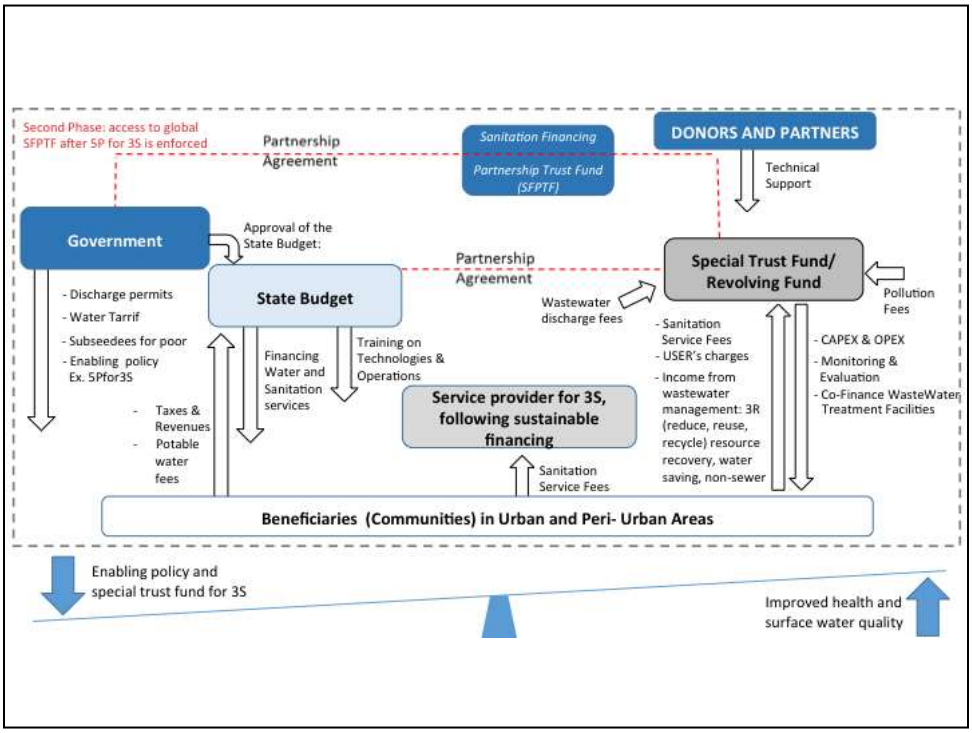

Capacity and willingness
Sanitation behavior change
Economic incentives and cost recovery
Increasing DEWATS demand


Wastewater
Resource
Opportunity
Industrial Waste Streams
Household Waste Water
City and Municipal Waste
Sewage
Solid Waste
Technology
Heat
Electricity
Salt
Nutrients
Fertilizer
Phosphorous
Compost
Pure Water
Increase demand for the Sanitation Systems
Lower the price of the systems
Encourage Entrepreneurship



FOCUS AREA 8:
ENSURE FINANCIAL AND INVESTMENT CLIMATE FROM GOVERNMENT, DONORS AND ENTREPRENEURS


CAPITAL MARKET INNOVATION - Impact Investing - Injecting Capitalism into Social Market
No financial return
Blended market returns
Market return
Grants
Recoverable Grants
Programme Related Investments
Investment Plus
Mainstream Investments
OUTCOME MODELS - Contingent Models Capturing Future Cashflow (Social Impact Bonds) x 10+
INTERMEDIARIES - Capable of Blending Different Sources of Social Capital
LEGAL STRUCTURES - Corporate (B Corp / CIC) and Partnership Structures (L3C/SELLP)
ENTREPRENEURSHIP - Social Entrepreneurship the R&D of Society
DISTRIBUTION- Leveraging Civil Society and Corporate Delivery Mechanisms


Second Phase: access to global SFPTF after SP for 3S is enforced
Partnership Agreement
Sanitation Financing Partnership Trust Fund (SFPTF)
DONORS AND PARTNERS
Technical Support
Government
Approval of the State Budget:
Partnership Agreement
Special Trust Fund/ Revolving Fund
Pollution Fees
- Discharge permits
- Water Tarrif
- Subseedees for poor
- Enabling policy Ex. 5Pfor3S
State Budget
Wastewater discharge fees
- Sanitation Service Fees
- USER's charges
- Income from wastewater management: 3R (reduce, reuse, recycle) resource recovery, water saving, non-sewer
- CAPEX & OPEX
- Monitoring & Evaluation
- Co-Finance WasteWater Treatment Facilities
Financing Water and Sanitation services
Training on Technologies & Operations
- Taxes & Revenues
- Potable water fees
Service provider for 3S, following sustainable financing
Sanitation Service Fees
Beneficiaries (Communities) in Urban and Peri- Urban Areas
Enabling policy and special trust fund for 3S
Improved health and surface water quality

What are the New Ways of Financing Sanitation?

A Paradigm Shift:

- Development of Financing for Tangible Results
- Move to Outcome Models
- Impact Investment

1. Release supply-side constraints
   - Encourage scale to reduce unit costs
   - Loan Financing to bring in players
   - Enable Partnerships & Collaboration
2. Cause social movements
3. Capture externalities
3. Incentivise economic scale
5. Distribute the benefits: equity focus

The Way Forward For Policy Makers (ctd.)

Financial Leverage

- ✓Explore innovative strategies to attract investments from the private sector, governments and donors
- ✓Leverage the potential contributions from households themselves

FOCUS AREA 9:
ENSURE SUSTAINABILITY OF DEWATS

Sustainability Elements

- Financial: continuity of DEWATS products and services through local financing (free from foreign funds)
- **I**nstitutional: sustained and functional local DEWATS systems with capable institutions, policies and procedures
- **E**nvironmental: sustainable management of water and waste flows that is considerate of the natural environment and climate and can be recycled and reused.
- **T**echnical: operation & maintenance of hardware, by local people, that preserves not depletes (natural) resources
- **S**ocial sustainability: demand-driven, inclusive (equity), gender equal, culturally sensitive and needs-based approach to WASH

FOCUS AREA 10:
EVALUATE DEWATS IMPLEMENTATION

Evaluate DEWATS

- Effectiveness of planning processes
- Assess progress in development
- Assess benefits of sanitation development

Ex: number of household connected to local sewer, on-time payment of tariffs/fees, timely and efficient desludging of septic tanks, O&M of other DEWATS components, how often services is interrupted

Ex: National performance measurement framework and International benchmarking network

The Way Forward

- Learning from the past DEWATS experiences and assessing ways to bring DEWATS at scale;
- Ensuring sustainability of service delivery through Pro-Poor Public-Private Partnerships for Sustainable Sanitation Services (5 P for 3 S), resource recovery and enabling a sanitation value chain with capacity building of supply chain interveners
- Creating demand, including from the poor, for sustainable sanitation services facilitating integration of DEWATS to centralized systems
- Strengthening the capacities of all interveners and creating a regional platform for dialogue, knowledge management and innovation among the three countries
- Enhancing innovative financing and financial viability of sanitation facilities by improving affordability, by smoothing and subsidizing sanitation expenditures, by using OBA, outcome-based financing models and other financing mechanisms (microcredit, revolving funds…)
- Enhancing regional cooperation among policy makers and experts on decentralised sanitation solutions through a Regional Resource Centre

Annex 7: Presentation on enabling policy analysis on DEWATS and faecal sludge management in three countries, good business models from the region

Effective Policy Analysis on DEWATS and FSM in Three Countries, Good Business Models from the Region

Dr.Thammarat Koottatep
Dr.Suthirat Kittipongvises

Sustainable Decentralized Wastewater Management in Developing Countries

Asian Institute of Technology, Thailand

A project granted under "Reinventing the Toilet" Program of the Bill & Melinda Gates Foundation during 2011 - 2016


Reinvent the toilet for whom?
At what cost?
October 18, 2014
© 2010 Bill & Melinda Gates Foundation


Reinventing the Toilet –
Innovations can save billions of lives
by turning human waste into…
Pure Water
Safe Fertilizer
Electri city
Heat
Fuel
NaCl
Salt

Concepts

N — Novel Approach

U — Advanced Knowledge

T — Technology Innovation

S — Sustainable Access

Catalyzing market through innovations & innovative business model

Products commercialization

5

Market-driven Research

PHASE I
Creating a platform for innovation
1. Idea Generation
2. Idea Screening
3. Concept Development & Testing

PHASE II
Designing and developing lead options for commercialization
4. Marketing Strategy Development
5. Business Analysis
6. Product Development

PHASE III
Catalyzing commercialization of lead options
7. Market Testing
8. Commercialization

Novel Approach

Presentation Contents
"Regulatory Framework for DEWAT/FSM in Developing Countries"

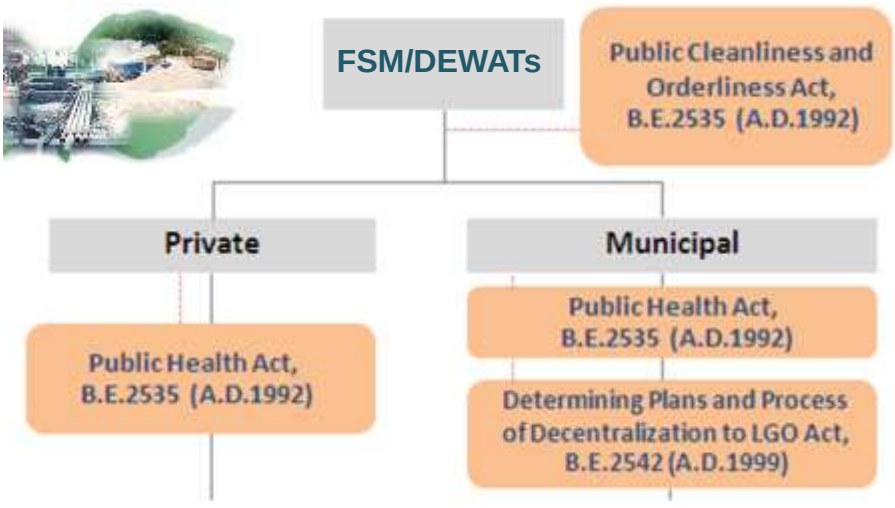
- **Regulatory Framework**
- **Policy synthesis**
  - Thailand
  - Vietnam
  - Cambodia

- **Good Business Models from the region**

THAILAND

9

Government of Thailand's regulatory framework for DEWAT and FSM



10

Government of Thailand's regulatory framework for DEWAT and FSM

Treatment Plant

Public Health Act, B.E.2535 (A.D.1992)

Management

Determining Plans and Process of Decentralization to LGO Act, B.E.2542 (A.D.1999)

Transportation

Public Health Act, B.E.2535 (A.D.1992)

Ministerial regulation on the prescribing rate of fee for fecal sludge collection and transportation , B.E.2545 (A.D.2002)

11

Government of Thailand's regulatory framework for DEWAT and FSM

Political Context

Key Ministries

Ministry of Natural Resources and Environment

Ministry of Public Heath

Key Schemes

ONEP: Drafting and implementing regulations on environmental quality and sewage
PCD: Water standard setting
DEQP: Raising public awareness of water and sanitation issues

Bureau of Environmental Health: Establishing technical guidelines and developing manual on integrated septage management

Health Law Administration Group: Enhancing law enforcement

Other relevant federal departments

Ministry of Interior

Community wastewater management indicated by the Building Controlled Act (e.g. construction of sewerage system and community wastewater treatment plant)

Local authorities

Setting regulations on septage collection, transport and treatment, and providing septic tank emptying services

Multilaterals involved in sanitation in Thailand

TDRI · TEI · ERTC · AIT Asian Institute of Technology

Government of Thailand's regulatory framework for DEWAT and FSM

Political Context

Enhancement and Conservation of National Quality Act, 1992 (B.E.2535)	- Setting up the Office of the National Environmental Board (NEB) in charge of overall environmental management issues - Determining environmental quality standards for water, SW
Public Health Act, 1992 (B.E. 2535)	- Establishing criteria for controlling public nuisance cause by the disposal of sewage, solid waste, and water drainage - **Developing the "Manual on Integrated Septage Management"** - **Determining the fee for collection, transportation, and disposal of sewage and solid waste**
Building Control Act, 1979 (B.E. 2535)	- Construction of **community WWTP** according to Act
Public Cleanliness and Orderliness Act, 1992 (B.E. 2535)	- Prohibiting any activities that is likely to cause dirtiness to public places and forbidding the dumping of sewage into the waterways.
Public Toilet Development Master Plan, 2013-2016 (B.E. 2556-2559)	- 90% of Thai households to have seated toilet by 2016 - 10% of targeted public places providing at least 1 seated toilet by 2016 - **90% of Thai households having hygienic, sufficient and safe public toilets by 2016** - 90% of Thai residents having sanitary toileting behavior by 2016; and 50% of LGOs having sanitary waste disposal by 2016

VIETNAM

14

Political Context

Government of Vietnam's regulatory framework for DEWAT and FSM

Key Ministries	**Ministry of Natural Resources and Environment**	**Ministry of Public Heath**	**Ministry of Construction**
Key Schemes	Implementation of environmental protection legislation (e.g. water resources, natural resources, etc.)	- Establishing the standards on water quality and sanitation - Developing the guideline and national code on the design and construction of septic tanks	- Implementing policies on the construction of wastewater and sanitation system in the country - Updating design standards for septic tank
Other relevant federal departments	**Ministry of Planning and Investment (MPI) and Ministry of Finance (MOF)**	Arranging financing for sanitation programs approved by government	
	Provincial People's Committee	Directing and inspecting the implementation of environmental regulation of their locality (e.g. water supply, drainage, and sanitation)	
Multilaterals involved in sanitation in Vietnam	URENCO, Hanoi University of Civil Engineering (HUCE), ADB, WORLD BANK		

Political Context

Government of Vietnam's regulatory framework for DEWAT and FSM

Law on Protection of the Environment: No.52-2005QH11	- Establishing national environmental standards - Developing plan to address environmental pollution derived from the process of improving, upgrading new wastewater collection and treatment system
No.88/2007: Urban and Industrial Wastewater **No.59/2007: SWM**	- Providing waste management rights and obligations of entities engaged in solid waste management activities - **In terms of FSM , Decree 88 introduces an external user fee for wastewater treatment**
Orientation for the development of urban sewerage and drainage, 1999	**Upgrading domestic sewerage system and cancellation of pit latrines** (Dry and bucket latrines should be eliminated from Hanoi by 2001 and from all cities in Vietnam by 2005). Orientation is required for 100% coverage of sewerage service in urban areas such as HCM, Hanoi
Strategic orientation for sustainable development (Vietnam agenda 21), 2004	Priority activities of sustainable utilization of water resources are: Promotion of WWT to reduce amount of emission and reuse WW - Raising up public's awareness about appropriate utilization and protection of water resources
Vietnamese Environmental Standards	- **Design standard for septic tank (TCXDVN51-1984)** - Surface water quality standard (TCVN 5942-1995) - General requirements for the use of wastewater and their sludge for watering and fertilizing purpose (TCVN 5298-1995)

CAMBODIA

17

Government of Cambodia's regulatory Framework for DEWAT and FSM

Political Context

Key Ministries	**Ministry of Environment**	**Ministry of Health**	**Ministry of Rural Development**	**Ministry of Pubic Work and Transport**
Key Schemes	-Environmental planning ; monitoring of effluent discharged to waterways / water drains	- Setting the -national standards for water supply and water drinking	-Planning and management of water supply and sanitation in rural areas	- Developing scientific national policy concerning all public work construction - Managing for urban drainage (i.e. sewerage) system
Other relevant federal departments	**Ministry of Finance**	Allocating budgets to the water supply and sanitation sectors		
	Ministry of Industry, Mines and Energy	Managing urban water supply in all provincial town		
Multilaterals involved in sanitation in Cambodia	World Health Organization	unicef	ADB	WORLD BANK

Government of Cambodia's regulatory framework for DEWAT and FSM

Law on Environmental Protection and Natural Resources Management, 1996	Implementing regulations on environmental quality according to the following schemes: - Sub-decree on water pollution control - Sub-decree on solid waste management - Sub-decree on EIA process
Water and sanitation law of the Kingdom of Cambodia, 2003	This law is intended to organize the provision of clean water and sanitation services with the purpose of improving people's living standard. It mainly consists of 3 parts: **Urban water supply, Urban Sanitation, and Rural water supply and sanitation.** - Wastewater are supposed to be discharging into either a decentralized treatment facility or into public sewerage
National Water Resource Policy, 2004	This policy aims to i) manage, protect, and use water resources with effective, equitable and sustainable manner. ii) To develop the national strategy and policy towards water resource management iii) To direct stakeholders for developing, managing and utilizing water resources

19

POLICY SYNTHESIS

20

POLICY SYNTHESIS: THAILAND

Lack of clarity communication between LGOs and community related to DEWAT and FSM	FSM is a low priority for both national and LGOs	No certified enforcement agency for DEWAT and FSM
Low level of awareness and understanding of connection between water quality and health impacts	Some goals of sanitation policy remain somewhat unclear i.e. sanitary toileting behavior	

21

POLICY SYNTHESIS: VIETNAM

National authority has not mandated or policy guidance on septage management	Many institutional organizations overlap their responsibilities i.e. MoNRE, MOC	No certified enforcement agency for DEWAT and FSM
Vietnam's laws specify only the design, construction, operation of septic tanks but do not regulate laws governing collection and treatment of septage	Budgets are not sufficient enough to cover the running expenses for DEWATs/FSM in rural area	Septic tanks are normally not designed due to lack of law enforcement by LGOs 

POLICY SYNTHESIS: CAMBODIA

Sanitation issue is largely ignored in Cambodia

No laws, regulations, standards on design/construction/placement of latrines and septic tanks

Many institutional organizations overlap their responsibilities i.e. MOE, MOH, MRD

No certified enforcement agency for DEWAT and FSM

There is a lack of support from both central and local governments

O&M is mainly a household responsibility carried out by individuals or by private

Budgets are not sufficient enough to cover the running expenses for DEWATs/FSM

Septic tanks are normally not designed due to lack of law enforcement by LGOs

23

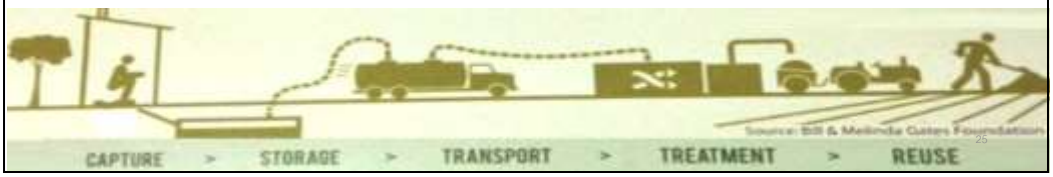
Key challenges of regulatory implementation and practices in 3 case study countries

- Government's priorities
- Occurrence of overlapping organization
- Quality of the law enforcement
- Availability of budget funds
- Inefficiency and ineffectiveness in local government administration
- Lack of expert and skilled workers
- Lack of awareness and intention among lay people

Regional Policy WS on DEWATs in SEA,
UN-ESCAPE, Bangkok, March 2014

Common Barriers for sustainable sanitation services

- **Lack of vision, urban policy and planning**
- **Low citizen's demand**
- **Priority on sewage**
- **Fragmented public and private sector**
- **Not a priority in national budgeting**



Regional Policy WS on DEWATs in SEA,
UN-ESCAPE, Bangkok, March 2014

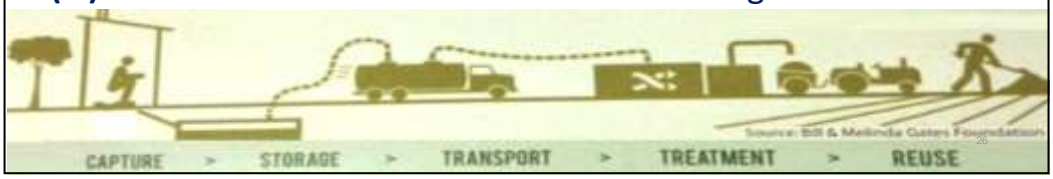
ADB's Concept of the WWM revolution

(i) **Knowledge Drive:** Sustainable environmental sanitation case studies

(ii) **Technology Drive:** Specific technology datasheets and its application

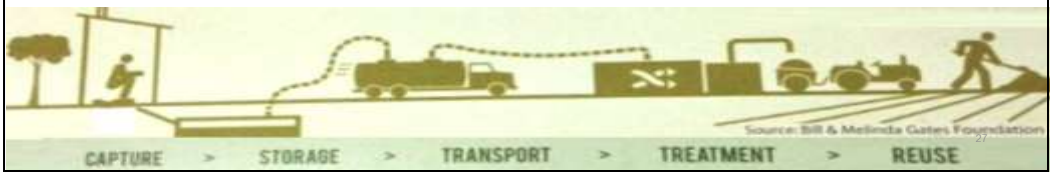
(iii) **Financing and incentive Drive:** Pro-feasibility studies with financing mechanisms to WWM investment projects

(iv) **Awareness Drive:** Stakeholders networking



Regional Policy WS on DEWATs in SEA,
UN-ESCAPE, Bangkok, March 2014

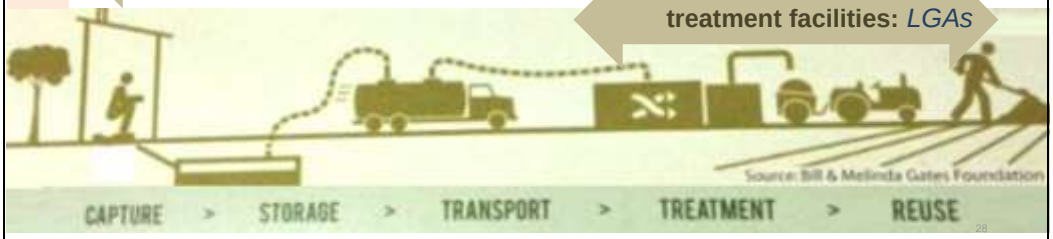
- Do our society need goals **beyond 2015**, especially on water and sanitation?
- How we can use **SDG (Sustainable Development Goal)** to access water and sanitation on-going practices
- How to set up **technical working group (TWG)** with regular meetings and then use it as a platform to get feedback from the other users



Recommendations

SHORT-TERM (≤1yr)

- **Develop national guidelines on DEWAT/FSM:** *MOPH*
- **Clarify the roles for national and local governments :** *MOPH + LGAs*
- **Increase enforcement of scheduled desludging and promote public-private partnership:** *LGAs and private sectors*
- **Provide regular training and exposure for policy makers and operator:** *MOPH + LGAs+Private+Academia*
- **Strengthen exiting manual on FSM:** *MOPH*
- **Rehabilitate existing treatment facilities:** *LGAs*



Recommendations

MEDIUM/LONG TERM (>5 yrs)

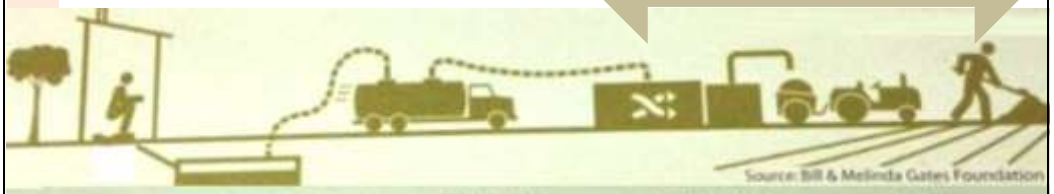
Integrate FSM /DEWAT into national environmental planning : *MOPH+MoNRE*

Create financing mechanisms: *MOPH + LGAs*

Creating and sustaining regional collaboration: *MOPH + LGAs+ Regional partners*

Research funding program/ Pilot projects for alternative technologies: *Academia*

Develop promotional campaigns/ promote public awareness: *Media*



29

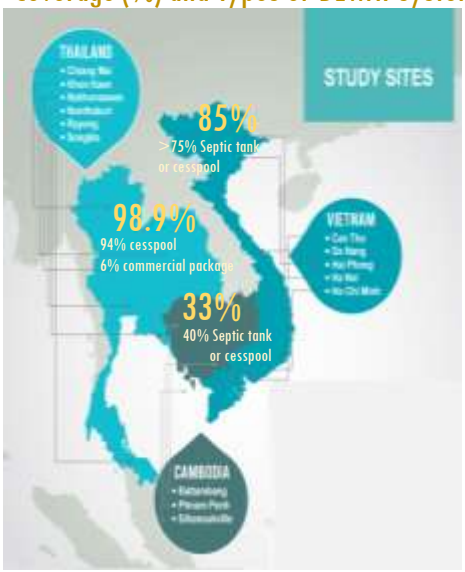
FSM Business Model

- Key features on FSM of Private and Local administrative organization models in Thailand
- How to develop Business model on FSM
- Case study of good practice

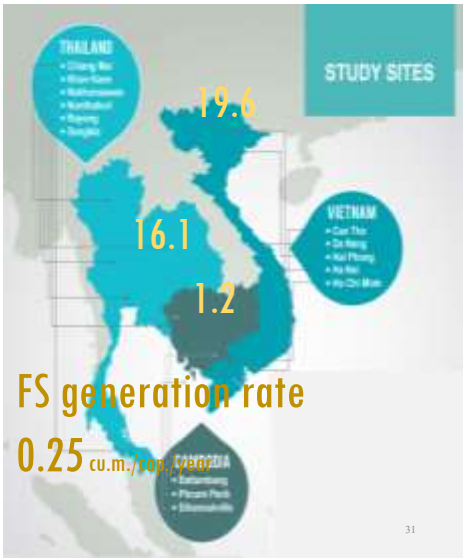
30

Existing FSM situations in Thailand, Vietnam and Cambodia

Coverage (%) and Types of DEWAT system



FS generation (million cu.m./year)



Steps of FSM service in Thailand

Collection and Transportation by FS vacuum truck

Composition
1. Faecal Sludge Tank
2. Tools Box
3. Petroleum Tank
4. Truck Engine
5. Discharge Pipe
6. Rubber Tube
7. Motor
8. Level Measure

Tanks is the vacuum

Routing is based on FS truck driver decision

FS truck driver will decide the route of the service base on job order information which includes name, address, contact information and amount of FS of requested households

The nearest location is usually served first

FS Treatment plant in Thailand

FS Treatment plant in Thailand

Example of Anaerobic digestion with sand drying bed and others equipment

35

FS Treatment fee in Thailand

Treatment fee condition	Price	Average price per m3
Per kilogram	0.35 Baht/kg (0.01 USD/kg)	350 Baht/m^3 (12 USD/m^3)
Per month	10000 Bath/month (333 USD/month)	23 Baht/m^3 (0.8 USD/m^3) *Based on PK case of 5149 m^3/year
	5000-6000 Baht/month (167-200 USD/month)	0.8-1.0 Baht/m^3 0.03 USD/m^3 *Based on Private Company in CM case of 5913 m^3/year
Per time	50 Baht/time (1.67USD /time)	8.33-16.67 Baht/m^3 (0.3-0.6 USD/m^3) *Based on 3-6 m^3/trip

36

Key features on FSM of Private and Local Administrative Organization (LAO) models

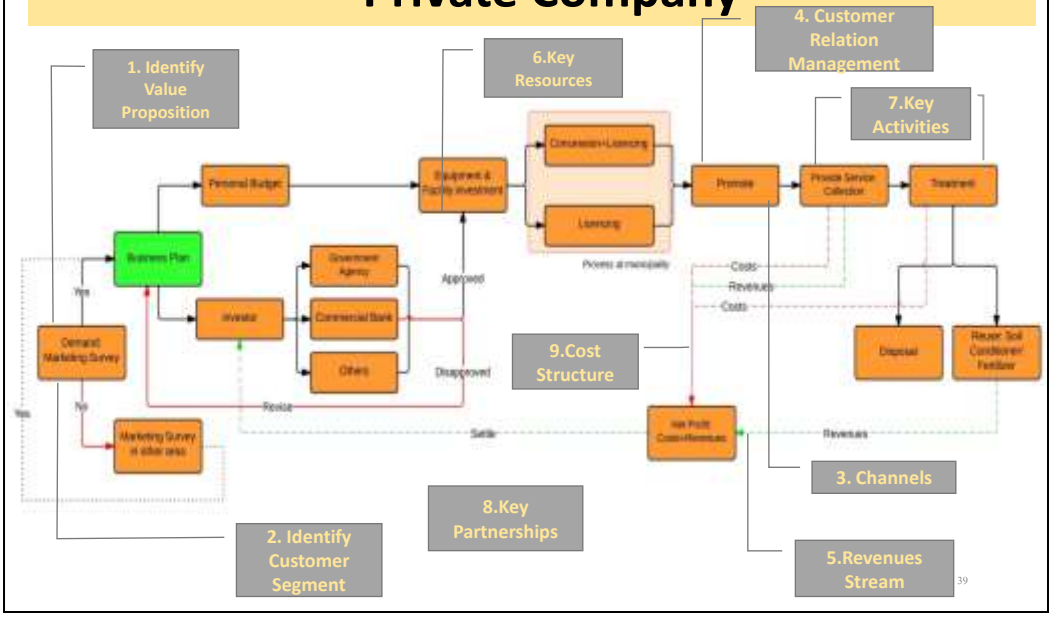
Factors	Types of service provider			
	Operated by LOAs	Licensed private company	Cooperate with other LAO/Organization (Cluster)	Outsource under control and supervision of LGO
Description	Municipality provides FS collection, transportation and operated the FS treatment plant by themselves.	Municipality allow the private company which can be a group of people or individual person to provide FS collection, transportation and operated the FS treatment plant with concession and licensing under control and supervision of municipality.	FSM is co-operation between municipalities and/or organization together. For example, FS treatment plant is located in a municipality where neighbor municipalities' collection truck can also discharge FS at the treatment plant.	The outsource is allowed by municipality to provided FS service under control and supervision of municipality without compensation payment.
Key Players	Municipality	- Municipality - Private company	-Municipality	- Municipality - Outsource
Financial support	Government Agency	- Personal Budget - Commercial Banks, NGOs	- Government Agency - Fund	Government Agency
Licenses	No (Own by municipality)	Yes	No (Own by municipality)	Yes
Service areas	One responded area	Several areas	Several areas	Several areas
Annual Remuneration	No	The private company have to pay annual remuneration to municipality.	Payment for FS treatment and disposal (Baht/trip, Baht/month, Baht/tons)	No
Goal/Attitude	Nonprofit organization	Profit organization and business sectors	Nonprofit organization Public Service	Nonprofit organization Public Service

37

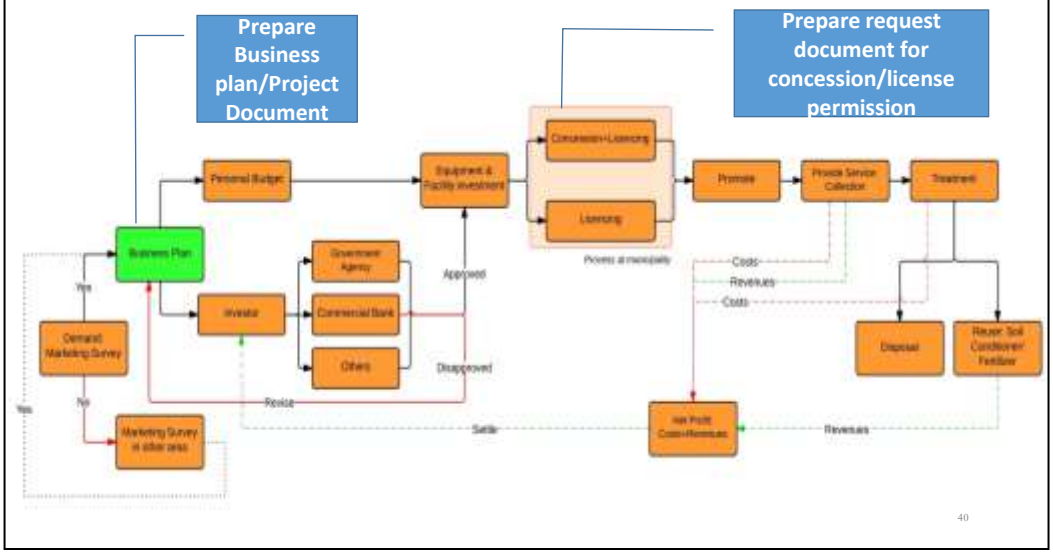
Factors	Types of service provider			
	Operated by LOAs	Licensed private company	Cooperate with other LAO/Organization (Cluster)	Outsource under control and supervision of LGO
Pros	-Organizations is reliable because they are government organization. - No focus on profit. - FS service is controlled by municipal law and regulations. - Reducing to step for requested the FS licensing.	- Benefit-sharing of private company and municipality. - Laws and regulation control by supervision of LGOs. - Can expand to new market because they can provide many area and operate the FS treatment plant that can make profit. - There are several financial sources.	-Organizations is reliable because they are government organization. - Reducing illegal dumping - Benefit both municipality and other organizations.	- Investment funds from authorized organization. - Reducing risk of investment because of low competition with other outsources. - Benefit both municipality and outsource.
Cons	- Limited service area to expand service and finding more customers - FSM budget is depended on the interests of mayor and management board which mostly focused on solid waste management (SWM) more than FSM. -The responsibility of FSM is involved in several division such as FS collection and transportation were controlled by public health and environmental division while FS treatment plant were operated by division of public work	- The concession or licensed duration re-new every 1-5 years, thus there is a risk to company for their investment. - Finding Investment funds/loan by themselves because lack of Investment funds from authorized organization. -Inadequate Investment budget for FS treatment plant investment for small company or individual person who operate the FSM which lead to illegal dumping. -The collection fee maybe higher than the regulations because lack of control from LGOs.	-It may be difficult on agreement between different municipalities due to unclear responsibility and profitability. -Inadequate FS treatment plant capacity because amount of FS collection are more than exiting FS treatment plant capacity. - Inappropriate FS treatment plant location can cause illegal dumping because the FS collection service provider may refuse to disposal there due to long transportation distance.	- Not fully control by supervision of LGO. - The outsource company may reduce cost of operation and management to increase profit. It may lead to the inefficient service.

38

How to start FSM Business? – Private Company



How to start FSM Business? – Private Company



How to: Access to Capital Financing

Commercial Bank

For what the money to spend to?

What are the details of your investment?

What is the information of your business?

Are there guarantees used as establishment?

Do you UNDERSTAND in such business or not?

Source: SME Bank, 2014

41

How to: Access to Capital Financing

Environmental Fund

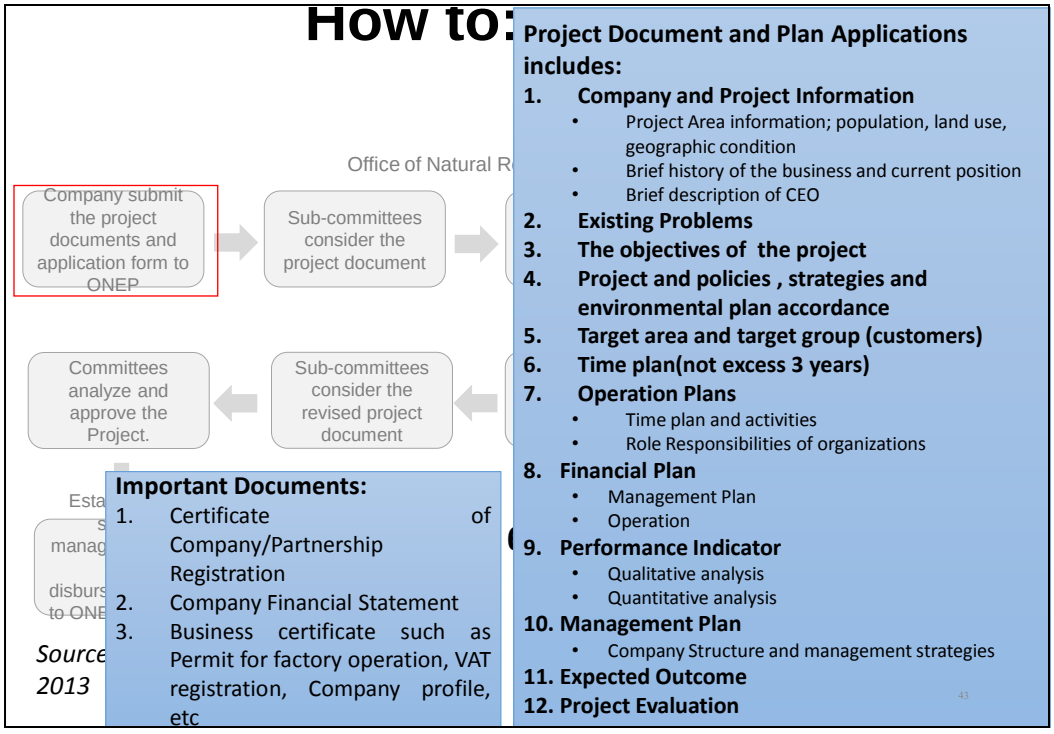
Office of Natural Resources and Environmental Policy and Planning (ONEP)

Environmental Fund is established according to "The Enhancement and Conservation of National Environmental and Quality Act, B.E. 2535 (A.D.1992)". It is a financial measure program to encourage government organizations and private enterprises to responsible for environment and natural resources in Thailand based on Polluter Pay Principle (PPP).

Approximately 60 Days

Source: ONEP, 2013

42


How to:
Office of Natural R
Company submit the project documents and application form to ONEP
Sub-committees consider the project document
Committees analyze and approve the Project.
Sub-committees consider the revised project document
Esta
manag
disburs
to ONE
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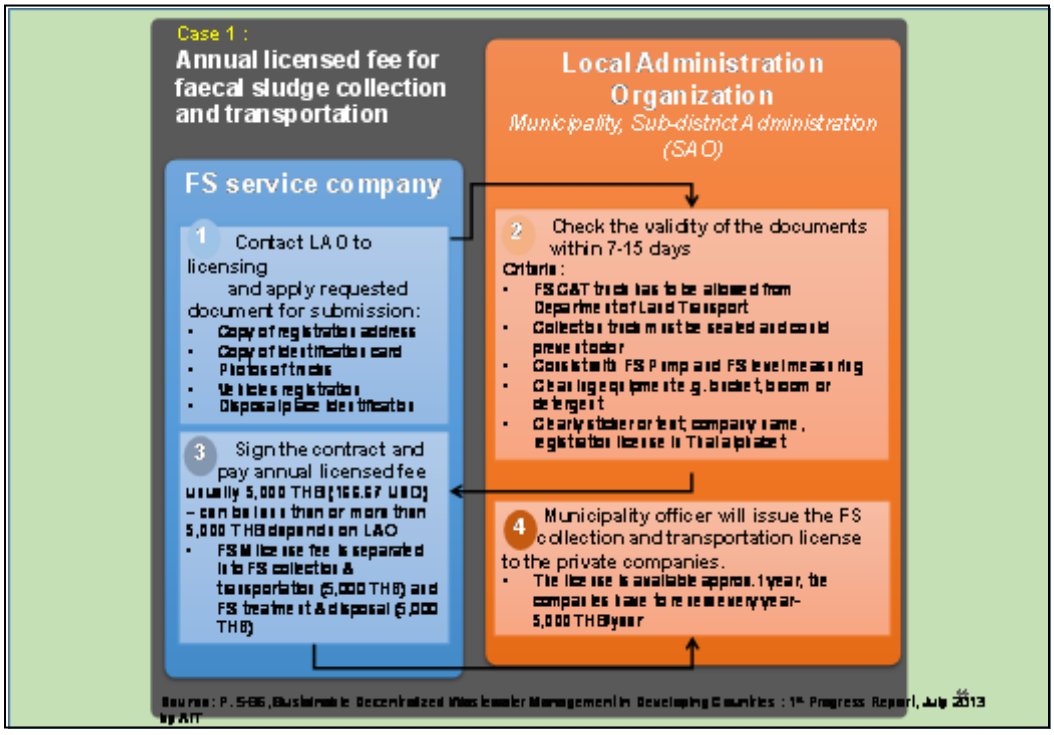
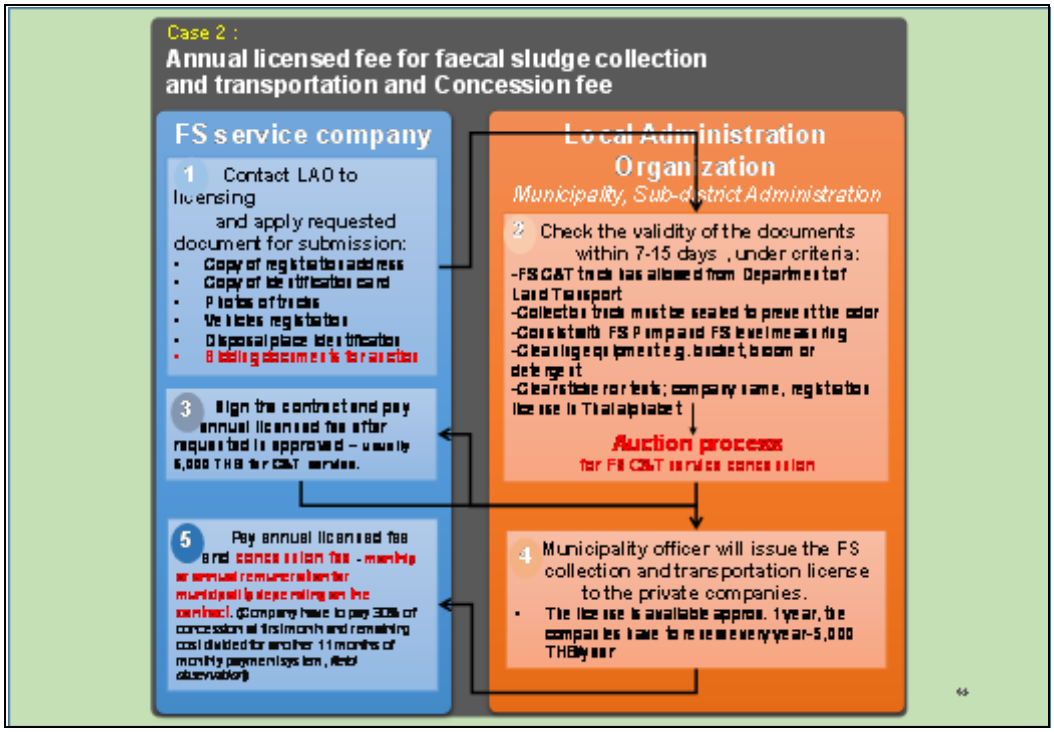
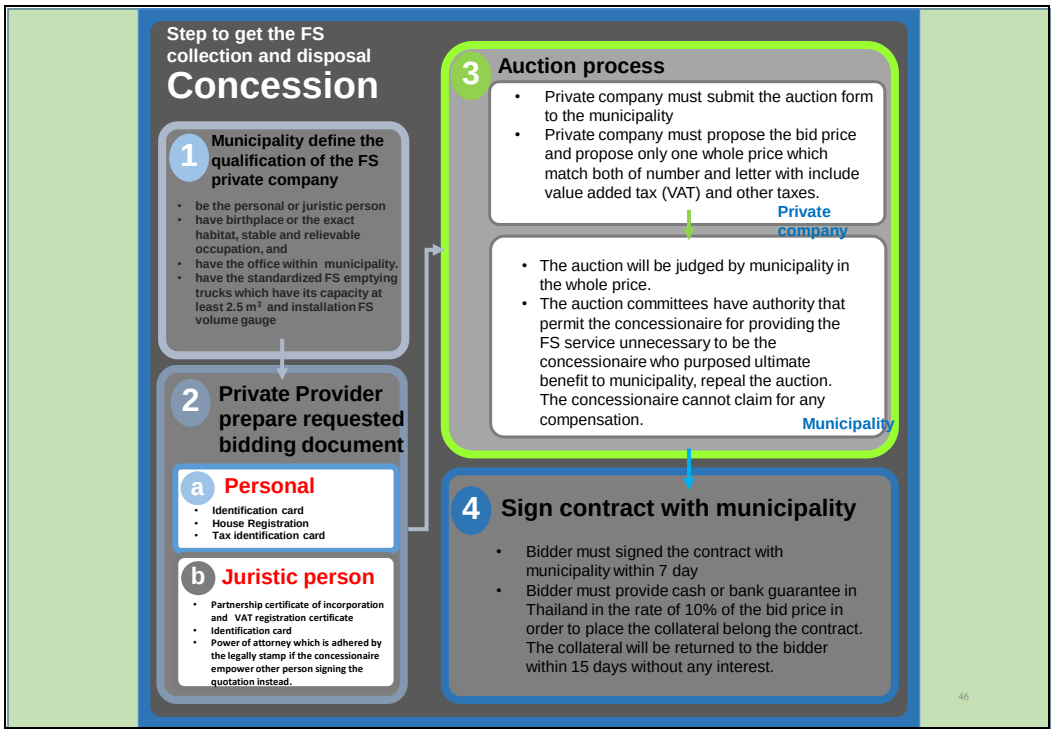
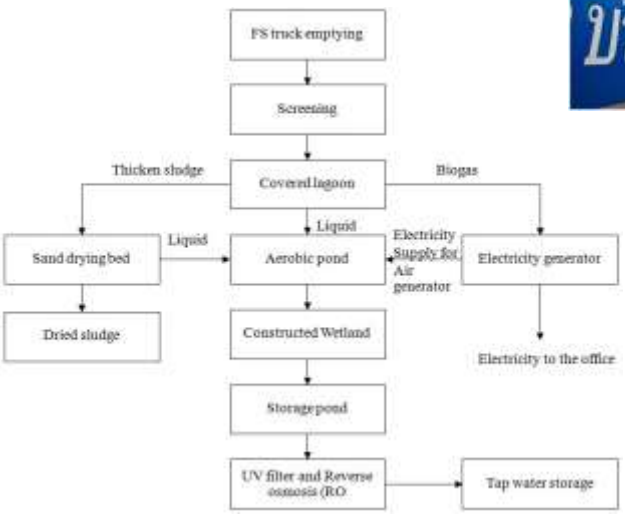
2013
Important Documents:
1. Certificate of Company/Partnership Registration
2. Company Financial Statement
3. Business certificate such as Permit for factory operation, VAT registration, Company profile, etc
Project Document and Plan Applications includes:
1. Company and Project Information
• Project Area information; population, land use, geographic condition
• Brief history of the business and current position
• Brief description of CEO
2. Existing Problems
3. The objectives of the project
4. Project and policies , strategies and environmental plan accordance
5. Target area and target group (customers)
6. Time plan(not excess 3 years)
7. Operation Plans
• Time plan and activities
• Role Responsibilities of organizations
8. Financial Plan
• Management Plan
• Operation
9. Performance Indicator
• Qualitative analysis
• Quantitative analysis
10. Management Plan
• Company Structure and management strategies
11. Expected Outcome
12. Project Evaluation


Case 1 :
Annual licensed fee for faecal sludge collection and transportation
Local Administration Organization
Municipality, Sub-district Administration (SAO)
FS service company
1 Contact LAO to licensing and apply requested document for submission:
2 Check the validity of the documents within 7-15 days
Criteria :
3 Sign the contract and pay annual licensed fee
4 Municipality officer will issue the FS collection and transportation license to the private companies.


Case 2 :
Annual licensed fee for faecal sludge collection and transportation and Concession fee
FS service company
1 Contact LAO to licensing and apply requested document for submission:
Local Administration Organization
Municipality, Sub-district Administration
2 Check the validity of the documents within 7-15 days , under criteria:
-FS C&T truck has allowed from Department of Land Transport
-Collection truck must be sealed to prevent the odor
-Consistent with FS Pump and FS level measuring
-Cleaning equipment e.g. bucket, broom or detergent
-Clear sticker on tank; company name, registration license in Thai alphabet
Auction process
for FS C&T service concession
3 Sign the contract and pay annual licensed fee after requested is approved – usually 5,000 THB for C&T service.
4 Municipality officer will issue the FS collection and transportation license to the private companies.
5 Pay annual licensed fee and concession fee - monthly or annual remuneration to municipality depending on the contract. (Company have to pay 30% of concession at first month and remaining cost divided for another 11 months of monthly payment system, field observation)


Step to get the FS collection and disposal
Concession
1 Municipality define the qualification of the FS private company
be the personal or juristic person
have birthplace or the exact habitat, stable and relievable occupation, and
have the office within municipality.
have the standardized FS emptying trucks which have its capacity at least 2.5 m3 and installation FS volume gauge
2 Private Provider prepare requested bidding document
a Personal
Identification card
House Registration
Tax identification card
b Juristic person
Partnership certificate of incorporation and VAT registration certificate
Identification card
Power of attorney which is adhered by the legally stamp if the concessionaire empower other person signing the quotation instead.
3 Auction process
Private company must submit the auction form to the municipality
Private company must propose the bid price and propose only one whole price which match both of number and letter with include value added tax (VAT) and other taxes.
Private company
The auction will be judged by municipality in the whole price.
The auction committees have authority that permit the concessionaire for providing the FS service unnecessary to be the concessionaire who purposed ultimate benefit to municipality, repeal the auction. The concessionaire cannot claim for any compensation.
Municipality
4 Sign contract with municipality
Bidder must signed the contract with municipality within 7 day
Bidder must provide cash or bank guarantee in Thailand in the rate of 10% of the bid price in order to place the collateral belong the contract. The collateral will be returned to the bidder within 15 days without any interest.

Case study of good practice in Thailand: Thongtawil Service Company, Rayong Thailand



47

Case study of good practice in Thailand: Thongtawil Service Company, Rayong Thailand

48

Case study of good practice in Thailand: Thongtawil Service Company, Rayong Thailand

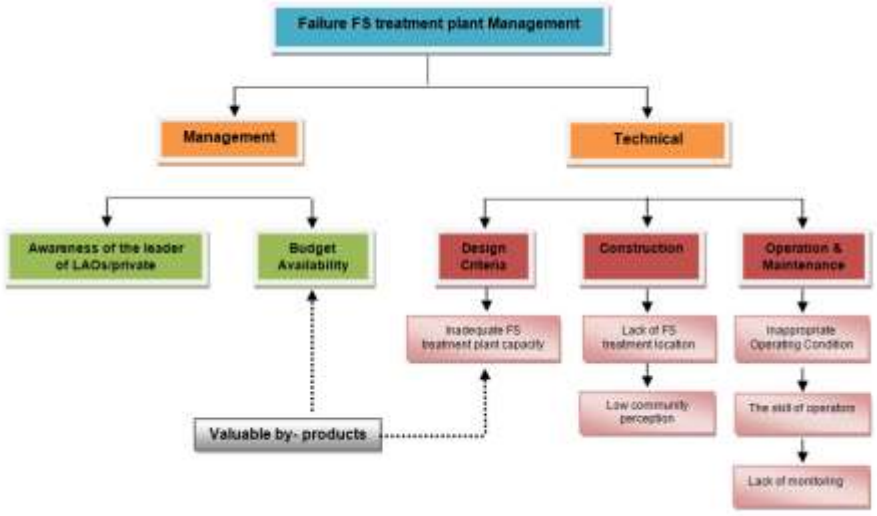
49

SWOT analysis

Four factors strongly affected to FSM

50

Failure of FSM



51

FSM strategies: Central Government Agency

Related to Policy, Law & Regulation, Knowledge & Budget support

FORWARD VERTICAL

- **Policy, Law and Regulation**
  - ✓ **Separate** the **standard of FSM** out of wastewater treatment.
    - **Clearly** standard of whole chain FSM activities e.g. DEWATs Effluent standard, FS treatment Effluent and efficiency.
    - Strict **penalties** to the illegal dumping.
  - ✓ External **monitored regularly** by central government agency.
- **Knowledge**
  - ✓ Meeting ,workshop and **providing the appropriate FSM practices** to the municipality.
  - ✓ **FSM data base** collection for the future planning and R&D of FSM practices e.g. no. of FS collecting service provider, no. FS vacuum truck.
- **Budget support**
  - ✓ Defining the appropriate **rate of fees** on both of FS collective & transportation and FS treatment &reuse service.
  - ✓ **Various of financial support sources** to FS service provider.

52

FSM strategies: Local Administrative Organization

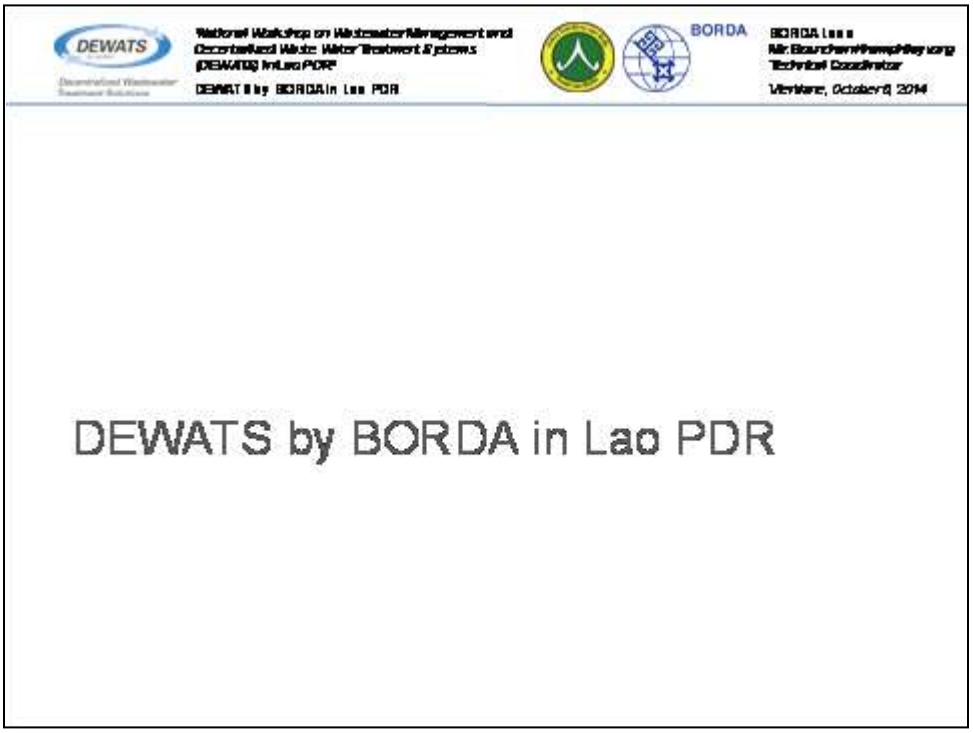
Related to Facilities, Operation and Management, Financial, Plan and Regulations , Knowledge

- **Facilities**
  - ✓ Studying the possibility of FS treatment plant construction or improving.
- **Operation and Management**
  - ✓ Clearly identify responsibilities of each unit.
  - ✓ FSM cluster operation among LAOs.
  - ✓ Monitoring illegal truck by co-operation with policeman.
  - ✓ Allow private sector to provide the service by give licensing.
- **Financial**
  - ✓ Seeking for the external fund for FSM service or allow private sector to operate.
- **LGO regulations**
  - ✓ clear plan of FSM and Future plan for growth of population to purpose the mayor.
- **Knowledge**
  - ✓ Rise up awareness to the public section.
  - ✓ Education and training the staff to improve the service efficiency.

HORIZONTAL INTEGRATION

53

Annex 8: Presentation on experience of DEWATS projects in Lao PDR by BORDA



Technical Assistance by BORDA

Technical Assistance by BORDA exceeds the trivial provision of hardware and includes the following services:

Planning:
- ✓ Participatory rapid appraisals,
- ✓ Need assessments survey,
- ✓ Feasibility studies

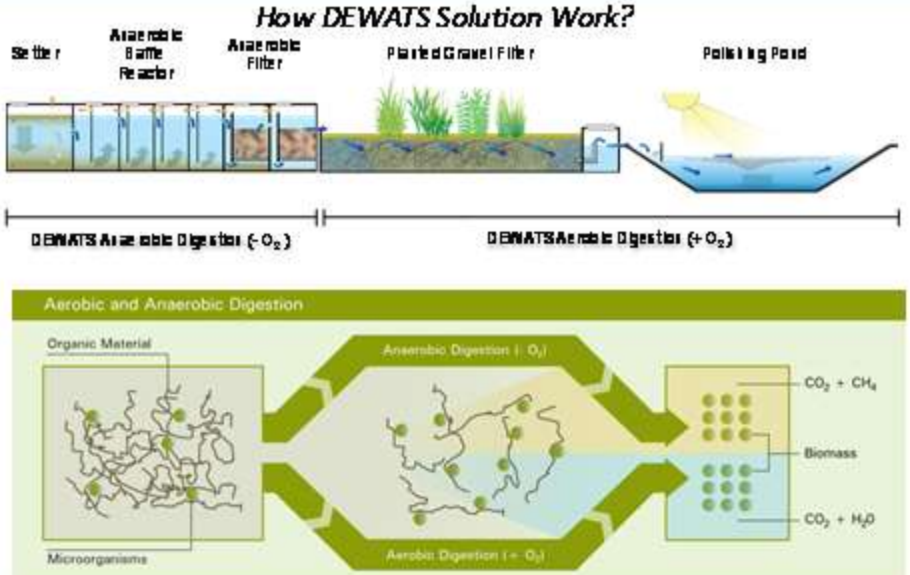
Implementation:
- ✓ Stakeholder meetings,
- ✓ Establishing action plans,
- ✓ Institution building,
- ✓ Construction and supervision

Promotion:
- ✓ Health and hygiene education,
- ✓ Operation and maintenance training,
- ✓ Awareness events

Follow up:
- ✓ Co-management for O&M
- ✓ Monitoring and evaluation,
- ✓ Health impact evaluation

DEWATS
Decentralized Wastewater Treatment Solutions
National Workshop on Wastewater Management and Decentralized Waste Water Treatment Systems (DEWATS) in Lao PDR
DEWATS by BORDA in Lao PDR
BORDA
BORDA Lao
[illegible]
Technical Coordinator
Vientiane, October 6, 2014

How DEWATS Solution Work?



National Workshop on Wastewater Management and Decentralized Waste Water Treatment Systems (DEWATS) in Lao PDR
DEWATS by BORDA in Lao PDR

BORDA Laos
Technical Coordinator
Vientiane, October 8, 2014

DEWATS Implementation

Community Based Sanitation (CBS)	1. Teacher house, Faculty of Engineering, NUoL (NuoL-LIRE&BORDA) 2. Thongkhankham village, Chanthabouly district, Vientiane (JICA-LIRE&BORDA) 3. Khoualouang Temple, Khoualouang village, Chanthabouly district, Vientiane (JICA-LIRE&BORDA) 4. Hintit village, Hinhuep district, Vientriane province (GIZ&DWR-BORDA&DHUP) 5. Pouxay village, Sanxay district, Attapue (Un-Habitat-NPSE Attapeu-BORDA) 6. Mixay village, Sanxay district, Attapue (Un-Habitat-NPSE Attapeu-BORDA)
School Based Sanitation (SBS)	1. Khoualouang Primary School, Chanthabouly district, Vientiane (JICA-LIRE&BORDA)
Real Estate Sanitation (ReSan)	1. Student dormitory, Northern Agriculture and Forestry college, Louangphabang (Helvitas-LIRE&BORDA) 2. Staff house and site office of THPC, Khammoan province (THPC-LIRE&BORDA) 3. National Academy of Politic and Public Administration, Thangon village, Saithany district, Vientiane (NAPPA-BORDA&DHUP) 4. Staff camp and site office of Laos Xe-Pian Xe-Namnoy Hydroelectric Power Plant (SKEC) (SKEC-BORDA)

National Workshop on Wastewater Management and Decentralized Waste Water Treatment Systems (DEWATS) in Lao PDR
DEWATS by BORDA in Lao PDR

BORDA Laos
Technical Coordinator
Vientiane, October 8, 2014

DEWATS by BORDA in Hintit Village

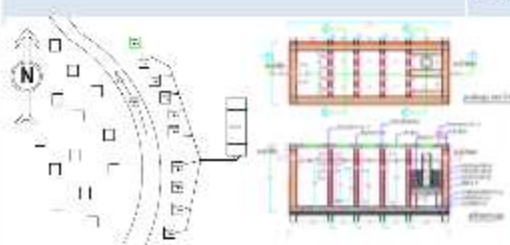
Specific Problems

- 3 households had no toilet
- Pit latrine was located close to the borehole
- Grey water discharged directly to Xong river

DEWATS C/SBS Service Package

Technical Information
- ✓ Connection of 10 Households
- ✓ Control boxes and grease trap
- ✓ Settler, ABR and AF

Community Based Organization
- ✓ Health & Hygiene Education
- ✓ Health Impact Evaluation
- ✓ Operation and maintenance by community



DEWATS by BORDA at NAPPA

Specific Problems

- The existing treatment was broken since 2011
- The wastewater overflow to Ngum river
- Strong smell

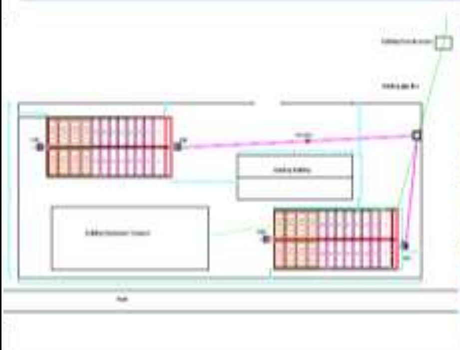
DEWATS C/SBS Service Package

Technical Information

- ✓ Connection of office buildings and dormitories with serving 3000 people
- ✓ Control boxes and grease trap
- ✓ Settler, ABR and AF

Community Based Organization

- ✓ Operation and maintenance by NAPPA



National Workshop on Wastewater Management and Decentralized Waste Water Treatment Systems (DEWATS) in Lao PDR
DEWATS by BORDA in Lao PDR
BORDA
BORDA Lao
Technical Coordinator
Vientiane, October 8, 2014

DEWATS by BORDA and UN Habitat in Attapheu

Specific Problems

- 40% of 31 HHs had no toilet in Mixay village
- 30% of 39 HHs had no toilet in Pouxay village
- 10% of HHs can access to safety sanitation facility

DEWATS C/SBS Service Package

Technical Information

- ✓ Connection of 31 HHs in Mixay and 39 HHs in Pouxay
- ✓ Control boxes and grease trap
- ✓ Settler, ABR and AF

Community Based Organization

- ✓ Health & Hygiene Education
- ✓ Health Impact Evaluation
- ✓ Operation and maintenance by community

DEWATS O&M Lesson Learned

Challenges

- ✓ DEWATS by BORDA collects a high amount of scum and solid waste coming from households already after a short period of time > closely connected to solid waste collection.
- ✓ Lack of awareness about how to use sanitation facilities, which are connected to DEWATS > general knowledge about environmental protection.
- ✓ Lack of willingness from community member to be the operator > image related to wastewater, benefits?
- ✓ Willingness to pay for wastewater management

DEWATS
Decentralized Wastewater Treatment Solutions
National Workshop on Wastewater Management and Decentralized Waste Water Treatment Systems (DEWATS) in Lao PDR
DEWATS by BORDA in Lao PDR
BORDA
BORDA Laos
Mr. [illegible]
Technical Coordinator
Vientiane, October 6, 2014

DEWATS O&M Lesson Learned

Lessons learned

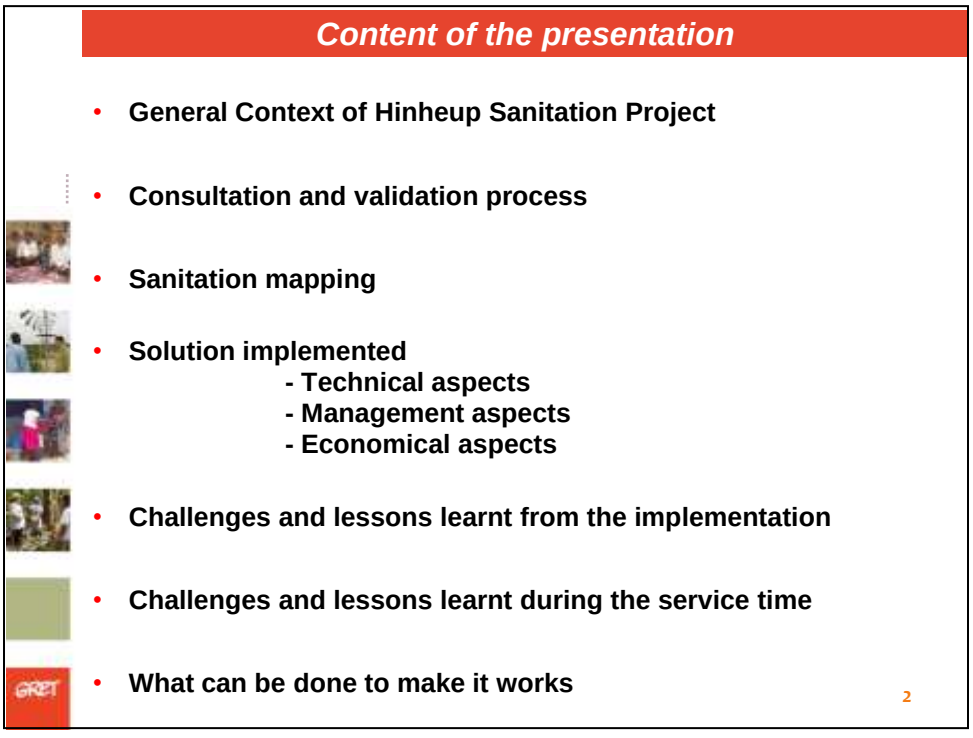
- ✓ Strong involvement of local authority (province, district, village, and others) in beneficial.
- ✓ Disseminating information and raising awareness on wastewater management to local staffs and community
- ✓ In-house management and solid waste collection has to be taken into greater account.
- ✓ Promotion of economical use of water, disposal of solid waste, reporting if problems are observed

BORDA

BORDA Lao
Mr. [illegible]
Technical Coordinator
Vientiane, October 6, 2014

Thank you for your attention!

Annex 9: Presentation on an innovative public-private management scheme for decentralised sanitation



General Context

Sanitation in Lao small towns

- Access to sanitation has progressed in recent years:
  - > *National: 65% of Lao population has access (latrine)*
  - > *Urban areas: 90% has access (latrine)*
- But :
  - > *Information available is limited and not so reliable*
  - > *Poor quality of sanitation systems*
  - > *Missing link in the value chain for sustainability: affordable & 'eco-friendly' desludging services*

Hin Heup location

- District Capital, with medium economic profile => villagers are willing to have simple water supply and sanitation services and they can pay for them
- Topography is favorable for gravity sewer system
- Easily accessible from Vientiane (2h)

Objectives

- Anticipate & test technical & institutional solutions: => Low-cost and easy O&M
- Improve the sanitation situation of Hin Heup and provide a model pilot project for other urban areas in Laos.
  - > *Reduce pollution of water bodies from poor existing soak pits and direct discharge of grey water*
  - > *Provide cheaper and 'greener' desludging service*

3

Consultation and validation process

Political will to set-up a pilot project

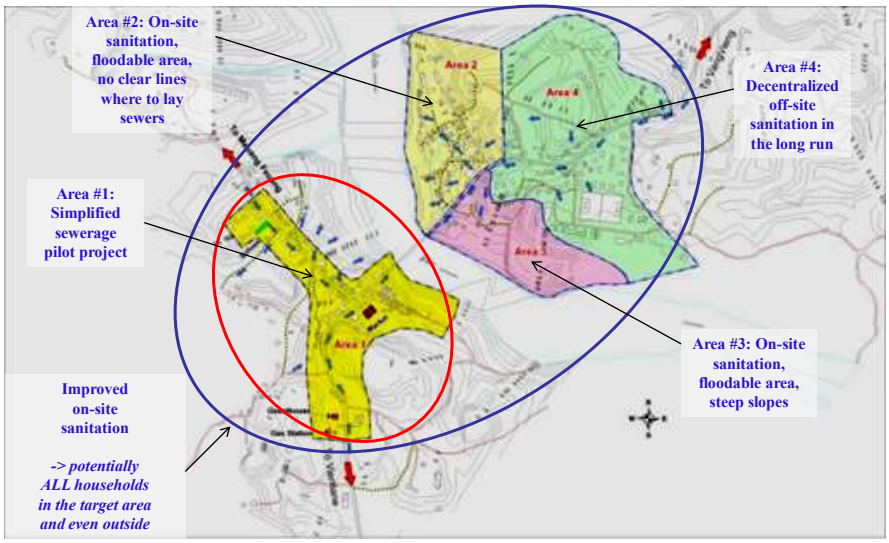
- At central level: DHUP – UDD: Urban Development Division
- At provincial level: Vientiane Province DPWT

A step by step approach with extensive consultation (30 months pocedure)

ACTIVITIES	DATE
Kick-off meeting at district level	Jan. 09
Baseline survey / feasibility study / mapping	Jan.-May 09
Presentation & validation of survey	Jul.-Aug. 09
Population training #1	Oct. 09
Topographic survey	Nov. 09
Network detailed design	Nov. 09 – Apr. 10
Treatment plant detailed design	May-Sep. 10
Setting management scheme (10 year management, PSP)	Apr.-May
Bidding – selecting the contractor	Jul.-Aug. 10
Contracts signature + works	Nov. 10
Construction works	Dec. 10 - May. 11
Operational start & 1st connections	Jun. 11
Population training #2	Jul. 11

4

Sanitation mapping



5

Solution implemented – technical aspects

Solution implemented – management aspects

Delegation to a local wastewater operator through a management contract with local authorities

- Same operator as water supply
  - > *decision of local authorities : district committee meeting*
  - > *abide to Lao regulations: according to Prime Minister decision 37, Nampapa enterprises shall be entitled to manage sanitation in their respective service area*
- 15 year service management contract: signed on Nov 2010

Monitoring and sustainability

- Report every 6month about service performance by the operator
- Regular meetings between District and Service provider, assisted by provincial and central levels when necessary
- Involvement of village authorities to promote & follow-up the service
- Natural Resources and Environment provincial department to monitor the environment

7

Solution implemented – economical aspects

Hin Heup Baseline Survey

- 80% of households would be interested in connecting to a sewer
  - > *Acceptable connection fee: ~30 US$ / Acceptable monthly charge: ~1 US$*
- Best "value for money" => simplified sewer: No individual pit, collection of black &grey waters,

Investment costs

TENTATIVE BOQ	SIMPLIFIED SEWERAGE		
	Quantity	Unit Price	Total (US$)
Design and monitoring	1	-	3 000 $
Treatment Plant	1	-	13 360 $
Sludge drying beds	1	-	7 140 $
Sewers + Manholes	1 043		20 125 $
Pumping Station	0	-	
Connection Box	59	120	7 080 $
Desludge pump & tank	1		1 500 $
Vehicle (tok-tok)	1		5 000 $
SUB-TOTAL			**57 205 $**

FINANCING PLAN			Total (US$)
GRET	subsidy		50 361 $
Households	59	31	1 844 $
Public authorities	land		0 $
Private operator			5 000 $
TOTAL			**57 205 $**

Operating costs

- Labor: ~ 40 US$/month
- Maintenance: ~ 40 US$/month
- Covered by bills : fixed charge ~1.3 US$/month

8

Challenges and lessons learnt from the implementation




A long implementation process

- Investigations and surveys (demand for sanitation and willingness to pay for a new technology are very difficult to assess!)
- Discussion and validation
- Building capacity, learning by doing, awareness raising

Address desludging issues at the same time

- Still a big challenge to enable the emergence of affordable &'eco-friendly' desludging services

Critical technical aspects

- Accurate and stable sewer slopes
- Household connections (time to find the best design)

Seek commitment of all stakeholders necessary to promote the service

- From local authorities to promote the service , set & enforce appropriate local regulations
- From service manager to maintain the system and keep all infrastructures in good state

9

Challenges and lessons learnt during the service time




Weak commitment of the operator and the local authorities

- Desludging service for areas 2,3 & 4 not developed yet
- Lack of service contract monitoring
- No collection of the monthly fee
- No promotion of the sewer system

Operation and maintenance

- Less connections than expected, (only 11 households out of 40 in the coverage area)
- No payment of monthly fees, none of the O&M costs are covered
- Technical objectives not reached yet (volume of wastewater treated maybe too low for the treatment process)
- No blocking of the pipes have occurred so far.

Co-relation between technical and commercial aspects

- Not enough HH -> Less technical efficiency -> Less work for the operator -> Less motivation to pay for a service

10

What can be done to make it works?

Promote the sewer system

- Develop a marketing approach
- Survey on households satisfaction to understand the perception and expectations of the households towards the sewer system
- Design of information/promotion tools

Quickly increase the sewer connection rate

- Connection costs fully subsidized for all HHs and business?

Develop a local desludging service

- Market survey on desludging service in other villages of the district

Improve contract management

- Discussion with the district authorities on the management
- Change the operator
- Develop the local regulation for sanitation
- Investigate new sanitation fees collection system (through the water bill?)

11

GRET
Professionals for Fair Development

ขอบใจหลายๆ! Thank you!

For more information please contact:

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GRET Lao PDR
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12

Annex 10: Presentation on sustainable financing frameworks for DEWATS and Regional Guidelines on DEWATS

FINANCING FRAMEWORKS FOR DEWATS

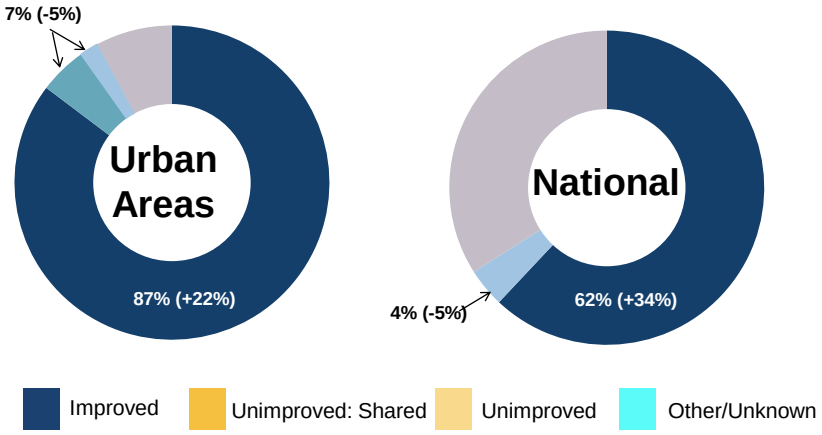
Vientiane, Lao PDR
October 6-7, 2014

Christoffer Larsson, Consultant ESCAP

Outline

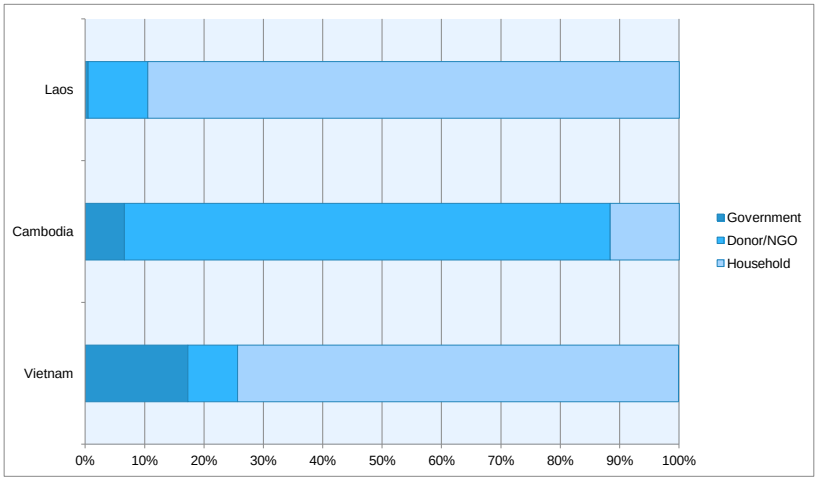
- Statistics of sanitation in Lao PDR
- Costs and benefits
- How can we stimulate demand?
- How can we increase supply?
- A financial framework for the region

Access to Sanitation in Lao PDR

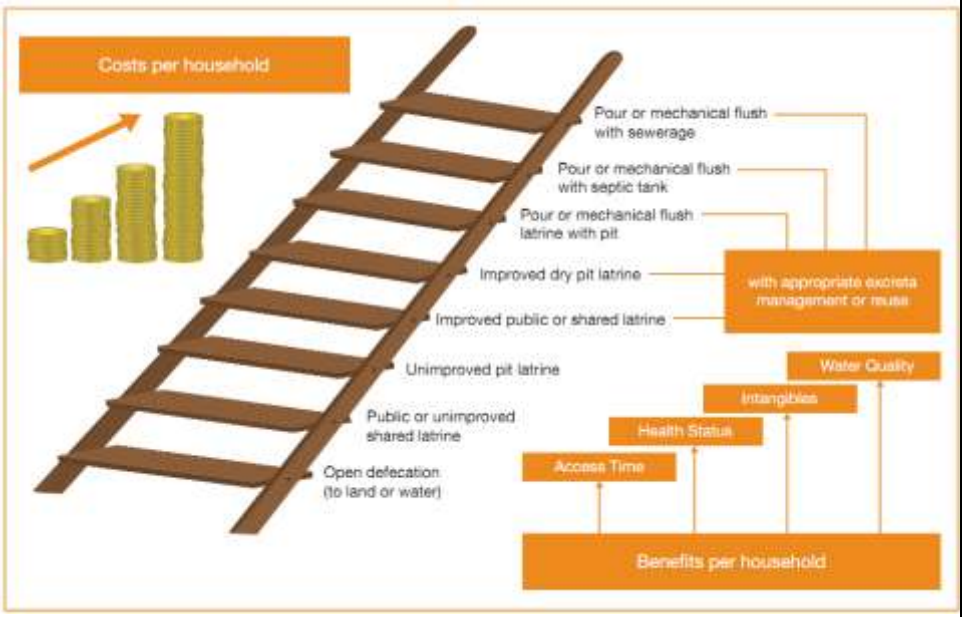


Numeric labels refer to per cent with or without sanitation services; in parenthesis is the per cent improvement since 1990.

Financing Sources for Sanitation in Lao PDR, Cambodia and Vietnam



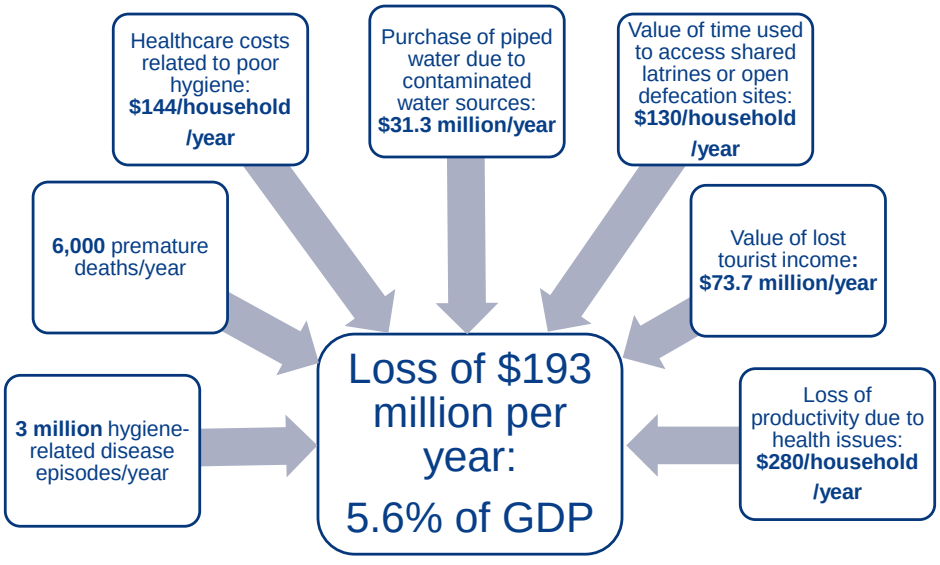
Source: World Bank - Average funding sources of sanitation projects studied 2012



Credits to World Bank, WSP, 2008

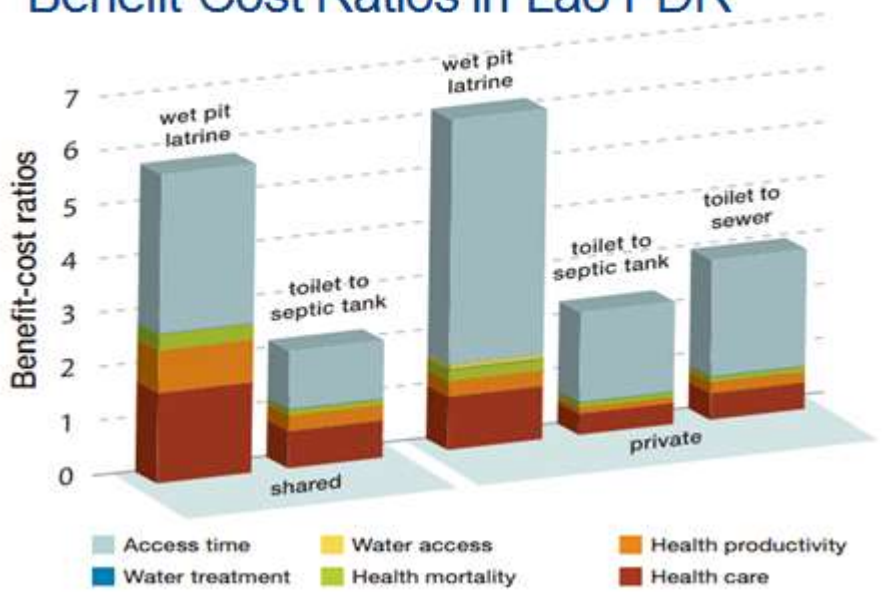
6

The Cost of Poor Sanitation



Source: World Bank (2008)

Benefit Cost Ratios in Lao PDR



8

Benefits of DEWATS

Economic

- Low initial investment & upkeep costs
- Modular design works in many settings
- Allows for incremental growth
- Sustainable revenue source for local contractors

Social

- Improved hygiene and reduced disease
- Opportunity for public-private partnerships
- Communities can invest in local systems directly
- Decentralised systems provide low-cost solutions for schools, hospitals, etc.

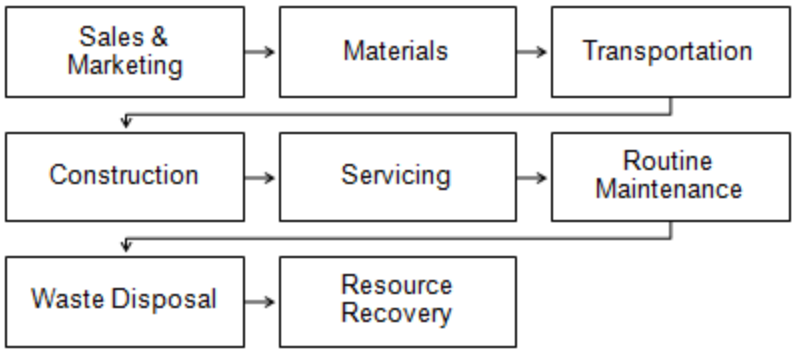
Environmental

- Immediate water quality improvement
- Reduces water needs for wastewater transport
- Adaptable to different water quality discharge standards
- Increases wastewater reuse opportunities

Photo credit: BORDA

Sustainable Business Opportunities

Job creation due to private sector
Sustainable Sanitation Services (3S)



How can we stimulate demand?

1. Prioritize schools to change behavior of next generation.
2. Microfinance schemes to increase affordability.
3. Reuse Wastewater and Waste as a resource (Example: Biogas Digester)

Viet Nam Domestic Biogas Digesters

- Investment: ~$600
- Operation and Maintenance: ~$20 – 25
- Duration: 20 years
- Require Livestock

- Annual reuse value
  - Fertilizer: $100
  - Biogas: $50

Biogas cannot be sold but can be used for cooking and lighting

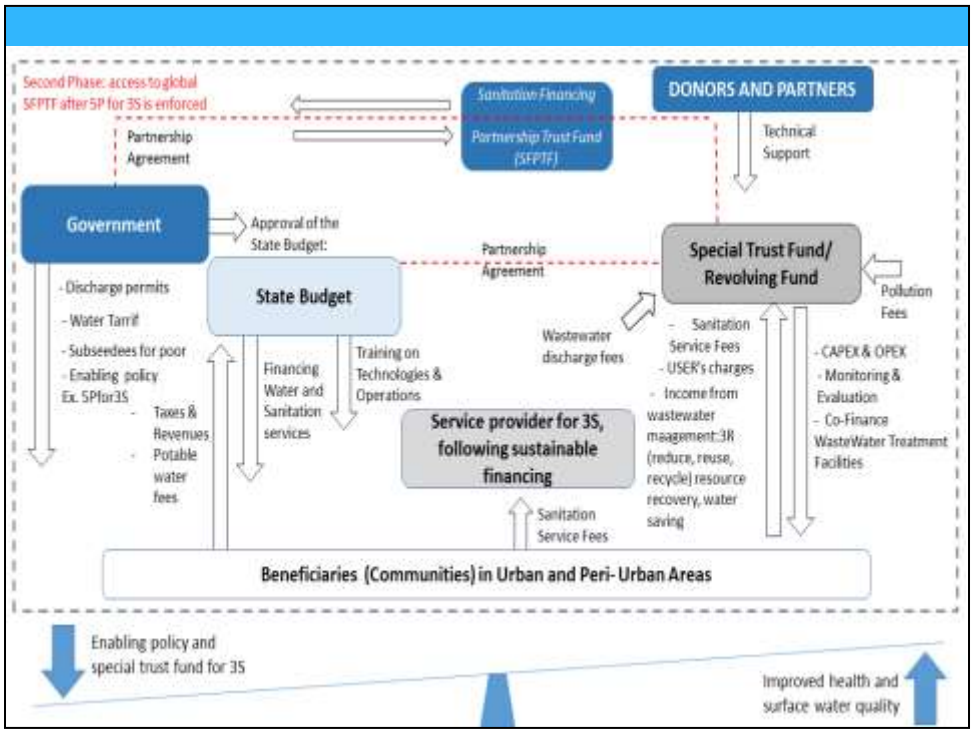
Source: World Bank, WSP, 2008

How can we increase supply?

1. Expand funding
   - National government
   - Donors, Foundations, Impact Investors, Philanthropists
   - Enabling policies to attract private sector to invest
2. Increase efficiencies
   - Regulations and enforcements of these
   - Results Based Financing (or Output-based Aid)
   - A balanced top-down bottom-up approach
   - Cost Recovery
3. Promote Innovations

Some Foundations for Cambodia, Lao PDR and Viet Nam

Grantmaker	Recipient	Years	Subject	Location	Amount($)
Gates Foundation, Bill & Melinda	East Meets West Foundation	2012	Basic sanitation	Vietnam, Cambodia	10,900,000
Gates Foundation, Bill & Melinda	East Meets West Foundation	2012	Basic drinking water supply and sanitation (and hygiene)	Vietnam, Cambodia	10,892,820
Gates Foundation, Bill & Melinda	International Development Enterprises	2011	WASH research	Cambodia	3,987,717
Stone Family Foundation, The	iDE Cambodia	2012	Education and training in water supply and sanitation	Cambodia	2,132,433
Vanguard Charitable Endowment Program	Splash	2011	Basic drinking water supply	Cambodia, China, Ethiopia, ...	1,200,650

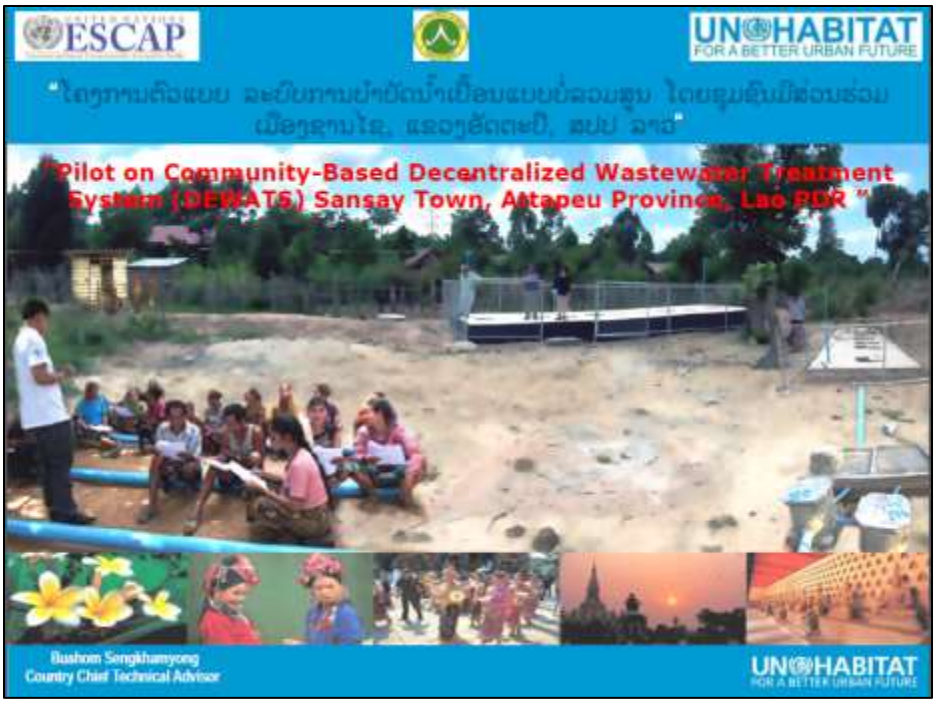


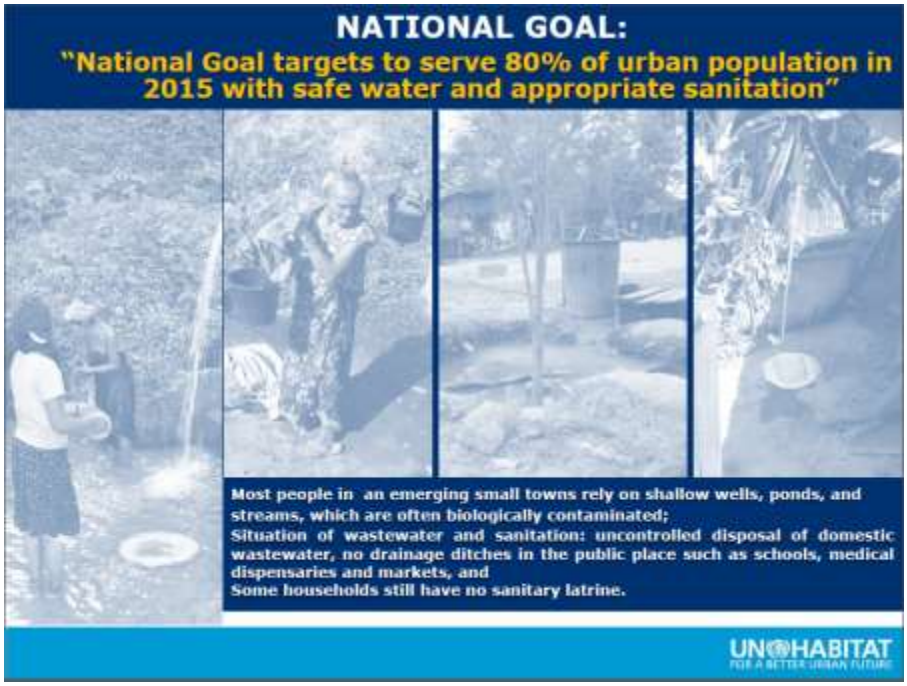
THANK YOU!

For questions please contact

larssonc@un.org
ESWRS/EDD/ESCAP

Annex 11: Presentation on a community-based DEWATS in Sansay Town, Attapeu






COMMUNITY-BASED WATER SUPPLY
AND SANITATION PROJECT
Location map of UN-Habitat Laos_010313.jpg
LEGEND:
UN-HABITAT
FOR A BETTER URBAN FUTURE


WATER AND SANITATION
PROJECT IN LAO PDR
Community participation
in trench digging
• The community participation promoted in all stages, from project planning to implementation
5
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Training and Pilot demonstration for the artisans in the communities on Latrine Construction
E IN LAO PDR
DSC03186.JPG
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7
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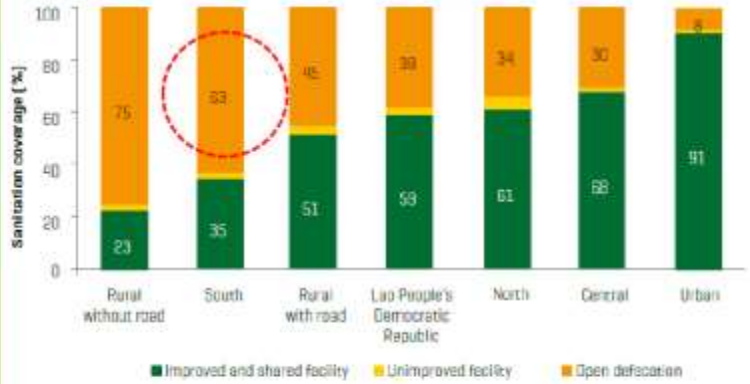
LAO SOCIAL INDICATOR SURVEY (LSIS)

Sanitation coverage in rural areas with road access is twice that in rural areas without road access in Lao People's Democratic Republic



Source: Lao People's Democratic Republic Social Indicator Survey, 2011–2012

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UN-Habitat's partnership with the Rural Livelihoods Improvement Programme (RLIP) in Attapeu Province, Lao PDR

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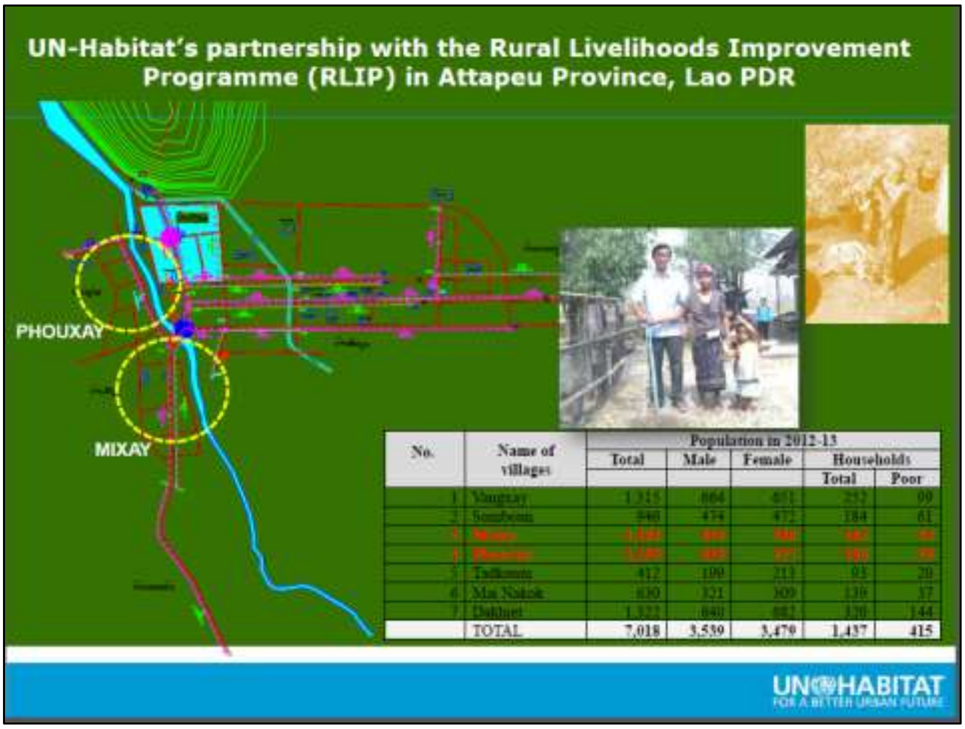
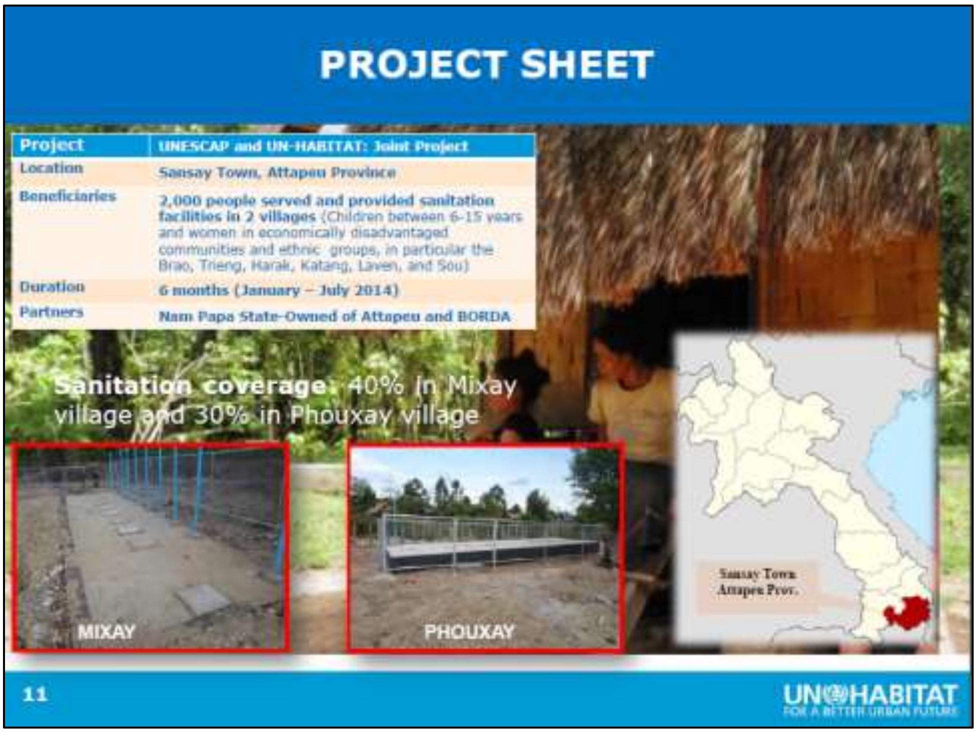


No.	Name of villages	Population in 2012-13				
		Total	Male	Female	Households	
					Total	Poor
1	Vangxay	1,315	664	651	252	99
2	Somboun	946	474	472	184	61
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	Tadkoum	412	199	213	93	20
6	Mai Nakok	630	321	309	139	37
7	Dakhet	1,322	640	682	320	144
	TOTAL	7,018	3,539	3,479	1,437	415




BEFORE PROJECT INTERVENTION
UN HABITAT
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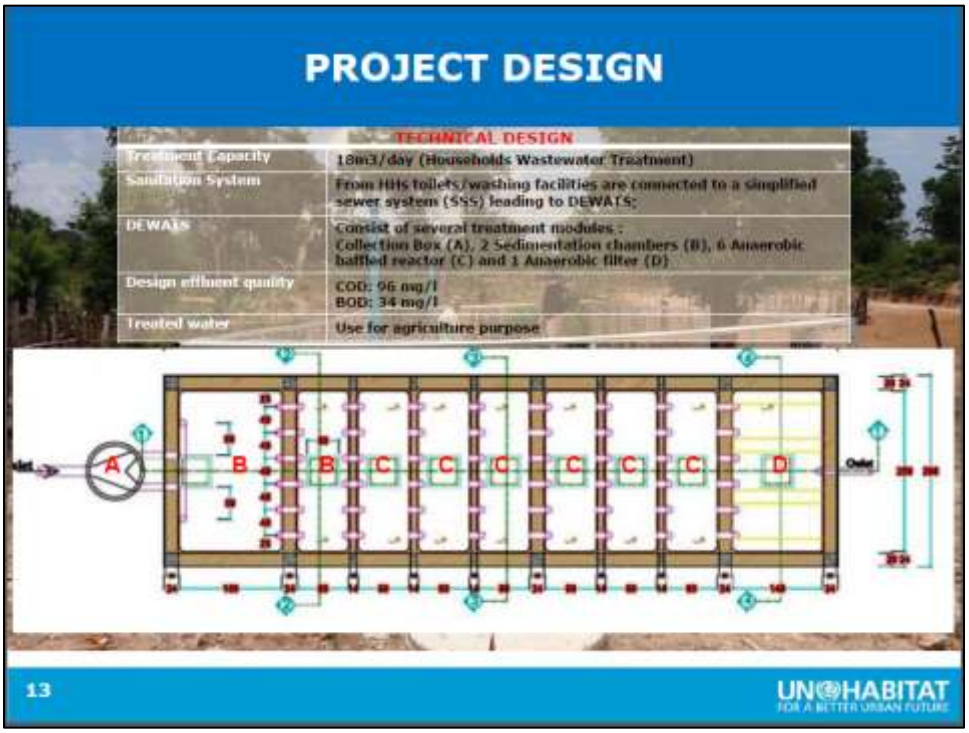
PROJECT DESIGN
TECHNICAL DESIGN
Treatment Capacity
18m3/day (Households Wastewater Treatment)
Sanitation System
From HHs toilets/washing facilities are connected to a simplified sewer system (SSS) leading to DEWATS;
DEWATS
Consist of several treatment modules : Collection Box (A), 2 Sedimentation chambers (B), 6 Anaerobic baffled reactor (C) and 1 Anaerobic filter (D)
Design effluent quality
COD: 96 mg/l
BOD: 34 mg/l
Treated water
Use for agriculture purpose
A
B
B
C
C
C
C
C
C
D
13
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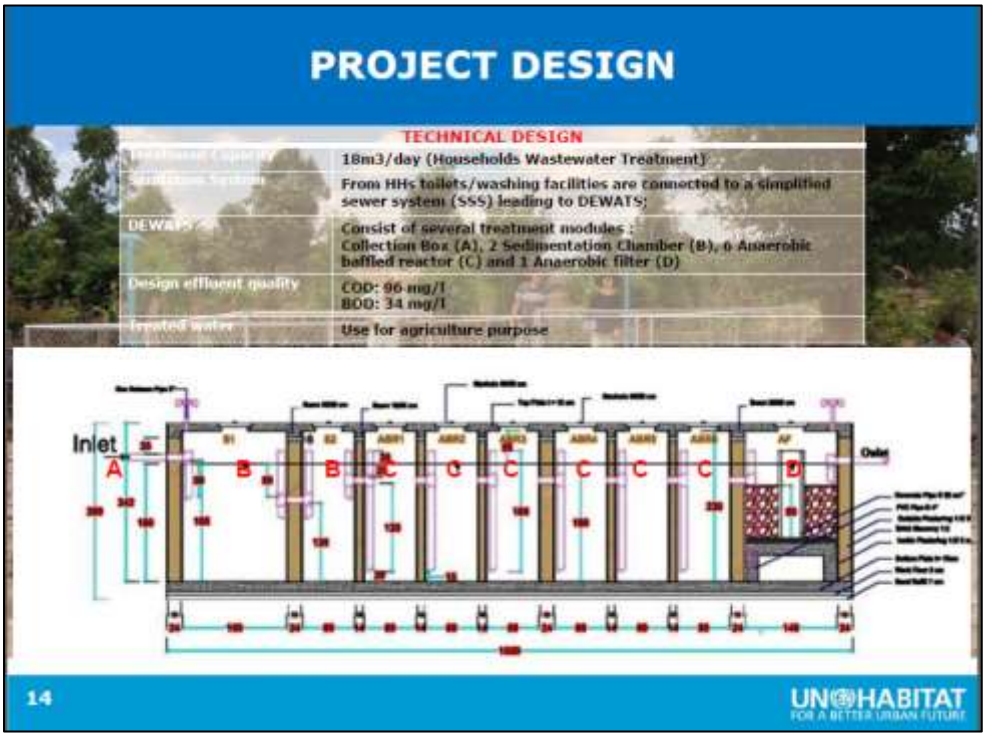
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Design effluent quality
COD: 96 mg/l
BOD: 34 mg/l
Treated water
Use for agriculture purpose
Inlet
Outlet
14
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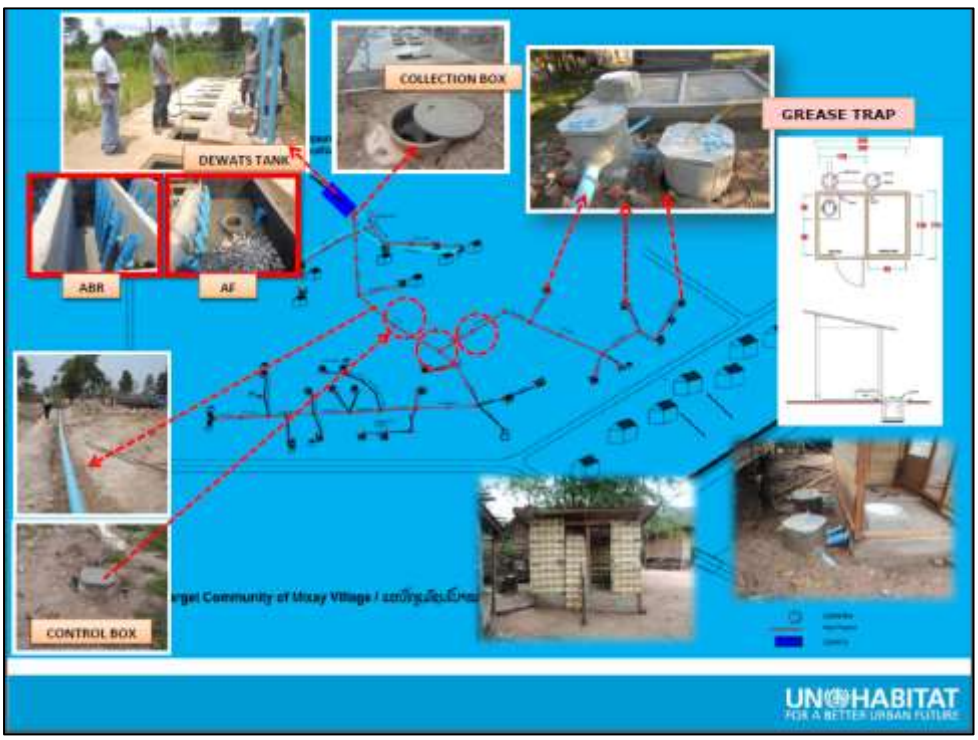
COLLECTION BOX
GREASE TRAP
DEWATS TANK
ABR
AF
CONTROL BOX
UN-HABITAT
FOR A BETTER URBAN FUTURE


COMMUNITY-BASED ON DEWATS
The community participation promote in all stages, from project planning to implementation
16
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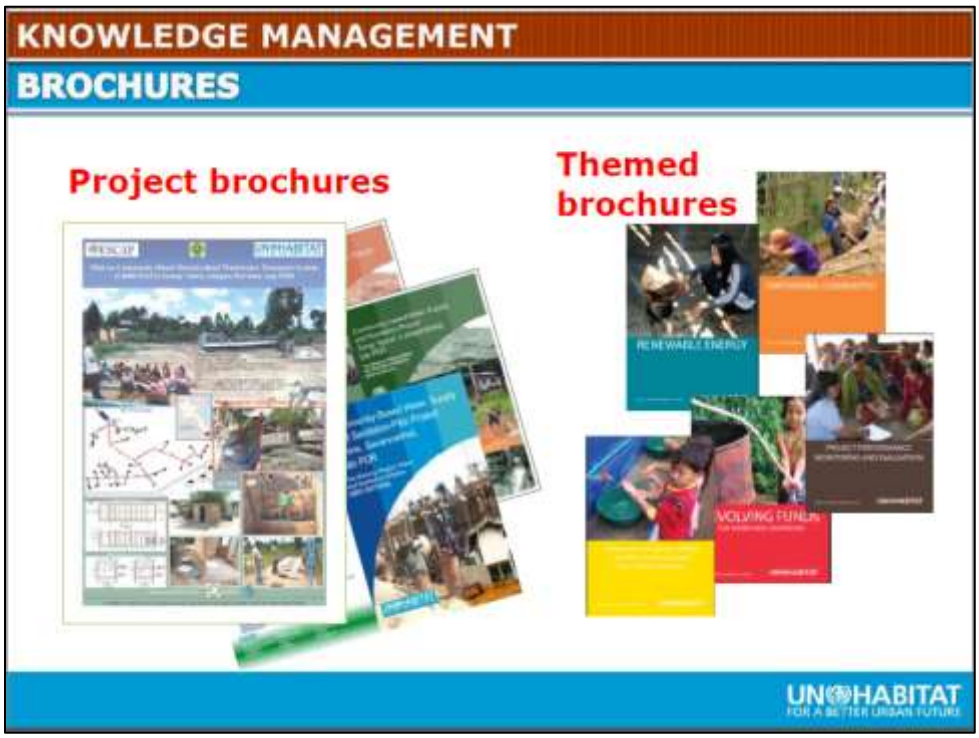
DEWATS OPERATION
MIXAY
PHOUXAY
UN HABITAT
FOR A BETTER URBAN FUTURE


PILOT ON BIOGAS
UN HABITAT
FOR A BETTER URBAN FUTURE


KNOWLEDGE MANAGEMENT
BROCHURES
Project brochures
Themed brochures
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KNOWLEDGE MANAGEMENT

MEDIA

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KNOWLEDGE MANAGEMENT

NEWSLETTERS

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KNOWLEDGE MANAGEMENT

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- General introduction to UN-HABITAT
- Up-to-date information on our programmes and projects in Lao PDR
- Links to all publications
- Contact details for project staff

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Thank You

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