



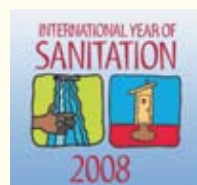
**Malteser
International**
Order of Malta Worldwide Relief

From safe water and sanitation to good health

Water, sanitation and hygiene projects in Asia



Marking the International Year of Sanitation 2008



Contents

Mission statement	2
Foreword	3
Abbreviations	4
“WASH” reduces child mortality	5
Becoming facilitators of improved health	6
Box 1 Rainwater harvesting in Sri Lanka	7
Box 2 Rainwater harvesting in Myanmar	8
Box 3 Child friendly schools WASH project in Sri Lanka	10
Box 4 Wetlands as a solution to treating wastewater in Thailand	12
Box 5 A WASH project in Sri Lanka	13
Box 6 Family latrines in Myanmar	16
Box 7 Rural water safety plans in Sri Lanka	17
Box 8 A piped water system in Indonesia	18
Box 9 Water and sanitation for tsunami housing in Sri Lanka	19
Box 10 Handwashing with soap	20
Concluding remarks	20
Box 11 WASH in a refugee camp in Thailand	21
International Year of Sanitation 2008	22
Further reading	22
Acknowledgements	23

MISSION STATEMENT

Malteser International is the worldwide relief agency of the Sovereign Order of Malta for humanitarian aid. The organisation covers around 200 projects in about 30 countries in Africa, Asia, Europe and the Americas. Currently, 20 national associations of the Order of Malta are members of Malteser International.

Evolved from Malteser Germany, therefore set up in accordance with German Law, and internationalised as the Order of Malta’s relief service in 2005, the organisation provides aid in all parts of the world without distinction of religion, race or political persuasion. Christian values and the humanitarian principles of impartiality and independence are the foundation of its work. Its mission is not only to provide emergency relief, but also to implement rehabilitation measures and to facilitate the link between emergency relief and sustainable development. Malteser International establishes and promotes primary health care services and seeks to reduce vulnerability and poverty. It is committed to ensure high quality standards. Accountability and transparency are priorities of its agenda.

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Responsible for content	: Ingo Radtke
Concept	: Roland Hansen
Editorial team	: Arno Coerver (editor-in-chief), Roland Hansen, Petra Ipp-Zavazal, Suzanna Lipscombe, Dr. Peter Schmitz
Text	: Suzanna Lipscombe, Dr. Peter Schmitz, Members of the WASH Standing Working Group
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Villagers built simple bathrooms because a participative assessment on village health revealed that the lack of privacy for women had an adverse impact on female hygiene and health, Cambodia



Foreword



For a long time now Malteser International has been involved in Water, Sanitation and Hygiene (WASH) activities, and they are an integral component of our approach to primary health care. With this brochure we want to show our expertise in this important sub-sector, and at the same time contribute to the International Year of Sanitation that calls upon all stakeholders to stress the relationship between sanitation, hygiene and related diseases.

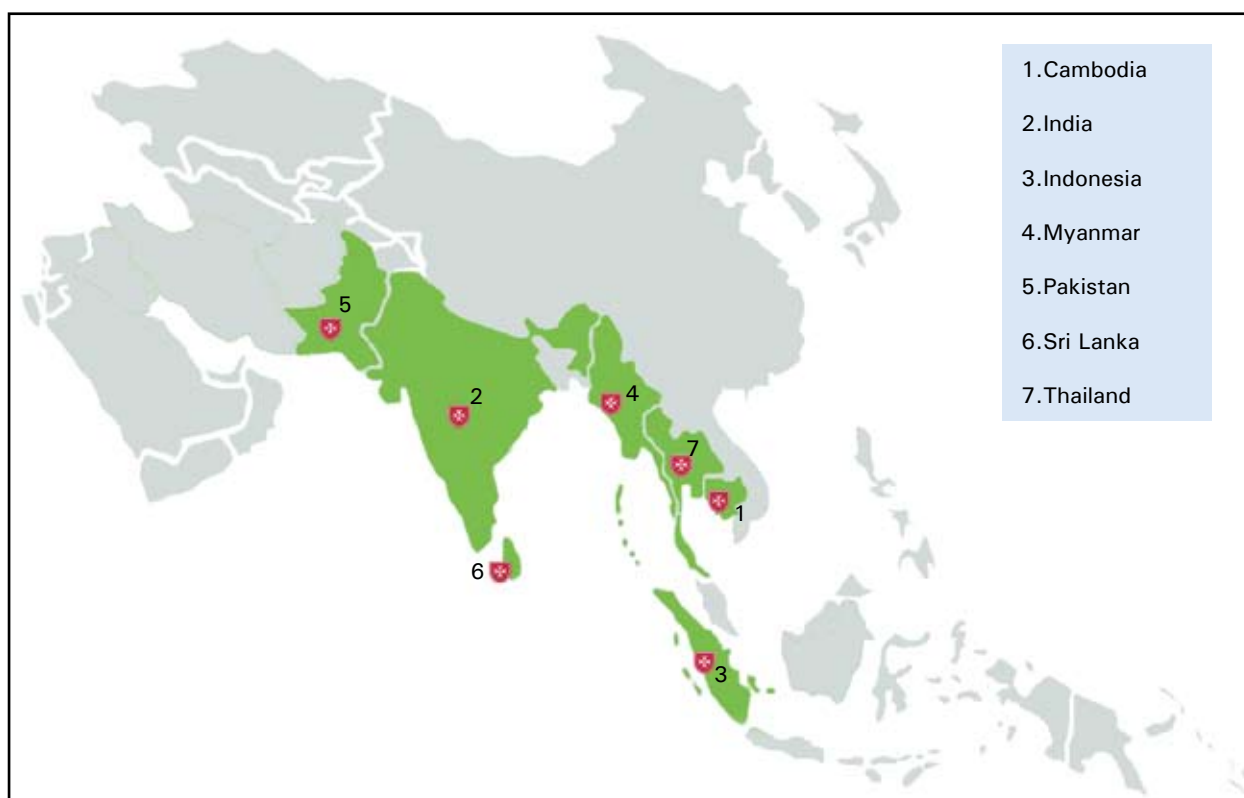
WASH is of significant importance in saving millions of lives - in particular the lives of children. The best practices of our WASH activities in Asia are described in this brochure, and they give us confidence that we have the knowledge and experience to continue in this field, though we are also embracing the challenge of further developing innovative approaches such as Ecosan. However, a strong commitment from the international community also plays a significant role. Both donors and implementing organisations in this field need to increase their efforts in WASH if they want to achieve the respective Millennium Development Goals, which are currently at risk of not being met. It is only with a strong commitment, accompanied by the necessary investments, that we will be able to save the lives of those in need.

Malteser International is grateful for the strong partnerships with our key donors such as UNICEF, the European Commission and the German Government. Our sincere thanks also go to our local partner organisations who make our work possible, and to the members of the WASH Standing Working Group who managed to successfully compile this brochure despite their day-to-day project work.

February 2008, Cologne

Ingo Radtke
Secretary General
Malteser International

Current Malteser International WASH projects in Asia



Abbreviations

ADH	: Aktion Deutschland Hilft e.V
BMZ	: German Federal Ministry for Economic Cooperation and Development
ECHO	: Humanitarian Aid Department of the European Commission
EuropeAid	: European Commission Development Aid
GN	: Grama Niladhari (administrative group of villages in Sri Lanka)
GTZ	: German Technical Cooperation
HWT	: Household Water Treatment
HQ	: Headquarters
IWRM	: Integrated Water Resources Management
LRRD	: Linking Relief Rehabilitation and Development
LRWHF	: Lanka Rainwater Harvesting Forum
MDG	: Millennium Development Goals
O&M	: Operation and Maintenance
PTA	: Parent Teacher Association
RWH	: Rainwater Harvesting
SODIS	: Solar Water Disinfection
UN	: United Nations
UNHCR	: United Nations High Commissioner for Refugees
UNICEF	: United Nations Children's Fund
WASH	: Water, Sanitation and Hygiene
WHO	: World Health Organisation
WSP	: Water Safety Plan



Rainwater harvesting tank under construction in Ransagoda, Matara District, Sri Lanka



Reconstruction of water collection tank in remote Himalayan village after earthquake, Pakistan



WATER, SANITATION AND HYGIENE

“WASH” REDUCES CHILD MORTALITY

Malteser International promotes concepts to prevent illness and deaths due to lack of sanitation and poor access to safe drinking water

Dr. Peter Schmitz
Chief Medical Officer
Malteser International, Cologne HQ

Diarrhoeal diseases are the most common health problems and causes of death worldwide. 4.4 billion people suffer from diarrhoea every year (Worldbank, 2003), and the WHO estimate that 1.8 million people die from it each year (WHO, 2004). This includes 4,000 children under five years of age who die from diarrhoea every day. The underlying causes are well known. To date there are 2.6 billion people worldwide who lack basic sanitation and 1.1 billion who do not have access to safe drinking water. The transmission of diarrhoeal and water related diseases are directly linked to inadequate access to water and hygiene practices. Diseases can be transmitted from the host through water, food and direct contact with human waste. The faecal-oral transmission of disease is typical for waterborne diseases. However there are also a number of vector-borne diseases related to poor water supply and sanitation. Factors that contribute to a higher risk of infection include substandard and crowded living conditions in slums or camp situations. Poverty is directly linked to poor access to drinking water and sanitation facilities.

Based on this reality, targets to improve access to water, sanitation, hygiene, the reduction of under-five-mortality and poverty reduction have been set as the Millennium Development Goals (MDGs). Those with poor access to water, who suffer from hunger and who live on one or two US\$ per day are the same population. Despite the improvements already achieved during the first Water For Life Decade there is still a significant gap in drinking water coverage between rural (899 million people) and urban (170 million people) communities (WHO, 2004). Alarming, this constitutes 15 % of the global population.

Diseases related to the lack of drinking water, hygiene and sanitation can be prevented by simple, well known and well established concepts. For example, hand-washing with soap is effective in reducing the incidence

of such diseases by 50 %. Safe storage of human waste in latrines is also without a doubt one of the important building blocks in reducing the risk of contamination and transmission. But the availability of sanitation facilities cannot stand alone - people must decide that this is advantageous and a benefit for their health, and an improvement for their communities.

Traditional habits, ignorance, misinformation and lack of knowledge can hamper acceptance and willingness to change attitudes and practice. There is an urgent need to educate and promote well known, basic concepts to improve hygiene in the communities of developing countries. The introduction of new technologies, appropriate in the context and living environment of the communities, needs to be discussed, offered and planned in a participatory manner. An individual's or community's ownership and involvement in the decision making process are preconditions for sustainable improvement.

A key concept is household water treatment and storage (HWTS), and has been strongly promoted by the WHO since 2003. The objective of the initiative is clear:

“ Simple techniques for treating water at home and storing it in safe containers could save a huge number of lives each year.”
(WHO and UNICEF, 2005)

The commitment of the initiative is to contribute to a significant reduction in waterborne disease, especially among vulnerable populations, by promoting household water treatment and safe storage as a key component of water, sanitation and hygiene programmes.

Malteser International is committed to contribute to better health, and dignified living conditions by providing access to drinking water, sanitation, and health promotion for people affected by disaster, conflict and poverty.

Becoming facilitators of improved health: The path towards greater participation in Water, Sanitation and Hygiene

by Suzanna Lipscombe
Water and Sanitation Engineer
Malteser International Sri Lanka

The significant contribution that improvements to water supply, sanitation facilities and hygiene practices make to public health has been widely accepted by those involved in serving the needs of poor communities in developing countries. Approaches and technologies used to facilitate these improvements have evolved over the past 50 years, as have the overarching policies of leading humanitarian organisations and donors.

Since the 1970s the manner in which water and sanitation facilities in developing countries have been developed or improved has shifted from a traditional 'top-down' approach, to the current method of increased community participation in the planning and decision making during project interventions. Projects undertaken during the 1970s and early 1980s tended to concentrate on investments in water supply and infrastructure. Sanitation and softer components such as hygiene promotion and community training on operation and maintenance were often ignored due to their greater complexity and the time needed for the impact to materialise. Thus, despite significant funds invested in drilling boreholes and installing hand pumps, much of this infrastructure has been cited as out of service due to lack of maintenance, with the use of inappropriate technologies, and even the exploitation of unsustainable water resources. The results of which led the original beneficiaries returning to their previous, often dirty and unsafe, water sources.

These failures were blamed on a number of factors, namely that construction targets and physical outputs were central to progress rather than a long-term impact on health, and that the users themselves were not involved in problem identification. It became widely accepted that health education and hygiene promotion activities were essential to support hardware interventions in order to achieve an identifiable impact of improved health.

This led to the promotion of a new approach during the first UN Water and Sanitation Decade between 1981 and 1990. Strategies were complementary in developing both water supplies and sanitation in an integrated approach. Programmes were encouraged to promote self-reliance, adopt socially relevant systems that people could afford to run, and to involve the community at all stages of project implementation.



Child friendly school WASH facilities in Ampara District constructed in collaboration with UNICEF, Sri Lanka



Latrine construction, Myanmar



Introduction of ceramic filters, Myanmar

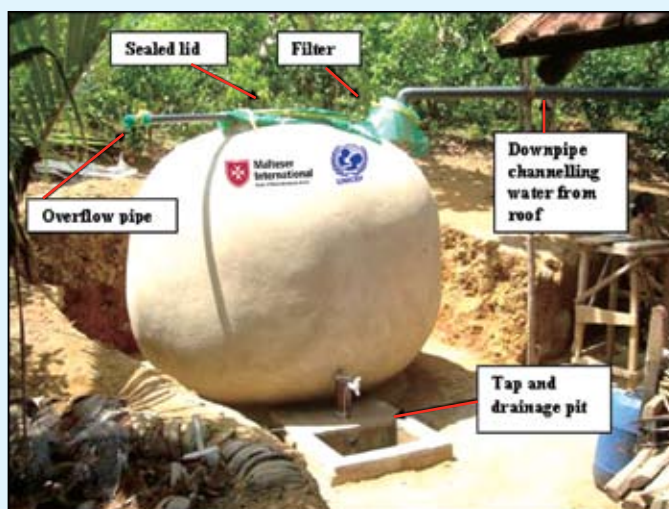


Box 1

Rainwater Harvesting: Improving water security in Sri Lanka

Malteser International and UNICEF are co-funding a three year rural water supply project in the Southern Province to provide 3,000 domestic rainwater harvesting (RWH) tanks. During the first year, 1,209 household rainwater harvesting tanks were constructed in the tsunami-affected areas of Galle and Matara Districts by the local partner Lanka Rainwater Harvesting Forum (LRWHF). The beneficiaries contributed unskilled labour and the valance board for the guttering. A further 1,005 tanks are planned for Phase II, which began in June 2007, and activities are now concentrated in more remote, rural areas further inland of Matara District, and will later extend into Hambantota District. These generally hill-top locations lack a piped water supply from the national network, and communities travel long distances across difficult terrain to collect water. Another 800 tanks will be constructed in the Southern Province between June and December 2008 with Malteser International funds. RWH tanks are also being constructed in Ampara District in the east, where a total of 250 tanks will be completed by the end of this year.

The RWH system consists of a five m³ (eight m³ in the more arid Ampara District) ferro cement tank that stores rainwater collected from the roof catchment. Debris, dust, droppings and dirt washed from the roof during the first rainfall can reduce the quality of water if collected in the tank, and therefore a means of diverting this 'first flush' is necessary. PVC guttering along the side of the roof channels water towards a downpipe with a removable plug at its base. The plug is re-inserted after about 15 minutes of rainfall, allowing clean rainwater to then pass through to the tank via a bucket of filter media to remove any remaining particles.



A completed RWH tank in Ransagoda, Matara District

Following construction, LRWHF conduct a workshop within the community and further inform beneficiaries about the RWH system and ways to maintain it. These activities are running in parallel with the Water Safety Plans Project, also implemented by Malteser International and co-funded by UNICEF. With a new water source, beneficiaries are introduced to household water treatment methods and safe hygiene practices to ensure their water supply and its quality are kept safe.

Given the amount of rainfall in Sri Lanka, RWH is considered a very appropriate technology to supply water. However, despite its long history in the country there remains considerable scope to promote RWH as a drinking water source. Traditionally open dug wells are the preferred source for drinking but they face a higher risk of contamination in comparison to the sealed RWH tank. Thus far, Malteser International's evaluation surveys have shown a high level of acceptance amongst the beneficiaries for RWH and the majority are using

it for drinking as well as domestic purposes. Awareness programmes are underway to increase knowledge and interest amongst the wider community for the future sustainability of the technology and the activities of LRWHF. These programmes take place at RWH Resource Centres that have been established in locations such as schools and temples. They also act as focal points for the community to observe the RWH system and find out more information about how to request a tank. In 2007, LRWHF reached a significant milestone in advocacy for RWH, as the Sri Lankan Government have now introduced legislation that will ensure all public buildings integrate RWH in the future.



Operation and maintenance training for beneficiaries in Matara

Finally, a holistic approach to incorporate water and sanitation programmes in other sectors, particularly health care, was strongly advocated. There was a shift in focus towards the software issues surrounding water and sanitation interventions, which were to be economically and culturally appropriate to the local context, in order to ensure sustainability.

Since the 1990s greater emphasis has been placed on sustainability through participatory approaches in water source development and management. There has been a general movement towards respecting and strengthening the pivotal role of women, and to understand the economic value of water. This concept of Integrated Water Resources Management (IWRM) offers a flexible, process-oriented and holistic approach to the optimal development of water, land and related natural resources that has been promoted by research institutions, in partnership with leading donors and development organisations in the field of water, sanitation and hygiene for developing countries. They advocated for increased attention to:

- Community participation during project implementation
- Health and hygiene promotion activities to be integrated into any water supply project
- Effective management of operation and maintenance to ensure sustainability
- Cost recovery to be incorporated into a project
- Gender balances in a community.



Community based latrine construction project, Myanmar



Participatory project planning involving schools, Thailand

Box 2

Rainwater harvesting tanks in schools in Myanmar Introducing safe water sources for students and teachers

With some areas in Myanmar receiving up to 5000mm annual rainfall, its precipitation rates are among the highest in the world. Nevertheless, rainwater is rarely used by the rural population for drinking purposes. Instead, water is carried over long distances to houses and schools. To generate a safe water source for students, Malteser International with the financial support of BMZ, ECHO, ADH and UNHCR is constructing 52 RWH tanks in schools and health facilities in different project locations throughout Myanmar. Through

the promotion of rainwater, the population is now getting used to it as a drinking water source, and are encouraged to collect rainwater by themselves.

The RWH tanks for schools are 22 m³ in volume, and consist of a reinforced ferro cement wall. Rainwater is collected from the corrugated galvanised iron (CGI) roof of the school buildings. To prevent accumulated dust and dirt from the roofs entering the tank, a 'first flush system', a down pipe with a plug, is installed in the piping system, which should be

activated after longer dry periods and especially in the first weeks of the rainy season. The tank is



School RWH tank under construction



Box 2 cont.

equipped with an overflow and washout pipe, and an outlet tap which is located in a lockable tap house. Drainage leads overflow or spilled water to a soak pit or an existing trench, depending on the location.

An important part of the activity is training in use and maintenance for students and the Parent Teacher Association (PTA) and promoting the good quality of rainwater. The PTA is

in most schools the responsible community-based organization, taking care of maintenance, cleaning and repairing of the tanks. This involves regular cleaning of roof and gutters, cleaning of drainage and checking if all openings of the tank are covered with fly screens to prevent mosquito breeding.

Rainwater is a safe water source if it is collected on a regularly cleaned roof and the first flush

does not enter the tank. Instead of using rain-fed, mostly unprotected ponds, the students are encouraged to take rainwater as a reliable alternative, at least during the rainy season. Normally the number of tanks for schools is calculated by the standard of one litre of drinking water per student per day, based on the required supply throughout the dry season, with the exception of school holidays.

There remained, however, the concern that 40% of the world's population were still without adequate sanitation facilities and that millions of children continued to die from water-related diseases. In the year 2000, the United Nations General Assembly set eight Millennium Development Goals (MDGs) that challenged the global community to reduce poverty and increase the health and well-being of the world's poorest people. In 2002, the World Summit on Sustainable Development in Johannesburg reaffirmed these goals and added access to basic sanitation as a centerpiece of the poverty eradication commitments. The International Development Target (MDG 7) was accepted and agreed to:

“Halve, by the year 2015, the proportion of people who are unable to reach or to afford safe drinking water and the proportion of people who do not have access to basic sanitation.”

Following the progress made in Johannesburg, another Water Decade was launched on World Water Day on 22 March 2005. Its aim is to promote efforts in fulfilling the water and sanitation related MDGs, and to incorporate themes such as scarcity, access to sanitation and health, water and gender, capacity-building, integrated water resources management, trans-boundary water issues, and disaster prevention.

Malteser International is committed to the cause of reducing child mortality, and to ensuring a life with dignity for the poor and people affected by natural disaster and conflict.

“40% of the world's population are still without adequate sanitation facilities and millions of children continue to die from water-related diseases.”



Hygiene promotion activities for children, Myanmar



WASH awareness campaign, Thailand

The principles of an integrated WASH programme have been incorporated into Malteser International's programmes throughout Asia. Our activities to date consist of inter-related projects that run in parallel to facilitate the development and improvement of primary health care services and the water and sanitation facilities of poor communities, and consider cross cutting issues such as gender and community participation in decision making.

Box 3

Sustainability through participation, child friendly schools WASH project in Sri Lanka

Together with UNICEF, Malteser International is implementing a child friendly WASH project in 110 schools in the Southern Province and 10 schools in the Eastern Province of Sri Lanka. During the first phase, the software components of the project for 43 schools in the Southern province and 10 schools in the Eastern province were successfully completed.

Project activities include:

- Students, parents and teachers are involved in participatory self-assessment and focus group discussions to identify existing ideas and needs
- Participatory selection of designs are conducted by school children, teachers and parents



Focus group discussion with school children



WASH facilities

- Customised designs for each school are produced reflecting the participatory activities held with the school community
- Participatory monitoring of the construction by school community
- Malteser International provides support to existing structures and persons that promote school health such as Public Health Inspectors, school health clubs, and teachers
- Hygiene promotion and the introduction of H2S kits in schools and at community level to raise awareness about water quality issues

- Participatory monitoring, operation and maintenance
- Joint evaluation and reflection by stakeholders

Malteser International has implemented activities focused on transferring ownership to the school community. Children were involved in each activity and their ideas have been reflected in the design. As a result, children have identified their ownership of the new construction and are encouraged to maintain the facilities by themselves.

The organisation has strengthened the existing school clubs by providing equipment and knowledge, and has conducted various health and hygiene promotion activities including story competitions and street drama with school health clubs.

A module titled "Participatory Health Education in School" which includes hygiene promotion lessons for school teachers and guidelines to implement similar projects of other organizations were also developed.



Malteser International expanded their activities in Asia following the devastating tsunami in December 2004 and participated in the relief operation in Sri Lanka, India, Indonesia, Myanmar, and Thailand. Our emergency response was built around the concept of linking relief, rehabilitation and development (LRRD), and many of our current projects are now focussing on the latter stage. Malteser International is supporting and coordinating with national institutions and local partner agencies to ensure effective communication, information sharing, and ultimately the sustainability of project achievements.

Water

Water is vital to all aspects of life, and its supply is necessary not only for drinking purposes, but also for domestic activities such as personal hygiene, cleaning and the preparation of food, rearing livestock, as well as agriculture. There are a number of different water sources that can be manipulated to provide a supply at household or community level, and these predominantly involve the extraction of groundwater. However, Malteser International is involved in promoting an alternative that reduces the exploitation of aquifers and are implementing a number of rainwater harvesting (RWH) projects serving households in rural communities in Myanmar, India and Sri Lanka.

There has been an increase in interest in RWH over the last two decades and this has been facilitated by the shift towards more community-based approaches and technologies which emphasise participation, ownership and sustainability. The failure of many piped water supply systems due to poor operation and maintenance (O&M) and the increased availability of low-cost tanks (e.g. ferrocement or plastics) have also made RWH an attractive option for domestic water supply. Since the RWH tanks are built adjacent to their houses, it has proven to be a convenient option for our beneficiaries in terms of energy and time required to collect it, particularly for women. This on-site advantage also creates a sense of ownership and encourages them to maintain and control their system without the need to rely on others. Although the RWH system is easy to use, the first flush remains a weak point that gains regular attention due to its relationship with the quality of water that collects in the tank. Malteser International is undertaking research and development with its local partner in Sri Lanka to further develop an appropriate, user-friendly and affordable solution to this feature.



Beneficiary assisting with construction of RWH tank, India



Drinking water facilities, Thailand



Provision of temporary water supply after tsunami in Aceh, Indonesia

Box 4

Wetlands as a solution to treating wastewater in southern Thailand



Wetlands for relocation site with 102 houses on Koh Mook Island

Coastal communities are suffering the consequences of pollution through untreated wastewater

Following the catastrophic tsunami in 2004, the rehabilitation of housing and the rebuilding of communities were the main focus of much of the relief and development work. Malteser International piloted a wetland wastewater treatment plant in a relocated community on Koh Mook Island.

The objective was to improve their sanitation facilities and offer a community based solution to environmental protection for a local fishing community by providing a wetland sewage treatment plant. The lack of proper sanitation and hygiene facilities is a major concern for rural villages in southern Thailand.



Wastewater pumped into sub-terra reed bed

and solid waste. Diseases related to unhygienic conditions are widespread and harmful, particularly amongst children. The sea has become polluted and therefore the source of income, marine products and tourism, are also in danger. The rehabilitation after the tsunami offered an ideal turning point. By (re)constructing settlements with a holistic concept, offering appropriate technology for waste treatment, the living conditions for the villagers could be made more sustainable in the areas of hygiene, sanitation and income generation.

A solution for the communities must be tailored to their requirements using simple and easily manageable techniques. Wetland technology for treating waste water offers these requirements. Moreover, it provides an alternative for rural and small communities to treat sewage on a biological base with the outcome of a clean effluent according to international standards. Thus, less pollution leads to better water quality in the shallow wells, no polluted run off into the sea, a clean environment, and fewer diseases.

The wastewater treatment plant is located on Koh Mook Island at a relocation site which covers 102 houses newly built by Safe Andaman Network and Malteser International. The construction area is located in a mangrove forest and therefore offers a real challenge for the constructors.

Wastewater (80 l per person per day) is collected from every household in a septic tank, where the sludge is separated. From here it is transported through pipes to pumping pits and finally pumped into the sub-terra reed beds. In the beds it is evenly distributed through irrigation pipes. By percolating through a filter layer and treatment through the roots of the plants in the bed it is cleaned and the effluent is collected and drained as clean water into the mangroves. However, the effluent can be used for agricultural and other purposes as e.g. flushing toilets. The whole system is easy to handle and runs automatically with a control unit switching pumps on and off. A wastewater user group will be trained in the operation and maintenance of the system.



Sub-terra reed bed



Box 5

A WASH project in southern Sri Lanka

Caritas SED Galle co-funded a pilot project of Malteser International for the improvement of water, sanitation and environmental health in Liyanagoda and Katukurunda of Habaraduwa division in southern Sri Lanka. The project covered all households of these two Grama Niladharis (GN) areas with its solid waste management component as well as health and hygiene promotion programmes, and more than half the households were provided with improved sanitation facilities, compost making and home gardening programmes. In particular:

- 58 new toilets with septic tanks were constructed and 277 upgraded;
- 619 families and 460 school children were visited and received messages on the health and hygiene promotion;
- 575 families each received two garbage bins for the separation of waste;
- 200 families each received concrete compost bins which they are now using in their home gardens;
- A tractor and trailer for the collection of this solid waste, and one bicycle was provided to each area for the GN collection of recyclable waste.

Mrs. Piyawathe who has lived in Katukurunda for the past 20 years was one of the beneficiaries who received a new latrine. She,



Introduction of solid waste management techniques

a widow with two children, said that after her husband passed away it was a difficult time for her to bring up the children and to construct the house. However, she has nearly managed to complete the house, and has been using a temporary pit latrine covered with cajan leaves for nearly 20 years. She said the area has a high water table and during the rainy season many latrines get flooded, causing them to overflow, creating an unfavourable environment. This was a serious issue for the community in Katukurunda. By mid-2006, Mrs. Piyawathe was delighted to have been selected as one of the beneficiaries to receive a new latrine following her application to the GN and Public Health Inspector.

During construction, all family members got involved in excavating the pit and the foundations for the cabin. Mrs. Piyawathe assisted the contractor and the mason with the work and it was completed within one week. She had tiled the floor and the walls of the toilet by herself. Mrs. Piyawathe said, "I am happy there is no more bad smell coming out from our new toilet and no flooding. We can also now



Mrs. Piyawathe in front of her new latrine

harvest rain water to the tank which can be used for washing our hands after using the toilet".

The two communities have benefited from the project in the following ways:

- There is no longer uncontrolled solid waste strewn around the area. The two GN areas are now neat and clean.
- The community members are now separating their waste and all recyclables are kept ready for selling.
- The tractor is being used to collect solid waste in the project area.
- The community are using their new or upgraded latrines efficiently.
- The living environment has been improved with no more odours from the latrines or garbage.
- There has been no major outbreak of communicable water and sanitation related diseases reported by the Public Health Inspector since completion of the project.

Sanitation

Sanitation refers to the safe disposal of human excreta, waste and wastewater, and constitutes the second of the three inter-related elements that contribute to improving health and significantly reducing the spread of communicable diseases.

By safely disposing human excreta, the use of a latrine is the first effective step in blocking the faecal-oral transmission route of harmful pathogens. (see page 15). However, the challenge lies in whether or not a household or community adopt and accept the use of a latrine as beneficial to their health, and this requires the inclusion of hygiene promotion activities using participatory methods throughout the intervention process. From the latrine, there are different means of excreta disposal, but it is important to ensure that this is done without contaminating ground- or surface water. Technologies such as septic tanks and wetlands have proved effective options for our activities in Indonesia, Myanmar, Sri Lanka, and Thailand.

A new area of interest is ecological sanitation (Ecosan) which recognises human excreta and household wastewater not only as waste but also as resources that can be recovered, treated where necessary and safely used again. Ecosan is therefore emerging as an area for considerable development, and one which Malteser International is embracing. We have already completed successful ecosan pilot projects with anaerobic filters, wetlands, and solid waste management in southern Sri Lanka, and biofil in Indonesia. Other ecosan initiatives, in the form of wetlands, were also developed in Thailand.

Another simple and effective technology that falls under the concept of ecosan are bio-sand filters. A recent pilot project with a Sri Lankan government department concerned with public health has successfully introduced these filters to a small community in Galle District, and there are plans to continue with this technology as part of a wider project integrating a water supply component with household water treatment methods. We are also introducing compost latrines in our Sri Lanka Country Programme. Compost latrines are a locally appropriate option supported by UNICEF and GTZ with their Sustainable Sanitation Network in South Asia.

With these new approaches come increased challenges in terms of raising awareness and conveying messages as to their importance within the community. Malteser International has gained significant experience in the essential software components that are vital to support any newly implemented technology.



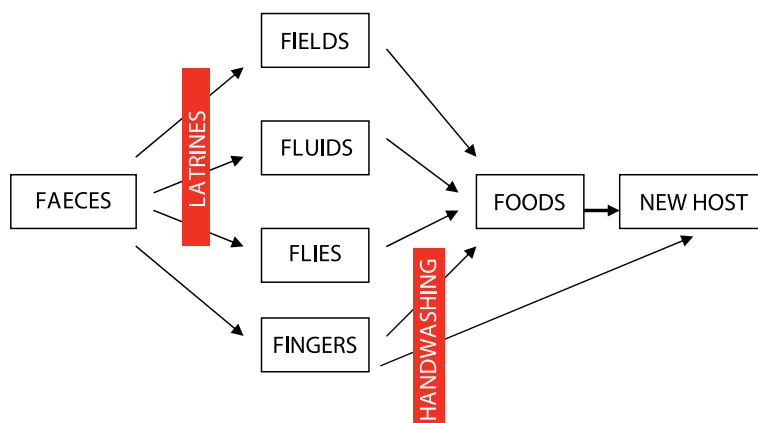
Handover ceremony for the pilot bio-sand filter project, Sri Lanka



Construction of a wetland and leach field where the pre-treated effluents from the Biofil tank are further filtered and finally released into the ground, Indonesia



Compost latrine in Habaraduwa, Sri Lanka



Faecal–oral transmission and effective barriers. Adapted from Wagner et Lanois 1958

Hygiene

Once a water supply has been established, its quality cannot always be guaranteed, and if it is safe, there remains the potential for re-contamination at the source, during collection, transport and storage. Therefore an improved water supply does not necessarily imply an immediate improvement in health. This stems from changes in hygiene behaviour which are promoted through education and awareness, and therefore stress the importance of integrating such activities in any water supply and sanitation intervention.

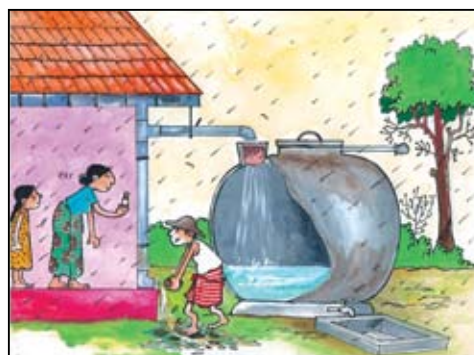
Hygiene promotion and health education are of paramount importance if any water supply and sanitation programme is to be effective. The availability and usage of soap for household cleaning and hand washing purposes has a tremendous impact in reducing the transmission of diseases. However, it cannot be taken for granted that people can afford soap in sufficient quantities. The key question should be asked: do people have the means to wash their hands after using the toilet, before preparing food and before eating?

In addition to this, the safe handling of drinking water at the household level can make a significant difference in terms of its bacteriological quality. According to a study in 2005 treating water at the point of use can result in a 35% reduction in diarrhoeal disease (Clasen, 2005). The WHO have been actively promoting household water treatment (HWT) in combating waterborne disease, and advocate that it should be integrated into any water supply project as part of a holistic approach to improving health.

WASH awareness raising materials from Sri Lanka to show....



....the need to keep your latrine clean



....the need to maintain the RWH system and check the water quality



....the need to keep the area around the hand pump clean

Box 6

Family latrines in Myanmar A low cost approach to improve sanitation in rural areas

National latrine coverage in Myanmar is less than 30%. Open defecation within domestic compounds and at creeks or fields is the normal practice for many people. As this contributes to the spread of faecal borne diseases, a low cost approach was chosen to improve the sanitation situation in the villages. Within a primary health care and nutrition project, funded by EuropeAid, in the western township of Maungdaw, Rakhine State, the villagers built 1,751 family latrines with support of Malteser International.

The traditional family latrine in Myanmar is the so-called 'fly-proof-latrine', a simple pit latrine with a superstructure made of wood or bamboo and an offset pit. Due to the scarcity of water in many villages, especially during the dry season, the bamboo-lined latrines were built with a wooden cover on the squatting pan rather than a water seal. There is a fly-screen covered ventilation pipe to prevent flies and vectors entering the pit. In areas with unstable soil conditions the pit is lined with locally produced concrete rings.

To ensure a sense of ownership, sustainability and the usage of the latrines, the villagers built them themselves after receiving material input and training from Malteser International. Bamboo for the superstructure and the labour was part of the villagers' contribution. For the most vulnerable groups of the community (widows, the elderly), additional material and labour were provided by Malteser International.

Awareness and training sessions were held in the communities on construction and O&M. In



Household latrine in Min Gyi, Maungdaw Township



Demonstration session for construction of family latrines

support of these activities, the health education component of the project involved presentations, discussions, games or songs for larger audiences, and finally the hygiene promotion element allowed households to discuss the problems they faced in smaller groups in all villages of the target area. Such software activities are incorporated in all WASH projects in Myanmar in order to reinforce behavioural change and thus long term sustainability.

Six months after the construction of the latrines, an evaluation showed that 95% were being used and almost 80% of the owners were using the pan cover in a correct manner.



The Water Safety Plans (WSP), a co-funded project with UNICEF in southern Sri Lanka, has these concepts at its core and promotes HWT and safe hygiene practices amongst the beneficiaries of the parallel RWH project. The two projects were designed to complement each other with an overriding goal of improving water security and water quality amongst rural communities in southern Sri Lanka. The WSPs promote the following methods for HWT:

- The three pot system
- Boiling
- Chlorination
- Filtering
- Solar Water Disinfection (SODIS) which uses the sun's UV-A and temperature to inactivate pathogens that cause diarrhoea



Training session on SODIS, Sri Lanka

Box 7

Rural water safety plans in southern Sri Lanka



The project aims to improve knowledge amongst beneficiaries about drinking water quality, the protection of their water source, and safe hygiene practices. The project is co-funded by UNICEF and is implemented in parallel to the rain water harvesting project. It extends through Galle, Matara and Hambantota Districts of the Southern Province, upgrading the living standards of selected communities.

Activities focus on water quality surveillance, health and hygiene,



Undertaking a sanitary checklist

as well as sanitation. The project aims to improve these conditions by:

- Introducing rural water safety plans addressing household water treatment and storage;
- Assisting government authorities in the dissemination of rural surveillance and capacity building of Public Health Inspectors;
- Community group awareness meetings, hygiene fairs, household visits and interviews focusing on health, hygiene and sanitation;
- Awareness building of communities on operation and maintenance of rain water harvesting systems;
- Encouraging the community to test their water source using H2S kits which are now available in the pharmacies.



Community survey in progress

Community health and hygiene promoters use participatory approaches to develop health messages that promote best practices among right holders.



WSP and RWH joint-monitoring

Box 8

Community participation versus economic efficiency: A piped water system for tsunami affected villages in Aceh Utara, Indonesia

Malteser International has rehabilitated two villages in Aceh Utara that were completely destroyed by the tsunami. Apart from rebuilding houses, infrastructure and livelihoods, Malteser International has also pledged to improve the villages' access to safe drinking water and improved sanitation.

Before the tsunami people had supplied themselves with water from shallow wells and boreholes with depths of between ten to 20 metres. After the tsunami, this was no longer possible. The impact of the waves had changed the morphology of the area, contaminating the aquifer with saline seawater. Several attempts by local and international NGOs to drill deep wells during their emergency response had likely worsened the situation. Rather than finding fresh water, waters with high levels of ammonium and a strong yellow discolouration were found.

Therefore, Malteser International followed a different approach that would combine economic efficiency with maximum possible participation on the village level. The initial plan was to supply fresh water from an artesian well in the hinterland via an extensive piping network to PVC storage tanks in up to six villages in the project area. Malteser International drew up

plans for a community based water user group system, who would organize water distribution and cover maintenance costs to ensure the economic efficiency of the system. Despite these efforts, the village based water system unfortunately failed.

A lesson learnt from this experience, however, was that despite the villagers being willing to pay for their drinking water, they were just not up to managing a complex piped water network. Hence, Malteser International opted to enable the local water utility company (PDAM) to pipe water to the project area. PDAM would charge their usual low price for the water and would be responsible for the maintenance of the system.

As of October 2007, the piped water system is being put into place. Activities involve the construction of a booster pump station in the project area, the upgrade of a river water treatment plant and the installation of nine km piping with small High Density Polyethylene loops on village level. Construction is financed by the German Government through the KfW Entwicklungsbank.

The economic efficiency of this system is ensured by the institutional solution with PDAM. PDAM charges the small



Trench digging in progress for pipe laying

price of approximately 40 Euro-Cents per cubic metre. Currently, the water price is still subsidized by the government and does not cover the production costs. Therefore, every house has to pay an additional connection fee of about 20 Euro. PDAM puts the connection fees in a maintenance fund to cover for broken pipes.

While economic efficiency is now more feasible, there remains a trade-off between efficiency and participation. Therefore Malteser International will try further to strengthen the participatory dimension of this project. Socialisation meetings between villagers and PDAM staff, and those between the village leaders and the head of PDAM, aim for a stronger involvement of the villagers in the development of the water system.



Other methods of HWT include coagulation and flocculation with the use of natural ingredients such as Moringa seeds, and the use of bio-sand filters to remove disease-causing micro-organisms from contaminated water.

It is important that a household or community understand the benefits of the number of different HWT options available to them, therefore they can make an informed decision and select the method that is most appropriate to their living environment and circumstances. These options are best introduced following discussions with the community members to identify the consequences of unsafe water, and therefore why they are necessary. Participation and contributions from all groups of the community are encouraged in order to maximise the transfer of hygiene messages.



Bio-sand filters completed with community for pilot project, Sri Lanka

Box 9

Water and sanitation for tsunami housing in western Sri Lanka

After the tsunami, Help for the Children, a local partner NGO, selected 86 families from a devastated coastal slum area near Colombo for an integrated resettlement project. Due to the scarcity of land a former Coconut Estate was purchased. This estate is surrounded by marshy land and looks like a small island. The groundwater table in this area is high and the water in the open wells is contaminated with coli form bacteria.

It was planned that all houses will have piped water from the national Water Board. This was not possible and new ideas have been developed. A hydro-geological survey was carried out and the Water Resource Board was also involved. The project aims to construct deep tube wells with hand pumps for clusters of houses. The WHO's

water safety plan states that there should be a distance of 15 meters between a tube well and a soakage pit. With this in mind, a 15 meters circle was drawn around each septic tank in the layout drawings, and the locations of the wells were selected. Each family will have its own septic tank. The high water level during monsoon will not affect the septic tanks.

The nature of the integration project implies that the new settlers will be integrated within the existing community and neighboring village. A village committee from both the new settlers and the host village was established and guided throughout the construction activities. Help for the Children concentrates on this social aspect while

Malteser International is responsible for the construction component. The project plans now to implement a hygiene education campaign for the beneficiaries and possibly also for their new neighbours.



Construction of septic tank, control chamber

Concluding remarks

Malteser International recognises the need for a holistic and integrated approach to working in the field of water, sanitation and hygiene. It requires the:

- “integration of improvements in domestic water supply (quantity, quality, accessibility and reliability), sanitation (safe disposal of excreta, wastewater and solid waste) and hygiene practices.””

These components are implemented by working together with the community in identifying appropriate solutions together, and finally by considering the social aspects, and cross cutting issues that affect our work such as affordability and gender roles.

The importance of participation within the community (with emphasis on the involvement of women and children) is integrated into all projects, thus enabling a greater sense of ownership and responsibility amongst the beneficiaries, and thus a significant contribution to the sustainability of the technologies and messages introduced.

Malteser International fully supports the promotion of WASH and HWT, and calls for further investment in appropriate concepts of proven effectiveness in reducing child mortality. Investing 1 Euro in water supply including HWT and sanitation programmes create economic benefits of 4 – 40 Euro depending on the region.

Initiatives like the International Year of Sanitation 2008 will significantly contribute to maintaining the momentum in support of the ongoing UN Water Decade.



Community awareness meeting on ceramic filters, Myanmar



School WASH promotion activities, Thailand



Emergency water supply in aftermath of the tsunami, Sri Lanka

Box 10

Handwashing with soap

A study conducted in squatter camps of Karachi, Pakistan revealed that washing hands with soap reduces diarrhoeal diseases by 53 %, pneumonia by 50 % and impetigo by 34 % (Luby et al., 2004). In the same study monthly costs for soap were US\$4 per family of 9 persons. Half of the households in the study had a monthly income of less than US\$60. Thus, soap may

not be affordable in the context of poverty. Only 35 % of the population in Kerala, 16% of slums in Kolkata, India, and less than 10% in studies conducted in Ghana, Peru and Kyrgystan wash their hands after defecation (Scott et al, 2004) - habits die hard - but we need to make sure that there is water and soap near the latrines. Malteser International's own data have shown the reduction



Promotion of handwashing, Thailand

of diarrhoeal diseases by 30 % after regular distribution of 336,000 bars of soap annually amongst more than 30,000 people in a refugee camp at the Thai-Myanmar border.



Box 11

WASH in a refugee camp at the Thai-Myanmar border

With the financial support of ECHO Malteser International is providing comprehensive health care, including water and sanitation, to about 33,000 refugees from Myanmar by applying primary health care principles and keeping in mind the specific social and cultural background of the refugees. The settlements are located on hilly slopes which limits accessibility during rainy season.

A gravity-flow water supply system is sourced from springs higher up the mountain and is piped to public taps via a number of storage tanks and sand filters. The local Thai population have been using spring water for generations, thus the integration of such a system was achieved without difficulty. Continuous development and daily maintenance are necessary to ensure that the water supply is sufficient to meet the needs of the camp. In order to prevent contamination of the water supply, the aerial pipe technique is used to avoid suction occurring in the flowing pipes. In addition, the health promotion campaign

advises that settlers boil their water before drinking, and that the health centres use chlorination to protect the quality of their water supply. The water at the public tap has also been chlorinated in order to avoid any outbreak of water borne diseases in the camp.

In terms of sanitation, Malteser International aim to provide one family with one latrine, and with sufficient water resources in the area these are pour flush. The sanitation team provides advice and support through the provision of toilet bowls and a net covered ventilation pipe during the construction to prevent fly and mosquito breeding. Cement is not used for the super structure, but can be for the flooring. More than 90% of household waste is organic, and the remaining plastic and product waste are separated and transported for recycling to a location two km from the site. Incinerators are provided for health centres.

The control of vector diseases, particularly dengue fever is one of the most important activities



Mosquito larval monitoring in household water containers

in the refugee camps along the border. Once a settlement has become stable, the household water containers are an ideal breeding place for the aedes aegypti mosquito. With regular use of temephos sand, larvacide, larval monitoring and camp cleaning, such vectors can be controlled. Additionally, the use of ash or lime powder and the application of insecticides aim to control fly breeding on site.

Among the refugees, supervisors are selected who oversee the water and sanitation programme in each camp, and Malteser International staff recruit and supervise community health workers to carry out the hygiene promotion and school health activities.



Childrens drawings from Sri Lanka showing the importance of handwashing

International Year of Sanitation 2008



The UN General Assembly declared the year 2008 the International Year of Sanitation. The goal is to raise awareness and to accelerate progress towards the Millennium Development Goal (MDG) target to reduce by half the proportion of people without access to basic sanitation by 2015.

Sanitation is the foundation of health, dignity, and development. Increased sanitation access especially for poor people, is fundamental for reaching all the Millennium Development Goals. The International Year of Sanitation aims to:

1. Increase awareness and commitment
2. Mobilize national and local governments
3. Secure real commitments
4. Encourage demand driven, sustainable and traditional solutions
5. Secure increased financing
6. Develop and strengthen institutional and human capacity
7. Enhance the sustainability and effectiveness of available sanitation solutions
8. Promote and capture learning

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www.worldtoilet.org

WEDC, Loughborough University
<http://wedc.lboro.ac.uk>

WHO Household Water Treatment Network



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BMZ Federal Ministry for Economic Cooperation and Development



Help for the Children



Lanka Rainwater Harvesting Forum



German Government Development Bank



United Nations High Commissioner for Refugees



United Nations Children's Funds



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**Malteser International
Headquarters**

Kalker Hauptstr. 22-24
D-51103 Cologne (Germany)

Phone +49 (0)221 9822-151
Fax +49 (0)221 9822-179

info@malteser-international.org
www.malteser-international.org

We would like to invite you to watch our new film on Malteser International WASH activities in Sri Lanka.
Please contact us by email on info@malteser-international.org if you would like us to send you a copy.

