

EcoSanRes Programme - Phase Two 2006-2010

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1. Summary

1.1. General Objectives of the EcoSanRes Programme Phase 2

The demand for ecological sanitation services is not yet main-stream but indications of increased awareness and interest are showing that this could quickly change. In 2005 there were three international conferences dealing with ecosan in South Africa, India and Syria. Also, some 100 projects are currently underway in various countries. The need for improved sanitation services is enormous as outlined by the MDG work. Some 2.6 billion people currently lack sanitation services and this figure is increasing indicating that there is a need for significant innovation if this trend is to be abated. Enormous investments will be made over the next decade in order to help meet the MDG on water and sanitation and this goal has major and direct implications on several of the other MDGs. Sanitation as a sector has not really yet entered the era of sustainable development. Trends involving source separation and recycling seen within the solid waste sector have not really begun within the sanitation sector. The advocacy, development and demonstration of ecological sanitation approaches in developing countries will therefore help provide new possible solutions and choices and this clearly justifies the next phase of the EcoSanRes Programme, sponsored by Sida.

Phase 1 of EcoSanRes between 2002 and 2005 has provided a broad foundation of knowledge, experience and an international network of partners within the field of ecological sanitation. The emphasis on developing urban solutions was and still is a major challenge for all countries in the North and South. That several new ecological sanitation initiatives are occurring around the world as independent local initiatives is a good sign that the efforts thus far are having positive effects. Phase 1 emphasised communications and awareness raising, guidelines and methods, R&D and implementation in the form of ambitious full-scale pilot projects. Some of the pilot projects are in full swing while others are only commencing.

Building on this momentum, Phase 2 will be even more ambitious, primarily centred on mainstreaming of capacity building by engaging and further developing expert groups in the South that can take on regional leadership. As a contribution to poverty alleviation and reversal of environmental degradation, ***the prime objective of Phase 2 is to develop and promote pro-poor sustainable sanitation in the developing world through capacity building and knowledge management.***

- The Programme will facilitate the establishment and development of nodes of expertise that will conduct regional projects dealing with awareness raising, training, policy and regulations reform, R&D, testing and development, demonstration and social marketing. The Nodes will determine the programme content and priorities for their respective regions.
- The Programme will also further develop the Swedish and international expertise base adapting to the needs of the South, help coordinate international efforts, provide a communications and awareness raising function, and further develop the globally linked normative knowledge base (eg WHO eco-sanitation guidelines which were released in September, 2006).

1.2. Central Components of the Programme

The prime components of the Programme are as follows:

- Capacity building through regional node development to regionalise efforts in the South so that regional-based training, policy development and implementation can be carried out

- Integrated normative knowledge development to maintain cutting-edge advancement interventions within the entire sanitation system and cycle emphasising the concepts of sustainable development and gender equality
- Communications, networking and coordination to help mainstream sustainable sanitation and strengthen North-South and South-South linkages

In addition a management and governance function will be provided as follows:

- Project management, monitoring and financial management
- Governance in the form of an international board and an international review panel
- An International Co-ordination Group will be initiated in order to better 'streamline the various international programmes and efforts being made.

All components of the Programme will apply a gender-mainstreaming approach including the principles of sustainable development since these are considered vital to providing livelihood resilience and socio-ecological harmony.

The target groups of this programme cover local governments (public authorities, regulators and policy makers), NGOs, academia, the private sector, financial institutes, bilateral multilateral organisations, the media, and the informed public.

1.3. Global Sustainable Sanitation Fund

Associated with ESR Phase 2 will be the formation of a global fund (called the Global Fund for Sustainable Sanitation) for implementation and scaling up of sanitation projects in order to help meet the MDGs. The Fund is presently being developed by Stockholm Environment Institute and will be launched in 2007. The Fund will be an independent body with its own administration closely linked to the ESR Programme at the start. It will undergo a two-year development period and then be fully operational by 2009. It is anticipated that it will become a facility representing several bi-lateral funding sources from various countries and will have formal collaboration with development banks and foundations.

2. Context

2.1. The Sanitation Challenge

The Joint Monitoring Programme (JMP) of the WHO and UNICEF reported in 2004 and 2006 that the number of people lacking basic sanitation services rose from 2.1 billion in 2001 to 2.6 billion by 2004. It is common knowledge that improved sanitation has a direct positive effect in reducing diarrhoea morbidity (Fewtrell et al 2005¹). Still, progress in improving sanitation for almost half the world's population remains slow and diarrhoea from unsafe water, sanitation and lack of hygiene causes 1.8 million deaths per year, 90% of which are children under 5 years of age (SIWI, 2005²). Calculations by WHO show that sanitation has significant benefits well beyond paying for itself (5.5 benefit to cost ratios) by directly improving hygiene, health and livelihoods (Hutton and Haller, 2004³). A direct relationship exists between child mortality and access to sanitation. Improved sanitation is defined by the World Health Organization as connection to a public sewer, connection to a septic system, a pour-flush latrine, a simple pit latrine or a ventilated improved pit latrine. These are the basic conventional sanitation solutions that are in many cases inadequate in protecting both health and the environment. Sustainable sanitation can provide these added features and encompasses in general the following criteria (Winblad and Simpson-Hébert, 2004⁴):

1 Fewtrell, L., R.B. Kaufman, D. Kay, W. Enanoria, L. Haller and J.M. Colford Jr. 2005. Water, Sanitation and Hygiene Interventions to Reduce Diarrhoea in Less Developed Countries; a Systematic Review and Meta-analysis. *Lancet Infectious Diseases* 5(1): 42-52.

2 SIWI. 2005. Securing Sanitation: The Compelling Case to Address the Crisis. Stockholm International Water Institute. 40p. (http://www.who.int/water_sanitation_health/publications/securing sanitation/en/)

3 Hutton, G. and L. Haller. 2004. Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level. WHO/SDE/WSH/04.04.

4 Winblad, U. and M. Simpson-Hébert (eds), 2004. Ecological Sanitation – Revised and Enlarged Version. SEI.

- Disease prevention: the sanitation system must be capable of destroying or isolating faecal pathogens and provide improved hygiene
- Environmental protection: the sanitation system must prevent pollution and conserve valuable water resources
- Nutrient recycling: the sanitation system should return nutrients to the soil.
- Affordability: the sanitation system must be accessible to the world's poorest people.
- Acceptability: the sanitation system must be aesthetically inoffensive and consistent with cultural and social values including gender equality, convenience, dignity and security
- Simplicity: the sanitation system must be robust enough to be easily maintained with the limitations of the local technical capacity, institutional framework and economic resources.

2.2. Sanitation, poverty alleviation, and environmental security

Sustainable sanitation has direct benefits on human livelihoods by improving household economy and quality of life. Apart from these direct tangibles, sustainable sanitation has important implications on the wider context of environment and development. The most important direct link is between sanitation and the global hunger challenge. Poor developing countries are home for the world's 800 million malnourished people, and the totality of population growth (60-80 million people per year over the next 25 years), occurs here. Food production will have to double over the next 25 years, in developing countries, in order to eradicate malnourishment and keep pace with population growth, which is the 1st Millennium Development Goal (MDG).

It is increasingly understood that this cannot be achieved through continued expansion of agricultural land into natural ecosystems (forests and savannahs), without seriously eroding key ecosystem services from terrestrial and aquatic ecosystems. According to the Millennium Ecosystem Assessment (MA), 65% of key ecosystem services (such as biodiversity, water regulation, carbon sequestration) have been eroded over the past 50 years. Agricultural expansion is the key driving force behind this dramatic decline in ecological resilience in the world's landscapes. The only way to solve this is to raise productivity on existing farmland. Soil fertility is a key limiting factor to achieve the required yield increase. The nutrient balances of many farming systems in developing countries are highly negative – where much more nitrogen and phosphorus is exported away from farmland with the harvest, compared to what is replenished by the farmer (up to -70 kg N per hectare per year in East Africa). Sustainable sanitation systems can close the loop between food production and consumption, and provide key soil fertilization for farming systems that cannot afford commercial fertilizers. A recent estimate by SEI (SEI, 2005⁵) indicates that in sub-Saharan Africa ecological sanitation could, if fully adopted, provide an equivalent of all commercial fertilizers currently used on the continent.

Closing the loop between production and consumption of food, has important environmental benefits. The conventional waterborne sanitation systems generate vast amounts of wastewater, causing major eutrophication in downstream aquatic ecosystems. Lake Victoria, which is threatened as an ecosystem and as a source of livelihood for coastal fishing communities, is a prime example, where coastal cities and towns in Kenya, Uganda and Tanzania, are unable to properly treat sewage, which contributes to the eutrophication causing fish decline and water hyacinth invasion of the lake.

Carbon sequestration in soils is important for sustainability and productivity of agricultural land, by providing soil fertility and water holding capacity of soils. Studies suggest that up to 0.5 t carbon/ha/yr can be sequestered in the soil through composting and soil fertility management, which corresponds to a significant 150 million tons C/year on tropical croplands. Sustainable sanitation has the potential to contribute to sustainable agricultural practices which raise productivity and contribute to mitigate climate change. Sanitation linked to agriculture in developing countries, thus has links to both the efforts of mitigating climate change and the strategies to combat desertification, which is closely linked to improving the water balance on agricultural land through investments in building organic matter in topsoil.

2.3. Strategic role of ESR 2 and the MDGs to 2015

⁵ SEI, 2005. Sustainable Pathways to Attain the Millennium Development goals – Assessing the Key Role of Water, Energy and Sanitation. SEI. 103p.

As is well publicised the sanitation challenge is increasing and is estimated to be 2.6 billion people lacking basic services. This development is a reflection of the fact that sanitation in poor countries has not received the sufficient support both institutionally and financially that it deserves. In part it also reflects the lack of political interest in an area that lacks vision and innovation. Open defecation which statistically is the most common practice in the world is often the only alternative that provides at least a perceived hygienic and aesthetically acceptable solution. A dialogue at all levels – local, national, regional and global is necessary to instil new confidence that something constructive can be done. Also innovative advances are needed like ecological sanitation solutions that can both protect human health and the environment. The whole element of sustainability has yet to break its way into the sanitation sector and the approaches taken today reflect rather antiquated models that fail to provide long-term security. Sanitation was finally flagged at the recent CSD 12 and 13 meetings in 2004 and 2005. ESR was very active in mobilising opinion and interest especially at the CSD 13 meetings. Also SEI provided significant input to the debate around building sustainability into the MDGs at the recent UN World Summit in September with the publication of the report “Sustainable Pathways to Attain the Millennium Goals. Assessing the Key Role of Water, Energy and Sanitation” Some excerpts from this report follow below and in Fig 1:

SITUATION TODAY

- 2.6 billion people lack sanitation
- 1.8 million deaths per year due to diarrhoeal disease (90% children under 5 yrs of age)

MDG TARGET FOR 2015

- 1.75 billion people (50:50 urban:rural)
- 450 million households (hh) (60:40 urban:rural)

REGIONAL DIFFERENCES IN TARGET SIZE

Millions of households	UN Region	Urban to rural split
151	East Asia	70:30
112	South Asia	35:65
80	Sub-Saharan Africa	50:50
39	Latin America & Caribbean	80:20
38	Southeast Asia	50:50

In total 95,000 household installations per day are required between 2003 and 2015 to meet the MDGs.

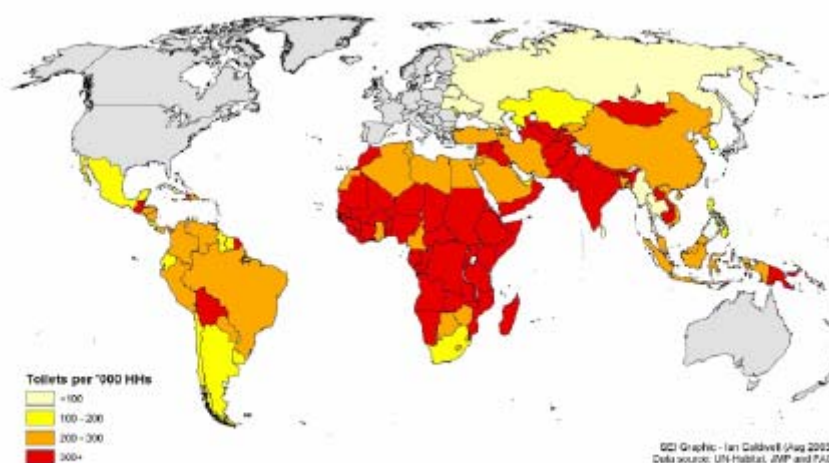


Fig 1. Number of toilets per thousand households to be installed through to 2015 to meet the MDGs

ESR 2 therefore has a key role in continuing the policy development and demonstration of sustainable sanitation solutions, providing opportunity to create interest and capacity in the target MDG countries and to demonstrate that ecological approaches to sanitation do work, are appropriate for rural and urban communities and are affordable.

2.4. Status of sustainable sanitation in the world today

Ecological sanitation has four main features: source separation, the containment of human excreta, its sanitisation and recycling back to the soil (closing the loop on both nutrients and water). This represents a paradigm shift in the entire approach to sanitation. Humans produce on the average only 50 L of faeces and 500 L of urine per year. A normal flush toilet uses an additional 15,000 L of drinking water per person per year. The greywater from kitchens and bathrooms adds an additional 35,000 L per person per year depending on the location. This makes waterborne sanitation a very costly item and a near impossibility for the cities in most developing countries if a majority of urban households are to be served. By making use of source separation, innovative solutions become available whereby the various products can be treated and returned to agriculture. These include soil composting shallow pit toilets instead of pit latrines, dry toilets with urine diversion for both rural and urban settings, toilets connected to biogas systems, etc. These are less costly than conventional systems when one takes into account the economic externalities such as human health and the environment. In particular ecosan has clear benefits for women in terms of their own living requirements, but also the household where sanitation often is managed by women. Ecosan can be applied in both rural and urban communities, both rich and poor and is particularly sensitive to the needs of both young and old. The provision of nutrients for production for cash crops is a central added-value component involving both men and women.

An over-simplified conceptual model of sustainable sanitation is shown below in Fig. 2. It integrates 8 major components that interact to provide sustainability (i.e. containment and sanitisation, recycling to soil, health and nutrition, environmental protection, institutional support, employment and livelihoods development, gender-friendliness and affordability).



Fig 2 Components of sustainable sanitation

The increasing demand

At the present time the demand for ecological sanitation is not of significant proportion. This innovative approach to sanitation has historical roots in East Asia but in modern times especially in urban areas it is really still in its infancy. Some 100 demonstration and pilot projects are ongoing in the world today according to an ongoing global inventory within the EcoSanRes Programme. The largest programmes are in China (the rural programme is already almost full-scale only after a few years after introduction), El Salvador, Vietnam and South Africa. Significant developments are in, for example, Mexico, Bolivia, Costa Rica, Guatemala, Peru, in several West, East and Southern African countries, in India, Sri Lanka, Nepal, Malaysia, Philippines, Ukraine, the Balkans, and in several countries in central Asia. In 2005 there were no less than three international conferences on the topic in South Africa, India and Syria. Numerous national and international training courses have been held over the past five years. Ecosan is now a priority for Sida, GTZ, aid agencies in the Netherlands, Austria, Switzerland, Finland, the WSP, UNICEF, Red Cross, WHO, UNDP, UNEP, UN-Habitat and several national governments. It is this increasing awareness and demand that phase 2 of the EcoSanRes Programme will be responding to and it is through regional capacity building that the Programme will help provide a supportive platform.

The strategy to promote alternative sanitation involves targeted awareness raising among stakeholders, from policy makers and legislators, to educators, social and biophysical scientists,

sanitation technicians, and civil society. However the emphasis of the targeting within the ESR Programme has been first to work with local community leaders and organisations involved in sanitation improvement, environmental and human health protection. Following this first step, in depth discussions and training are arranged with professionals and technicians. If these are successful, demonstration and pilot projects of various sizes can be introduced. These in turn lead to expanded training and awareness building to larger groups of people and eventually full-scale projects can be proposed. Throughout these steps requires an adaptive and opportunistic approach to management depending on the local situation.

EcoSanRes has been focussed on ecological sanitation but the term sustainable sanitation has been introduced as well.

“Sustainable sanitation protects and promotes human health, does not contribute to environmental degradation or depletion of the resource base, is technically and institutionally appropriate, economically viable and socially acceptable.”⁶ (with the present state of sanitation in the world today the issue of reuse and recycling is an optional feature)

Sustainable sanitation therefore includes ecological sanitation which can be simply defined as follows:

Ecological sanitation has 4 main characteristics:

- *source separation of urine, faeces and greywater,*
- *containment of each product*
- *sanitisation and treatment*
- *recycling of the nutrients, humus and water to soil and agricultural systems*

There is a growing interest within the water and sanitation community to encourage EcoSanRes to take on the broader area of sustainable sanitation including wastewater treatment and reuse. To do this would require major leaps and bounds in technological research, knowledge management and capacity development, in both the North and the South. And these go beyond the practical dimensions of development aid.

What EcoSanRes is prepared to do in this area is to provide dependable methods for source separation of greywater and practical methods of treatment and reuse. Also along the same lines, EcoSanRes should consider to take on source separation of faeces in urine-diverting flush toilets. But the whole area of trying to make mixed sewage systems more sustainable is well beyond the scope of this programme.

The question comes to a crossroad, however, when EcoSanRes is requested to deal with the whole question of agricultural reuse of untreated municipal and industrial effluents. This is a vast area requiring serious and immediate attention. And there are surely small and large-scale approaches that can be used to pre-treat such wastewaters in order to reduce pathogen loads and to retain nutrients for agriculture. For EcoSanRes to take on full-scale pilot projects dealing with this question would require major financial commitments possibly from several bilateral sources, beyond those from Sweden. This could be a topic worthy of discussion within the donor community.

Figure 3 illustrates the components required to close the loop on nutrients and water. Source-separation of products from households optimises the capability of containment, treatment and reuse. The big challenge especially in urban centres is that most of these products are mixed and diluted into large volumes of water, thereby resulting in a mammoth engineering task that is very costly. Sewage treatment systems in most parts of the world are difficult to finance and maintain. But this has not brought about new and innovative approaches that are economical, safe and sustainable. Ecosan development is really only in its beginning stages and requires enormous efforts to make significant impacts.

⁶ Kvarnström E.; Bracken P.; Ysunza A.; Kärrman E.; Finnson A. and Saywell D.: Sustainable Criteria in Sanitation Planning, Paper produced for People Centred Approach to Water and Environmental Sanitation, 30th WEDC International Conference, Lao PDR, 2004.

EcoSanRes Phase 2 will widen its scope in the following areas:

- closing the nutrient loop with agriculture
- address system interactions between water, agriculture and sanitation
- address rural, peri-urban and urban linkages
- further the emphasis on urban areas
- delve more into cross-cutting issues such as vulnerability linked to diseases like HIV/AIDS, gender aspects and environmental sustainability
- assess the costs of ecological sanitation

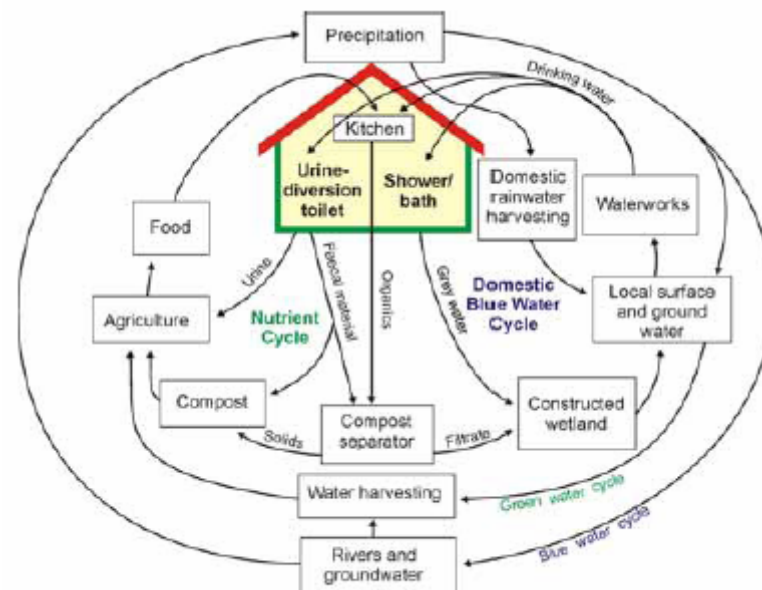


Figure 3 Components of closing the loop on nutrients and water.

3. Overall Programme Vision, Strategy and Future Direction⁷

3.1. Overall Strategic Aims of the EcoSanRes Programme

- To develop and introduce sustainable, innovative approaches to help improve sanitation services in needy communities in the South
- To advance knowledge on sustainable sanitation systems for livelihood improvement and sustainable development
- To advance integrated strategies that link sustainable sanitation to management of water, land, food systems and socio-economic development
- To work with and within the authorities, organisations and businesses that are responsible for sanitation in urban and rural settings in selected regions
- To integrate ecological sanitation into the mainstream sanitation by finding useful entry points and linkages
- To communicate more effectively about sustainable sanitation
- To emphasise in the public forum the advantages of ecosan in terms of health and environmental protection, water savings, simplicity, reliability and linkages to agriculture – elements that would allow sanitation to pay for itself

⁷ This section is based on the experience of carrying out ESR Phase 1, the Sida assessment of ESR Phase 1 (summarised in Annex 2) and the list of prescribed needs and actions arising from the Lubeck (2003) and Durban (2005) ecosan conferences (listed in Annex 3).

- To create centres of competence in selected global regions and to assist in building capacity in the area of sustainable sanitation
- To promote sustainable sanitation and to help coordinate the international efforts within similar programmes
- To support the development of policies and regulations that will allow for sustainable approaches to sanitation in developing countries
- To promote gender aspects in sustainable sanitation
- To ensure that the following building blocks are part of the ESR Programme:
 - o capacity building, regional node development and demonstration projects
 - o normative knowledge development
 - o communications and networking

3.2. Moving from Phase 1 to Phase 2

Phase 1 evolved from its forerunner the SanRes Programme which ran from 1993-2001. The general areas emphasised within ESR Phase 1 were communications and networking, capacity building, R& D and implementation in the form of pilot projects. The strategy used in Phase 1 was somewhat opportunistic based on the capacity available within the established ecosan networks available in 2001. The dominant activity within Phase 1 has been the pilot projects and in particular the project in northern China which has shown significant progress, with phase one completion in 2006. The ESR Programme has been reported on in progress reports, plus numerous publications have been produced.

3.3. Suggested Directions for the EcoSanRes Programme Phase 2

In general it can be said that expertise in the area of sustainable sanitation is extremely lacking throughout the world, especially when one considers the size of the global challenge at hand. Only a few countries have developed advanced research and development programmes with demonstration and implementation projects. The prime goal of ESR Phase 2 is therefore capacity building in the South. And it is through carrying out of hands-on projects through the regional nodes that this capacity will be built up.

The following is a list of areas now requiring special attention in Phase 2. These are offered as a comprehensive list of possible areas that the different regional nodes could take a lead on. Priorities will have to be made by the regional nodes through stakeholder consensus in dialogue with the ESR Programme.

3.3.1. Gender mainstreaming

Gender mainstreaming is basic to achieving sustainable sanitation and water use⁸. As pointed out by Hanna and Andersson (2002)⁹, the gender perspectives on ecological sanitation have not yet been specifically explored. An examination of the different roles women and men have with respect to sanitation improvement is necessary. Women's role in securing household hygiene and provision of food would be enhanced in programmes promoting ecological sanitation. Men's role as masons, builders and in latrine maintenance would also be enhanced through the provision of permanent and easily maintained installations. The added value of available nutrients and increased soil fertility from ecosan systems will have positive impacts on household nutrition but also income from cash crops. The ecocycle characteristic to eco-sanitation provides a central meeting point for both men and women. Ecosan projects tend to create a more equitable approach to both the planning and execution. Ecosan lends itself to being gender-sensitive when it comes to technology development, social marketing, socio-cultural linkages and socio-economic aspects. Phase 2 however will provide greater insight into and assess how well this work has succeeded thus far. Gender-mainstreaming capacity needs to be added to the governance, participatory and planning aspects of sanitation projects. Gender needs to be built into all the priority areas described below. The new Programme will make extra efforts to ensure that gender mainstreaming is a central feature to be addressed in the capacity building projects and activities.

⁸ UNDP. 2003. Mainstreaming Gender in Water Management: A Practical Journey to Sustainability: A Resource Guide. 90p.

⁹ Hannan, C and I. Andersson. 2002. Gender Perspectives on Ecological Sanitation. In: Proc 1st Int. Conf. on Ecological Sanitation 5-8 November 2001 Nanning, China. www.ecosanres.org

3.3.2. Targeted Capacity Building

The target groups of the capacity building efforts of the Programme are at three levels:

- *Regional level:* regional training and research institutions (training of trainers)
- *National level:* governments, institutions for research and training
- *Local level:* local government, municipal institutions, private sector organisations, NGOs and CBOs. Training will target e.g. small private contractors, sanitary engineers, health officials, urban planners, maintenance staff and health workers

Capacity building for scaling up of sustainable sanitation systems also requires participatory processes. Projects will include promotion, awareness raising and training of village and town leaders, inhabitants, and relevant government departments responsible for water and sanitation, housing, environmental protection, health protection, solid waste management and urban/local agriculture. Other targets will be business, universities, financial institutions and NGOs. It is through the process of demonstration and doing that capacity will be built. The learning alliances being used by CREPA in West Africa can be used as a model. Here ecosan has been introduced to cover social impact and acceptance, economic aspects, toilet design, containment and sanitisation, collection and storage, health impact and hygiene and agricultural reuse of products. An important learning aspect will be the concept of the sanitation system and nutrient and water ecocycles and not just the toilet itself. By addressing and understanding the entire system, health and environmental protection can be achieved.

Professional capacity is a major bottleneck in the development of sustainable sanitation practices. Examples of areas requiring attention are agro-reuse of human excreta, wastewater reuse, toilet design, urine system design and greywater systems. And the following groups need to be targeted: sanitary engineers, entrepreneurs, policy specialists, planners, maintenance staff, social marketers, communications experts, journalists, professors, teachers, trainers, architects, health workers, etc. Phase 2 will assist in introducing ecological sanitation into the curricula at universities and training schools in the South.

3.3.3. Policy, Legislation and Regulation

Policies covering provision of sanitation are lacking on local, national, regional and global scales. Sanitation was not included in the original set of MDG targets in 1990, but was added at the WSSD in Johannesburg in 1992. It turns out to be the largest single MDG, much larger than the targets for HIV/AIDS, malaria, safe water and nutrition. This in itself is revealing of the situation and the challenges at hand. Sanitation lacks dedicated political leadership and will. Legislation along the lines of the “Polluter Pays Principle” for municipal sanitation is virtually non-existent. For ecological sanitation to develop, basic legal definitions need to be created for human urine and faeces, which up to now are not recognized legally. For example, the EU has no regulations for collection or reuse of urine, thereby making such manipulations, in effect, illegal.

Phase 1 provided a first assessment of the challenges ahead especially in the area of legislation and regulations for human excreta handling, treatment and reuse. It also provided a series of guidelines which lead to the WHO guidelines, considered a major breakthrough in the development of ecosan systems. Urine and faeces have no legal status when it comes to legislation in most countries and modifications and reforms are therefore needed. Much development is required in this area and this should be one of the areas to be attacked in the regional node work during Phase 2.

3.3.4. Local leadership

Linked to this is the whole area of enhancing local leadership in the regional projects, in particular the pilot projects. In all pilot projects, one of the basic criteria for moving forward is the presence of dedicated local leadership. This will be improved by taking more time in contacting and communicating with the local authorities in the municipalities where the projects are taking place. A handicap experienced thus far in Phase 1 was the effect of a change in government. In Mexico, for example, mayors cannot be re-elected and must leave after one term (2-3 years). Most agreements become annulled and must be regenerated with the new regime. In Phase 2 agreements with local governments will be carefully worded to attempt to build in longevity. Also Phase 2 will provide the

Programme with a Director that can backstop the local partners in their work with local leadership so that the intentions of the Programme are well understood.

3.3.5. Social Marketing of Sanitation

During Phase 1 it became apparent that efforts have to be focussed on demand-driven processes for sustainable sanitation. Modern marketing methodologies and techniques need to be adapted to the particulars of provision of sustainable sanitation solutions in developing countries. It will be necessary to bring in expertise from the commercial marketing world with an understanding of the concept of closing the loop on sanitation including public exhibits, descriptive materials and media events.

Sanitation marketing in the words of WSP consists of:

- Winning consensus towards a marketing approach rather than supply driven
- Learning about the market (demand and supply)
- Overcoming barriers (eg regulations, new partnerships)
- Developing the right products and support to local industry development
- Regulating waste/nutrient transport and disposal/recycling

Phase 2 will need to build in social marketing as a capacity building component. The expertise for this is found in both the North and the South. This will be of major importance in urban centres where the issues of ecosystems and reuse are not always apparent or well understood by members of society. It will also be important in those areas of the world that are phobic towards ecological approaches to sanitation due to religious views, cultural traditions and aesthetics. These are not at all static issues, however. And if the facts are made clear about the risks of inadequate and failing sanitation systems, logic will sooner or later prevail. The introduction of dry ecosan latrines in India has produced very positive results and what was considered only 5 years ago as an impossibility is now becoming a reality. Introduction of the new WHO Guidelines on the handling, treatment and reuse of human excreta and greywater will have major impacts in the social marketing of ecosan around the world.

3.3.6. Economic analysis

Assessment of the costs of sanitation was found to be a very difficult area to tackle in Phase 1 of ESR. Good data on the costs of building and maintaining any sanitation system are difficult to find. And extracting relevant data from municipal governments is even harder. Costs of negative impacts of poor or non-existent sanitation on health and the environment are also very difficult to be had. Now with the establishment of a few large full-scale pilot projects (eg Erdos in China and Kimberley in South Africa) the original data will be made available from source. And the actual costs and benefits of urban ecological sanitation will be assessed. These will be compared with what conventional approaches would have cost, from neighbouring housing developments using sewage systems. By bringing in a few organisations that specialise in environmental and health economics (including input from within the Swedish resource base), necessary expertise will be added to the capacity building work. These assessments will have major impacts on the future implementation of source-separation sanitation at a large scale around the world.

3.3.7. Environmental, health and social impact assessment

Studies covering the social, economic and environmental impacts of ecosan will also be carried out in connection with the full-scale pilot projects. Methods developed for EIA (environmental impact assessment) will be employed. Here both positive and negative impacts will be evaluated using a **systems analysis and livelihoods and vulnerability** assessment approach. Although ecosan because of its ability to source-separate and contain the various fractions, protects ground and surface water, the process of collection and especially transport will have certain negative impacts eg in the form of energy consumption, especially if the products are not used in the immediate local areas. Also the labour intensive aspects of ecosan will have both positive and negative impacts. That people will be working with sanitisation systems also introduces new handling risks requiring added precautions for example in the steps of collection, and in the processing and treatment steps in ecostations. These need to be compared to the present risks that are being taken through the use of more conventional approaches such as pit latrines and waterborne sewage systems. Ecosan provides improved access to sanitation systems and this has major social impacts in terms of providing convenient, appropriate and affordable services.

3.3.8. Broader range of sustainable sanitation solutions including wastewater treatment and reuse

The more classic approach to ecological sanitation using dry techniques and source separation has been the optimal approach, especially where water has been lacking. But there have been considerable negative reactions to this attempt to specialise in dry sanitation, especially for the communities that prefer to provide waterborne solutions. Phase 2 should continue the process of devising ecological solutions for the collection, containment, treatment and reuse of wastewater from source-separated water fractions containing faeces only (following urine diversion) and greywater. This requires research on handling, treatment and reuse systems. These solutions would help introduce ecosan into the whole area of pour-flush and flush latrines that empty presently into leaky septic tanks, cess pits and deep pits. It is also important that the ecosan community of experts take on this research and development in order to assist in the transition of making conventional sanitation more sustainable.

With the use of dewatering and wet composting systems, ecological systems need to be developed for those areas of the world that prefer to use water-based sanitation. That farmers throughout the developing world are using raw wastewater from municipal sewage and industrial sources requires the attention of the ESR Programme. This includes evaluation of health and environmental risks, development of sustainable methodologies for pre-treatment e.g. gravity filtration systems, constructed wetlands, etc. and safe methods of reuse. The new WHO Guidelines will assist in these efforts.

3.3.9. Technology Development and Town Planning

A suite of technology development opportunities and new planning requirements exist in the process of mainstreaming ecological sanitation. These include aspects relating to architecture, building norms, building and bathroom design, ventilation systems, piping, latrine and toilet design, etc. The whole area of ecostation design especially in urban areas requires new elements within town planning whereby sanitation is integrated into urban centres and urban agricultural areas. Shifting sanitation in part to the solid waste sector may provide needed capacity to deal with organic fractions such as faeces and kitchen wastes. Water treatment and reuse and storm water management plus solid waste management are also centrally affected and require new approaches.

3.3.10. Cross-cutting issues of relevance

The MDGs provide a central platform for the ESR Programme to build on. The 8 MDGs are cross-cutting issues for sanitation to link with, i.e.

- reduction of poverty and malnutrition,
- universal primary education,
- gender equality and empowerment of women,
- reduction of child mortality,
- improvement of maternal health,
- reduction of malaria, HIV/AIDS and other diseases,
- ensure environmental sustainability, and
- develop a global partnership for development.

Providing safe and affordable sanitation that also increases soil fertility touches on most of these goals. It is therefore important in the formulation of the projects within the ESR Programme to design them with these goals in mind. This has an impact on the scientific methods, the parameters being assessed, the social marketing approaches taken and the overall strategy for communications and choice of target groups

3.3.11. Mechanisms of pathogen destruction

A key element in sustainable sanitation is the use of composting to treat faecal matter that contains pathogens (microbes and parasites). Much progress has been made of recent in this area by increasing pH (e.g. using wood ash) and storage time to reduce pathogen levels. But there are still questions surrounding the mechanism of destruction of ova in thermal and ambient temperature composting. This is especially of interest if wet systems are to be developed. Phase 2 should

provide the opportunity to further assess and improve low-cost treatment systems that can provide health protection.

3.3.12. Linkage of sanitation to improvements in coping with health-based vulnerability

Little has been studied about the nutritional and hygiene status of HIV/AIDS patients that are receiving medication to slow the downward trend in immune capacity and increased vulnerability. A literature survey was recently carried out by the CRS in Ethiopia (CRS, 2005)¹⁰ where the subject is introduced. The question to be tested is whether such patients can extend the length of their lifespan by improving hygiene practises (water and sanitation-related) and by improving the quality of their nutritional status by making use of nutrients from ecosan systems in subsistence farming. Ecosan provides nutrients that can be used in farming gardens and the resultant fresh vegetables and fruits can provide an important supplement to the diet.

Cohort analyses comparing ecosan and non-ecosan villages will be carried out during Phase 2 in order to test these hypotheses.

3.3.13. School sanitation

Schools in poor rural villages often lack adequate water and sanitation facilities. This is a problem around the world. The target size requiring attention is enormous and much capacity building is necessary in order to make a positive impact. Childhood is the best time in life to instil good hygiene habits. Primary schools are particularly well-positioned to provide guidance on hygiene, safe water use and sanitation not only for the school children but for their parents and families as well. Sanitation improvement in schools improves generally the attendance by girls through the provision of facilities that can properly accommodate their needs.

Phase 2 of ESR will assist ongoing school sanitation programmes (eg through UNICEF) and help introduce ecological approaches thereby introducing ecosan to children and their families. Examples of school sanitation using ecological approaches are found in the Ukraine (Mama-86), Mexico (Tepoztlan) and China (Nanning, Guangxi).

3.3.14. Collaboration with the private sector and influencing large-scale investment

The ongoing urban pilot projects particularly in Erdos, Kimberley and Buffalo City show clearly that if ecosan is to reach full-scale implementation, the private sector and related financial institutions are necessary to play a central role. This includes, for example, building companies, architects, toilet and urinal manufacturers, ventilation suppliers, manufacturers of collection bins for source separation, solid waste entrepreneurs, designers and builders of composting systems, agricultural entrepreneurs interested in recycling of nutrients (urine) and humus (compost), marketing and real estate companies and financial institutes and banks. Market expansion can be achieved through incentives, up-scaling initiatives, making inroads on building standards and through innovation funds. Continued collaboration with the private sector and development banks will be emphasised in order to help influence both small and large-scale investment programs.

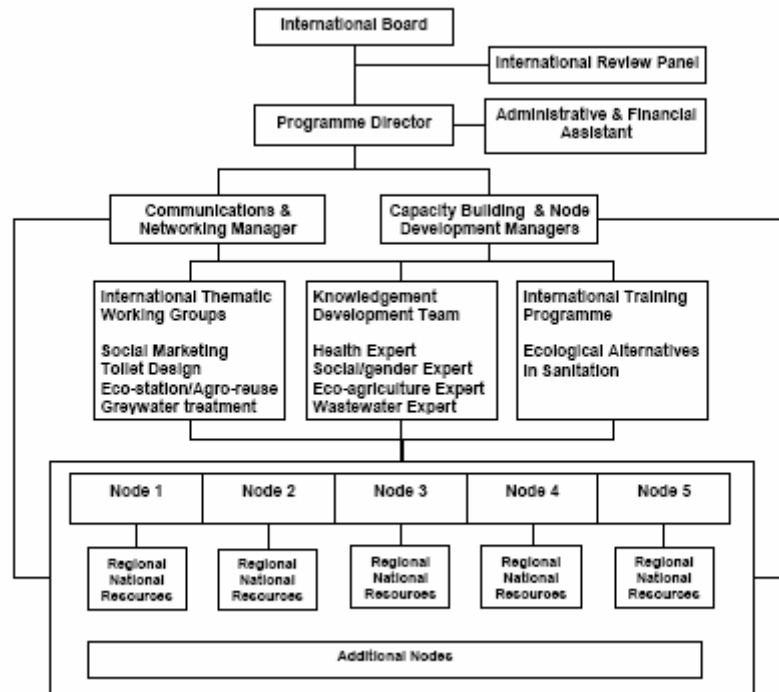
3.3.15. Networking and coordination between international actors

Networking has been based thus far on providing a professional level of response to opportunistic needs that have arisen. There has not been the time to work according to a larger communications strategy and thus there are missing links and gaps in the work. In addition, coordination between international actors funding ecosan projects around the world has not been possible. With Phase 2 there will be a dedicated manager for networking and communications in order to work around a more complete strategy including the formation of an International Coordination Group for Ecosan. The latter will provide an opportunity for the major international actors to co-ordinate their activities and exchange programme plans.

10 CRS. 2005. HIV/AIDS Water Security and CRS. What's the Connection?. CRS. Ethiopia. 15 p

4. Organisation and Staffing

The organisation chart below is being followed in the staffing process and the accession of regional partners.



4.1 International Coordination Group

There is a need to co-ordinate the efforts of ESR2 with other major actors around the world. Of particular interest are the linkages with e.g. WHO, WSP, UNICEF, UNEP, UNDP, FAO, UN-Habitat, GTZ, WASTE, SANDEC - EAWAG, BOKU, WECF, CREPA, WaterNet, CapNet, WaterAid, and other organisations involved in capacity building. In relation to health, a linkage with WHO is essential from several different aspects. A formalised liaison gives the advantage of policy promotion to a group of people that would be difficult to reach through different other channels. In addition, it may have the advantages of synergistic effects in relation to pilot and educational activities, related to the series of forthcoming WHO Guidelines. It gives an advantage in relation to monitoring of “health and impact indicators” on both an international as well as regional and national level. It further gives the advantage of focussing on different aspects and sub-areas of sustainable sanitation and provides the possibilities for comparative investigations in relation to different re-circulation aspects (including wastewater reuse). In relation to food security, it is equally important for ESR to work for a formalized relationship with FAO and other agricultural organizations, such as IFOAM (International Federation of Organic Agriculture Movements) and IFPRI, one of the CGIAR institutes. A break-through for acceptance of human urine for organic farming in the regions ESR will be active in can be a crucial factor for creating a demand for human urine and thus also for sanitation technologies allowing for collection of human urine.

By organising an International Coordination Group for international funding agencies, co-ordination of efforts will be possible to a larger extent than at the present time. In particular the agencies involved in funding projects in the South will be able to report on, co-ordinate and plan their initiatives. Thus, collaboration efforts will then be more effective and funding hopefully more efficient. This Group will be set up during the first quarter of 2007.

Also the linkage to such activities as NETSSAF which is a networking project sponsored by the EC and involving some 20 organisations in Africa and Europe will be part of the outreach, networking and as support to the regional co-ordination work.

5. Node Development and Capacity Building

5.1 Regional Node Terms of Reference

A regional node is an organisation that can take a lead role in the promotion and development of sustainable sanitation in a specified global region of the world. The node organisation would create a sub-network of regional and national organisations as targets for further capacity building and implementation. Each node will set up its own programme designed to serve that region. Each node will set up a networking team representing the participating organisations. EcoSanRes will provide an annual base budget for capacity building projects, workshops and a node manager. Co-funding or contribution of resources for the node will be necessary from the hosting organization. The node and participating organisations will also be able to seek additional funds for specific projects dealing with demonstration and testing, various studies and pilot projects. Sources of funds for the larger projects would be the Global Fund for Sustainable Sanitation, but also other sources managed by other bilateral organizations, multilaterals and finance institutions.

5.2 General Modus Operandi in Node Development

The central mechanism for capacity building within ESR2 is facilitation through the regional nodes. A stepwise approach is being taken to develop 10 nodes in Latin America (2), Africa (3), MENA, EECCA, South Asia, SE Asia and East Asia.

First a **scoping assessment** of potential lead partners and eventual host organisations is being carried out. A **workshop** will be held in each region with the most active potential partners to describe the criteria that a host organisation must have and also to discuss the results of the scoping assessment and the characteristics of the knowledge and capacity base in the region. Then a **call for proposals** will be made in order to allow possible host organisations to compete for the hosting role in each region. The proposals will be assessed by the Review Panel based on criteria. Recommendations will then be made to the Programme Board that will make a final decision. A **project document** will be written for each regional node and **annual workplans and budgets** will be drawn up.

ESR2 will write contracts with the host organisations and provide funds for personnel (e.g. **Node Manager**) and capacity building, training and demonstration projects. Advisory services will be provided by the ESR core team including the Knowledge Development Team but even local and international experts including the Swedish ecosan resource base.

5.5 Regional Node Activities

- Node to always work stakeholder-oriented and in a gender-sensitive way
- Each node to provide an overview of general status of region of sanitation in rural and urban areas.
- Each node to map capacity within region for sustainable sanitation (including policy, legislation, expertise, networking, private sector involvement, linkages with government structures) and strengthen liaison with regional partners
- Node to feed into policy-making processes in region.
- Each node to help regional partners formulate sustainable sanitation-oriented proposals for external funding, through e.g. Global Fund for Sustainable Sanitation
- Node to provide sustainable sanitation awareness raising, technical training
- Details on present status and potential for regional development of ecological sanitation;

6. Knowledge Development

6.1 Knowledge Development and Advisory Team

The knowledge development team made up of 4 half-time professionals will have a key role to play in the provision of advisory services especially in the development of regional nodes and the ongoing pilot projects within the ESR Programme. The expertise will be made available through direct contact and also as a pooled sourced of expertise to help plan training and curricula, demonstration, R&D, policy and implementation projects.

Under the direction of the Programme Director as advised by the International Review Panel with the day to day assistance of the Capacity Building Manager, the team will

- be responsible for the development of the existing knowledge base on ecological sanitation
- update and refine guidelines for the safe use of human excreta and greywater
- carry out formal liaison with WHO in the implementation of the new WHO guidelines dealing with ecological sanitation through the regional nodes
- assist in setting up curricula in ecosan for educational institutions
- develop materials for education, curricula and training
- produce semi-annual status reports, fact sheets and publications
- link experience from the ongoing pilot projects in the development of new projects in other regions
- published research summaries
- carry out workshops on specific topics
- provide responses to demands in the regions for technical support

In order to ensure that the international community is advancing knowledge in eco-sanitation and can provide regional advisory services, a rolling programme of knowledge development activities is proposed. The attempt here is to make use of and strengthen both the Swedish and international ecosan capacity and to catalyse its further development. The team will function as an integrated think-tank and advisory group and tackle a series of specialized topics:

- Social, health and environmental impacts
- Systems analysis/material flow research
- Handling and treatment systems for excreta and greywater
- Social acceptance assessments
- Gender aspects
- Livelihoods and health vulnerability research
- Economics of sanitation
- School sanitation topics
- Integration of ecosan with eco-agriculture and efficient use of water

But it is not enough that specialised topics be mastered. These need to be applied as well to cross-cutting issues such as:

- mainstreaming and scaling up of ecosan,
- design and operations to avoid odour problems,
- institutional capacity issues,
- logistics, maintenance and efficiency, and
- system performance

6.2 Global Thematic Working Groups

In order to better maintain cutting edge competence within the most active organisations around the world, four thematic working groups will be set up and managed by chosen experts. Leadership and active participation will be sought from partner organisations in the South. The working groups will cover a few selected topics of special interest. But as indicated for the Knowledge Development and Advisory Team a problem-oriented approach is necessary attacking cross-cutting issues. Through electronic discussion groups, sessions will be held, workshops organised and recommendations published. Key sectors and problem-oriented topics will be identified eg as follows:

- greywater and wastewater reuse,
- toilet design and architectural aspects,
- social aspects including gender mainstreaming
- economics of sanitation (primarily hardware)
- urine and faeces collection, composting, storage and agro-reuse
- health aspects (primarily risk assessment)

Four lead chairpersons will be identified. Participants will be chosen from organisations currently carrying out ecosan projects in the regions. Choices will be made in a gender-sensitive way. This will be a global collaboration effort as was recommended at the Durban Conference in May 2005. Scheduled electronic meetings will be arranged with strict agendas and PPT presentations by participants. The summary and proceedings of the meetings will be published on the general website by the group chairpersons.

7. Communications and Networking

7.1 Objectives

Communicating knowledge regarding ecosystem-based sanitation and its related fields has been key to successful acceptance and implementation of capacity-building, institutional development and policy promotion. Furthermore, since the aim of ESR2 is to advance the overall development agenda of poverty alleviation and especially in regard to the attainment of MDG7 Goal 10 in providing pro-poor sanitation, networking and outreach through designated channels is a prerequisite.

7.2 Supporting Development of Policy, Legislation and Regulation

Policies covering provision of sustainable sanitation are lacking at local, national, regional and global scales. In fact, sanitation was not included in the original set of MDG targets in 2000, but was added at the WSSD in Johannesburg in 2002. It is the largest single MDG target in addition to having bearings on additional concern, e.g. gender dimension, rights issues, decreased child mortality, safe water, improved maternal health, enhanced nutritional intake for better health and resistance to malaria, HIV/AIDS, tuberculosis, and lastly but not least poverty alleviation.

Sustainable sanitation has suffered from lack of dedicated political leadership. Policy, legislation and regulations along the lines of the “Polluter Pays Principle” for municipal and national sanitation legislation is virtually non-existent. However, a few champions have appeared during the years since WSSD. They include institutions and individuals, incl. national and municipal governments, international organisations, NGOs, as well as ministers, scientists, policy-focussed persons, and practitioners. Thus, an informal and growing international network of dedicated institutions and persons has developed. Indeed, the seriousness of efforts such as those of EcoSanRes, GTZ, WASTE, WHO and others have resulted in placing sustainable sanitation on the international agenda in connection with international meetings.

For ecosan policy and legislation to advance, basic definitions need to be formulated for the handling of human urine, faeces, greywater and solid waste streams. A major step forward is the publishing of WHO’s third edition of its *Guidelines for the safe use of wastewater, excreta and greywater*. This instrument provides recognition and support for introducing safe closing of the water and nutrients cycles. Yet, much work is required to have excreta reuse legally recognised. New studies and guidelines in regard to management, financing, economics, community acceptance, institutional development, urban planning tools, legislative frameworks for human excreta handling, treatment and reuse, social marketing, etc. are required. They will be developed in accordance with the specifications proposed by ESR2’s International Thematic Working Groups, Knowledge management Development Team and International Training Team. The priorities for the studies will be developed in collaboration with concerned stakeholders.

Thus, considerable development efforts are required in advancing the legislative frameworks and this is also one of the areas to be focussed on through communications and outreach during Phase 2. It is work that will take place both within ESR2 itself, within the Node development efforts and encouraged to take place in South-South collaboration. The work plan for communications and networking relates closely to the overall ESR Programme and is intended as support to management and the Strategic Planning Team in their endeavours.

When the communications and networking functions are fully operational, they will to a degree have paved the way for new programme initiatives, by having established proper contacts at the substantive and policy levels regarding particular subject matters or for different locations, i.e. local,

national, regional or international levels. The communications and networking functions presuppose exchange within the programme in addition to relevant external bodies. Therefore, the communications and networking activities form a pivotal juncture to facilitate interventions. Such collaboration is likely to provide synergies and increase the impact of any effort to promote ecological sanitation interlinking ESR2 with the MDGs.

7.3 Activities

The communications strategy for ESR2 is built on North-South and South-South collaboration. The following activities are foreseen, namely:

- Networking and Knowledge Management
- International publications series
- EcoSanRes Fact sheets
- Global and regional websites and general electronic discussion group
- Co-ordination between bilateral funding agencies.
- Co-ordination for policy development.
- Library service and help desk.
- International conferences
- Contact with media

7.4 Social Marketing of Sanitation

During Phase 1 it became apparent that efforts have to be focussed on demand-driven processes for sustainable sanitation. Modern marketing methodologies and techniques need to be adapted to the particulars of providing sustainable sanitation solutions in developing countries. It is therefore envisaged that expertise from business and the commercial marketing world will have to become conversant with and to fully understand the concept of closing the loop on sanitation. With the support from such experts ESR will prepare new public exhibits, descriptive materials and media events. Some collaborators have initiated such marketing efforts and in the words of WSP consideration needs to be given to:

- Winning consensus towards a marketing approach rather than supply driven
- Learning about the markets' demand and supply sides
- Overcoming barriers, e.g. regulations and new partnerships
- Developing the right products and support to local industry development
- Regulating waste/nutrient transport and disposal/recycling

Phase 2 will incorporate social marketing as a capacity building component. The expertise for this is found in both the North and the South. This will be of major importance in promoting urban ecosan. The issues of lifecycles, ecosystem based sanitation, recycling and reuse are not always apparent or well understood by members of society, especially not in urban areas. In part of the world where excreta reuse is not explicit, special social marketing efforts will have to be made. Additional efforts concern objections related to religious views, cultural traditions, political ambitions, socio-economic aspirations and aesthetics. They are not static and if the facts are made clear about the risks of inadequate and failing sanitation systems, logic will sooner or later prevail. The introduction of ecosan installations in India has produced positive results and what was considered an impossibility five years ago has now becoming a reality. The availability of the WHO Guidelines on the handling, treatment and reuse of human excreta and greywater will have major impacts in the social marketing of ecosan around the world.

7.5 Integrating Sustainable Sanitation into Livelihood Concepts

If ecosan is integrated into a framework of societal development and clearly put into a perspective that goes beyond the sanitation service to include livelihoods, the success in dissemination is likely to increase. This will also be the case with ESR2 as it is now part parcel with major fields of inquiry across a range of natural, health, and social sciences within the SEI sustainability programme and the centre of excellence in which SEI forms a part. There are clear linkages to and synergies to develop in relating the analytical tools of SEI programmes such as water for food production; conservation agriculture; risk and vulnerability; policy and institutions; etc. that operate at different scales.