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A Review of Sanitation Regulatory Frameworks

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Preface

This desk study has been produced by project leader Mats Johansson[1] and Elisabeth Kvarnström[2] from Sweden, in cooperation with Luis Enrique Ramos[3], Ana Cordova[4], Ron Sawyer[5] all from Mexico, Richard Holden[6] from South Africa, and Paul Semakula[7] from Uganda. The study has been financed through the Sida-funded EcoSanRes programme on ecological sanitation. The findings in this report are based on contributions from the authors and country-specific consultants. We did not have the resources to make a thorough legal and institutional analysis at country-level in order to be able to propose far-reaching country-specific changes and actions to existing legal frameworks, which also would have been outside the scope of this report.

The report has benefited from constructive comments from the EcoSanRes Programme Advisory Committee and also from Dr Jonas Christensen, Swedish Environmental Law specialist. However, the main authors of this report, Mats Johansson and Elisabeth Kvarnström, take full responsibility for any remaining errors.

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1 Introduction

1.1 WHY REVIEW THE REGULATORY FRAMEWORK IN RELATION TO ECOLOGICAL SANITATION?

The policies for water supply and sanitation (WSS) of many developing countries often seem good on paper, but in practice are not effectively implemented. The action plans aimed at implementing the policy are often unrealistic and impractical. Implementation of reform processes has often failed because involvement and commitment of stakeholders at all levels has been inadequate[8].

Ecological sanitation[9], where sanitized human excreta is reused in agriculture, is a concept that seems often to fall outside of the existing regulatory framework. One reason could be that the implementation of the complete ecological sanitation concept implies activities that touch more areas in society than conventional sanitation, hence making it subject to several different sets of regulations. Two aspects related to sanitation at large are public health and environmental protection. However, in the implementation of ecological sanitation there is also a need to focus on agricultural regulation since the objective is agricultural use of human excreta. The often weak legal and institutional framework in many countries makes it difficult to implement and scale up sanitation solutions such as ecological sanitation[10]. An investigation carried out in 11 Latin American countries regarding, among other things, the regulation of reuse of wastewater in agriculture showed that most of the countries lacked such regulation[11], and this also suggested that recycling of nutrients from waterborne systems might not be covered by current legislation in these countries.

The need to focus action on legislative aspects to achieve implementation of large-scale ecological sanitation projects has been underlined in recommendations made by the two major ecological sanitation conferences held 2001 and 2003, which is shown by the citations below:

A conclusion from the 1st Conference on Ecological Sanitation in Nanning, 2001:

"Ecosan is now ready to move beyond the small-scale demonstration project to the large-scale sustainable programme, especially in urban areas. To achieve this, by-laws and regulations may need to be adjusted and a system of incentives and sanctions devised." [12]

A recommendation from the 2nd International Symposium on Ecological Sanitation in Lübeck 2003:

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8 Seppälä, O. 2002. Effective water and sanitation policy reform implementation: need for systematic approach and stakeholder participation. In Water Policy 4 (2002) issue 4.

9 Definition of ecological sanitation in this report: Ecological sanitation systems are appropriate sanitation systems from which hygienically safe nutrients are recycled for productive purposes, with the lowest impact possible on the environment. This definition is, however, not universally accepted and many different definitions and understandings of what ecological sanitation stands for are currently in use.

10 Stoll, U. & Schönewald, B. 2003. Integrated management of water resources in projects of German financial cooperation. Paper presented at the 2nd International Symposium on Ecological Sanitation, 7-11 April, Lübeck, Germany.

11 Cavallini, J.M. and Young, L.E. 2002. Integrated systems for the treatment and recycling of wastewater in Latin America: Reality and Potential. IDRC-PAHO/HEP/CEPIS Agreement 2000-2002. OPS/CEPIS/PUB/02.94

12 Proceedings from the 1st Conference on Ecological Sanitation in Nanning, 2001.

> *"Adapt the regulatory framework where appropriate*
> *The documentation and results of pilot-projects must be transformed into among others technical, socio-economic, and reuse guidelines reflecting the interdependencies of water supply, sanitation, waste management, health, hygiene, environment, agriculture and energy supply. Ecosan technologies should be codified into the local, national and international systems of technical standards and norms in order to provide reference for Best Practice and Best Available Technology.*
>
> *The regulatory framework should be verified or adjusted with the aim of authorizing and promoting a closed loop with new innovative technologies and management concepts."*[13]

Thus, there is a need to review and document the present state of policies and regulatory framework related to some key areas for ecological sanitation, that is public health, environmental protection and agriculture. Moreover, there is a need to identify limitations and possibilities within existing legislation and regulation.

This report will provide the reader with four examples of how the regulatory framework regarding sanitation in four countries is built, and if and how the ideas of ecological sanitation relate to this. The barriers and opportunities, as well as identified target areas, are presented and they may be relevant for, or of interest when, discussing the introduction and development of ecological sanitation in other countries and settings. The examples and discussions may help the reader to identify the specific parts and aspects of their own legislation which are of interest in relation to the objectives of ecological sanitation.

For large-scale implementation of ecological sanitation it is important to analyse and understand the existing legislative situation from an ecosan perspective. This can be done both from a "what is not strictly prohibited?" and from a "what is specifically allowed?" perspective[14]. Depending on the perspective chosen different conclusions may be derived.

1.2 OBJECTIVES OF THE STUDY

The objective of this study is to review, document, and synthesize experiences of possibilities, limitations, difficulties and challenges in policies/regulation/legislation relating to ecological sanitation in four different countries.

1.3 EXPECTED RESULTS

The aim is to provide a base for further discussions on how existing laws, regulations and policies can be used to promote the development of ecological sanitation and to serve as input when developing sanitation policies and regulatory mechanisms at national, regional or local levels.

The lessons learned from the four studied countries, together with the barriers and possibilities that are identified, will provide new ideas and perspectives when challenging the legislative and regulatory problems often related to the implementation of ecological sanitation.

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13 10 Lübeck recommendations for action. In proceedings from the 2nd International Symposium on Ecological Sanitation, 7-11 April, Lübeck, Germany.

14 http://web.mit.edu/urbanupgrading/waterandsanitation/policies/defining-leg-frame.html

Target areas where openings for ecosan need to be made are also identified. These can be investigated and further developed by other actors in the field of ecological sanitation.

1.4 METHOD

Country-specific studies were carried out in the following countries: Sweden, Mexico, South Africa and Uganda. These studies have resulted in reports that have been the base for the country-specific part of this report. The contracted under-consultants were asked to address the following open questions:

1. What does the current legislation and regulation in your country state regarding activities and technologies associated with ecosan?
2. Which agencies regulate and control activities and technologies related to ecosan?
3. What gaps and overlaps exist in agencies and their mandates?
4. How are policies formulated in these areas and how well do they function or not function?
5. What are the main barriers ecosan faces in the current legislation and regulatory context in your country?
6. What are the main opportunities already open for ecosan in the current legislative and regulatory context in your country?
7. What are the target areas and policies that will have to embrace ecosan or where openings will be needed to be made?

1.5 DEFINITION OF LEGAL CONCEPTS

Below is a list of terminology used in the report and an explanation of what is meant by each term. These terms are being used in different ways in different countries and contexts and some of them may not even be applicable in some situations. This, together with the plethora of definitions regarding different sanitation concepts, technical solutions and agencies and organizations in each country, does not make the legislative and regulatory aspects of sanitation easily accessible for the non-specialist.

Act – decree or law made by a legislative body
By-law – law or regulation made by a local authority
Decree – order given by an authority which has the force of a law[15]
Directive – an official instruction can have many forms, i.e. the European Union Water Framework Directive
Legislation – the laws made or the action of making laws
Legislative body – an authority or institution which has the right to formulate and decide on legislation
Notification requirements – when an activity or circumstance must be notified to the authorities before actions are taken, i.e. not so demanding a requirement as a permit
Ordinance – order, rule or law made by a government or an authority
Permit – official document that gives somebody the right to own something or to do a certain activity

15 In South Africa the concept of a decree is unknown in this context.

Policy – a set of procedures, rules and allocation mechanisms that provide the basis for programmes and services. Policies set priorities and often allocate resources for their implementation[16]
Regulate – control or direct something by means of rules and restrictions
Regulation – a rule or restriction made by an authority
Regulatory framework – the context of laws, rules, by-laws and other requirements that steer a specific question, target area or situation, i.e. the implementation of ecological sanitation
Rules – what can and should be done in certain circumstances, i.e. local ordinances

2 Current legislative and regulatory situation and agencies regulating and controlling activities related to ecological sanitation

Each country has its own overall legal system and institutional framework for water and sanitation issues, legislative bodies and legislation at national/regional/local levels. The regulatory functions in the water and sanitation sectors are by some authors broadly divided into three major categories: economic, environmental and public health. But when discussing implementation of ecosan additional parts of the regulatory framework need to be considered such as planning and building regulations and regulations on agricultural activities. In many reports on the subject of regulatory aspects and sanitation economic regulations such as price regulation, service regulation and competition regulation have been in focus[17]. In this report more focus will be put on the environmental and public health regulations and also on other possible aspects which need attention when discussing more innovative approaches such as ecological sanitation.

2.1 CURRENT LEGISLATIVE AND REGULATORY SITUATION

2.1.1 Sweden

Legal system

Sweden is a constitutional monarchy, although the King's functions as head of state are limited to official and ceremonial interventions. The nation's legislature is the Swedish Parliament. The Swedish model means that the Swedish Government functions as a collective, which means that all decisions directed towards a public authority must be taken by the Government collectively. All missions and directives from the ministries to the public authorities must go through a Government meeting. This is where the Swedish model differs from the concept of ministerial rule. In addition, the Swedish ministries have relatively few employees in comparison with ministries in other countries.

Sweden is divided into 21 counties, each of which has its own County Administration and County Governor. The County Administrations function as representatives of the state in their

16 In South Africa policy is often defined as a plan of action made by government. Once a policy has been adopted it needs to given effect through legislation, (Acts at National and Provincial level and by-laws at municipal level).

17 An example of a thorough study of economic regulations for water and sanitation systems is: Tremolet, S. & Browning, S. 2002. The interface between Regulatory frameworks and Tri-Sector partnerships. Research and Surveys Series, BPD Water and Sanitation Cluster.

respective counties, and as links between the inhabitants, the municipal authorities, the Central Government, the Swedish Parliament and the central state authorities[18]. The counties are further divided into a total of 290 municipalities. The County Administrations are a regionally active part of the national state. The municipalities are self-governed in many aspects and are legally responsible, among other things, to carry out services related to sanitation and waste disposal and they also have a monopoly on the spatial planning within the municipality.

Ecological sanitation activities touch three different main codes or acts in Swedish legislation, namely the Environmental Code (which came into office in 1999), the Planning and Building Act (updated 1993), and the Public Water Supply and Wastewater Systems Act (currently under revision). These are further described in Appendix 1. In addition, both a number of agriculture-related laws and many EU laws have implications for ecological sanitation in Sweden.

The Environmental Code

The Environmental Code has the objective of protecting both environmental and public health interests. All wastewater discharge of either mixed wastewater or greywater is considered environmentally hazardous and permits or notification are required, which are issued by the local environmental authority, or for larger discharges, by the county administration.

The Planning and Building Act

The Swedish Planning and Building Act embraces the ideas of sustainability: reuse and recycling of natural resources. This Act gives the municipalities the faculty to single-handedly decide on the spatial planning and development of infrastructure in the local situation. However, the Planning and Building Act is seldom used by the planning sections of Swedish municipalities for steering the use of water resources and in strategic planning of sanitation. Strategic wastewater planning is usually performed by local and regional environmental authorities and cooperating organizations. The Planning and Building Act is therefore not used to its full potential in Sweden today.

The Public Water Supply and Wastewater Systems Act

The Public Water Supply and Wastewater Systems Act applies to all municipal water supply and sewerage systems and gives the municipalities a powerful tool for deciding upon sewerage and wastewater treatment. It gives the municipality the right to compel people to connect to a centralized system and the right to charge both a connection fee and yearly fees. This gives the municipal water- and wastewater departments a great income and power over water- and wastewater planning.

Laws regarding agricultural aspects and reuse

Agricultural laws and regulations also affect ecological sanitation systems. Currently, sludge is the only wastewater component which is regulated (SNFS 1994:2)[19], its reuse in agriculture is based on the EC directive 86/278/EEC. This regulation has been revised and a new regulation,

18 Read more at: http://www.lst.se/english/index.htm

19 NV 1998. Swedish Environmental Protection Agency's regulation regarding environmental protection, the soil in particular, when sewage sludge is used in agriculture (in Swedish). Swedish Environmental Protection Agency's Statute book: SNFS 1994:2, amended by SNFS 1998:4.

embracing wastewater fractions other than sludge, has been proposed by the Swedish EPA and is expected to be approved by the Ministry of the Environment and come into force in 2005.

EU-related laws

Sweden is a member of the European Union and is therefore governed by the EG Directive Water Framework which is now being implemented throughout the EU. There are also many EU-related laws and regulations that are applicable to agricultural activities. One EU regulation is the so-called "Positive list for organic fertilizers" on which all the fertilizers that may be used in organic farming within the European Union are listed. If organic farmers use any fertilizing agent not mentioned on this list they lose the right to use the label "organically grown" and hence their market niche. An example is that currently human urine is not mentioned on the "Positive list". Thus, it is difficult for organic farmers to use human urine even if they have nothing against it per se as a fertilizer.

2.1.2 Mexico

Legal system

Mexico is a federal republic with 31 states and one federal district, which is where the capital is located. The states are then divided into municipalities. There are three different types of legal regulations that are applicable for sanitation issues: federal, regional (state level), and municipal. Water, environment, soil, health, urban development and solid waste management issues are regulated at these three levels according to faculties given to each of the authorities involved. According to Mexican legislation, sanitation is considered a public service which falls under the jurisdiction of local governments. However, many issues that are directly or indirectly related to sanitation fall under regional (state) or federal jurisdiction. The new water law places a lot of importance on regional watershed management offices.

The officials at municipal level are in many cases politically elected and their mandates are for relatively short periods. As there is no established civil service in Mexico, senior politicians tend to fill public offices with friends and political cronies as pay-back for campaign support, contributing in turn to high levels of inefficiency and corruption. This leads to lack of local capability in the local administration. Furthermore, most politically elected officials can only serve for one term in office, which is another important factor in the lack of professionalism in the public arena. The limitation to only one term ("no reelección") was one of the key principles of the Mexican revolution, in order to prevent the sort of political domination that permitted Porfidio Díaz to remain in power for 30 years. This of course leads to lack of continuity and to changes in the local political agenda. Knowledge, experience and agreements that have been developed, for example, between a pilot project and a municipality, can very rapidly go astray.

The Federal Environmental Law

The Federal Environmental Law (LGEEPA) states that ecosystems and their elements must be used in a way that ensures their optimal and sustained productivity; that the responsibility regarding ecological balance includes both the present conditions as well as those that will determine the quality of life of future generations; and that prevention is the most effective means to avoid ecological imbalances. LGEEPA foresees the possibility of the installation of alternative systems processes or equipment as long as they fulfil corresponding environmental regulation. This Law also establishes the faculty by which the Ministry for the Environment can

establish conditions and evaluate the environmental impact of works and activities specified in law that may upset the environmental balance, as well as dictate official measurement regulations. LGEEPA establishes the need to treat water in order to return it in an adequate condition for use in other activities and to maintain the balance of ecosystems.

LGEEPA also regulates solid waste management in terms of prevention and control of soil contamination. It is stated that it is necessary to prevent and reduce the generation of municipal solid waste; incorporate techniques and procedures for their reuse and recycling; as well as regulate their management and final disposal. However, the operation of solid waste management systems falls under municipal jurisdiction.

The National Water Law

The National Water Law considers it of public interest to foster the development of sanitation systems as well as the efficient use and conservation of water in all phases of the hydrological cycle. As mentioned above, the LGEEPA states the need to treat water before discharge. There are also special regulations called Official Mexican Norms (NOMs) that establish the obligation for municipalities to reduce and prevent water pollution as well as to determine the quantity and degree of pollutants discharged in water bodies.

By constitutional prescription, the Nation is the owner of water in Mexico. These waters can be used and exploited by private persons or organizations through grants or permits, which constitute acquired rights once given. States and municipalities must be granted specific allocation of water rights to use and exploit national waters. Specific permits must be granted for wastewater discharges. The National Water Commission (CNA) is the competent authority which delivers all concessions, water rights and wastewater discharge permits to national water bodies. Concessions and allocations can be granted for periods ranging from 5-30 years, with the right of extension for an equal period.

The Federal Health Law

According to the Federal Constitution all people have the right to the protection of health. The translation of this right in terms of the Federal Health Law (LGS) means the improvement of the quality of human life. In this sense, according to this law, there is a National Health System the objective of which is, amongst other things, to support the improvement of sanitary conditions of the environment. Fostering basic sanitation is stated in the law as one of the basic health services that the State must address.

2.1.3 South Africa

Legal system

To gain an understanding of the legislation and policy context it is important to understand the political dynamics of the country as this has had a major impact on the development of legislation and people's aspirations. This is briefly discussed below and a more detailed description can be read in Appendix 2.

Until 1994 the country was governed by a number of different and fragmented systems. The only standard, which appears to have been applied consistently, and then only in the municipal areas, was the National Building Regulations (NBR). The NBR set waterborne sewage as the standard compelling consumers to link to a municipal reticulation system, if provided, and pay the tariffs whether they wanted it or not.

Outside of the municipalities there were no standards and anything was acceptable. Since there was very little money allocated to sanitation people provided for themselves in the form of pit toilets or septic tanks.

Also South Africa has spheres, not tiers, of government. This means that the Constitution assigns responsibilities to the different spheres, and as long as local government acts within its mandate it cannot be instructed what to do by another sphere of government.

Regulations

The main regulations affecting ecological sanitation are the National Building Regulations, which were developed to ensure that buildings complied with certain acceptable standards. They combine structural, architectural and wet service elements into a single standard utilizing them to satisfy rules.

There are a number of other acts that affect sanitation. These are:

- The Constitution of the Republic of South Africa (Act No. 108 of 1996)
- National Water Act (Act No. 36 of 1998)
- Water Services Act (Act No. 108 of 1997)
- National Environmental Management Act (Act No. 107 of 1998)
- Public Finance Management Act (Act No. 1 of 1999)
- Municipal Finance Management Act (Act No. 36 of 1998)
- Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947)

These, together with the policy documents that have been developed[20], do not comprise comprehensive and integrated sanitation policy, strategies and legislation covering all aspects. The policies and programmes only cover access by households to on-site sanitation, with a focus on the rural areas, rather than forming an integrated policy covering household access to sanitation, safe disposal of excreta, effluent and health and hygiene.

Safe disposal of excreta and effluent is covered under National Water and Environmental Management Acts.

A "Classification of Sewage Sludge and Permissible Uses" exists taken from the Water Research Commission Report "Permissible Utilisation and Disposal of Sewage Sludge, August 1997". Strictly speaking, the dry content of a urine diversion toilet is not a sludge (i.e. from a sewer mixed with all the other pollutants). However, in terms of the report it can be classified as a sludge with a wide range of application possibilities, provided that the faeces fraction is stabilized, shows high hygienic quality, and is certified. For it to be used for agricultural/horticultural activities, it must be registered in terms of the legislation. This legislation, however, dates from 1947.

2.1.4 Uganda

Legal system

Uganda is divided into 56 administrative districts, each of which is divided into counties, sub-counties and villages. There are about 40,000 villages. District councils form the apex of local government below which there are sub-county councils and village councils. Towns with populations over 15,000 have town councils.

20 See section 3.2.3 below.

Over the past 15 years new policies have been established for sanitation in terms of health, water, and environment at local and national levels. Although this development had strong political and governmental support, as years have passed by this has waned. There has been a slow implementation of the policies and sanitation services, especially in rural areas.

The government of Uganda is following a policy that decentralizes power and decision-making to the lowest practical local government level. Responsibility for the delivery of basic services now lies at the district and town council levels. There exists a reasonably well-developed framework of national sanitation policies. Laws and regulations have been established or revised to support these policies and the process is still ongoing. The reformation of the water sector which has taken place had one major component, i.e. the decentralization of responsibilities to regional and local authorities mentioned above. At the same time as this reform the Government cut all the former subsidies for constructing latrines in rural areas and stated that further costs should be met by local funding and initiatives.

The Constitution of Uganda (1995)

The Uganda Constitution advocates a clean and healthy environment. The Constitution empowers central government, local governments and the communities/municipalities to ensure that it is a fundamental right for every Ugandan citizen to have access to a clean and healthy environment.

Local Government Act (1997)

The Local Government Act defines, albeit somewhat vaguely, the roles of local councils in providing and promoting sanitation and hygiene services at community and household levels. However, the annexes to the Act can be interpreted in many ways. The Act provided for the decentralization of powers, services and resources from central government to local government with the aim of increasing local democratic control, participation in decision making, and mobilizing local support for development activities relevant to local needs. In this way the Local Government Act provides an opportunity for the district to enact laws or formulate policy regarding ecological sanitation, if they find it an acceptable option/alternative for excreta management, and the possible use of the sanitized human excreta as a fertilizer and soil improver. However, it currently appears that no local government has enacted specific policy or legislation regarding the use of ecological approaches for the management of human excreta.

Decentralization policy

The district councils have powers to enact District Laws (Ordinances) while urban, sub-county, division or village councils may, in relation to their specified powers and functions, make ordinances and by-laws that are not inconsistent with national statutes or the constitution. These could include legislation regarding the development and use of ecological sanitation approaches at district levels and below. Through this method, it is hoped that the district and other lower local councils will effectively control and manage their excreta disposal systems and environment. However, the technical and legislative capacity to carry out these functions at these lower levels is lacking.

The Public Health Act

The current Public Health Act was enacted in 1935. It is now considered outdated and all the key health laws and regulations are being collated into a National Health Services Act that is to replace the Public Health Act. However, the Public Health Act is still in force in Uganda.

According to this Act (Chapter 269) every citizen is obliged to have suitable access to an excreta disposal facility (latrine) in his or her home and at work places. Lack of sanitary latrines is defined as a nuisance.

The National Health Services Act (currently in the making)

The new act, the National Health Services Act, is expected to take into account the needs of new population groups and patterns (as observed in people living in urban centres, small towns, rural growth centres, rural communities and also in emergency situations). Moreover, it is expected to consider the development of approaches, technologies and technical guidelines appropriate to the social-economic and geographic (including geological) conditions of the user communities and the development trends within the sector. The National Health Services Act, when enacted, will cite the contemporary technologies and approaches, including ecological approaches to sanitation.

National Health Policy

The Ministry of Health has in place the National Health Policy. This is an umbrella policy regarding the health sector. The flexibility in the national health policy should allow for the formulation of appropriate legislation that would, for example, leave the way open for more permanent technologies. However, this process has to be initiated most probably by the Environmental Health Department or other competent agency as it will be implemented in an integrated manner in addressing the priority health problems.

The Health Sector Strategic Plan

The Health Sector Strategic Plan was developed and launched in order to bring the National Health Policy into operation in line with the national Poverty Eradication Action Plan (PEAP) launched in the financial year 1999/2000. Regarding its outputs, focus lies on the strengthening of the legal and regulatory framework. One of the elements of this output area is the strengthening of Health Acts. In line with this, the Environmental Health Act and its subsidiary legislation is currently being formulated. It involves developing and reviewing environmental health policies, supportive laws, and regulations and guidelines related to the promotion of sanitation.

Environmental Health Policy (draft)

The Environmental Health Policy, a sub-set of the National Health Policy (which will also act as the Sanitation Policy), is in the process of formulation. This policy describes, among other issues, the intentions and agreed norms of government (Ministry of Health) regarding the management of human excreta. The technical considerations in this policy state that sanitation facilities shall be subject to acceptability and adaptability of the users. Specifically, all sanitation systems should be designed in such a manner as to reduce the environmental impact of unmanaged human waste disposal. Hence, ecological approaches to sanitation have been included among the options for the management of human excreta in this policy.

The Water Statute

The Water Statute, enacted in 1995, is the fundamental code for the use, protection and management of water resources and water supply; and for the constitution of water and sewerage authorities for the various towns and cities.

The Waste Discharge Regulations (1998)

The Waste Discharge Regulations 1998 define standards for water discharged into water or onto land – within quite strict limits (NH4-N<10mg/l, COD<100mg/l). This could be favourable for ecosan solutions, at least theoretically. The responsibility lies with the National Environmental Management Authority (NEMA) which was operational by 1997.

2.2 AGENCIES REGULATING AND CONTROLLING ACTIVITIES AND TECHNOLOGIES RELATED TO ECOSAN

The agencies and authorities have important roles in regulation of sanitation services, law/regulation enforcement and the follow-up and monitoring of the performance of the systems. In this part of the report the most important agencies and actors at national, regional and municipal level are presented for each country. This is not a fully comprehensive description and shall be considered as an overview to help the understanding of the discussions in the following parts of the report.

2.2.1 Sweden

National level

The Swedish Environmental Protection Agency is responsible for environmental, water-related, and public health issues. The EPA also has responsibility for implementation and follow-up of several National Environmental Quality Objectives such as the objective of no eutrophication. The Swedish EPA is responsible for some regulations regarding agricultural reuse of different products from wastewater and organic household waste.

The National Food Administration is responsible for the quality of drinking water both produced within the centralized municipal water plants and the drinking water from private sources such as private wells. This national administration shall ensure that all Swedish persons have access to enough water of good hygienic and chemical quality.

The Swedish Board of Agriculture is responsible for all aspects of agriculture and the environmental and public health aspects related to this. One EU-related topic is the "Positive list" mentioned earlier on which all the fertilizers that may be used in organic farming within the European Union are listed.

The National Board of Health and Welfare and the Swedish EPA are responsible for public health aspects, with the EPA being responsible for the parts lying under the Environmental Code and the National Board having a wider scope.

The National Board of Housing, Building and Planning is the national body responsible for urban development and spatial planning of land and water resources.

County – regional level

County administrations are responsible for environmental, water-related, agricultural aspects as well as public health and urban development/regional planning. The county administrations act as the link between the national boards and the municipalities. The county administrations grant permits for large-scale "environmentally disturbing activities" such as discharge of wastewater from municipal wastewater treatment plants.

Soon Sweden will also have five regional water boards, which will be responsible for the implementation and follow-up of the EU directive on water quality.

Municipality – local level

The municipal authorities are the implementing body for sanitation services, as well as for urban development and spatial planning. The local environmental authority, within the municipality, grants permits and is responsible for control of the functioning of on-site wastewater systems. Approximately one million on-site systems exist in Sweden. The control of their function is usually exerted only if re-construction permits are demanded or acute problems occur and are brought to the attention of the environmental authority. Thus, the efficiency of the large majority of the million on-site systems is unknown. The environmental authority is also responsible for the control of treatment efficiency of the municipal wastewater treatment plant, the function of which falls under the technical division at the municipality. This control function is, however, implemented. National recommendations and guidelines are used at municipal level to guide decisions.

2.2.2 Mexico

Authorities and other stakeholders at the national level

The Ministry for the Environment and Natural Resources, is in charge of the coordination, planning and implementation of policies regarding the environment. Amongst other things, it establishes conditions and evaluates the environmental impact of activities and projects that may interfere with the environmental balance.

The Ministry of Health, amongst other obligations, must improve and protect the sanitary conditions of the population and promote related policies according to environmental prescriptions. It dictates specific Official Norms to regulate sanitary processes and systems.

The Ministry of Agriculture and Rural Development. This ministry must promote the sustainability of rural activities including a rational use of natural resources, as well as the prevention and control of soil contamination (which includes solid waste management).

The National Water Commission. This authority, which is attached to the Ministry of the Environment, is basically in charge of all aspects related to water management, including sanitation issues. It dictates Official Norms related to wastewater discharges. Implementation of sanitation systems is considered of public interest. This is a leading authority regarding implementation of sanitation systems.

Authorities and other stakeholders at the regional level

Although in Mexico many faculties in this specific area are given to the municipalities, State authorities retain some important ones. Some are related to planning, regulation and surveillance, but some are executive faculties as well. Examples of the latter are aspects related to sanitary control in general, and specifically to the control of water provision services and sewer systems; formulation and implementation of policies of conservation, land-use and water systems management. State authorities are required to monitor waters under their jurisdiction to prevent the presence of pollutants or organic wastes. In housing developments they should promote the incorporation of environmental-friendly technologies, including dry toilets (for the case of the State of Morelos). In practice, regional authorities exercise many coordination activities, linking municipal and federal authorities. State ministries differ from state to state

in Mexico. In the following section we describe the relevant agencies of the Morelos State Government:

Environmental Development Ministry. Its major task is the prevention and control of pollution, and planning the instrumentation of a policy of conservation and environmental balance.

Ministry of Health. Within its scope one of the main responsibilities is the sanitary control and regulation of activities that present a potential risk to health. It has many surveillance faculties, including control of compliance with the Mexican Technical Norms.

Agricultural Development Ministry. It is required to take into account the preservation and sustainability of soil exploitation as criteria in policy making. It is also in charge of developing the inventory of agricultural resources of the State.

Water and Environment Commission. It is responsible for the promotion and regulation of activities and programmes for water use and the environment, including policies for reuse of water and the monitoring of waters within the jurisdiction of the State.

Urban Development and Public Works Ministry. This institution fosters urban development and housing. Within its mandate it must curtail deterioration of the environment.

Authorities at the municipal level

The municipal councils are the implementing bodies for sanitation services, as well as for urban development and regulation of land use. Although they have primary and more direct responsibility over the provision of basic services, municipalities often lack financial, technical, administrative and human capacity to fulfil the wide range of obligations assigned to them. The constant change of municipal authorities – every three years – inhibits middle and long term planning. Sanitation is an area which is particularly affected by these obstacles and it is often neglected or marginalized because it is less profitable in terms of political party politics.

2.2.3 South Africa

In South Africa there are three spheres of government, National, Provincial and Local. The constitution allocates responsibilities to the different spheres. These are, broadly, policy making at national level, monitoring and regulation at provincial levels (though provincial parliaments can enact province-specific legislation) and implementation at a local level.

At local level there is currently a two-tier system of district and local government. The ultimate goal is to devolve all powers to local government as their capacity increases. The result is that currently different district and local municipalities have different responsibilities allocated to them.

National and provincial level

The main role players at national and provincial level are:

The Department of Water Affairs and Forestry.

1) As the public trustee of the nation's water resources the National Government, acting through the Minister must ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all persons and in accordance with its constitutional mandate.

2) Without limiting subsection (1) above, the Minister is ultimately responsible to ensure that water is allocated equitably and used beneficially in the public interest, while promoting environmental values.

3) The National Government, acting through the Minister, has the power to regulate the use, flow and control of all water in the Republic.

To this end the Department issues permits for the abstraction of underground and surface water and the discharge of any effluent back into the environment. Control of the Department is exercised nationally through the Minister and the Portfolio Committee as water must be managed on a national (and international basis) and not at provincial or local level.

This department also monitors municipalities in their delivery of services through Water Services Development Plans. This is currently problematic as a national department is monitoring when this should be at provincial level.

The Department of Environmental Affairs and Tourism's (DEAT) duty is to preserve the environment through a consolidated environmental implementation and management plan.

To ensure integration and co-ordination of environmental functions it comprises a national committee of ten national, and their respective provincial, departments, plus a representative of local government (SALGA). This committee has a statutory duty of making recommendations aimed at securing compliance with environmental principles and the harmonization of environmental functions.

The Department is also responsible for assessing Environmental Impact Assessments, which require authorization or permission by law prior to their implementation. In terms of water services these are required for:

1) The construction or upgrading of:
   - schemes for the abstraction or utilization of ground or surface water for bulk supply purposes; and
   - sewage treatment plants and associated infrastructure.

2) The change of land use from:
   - Agricultural or undetermined use to any other land use (from the Department's point of view the most significant change is to residential use, particularly for low income housing).

To obtain such an authorization the responsible person must employ an independent consultant who must demonstrate that the activity will not have an adverse effect on:

a) the environment;
b) socio-economic conditions; and
c) the cultural heritage.

The Department of Provincial and Local Government is responsible for the effective functioning of municipalities. To ensure the effective delivery of sustainable services every municipality is required to draw up an Integrated Development Plan (of which the Water Services Development Plan is part). The problems with both these plans are that they are often an infrastructure "wish list" rather than a comprehensive SWOT analysis of the municipality, with a realistic programme on how to deliver sustainable services. In July 2004, to ensure a more coherent approach to infrastructure development all municipal grant funding was consolidated into the Municipal Infrastructure Grant, which is administered by this department.

The Department of Health is responsible for developing a comprehensive environmental health policy and supporting its implementation at district municipality level. At present this policy is very weak with no legislation clearly assigning the roles and responsibilities of the municipalities, and thus the duties of the Environmental Health Officers ("EHOs"). As a result the "EHOs" are often left without the resources to enable them to undertake their work, particularly where they have been transferred from provincial health structures to district municipalities with no experience in this work. Also, their responsibilities have changed dramatically over the past 10 years from being reactive Health Inspectors to proactive preventative "EHOs".

Municipalities – local level

The municipal authorities are the implementing body for all services as well as for spatial planning. The policy framework in which a municipality does this is the Integrated Development Plan (IDP). It develops an IDP in line with policy developed by national government. The policy for determining tariffs falls within the IDP. Tariffs are determined by the type of technology and the operation and maintenance costs, socio-economic status of the residents and grants from national government.

At all levels the work is carried out by officials overseen by elected politicians. At local level the degree of responsibility taken by politicians varies depending on whether the municipality has an executive mayoral system or not.

2.2.4 Uganda

The situation and the regulatory context in Uganda are developed but quite complex. The question is how the different institutions, advisory committees, working groups etc., really are reaching out and implementing the laws and policy documents that have been developed.

The system exists at two levels: the national level and the district local governments. At the national level it is broadly concerned with policy making, formulation of guidelines and monitoring the progress of activities at district local government level. At the district level there exists a two-tier system (district local government and the sub-county local government).

At all the three levels mentioned above (national, district and sub-county) there exist two structures: a political structure that is elected by the people and an administrative structure composed of technical persons appointed by the Public Service Commission at national level and the respective District Service Commission in the 56 districts. The political structure represented by a district local council is responsible for the development of district policy in line with national policy, approving district plans, and overseeing the implementation of these plans. This is done through sectoral committees responsible for public health, agriculture, environment etc. The administrative structure is responsible for the technical implementation of these plans under the various corresponding Departments of Public Health, Agriculture, Environment etc.

National level

Responsibilities regarding sanitation are generally defined in memorandums of understanding between the Ministries of Health, Water and Education, which define their respective responsibilities with regard to sanitation, including household sanitation, waterborne sanitation, school sanitation. These memorandums of understanding between the three ministries were developed in the year 2001.

Added to these are some interesting bodies and actors that heavily influence the ecosan activities:

Ministry of Health
At ministerial level the Ministry of Health, under the Community Health Services Department, takes the lead responsibility for the development of policy and regulation regarding sanitation promotion in general. Specifically, the Environmental Health Division (EHD)[21] is charged with ensuring that these roles and responsibilities are fulfilled regarding the promotion and control of rural household and community sanitation. At the 3rd joint sector review, 2003, it was decided that sanitation be given stronger importance and not be neglected as compared to water supply. This, in effect, led to the setting up of a sanitation sub-sector working group to oversee and give guidance on how sanitation and hygiene can receive appropriate attention and response, particularly regarding development of strategy and the allocation of resources for sanitation and hygiene.

Ministry of Water, Lands and Environment (and agencies thereunder)
The Ministry of Water, Lands and Environment, through the Directorate of Water Development (DWD), plays a central role in the development and implementation of national policy for the water and sanitation sector. It also plays a supportive role in the formulation and implementation of policies and regulation at district level.

Ministry of Education
The Ministry of Education is responsible for school sanitation, including both implementation in schools and consideration in curricula.

Inter-Ministerial Steering Committee (IMSC)
The Inter-Ministerial Steering Committee (IMSC) is a policy- and strategy-making body that addresses water supply, sanitation and hygiene. It is made up by the Permanent Secretaries and Directors from the Ministries of Health, Water, Lands and Environment, Gender, Labour and Social Development, Local Government, Education and Sports, Finance Planning and Economic Development. The role of this committee is to:

- review the overall sector policy;
- co-ordinate and promote convergence between sector agency activities; and
- promote appropriate changes in policies on sector programmes and projects.

The Water and Sanitation Sector Working Group (WSSWG) is responsible for coordination and consultation among the stakeholders. This working group is supported by five other sub-sector working groups:

- The General Sector Issues and Reform Sub-sector Working Group.
- The Rural Water Supply and Sanitation Sub-sector Working Group.
- The Urban Water Supply and Sanitation Sub-sector Working Group.
- The Water for Production Sub-sector Working Group.
- The Water Resources Management Sub-sector Working Group.

21 The EHD initiated at one point the National Advisory Committee on Ecological Sanitation (NACES), which was composed of various stakeholders from other agencies. Its aim was coordination of efforts at policy level. However, since the sanitation sub-sector working group came into existence in March 2004 the NACES dissolved itself. Moreover, the NACES interpretation of ecological sanitation was limited to dry urine-diverting toilets.

The Directorate of Water Development (DWD)
DWD is the government sector-led agency responsible for managing water resources, and coordinating and regulating all sectoral activities. It has a policy, due to former experience of its staff, to develop ecological sanitation, although DWD legally is responsible for waterborne sanitation only. A one-year operational plan to promote ecological sanitation and a draft ecosan promotion strategy exist. The promotion of ecological sanitation includes support for research, documentation and dissemination of ecosan experiences, advocacy and development of ecosan guidelines and manuals, development of a national training curriculum and the training of the various stakeholders. The plan is currently under revision. DWD also monitors construction, operation and maintenance of ecosan facilities including the aspect of re-use. An ecosan liaison officer has been contracted until the end of June 2005 to coordinate the development of the ecological sanitation approach within the Directorate. In fact the Directorate of Water Development constitutes a further step in the development of ecological sanitation as compared to other agencies.

National Environmental Management Authority (NEMA)
NEMA is an agency that came in operation by 1997. It is not involved in the ecosan discussions on a national level even though it does define criteria for wastewater effluents and clearly has roles and responsibilities regarding sanitation. The reason for this might be a memorandum of understanding between the Ministry of Health, and the Ministry of Water and Education which defines their respective responsibilities with regard to sanitation (household sanitation, waterborne sanitation, school sanitation) and which does not consider NEMA's position.

Agencies and actors on regional and local level

At county/regional level there are district Water and Health Officers at the district councils responsible for sanitation.

Local governments (districts, towns and lower local governments), together with the communities, are responsible for implementing, operating and maintaining water supply and sanitation facilities in their area of jurisdiction, except in the large urban centres.

At municipal/local level the town council has health inspectors and water engineers working with water and sanitation. There are also engineers whose responsibilities include town planning. The Water Authority in the municipalities acts through a Water Supply and Sewerage Board, responsible for waterborne sanitation only, while the town council is responsible for sanitation in general.

In Uganda the water and sanitation sector does not operate or have permanent structures at the regional level except for the Technical Support Units (TSUs) which are currently rather temporary structures that provide technical support to district water offices. There are eight TSUs in total and each one covers districts according to geographical distribution. The district water offices are responsible for water supply services and sanitation at point water sources and rural growth centres. The districts are also responsible for the overall translation of national policy into district plans and also for overseeing the implementation of these plans. The sub-county local government (and the town councils) is the actual implementation level (or arm) of government activities under the decentralization approach. However, monitoring and evaluation of activities is done at both levels.

3 Results and discussion

All the four countries described above have fairly developed legal systems at national level. One important difference between the legal systems in the different countries in the study is that South Africa and Sweden have municipalities with the mandate and resources to reinforce laws and regulation. Uganda and Mexico seem to have fewer resources to implement the laws and regulations. However, this does not necessarily mean that they have a lesser mandate at the local level. In Mexico, both the municipalities and the State authorities have the power to adopt their own by-laws and regulations. The problem is that they do not use this legal tool. Another major difference is that Sweden is the only country out of the four which is subject to a super-national legislation, namely the EU water framework directive, which will play a major role for future sanitation work in Sweden.

One challenge, when looking at the regulatory framework regarding sanitation in different countries, is that the term "regulation" is not understood in the same way in different legal traditions. Another important aspect is the distinction between the policy-setting role of the public sector, which sets the rules and defines the objectives for the regulator (such as overall tariff structure and inclusion of social goals), and the regulator itself, which assures adhesion to these goals (and thus seeks to act as an independent referee)[22].

Political interference becomes a problem when politicians try to change the rules of the game after they have been set, or try to influence the regulator to take decisions that favour political interests over society's interests. One way of minimizing the risks of political interference is the division of powers at the municipal level between the politically elected members of different boards and the municipal employees in charge of implementation of political decisions, which is done in Sweden and in Uganda. This is in contrast with the Mexican system where almost everybody, including politicians and employees, is replaced after each election. The system employed in Sweden will allow for strategic, long-term planning and decisions, which will be difficult if most or all employees of the municipality are replaced every three years, as is the Mexican case. However, more inertia and less motivation for change could be drawbacks of the Swedish system.

3.1 GAPS AND OVERLAPS IN AGENCIES AND THEIR MANDATES

Gaps and overlaps in the mandates of different agencies might render the implementation of large-scale ecosan projects difficult due to, among other things, confusion in applicable legislation and non-compliance of regulation by both the governing agency and the private sector.

3.1.1 Gaps and overlaps – Sweden

The main gaps in Sweden are:

- Lack of a national authority taking the lead in coordinating and implementing the national strategy that has been launched concerning sustainable wastewater treatment and reuse of resources (addressing both centralized and on-site systems). The Swedish EPA (that would be the most natural national actor) will not act unless given the mandate from the

22 Tremolet, S. & Browning, S. 2002. The interface between Regulatory frameworks and Tri-Sector partnerships. Research and Surveys Series, BPD Water and Sanitation Cluster.

Ministry of Environment. Hence, there is a gap in the responsibility and definition of mandates on the national level.

- No specific Swedish National Environmental Quality Objective has been formulated around nutrient recycling even though the question of recycling of nutrients and natural resources has been pointed out as having a high priority.
- Lack of clarity as to how the EU Water Directive will affect the development of on-site sanitation and closed loop-systems. It is possible that the performance of any sanitation option will need to be considerably improved in order to meet the future water norms.

The main overlaps in Sweden are:

- According to the decree on waste in the Environmental Code, wastewater fractions such as human urine, latrine or faeces are regarded as household waste and should be managed by the technical division within the municipalities. This is usually not recognized in the municipalities and the issue of closing the nutrient cycle is mostly left to the local environmental authority to promote. This is unfortunate due to several reasons, one of them being the small amount of resources available within the environmental authority compared to the budgets allocated for the technical and planning divisions/offices.
- The jurisdiction of the local environmental authority only includes on-site wastewater treatment facilities via permits. If nutrient recycling of high quality human waste, demanding ecological sanitation solutions, is going to go to scale, ecological sanitation must also be embraced by the technical departments in the municipalities who are in charge of the municipal wastewater treatment and household waste systems.
- The National Board of Health and Welfare has the role of developing guidelines for the safe on-site treatment and use of human excreta from latrines as well as the protection of water supply at household level (for example dug or drilled wells). The Swedish EPA has the responsibility of developing guidelines for on-site sanitation systems and of guiding the regional and municipal authorities regarding permits for household production of drinking water. These aspects are closely linked and are unfortunately handled by two different national authorities. This of course makes things difficult to understand for the households and the municipal authorities.
- The different offices of the County boards seem to be working in a discrete manner, which clearly does not favour the recognition of either the possibilities or the complexity of ecological sanitation.

There are still many overlaps but in the coming years we will see the development of national directives which will compel the actors at regional and municipal level to clearly define their action plans taking into account how to meet the objectives in the Water Framework Directive. This will hopefully bridge many of the above listed gaps and reduce unnecessary institutional overlaps.

3.1.2 Gaps and overlaps – Mexico

The main gaps noted in the Mexican context regarding ecological sanitation are:

- Human urine and faeces are not well-defined in the law, which means that it is not clear whether the law considers them solid waste, hazardous solid waste (due to their potential pathogen content), hazardous material (because fertilizers are considered

hazardous material), or urban wastewater (because until now the conventional method of management is through water). If they are not well-defined, or improperly defined in a category they do not necessarily fit into – such as wastewater – then it is not clear which regulations govern their management. This might pose a barrier if the authorities choose to interpret the law conservatively.

- Composting facilities (or excreta processing facilities in general) are not defined in the law, creating regulatory gaps. Currently, they might be regulated as small farms – under a conservative approach – or not regulated at all – under a liberal approach.
- No recognition and regulation exists for the use of human excreta in agricultural production. Current regulation treats urine and faeces only as wastes to be disposed of or treated. On a generic level the regulation states the importance of sustainable agricultural production, though without pinpointing what is meant by the concept 'sustainable' in relation to agricultural production.

Overlaps noted in the Mexican contexts regarding ecological sanitation are:

- The common competences between federal, state, and municipal authorities exist for several jurisdictions. The examples below illustrate the effects of concurrent jurisdiction for wastewater management. It can be difficult to build effective public policy around water management and sanitation with such a mixture of jurisdictions.

Example 1: Concurrent jurisdictions in Mexican wastewater management

The management of water related to purification, sewer systems and sanitation is given to the municipality, but at the same time the local government cannot decide over water tariffs, because these are the competence of the State Congress, while the property of water belongs to the Nation and its use (as well as the discharge permits) has to be granted by federal authorities. Following this argument, one can deduct that the faculty of inspection within the concerned houses or establishments belongs to municipal authorities in order to check issues such as the proper use and management of water inside their buildings, but once water is discharged jurisdiction goes to the federal authorities because the body where water is discharged is a federal property.

Example 2: Concurrent jurisdictions in Mexican wastewater management

In the case of urban areas it is the duty of local authorities to install and manage wastewater treatment systems. However, the state and federal Ministries for the Environment have faculties of inspection and control. On the other hand, the National Water Commission has the right to grant the permits for wastewater discharges in water bodies of federal jurisdiction, while the state Ministry for the Environment can do so in waters of state jurisdiction.

3.1.3 Gaps and overlaps – South Africa

The main gaps in the South African context regarding ecological sanitation are:

- The fact that the National Water and Environmental Management Acts give responsibility for implementing, monitoring and enforcement to different departments, spreads resources, and often duplicates and confounds efforts.
- EIAs for water and sanitation projects are often not done or are passed even when they fail to assess the impact of, for example, waterborne sewage. This leaves the Department of

Water Affairs and Forestry (DWAF) with the problem of how to deal with a deteriorating resource. The gap is that the responsibility for preventing the pollution of the water resource lies with the DWAF, yet the responsibility of Environmental Impact Assessments lies with the Department of Environmental Affairs and Tourism.

- The safe disposal of excreta and effluent is covered under the National Water and Environmental Management Acts. These Acts tend to be reactive to a problem, specifying what will happen when the water resource is polluted, rather than pro-active, preventing the infrastructure, which causes the pollution, to be built in the first place.
- The legislation makes the assumption that only private individuals or organizations will be responsible for pollution. In the case of sanitation it is primarily the municipalities who are responsible for pollution, by discharging raw or insufficiently treated sewage from the centralized systems into the environment. Also, the legislation makes no provision as to how the regulating departments at national and provincial level can effectively deal with this situation.

There are no identified overlaps from the South African study.

3.1.4 Gaps and overlaps – Uganda

The gaps identified from the Ugandan study are:

- An absence of supportive policies to provide the basis for planning and implementing sanitation programmes at the lower levels is a missing link in improving the implementation of ecological sanitation.
- The gap between the national and local levels and translating national sanitation policy into action within the municipality has been shown to be a highly complex matter, therefore the task of planning, enforcing regulations and allocating resources at the lower levels does not meet the goals that have been set in the process of decentralization of responsibilities.
- Specifically at the lower levels (local governments) there is lack of knowledge and skills capacity and also resources to implement ecological sanitation. However, conditional grants provided by the central government to districts and towns are not restricted and can thus be used for implementation of ecosan programmes. This implies that the lack of competence is the more pronounced problem than lack of funds at local level.

3.1.5 Discussion – Gaps and overlaps

Sweden has carefully developed laws and in many aspects a good framework for sanitation at regional and local level. The responsibilities are clearly defined as to who is the "responsible person/actor" (households /service providers) and who is in charge of controlling the sanitation system (municipal environmental authorities). In spite of this there is still an uncertainty within many municipalities as to which department has the responsibility to establish and operate systems for recirculation of wastewater fractions, such as human urine. Gaps and overlaps in legislation and regulation can be identified and highlighted through ecological sanitation pilot projects and case studies. These activities can, if having a systems and organizational approach, pinpoint gaps and responsibility voids in the current legislative framework for the local setting. This has been seen, e.g., in a Swedish municipality where a project, with the objective to organize the agricultural reuse of urine from 250 households, has highlighted,

among other things, the responsibility issue between stakeholders[23]. This project also highlighted the necessity of political will for compliance to national codes, and implementation of the municipal mandates and policies.

A gap at national level was revealed for the Swedish case where there is a lack of national actors to raise the sanitation question on the national agenda. In Uganda, on the other hand there is at least the will to address the issue at national level but it has not yet been given full priority. If the national committees avoid taking action they will leave a gap, irrespective of the number of pro-ecosan policies produced. Translating the Ugandan national sanitation policy into action within the municipalities has been shown to be a highly complex matter. The lack of local capacity and (possibly also lack of resources) is another hampering factor to implementation of legislation and policies, as illustrated in the Ugandan study.

The South African municipalities have a concomitant responsibility to prevent pollution from the sanitation systems under their control (such as sewage networks etc.) and need permissions from the Department of Water Affairs and Forestry to discharge treated or untreated water to any water course. But the municipalities seem to have little practical influence on the decisions needed to really prevent the present discharges of untreated water. Decisions on the financing of wastewater treatment or development of alternative strategies and technologies for reducing the environmental and hygienic problems related to discharges of untreated wastewater, are not possible to implement in many municipalities, which leads to continued discharges as more people are connected to the municipal sewage systems. There seems to be a clear lack of regulation regarding allocation of responsibilities for unconventional/innovative techniques at municipal level in the South African setting.

The importance of defining the human waste components within the legislation is illustrated by the Mexican case where the lack of definitions makes it unclear whether urine and faeces are nutrients, wastes, or even hazardous waste.

3.2 FORMULATION AND IMPLEMENTATION OF SANITATION POLICIES – EXAMPLES FROM SWEDEN, MEXICO, SOUTH AFRICA AND UGANDA

When implementing ecological sanitation in a country or specific situation the regulatory framework may be more or less supportive even if the national or regional laws have strong objectives. This section presents examples of how sanitation policies have been implemented and formulated in the four countries studied.

3.2.1 Sweden

The development of sanitation policies in Sweden has gone through a remarkable shift in the last 5–10 years. One example is the withdrawal of the guidelines for implementation of on-site sanitary systems that has been in place since 1987. It has been concluded from different on-site sanitation actors that the guidelines' focus on two technologies, sand filter or infiltration beds, possibly facilitated the everyday-life of the local environmental authorities (the issuing of permits for on-site sanitation became quite uncomplicated) but the technologies as such did and do not comply with desired results in, e.g., phosphorus reduction. Moreover, they hampered the development and implementation of innovative technologies for on-site sanitation and especially nutrient recycling. The Swedish EPA is currently developing guidelines stating defined performance requirements (functions), or criteria, that the on-site sanitation systems

23 Stintzing et al. 2004. Unpublished data

should comply to. This might complicate life for the local authorities (they will have to issue future on-site sanitation permits for a more diverse number of technologies) but it will also open up opportunities for innovative technologies for on-site sanitation systems, and thereby also for closed loop-systems/ecological sanitation. This change will affect the choice of technology in different situations as well as the on-going development of new policy and legislation in Sweden[24]. More on defined performance requirements for sanitation planning and implementation is found in Kvarnström and af Petersens (2004)[25] and in Kvarnström et al[26].

3.2.2 Mexico

For centuries in Mexico laws have been formally accepted but have in fact often not been applied. This has been a normal practice since the days of Spanish colonization when the local authorities of the New Spain (Mexico's name at that time) had trouble with royal decrees dictated by the King in Spain and, in order not to confront the central authority, began this practice that later became known as the practice of "obeying the law without complying with it" – that is, accepting it as formal legislation but without putting it into practice.

In addition to non-compliance, as described above, the weaknesses in law enforcement and policy implementation are also due to various other causes, including lack of sufficient economic, human and infrastructure resources of government agencies to enforce and implement; unbalanced budgeting that favours planning over implementation; lack of continuity due to personnel and programme changes with each administration; lack of personnel qualifications due to these changes; often low salaries and corruption; etc. Even though they are not universal and can be improved upon, these conditions are widespread in the Mexican context.

At the local level, two main constraints are: 1) that municipalities do not have developed sufficient and adequate regulation; therefore urban development and environmental protection are often chaotic, if not lacking, and 2) that their budget is very limited and the taxes and revenues they receive locally are insufficient; therefore they depend on state, and particularly federal, funds.

Another issue at stake is that often the written law clashes with the real and concrete situations in which it has to be applied. Many principles clash when there is a need for a specific permit and where the viability would depend on the rigidity or the flexibility of the public official in office (or how conservatively or liberally they interpret the Law). This may open the door to corruption in the granting of permits and must therefore be prevented partly by means of better legislation.

3.2.3 South Africa

The development of policy and strategy is often allocated to ministries with a background in water resource management rather than health. In South Africa the Department of Water Affairs and Forestry developed policy and legislation whilst implementation has been through municipalities, DWAF, and the provincial departments of Provincial and Local Government.

Sanitation is, therefore, often seen as an additional responsibility rather than a core function of DWAF. This has meant that despite the best efforts of many, it has been relegated to an exercise in sewage treatment and disposal in urban areas and toilet building in the rural areas.

24 This is further elaborated in Appendix 4.

25 Kvarnström, E. and af Petersens, E. Open Planning of sanitation systems, EcoSanRes report 2004-3.

26 Kvarnström, et al. 2004. Sustainabilty Criteria in Sanitation Planning. Paper presented in pre-prints from the 30th WEDC Conference: People-centred Approaches to Water and Environmental Sanitation. LAO PDR.

Policy White Papers and Strategy Framework

In October 1994 the White Paper on Water Supply and Sanitation was passed. It envisaged the basic level of service to be a Ventilated Improved Pit (VIP) toilet. However, since this White Paper mainly addressed water supply it was felt that a separate White Paper was required on sanitation. The first draft was produced in 1996 but the final White Paper was not passed until September 2001. This delay was fruitful in that it was realized that the VIP was not the solution in all areas (hard rock on the surface, high water table and dense informal settlements) thus the description of sanitation in the White Paper became based on principle rather than on technology. The descriptions are still based on technology in the National Building Regulations.

The White Paper stated the following:

> *For the purpose of this policy it is necessary to define sanitation and also to give guidance on the minimum acceptable basic level of sanitation:*
>
> *"Sanitation" refers to the principles and practices relating to the collection, removal or disposal of human excreta, household waste water and refuse as they impact upon people and the environment. Good sanitation includes appropriate health and hygiene awareness and behaviour, and acceptable, affordable and sustainable sanitation services.*
>
> *The minimum acceptable basic level of sanitation is:*
>
> *(a) appropriate health and hygiene awareness and behaviour;*
> *(b) a system for disposing of human excreta, household wastewater and refuse, which is acceptable and affordable to the users, safe, hygienic and easily accessible and which does not have an unacceptable impact on the environment; and*
> *(c) a toilet facility for each household.*

It was unfortunate the word 'basic' was included in the definition as many people thought that it implied that this definition does not apply to higher levels or service such as waterborne sewage. However, it can be easily interpreted that for any sanitation system to be acceptable it must comply with the above. More important was the phrase "and which does not have an unacceptable impact on the environment." Although this phrase was inserted because of many people's concerns of the impact of VIPs on groundwater it applies very powerfully to waterborne sewage, which if it fails due to lack of maintenance, has a far larger impact on both ground and surface water. The Strategic Framework for Water Services, September 2003, repeated this definition but retained the word 'basic', which is open to misinterpretation instead of using the word 'acceptable' or 'adequate'.

The White Papers contained the principles that "The user pays" (1994) and "The polluter pays" (2001), in order to ensure that households make appropriate choices around technologies. These principles were, however, undermined by the introduction, by National Government, of the policy of Free Basic Services.

Example 3: Free Basic Services in South Africa

The policy of the government is to provide free, to indigent households:
1) 6,000 litres of potable water per household per month at a maximum distance of 200 m
2) 50kwh of electricity
3) An acceptable sanitation facility. The household is provided a toilet for free but has to maintain it at their own cost.

More information on the free basic services can be found below and in Appendix 3.

The policy of free basic services

The problem with this policy is that, with the way it is applied at the moment as a blanket policy across a municipality, it encourages waterborne sewage with water house connections, as there is no incentive to the household to take any other option.

The other major assumption of free basic services is that householders will either limit their consumption or pay when they exceed the free basic amount. Where there are normal meter reading and billing systems this has been found not to work. Households exceed the allocations and do not pay for the excess. The most effective control has been with pre-paid meters, or electronic dispensing valves, which prevent households running up bills which they cannot pay. However, the capital expenditure on this is high and if some are to receive this level of service others will receive nothing.

Providing free basic sanitation, for all forms of sanitation, also undermines the principle that the "polluter pays" since, from the household's perspective, a household generating 6,000 litres of polluted water will pay no more than a household disposing of 3,000 litres of water on-site for irrigation whilst managing their own excreta.

The policy of free basic services has, therefore, put an enormous disincentive in place for the introduction of ecological sanitation.

3.2.4 Uganda

National sanitation policies

Uganda probably offers a good example of well-written national policies, but the task is with implementation in a decentralized environment. In general, the major difficulty is in creating an environment in which national policy is implemented at the lowest level of government. It is quite common to find local governments lacking the technical, managerial, and financial capacity to address sanitation needs. Programmes also tend to focus on facilities and give less attention to software such as health and hygiene promotion. This is where ecological sanitation that demands a commitment to practice may find problems in implementation.

Over the last two decades there has been a strong political momentum for strengthening sanitation promotion. This has lead to significant developments in the sector regarding policy on the promotion of sanitation in Uganda. This political goodwill still exists right from the highest political office of the President to the lower levels of leadership. Furthermore, the decentralization policy on governance allows for district local governments to take a lead in policy and regulation formulation through the relevant sector. There are several committees at district level that are multi-purpose bodies responsible for planning and implementing a range of development activities, for example, the local councils, Parish Development Committees (PDCs) and the Sectoral Committees at the various levels of political organization. There is no need to create new structures in Uganda but it is necessary to work with the existing structures to advocate and promote the use of ecological sanitation.

Therefore, the existence of national sanitation policies and guidelines can serve as a key stimulus to local action by working through the existing structures mentioned to translate national policy into local action and for local initiatives that should fit in the overall sanitation strategy. The district mechanisms, projects, programmes, local CBOs and NGOs can be used to turn the good national policies into actions that will promote ecosan.

The Health Sector Strategic Plan

To operationalize the National Health Policy, and in line with the Poverty Eradication Action Plan (PEAP), the Health Sector Strategic Plan was developed and launched. Regarding its outputs, focus lies on the strengthening of the legal and regulatory framework. One of the elements of this output area is the strengthening of Health Acts. In line with this the Environmental Health Act and its subsidiary legislation is currently being formulated. It involves developing and reviewing environmental health policies, supportive laws, regulations and guidelines related to the promotion of sanitation.

National Sanitation Guidelines

The National Sanitation Guidelines under the National Health Policy (in the Environmental Health Policy), in the chapter on Institutional Framework state that districts (including sub-counties) and urban councils have the responsibility through the relevant sectoral committees to, among other things, develop and enact by-laws governing sanitation. They further state that the operationalization of the laws is through the District Management Teams (DMT) and the District Implementation Teams (DIT).

National Water Policy

The National Water Policy (1999) promotes an integrated approach to management of water and sanitation services in ways that are sustainable and beneficial to the people of Uganda. The key principles include a demand responsive approach, the use of appropriate technology and involvement of women.

Policies, action plans and strategies in Uganda

The National Rural Water and Sanitation Strategy "Putting People First" promotes a sector-wide approach. The sector-wide approach is a strategy that aims at ensuring that all actors in the water and sanitation sector are involved in planning, implementing and monitoring programmes.

Existing networks

The presence of formal networks (like UWASNET and NETWAS) and informal networks, and inter-ministerial association with sanitation working groups is an opportunity that brings together actors in ecological sanitation to share experiences and document lessons learnt. Agreement between development partners and the Government of Uganda is needed regarding the sustainable development while ensuring protection and conservation of the environment. A case in point is the agreement between the Government of Uganda and the Swedish International Development Agency (Sida) on sustainable development within the Lake Victoria region.

International (large) NGOs already piloting ecological sanitation

Large international NGOs like WaterAid, UNICEF, and CONCERN are already piloting urine-diverting dry toilet approaches in rural and urban areas in Uganda. They come with international experience and exposure in other countries where ecological sanitation has been a success. In Uganda, CONCERN had documented some experiences regarding ecosan in urban areas, while Water Aid Uganda is currently documenting ecosan experiences from the pilot projects they have been running in rural areas.

The DFID/World Bank capacity building project for the Environmental Health Division

The Ugandan government already has a mechanism through which sanitation can be promoted. The DFID/WB project has been designed to strengthen the Environmental Health Division (EHD) so that they can strategically review policy and formulate relevant policy on ecological sanitation. Also, the strengthening of the EHD should have a focus on consolidating linkages with other stakeholders. The ecosan approach needs to be multi-sectoral and therefore this capacity building project ensure that roles and responsibilities are clearly spelled out and the necessary linkages built between line ministries, projects and other institutions such as training schools, research institutions and the DWD. However, presently all discussions and documents regarding this activity do not mention ecosan explicitly.

3.2.5 Discussion – formulation and implementation of sanitation policies

Appropriate legislation, coupled with sufficient fiscal and budgetary discretion to provide services and monitoring, is of utmost importance in provision of sanitation services[27]. Even so, the present study suggests that there might be an implementation deficit of regulation. All the studied countries seem to have somewhat fairly developed institutional frameworks concerning sanitation, and even so they all show a varying efficiency in implementing their given mandate. They show different levels of implementation deficit of existing regulation/ legislation. This implementation deficit is by no means unique to the investigated countries but rather commonly occurring worldwide. Jakarta (Indonesia) is one example of a megacity with one million on-site septic tanks[28]. Building regulations require soil adsorption systems for these septic tanks, but these regulations are not enforced, and thus septic tank owners discharge their effluent into storm drainage systems which connect to inland waterways[29]. An investigation of 11 Latin American countries revealed that existing regulation on wastewater effluent quality is not applied, due to weak capacity of supervision and control[30].

Other possible reasons for the implementation deficits are:

- outdated legislation (e.g. the Ugandan Public Health Act) or legislation based on international recommendations without being adapted to the country setting;
- new legislation/regulation has not been integrated into the daily implementation of the responsible authorities at different levels (e.g. the Environmental Code in the Swedish setting);
- inconsistencies in bordering legislations/regulations /responsibilities of enforcement;
- lack of personal/financial resources or knowledge/capacity for the responsible authorities and actors, one possible effect of an incomplete decentralization process; and
- lack of public adherence to the legislation/regulation.

These reasons for implementation deficits are addressed in WHO documentation[31], where, for example, national governments are recommended to develop national sanitation strategies and create the necessary legislation/regulation to advance the strategy, define roles and

27 Wright, A. 1997. Toward a Strategic Approach: Improving the Sustainability of Urban Sanitation in Developing Countries. UNDP- World Bank Water and Sanitation

28 From presentation by Rick Pollard, WSP during Stockholm World Water Week, Aug 15 2004.

29 Wright, A. 1997. Toward a Strategic Approach: Improving the Sustainability of Urban Sanitation in Developing Countries. UNDP- World Bank Water and Sanitation.

30 Cavallini, J.M. and Young, L.E. 2002. Integrated systems for the treatment and recycling of wastewater in Lating America: Reality and Potential. IDRC-PAHO/HEP/CEPIS Agreement 2000-2002. OPS/CEPIS/PUB/02.94.

responsibilities of different national institutions to implement the law, to involve stakeholders at all levels of the process in order to ensure the viability of the legislation/regulation, and also to create monitoring/enforcement mechanisms for implementation of the legislation/regulations. It is of utmost importance to stress that legislation/regulation development is an internal affair that shall be undertaken by national experts in order to guarantee the appropriateness of the legislation to the context[32]. Moreover, it is important to remember that legislation might quickly become outdated if it is too specific and that one needs to strive for a balanced situation between legislation and regulation[33]. It is usually easier to adapt regulation than it is to adapt legislation to rapidly changing circumstances. However, less specific legislation demands that the authority in question has great political support and capacity, since less specific legislation can give rise to corruption, as described for the Mexican setting.

Decentralization of management is an institutional arrangement strived for in many countries today. When successful, and where responsibilities are accompanied by both appropriate funding and capacities, some of the implementation deficits outlined above will be addressed.

The lack of public adherence to the legislation can be due to several reasons. One can be that the content of the legislation/regulation is not accepted by the greater public. To create viable legislations/regulation stakeholder participation is of utmost importance. Moreover, the greater public might not even know of the existence of the regulation in question. One way to address this is to inform citizens of their rights and duties under current legislation[34]. Another reason for non-compliance to regulation/legislation could be low incentives to either comply with the legislation or to report back to the authorities when laws are broken. As exemplified by the Mexican case, the non-adherence to legislation can also be due to cultural norms and attitudes ("obeying the law without complying with it"), which can be reflected not only among the greater public but also among officials at different levels.

3.3 BARRIERS AGAINST AND OPPORTUNITIES FOR ECOLOGICAL SANITATION IN CURRENT LEGISLATION AND REGULATORY CONTEXT

Barriers for ecological sanitation derive from the regulatory gaps, concurrent jurisdictions and policy implementation weaknesses as outlined above. Different barriers can, however, be identified at different legislation levels.

3.3.1 Sweden

The barriers and opportunities that have been identified for the Swedish context are summarized below.

Barriers

- The Public Water Supply and Wastewater Systems Act poses a barrier against the implementation of closed loop systems in urban areas due to its inconsistency with the Environmental Code, when it comes to efficient use of natural resources and other sustainability-related issues.

32 http://www.thewaterpage.com/water_sector_reform.htm

33 http://web.mit.edu/urbanupgrading/waterandsanitation/policies/defining-leg-frame.html

34 http://www.who.int/water_sanitation_health/hygiene/envsan/sanitchallenge/en/index3.html

- The environmental authorities do not have the mandate to impose the objectives of the Environmental Code on the wastewater systems which lie under the jurisdiction of the Public Water Supply and Wastewater Systems Act.
- The fact that all urban areas have municipal services that function fairly well in terms of protection of human health does not work in favour of the installation of urban ecosan systems.
- The consideration that nutrient recycling should be achievable through sludge reuse, and a notion that the existing infrastructure has trapped the Swedish wastewater sector into centralized wastewater treatment for the foreseeable future, do not work as driving forces to start the R&D projects necessary for driving urban closed-loop systems towards full-scale implementation.
- The Environmental Code contains a condition that the requirements that are imposed on a single household must be reasonable in a practical and economical context. This is a barrier if the ecological sanitation systems are more expensive than the conventional ones.
- There is little possibility of establishing local by-laws or rules in Sweden. The efforts made in the municipalities regarding on-site and closed-loop systems are not enforced by national regulations but rather by policies at municipal level that have no real legislative validity. They can only serve, from a legislative point of view, as a framework and guidance for the local authorities.

Opportunities:

- The Water Supply and Wastewater Systems Act is, however, currently under revision and one possible change being discussed is to include sustainable use of natural resources in the objectives of the Act. The Swedish EPA considers it reasonable that the revision of the Public Water Supply and Wastewater Systems Act includes a provision stating that the municipal department responsible for water and wastewater services shall be responsible for recycling of nutrients from the wastewater fractions[35].
- The Environmental Code contains several opportunities for the implementation of ecological sanitation systems in rural areas in Sweden. One is the fact that recycling and efficient use of natural resources are integral objectives of the Code. Others are the precautionary principle, the polluter pays principle and the concept of "Best Available Technology".
- For rural applications there is a great potential for using the Environmental Code to improve existing systems so that they fulfil the requirements of hygiene, environmental protection, and also, where appropriate, recycling of nutrients, i.e. to meet criteria generally specified for ecosan solutions. The supervisory and licensing authorities have the power to base their decisions on these general rules of consideration concerning injunctions, bans, permit conditions etc.
- Another opening will arrive if the recirculation of nutrients is included as a specific criterion in the coming guidelines for on-site systems now being developed by the Swedish EPA.

35 NV 2002. An Action Plan for Recycling of Phosphorus from Wastewater. Swedish Environmental Protection Agency, Report # 5214.

- The reuse of sewage sludge is regulated through statutes issued by the Swedish Environmental Protection Agency[36]. The lack of statutes, e.g. for urine, has been noted and the current proposed revision (decision will be taken by the Environmental Ministry during the fall of 2004 at the latest) of the statutes contains the proposal to allow for urine reuse by utilizing the term 'wastewater fractions' rather than 'sewage sludge'. Even though the revised statutes are not in operation, the Swedish EPA sees no reason for banning the use of urine in agriculture as long as the recommendations in the proposed statutes are respected[37]. This can be regarded as an opening towards ecological sanitation.
- Moreover, the local environmental authorities cannot use the Environmental Code or other legislation for denying house owners permits to reuse the urine at household level. This can also be seen as an opening towards ecological sanitation. However, it is frequently the case that local environmental authority officers deny on-site urine reuse permits because of lack of experience of, and knowledge about, ecological sanitation systems. The individual house owner usually does not have enough knowledge about the appropriate legislation to meet the authorities.

Another possible opening could be to apply differentiated fees for on-site sanitation permits. One could imagine the local environmental authorities demanding lower fees connected to on-site sanitation systems complying with the recycling and efficient use of natural resources stated in the Environmental Code than for systems not reaching these objectives.

Example 4: Municipal policies that require ecological sanitation when building new houses in Mexico

In Sweden, two municipalities, Norrköping and Tanum, have independently interpreted the Environmental Code and the Planning and Building regulations in a very "pro-ecosan way". When issuing building permits and permits for new sanitation systems households must choose a technical system that protects public health, protects ground- and surfacewater and that recirculates most of the nutrient content in the wastewater fractions. The requirement for recirculation is unusual for the Swedish situation but it is in accordance with the laws as long as it can be seen as practically and economically reasonable for the household to pay for such a technical solution. The decision as to whether this is reasonable or not is a political consideration that the municipality can decide on without approval from regional or national authorities. In the two municipalities there are systems for collecting and recirculating human urine to agriculture that are organized and provided for by the municipal waste departments.

3.3.2 Barriers and opportunities in Mexico

Below are barriers and opportunities identified for the Mexican setting:

Barriers:

- At municipal level the greatest barrier is the lack of regulation and insufficient capacity to deal with sanitation within the municipalities.
- At State level a key barrier is the perception of urine and faeces within the legislation. Urine and faeces are seen as waste to be disposed of within the health legislation. However, the solid waste management legislation contains neither a classification nor

36 NV 1998. Swedish Environmental Protection Agency's regulation regarding environmental protection, the soil in particular, when sewage sludge is used in agriculture (in Swedish). Swedish Environmental Protection Agency's Statute book: SNFS 1994:2, amended by SNFS 1998:4.

37 Pronouncement to Linköping Municipality March 24, 2003.

definitions of urine and faeces. Moreover, little recognition of recycling properties of urine and faeces is made within water and soil legislations. Environmental legislation lacks incentives for ecological sanitation and there is insufficient capacity in the urban development legislation at State level.

- At federal level there is also a lack of proper definitions of urine and faeces in solid waste management legislation, and so too a lack of incentives within environmental legislation and insufficient capacity in Urban Development legislation. A lack of regulations necessary for the application of ecological sanitation is noted within several legislations, such as the soil legislation, which lacks regulations for recycling of urine and faeces, and the health legislation, which lacks regulation for the proper handling of urine and faeces. Moreover, the water legislation does not recognize the right to water of present as well as future generations.

Example 5: Problems in financing the public sectors activities and engagements in Mexico

In the case of the State of Morelos the setting of water tariffs is a faculty of the Congress of the State, which has to approve all tariffs derived from public services and dispatch the corresponding income laws of the different municipalities. This is a shortcoming that sets the fixing of water tariffs on a distant political agenda subject to the vagaries of legislators while there is no reason to believe that the State Congress is better equipped to decide on water tariffs than local government officials. On the contrary, it would be more efficient to deliver the faculty of tariff fixing to the municipalities.

Many municipalities have had enormous trouble planning and implementing wastewater treatment systems. This is due to the fact that many lack financial, technical and human capacity to invest in these systems. The high cost of conventional sanitation systems is one of the main obstacles, and the other is related to the low level of water charging (people are not used to paying for water services). One of the consequences of this is that many municipalities do not pay the fines for discharges of untreated water to CNA, because they simply do not have the funds for treatment or fine payment. Despite this, CNA does not enforce water supply restrictions, because cities would be left without water, and the end result is that legislation is not complied with.

Opportunities for ecological sanitation within the Mexican legislative and regulatory context:

- At municipal level the main opportunities lie within the possibility of practising law enforcement. The municipality has the faculty of control and management within water and environment legislation and also the legal possibility to regulate within the health legislation. Moreover, the municipality has the primary responsibility to manage solid waste and wastewater. Concurrent jurisdictions can be explored within the environment legislation.

- At state level an important opportunity arises from the statements of "prevention of pollution" within the environment and urban development legislations. The solid waste management legislation opens the way for ecological sanitation through its objective of recycling of solid waste. According to the environment and health legislations all people have the right to health and a healthy environment. Moreover, the water legislation states that wastewater shall be treated and opens the way for reuse of treated wastewater. The State Health Law specifically recognizes the need to foster development of sanitation.

- A specific example of an opportunity is that the environment legislation of the State of Morelos explicitly recommends the use of dry toilets or other environmentally-friendly technologies for residential buildings. This regional legislation has not been complied with by the municipalities and local authorities.

- At federal level the right to health is stated in the health legislation as is the recycling of solid wastes in the solid waste management legislation. Other openings for ecosan at Federal level include the possibility to install alternative sanitation systems (environment legislation), the remit to develop sanitation systems and the reduction and prevention of water pollution (water legislation); basic sanitation is also mentioned as a basic health service (health legislation), and the preservation of natural resources are prescribed to be considered for urban planning (urban development legislation).

3.3.3 Barriers and opportunities in South Africa

Many of the barriers preventing the implementation of ecological sanitation in South Africa are directly related to the legislative and regulatory aspects, whereas others are not.

The barriers identified for South Africa are:

- The National Building Regulations are developed around technology instead of principles. The result is that acceptable technologies, that comply with policy and legislation are excluded by regulation.
- The legislation is reactive instead of proactive which means that it too often only allows action once something has occurred rather than introducing mechanisms which prevent failure in the first place.
- Lack of enforcement of the laws when government departments and municipalities disregard legislation and fail to follow procedure when implementing sanitation projects.
- The implementation of the Free Basic Sanitation Policy in a manner which may encourage households to demand waterborne sewage. At present, the draft policy has been developed around the assumption that society shall provide a sanitation service that is viable and can be maintained. If subsidized waterborne sewage if provided free to households this will give them little or no incentive to accept systems which require their involvement (such as urine diverting, dry toilets etc.).
- The continued perception amongst officials, engineers and politicians that waterborne sewage provides the ultimate solution, even when they are unable to provide this and there even are examples of existing systems breaking down.
- Ecological sanitation is still seen as an interim solution, only suitable for rural and informal settlements, and many people argue that eventually it will be replaced by waterborne sewage.

Opportunities:

- Legislation and policy should be based on principle, rather than technology, according to the white papers on sanitation. This allows any technology, such as ecological sanitation, to be implemented as long as it complies with the principles. Principle-based legislation also allows individuals and organizations to take the government to court if they implement a technology which subsequently results in the pollution of the environment. It is a Constitutional right to have access to a safe environment.
- The growing water scarcity in the country is encouraging people to find water-saving alternatives. The first step in this process is the recycling of greywater for irrigation of gardens and flushing of toilets. This step alone can reduce water consumption by

50%. Once it can be demonstrated that greywater can be managed on-site (the biggest component of waterborne sewage) then the need for a piped system falls away and on-site, or local treatment of human excreta, can be contemplated and then implemented.

- The growing realization at national level that the government cannot meet the housing and sanitation backlogs through a supply of centralized systems and that the most effective intervention is to provide an enabling environment so that people can help themselves. This enabling environment would include title to land, access to the financial system, access to communication, reduced transportation costs and increased knowledge of appropriate technologies that households can build and maintain themselves without the massive external support that the conventional water and sanitation systems need.
- The households can make the changes themselves without waiting for municipalities, as long as they remain within the legislation and on-site sanitation is a household responsibility.

3.3.4 Barriers and opportunities in Uganda

Below are barriers and opportunities identified for the Ugandan setting presented:

Barriers:

- Laxity on the part of government and the various arms of government to enforce the legislation at the various lower levels (district and sub-county) is a major barrier. The enforcement of good sanitation and hygiene practices is a responsibility of law enforcement departments in urban authorities and of the health officers in the districts. Implementation is insufficient due to challenges relating to obsolete legislation, low motivation of staff, and in some urban areas, corruption. Moreover, by-laws set at local level are rarely enforced by local leaders as they are afraid to harass their voters and thereby risk losing votes in future elections[38].
- Little or complete lack of knowledge and skills in ecological sanitation by the implementers and the local communities. In some instances the technical personnel in the districts simply have not yet heard about ecological approaches to sanitation though human excreta has been used for enriching agricultural grounds in one way or another.
- The concept/term ecological sanitation is not cited in the existing laws and regulations and this may lead to it not being seen as an appropriate solution, however, the law is quite flexible and can be interpreted to accommodate contemporary approaches.
- The lack of a policy and regulations regarding the disposal of sanitized human excreta, whether for re-use in crop production or final disposal, makes it difficult when implementing and organizing closed-loop systems and ecological sanitation.

Opportunities:

- There is a need to strengthen the implementation mechanisms of the Environmental Health Division at national, district lower levels. An opportunity exists for the review and development of relevant policy and guidelines.

38 Nalubega, N. 2004. What drives choice of sanitation technologies: Case study from Uganda. Water and Sanitation Programme - Africa.

- An important area to be addressed in the development and implementation of policy is the social mobilization aspect, as ecological sanitation has a high demand for practice on the part of the users.
- Although the Ministry of Agriculture has a policy regarding the use of compost as a fertilizer and soil improver, it does not yet have a concrete policy on the re-use of nutrients in sanitized human excreta as a valuable resource for agricultural purposes. If this were to be developed recirculating systems would benefit.
- Many of the laws still in force have been enacted for so long that they have outlived the test of time and need to be reviewed in order to match contemporary developments in the sector. For example, the law still stipulates that the minimum distance between a latrine and a dwelling house and/or a water source should be 10 metres and 33 metres respectively. This may not apply to ecological sanitation or many on-site techniques, which can be constructed even within the premises or inside a house.

3.3.5 Discussion barriers and opportunities

The barriers and opportunities addressed above are in many cases country-specific and may not be applicable in all contexts. Some general aspects are nevertheless interesting to highlight:

Some barriers identified in more than one investigated country

- The non-compliance with the existing legislation and regulation regarding sanitation systems.
- The lack of capacity and resources to meet up to the implementation deficit created. The weak institutions and lack of political will for sanitation makes it difficult to enforce and follow up even the existing legislation and also makes it difficult to incorporate ecological sanitation and other innovative solutions/approaches.
- Outdated legislation and lack of harmonization of laws which makes interpretation difficult for local authorities, with laws sometimes even contradicting each other.
- The perception of human excreta as waste and the lack of incentives for reuse in the existing legislation.

This is in accordance with Seppälä (2002) who identified several of the above-highlighted barriers in his analysis of impediments to action and policymaking which have implications for water policy reform. Some impediments, listed by Seppälä (2002), but not underlined as barriers in the present study, are strategic constraints, information and communication constraints, and consensus and coordination constraints.

Opportunities identified

- The existing legislation and regulation can in many cases, if enforced, serve as a good platform for promoting the implementation of sanitation systems such as ecological sanitation.
- By developing and reforming the existing legislation and regulation (sometimes only by changing the practice of how the local laws and rules are enforced) one can create opportunities for ecological sanitation.
- In some cases, as for example in Mexico, the state and municipal governments have the faculty to pass regulations that steer towards a specific approach or technical option.

- By raising the political will at local or regional level the regulatory framework can be changed and allocation of resources for implementing the rules will create incentives for the households to choose an ecosan solution.
- The review and development of existing regulation can bring many existing opportunities to light that can serve as openings for programmes and projects promoting and implementing ecological sanitation.
- The inclusion of criteria that require recycling of nutrients in the laws and regulations will provide openings for ecological sanitation systems that, for example, conventional waterborne systems and pit latrines will have difficulties to fulfil.
- Giving incentives within the existing regulatory framework, for example, in the Swedish setting, the possibility of obtaining a housing permit only when choosing a specific sanitation system that can fulfil requirements that are "pro-ecosan".
- Finally, the opportunity of an "allowing" or flexible legislation based on principle, rather than technology, would make it possible for households to make the changes themselves as long as they remain within the legislation. By awareness raising and examples of affordable and acceptable sanitation systems progress can be made at the household level.

3.4 TARGET AREAS AND POLICIES WHERE OPENINGS FOR ECOLOGICAL SANITATION NEED TO BE MADE

Target areas to address in order to facilitate the implementation of ecological sanitation mainly from a regulatory perspective in the four investigated countries are described in this section.

3.4.1 Sweden – target areas

There is a need to establish precedences detailing under which circumstances recycling of nutrients is reasonable according to the Environmental Code. This is under assessment in some Swedish municipalities where nutrient recycling is included at municipal policy level (see example in Chapter 3.3.1).

Integration of work executed by different municipal divisions involved in sanitation issues (planning, technical and environmental) is a clear target area where improvement is necessary for a more enabling environment for ecological sanitation options, both within and outside the municipal wastewater jurisdiction.

The knowledge level on sanitation options and requirements for sanitation systems among house owners outside the municipal wastewater jurisdiction is today quite low. Thus environmental authority personnel are often overworked, almost serving as consultants for the house owners. This situation can be addressed by improved communication between the local environmental authorities and the house owners.

Example 6: Website targeting households with information on sanitation in Sweden

A new Swedish website has recently been launched where information on small scale sanitation systems is provided. The target audiences are house owners outside the municipal wastewater jurisdiction, municipal officials and entrepreneurs. A number of member municipal environmental authorities finance the site in order to reduce the workload of their personnel. The website address is www.avloppsguiden.se (in Swedish).

Another important target area is to clarify the divisions of roles and responsibilities between the municipality and the house owner for source-diversion systems and the wastewater fractions they collect. It is somewhat unclear today what services the house owners, within and outside the municipal wastewater jurisdiction, can demand from the municipality regarding collection of wastewater fractions. The pinpointing of roles and responsibilities demands ecosan piloting activities where the limits of existing legislation/regulation are tested in reality. As seen earlier in the report, there are already municipalities enacting the Environmental Code. For them it is important to develop stable and economically viable systems for reuse of wastewater fractions.

3.4.2 Mexico – target areas

The idea of a bottom-up strategy for legal transformation was discussed in Mexico during the 1990s and has now been further developed and specified within the Mexican ecological sanitation project TepozEco. Through proper municipal regulation it may be possible to influence legislation at state and federal levels, applying a good example of a bottom-up approach[39]. The municipal level is where most work can and will be done because the municipality is the level of government most directly involved with solid waste and wastewater management and physical planning. Proper legal regulation at municipal level may help in the paradigmatic shift necessary for widespread adoption of ecosan. Proper municipal regulation would deal with the different issues of municipal government in an integral manner.

Example 7: Developing a municipal regulation for the city of Tepoztlán in Mexico

The content of a regulatory framework for a municipality regarding ecological sanitation is being proposed for the municipality of Tepoztlan in Mexico. This municipal regulation should according to the proposal from the Tepozeco project and other local stakeholders contain:

a. Basic principles and rules taking into account particularities of the municipality.
b. Inclusion of rules for construction permits and new urban developments.
c. Policy and procedures regarding water management and sanitation, including assessment and monitoring.
d. That concrete measures and actions regarding ecological sanitation should be specified and undertaken by the municipality.
e. Adapting local regulation to federal and regional legislation to avoid conflicting jurisdictions and to promote concurrent jurisdictions.
f. Institutional mechanisms of participation of the local population in the process of municipal management in specific affairs of importance such as sanitation, with specific emphasis on surveillance.
g. Definition of minimal norms of quality of the public services offered by the municipality.
h. Establish as a requirement for the development of housing to fulfil regulation in relation, amongst others, to sanitation issues.
i. Establishing proper systems of incentives for conversion and retrofitting of conventional technology towards ecological sanitation.
j. Implementation of registers and inventories of waters and soils.
k. Improving tariff system collection and the making of proposals of tariff reform

Another possible target area for the Mexican setting is the need to clearly define ecological sanitation and its elements in the law so that they can be regulated based on their attributes and not as elements incorrectly placed within the realm of water or hazardous materials regulations. This may be possible to achieve at national level by using the Mexican Official Norms.

39 In the specific case of the municipality of Tepoztlán in the State of Morelos a municipal regulation would also help to cope with the problem of absence of sanitation policies at all or from the constant changes in the existing policies regarding sanitation practices. The development of new regulations for the municipality of Tepoztlán may then serve as a model for other municipalities and could help influence gradual change of law at other levels of government.

A further target area is the need to communicate to the water agencies responsible for supplying water and sanitation that waterless sanitation may be a very attractive alternative when they cannot supply or treat enough water for the urban areas.

There is also the need to present the benefits of processed and sanitized human excreta; and with solid waste management agencies, for guidelines in the collection, transportation, storage and processing of human faeces and urine.

It will be crucial to make ecological sanitation both easily accessible and legal for households. By overcoming those barriers one could develop sets of incentives at the household level that targets the main drivers for investing in/choosing a sanitation system.

Policy issues: incentives for widespread adoption of ecological sanitation in Mexico

Incentives which are essential for the widespread adoption of ecological sanitation in Mexico would need to be built into the regulatory framework and operating strategies of various government agencies. These would be:

1. Economic Instruments
2. Lobbying and awareness-raising
3. Other incentives such as institutional support in the form of training, technical support, maintenance and end-product collection services

Legal issues: some proposals for legal transformation towards ecological sanitation

Some changes that would lead to a more favourable legislative and regulatory environment for ecological sanitation are:

- A change in policy from "payment against discharge", towards a policy of "zero pollution goal". This may be achieved by specifying that the right to water for "all people", includes both present and future generations.
- To regulate the processing, treatment, and storage of faeces, urine and their transformed products at federal level.
- A group of specific Mexican Official Norms (NOM) should be put forward, where the technical aspects and criteria for handling, processing and managing human faeces and urine are established, including specification of measurement systems, certifying authorities, etc.

3.4.3 South Africa – target areas

National Building Regulations

The problem arises that the National Building Regulations (NBR) take the de-facto standard as waterborne sewage, and only if this cannot be provided do the NBR contemplate alternatives, i.e. they are based on a technology choice, rather than stating principles and whether or not the technology complies with the principle. The assumption is made that the municipality will automatically be able to treat the sewage and safely discharge it to the environment.

The NBR also erroneously states that waterborne sewage and chemical closets are the only acceptable inside toilets. A chemical toilet, in terms of South African policy, is not an acceptable technology and there are many toilets on the market, principally dehydrating and composting toilets, which can be placed inside a house. The NBR needs to be modified to take this into account.

The NBR needs to be modified to include the principles of safe treatment and disposal of excreta and greywater. Excreta comprises two components, faeces and urine, so disposal can encompass dealing with both solids and liquids. Greywater has a far lower pathogenic content than faeces and if kept separate can be treated differently. Only if the owner of the building and the municipality can demonstrate that they can comply with these principles would it be permissible to proceed with the technology. In the case of waterborne toilet systems the municipality would have to demonstrate that they are currently able to operate the reticulation and treatment system before this option would be allowed.

For ecological sanitation to become a mainstream technology a number of strategic target areas have to be addressed:

1. The National Building Regulations need to be amended so that they comply with policy and legislation and deal with principles and do not promote a single technology. Separate standards are then required for the different technologies such as flush-systems, VIP-latrines, urine diversion toilets and greywater treatment.
2. Legislation needs to be amended so that it becomes pro-active not reactive.
3. The regulation regarding sanitation needs to be centralized under one department and that department should be given sufficient power to prevent municipalities and other departments from breaking the legislation.
4. Ecological sanitation must be something that people aspire to, rather than something they are compelled to use. To this end a marketing drive (which already has proven successful in the South African setting) is required. Also, people aspire to what the middle and upper class have. Since this section of the population will not readily change their flush toilets, but are faced with ever increasing water bills, greywater recycling needs to be widely promoted amongst this section of the population so that it becomes a common denominator with the poor.
5. Incentives need to be given to make appropriate choices. It has been demonstrated that by not installing centralized waterborne sewage cost savings of over R10,000 can be achieved. These savings can be used for a solar heating system giving poor households access to both hot water and sanitation with very low ongoing maintenance costs.

3.4.4 Uganda – target areas

In a recent case study on sanitation projects in Uganda one lesson learned is that there is a need to support the enforcement and application of updated and relevant policies and legislation[40].

The fact that the Directorate of Water Development[41] (DWD) is pioneering some ecological sanitation projects, even though it is only responsible for waterborne sanitation, could contribute to the influencing of policy and also streamlining of laws and regulations that affect ecological sanitation.

Regarding technologies, the incoming National Sanitation Guidelines promote a technology option (the dry-box latrine) which works on the same basic principles as followed in ecological

40 Nalubega, M. 2004. What drives choices of sanitation technologies; Case study from Uganda. WSP-Africa.

41 The Directorate of Water Development (DWD) has in the recent past strengthened and streamlined its implementation mechanisms down to the lower levels in most of the districts. This has been through creating district water offices that have recruited suitable officers.

sanitation approaches. Furthermore, the guidelines mention that the dry box latrine can be attached to a house and is suitable for use in high-density population areas. Although this technology or approach is not called ecological sanitation in the guidelines, it offers a strong premise in the country's sanitation regulatory framework that can accommodate the re-use of sanitized human excreta as a valuable resource. This indicates that ecological approaches to sanitation already may have a niche in the regulatory framework for sanitation in Uganda.

3.4.5 Target areas – discussion

It is important to remember that there is no universal concept of appropriate policy for water supply and sanitation that can be generalized, but there are impediments to policy reformation at different levels that seem to be similar everywhere and largely independent of nationality and culture[42].

There are many examples of implementation of WSS policies that have not been very successful. It is fairly easy to formulate policies, and relatively easy to pass legislation but much more difficult to change informal institutions such as attitudes, human and organizational behavior, codes of conduct and behavioral patterns[42.]

Existing policies and regulations in the present study seem to provide openings towards ecological sanitation either directly or after minor changes/transformations. A number of examples of minor changes in the legal framework in order to embrace ecological sanitation are suggested for the Mexican and South African case. In Sweden there is already a suggestion from the Swedish EPA to change the sludge reuse regulations to embrace other human excreta fractions by using the terminology "wastewater fractions". This highlights the need of an analysis of possibilities within existing regulatory framework before launching large-scale ecological sanitation programmes. This might require a leadership that is ready to look for "what is not strictly prohibited" under existing legislation rather than a leadership looking for "what is specifically allowed"[43].

The next important target area is how to get those existing ecosan-supportive regulations and policies working on the local level. There are elements of support for ecosan in the legislation/regulation of all investigated countries. However when it comes to the local reality there is non-compliance with the laws and a lack of capacity and resources allocated for law enforcement and implementation. How the local authorities, municipalities and organizations can get the support needed to accomplish this is one important target area to address. A functioning decentralization process where the mandate to exert and provide services/control is accompanied by sufficient financial resources and capacity will provide an important base. Moreover, political will is of utmost importance for compliance with regulation and policies.

The need to adapt policies, legislation/regulation to facilitate ecological sanitation has been highlighted both by the Mexican and South African study. Changes to policies may, however, often be accommodated within the existing legislation using existing institutional structures but requiring changes in regulation[44]. A bottom-up strategy is proposed for the Mexican case, where appropriate regulation for a municipality, in this case Tepoztlàn, could serve as a model for other municipalities and gradually influence regulation at other levels of government. There

42 Seppälä, O. 2002. Effective water and sanitation policy reform implementation: need for systematic approach and stakeholder participation. In Water Policy 4 (2002) issue 4.

43 http://web.mit.edu/urbanupgrading/waterandsanitation/policies/defining-leg-frame.html

44 http://web.mit.edu/urbanupgrading/waterandsanitation/policies/defining-leg-frame.html

are several reasons why this approach is appealing, one of them being the fact that sanitation services often come under a municipal mandate.

Another is time, where legislative reform may be a long process entailing going through a governance cycle as seen in Figure A.

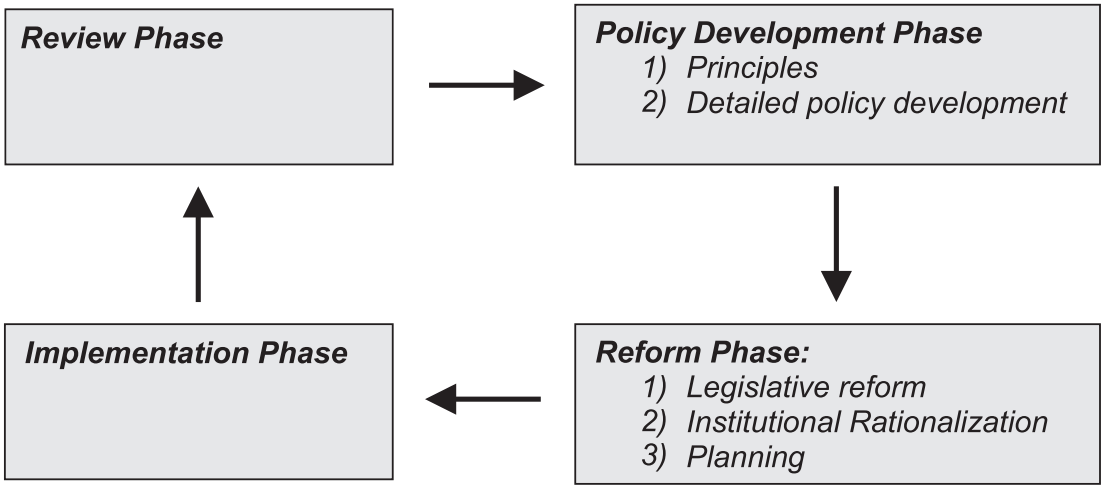

Figure A. The governance cycle[45]

It is important to remember that a combination of soft and hard instruments and economic incentives for the individual might be more efficient than enforcement of new legislation only. The most effective way of promoting new innovative concepts is often by using both the stick and the carrot. Economic instruments are suggested as drivers for ecological sanitation. Tax exemption or tax reduction for people installing ecological sanitation systems (motivated by the reduction in treatment cost for the municipality) are suggested for the Mexican case as is introduction of wastewater treatment cost on the water bill (full cost recovery), and proper pricing of water.

In recent years, internationally, the water and sanitation sector has moved away from supply-led approaches and embraced demand-driven philosophies that emphasize the importance of community management, user choice and cost recovery[46]. This highlights another important target area, which is to increase the demand for sanitation services[47] and more specifically for ecological sanitation. It is necessary to achieve this increase in demand for ecological sanitation not only among the unserved but also among middle-income groups since they as a group represent a way of life that the unserved strive for, as highlighted by the South African case. However, it is important to remember that as long as people connected to centralized "systems", as in downtown Tepoztlàn, Mexico, do not pay the full price either for the water or for the wastewater collection and treatment it is difficult to assess the true demand for waterborne sanitation services compared to ecological sanitation.

45 http://www.thewaterpage.com/water_sector_reform.htm

46 WSP 2002. The national sanitation programme in Mozambique. Pioneering peri-urban sanitation. Field note 9.

47 Reasons for low sanitation demands and ways to mitigate such are proposed by the Task Force 7 on Water and Sanitation. Possible policy and planning responses to low demand include action such as social marketing and education, partnerships with civic organizations, regulatory reform, and facilitating for innovative technologies (Millenium Project Task Force 7 on Water and Sanitation. 2004. Interim Report of Task Force 7 on Water and Sanitation (coordinators Roberto Lenton and Albert Wright). February 2004)

4 Discussion

Legislative and regulatory aspects need to be considered when implementing and going to scale with ecological sanitation. These are of course not the only aspects that affect the upscaling of ecosan, but without a parallel development and capacity building on effective policy and reform implementation, the activities and efforts made in pilot projects may in the long run not produce the expected results. Before legislation in itself will provide incentives to the households it must first enable (at least not prohibit) the desired activities, and thereafter the political will to enforce the laws is needed. To come to a point where upscaling of ecological sanitation is possible, pilot projects, capacity building and, in many cases, legal reform is needed. The interdependency between legal aspects, pilot projects and capacity building is illustrated in Figure B, below and is also elaborated in the following discussion.

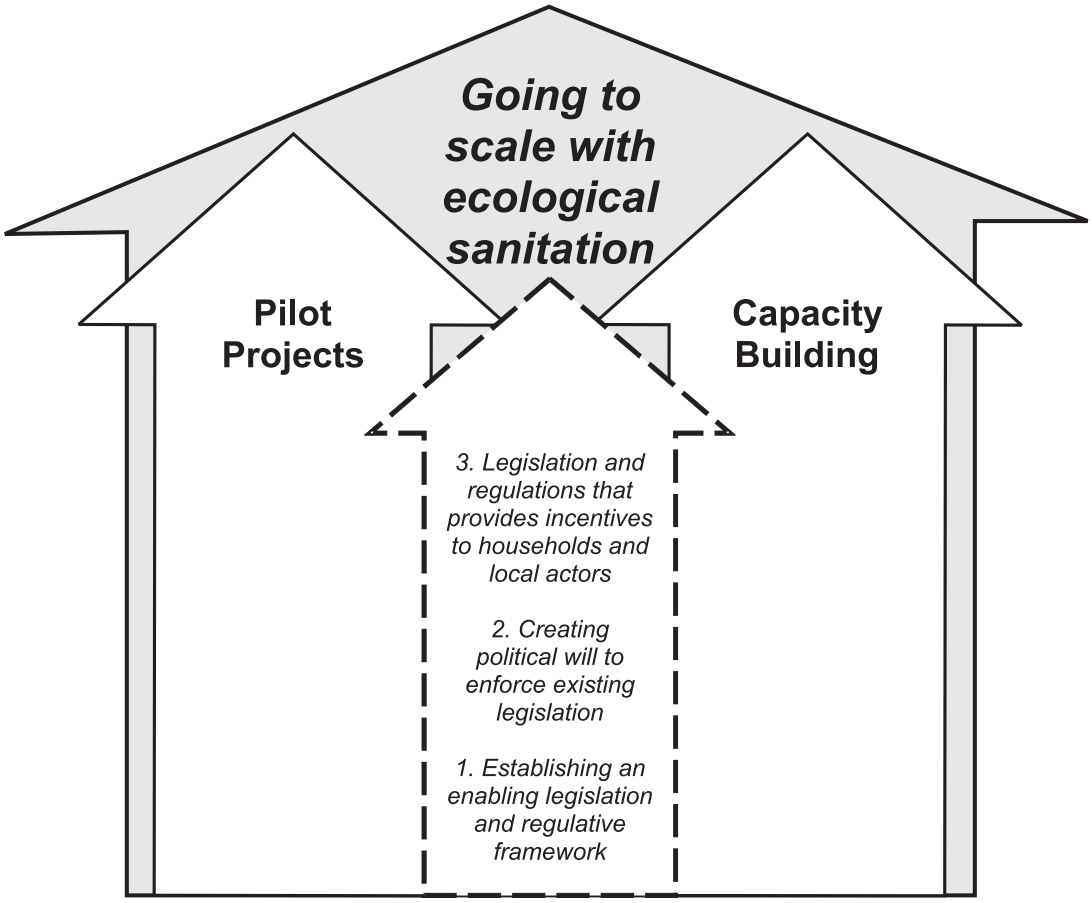

Figure B. Conceptual illustration showing the need for legislative aspects to be part of both pilot projects and capacity building activities.

The interconnections between processes, institutions, donors and recipients etc., involved in policy reform and implementation are very complex as has been pointed out by Seppälä (2002)[48]. Figure B presented above can be seen as a simplified picture illustrating the need for integrating the legislative aspects in the pilot projects and capacity building activities to secure the long-term effect of invested efforts and resources.

48 Seppälä, O. 2002. Effective water and sanitation policy reform implementation: need for systematic approach and stakeholder participation. In Water Policy 4 (2002) issue 4.

4.1 ESTABLISHING AN ENABLING LEGISLATION AND REGULATORY FRAMEWORK

A base for implementing sustainable ecological sanitation services is an enabling national legislation and a supporting regulatory framework at national, regional and local level. The appropriate role of governments is to provide an enabling environment and a leadership role in defining a national policy framework and to coordinate investments.

Without legal recognition and support from the local regulatory framework many pilot projects and other capacity building activities promoting ecological sanitation may be futile. Of course, there are many other aspects that in the short term have higher priorities and may be more strategic than mainly focusing on the legislative aspects. Seen in a longer term perspective, the legislative and regulatory aspects must be dealt with and integrated in the capacity building, pilot projects, and other activities, to ensure success and enable ecological sanitation to go to scale.

Need to analyse and understand existing legislative situation

For large-scale implementation of ecological sanitation it will be important to analyse and understand the existing legislative situation from an ecosan perspective. It is probably important to do so from a "what is not strictly prohibited" rather than "what is specifically allowed" perspective[49]. At both national and regional level there may be much to learn for ecosan projects from existing and on-going work on legislative aspects within more "traditional" WSS programmes and projects.

Dichotomy between legislation and reality

When speaking of the main barriers that large-scale ecological sanitation is confronted with, reference must necessarily be made to the situation in the specific context in which such legislation is applied. Many of the problems related to the legal field have to do with a strong dichotomy between legislation and reality. Mexico has, for example, a long tradition of having very advanced legislation and comprehensive policy and planning instruments, but poor law enforcement and poor implementation of plans and policies. Any effort to build a different legal framework must tackle this issue in order to promote laws that are in accordance with the complexities that the different actors will have to deal with when applying or being affected by the legislation concerned.

Need for reforming the legislation

WSS policies of most developing countries have been developed with donor assistance. Therefore, the policy documents often reflect the strategies of the donor countries and organizations rather than indigenous strategies that may be more appropriate. Past policies have drawbacks, among them the lack of sufficient monitoring and enforcement mechanisms, and a key constraint identified is that institutions and principles of water rights have been set up in the past and are not compatible with present demographics[50].

There is a need for better compliance with existing laws and rules and in many cases also a reformed legislation as both these issues are important and intimately related: better rules may

49 http://web.mit.edu/urbanupgrading/waterandsanitation/policies/defining-leg-frame.html

50 Seppälä, O. 2002. Effective water and sanitation policy reform implementation: need for systematic approach and stakeholder participation. In Water Policy 4 (2002) issue 4.

allow and foster different policies and help, amongst other things, to get better compliance; however, new laws and rules have to be coupled with concrete and specific application and enforcement of the law. When legal reform is discussed the aspect of compliance must always be on the agenda, similarly when dealing with rules and procedures.

If the legislation and regulatory framework are shown to be only partially enabling or even counter-productive to the desired objectives there are at least three principally different strategies to choose for legal reform:

A. Legislative reform at national level that would change the legislative framework and specific regulatory frameworks in such a way as to enable the implementation of ecological sanitation. If the reform aims to make substantial changes in the legislation it will have to follow the necessary steps of a governance cycle (which was described in an earlier section of the report). The need for new regulations concerning ecosan is called for among others by the authors of the revised edition of the book Ecological Sanitation[51]. Regulatory reform processes, in a wider water and sanitation sense, have been implemented in many countries, even though ecological sanitation generally does not seem to have been handled specifically.

B. Another possibility is to modify existing legislations and regulation in such a way that they open up/allow for ecological sanitation. In the four countries studied openings were identified that may not even need any change of legislation but merely changes of interpretation or the enforcement of existing laws and rules. One way to keep legislation relevant for a longer time period is to make it less detailed and specific. For the sanitation case one way of achieving this is to avoid mentioning technologies in legislation/regulation, but rather to focus on criteria that the sanitation services should provide.

Example 8: Possibility to develop a specific regulatory framework for the Mexican setting

A specific regulatory framework based on Mexican Official Norms can be developed for ecosan practices. Although most laws and regulations in Mexico do not refer to human excreta, what is behind the concept of drainage, sewage, treatment and disposal is human excreta handling. The Federal Constitution states that the States must formulate laws to regulate public services such as drinking water, sewage treatment and wastewater disposal. The path that each state will follow to provide these public services is of its own jurisdiction. Once local and state authorities have provided the sanitation service, the key regulatory framework for this activity has to be covered by the Mexican Official Norms.

C. Instead of addressing the legislation at the national/federal level a bottom-up approach could be an alternative. This has been described in an example earlier in the report for the municipality of Tepoztlàn in Mexico. The idea is to develop a complete regulatory framework at local level (for individual municipalities) which has as its basis in the attitudes and norms of the people living there. This could then be used as a model for developing and reforming legislation and regulation at regional and national level.

51 Winblad U. & Simpson- Hébert M (editors): Ecological sanitation – revised and enlarged edition. SEI, Stockholm, Sweden, 2004. In Chapter 7.2.5 (p. 105) of this is stated: "Existing regulations pertaining to water-borne sanitation systems are not appropriate. New regulations will be required."

One important aspect of an enabling legislative environment is the integration of water and sanitation sector policies with other sector policies[52]. This might be the case even more for ecological sanitation, where one given benefit is the generation of fertilizer, which can be reused in agriculture and in peri-urban farming. However, it has been shown that peri-urban vegetable production faces rather poor prospects, at least for the Asian setting, unless promotive policies and improved technologies become available and farmers are compensated for the positive externalities they generate[53].

Regardless of which strategy is chosen the process will take many years to implement and will depend on both skilled advocacy and on the availability of resources for lobbying and awareness raising. Hence, when reforming the legislation and the regulatory framework a long-term perspective and planning horizon must be used, and to secure continuity it must be implemented parallel to, and in close connection with, other activities, programmes and projects.

4.2 CREATING POLITICAL WILL TO ENFORCE EXISTING LEGISLATION

An enabling legislation and regulatory framework do not alone produce the fulfilment of the desired objectives of solving the sanitation problem. It has been shown for the four countries described in this report that without the political will the water policies and legislation may not be implemented at all at the local level. All of the four countries have a more or less enabling legislation at national level but the objectives have not been implemented by regional and local authorities. Without a political will and the institutional capacity to enforce and implement the regulations from national down to local level the laws will remain beautiful words that do not call for action. Creating the political will to solve the sanitation problems at all levels in society is a major challenge. It is appropriate to ask if there will be more support and political will for ecological sanitation in a country than there is for conventional water and sanitation. The specific benefits of the closed loop approach must be communicated and promoted in such a way that the advantages of ecological sanitation, compared to other available sanitation systems and approaches as well as to the "business as usual" alternative, become very clear to decision-makers and politicians.

Political endorsement and support are a key element of policy development while political will is needed in implementation. Much effort must be devoted to political facilitation of policy reforms and the enforcement of them, although technical, economical and other considerations are also important. A serious crisis, as was the case with the well-known cholera outbreak in South Africa, can force governments and decision-makers to undertake reforms that otherwise would have been previously unacceptable and non-existent on the political agenda.

4.3 LEGISLATION AND REGULATIONS PROVIDE INCENTIVES TO HOUSEHOLDS AND LOCAL ACTORS

If one could change the law one could then concentrate on the cultural/educational policies, with a legal foothold to support such measures as allocating rights, creating incentives, giving

52 Seppälä, O. 2002. Effective water and sanitation policy reform implementation: need for systemic approach and stakeholder participation. Water Policy, vol 4, issue 4

53 Including cleaner air, greener space, water storage and possibilities for waste reuse (Midmore and Jansen, 2003. Supplying vegetables to Asian cities: is there a case for peri-urban production? Food policy, vol 28, issue 1)

a foothold to authorities to foster such policies, etc. This means that, given the appropriate legislative environment, a pronounced political will and the consequent mandates and resources to local and district officers, NGOs and others, it is possible to provide stable incentives to the households. A demand-driven approach will be interesting to adopt for ecological sanitation. Promotion of appropriate technology through development of effective information, education and communication (IEC) tools combined with economic incentives and regulatory measures will definitely help speed up the implementation of ecological sanitation.

It is basically true that nowadays it is not "cool" to speak of sanitation and deal with excreta and urine etc. Some advocate marketing campaigns and similar activities as being more important than changing the legislation surrounding sanitation. At the moment both the culture and the law offer obstacles. It is important to take into account the legal principle that "authorities can only do what the law allows them to do". Legal recognition may offer a foothold – together with concrete policies and technologies – to help provide the "rationality" regarding ecological sanitation. At the present time, ecological sanitation is not only an "un-cool" subject, it presents many institutional obstacles that hamper the possibility of expanding on-going and planned sanitation projects.

Capacity building

Creating an enabling legislation could be met by programmes focusing on institutional strengthening in general and the building of the capacity to enforce the laws.

All the above mentioned steps and processes will be difficult to take without a parallel capacity-building process. Capacity building is more than the building of local skills and abilities as it is a process required for most projects financed by any sector of government[54].

A cross-fertilization between sanitation programmes and activities focusing on capacity building, projects specifically focusing on legislative and regulatory aspects of sanitation, and more technically oriented pilot projects focusing on building and implementing sanitation hardware, would be something to strive for within each country or specific region.

Donor organizations should increasingly assist developing countries to set up their regulatory structures and build regulatory capacity but this of course must be done from the perspectives and the needs of the country.

Pilot projects

A strategy that may not have been fully used for the promotion of ecological sanitation is to use the pilot projects run by different countries, NGOs and donors, to get an understanding of the regulatory framework where the specific pilot project is undertaken. The activities carried out in relation to the pilot projects can examine the way existing laws and rules are enforced at local level. They can also serve as a base that integrates the establishing of local legislative skills and a widened knowledge of the regulatory framework among people and helps the exploration of new ideas and ways to reform the regulatory framework.

54 The concept 'capacity building' is defined by Abrams, L.J. 1996. as: "… the process whereby a community equips itself to undertake the necessary functions of governance and service provision in a sustainable fashion. The process of capacity building must be aimed at both increasing access to resources and to changing the power relationships between the parties involved. The "community" may be a local government, a village level committee or even a central government department. Capacity building is not only constrained to officials and technicians but must also include the general awareness of the local population regarding their services and development in general." http://www.thewaterpage.com/threshld.htm

There are many ways of integrating the legislative and regulatory aspects in ongoing and planned programmes, pilot projects and activities focusing on ecological sanitation. Local legal experts and technical expertise on ecological sanitation can, for example, be brought together with project leaders, funding agencies and other stakeholders to discuss the regulatory and legislative aspects in a structured way in the early programme planning stages. This could result in a "map" of the legal and regulatory framework for the specific situation. By doing this future problems and possible obstacles can be identified at an early stage and properly dealt with.

Even though in most cases the main drivers for action at the household level will not be the enforcement of the laws, planned concerted communication campaigns should take into account the policy and legislative aspects when developing the communication and advocacy strategy at all levels.

The interconnections between sanitation services and agriculture

One interesting aspect when analysing the gaps and overlaps in the four countries is the absence of analysis of gaps and overlaps regarding the interconnections between sanitation services and agriculture. The link to agriculture is missing in many ecological sanitation projects. Seen from the objectives and principles of ecological sanitation it is obvious that a more thorough examination of the agricultural legislative and regulatory context needs to be done. Questions that need to be further investigated are:

- How does the agricultural regulatory framework look in relation to ecological sanitation?
- Are there countries where the regulatory framework promotes or hinders systems for reuse of human excreta in agriculture?
- Which laws and regulations are applicable and which agencies and actors are involved in each country?
- Where and how can we collect the lessons learned on regulatory aspects in pilot projects and from practitioners around the world?

Focus on technical requirements or the desired performance/function?

Different views on how to include ecological sanitation into the regulatory framework have been raised in this report. The focus on promoting and/or prescribing specific technological options is voiced from the Mexican and the Ugandan settings. For the Swedish and South African situation the importance of focusing on sanitation principles, or the desired performance of the sanitation systems, has been raised.

It may, at least over the short time frame, seem efficient to specify the preferred techniques that are to be used in a specific setting or in general in a municipality, region or country. By specifying the technique in the law or regulation one can give the authorities a powerful tool to implement this once they receive adequate resources and political support. The flipside of the coin is that there is seldom only one universal technical solution that fits all local situations and settings. It also "disqualifies" aspects such as public participation in the decision on sanitation systems, which might be detrimental to the sustainability of sanitation services. Moreover, the approach will make the legislation sensitive to technological development and thus there is a risk of it becoming out-of-date rather fast because of technological progress. This technique-oriented view is a heritage from the engineering tradition focused on finding and developing universal technical solutions to sanitation problems.

The possible future change from promotion of certain technologies to specifying the desired performance of the sanitation systems poses a great opportunity for innovative technologies and approaches such as ecological sanitation. An example is the South African legislation and policy on sanitation which is based on principle rather than technology, thus ecological sanitation will be embraced as long as it complies with the stated function requirements. There is a need to develop tools that the authorities and decision makers can use for comparison between different techniques and sanitation systems. The skills required for the people making the decisions and choices regarding technical solutions are also great. This discussion is further developed and country-specific examples are given in Appendix 4.

These two ways of formulating laws, regulations and policies are connected to the ongoing discussion on how to define ecological sanitation. What is ecological sanitation? Is it a certain set of technical options or is it based on a number of criteria that describe the desired function of a sanitation system?

Few law experts among the ecological sanitation practitioners

Naturally, knowledge regarding ecological sanitation and its relation to regulatory framework is to be found in each country. Among an initiated group of people involved in specific programmes, processes and projects on ecological sanitation, there is hands-on experience of the barriers and opportunities. It is important that these competences are being used and that the experience and knowledge that have been gained in each country or programme are documented and disseminated.

Therefore nodes and networks where people involved with ecological sanitation and with special interest in policy, legislative and regulatory aspects can meet and communicate to cross-fertilize their knowledge are needed. By identifying the persons and organizations in a region or country that have high competence regarding policy, law and regulations within the sanitation sector, and especially regarding ecological sanitation, one could build specific dissemination activities around them. They could become “key-trainers” with a role to both “train the trainers” and give support to project managers, municipal and state officers as well as to civic groups and NGOs. It is also likely that the regulatory frameworks and specific situations will be similar in neighbouring countries which will make developing regional networking and dissemination of knowledge even more worthwhile.

5 Conclusions

There is a need to incorporate the reviewing of relevant policy/legislation/regulation as an activity within ecological sanitation projects. Relevant legislation/regulation includes not only water, environment, health and sanitation, but also agricultural legislation/regulations, as ecological sanitation entails reuse of sanitized human excreta in agriculture.

5.1 GAPS

The current review of the regulatory framework in Sweden, Mexico, Uganda and South Africa showed that the investigated countries have fairly developed regulatory frameworks which could embrace ecological sanitation to a certain extent (varying with country), but even so all countries show ecological sanitation implementation deficits. The actual reasons for this

deficit can be found in all parts of the "law-chain" and have many different forms, some of which are, for the investigated countries:

- outdated legislation;
- new legislation/regulation not incorporated into the daily regulatory work of the authorities;
- lack of personal/financial resources; and
- lack of public adherence to existing legislation/regulation.

5.2 BARRIERS AGAINST IMPLEMENTATION OF ECOLOGICAL SANITATION

The lack of capacity and resources to meet the implementation deficit created is a major barrier against the implementation of ecological sanitation, as are the weak institutions and the seemingly universal lack of political will for sanitation. Outdated legislation which is not harmonized with related legislation is also an important barrier. Many of the barriers and impediments to implementation of ecological sanitation are similar to general aspects documented for the water supply and sanitation sector as a whole. Therefore it is very important to document and disseminate lessons learned within the water supply and sanitation sector in each country and within each region. It is as important to draw the "institutional map" for each specific setting to identify the specific barriers for a project or specific programme.

5.3 OPPORTUNITIES FOR ECOLOGICAL SANITATION

The existing legislation and regulation can in many cases, if enforced, serve as a good platform for promoting the implementation of sanitation systems such as ecological sanitation. Minor changes to existing legislation and regulation can create opportunities for ecological sanitation. By raising political will at local or regional level the regulatory framework can be changed and allocation of resources for implementing the rules will create incentives for households to choose an ecosan solution. The opportunity of an "allowing" or flexible legislation based on principle rather than technology would make it possible for households to make the changes themselves as long as their activities remain within the legislation. A combination of awareness raising and the availability of affordable and acceptable sanitation systems can lead to progress at household level.

5.4 TARGET AREAS TO ADDRESS FOR ECOLOGICAL SANITATION PROJECTS

Target areas originating from the discussions in this report that should be addressed for ecological sanitation projects include:

Identification of opportunities for the promotion of ecological sanitation within existing regulatory framework

- Pilot projects, if they have a systems and organizational approach, can pinpoint gaps and responsibility voids in the current legislative framework for the local setting.
- Barriers and impediments within the policy framework can in many cases be similar between countries and even regions, which makes the sharing of lessons learned worthwhile.

Lobbying for implementation and enforcement of existing legislation that is supportive to ecological sanitation

- Lobbying for the use of economic instruments to guide development.
- Lobbying for proper pricing of water and sanitation services.

Proposal of reforms of parts of the legislation/regulation that have been identified as crucial to embrace ecological sanitation

- Minor changes to existing frameworks to embrace ecological sanitation are suggested for the investigated countries rather than legislative reforms
- Use of bottom-up strategies for developing sanitation policies is recommended when applicable.
- Function/principle/criteria-based regulation is preferable to technology-specific regulation.

Work with demand-driven approaches to sanitation

- Adoption and piloting of demand-driven approaches to ecological sanitation are interesting as many new policies and regulations and marketing campaigns are being developed in accordance with this within the water supply and sanitation sector.

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(These can be provided as pdf-files from VERNA Ecology. Please order by sending an e-mail to: info@verna.se)

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http://www.boverket.se

Appendix 1

MORE ON THE ENVIRONMENTAL CODE , THE PLANNING AND BUILDING ACT AND THE PUBLIC WATER AND WASTEWATER SYSTEMS ACT IN SWEDEN

In Sweden the laws and regulations regarding sanitation have been developed over a long period of time. The Environmental Code, the Planning and Building Act and the Public Water and Wastewater Act, all stem from a long tradition of legislative development. However, all three have either recently been revised or are under revision. This is due to the rapid development in the environmental sector that has made some of the laws outdated and to the Swedish membership in the European Union and the following harmonization of legislation.

THE ENVIRONMENTAL CODE[55]

The Environmental Code, which was established in 1998 and that is considered as rather progressive at least in a European context, has the objective to protect both the environmental and the public health interests.

The aim of the Environmental Code is to promote sustainable development that ensures a healthy environmental impact on both current and future generations. To achieve this aim, the Code is to be applied so that:

1. human health and the environment will be protected against damage and nuisance, regardless of whether this is caused by pollution or other influences;
2. valuable natural and cultural environments will be protected and conserved, biological diversity will be preserved;
3. land, water and the physical environment will generally be used so as to safeguard long-term good management of resources from an ecological, social, cultural and socio-economic viewpoint; and
4. reuse and recycling, as well as other management of material, raw materials and energy, will be promoted so that an “ecocycle” is created.

Most of the Environmental Code stems from the former Environmental Protection Act from 1969. The Environmental Code regulates among other things the discharge from individual on-site wastewater treatment systems. All wastewater discharge of either mixed wastewater or greywater is considered environmentally hazardous and the Code demands permits or notification requirements, which are issued by the local environmental authority, or for larger discharges by the County administration.

THE PLANNING AND BUILDING ACT[56]

The Swedish Planning and Building Act embrace the ideas of sustainability: reuse and recycling of natural resources. This Act gives the municipalities the faculty to single-handedly decide on the spatial planning and the development of infrastructure in the local situation. However, the Planning and Building Act is seldom used by the planning sections of Swedish municipalities for steering the use of water resources and for strategic wastewater planning. Strategic wastewater planning is usually performed by local and regional environmental authorities and cooperating organizations. The Planning and Building Act is therefore not used to its full potential in Sweden today. To read more about this act visit Boverket, The National Board of Housing, Building and Planning, which is the Swedish government agency for planning, the management of land and water resources, urban development, building and housing.

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55 Read the entire Environmental Code in english on http://www.internat.naturvardsverket.se

56 Read a description of the Planning and Building Act at the website of the National Board of Housing, Building and Planning, www.boverket.se

THE PUBLIC WATER SUPPLY AND WASTEWATER SYSTEMS ACT

From a historical perspective the legislation on wastewater treatment was formulated to confront the unsanitary conditions in the cities in the late 19th century. In the early 20th century there was a rapid change from the existing dry latrines used in the cities of Sweden to water closets, and an increase in untreated wastewater transported by the sewage systems to the local recipients followed. During the first half of the 20th century more and more focus was put on recipient control and preventing emissions of eutrophicating substances and organic matter that caused oxygen depletion in lakes, rivers and also the bays of the Baltic Sea. This led to a continuous construction and increase in sewerage coverage and wastewater treatment plants for urban and peri-urban areas starting in the 1950s. This also led to the new Public Water Supply and Wastewater Systems Act that came into force in 1970 (see below).

The Public Water Supply and Wastewater Systems Act applies to all municipal water supply and sewerage systems and gives the municipalities a powerful tool for deciding upon the sewerage and wastewater treatment. It gives the municipality the right to force people to connect to a centralized system and the right to charge both a connection fee and yearly fees. This gives the municipal water- and wastewater departments a great income and power over water- and wastewater planning.

This act came into force in 1970 and most of the wastewater treatment systems were built during a short period between 1970 and 1980. This was mainly because of the demands put forth in the Environmental Protection Act. Generous subsidies (up to 50% of the total costs) from the government made it possible for the municipalities to construct thousands of treatment plants and tens of thousands of kilometres of sewage pipes. This large investment allowed the connection of approximately 90% of the population to central treatment systems, all with very uniform design. The households not covered by the municipal wastewater treatment systems were, and are, monitored by the environmental authorities and are managed by the individual households.

The Public Water Supply and Wastewater Systems Act lacks discussions on sustainability or effective use of natural resources, closing nutrient loops etc. One consequence of this is that there is little pressure on municipalities to develop recycling systems or trying new promising concepts as urine diversion on a larger scale. The environmental authorities have little or no faculty to impose the objectives of the Environmental Code on the systems regulated by the Public Water Supply and Wastewater Systems Act.

Appendix 2

DESCRIPTION OF THE POLITICAL DEVELOPMENT IN SOUTH AFRICA AND THE IMPLICATIONS FOR THE SANITATION POLICIES AND REGULATORY CONTEXT

To gain an understanding of the legislation and policy context one must first understand the political dynamics of the country as this has had a major impact on the development of legislation and peoples' aspirations.

Until 1994 the country was governed by a number of different systems. These included:

1. The so-called TVBC States. These were nominally independent homelands, which were only recognized by South Africa.
2. Self-governing territories. These were homelands, which were not regarded as independent but had separate administrations from mainstream South Africa.
3. Section 7 areas for coloured people in the Cape Province.
4. Municipalities (both in the homelands and mainstream South Africa), which had elected councils and by-laws.
5. Joint Service Boards in KwaZulu-Natal, which tried to provide services in a co-ordinated fashion across the borders of KwaZulu and Natal.

6. Provincial Administrations, which administered the rural and peri-urban areas outside municipalities in "white" South Africa.
7. A Tricameral parliament with separate house for whites, coloureds and Indians.

Within this fragmented system the only standard which appears to have been applied consistently, and then only in the municipal areas, was the National Building Regulations (NBR). The NBR set the standard as waterborne sewage compelling consumers to link to a municipal reticulation system, if provided, and pay the tariffs whether they wanted it or not. It did not, and still does not, deal with the separate components of urine, faeces and greywater and how to manage them in a manner which does not cause environmental pollution.

Outside of the municipalities there were no standards and anything was acceptable. Since there was very little money allocated to sanitation, people provided for themselves in the form of pit toilets or septic tanks.

In 1993 transitional local government was introduced, which sought to give previously disadvantaged groups representation in local government until the first democratic local government elections could be held in 1995. The Constitution was passed in 1996 and this gave the responsibility for providing sanitation services to local government whilst the national government set policy and legislation. Provincial government does not have a distinct role and acts as an administrative arm of national government in supporting local government in the implementation of policy.

Also, South Africa has spheres, not tiers, of government. This means that the Constitution assigns responsibilities to the different spheres and so long as local government acts within its mandate it cannot be instructed in what to do by another sphere of government.

The 1995 municipal demarcation was not a success. The division of the metropolitan areas into substructures and the creation of urban and rural municipalities created immense problems in the administration of areas and left many of the rural municipalities severely under-resourced. As a result the municipal boundaries were redrawn in 2000 and the present system of local government established. The 2000 demarcation brought into being two levels of local government district and local municipalities. The idea behind this was that district municipalities would support local municipalities until they were strong enough to run on their own. Unfortunately the legislation did not take into account the vast differences in the capabilities of the local municipalities across the country. As a result there was a major argument over the division of powers and responsibilities, in particular who would be responsible for water and sanitation. This was not resolved until 1 July 2003 and the result was a pragmatic compromise whereby strong local municipalities retained the powers to provide water and sanitation (generally those in the west and south of the country) whilst the district municipalities serving the former homeland areas were given this responsibility.

It can thus be seen that only since 1 July 2003 have officials and councillors known what is expected of them and can start addressing the issue of giving access to sanitation services. Unfortunately many of the municipalities rely on officials whose only experience was with waterborne sewage serving a high income population and as a result there was a learning curve as they grappled with their new responsibilities. For example, in 1993 in Ethekwini (Durban), almost 95% of the households had waterborne sewage. With the creation of the metropolitan area, which stretched into the rural areas, this figure dropped to 50%. Fortunately, the development of policy and legislation, since 1994, has been pro-active and officials have had a framework in which to work with the new realities.

There are a number of Acts which affect sanitation. These are:

- The Constitution of the Republic of South Africa (Act No. 108 of 1996)
- National Water Act (Act No. 36 of 1998)
- Water Services Act (Act No. 108 of 1997)
- National Environmental management Act (Act No. 107 of 1998)
- Public Finance Management Act (Act No. 1 of 1999)
- Municipal Finance Management Act (Act No. 36 of 1998)

- Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947)

These, together with the policy documents, do not comprise a comprehensive and integrated sanitation policy, strategies and legislation covering all aspects. The policies and programmes only cover access by households to on-site sanitation, with a focus on rural areas, rather than an integrated policy covering household access to sanitation, safe disposal of excreta and effluent and health and hygiene

Safe disposal of excreta and effluent is covered under the National Water and Environmental Management Acts.

A "Classification of Sewage Sludges and Permissible Uses" exists taken from the Water Research Commission Report "Permissible Utilisation and Disposal of Sewage Sludge, August 1997". Strictly speaking the dry content of a urine diversion toilet is not a sludge (i.e. from a sewage mixed with all the other pollutants). However, in terms of the report it can be classified as a sludge with a wide range of application possibilities, provided that the faeces fraction is stabilized, shows high hygienic quality, and is certified. For it to be used for agricultural/horticultural activities, it must be registered in terms of the legislation. This legislation, however, dates from 1947.

Appendix 3

DESCRIPTION OF THE FREE BASIC SERVICES FOR THE SOUTH AFRICAN PEOPLE

Free basic water

The 6,000 litres of potable water per household per month is based on the assumption of a family of 8 using 25 litres per person per day. All the water reticulation systems, where there are communal taps, are designed to provide this at 200-m and the main supply lines are designed for 50 litres per person per day.

All studies, however, have shown that where water has to be carried from the tap to the house, consumption is between 2-3,000 litres per household per month. It is inequitable that one household should receive a higher benefit than another, yet due to the different service levels this is exactly what is happening, and it is the richer consumers who are benefiting at the expense of the poor. Those currently unserved will then demand the same benefit and will not be interested in more appropriate solutions.

However, since the richer, already serviced, consumers are being subsidized, they will have to wait longer to receive the same level of service, as money will be diverted from capital expenditure to operation and maintenance.

Free basic electricity

To use electricity a household must have an electrical connection. Most people who live on a serviced stand have a connection and if they live in a municipality, which has adopted this policy, receive the benefit. However, without a connection, nothing is received and again the richer consumers will receive the benefit while the poorer receive nothing.

Free basic sanitation

From a technical position a properly functioning VIP, a dry urine diversion toiled and a flush toilet comply with the definition of acceptable sanitation. From a consumer's point of view, however, they offer vastly different benefits:

- A flush toilet takes the excreta away, together with the greywater, for someone else to deal with. It is located in the house and easily maintainable by the household (at household level);

- A dry urine diversion toilet does not take the excreta away. It can be located inside the house. Someone must empty the vault (if not done by the household this is an expensive operation) and although easily maintainable people are still not comfortable with handling the dry faeces. Separate provision must be made for the disposal of greywater; and
- A VIP is outside the house (as a result potties are used at night) and is not easily maintainable when the pit is full. Separate provision must be made for the disposal of greywater.

If a sanitation service were to be provided for free most households would opt for a flush toilet and would consider it highly inequitable if some households received a free flush toilet whilst they had a urine diversion or VIP toilet.

Appendix 4

DIFFERENT WAYS OF DEFINING CRITERIA AND REQUIREMENTS FOR ON-SITE SANITARY SYSTEMS: SWEDEN

Appropriate on-site sanitation can fulfil both primary requirements from society concerning disease protection, water protection, and natural resource conservation, as well as practical requirements from the user such as convenience and reasonable costs.

This appendix describes two approaches to aid in decision-making for on-site sanitary systems at municipal level.

The recommendation of a few, authorized technologies guides the choice of on-site sanitation system

One approach, traditionally used by Swedish environmental and building authorities at municipal level, has been to issue building permits only to those house-owners ready to install on-site sanitation systems utilizing a few technical solutions as proposed by the authorities (for the Swedish setting vertical sand filters and soil infiltration after a septic tank have been promoted). There are a few advantages with this approach:

- decision-making, planning, and control are made easier for the authorities if they only have to relate to a few different technologies;
- competence requirements on the environmental authority can be limited if only few technologies needs to be handled;
- economic incentives, such as subsidies, are more easily managed for the environmental authorities for few, well-known technologies.

There are also some major drawbacks with this approach:

- the use of some few authorized techniques does not endorse innovation within the sector;
- inflexibility and risk of authorizing inappropriate sanitation solutions, due to lack of possibility to respond to possible demands from the householders, and also from possible new innovations within the sector;
- low capacity to deal with situations where the recommended few technologies do not work;
- low acknowledgement of local conditions; and
- low participation of involved stakeholders

The definition of desired functions of the sanitation system guides the choice of on-site sanitation system

Another approach to on-site sanitation is to identify what functions the sanitation system should fulfil in order to be appropriate to the context. This approach recognizes that the desired functions of a sanitation

system can be fulfilled by a range of different technologies. In fact, by this approach the local conditions and the users' preferences are allowed to guide the choice of sanitary solution. This is also in accordance with the principle of BAT (best available technique) which is a part of the environmental legislation in many countries. Practically, this is achieved by identifying, together with the relevant stakeholders in the actual context, what functions the on-site system shall fulfil both concerning practical aspects (convenience for the user, user costs etc.) and primary functions (water protection, health, resource conservation). A list of these desired functions is then used to compare the performance of different sanitation technologies and the best solution, concerning both practical and primary functions, can be identified for each context.

Advantages of this approach are:

- The focus is on the function of the sanitation system and not on the technology (that is only a means to provide the function). Both practical, user-related functions such as costs and convenience, and primary functions such as water protection, health, and resource conservation can be covered.
- It facilitates innovation, since the identification of system function and comparison of how different techniques perform compared to the desired function will show where development is needed and thus spur innovation.
- It allows for an objective approach to sanitation and invites stakeholders to identify the practical functions (convenience, costs, etc) of the sanitation system. Thus, this might also increase awareness and understanding about the primary functions (water protection, health and resource conservation) among householders.
- It breaks up habitual thinking and preconceived opinions that often may obstruct a fruitful discussion and planning process among wastewater professionals.

The drawbacks with a function approach to on-site sanitation planning are:

- High competence requirement within the on-site sanitation field at the environmental authority.
- The participatory approach demands more resources in the planning stage.
- The spur in innovation will increase the number of untested technologies on the market, which will in turn cause an increased flow of information relevant to both for the household and the environmental authority, which increases the need for guidance for the household. This guidance role needs to be taken by by either the environmental authority or other institution in the society.

The development of requirements based on function for on-site and small scale wastewater treatment in Sweden and Finland

Traditionally, the criteria for on-site sanitation from the environmental authorities in Sweden regarding wastewater treatment have been specified in such a way that only a few technical solutions have been accepted: soil infiltration and vertical sand filter beds.

However, there has been a rapid technical development of on-site sanitation systems in Sweden during the 1990s. New urine-diverting and dry toilets, black water systems, greywater-treatment and a number of different products aimed at treating wastewater on-site have entered the Swedish market. The municipal authorities are now being challenged by a number of new techniques that are not "on their list" of traditionally allowed techniques.

During 2005 new rules and recommendations for on-site sanitary systems will be published by the Swedish EPA. These new rules will be an interpretation of the Environmental Code and the criteria will most probably be formulated as requirements based on function which will entail the local environmental authorities having to change their way of working.

There are also a number of municipalities in Sweden that have developed their own policies based on the same concepts with requirements based on the desired functions. The municipal policies are in some aspects similar but most of them have differences regarding the specific reduction, whether recycling of nutrients is included and for which type of households and situations they are applicable.

Evaluation of small wastewater treatment systems – Bra Små Avlopp

To generate more knowledge on the performance of on-site sanitation systems a three-year evaluation of on-site systems was launched in 1999 by Stockholm Water Company and the Swedish Delegation for Sustainable Technology (Miljöteknikdelegationen). It was initiated in 1998 as a competition to encourage the development of new on-site sanitation technologies to reduce discharges from private dwellings and to enable efficient recycling of nutrients from wastewater to agriculture.

The function requirements to meet for the competing systems were the following[57]:

- they should remove at least 90% of the phosphorus, preferably 50% of the nitrogen and 90% of the biodegradable organic substances;
- the treated wastewater should meet the microbial quality requirements for bathing water if exposure to humans is expected;
- it should be possible to use at least 70% of the phosphorus from the wastewater in agriculture.
- they should conserve natural resources;
- they should be economical and user-friendly;
- handling of residual products (e.g. sludge) should be possible in a hygienically acceptable manner;
- proposals should be submitted for the prevention of the spread of infection in conjunction with the storage and use of residual products.

About 30 entries were received and eight types of systems were selected for a more detailed evaluation.

The evaluated systems in the project can be divided into three groups:

- small treatment plants;
- chemical precipitation as a supplement to existing infiltration beds; and
- diversion systems, such as urine diversion and black water systems with on-site greywater treatment.

All the systems were installed during the fall of 1999 in private homes around Lake Bornsjön, which is the reserve water supply for greater Stockholm. The land and many of the properties around Lake Bornsjön are owned by Stockholm Water Company.

The criteria for the evaluation were formulated as requirements based on the primary functions of wastewater treatment. This project has now been completed and it has had a great impact on the way municipalities, regional county boards, and not least national actors, such as the Swedish EPA, approach these questions today.

New legislation for on-site systems in Finland

In Finland, several new laws has been passed lately, among them the Environmental Protection Act in 2000. Other principal new legislations are the Water Supply Act, the Land and Building Act and the Health Care Act. Overall, the legal framework surrounding on-site sanitary systems is good. There has not, however, been much improvement in the sanitary situation in Finland. Therefore a decree on wastewater treatment in rural areas was ratified on 11 June 2003 and came into force as of January 1, 2004. According to the decree, wastewater must be treated so that:

- BOD load is reduced by 90 %;
- total phosphorous content reduced by 85 %; and
- total nitrogen content reduced by 40 %;
- a municipality can lower the reduction percentages to 80 % (BOD), 70 % (P) and 30 % (N) in an area which is not very sensible to environmental damages;
- every household without a sewer connection must have a written description of its wastewater treatment system(and a blueprint);

57 Evaluation of small wastewater treatment systems. Brochure presenting the project. Available as PDF-file at www.stockholmvatten.se

- each wastewater treatment system must be designed according to the guidelines given in the decree;
- sludges from septic tanks, other treatment units and containers must be collected from the properties in the same manner as solid wastes. Thus, the municipality must organize centralized collection if the house owner cannot show he has made a contract concerning the collection with a company or an entrepreneur.

These are rigorous and ambitious goals and the enforcement of this decree will demand high levels of work and investment. Finland sees this as the only way to prevent deterioration of their coastal and inland waters.

Appendix 4

SPECIFIC TARGET AREAS AND SUGGESTED ACTIONS TO REFORM THE REGULATORY FRAMEWORK IN MEXICO

In this appendix the specific results and proposed actions to reform the regulatory framework in Mexico is presented.

Target areas in Mexico

A possible target area to address is the need to clearly define ecological sanitation and its elements in law so that they can be regulated based on their attributes and not as elements incorrectly placed within the realm of water or hazardous materials regulations. On the other hand it may be possible to achieve this at national level using the Mexican Official Norms . It is also important to bring the discussion out of the regulatory realm of water, related only to public health and wastewater treatment considerations, and into a sphere where nutrient recovery and agricultural use are considered. However, because ecological sanitation will likely coexist with water-based sanitation for a long time, it will still be necessary to work with water agencies and legislation dealing with wastewater treatment. Sanitation for the time being is in their sphere of action and regulation, and waterless sanitation may be a very attractive alternative to them when they cannot supply or treat enough water for urban areas.

In addition to these agencies, it will also be important to work closely with health agencies to clarify the public health concerns relating to ecological sanitation; with agricultural and soil conservation agencies to present the benefits of processed and sanitized human excreta; and with solid waste management agencies, for guidelines in the collection, transportation, storage and processing of human faeces and urine.

For individual citizens, it will be crucial to make ecological sanitation legal (so they do not have to engage in excessive paperwork to get a permit), easy and attractive. This will be possible through legal changes, institutional support, and sets of incentives. This will be developed in the following sections.

Policy issues: incentives for widespread adoption of ecological sanitation in Mexico

Policies which are essential for the widespread adoption of ecological sanitation in Mexico would need to be built into the regulatory framework and operating strategies of various government agencies.

1. Economic Instruments
Once legal recognition exists, specific fiscal and financial incentives in the promotion of ecological sanitation can be developed. These might include tax exemption or tax reduction when investing in ecological sanitation; the financing of ecological toilet purchase and installation by the water utilities (based on their water supply and wastewater treatment savings); and pricing disincentives for water-based sanitation such as the inclusion of wastewater treatment costs in the water bill, charging the full supply costs of water to the users, imposing a tax on flush toilets, etc. Incentives applicable to the production of compost and fertilizers from human excreta would also be attractive.

2. Lobbying and Awareness-Raising
It will be important to lobby for funding and institutional support for ecological sanitation among government agencies responsible for sanitation provision and development. In addition, status campaigns for ecological sanitation will be necessary among the general population. This is because currently in Mexico, dry toilets are perceived as temporary, partial, low-status, 'backward' solutions for the poor or as 'hippie' solutions for back-to-the-land environmentalists[58]. There are hardly any role models or examples that would appeal to the great mainstream majorities. Within the status raising efforts it will be important to present ecosan not as the sole alternative to conventional sanitation, but rather as a component of a repertoire of socially-accepted, convenient, first-class, institutionally-provided sanitation options.

3. Other incentives
In addition to economic and status or awareness-based incentives, institutional support in the form of training, but especially of technical support, maintenance and end-product collection services will be essential in achieving user acceptance of ecological sanitation technologies[59]. Finally, aesthetics and functionality of the toilets are also important.

Legal issues: some proposals for legal transformation towards ecological sanitation

Some changes that would lead to a more favourable legislative and regulatory environment for ecosan are presented below. The first four are at federal level, except No. 4, which in some parts is applicable at state level:

1. Constitutional recognition in article 4 is needed for the right to water for all people, specifying that "all people" includes both present and future generations. This would foster a change in policy from "payment against discharge", towards a policy of "zero pollution goal". Translating this right into public policy would facilitate the transition towards ecological sanitation practices. The fact that LGEEPA (The Federal Environmental Law) addresses both present and future generations in natural resources management should facilitate this required change in the Constitution.

2. Regarding the health sector, at the federal level, it would be necessary to include in the LGS the regulation of the processing, treatment, and storage of faeces, urine and their transformed products. To this end, statements to the effect that human excreta may (or should) be treated and/or processed for reuse would be desirable.

3. A group or a set of specific Mexican Official Norms (NOM) should be put forward, where the technical aspects and the criteria for handling, processing and managing human faeces and urine are established, including specification of measurement systems, certifying authorities, etc. These NOMs could then form a regulatory framework for the state and municipal authorities and actors to work within.

4. A chapter referring to compost and organic fertilizers should be added to the corresponding Reglamento de Control Sanitario de Productos y Servicios. At the state level, in the LSEM (Morelos State Health Law) a paragraph may be added to state that in local sanitation the regulation and promotion of sanitation through the making of compost and organic fertilizers is a competence of the State. Adding this law would embrace aspects of recycling human faeces and urine and establish some of the sanitary measures that must be taken to this end.

The following recommendations are for the level of the State of Morelos or for the municipal level:

5. Regarding soil, a paragraph could be added to establish that the State would support producers and organizations in technological transformation of processes for the use of excreta and urine for agricultural purposes, under adequate public health measures.

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58 See Cordova A. 2003. Factors Affecting the Vialbility of Large-Scale Dry Sanitation Programs in Cities: An Assessment Based on Mexican Experiences. PhD Dissertation. Cornell University. Ithaca NY.

59 Ibid.

6. In urban development it is important to state expressly in the urban development planning of the different levels, the relevance of finding alternatives for feasible environmentally friendly sanitation systems. Reform in this sense is needed in LGAH (The Law for Urban Settlements), LOTAS (The Law of Territorial Planning and Human Settlements of the State of Morelos), and it might be stated in terms similar to those in LEEPA (The Law of Ecological Balance and Environmental Protection in the Sate of Morelos).
7. In the BPYBGMT (The Municipal Governance and Police Regulation of Tepoztlán) it would be relevant to include in the measures to preserve ecological balance the need and obligation to recycle whenever possible.

Municipal issues – A bottom-up strategy for legal transformation: influencing legislation through proper municipal regulation

The municipal level is where most work can and will be done because the municipality is the level of government most directly involved with solid waste management, wastewater treatment, and land-use planning on its territory. Proper legal regulation at municipal level may help in the paradigmatic shift necessary for widespread adoption of ecosan. In the specific case of the municipality of Tepoztlán it would also help to cope with the problem of the absence of any sanitation policies or from the constant changes in the existing policies regarding sanitation practices. The development of new regulations for the municipality of Tepoztlán may then serve as a model for other municipalities and could help influence gradual change of law at other levels of government. Proper municipal regulation would deal with the different issues of municipal government in an integral manner.

The content of a regulatory framework for a municipality regarding ecological sanitation is being proposed by the Mexican consultants. This municipal regulation should, according to them, contain:

a. Basic principles and rules taking into account particularities of the municipality.
b. Inclusion of rules for construction permits and new urban developments.
c. Policy and procedures regarding water management and sanitation, including assessment and monitoring.
d. That concrete measures and actions regarding ecological sanitation should be specified and undertaken by the municipality
e. Adapting local regulation to federal and regional legislation to avoid conflicting jurisdictions and to promote concurrent jurisdictions.
f. Institutional mechanisms of participation of the local population in the process of municipal management in specific affairs of importance such as sanitation, with specific emphasis on surveillance.
g. Definition of minimal norms of quality of the public services offered by the municipality.
h. Establish as a requirement for the development of housing to fulfil regulation in relation, amongst others, to sanitation issues.
i. Establishing proper systems of incentives for conversion and retrofitting of conventional technology towards ecological sanitation.
j. Implementation of registers and inventories of waters and soils.
k. Improving tariff system collection and the making of proposals of tariff reform (in the TepozEco–project this would a proposal would be made for the Congress of the State of Morelos).

This very comprehensive proposal may serve as an inspiration and a starting point that can be used in its entirety or in parts by stakeholders or actors at the municipal level. It must of course be discussed and developed in relation to the local situation. In the Tepozeco project, supported by Ecosanres, steps are being taken to further develop and "anchor" this concept in the municipality of Tepoztlan. Hopefully, the lessons learned from that process will be disseminated during the next few years.