Large Scale Ecosan Capacity Building Project in India
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ABSTRACT

The EU Asia-pro-eco action described here is a large scale Ecosan capacity building project for introducing the Ecosan approach to several target groups in India. It is undertaken by the ttz-Bremerhaven, together with the Indian Water Works Association, the Maharashtra Government, the Indian ecosan services foundation and several other partners.

Most towns, cities and mega cities in India face serious problems in providing adequate sanitation, sewers and wastewater management systems. Insufficient or non-existing management of municipal and industrial waste water results in immense environmental problems and increasing hygienic risks for the growing urban population thereby hampering poverty alleviation and a sustainable development of the Indian society. The largest part of India's human waste is still discharged untreated into the environment.

A sanitation system that provides Ecological Sanitation (ecosan) is a cycle—a sustainable, closed-loop system, which closes the gap between sanitation and agriculture. The ecosan approach is resources minded and represents a holistic concept towards ecologically and economically sound sanitation. The underlying aim is to close (local) nutrient and water cycles with as less expenditure on material and energy as possible to contribute to a sustainable development

Ecological sanitation ("ecosan") is a market proven cost effective and environmental sound concept that can help to struggle these problems. The objective of ecosan concept is to produce hygienically safe and useful resource out human wastes, which can not only improve the environmental situation, but also improve living conditions in a sustainable way and lower risks on human health. This will particularly help poorer sections of the society, which are more often directly affected by health risks due to human waste management.

Though ecosan is becoming more and more known in India and several projects have raised awareness and also acceptance of innovative sanitation systems, there is a significant lack of qualified people is the core of successful project implementation. Therefore, the project described in this paper intends to increase the capacity of ecosan implementation-this means: to increase the amount of ecosan experts in India, which are able to implement ecosan projects on their own. The main activity of the project is to train the three different stake holder groups "government level", "multiplicators and consultants" and "implementers and users" in ecosan implementation based on a participatory cross institutional approach.

Key words: Awareness raising, Planning, Implementation, capacity building, Education

1. INTRODUCTION

1.1 The Crisis of Sanitation:

Since the UN Earth Summit 1992 in Rio de Janeiro, Brazil, people have been discussing seriously about environmental pollution, exploitation and limitation of natural resources all over the world. The intake capacity and overloading of the natural environment with emissions and waste are reaching a critical point (further aggravated by) rapid and increased urbanisation, population growth and depleting of fresh water resources. The effects are manifold, but the most affected are the poorest in society, who have to bear the burnt. Especially women and children in developing countries suffer most from water related diseases and the damaged environment (WHO/UNICEF, 2003).
According to most recent reports, around 2.6 billion of the 6 billion people on the planet have no access to any form of safe sanitation. Sanitation has been a critical issue as it is linked to both

human health and dignity. Poor sanitation is leading directly to a decline in the quality and quantity of available fresh water resources, and the problem is now finally being treated with a greater degree of seriousness than even before. This was highlighted during the World Summit on Sustainable Development in Johannesburg, 2002, where the existing Millennium Development Goals (MDG's), adopted by the UN in New York in September 2000, were expanded to include the sanitation target, of halving the proportion of people without access to the sanitation in 1990, by the year 2015 .

But sanitation is not only a problem concerning to developing countries, as it is linked with environment protection all over. Over the past decades, mainly centralized systems have been built to serve the densely populated areas (Wilderer, 2001). These centralized systems resulted in large investment costs especially for the sewer lines, besides consuming large quantities of water. (Lettinga et al., 2001).It is also the end of pipe technology.

Most towns, cities and mega cities in India face serious problems in providing adequate sanitation, sewers and wastewater management systems. Insufficient or non-existing management of municipal and industrial waste water results in immense environmental problems and increasing hygienic risks for the growing urban population thereby hampering poverty alleviation and a sustainable development of the Indian society. The largest part of India's human waste is still discharged untreated into the environment reason being exorbitant cost of conventional sanitation systems and its low efficiency.

1.2. Current Sanitation Situation in India

India, the seventh largest and second most populous country in the world, is located in the southern peninsula of the Asian continent and lies to the north of the equator between 8°4' and 37°6' north latitude and 68°7' and 97°25' east longitude. The mainland of India measures about 3,200 kilometres from north to south and about 2,900 kilometres from east to west and encompasses an area of 3,268,090 square kilometres.

Indian cities, like many of their post-colonial counterparts, are beset by immense environmental problems at the end of the twentieth century. As the growth of urbanization continues, these problems are escalating. While environmental problems such as air pollution and toxic wastes are occasionally addressed by governments when given publicity, the most profound of these environmental problems, the unsanitary living and working conditions of large sections of the urban population are ignored. It is only when the threat of epidemic occurs that government authorities intervene in an attempt to control the public health risk. Such was the case during the 1994 plague outbreak in western India which caused thousands of people to flee Surat to escape infection. It was the dramatization of events by Indian and foreign media which forced the various levels of government to intervene.

In India, a similar pattern as world over, of urbanization has emerged. Impoverished rural migrants have moved to cities in search of employment. The consequent lack of housing has produced slums, while the factories that employ them have polluted their surrounding environments. Totally inadequate sanitation and water supply systems have turned rivers into sewers and have contaminated/exploited ground water supplies. While epidemics of cholera and typhoid occur infrequently, it is the recurring endemic diseases such as gastroenteritis, dysentery, diarrhoea and malaria which have devastating and long-term impacts on the health of the poor and slum dwellers, with accounting for world's $1/3^{rd}$ diariahal diseases.
The per capita fresh water availability in India is on the decline, from 3450 m^3 /cap in 1951 to 1967m^3 today, and it is estimated that it will fall drastically to between 1500 to 1800 m^3 by 2025,

even though annual precipitation is around 4000 billion cubic meters. It is the contamination of fresh water that is increasing the stress on availability of water.

		MDG coverage attained		**daily increase needed in people served 2002 - 2015 to meet the MDG targets**	
		water supply [%]	**sanitation [%]**	**Water supply**	**Sanitation**
Afghanistan	41,401	No data	No Data	-	-
Bangladesh	168,158	86	62	8,000	7,000
Bhutan	2,684	No data	No data	-	-
India	**1,260,366**	**84**	**56**	**33,000**	**82,000**
Iran	79,917	96	92	3,000	3,000
Maldives	416	100	No data	> 50	-
Nepal	32,747	85	56	2,000	2,000
Pakistan	193,419	92	69	9,000	11,000
Sri Lanka	22,293	86	60	1,000	1,000
South Asia	1,801,401			64,000	115,000

Table 1: Daily increase in population to be served to meet the MDG target on Water supply and sanitation in 2015

The survival and well being of the Indian nation depends largely upon sustainable development and for this, sustainable water supply and sanitation are essential requirements. For the poor people living in urban slums and rural areas, bereft adequate sanitation and water supply, to achieve a better economic growth rate and higher productivity, priority has to be given to the health of these people.

State	Population[1] served by safe drinking water supply	Per capita Supply (liters per capita/day)	% Population coverage by sewerage
Andhra Pradesh	73.8	134	11
Assam	64.1	30	16
Bihar	73.4	61	23
Gujarat	87.2	133	38
Goa	61.7	NA	13
Himachal Pradesh	91.9	144	14
Jammu & Kashmir	NA	33	8
Karnataka	81.4	108	38
Kerala	38.6	106	28
Madhya Pradesh	79.5	185	8
Maharashtra	90.5	175	40
Orissa	62.8	239	10
Punjab	94.2	170	49
Rajasthan	86.5	108	10

Tamilnadu	74.2	94	48
Uttar Pradesh	85.8	192	14
West Bengal	86.2	106	20
Urban India	81.4	142	28

Table 2: Levels of Water Supply and Sanitation in Urban India

For this, improved sanitation and safe water supply is necessary. It is obvious that a massive effort is needed to reduce the sanitation backlog in the coming years and India has major contribution to make in this regard. Moreover, it is utmost importance, that the concept of sustainability is considered as a part this contribution. Viable alternative to CST is then become imperative.

Recent symposia in different parts of the world indicated that there is a need for alternative solutions, and that only a change in paradigm will allow us to achieve the Millennium Development Goals (MDG's). A paradigm shift that leads from the 'FLUSH & FORGET' systems to 'RECYCLE' in consonance with 'WASTE TO WEALTH' approach is therefore essential. Innovative, decentralized solutions that are cost effective and environmental friendly has to be developed without any further delay, for India. Amongst the various sanitation concepts, Ecological Sanitation, referred to as "ecosan, which can be termed as holistic approach to sanitation and water management, is the most efficient and viable solution. Though ecosan is becoming more and more known in India and several projects have raised awareness and also acceptance of these innovative sanitation systems, there is a significant lack of qualified people in the core of successful project implementation. Therefore, the project of capacity building on large scale, considering population and geographical volume of India, is undertaken. Described in this paper is the detail aspect of the project which, intends to increase the capacity of ecosan.

2. OBJECTIVES

The main objectives of the project are:

1 To increase the number of ecosan experts on different institutional levels in India, which are able to implement ecosan projects on their own.
2 To increase awareness and to improve the know-how of local authorities, engineers and planners, NGOs, related consultants and household individuals, for/about adapting ecosan solutions.
3 To enhance the ecosan organisation, implementation and management capacity in India on the individual, institutional and inter-institutional level.
4 To support a participatory, inter-institutional approach for locally adapted ecosan implementation, and to particularly support the Dalit involvement in the project.
5 To have number of pilot projects demonstrating the use of different ecosan models.

3. RESULTS/Action

The project consortium intents **to increase the capacity for ecosan implementation**, means: to increase the number of ecosan experts in India, which are able to implement ecosan projects on their own. The project is to train different stake holder groups in a participatory approach in how to implement ecosan solutions "on the job". This included all steps from problem definition, solution-finding, implementation of different ecosan modules in different social surroundings, up to developing sustainable solutions for ecosan implementation partnerships.

India being large country and considering the fact that enormous efforts are required for the big number to be made aware of this alternative sanitation solution, for effective implementation of this vital project, many organisations from India, namely ACTS, NAVASARJAN, IWWA, MJP, ICEE, and the organisations from other countries namely TTZ, SEECON, TNU, GTZ, have come together, along with Innovative Ecological Sanitation Network of India, **IESNI.** State water and sanitation dept. has come forward and has made available the excellent training facilities for this project which have class room training and "e" learning as well.

Fig 1: Ecosan Training Course

Fig 2: Ecosan Training material

In the Face to Face training the stakeholders gets a profound knowledge and awareness about sustainable sanitation, covering ecological, social, economical, cultural and methodical issues. The ecosan training session follows three parts:

1 **ECOSAN-FOR-YOU,** with focus on the specific roles of different stake holder groups in ecosan implementation
2 **ECOSAN ON-THE-JOB** includes all steps from problem definition, solution-finding implementation of various ecosan modules to sustainable development for private-partnerships for ecosan implementation**.**
3 **ECOSAN – KEEP ON DOING,** to train the participants to consolidate permanent exchange ,planning and implementation platform for ecosan in India, including durable EU-Asia exchange and joint initiatives

Besides training, several additional activities support the dissemination of the ecosan approach to the broader stakeholder group: an ecosan learning CD, an ecosan webpage and ecosan flyers are produced and related information are published in news letters. Unifying the experiences, from the European partners in worldwide ecosan implementation and capacity building, and from the Indian partners with local situation/problems and in implementation of first ecosan pilot projects and training, has strengthened the links and the mutual understanding and awareness of environmental issues between Europe and Asia with focus on good sanitation practises, benefit of the most vulnerable Dalit population. The cross-institutional and participatory approach, involving the governmental level, NGOs, the private sector (engineers, planners etc.) helps to strengthen the sustainable networks of institutions. In order to ensure the sustainability of the gained capacity, one important part of the training sessions is "ECOSAN - KEEP ON DOING", the participants are trained in how to establish and to consolidate a permanent exchange, planning and implementation platform in the first instance for ecosan in India, including durable EU-Asia exchange and joint initiatives.

The involvement of local authorities in the training activities dismantled institutional barriers and helped to raise awareness among higher government levels in the promotion of ecosan

technologies. By the increase of local ecosan experts the Innovative Ecological Sanitation Network India and capacity building activities will be further strengthened. The project aims to support the development of improved legislation, codes of conducts or related incentives that support the implementation of sustainable sanitation systems.

4. DISCUSSIONS & CONCLUTIONS

The project is an essential module for starting ecosan movement in target region. It queues in a range of already accomplished activities related to ecosan, and extents them through the very important aspect of a participatory and inter-institutional capacity building. The projects which already concluded are ACTS Eco-friendly Toilet centre at Rajendra nagar, Bangalore; Navsarjan Vocational Training School Project and Navsarjan Primary School Project Ahmedabad. Ongoing projects are Ecosan Neral tribal school project, Gujarat (Paliad) Dalit Project and Badlapur school Project.

Fig 3: Navsarjan Project

Fig 4: ACTS Eco-friendly toilet

The main activity of the project is to train the three different stake holder groups “government level”, ”multiplicators and consultants” and “implementers and users” in ecosan implementation based on a participatory cross institutional approach. The training activities will directly reach about **140** stake holders of the target group: through face-to-face training and to **300** participants through distance learning. The different dissemination activities will reach much more stakeholders directly. The number estimated to be about **4000.**

The foreseen platform of the project is to conduct training in all over India and with this setting up a city-network of ecosan platforms for ecosan implementation. Further, to establish different pilot projects in different urban situations (slums, public buildings, blocks of houses etc.) in different Indian cities and for individual households in rural part of India. This helps to convince the responsible potential ecosan constructors by giving them the option to see how ecosan modules work in practice. “ECOSAN-KEEP ON DOING” training session helps the stakeholder groups to train their participants to establish a platform for exchange and future implementation of ecosan projects.

Generating the local expertise and knowledge, through large scale capacity building to cater the urgent need, which in total will improve the sanitary situation in India in a short/medium term, will also support the India’s national environmental policy. This helps to improve the living conditions, health and the environmental urban situation, and helps to reach the goals on national and international level, like for instance the **Millennium development Goals.**

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