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**SUSTAINABLE WATER AND SANITATION SERVICES  
FOR ALL IN A FAST CHANGING WORLD**

**Wastewater management in Indonesia: Lessons learned  
from a community-based sanitation programme**

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*This paper describes wastewater management in Indonesia, particularly Community Based Sanitation Programme or in Indonesian language is well-known as SANIMAS (Sanitasi Berbasis Masyarakat), which is intended for low income people in densely populated neighbourhoods, slums and poor sanitation in urban areas. In its implementation, this programme has to follow some basic principles. For the technology options, this programme adopts some models, for instance: Communal Bath-Wash-Toilet Plus++, Simplified Shallow Sewerage System, Communal Septic Tanks, and Combination System between Communal Bath-Wash-Toilet and Simplified Shallow Sewerage. In order to achieve successful implementation, some stages are needed to be implemented as an inseparable unity. This programme has been implemented in more than 900 locations in 32 provinces in Indonesia and replicated in thousands locations by other funding sources. This programme does not only giving advantages in technical aspects, but also in social economic aspects.*

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**Wastewater management in Indonesia**

Administratively, Indonesia consists of 17,504 islands with total area of 1,890,754 km<sup>2</sup> and has 34 provinces with 410 regencies and 98 cities (Statistics Indonesia, 2010). As a developing country, Indonesia has many inadequate sanitation facilities and citizen's improper sanitation behaviour, for example open defecation. This condition might cause some problems, such as rivers and groundwater pollution and waterborne diseases. As the main source of clean water production, the heavier polluted water bodies need the higher costs to produce clean water, thus the selling price of clean water supply will go up. Waterborne diseases, for instance diarrhoea, might increase the infants and children death, as well as the decrease of economic activity of the adults. These problems can engender the high potential economic loss.

Based on Statistics Indonesia (2012), about 57.35% of Indonesian people have access to improved sanitation facilities, meanwhile the target of Millennium Development Goals point 7c is to halve the number of people without access to basic sanitation facilities by 2015 or about 62.41% of Indonesian people. Thus, it is still needed about 5.06% of Indonesian people access to the improved sanitation to fill the gap. This means that the development of domestic wastewater infrastructure in Indonesia has not reached the desired conditions yet, especially for low income people in densely populated neighbourhoods, slums and poor sanitation in urban areas.

In order to accelerate and to improve the sustainability of sanitation services in Indonesia, since 2005 the Indonesian government has changed the paradigm in handling waste water management, from top-down approach (target oriented) to bottom-up approach (public needs oriented). In the top-down approach, the community were not fully involved in the whole process of the sanitation facilities development; thus it had resulted low public awareness and unsustainable sanitation system. On the other hand, in the bottom-up approach, the community play the main role as a component of development and were fully involved in the whole process of the sanitation facilities development: planning, construction, as well as operation and maintenance stages; therefore it can contribute higher public awareness on the importance of adequate sanitation and sustainable sanitation system.

## Community based sanitation programme

One best solution in providing wastewater infrastructure for low income people in a densely populated neighbourhood, slums, and poor sanitation in urban areas, Indonesia has introduced a Community Based Sanitation programme or in Indonesian language is well-known as SANIMAS (*Sanitasi Berbasis Masyarakat*). This programme is an initiative to provide domestic wastewater infrastructure which is community-based development with demand responsive approach. In this programme, facilitated by the facilitators, community are fully involved in each stage of the implementation, such as: people choose their own appropriate sanitation system model, participate actively to develop an action plan, to form community-based organization, and to implement construction, including managing the operation and maintenance activities.

This programme has been tested and successfully implemented from 2003 to 2005 in the provinces of Bali, Yogyakarta and East Java. This trial programme was done by Indonesia National Planning Agency cooperated with AusAid and World Bank. After that, since 2006 this programme has been replicated and implemented by Directorate of Environmental Sanitation Development, Directorate General of Human Settlements, Ministry of Public Works, Republic of Indonesia cooperated with BORDA (Bremen Overseas Research and Development Agency), an NGO from Germany.

Community Based Sanitation programme has already been implemented in 916 locations in 32 provinces in Indonesia. Because of its success, this programme has been replicated in all over provinces in Indonesia by special allocation budgets for the local governments since 2010 and has also replicated in over 900 locations in 5 provinces by loan funding from Asian Development Bank.

Actually, Community Based Sanitation which is a decentralized sanitation system is a solution to fill the gap between onsite system and offsite system. The onsite system is used for rural or low population density area in small community scale with low socio-economic condition that is quite less costly, but cannot provide adequate and safe sanitation system. On the other hand, the offsite system is used for urban or highly population density area in city-wide scale with high socio-economic condition which requires high cost, but can provide adequate and safe sanitation system. Meanwhile, Community Based Sanitation system is used for urban or highly population density area in communal scale with medium to low socio-economic condition which requires lower cost than offsite system, but can provide adequate and safe sanitation system.

## Basic principles of community based sanitation

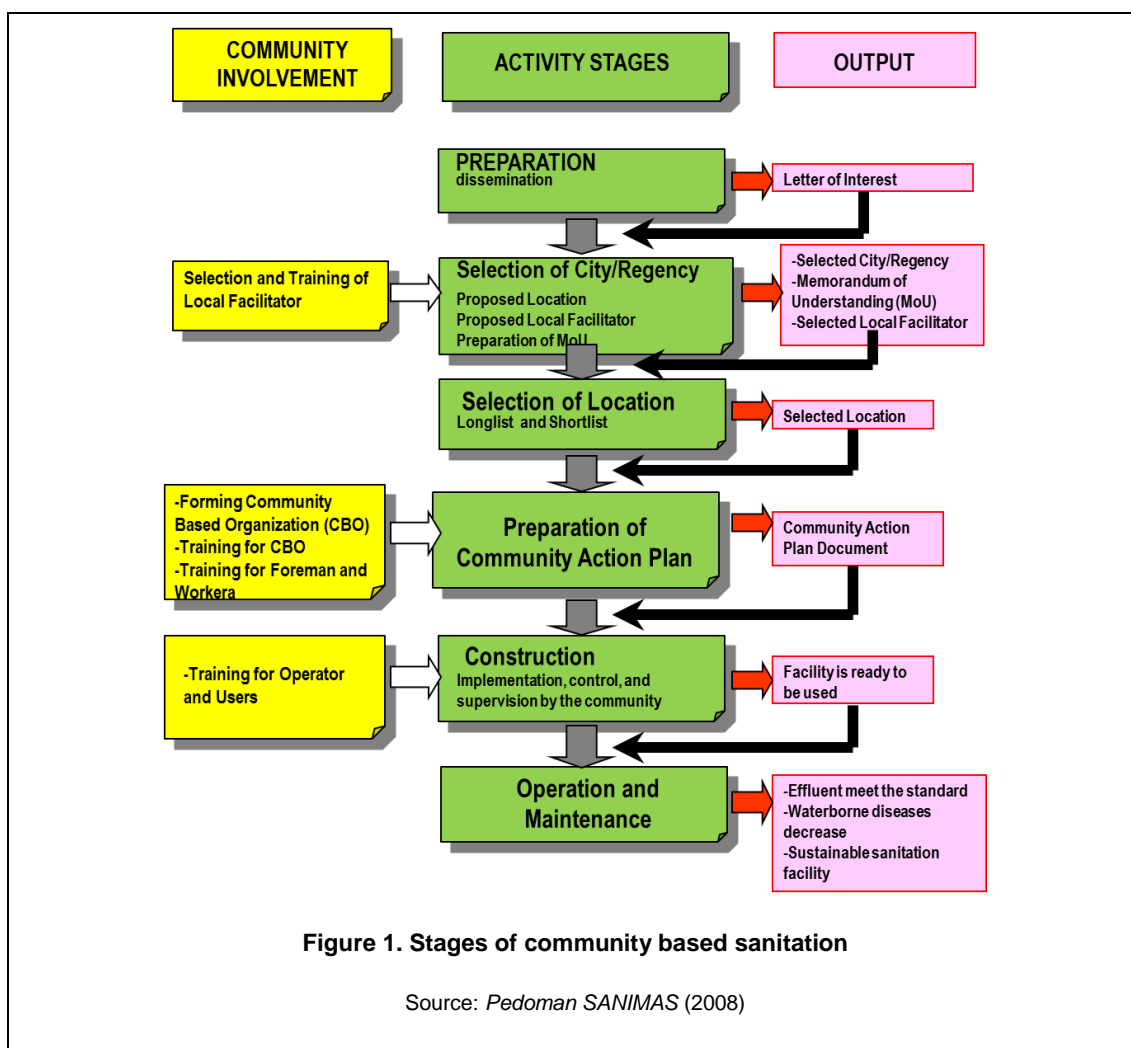
Community Based Sanitation has some basic principles, such as:

1. Demand Responsive Approach.  
Community Based Sanitation Programme only facilitates city/regency and community who explicitly stated their demand for improving their sanitation condition and willing to allocate the matching funds required in this programme.
2. Self-selection Process.  
Community, facilitated by local facilitator and local government, implement Rapid Participatory Appraisal method to some location candidates and jointly assess the score obtained by the candidates according to some indicators of readiness criteria. The location that reaches the highest score represents the highest readiness so that the location deserves the programme.
3. Technology Informed Choices.  
There are some technology and system options that have to be well-informed to the community, such as: Communal Bath-Wash-Toilet Plus++, Simplified Shallow Sewerage System, Communal Septic Tanks, and Combination System between Communal Bath-Wash-Toilet and Simplified Shallow Sewerage. Facilitated by the facilitators and local government, community will select the most appropriate model based on their needs and the area physical condition.
4. Multi-sources of Fund.  
The Government – central and local – and the community share the fund needed to build the improved sanitation facility. The central government provide investment fund for sanitation facility building, while the local government provide fund for monitoring, assistance, and rehabilitation, as well as the support for operation and maintenance. Lastly, the community responsible for operation and maintenance cost to ensure the sustainability of the sanitation facility.

5. Local Capacity Building.  
In order to build qualified and sustainable sanitation facility, it is needed to facilitate local capacity building, such as: local facilitator training, management and financial training, training for foreman and workers, technical training of operation and maintenance for operator and users.
6. Participative.  
All components of community are fully involved in the whole process of the sanitation facility development: planning, construction, operation, and maintenance.
7. Sustainability.  
The fully involvement of all stakeholders in the whole process – planning stage, construction, as well as operation and maintenance – will raise sense of belonging of the built sanitation facilities. Therefore, the community will maintain the sanitation facility properly and sustainably.
8. Accountability.  
The involvement of the community is also implemented in financial aspect. They set up community based organization who organizes the operational finance transparently by issuing financial cash book and regularly reporting it to the community.

**Stages of community based sanitation**

Figure 1 shows the various stages, how the community can be involved, and what should be the outcomes from the different stages.



**Models of community based sanitation technology**

Community Based Sanitation programme offers some options of technology models, as follows:

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1. Communal Bath-Wash-Toilet Plus++  
This system consists of upper unit (toilet, bathroom, washing area), wastewater pipes, treatment unit (usually used Anaerobic Baffled Bioreactor/Anaerobic Biofilter), and completed with Biodigester (collector building of methane gas produced by faeces. This gas can be utilized for energy of cooking and lighting). This system is suitable for community without private toilet and minimum 55 households.
2. Simplified Shallow Sewerage System  
This system consists of pipe network and treatment unit (usually used Anaerobic Baffled Bioreactor/Anaerobic Biofilter), and completed with private toilet (not covered in this project fund). This system is suitable for the area which the community already have their own private toilet or the community are willing to build their own private toilet. This is also suitable for the area with no space for communal toilet.
3. Communal Septic Tanks  
This system consists of communal septic tanks (usually for 10-15 households) and pipe network, and completed with private toilet (not covered in this project fund). This system is suitable for the area of some groups with 10-15 adjacent houses.
4. Combination system between Communal Bath-Wash-Toilet and Simplified Shallow Sewerage  
This system is the combination of Communal Bath-Wash-Toilet Plus++ and Simplified Shallow Sewerage System. This system is suitable for the community in a sloping area which some households have no private toilet and some have private toilet.

### Community based sanitation implementation and replication

Table 1 represents the implementation of Community Based Sanitation Programme, funded by National Budget from 2003 to 2013. It is implemented in over 900 locations in 32 provinces in Indonesia. Nevertheless, this programme was paused in 2010, because of the preparation for its replication by other funding source, namely special allocation budget.

<b>Table 1. Community based sanitation by national budget</b>			
<b>Year</b>	<b>Number of provinces</b>	<b>Number of cities/regencies</b>	<b>Number of locations</b>
2003	2	6	6
2004	2	7	8
2005	4	12	13
2006	20	50	65
2007	22	74	124
2008	16	69	108
2009	17	65	100
2010	0	0	0
2011	17	37	66
2012	18	43	82
2013	32	180	344
<b>Total</b>	<b>32</b>	<b>260</b>	<b>916</b>

Because of its success, Community Based Sanitation programme has been replicated in over 5,000 locations in all over provinces in Indonesia by special allocation budget for the local governments since 2010. (As it can be seen in Table 2.)

Year	Number of provinces	Number of cities/regencies	Number of locations
2010	32	491	1,021
2011	32	428	1,199
2012	32	449	1,325
2013	33	447	2,294
<b>Total</b>	<b>33</b>	<b>-</b>	<b>5,839</b>

In addition, Table 3 shows that Community Based Sanitation programme is also replicated in over 900 locations in 5 provinces by loan funding from Asian Development Bank.

Year	Number of provinces	Number of cities/regencies	Number of locations
2012	5	34	496
2013	5	34	461
<b>Total</b>	<b>5</b>	<b>34</b>	<b>957</b>

### **Lessons learned from community based sanitation**

Community Based Sanitation programme provides improved sanitation access to lower income community which can increase environmental quality so that it may decrease waterborne diseases, such as diarrhoea. Besides that technical aspect, this programme also has changed the community sanitation behaviour, from doing open defecation to become clean and healthy behaviours. In addition, the facilities are well-maintained thus they are clean and beautifully seen, do not smell bad, give better drainage system, and give a place to the community social activity centre.

In other words, Community Based Sanitation implementation gives some advantages, as follows:

- Adequate sanitation facility makes better health standard of community which can bring the improvement of the life quality.
- *Protect water resources.* The improved sanitation facility completed with waste water treatment unit of Community Based Sanitation system may decrease the pollution load of groundwater, rivers, and beaches;
- The right choice for sanitation problems. Community Based Sanitation programme gives the right choices for waste water disposal system in highly density urban areas.
- *Time efficiency.* It only needs less than 12 months to plan and implement the Community Based Sanitation system;
- *Cost efficiency.* Investment, including operational and maintenance cost of Community Based Sanitation technology is not really expensive;
- Technology Informed Choices introduced in Community Based Sanitation programme are not complicated, has been proven, and has been tested;
- *Trainings and community development.* Community are trained to plan, implement, and manage the Community Based Sanitation facilities by themselves.

However, several drawbacks are existed in implementing this programme. First, some communities still have low awareness of the importance of sanitation for health. Therefore, they do not utilize or use inappropriately of the latrines and poorly maintain the sanitation facility. Other challenge is the lack of priority for sanitation sector from central government, local governments, legislative members, and the private sector. This is reflected in their limited budget allocations for sanitation sector. Moreover, there is

limited number of NGOs which focus on sanitation sector (Indonesia Progress Report on the MDGs, 2005). Last but not least, UNICEF Indonesia (2012) reported that it needs stronger coordination among different ministries and agencies involved in the water and sanitation sectors since the responsibilities for maintenance are unclear and community management structures are weak.

In brief, the success key of Community Based Sanitation programme is the fully involvement and cooperation of all stakeholders – central government, local governments, legislative members, the private sector, NGOs, and community. This will raise the sense of belonging to the built sanitation facilities so that they will utilize the sanitation facility appropriately and maintain it voluntarily. Therefore, the built sanitation system will be well-maintained and sustainable.

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