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Sanitation in Emergency Situations

**Proceedings of an
International Workshop,
held in Oxford, December 1995**

Edited by John Adams

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An Oxfam Working Paper



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An Oxfam Working Paper

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Contents

Introduction 5

1 Executive summary 7

- 1.1 Summary of working group discussions 7
- 1.2 Summary of recommendations and action points 10

2 Working paper summaries 11

- 2.1 Principles for better sanitation programmes 11
Dennis Warner, WHO, Geneva
- 2.2 Excreta disposal kits 12
Jim Howard
- 2.3 First-phase excreta disposal 13
Martin Oudman, MSF Holland, Amsterdam
- 2.4 Latrine construction 14
Woldu Mahary, Oxfam, Oxford
- 2.5 Excreta disposal on difficult sites 14
Yves Chartier, MSF France, Paris
- 2.6 Emergency solid waste management and disposal 15
Bob Reed, WEDC, Loughborough University, Loughborough
- 2.7 Vector control in emergency situations 17
Lynette Lowndes, IFRC, Geneva/Tanzania
- 2.8 Personal hygiene, water collection and storage facilities 18
Eddie Potts, Liverpool School of Tropical Medicine, Liverpool
- 2.9 Drainage, and washing and bathing areas and facilities 19
Richard Luff, Oxfam, Oxford
- 2.10 Sanitation in enclosed centres 21
Riccardo Conti, ICRC, Geneva
- 2.11 Environmental impact of sanitation programmes 22
Paul Sherlock, Oxfam, Oxford
- 2.12 Preparation and training of staff 24
Bobby Lambert, RedR, London
- 2.13 Community participation in emergency sanitation programmes 26
John Adams, Oxfam, Oxford
- 2.14 Assessment, monitoring and evaluation 29
Claude Rakotomalala, UNHCR, Geneva

3 Working group discussions and presentations 32

- 3.1 Principles for sanitation promotion in emergencies 32
- 3.2 Objectives, techniques, tools and equipment for first-phase excreta disposal 33
- 3.3 Objectives, techniques, tools, and equipment for second-phase and longer-term excreta disposal 34
- 3.4 Off-site and on-site excreta disposal 34
- 3.5 Strategy flow-chart for emergency excreta disposal for a range of site conditions 35
- 3.6 Refuse disposal 36
- 3.7 Hygiene education in first-phase emergencies 37
- 3.8 Personal hygiene kits 37
- 3.9 Vector control in emergencies 38
- 3.10 Hygiene facilities 39
- 3.11 Environmental impact of emergency sanitation programmes 40
- 3.12 Sanitation in enclosed centres 41
- 3.13 Preparation and training of relief workers 41

Recommendations and action points 42

Annexes 46

- 1 Programme and presentations 46
- 2 List of participants 47

Introduction

It is generally accepted that in most emergencies, water supply and sanitation are among the most important interventions for improving public health and controlling disease. However, whilst water supply programmes are easily understood and have obvious, measurable objectives and results, this is largely not the case for sanitation. There is a widespread lack of understanding, even within relief agencies, about what sanitation is, how important it is and how to do it well. Emergency sanitation is weak in many areas, including programme funding, agreement on technical approaches and standards, and recognition of its importance by donors, relief agencies and people affected by emergencies.

While it is important that water supply and sanitation programmes are closely coordinated so that they make a full impact on health, they differ in time-scale, technology, skills required, and ways of working with affected communities. It is time to give more attention to sanitation as an essential emergency intervention in its own right, needing a distinct technical and organisational approach, its own research and development, particular professional competence, and targeted funding.

Sanitation is taken here to mean interventions to reduce people's exposure to disease by providing a clean environment in which to live. This includes disposing of human excreta, refuse and wastewater; control of disease vectors; and providing washing facilities. These activities are closely linked and often overlap; for instance, disposing of wastewater and refuse helps to control vectors, and washing facilities produce wastewater, which needs to be dealt with. Community participation and hygiene education are essential parts of a sanitation programme, because so much of sanitation is concerned with human behaviour. There are other interventions which are also closely allied, such as the provision of sufficient water for washing, which could, arguably be included, but emergency water supply is dealt with very well elsewhere.

The workshop

The idea for holding an inter-agency workshop to share experiences of sanitation interventions was conceived at a summer party and born just six months later at Manchester College in Oxford. Forty-five delegates from 25 organisations, including NGOs, UN organisations, and the Red Cross, and independent sanitation workers, met for four days to discuss technical and organisational problems and to try to agree on basic operating principles, recommendations, and action points. Working papers were presented on a range of subjects relating to sanitation in emergencies, and issues arising from the papers were discussed by working groups and then presented to plenary sessions for comment. The workshop was organised by a steering group representing Oxfam, UNHCR, MSF, ICRC and IFRC.

Thanks are due to: Pat Diskett and Paul Smith Lomas of Oxfam, and Jim Howard, for their idea for holding the workshop. Yves Chartier of MSF-France, Riccardo Conti of ICRC, Uli Jaspers and Haken Sandbladh of IFRC, and Claude Rakotomalala and Gloria de Sagarra of UNHCR, members of the steering committee who collaborated on the preparation, running, and post mortem of the workshop. Priscilla Frost of Oxford Conference Management for the workshop administration, and for transcribing hours of discussion about sanitation. Anita Owen and the staff of Manchester College, Oxford, for looking after the workshop participants. All the participants for their time and effort, and for their contribution to the success of the workshop.

Contents of this Working Paper

Section 1 of the paper takes the form of a summary of plenary discussions, illustrated with quotes from participants, followed by a list of the recommendations and action points agreed

Sanitation in emergency situations

during the final sessions of the workshop, in summary form.

The working papers presented during the workshop are given in Section 2. They have been edited and appear in a shortened form. They provide many ideas and insights, but were not intended to present a comprehensive review of the issues, but rather to promote discussion in the working groups.

Presentations from the working groups are in Section 3. These represent the experience and

thought of many of the people most involved in the field of emergency sanitation and indicate substantial agreement between agencies on most issues. They should provide a good basis for developing ideas on a range of subjects, either by individual agencies or through inter-agency collaboration.

Finally, Section 4 gives a complete version of the list of recommendations and action points drawn up in the plenary session at the end of the workshop.

Section 1 Executive summary

1.1 Summary of workshop discussions

The fundamental problem which prompted this workshop is this: in most emergency situations, sanitation interventions are often inadequate, and certainly not as effective as those to provide water, health care or other vital necessities. There was a remarkable consensus among the participants on a number of related and overlapping reasons for this. The following summary, illustrated by quotes from the workshop discussions, presents some of the areas where work is needed. The participants agreed on recommendations for addressing some of these needs and these are presented in full in Section 4.

Promotion of sanitation in emergencies

Many participants have experienced difficulty in persuading others, including those within their own organisations, of the importance of sanitation in emergencies.

... In the field there are journalists coming every second week. We take them to the hospitals, to the UN aid centre, to see the social services, and to see some kids. I always put my hand up and say 'no one ever comes to look at my latrines.' You know, it becomes a real pain... My latrines are never on the schedule.

Giving more attention to sanitation in emergencies is at least partly the responsibility of those working in the sector.

It seems that nobody wants to deal with sanitation, and people working in the sector seem to have failed to bring sanitation to the attention of key decision makers. A crucial problem is how to give sanitation more priority in emergency responses.

One answer is promoting sanitation with core messages, media strategies, and lobbying, but there are also some fundamental reasons why few

agencies do good sanitation work in emergencies.

Coordinated technical development

Part of the reason for the very variable quality of emergency sanitation work in the field is the lack of clear guidelines for technology choice and implementation and lack of agreement on minimum standards. This makes field coordination difficult.

For effective coordination in the field, the sanitation coordinator should have the backup of agreed guidelines. At the moment anybody can say anything goes and there is no agreement on what is good or bad practice.

Most of the current literature relating to emergency sanitation is of very limited practical use and rarely helps in the more difficult situations faced by workers in the field.

We have a number of flowcharts in sanitation books asking 'is there a sewer available? Is there a town engineer?' This is not specific to what we are talking about. If I were to go out into the field again as part of a coordinating team I would want a flowchart on four or five key subjects, then the team would all be working along the same lines. One of the problems in sending in a team is that you can fall out very quickly within the team as to what your priorities are. ... If there were a good set of documents coming out of this meeting then people going into the field would not just be referring to a lot of books that are not strictly relevant.

Guidelines are needed on implementing the technical options already available.

I think that if you look at the basic technical options, there are actually very few. The problem is the way in which you implement those options, not the options themselves.

Implementing is very site specific.

Exchange of information

Many agencies implement emergency sanitation programmes, and they come across the same problems and go through the same learning process. There is no mechanism, at the moment, for agencies and individuals to be able to exchange information and learn from each other.

I think that a newsletter on sanitation in disasters might be the way forward.

This could be used, among other things, to advertise training courses, present ideas for improved equipment, run debates about issues of common concern, such as funding, and describe projects with their successes and failures.

Information for learning from other programmes is not easily available, as it is mostly filed away in agency offices and not shared between agencies.

It is important to record experiences of different sanitation programmes: what went wrong as well as what went right. The more you know about other experiences, the better your decisions are likely to be. A small book of case studies would be really useful, if people are willing to talk about their failures.

There is also a need to review existing literature and ideas on the subject to ensure that relevant and appropriate information is available for training and project design.

It is quite frightening if you read the literature on what is still advocated, on community participation for example. A lot of the literature that is used in the universities is outrageous.

Information and specialist advice is currently available from individuals and institutions such as universities. Some form of directory would enable people to get in touch with such experts when they need the kind of specialised information that most agencies do not have.

Better initial assessments of emergencies:

At the time of the initial assessment of emergency situations, information is gathered for critical decisions which define future interventions. Sanitation needs should be adequately considered in assessments, along with needs for water, shelter, food, security, and medical care. This

requires sanitation specialists to be included in assessment teams, and good coordination to ensure that at least one capable agency is looking at the sanitation problem.

Improved kits of equipment and information for emergency sanitation

While for water supply and health there are tried and tested packages of equipment and guidelines for use, there is very little available for sanitation workers in the form of standard equipment, ready to use, to enable a fast, good quality response in an emergency.

I think our technology is not adequate. I am still bothered by what to do on problem sites. For a lot of sites we do not yet have a solution.

Some agencies have developed basic equipment such as plastic latrine slabs or kits of tools for digging latrine pits but in comparison with water supply equipment, there has been little collaborative work so far.

Effective community participation in emergency sanitation programmes

Community participation is essential for effective and sustainable emergency sanitation programmes. There is very little guidance available at present on when, how and to what extent to engage people affected by emergencies in solving their sanitation problems. Whether or not this is done and how well it is done depends very much on the background and interest of individual workers. Relationships and approaches established during the early stages of an emergency strongly influence the outcome of later stages.

I think that there needs to be some basic research done as to what are the methods to be used and what guidelines there should be to promote community participation in the early stages.

There is a need both for better training and guidance for generalist sanitation workers, and for better use of existing staff within agencies.

You cannot expect an engineer to adopt these methods overnight, or even in a lifetime because it requires entirely different skills. So it is not just training of present staff but getting different people into these situations

Often specialists in hygiene promotion or community mobilisation may be included in

emergency teams but not given the resources to do their job. Greater commitment is needed from agencies for involving communities in emergency sanitation.

John did mention a situation where two health education people got squeezed out by the engineers and this happens more or less every time as far as I can see. So we need some commitment from us as agencies, that these things are important and that we won't squeeze people out.

Better project management tools

Part of the reason for the variable quality of sanitation work in emergencies is the lack of suitable project management tools to enable implementing agencies, co-ordinating bodies, and funders to measure and control the quality of work done and to allow objective evaluation of performance and impact.

In the sanitation sector my feeling is that we lack goalposts. We all know that we are specialists and we know basically how it works but concretely we lack tools. From the very beginning we need to be tools for assessment, formulation of the project, implementation, monitoring and then reassessment and so on.

Recruitment and training

Sanitation in emergencies requires a distinct set of skills which cross the boundaries of traditional disciplines such as civil engineering, public health, and community work. There is a need to look at the type of skills required to design and manage emergency sanitation programmes.

Do we want to use the existing range of people and skills that we have got, or people from a different type of background? ...Engineers are probably not the best people to do sanitation and the sort of people we are looking for have to have a wider base. Maybe we should be looking for environmental health officers ...

Indeed, sanitation in emergencies often suffers from management by people with very few relevant skills.

So far, sanitation has been done by the butchers. They can't get any other job, so they go off and do sanitation. We are now trying, as a profession, to become more professional.

It may be that people with a different background are needed. On the other hand, more could be done by training existing staff.

It comes back to a problem of training, particularly at the level at which major decisions are taken. There seems to be a lack of confidence among people deciding about emergency sanitation programmes, which is not seen in other sectors. If institutions and courses could be identified and developed for all sorts of people involved in sanitation, that would be a major resource.

Currently training specifically for emergency sanitation is done in an ad hoc way, with different agencies arranging courses, internally or through training institutions.

What you want is a coordinated training programme available to all.

Agencies currently running their own training programmes do try to make them available to others but there is no central register of courses available.

More on-the-job training of inexperienced staff is needed, to increase the pool of experienced people.

You will always be dealing with a situation where you have a significant proportion of people operational in a crisis situation who have not got very much or any experience. That is because in non-crisis situations agencies take only the most experienced people they can get hold of. They don't pay enough attention to the fact that they should try to build for the future.

Early warning systems and information for project planning

A number of agencies are involved in large-scale emergencies, and the quality of their work, particularly in sanitation, can be very dependent on the information they gather on the situation. At present there is no effective mechanism for gathering relevant data and disseminating this widely to agencies for early warning, planning, and monitoring. (See paper and working group discussion on the environmental impact of emergency sanitation programmes.) Several recommendations were made on this issue.

More and better directed funding

Money is needed for training, technical development and community mobilisation to produce better sanitation programmes with more effective and sustainable outcomes.

Donors, coordinating bodies and implementing agencies should understand that good sanitation cannot be done cheaply.

It costs a lot of money to do sanitation well. Oxfam's experience with setting up water supply systems is that they cost a lot of money but once they are done they last a long time. With sanitation it seems that we underfund and we put in systems which don't cost too much to begin with but in the long run it costs a lot of money.

The message that should be given very strongly to donors is that effective emergency sanitation costs money, but that sufficient investment early on in the programme produces savings later, in lower costs for maintenance and replacement of facilities.

Further participatory work by agencies concerned in emergency sanitation

Specific issues need to be pursued in other fora, in multilateral and bilateral work as well as within each agency. A focal point for keeping people in touch with progress is needed.

The participants agreed that the workshop was the first opportunity of this kind for a range of people concerned with the practical problems of sanitation in emergencies to share ideas and make joint recommendations for improving practice in the field. It was agreed that a follow-up meeting be planned for in a year's time to evaluate progress on the recommendations made.

1.2 Summary of recommendations and action points

Apart from recommendations made by the working groups on particular subjects, a list of recommendations and action points was drawn up on the final day in a full plenary session. General agreement was found on the following points (given in full in section 4):

- 1 Promotion of sanitation in emergencies:** Sanitation should be given a higher priority, as a distinct and vital part of any response to emergency situations.
- 2 Coordination of developments in emergency sanitation:** Developing techniques and guidelines for improved practice in emergency sanitation work should be given higher priority and should be done in a collaborative way.
- 3 Information exchange:** The exchange of information on emergency sanitation should be improved.
- 4 Initial assessment of emergency situations:** Sanitation considerations should be given a higher priority in initial assessments.
- 5 Development of sanitation kits:** Kits, or packages of equipment and information should be developed for emergency sanitation work.
- 6 Community participation in emergency sanitation programmes:** Community participation in emergency sanitation programmes should be encouraged and practice improved.
- 7 Project management tools:** Project management tools should be developed to improve sanitation work in emergencies.
- 8 Recruitment and training:** Recruitment and training of emergency sanitation workers should be improved at all levels.
- 9 Early warning systems and information for project planning:** Early warning information, baseline and planning data should be made more accessible for agencies working on emergency sanitation programmes.
- 10 Funding:** More and better targeted funding should be made available to enable good quality sanitation work to be done in emergencies.
- 11 Further participatory work:** This workshop should be the start of a process to improve the status and practice of sanitation in emergencies, and should not simply be a one-off event.

Section 2 Working paper summaries

Papers were presented by a number of participants with particular experience in or knowledge of a range of subjects concerning sanitation in emergencies. The purpose of the papers was to highlight important issues and areas for attention, and to stimulate discussion in the working groups. The papers were not intended as pieces of academic writing. They have been summarised and edited for more uniform presentation in this publication.

2.1 Principles for better sanitation programmes

Dennis Warner, World Health Organisation

Dennis Warner presented the *Principles for Better Sanitation Programmes* produced by the WHO Collaborative Council Working Group on the Promotion of Sanitation. These principles were developed for the sanitation sector in general, and not specifically for emergency situations. The presentation involved comments from participants on the relevance of each principle to emergency situations and on the wording used. A working group discussed the principles in more detail and came up with a modified list for emergency situations (see section 3.1).

The principles

- 1 Give sanitation its own priority:** From an implementation point of view, sanitation should be treated as a priority issue in its own right and not simply as an add-on to more attractive water supply programmes. Sanitation requires its own resources and its own time-frame to achieve optimal results.
- 2 Remember: sanitation is the first barrier:** From an epidemiological point of view, sanitation is the first barrier to many faecally transmitted diseases and its effectiveness

improves when integrated with improved water supply and behavioural change. However, improvements in hygiene behaviours alone can result in disease reduction and can serve as a valid programme objective.

- 3 Promote behaviours and facilities together:** Sanitation comprises both behaviours and facilities, which should be promoted together to maximise health and socio-economic benefits.
- 4 Take a 'systems approach':** At household level, good sanitation is a 'system'. It is a harmonious resolution among four factors: the waste, the physical environment, the cultural beliefs, and the attitudes of the local population, and a technology.
- 5 Generate political will:** Political will at all levels is necessary for sanitation programmes to be effective. Communities are more motivated to change when they know political will exists.
- 6 Be gender sensitive:** Sanitation programmes should equally address the needs, preferences and behaviours of children, women and men. Programmes should take a gender-sensitive approach but, learning from the mistakes of other sectors, should guard against directing messages only to women or placing the burden of improved sanitation primarily upon women.
- 7 Empower people:** User ownership of sanitation decisions is vital to sustainability. Empowerment is often a necessary step to achieving a sense of ownership and responsibility for sanitation programmes.
- 8 Prioritise high-risk groups:** Sanitation services should be prioritised for high-risk under-served groups in countries where universal coverage seems unlikely in the foreseeable future. Hygiene promotion should be targeted at all groups.
- 9 Use promotional methods:** Good methods of public health education and participation, especially social marketing, social mobilisation, and promotion through schools and

children, exist to promote and sustain sanitation improvements.

10 Create demand: Sanitation programmes should be based upon generating demand, with all of its implications for education and participation, rather than provision of free or subsidised infrastructure. Government sanitation policy should facilitate and enhance partnership among the private sector, NGOs, community-based organisations and local authorities in the achievement of improved sanitation.

11 Build on existing practices: Sanitation improvements should be incremental, based on local beliefs and practices and working towards small, lasting improvements that are sustainable at each step, rather than on the wholesale introduction of new systems.

12 Understand consumers: Latrines are consumer products and their design and promotion should follow good marketing principles, including a range of options, designs attractive to consumers and therefore based upon consumer preferences, affordable, and appropriate to local environmental conditions. Market forces are best understood by the private sector.

13 Continually promote: As in all other public health programmes aimed at preventing disease, the promotion of sanitation should be a continuous activity. This continuous promotion is necessary to sustain past achievements and to ensure that future generations do not become complacent as diseases decrease.

Apply these principles to developing:

POLICY → PROGRAMMES → PRACTICE

2.2 Excreta disposal kits

Jim Howard

Thinking on sanitation in emergencies is surrounded by a lot of confusion and this is reflected in the lack of prepared equipment and packages, compared with other interventions such as water supply and health care.

The fundamental problem is that while the supply of food and water involves bringing in welcome inputs to the needy population, sanitation

(particularly excreta disposal) concerns taking away a daily production of unwelcome and unpleasant human excreta. Talking about the subject is difficult, even for professionals in the field (witness the number of euphemisms commonly used for human shit), and agencies usually try to deal with it on the cheap.

Many current attitudes display a tendency to excuse bad engineering by over-stressing the 'software' side of sanitation, which is only of use when supporting a well-prepared physical engineering input.

The answer lies in having well-thought-out and tested sanitation equipment, to provide facilities which are welcomed by people in emergencies. This is not available today. Because sanitation needs are very specific to, for example, terrain, climate, culture, and duration of the situation, there must be a wide range of technical options available.

There are examples of pre-prepared sanitation equipment from the past, such as the Oxfam Sanitation Unit, used in Bangladesh in 1972-80, and other examples of hard engineering solutions used to overcome extreme sanitation problems, such as sea-water flush sewerage, used in Pulau Bidong, Malaysia in 1978-79. Some lessons learned from these experiences are:

- 1 Each situation is different, but several technical options are usually available.
- 2 People like, and will use, safe, pleasant, clean and private latrine facilities.
3. The user need not be aware or involved in the type of treatment or disposal system used, but is very aware of the point of contact with the system. It is vital to make the facilities user-friendly for men, women, and children.
- 4 It is important to ascertain and provide for the anal cleansing habits of the affected population. What can be provided – water, soap, paper?
- 5 More thought should be given to using mechanical means to prepare defecation areas and trench latrines, so that trenches can be cut deeper, with more controlled width, suitable for bridging with lightweight, moveable latrine structures.
- 6 Oxfam-type water tanks could be used for sewage containment or even treatment, either lined or unlined, particularly where natural gradients exist on the site.
7. More thought should be given to transporting sewage off sites. Agencies often get involved

with transporting water. The volumes of sewage to be moved would normally be much smaller and would have to be carried over far shorter distances than water. Pumping of sewage, particularly if macerated, could also overcome problems on certain sites

- 8 The site collection of sewage via plastic buckets with lids supplied to each family is not beyond the realms of possibility and is already extensively used in different parts of the world.

It seems that as a part of good camp management, as much human excreta and refuse as possible should be removed and disposed of outside the camp area.

Fresh and more creative thinking on engineering preparedness is urgently needed from all the agencies involved.

2.3 First-phase excreta disposal

Martin Oudman, MSF Holland

Introduction

Excreta disposal in emergencies is an issue that needs to be tackled from day one of an emergency in the same way as water and food are dealt with. Because of its lack of glamour, however, excreta disposal is often not given the attention it deserves, even by well meaning health experts. As health experts in our various ways, we should aim at changing this attitude with all the vigour we can marshal. Most important is to ensure that competent expertise is available for excreta disposal and water supply programmes at the same time. Managers of water and sanitation programmes should bear full responsibility for excreta disposal, as they do for water supply. The consequences of such neglect as we have seen in the recent past, are appalling and unnecessary loss of life.

Aims of a first-phase excreta disposal programme

The aim of a sanitation programme in the emergency phase should be to *quickly* provide facilities for *safe* excreta disposal to the population in need. Excreta disposal systems should be chosen

to provide facilities which are used, are safe, are feasible, and can be set up quickly.

In the first phase of an emergency, it may not be possible to take all these considerations into account, in the urgency of the need to install facilities quickly, and a correction of such oversights should be possible by the time second-phase excreta disposal facilities are being installed.

Options for first-phase excreta disposal

- 1 **Defecation fields** may provide an emergency solution for containing excreta, particularly in hot dry climates and where there is enough space available.
- 2 **Trench latrines** are a simple and quick way of disposing of excreta in a more hygienic way than defecation fields, provided they are properly built and maintained. The question is whether trench latrines are necessary, or should we move directly from defecation areas to family latrines?
- 3 **Family latrines** are a very hygienic way of disposing of excreta, where space and time allow. They can be built for single families or groups of families.
- 4 **Communal latrines** should only be considered in exceptional circumstances. The difficulties connected with communal latrines outweigh any short term benefits in most situations. It is usually necessary to hire a team of workers for regular cleaning and maintenance of communal facilities.

All these options have advantages and disadvantages and are more or less suitable for different situations.

Kits

Much effort has gone into preparing kits for water supply, which can be installed in a matter of hours in an emergency. This has not been the case with excreta disposal. There is a need to redouble our efforts to find suitable excreta disposal kits that are cheap, portable, quick and easy to install. Kits already available include the MSF lightweight plastic squatting slab and latrine kit, and the Oxfam sanitation unit.

Discussion points

- 1 The squatting slab kit is a useful tool for first phase excreta disposal. The idea could be

extended to develop a kit including super-structure. Research could be done in the use of the borehole latrine in combination with the squatting slab.

- 2 A great deal of environmental damage is done by cutting wood for latrine construction. A pre-fabricated latrine kit could limit this.
- 3 What is the role of health education and community involvement in first-phase excreta disposal?
- 4 In Eastern Europe, for example, facilities exist for excreta disposal. How can they be used in a more efficient way in emergencies, for example, by constructing latrines over existing sewer systems?
- 5 The figures used to calculate the size of latrine pits are usually based on long-term excreta accumulation rates. For the first phase of an emergency it might be necessary to increase the excreta accumulation rates by 50 per cent, as the latrine will be used for a short time only and there will be very little decomposition.
- 6 What criteria, based on safe excreta disposal, should be used in the selection of the location for a refugee camp?

2.4 Latrine construction

Woldu Mahary, Oxfam

Latrine design and construction has evolved over many centuries, and the variety of designs and construction techniques have multiplied many fold since the earliest biblical reference to the subject. However, the majority of people in the world lack this basic facility, and in emergency situations the lack of latrines has been and continues to be the cause of untold suffering.

Questions to be considered when planning a latrine programme

- 1 **Digging and building tools:** what type, quality, numbers and designs should be used? How should they be managed and what can be done to minimise loss and breakage?
- 2 **Digging the hole:** safety considerations, pit size and shape
- 3 **Latrine floors:** options include logs and earth, wooden slabs, plastic slabs (eg the MSF/Monarflex squatting plate), stainless steel

plates, and concrete slabs. Various issues have to be considered when making concrete slabs, such as procurement, manufacture and use of the moulds, shape, size, reinforcement, aggregates used, the concrete mix, curing, and test loading.

- 4 **Vent pipes:** various materials may be used for vent pipes. What diameter should they have? What material should the vent pipe screen have, and what mesh size?
- 5 **Superstructure:** What materials are normally used locally? Is plastic sheeting available? Are roofs really needed or desirable? Considering that many children are afraid to go into a small dark room with a hole in the ground full of gruesome mess, is it not better to have no roof and make the latrine airy and light, while a loosely fitting cover for the squat hole could keep the pit dark without obstructing the downward flow of air in VIP latrines?

2.5 Excreta disposal on difficult sites

Yves Chartier, MSF France

Problems encountered: High water table, hard, compacted soil or rocks near the soil surface, lack of space and urban situations.

Technical options: Open, uncontrolled defecation areas, open, improved defecation areas, shallow or deep trench latrines and raised latrines, such as 50 to 200 litre emptying 'bucket' latrines.

Life of latrine pits in emergency situations: Suggested solids accumulation rates are 0.5 litres/person/day (0.15 m³/person/year) in emergencies, compared with 0.05 m³/ person/ year in long-term situations.

Logistics support needed: Transport, storage of materials, heavy duty machinery if soil is too hard to dig by hand.

Human resources needed: Sanitation teams, either volunteers or paid, to: set up the technology chosen, inform the community of the importance of using the facilities, inform the

users how to use the latrines, ensure maintenance and daily running of the facilities, ensure that users wash their hands, ensure general cleaning throughout the camp.

'Software' needed: The entire community should be motivated and made aware by teams working in the camp giving basic messages on general hygiene and appropriate use of water and sanitation facilities.

Maintenance and hygienic facilities: Hand-washing facilities, preferably with chlorinated water, should be available on site. Excreta in open defecation fields should be disinfected, and removed. Latrine emptying equipment may be needed. Safe disposal off site should be chosen with the local authorities

Costs involved: This depends on the site and the urgency of the situation. For example, a cholera outbreak may necessitate spending resources very quickly to bring it under control.

Misunderstandings regarding difficult sites in emergencies: Lack of knowledge and experience, use of inadequate technical solutions, lack of adequate cleaning of short-term facilities, lack of guidance in the literature on solutions for difficult sites, high-cost solutions needed may not be considered worth doing, short-term solutions are often used, which create problems later on, and a lack of general technical policy and operational coordination in the field between the organisations involved,

Post-first-phase technical options: Alternating twin-pit family latrine, use of heavy equipment to dig deep trenches for rows of family latrines, raised family latrines, concrete slab workshops, simple pit latrines.

Examples

1 In Malawi in 1998, Mozambican refugees settled in Khampata camp on the banks of the river Shire on land with a very high water table. A programme of building raised family latrines was started at the beginning of the settlement, while upgraded trench latrines were used to respond to first needs.

2 In Goma, Zaire, in 1994, Rwandan refugees settling in Kibumba and other camps were provided with controlled open defecation zones, as the volcanic ground was extremely difficult to

dig and the camp was very densely settled. Operation and maintenance of the defecation zones was very intensive and depended on trained and dedicated staff and users who are comfortable with this kind of facility.

2.6 Emergency solid waste management and disposal

Bob Reed, WEDC, Loughborough University

In the past, the collection and disposal of solid waste has often been ignored. This is because in 'traditional' refugee camps, solid waste has not been a problem. Quantities of solid waste were small and consisted mainly of ash and other inorganic waste.

Recent changes in the focus of refugee support to communities in Eastern Europe, however, have changed this situation and have inevitably led to an increase in solid waste, particularly plastics and organic waste. In addition, the provision of humanitarian support in a war zone produces its own solid waste problems.

Why collect solid waste?

Disease control: Decomposing organic waste attracts animals, vermin and flies, which may act as reservoirs and vectors for many diseases, and reduce the quality of life. In times of famine, people may be attracted to the waste to scavenge for food, with the risk of gastro-enteritis, dysentery, and other illnesses.

Improve access: Rubble from demolished buildings after a war or natural disaster is also a form of waste, which may restrict movement around an area. Damage done by flood or high winds may result in debris containing considerable organic matter, and possibly dead animals, which produce noxious odours and attract flies as they decompose.

Improve morale: People forced to live in unhygienic and untidy surroundings are likely to become demoralised and less interested in improving their condition.

When is solid waste likely to be a problem?

Solid waste is likely to be a problem after natural disasters causing widespread damage to property and surrounding landforms (eg Kobe, Japan); in an urban war zone (eg Kabul, Afghanistan); in established refugee camps; and where displaced people are within easy reach of road communications with Western Europe or North America (eg Central America, Eastern Europe).

Principles of solid waste management

Technologies and methodologies of the three main areas of storage, collection and disposal are well documented.

Storage: Domestic and institutional waste should be stored awaiting collection no more than 50 metres from the generation point and covered if possible.

Collection: Vehicles ranging from hand-carts to specialised compacting trucks may be used, depending on finance and local resources. Where possible existing collection facilities should be supported rather than a separate system be set up. The period between collections usually varies between one day and one week.

Disposal: There are a number of ways that waste can be disposed of, depending on the volume, composition, the level of funding and available technology. They include burial and landfill, incineration, composting, and recycling.

Problems

Problems are primarily managerial and financial rather than technical.

Responsibility: Responsibility for ensuring wastes are collected and disposed of will depend on the type of emergency, but responsibility is not always clear.

Implementation: In existing urban areas there is normally a waste management system already in

operation, but it may not be operating effectively because of lack of resources. Building rubble may be removed by householders or a central organisation. In refugee camps, there may be no existing effective refuse management organisation. Historically, NGOs have not been involved in this area, possibly because it has not been a problem or they do not have the skills or maybe it does not appear attractive.

Finance: Whatever solution is found must ultimately become sustainable by the community in the longer term

Skills: If aid agencies are to become more involved in solid-waste management, do they have the skills? Organisations such as WHO may be able to help but most agencies have little expertise and a significant training input may be required.

Conclusions

- 1 The methodology of solid waste management is well documented and understood. The main problem is its management and financing.
- 2 Waste management for field hospitals is well understood and requires little further consideration here.
- 3 Large-scale management of solid waste, however, has only recently become a concern because of the change in focus of humanitarian aid. Accordingly there is very little expertise in the aid community in dealing with it.
- 4 Waste management within existing communities is less of a problem because organisations usually existed prior to the emergency. It is likely that financial and technical support will be needed to deal with the increase in demand put on the service.
- 5 Waste management within refugee camps is more of a problem. Criteria are needed for deciding when the problem should be considered. Responsibilities for implementing, managing and financing must be clarified, and the implications for planning and training assessed.

2.7 Vector control in emergency situations

Lynette Lowndes, IFRC

The environment in a refugee emergency or the breakdown of sanitary services following a natural disaster often results in conditions suitable for extensive breeding of insects and rodents and the exposure of the population to diseases carried by these vectors. Limited opportunities and facilities for personal hygiene, and close proximity resulting from overcrowding, exacerbate these problems.

The most effective method of controlling vectors in the longer term is prevention: improving sanitation, latrines, drainage, refuse disposal, food storage and handling practices; and improving personal hygiene through the provision of soap and a sufficient supply of water. However, in an emergency situation these methods may need to be supplemented by chemical control to prevent disease outbreaks.

Major considerations in planning vector control programmes

A chemical based vector-control programme should be implemented in response to an existing or potential vector-borne disease outbreak. Public nuisance conditions may also result from the presence of vectors, but the first priority is to reduce the incidence or potential threat of disease, and reducing nuisance is generally regarded as a secondary outcome only.

There are several aspects to planning a vector control programme, including an assessment of the prevalence of vectors in the field and the type of vector control programme required (preferably environmental control).

If a chemical control programme is considered essential, check the availability and suitability of insecticides and spraying equipment; choose the target site for treatment (control of adults or larvae); adapt the application procedure and treatment cycle to the particular vector and conditions involved; ensure that spray operators are adequately trained in spraying techniques and procedures; ensure that health and safety requirements are met; set up adequate regular programme monitoring, and support the programme with community education, information and participation.

Problems in the implementation of vector control programmes

Lack of knowledge and limited access to information: Sanitation field workers employed by NGOs often come from a range of backgrounds and do not necessarily have specialist knowledge or understanding of environmental health or vector control activities. Whilst there is a significant body of knowledge and technical reference material available, NGOs do not generally make this available to their field staff, or have access to it themselves.

Chemicals are often seen as a cure-all: Vector control is often automatically equated with the use of chemicals. But a vector control programme should be carefully planned and the appropriateness of chemical control carefully considered together with epidemiological data and monitoring of vector levels.

Insufficient emphasis on assessment and monitoring: Sanitation field workers generally lack knowledge and experience in making field assessments of disease vectors. Basic training is required together with an understanding of when specialist knowledge is required and how it can be obtained.

Lack of knowledge of effective insecticide use: This lack of knowledge often results in concentrations of insecticides being used which are either too low to be effective, or so high that they are dangerous.

Lack of training of operators in spraying techniques: The success of the programme depends on the skill of operators recruited in the field.

Insufficient consideration of health and safety requirements: The controls which would automatically apply in the 'developed world' are sometimes not considered important in a 'third world emergency'. Vector control programmes need to ensure adequate protection for operators, the environment, and the general population.

Difficulties in the supply of chemicals, spray equipment and protective clothing: Where these items are available the quality is often substandard. Consideration should be given to

kits of appropriate equipment for emergency vector control. Insecticides used in emergencies should be standardised with supporting chemical data made available.

Recommendations

- 1 Existing technical material should be made available by NGOs to all field staff.
- 2 A standard training programme and a 'user friendly' field guide* should be developed for sanitation technicians.
- 3 All materials and equipment for vector control should be part of emergency response kits.
- 4 A standard stock of preferred chemicals should be held, with information on application for a range of vectors and the most common species, with the aim of streamlining the use of chemicals.

(The paper continued with a section on the control of food pests in stores, which is an important issue. Factors to be considered when deciding on control measures are similar to those for disease vectors.)

2.8 Personal hygiene, water collection and storage facilities

Eddie Potts, Liverpool School of Tropical Medicine

A water supply for any group of people is a fundamental need. The quality of that water must be safe enough not to cause waterborne disease, but in emergency conditions a safe water supply in sufficient *quantity* is what is required. People need two to three litres per person per day for drinking and food preparation, but a minimum of 20 to 30 litres per person per day is required to allow essential cleaning and washing for good health. At these minimum levels there is a direct correlation between the quantity used and health.

Refugees and displaced people carry a small quantity of drinking water, if at all possible and when they stop, they need more water to drink, cook and replenish water containers. Given a little time, they will then need increasing quan-

ties of water for washing, washing clothes and, eventually, bedding. The need to wash is possibly greater than in a settled situation because conditions are generally dirtier.

Without sufficient water, washing is restricted and 'water-washed' disease transmission is bound to increase. Without sufficient safe water, people may be forced to use a secondary source, with the risk of bringing in waterborne disease. The urge to wash in squalid conditions is strong, and if water is at all available, people will use it. The lack of adequate water supply and facilities will not stop washing, but will merely force it to be done in an unsatisfactory way.

If washing is carried out without some control the activity creates pollution, by polluting water sources (eg with guinea worm or other waterborne disease), or because of the wastewater flooding paths, and recreation and rest areas, and eventually becoming breeding sites for pests.

It is a constant aim of health promotion to improve personal hygiene practices. It may be difficult to get children and food handlers to wash their hands after using the toilet, but generally people wash for comfort. Any interruption to personal hygiene soon gives rise to increases of diseases such as scabies and food poisoning. Soap is also very important for hygiene. A sudden rise in the incidence of scabies is a sure indicator of a lack of water or soap.

Washing facilities need plenty of water for both washing and rinsing, soap, and provision for scrubbing and beating. The activity of washing introduces some semblance of stability into stressful conditions and provides valuable stabilising social contacts. The official guidance for the management of refugee settlements seems to omit all reference to washing and cleaning. It is presumably left to the community to arrange this for themselves. In practice, without some guidance, the need for cleaning short circuits other good programmes and creates unnecessary difficulties. Washing facilities should be provided in similar number to sanitary facilities. Personal hygiene may well be incorporated in family latrines, while for laundry, more communal facilities with a drainage system are needed, together with drying areas.

Water collection and storage is another area of potential hazard, and the effort of protection of water supplies can be undermined by domestic collection. Domestic water containers may often be a source of biological and chemical contamination, and during water collection, not only is there a risk to the family, but the whole water

* See *Disease Prevention through Vector Control*, by Madeleine Thomson, Oxfam 1995.

supply may become contaminated. Clean and safe containers, with a closure, are essential, and at the water collection point, the family water containers must not be allowed to contaminate the water source.

Refugees on the move soon realise that carrying some water for drinking is vital, and they need small containers, usually bottles. After the earthquake in Limon, Costa Rica, the Coca Cola company brought in large quantities of one-litre plastic bottles filled with water. These were used as the initial emergency supply, then kept and replenished for a long time afterwards as drinking water reserves.

2.9 Drainage, and washing and bathing areas and facilities

Richard Luff, Oxfam

1 Drainage

Drainage must be considered for three kinds of water: waste water, storm water, and existing surface water sources, which need to be drained to prevent disease-vectors breeding in them.

Waste water

Waste water is generated from several sources, such as excreta disposal, personal bathing, washing of cloths and utensils, and spillage from water collection facilities.

The main factors to consider are soil conditions, the provision of facilities to enhance health, and how the community will use these, by involving them.

Excreta disposal: The liquid load of the latrine should not exceed the soil's capacity to absorb it, otherwise its design life will not be achieved or worse still it may overflow. Latrines should be sited so that they do not contaminate ground water sources. One particular problem that can arise is latrines being used for bathing in and thus the liquid load exceeding the design capacity.

Personal bathing, washing of clothes and utensils for cooking and eating: Although there is a lower level of health risk from waste water

generated from these activities than waste water from excreta disposal, it does need to be disposed of properly. Where soap is available and used the amount of pathogens in the waste water itself will be low but as the water will be rich in nutrients, it will provide a rich breeding ground for flies and certain mosquitoes. Also it can become malodorous.

For all these types of waste water, try to localise disposal of water and make use of natural ground slope where soil conditions dictate that water has to be shed rather than absorbed. This water may be used for irrigating small vegetable gardens or for watering animals.

Where it is desirable for this water to be absorbed into the ground, it may be necessary to dig soakaways with a channel connecting these to the place where the activity that generates the water is taking place. Simple tests exist to quantify infiltration capacities and thus to design soak-away pits and trenches. In some instances it may be necessary to auger through a relatively impermeable layer to get through to a more permeable layer. Consider the use of a hand auger if quantities of water are small.

The amount of water to be disposed of will depend upon how much is available and what level of washing is traditionally undertaken. In some countries, for example, Sri Lanka, large quantities of water are used; while in others, very little may be used. In the latter case it may be useful, from a health point of view, to encourage greater water use. The wastewater disposal facilities may thus need to be over-designed initially to cope with the quantities of water that it is hoped will be used in the longer term.

Spillage from water collection facilities: This should be directed away from water collection points, to provide people with a serviceable area to collect water from. The provision of suitable materials under the distribution points such as gravel, or sand on a plastic membrane would be an appropriate first phase construction. Later if required it could be upgraded by constructing a platform of either concrete or bricks laid in a herringbone fashion.

Storm water

This is generated from rain water run-off, flooding of surface water sources after rain, and waterlogging due to raising of water table.

Rain water run-off: The main concern here is to ensure that rain water run off during periods of

rain does not flood shelters, pollute water sources or damage latrines. Rain water that seeps into latrines down the edge of a pit without lining could cause soil to collapse into the pit. Another concern is at the early stages of an emergency, when any open defecation site where solid waste is likely to be washed down slopes by rainfall will expose the population to great risk.

If possible, a settlement should be located on sloping ground so that it will self-drain. Then water run-off can be dealt with by building diversion channels to direct water away from vulnerable areas. These channels may need to be protected in areas of high rainfall. At changes of direction, slope and width the channel may need strengthening with concrete blocks or wood to avoid scouring and collapse. The channels will need maintaining, repairing, and cleaning out to stop them becoming blocked and overflowing.

Flooding of surface water-sources (rivers, lakes) after rain: Again, this is most likely to occur during seasons of heavy rain. Clearly, flood plains of rivers and areas below high-level points of lakes should be avoided; look for signs in vegetation and debris, and use local knowledge to find out what is flood level. Then always leave several metres above this where possible, in case of exceptionally high rains.

Waterlogging due to raising of water table: Flat land or areas of land in a natural bowl are prone to waterlogging. Where possible the water table should be at least 3 metres below the surface, which is very important for latrine construction reasons. If this is not possible, 1 metre must be considered as the absolute minimum depth. Settlements should never be located in marshy areas. Rocky and impermeable soils may also create flood-prone locations.

Existing surface water sources

In some cases it may be useful to consider draining or backfilling existing surface water sources that may constitute a risk in terms of potential vector breeding sites. How much is worth doing depends on how far infected mosquitoes will fly. Small water courses may be diverted, while stagnant standing bodies of water could perhaps be backfilled using either mass labour or mechanical plant.

2 Washing and bathing areas and facilities

Washing activities include personal bathing of body, and hand-washing by latrines, and the washing of clothes and utensils for cooking and eating. Most of these washing activities will occur, even without the provision of special facilities. However, there is a need to ensure two things:

- that they can be undertaken by all sections of the population (women and children as well as men) sufficiently easily and effectively to minimise health risks associated with water-washed disease, disease transmission from dirty cooking and eating utensils, and to eliminate lice in clothes;
- that the washing activities themselves do not constitute a risk to water sources by contaminating these with the waste water produced.

Personal washing

Initially, bathing may be limited because of lack of privacy and this in itself could be a health risk. It may be necessary to upgrade bathing facilities, both to improve personal hygiene and to prevent contamination of existing water sources.

Segregation of the sexes must be considered wherever there are no family facilities and the community shares facilities or areas. Special provision may have to be made for children to wash. Bathing within latrines is sometimes the only way for privacy to be ensured, but this may create problems with the liquid load in latrines. If this is the case, then separate bathing cubicles may have to be built.

Where cubicles are required, a suggested ratio is 1:50 people (assuming 1 wash per day and 2 toilet uses per day, and based on a ratio of 1:25 for latrines). It is better to locate these within easy reach of water supplies, and reasonably near to the people that will use them, to encourage a sense of ownership.

The floors of bathing cubicles should be non-slippery and easy to keep clean. They may be of sloping soil or sand in the first instance and upgraded to cement mortar or concrete later on. The screen of cubicles could be constructed with temporary materials (local or imported), or with solid walls for more permanent structures.

Bathing ponds to catch rainwater, or designated areas of the river may be an appropriate alternative with or without screens located nearby. However, the health risks of washing in a surface water source (for example, bilharzia, or

hookworm on banks) must be evaluated, and the risk of pollution of drinking water sources.

Hand washing next to latrines

This is rather a specialised form of washing intended solely for ensuring good hygiene practices associated with toilet use. The benefits could be great in some situations but operating the system will be very labour intensive and it may not be possible on a community-run basis. If this system operates at a household level, this would reduce the operational burdens, but might also reduce the effectiveness for improved health, as it would be much less convenient.

Again, the role of hygiene education is crucial, particularly for women, otherwise this activity in particular is likely to fail, given that it may be a new, unfamiliar hygiene practice.

Washing of cloths and cooking/eating utensils

These activities may or may not happen in the same area. Obviously privacy is not an issue and thus special facilities will not need to be provided in most cases. Care must be taken to ensure that waste water does not pollute water sources. It is also important to consider how easily water can be brought to the area and how the waste water will be disposed of. Clothes washing is often likely to be undertaken in the vicinity of water sources thus constituting a pollution risk, and if so should be discouraged.

Making washing slabs may be an effective way to get people to undertake washing of clothes and cooking and eating utensils in a way that does not constitute a health risk. A trial model involving the community in design and construction would be a good way to test the usefulness and acceptability of the design.

2.10 Sanitation in enclosed centres

Riccardo Conti, ICRC

Programme approach

Enclosed centres include prisons, detention centres, detention camps, and hospitals, where work is restricted to a confined area.

ICRC, as well as some NGOs and religious organisations are working in prisons. ICRC's approach, in 15 different countries on four continents, is to tackle problems in an integrated way, using the concept of the 'Health pyramid', where nutrition and water and sanitation are the base pillars.

Curative health

Public health

Nutrition

Water supply
and sanitation

The objective of any intervention is to guarantee living conditions which keep morbidity and mortality rates at the best possible level.

The specific constraints related to enclosed centres are generally the limited area, with no possibility of expansion; security concerns; administrative problems; and the restricted interaction between inmates and the environment.

Current sanitation interventions in enclosed centres

Taking into account the specific constraints outlined above, and adding the usual constraints encountered in open concentrations of large populations, one can easily imagine the tremendous potential health risks the inmates are confronted with if quick and efficient measures are not taken.

In refugee camps, one usually has the choice between on-site and off-site sanitation, but in enclosed centres, the answer is *to get the human and solid waste out as quickly as possible.*

To evacuate human waste, toilets should be functioning and in sufficient numbers to cope with demand. They should be built or modified to be very simple and adapted to local techniques. To transfer this waste from the toilets to the exterior, channels and pipes must be clear of solids big enough to block the system. Very often, simple improvements in the profile of the section of the channels drastically improves the flow.

Finally, to move all this matter a few hundred metres down the system, one needs water: *lots of water.*

In an overcrowded prison, the only sanitary system which will function is one driven by water. Since water is generally scarce, its management is of paramount importance. Where possible, showers and washing places should be placed

upstream of toilets to help to flush them. Buffer stocks of water should be kept both outside and inside to cope with shortages or deliberate cuts.

In summary, *simplicity is better than sophistication: think simple and strong*. One simple, functioning toilet is more appreciated than ten syphon-type toilets which are clogged every second day.

Action should also be taken to improve drainage, roofing, hygiene, kitchen and cooking facilities, refuse collection and vector control.

Sewage treatment off-site

When sewerage systems are not present (95 per cent of cases), septic tanks are used. Depending on the quality of the effluent it is disposed of directly through soakaway pits, or via maturation ponds.

For septic tank design, based on a range of design formulae, operating conditions and legislation in different countries, ICRC uses a figure of 50 litres per inmate for tank volume, with a two-chamber tank with two-thirds of the total length for the first chamber and one-third for the second, and the maximum depth according to desludging methods used (eg suction pump, rope and bucket etc).

The main problem in desludging is the solid waste: particular attention should be given to cultural, religious or bad habits when choosing the type of pump. The following types have been used over the past five years:

- Centrifugal submersible
- Membrane
- Rotary pistons
- Peristaltic
- Vacuum truck
- Rope and bucket

Sludge disposal remains a problem and the solutions are always ad-hoc and not sustainable.

Key words: Overpopulation, area per inmate, vector control, infestation, bed-bugs, fleas, lice, mosquitoes, shigellosis, cholera, scabies, diarrhoea, malaria, maintenance, ventilation, light, water supply, septic tank, maturation pond, soakaway pit, epidemics, standards.

2.11 Environmental impact of sanitation programmes

Paul Sherlock, Oxfam

(This paper was adapted from one given at the UCL-CRED/ECHO Expert Consultation on Priority Policy Issues and Humanitarian Aid in Brussels on 23-24 September 1995.)

Emergency sanitation programmes and the environment

When mass movements of people occur and large populations settle in an area, there are many consequences for the surrounding environment. Sanitation programmes may contribute to environmental damage in a number of ways, including depleting forest to provide timber for building latrines; pollution of land and surface water with human and other wastes; pollution of groundwater by latrines; and pollution by badly applied pesticides. Oxfam's stated policy is to work to avoid environmental damage in all its programmes, for reasons which include global as well as local resource depletion and pollution and the effect on the livelihoods of local people.

Practical constraints on good environmental practice

However, experience in a number of emergency situations in past years shows that, despite good policy intentions, good practice is not always achieved in limiting negative environmental impacts of sanitation programmes. The reasons for these include the following:

Conflicting priorities and limited resources: Priorities for funders, coordinating bodies, and implementing agencies are to save lives in the short term, without giving enough attention to longer-term environmental problems. Measures to minimise negative environmental impact may cost more to implement and take more time.

Short term planning and programme inertia: During the emergency phase, the priorities of all involved, most importantly the refugees and displaced people themselves, are short-term. Even after the emergency passes, these situations usually remain politically unstable, which makes

governments, donors and implementing agencies cautious about longer-term programmes and funding. Even where there is scope for longer-term planning, it is hard to change the direction of large programmes, in which inertia quickly sets in.

Political and security constraints: The situation of refugees and displaced people is a political issue at many levels. They have an impact on local politics, they may be used by host governments as a bargaining tool or for gaining revenue, they have political significance for the countries or areas they left, and the politics within settlements of refugees and displaced people are often crucial to the outcome of programmes. The security implications of significant numbers of displaced people and refugees are many and various, ranging from disputes with local people over water supplies to the creation of bases from which to launch attacks on the country from which the refugees came.

Unsuitable sites: Decisions on where to settle displaced people and refugees have critical significance for subsequent environmental impacts, and yet basic considerations such as a sustainable water supply and terrain suitable for installing latrines are often outweighed by political and security constraints or competition for better land. Refugees and displaced people are usually settled on marginal land which, in many cases, is available only because it has not been intensively settled by the indigenous population because of lack of water. Whether settlements are large and concentrated or small and scattered has enormous significance for the environment.

Fragmented response: The growing tendency, when a massive displacement of people occurs, is for a large number of agencies to become involved, each with different responsibilities and objectives. The environmental impact of the programme as a whole is the responsibility of many different people, creating great difficulties for coordination and integration of activities.

Inadequate information for planning: The information usually available to agencies planning emergency environmental health interventions is extremely limited, partly because of the speed at which decisions have to be taken, but partly because information needed for building environmental impact considerations into emergency work is not accessible, or readily available.

Agencies may unwittingly create environmental hazards, or planners may create inappropriate settlements because they are not fully aware of the impact of their decisions. Baseline data may not exist, leading to problems, later on, in measuring the environmental impact of programmes and reducing learning opportunities.

Poorly developed environmental impact monitoring and assessment: When looking at the environmental impact of emergency water supply and sanitation projects, it is difficult to compare environmental costs with other project outcomes, particularly when human lives are part of the equation. The UNHCR have produced guidelines for environment-sensitive management of refugee programmes and for environmental surveys and studies; other agencies have produced guidelines as a result of specific studies. These need to be further developed to make them more generally useful in emergency situations, and have yet to be widely adopted by implementing agencies.

Suggested ways forward

Programme integration: In order to appreciate the overall impact of an emergency programme on the environment, planning, monitoring, and evaluation of the various programme elements have to be brought together. This is most effectively achieved where there are few agencies implementing broad programmes, rather than where there are a multitude of agencies with different levels and areas of competence, with overlaps and gaps in programme cover. This is true for programme quality as a whole and for this reason among others, Oxfam is moving towards a more integrated approach to refugee programmes. Were there are many different agencies involved in the same programme, effective consideration of environmental impact demands strong coordination and a willingness on the part of the agencies to accept the role of coordination bodies.

Information and pre-planning: Very good information already exists on many places which are subject to large population influxes, in the form of satellite images, aerial photographs, maps, ground surveys, and so on. The data are held by a variety of bodies, including government ministries, universities and defence forces. It is time-consuming and difficult to search out and bring together the relevant data when it is needed.

Information related to water resources and land uses should be more readily available, in a form more convenient for planning interventions. Desk studies could be made on areas where population movements are likely to occur, so that a basic understanding is formed before the emergency occurs, for short-term decisions with better long-term environmental consequences. This could be done by a coordinating body such as UNHCR, or a consortium of agencies, which could then make the relevant information available to implementing organisations when needed.

Agreed procedures and minimum standards: Environmental impact mitigation measures need to be spelt out in proposals to funders and coordinating bodies. This requires more practical and widely acceptable guidelines which recognise the outstanding operational difficulties faced by implementing agencies. Monitoring and evaluation of programmes should take into account their negative environmental impact. This needs programme objectives and evaluation criteria to be broadened. Environmental monitoring should begin as close to the start of the emergency as is practical, and should be reported on regularly. More effective programme planning, monitoring and evaluation demands clearer criteria for measurement, and a commitment to provide the resources needed.

More realistic planning horizons: It is generally true that temporary settlements of refugees and displaced people have lifetimes spanning years rather than months. Thus we know, even as we battle with fast-moving events at the beginning of a crisis. Oxfam's interventions in water supply and environmental sanitation tend to use equipment which may last for many years, and to engage the communities involved in a way that produces sustainable management of the infrastructure installed.

Better site selection: So many of the factors which affect the health and welfare of displaced people and refugees relate to the site in which they live. The environmental impact of these people depends crucially on the location and size of the settlements. The conditions for the people in camps could be used as an argument for settlements which cause least environmental damage. Dispersed settlements, whilst being more difficult to service in some cases, are healthier places for people to live in, and their environmental impact is less concentrated.

2.12 Preparation and training of staff

Bobby Lambert, RedR

(This paper was a draft report from an Interagency Workshop on the Preparation and Training of Relief Workers, held in London on 8 December 1995.)

Background

Increasing demands on humanitarian relief workers: In recent years the amount of resources devoted to humanitarian relief has increased dramatically. Current indications are that this is likely to be the case for the foreseeable future. Humanitarian relief work is taking place in increasingly difficult and dangerous circumstances, and this puts special demands on relief workers.

There is an obligation on all concerned to ensure that resources devoted to humanitarian relief are utilised as effectively as possible and that relief workers are given the support and help they need. Central to the effective utilisation of resources is the quality and competence of relief workers. Humanitarian relief requires knowledge, skills and qualities which differ from those required in other sectors.

Humanitarian relief workers come from a variety of backgrounds, including:

- the affected population
- host government staff
- host country permanent or temporary staff of other relief agencies
- external permanent or temporary staff of relief agencies.

The nature of large-scale humanitarian crises means that there is a highly fluctuating demand for relief workers. This demand means that, in order to supplement their own permanent staff, whether local or external, relief agencies frequently have to recruit large numbers of temporary staff at short notice. In the early phases of a large-scale emergency it can be difficult to recruit such staff locally, and external staff are frequently required. As the relief effort continues, these temporary external staff may be replaced by staff recruited locally.

Selection and preparation of relief workers: Proper selection and preparation of relief workers is critical to an effective response. As demonstrated in the recent report by Rebecca Macnair (*Room for Improvement: The Management and Support of Relief and Development Workers*, ODI, London, 1995) there is scope to improve the methods of selecting relief workers.

Registers of relief workers: To facilitate the rapid deployment of temporary external staff a number of registers have been set up, either by individual agencies or as a common register, such as those by RedR (Registered Engineers for Disaster Relief, London) and IHE (International Health Exchange, London), serving a range of client agencies. Operating such registers takes considerable time and effort if they are to produce suitable personnel when required. This has been recognised by many agencies, who are devoting considerable efforts and resources to improving their own registers. At the same time, many relief workers are on several individual agency registers, as well as being on separate RedR or IHE registers; and this raises the question of duplication of effort.

Preparation of relief workers

As with any other sector or enterprise, proper preparation of relief workers pays dividends in terms of lives saved in emergencies, and in the effective use of the considerable resources that are frequently mobilised. The message is being reinforced by the feedback from the Rwanda crisis. Proper preparation for relief workers includes:

- understanding the issues (political, social, technical, personal) involved in relief work and appreciating the range of agencies involved in such work and their varying agendas;
- gaining skills which are particularly important, be they specialist technical skills or generic personal and management skills;
- personal preparation including discussions with family and employers (if working temporarily in relief work), insurance, wills, field kits, etc;
- familiarisation with the culture and procedures of the employing agency (induction) and with the nature of the job and country in which the relief effort is being conducted (briefing).

This preparation can be greatly enhanced through effective training, complemented by individual study. Induction and briefing are largely the responsibility of the recruiting agency.

Training

Scope and timing of training: This depends on the background and intended role of relief staff and on the circumstances in which they are deployed. Agencies may be willing to invest in considerable training for permanent staff but not for temporary staff. Where deployment has to be rapid, there may be no time for training beforehand. Locally recruited staff will require a different approach to training than externally recruited staff. There is a need to define minimum requirements for training and preparation.

Who should pay for training: This is a major issue. Costs for training provided through the voluntary sector are currently estimated at £100 per person per day. Some training courses are subsidised and some are not. Where participants are expected to pay full fees for training, self-selection is usually adequate to ensure that the training reaches those who require it and can pay for it. Where fees are heavily subsidised, a combination of active selection by the training agency and self-selection by participants takes place. There are different opinions on who should pay for training, but as the benefits accrue to the relief agencies and those they serve, and to individual relief workers, it would appear fair that the costs of such training should be shared.

Common property, 'free riders', and safety factors: Relief workers on a common register are available to a wide range of relief agencies. As seen from the broad perspective of deploying effective relief workers quickly, and indeed for the long-term good of an individual agency, this is a good thing. However, there is little incentive for one agency to invest in training of a member of such a register, as that investment does not guarantee a return to that agency. Other agencies may appear to act as 'free-riders', benefiting from any investment by their colleague agency.

Only a proportion of relief workers on a register will have the right skills and be available when needed. Experience suggests that such a proportion may vary from under 10 per cent to, in exceptional circumstances, 25 per cent of

members on a register being deployed in any one year.

Both these factors combine to provide a major disincentive for any one agency to invest in training of register members, yet it is in the interests of each individual agency to ensure that register members are trained properly. This conundrum requires a common approach and a long-term view on the development and utilisation of such resources.

Major themes for training: These include orientation to relief work; development and adaptation of specific technical skills; and development of key generic skills.

Methods of delivery: Attendance at training courses has many benefits over individual study, particularly in terms of experiential learning and shared experience. Therefore it is likely that training courses will continue to form a central plank in the strategy for preparing relief workers.

Sources of training and accreditation: There is a need to ensure that information on training materials and courses is collated and disseminated to those who need it. With the likely increase in demand for training in relief work, there is a need to maintain quality control. In the short term it may be necessary to consider some form of accreditation of training courses. In the longer term, a 'competency-based approach' may be the way ahead. Rather than evaluate the quality of training courses, in this approach the competence of the individual is evaluated against agreed criteria. However the development of such a system is a major undertaking.

Draft recommendations

- 1 All relief workers should be properly prepared for their work because:
 - proper preparation enhances the effectiveness with which humanitarian relief is delivered;
 - relief workers have a right to proper preparation.
- 2 Relief agencies should commit themselves to and support a common approach to the preparation and training of temporary staff from registers. The means of preparing and training permanent staff or staff recruited locally can be left to each agency. Preparation of

temporary staff from registers requires an agreed approach. Such commitment could be manifested by:

- requiring members of relief agencies to attend a minimum of training before being considered for deployment;
 - committing significant resources to such training according to some agreed system (e.g. in proportion to the number of temporary relief workers used in the previous year);
 - lobbying donors to fund central training of register members.
- 3 Individual preparation should be facilitated. Relief workers should have access to up-to-date reading materials covering agency policies and procedures, and technical, personal and contextual issues.
 - 4 A minimum amount of preparation and training is:
 - attendance at an approved orientation course;
 - attendance at short courses focusing on relevant technical skills;
 - evidence as to why either or both of the above is not required
 - 5 When deciding on the funding of relief projects, donors should take account of an agency's record on the management and support of relief workers, including preparation and training.
 - 6 An interagency working party should be set up to co-ordinate the implementation and development of the above policy. Such a working party could work with the interagency co-ordinator currently being recruited to co-ordinate the management and support of relief and development workers. Such a working party should take account of the needs of relief agencies and those they serve, the needs of relief workers and the needs of donors.

2.13 Community participation in emergency sanitation programmes

John Adams, Oxfam

Community participation is defined, here, as a relationship of sharing between agencies doing sanitation work and people affected by an emergency: sharing information and ideas; sharing decision making and power; and sharing the workload and responsibility for project implementation. It includes:

- consulting the people affected on the direction and approach of the programme and listening to their ideas about the design, progress and impact of the programme;
- giving people the knowledge to practise good hygiene and sanitation, given the constraints of the situation in which they find themselves;
- involving people in the implementation of emergency measures.

This paper looks at why community participation may be necessary in emergency sanitation work, suggests a few ideas about how it can be achieved, and notes some of its limitations.

Consultation

Responsibility is empowering: People should have some say in decisions affecting their lives. But remember that many people do not want to get involved in sanitation, except as users of the facilities provided.

Good sanitation depends on socially appropriate engineering: Effective sanitation depends on people using facilities properly, so they should be consulted on such matters as the design and siting of the facilities.

Consultation encourages involvement: Many sanitation problems, for example, drainage, and vector control, have environmental solutions involving community participation. This is easier to achieve in a sustainable way if people are consulted.

Good relationships are based on trust and sharing: The relationship between the agency and the people affected by an emergency

becomes increasingly important as time passes. The success of mid- and long-term work depends on this relationship.

Who should consult the community?: It takes time and skill to do it properly. There may be a tension in the first phase of an emergency between efforts to do practical things and efforts to consult people. Hard-pressed engineers may not have the time, interest or skills to do this, so additional staff may be needed at the beginning to get in touch with the community and ask the right questions.

Hygiene and health education and promotion

Sanitation facilities should be correctly used to have a benefit: Particularly in the early days of an emergency, the sanitation facilities provided may be very different from those people are used to. People may need explanations of the way to use them.

Knowledge is power: People affected by emergencies are generally vulnerable and powerless. Giving people the knowledge to improve their health has benefits beyond a contribution to health alone.

Emergencies create extraordinary sanitary risks: Completely new rules for safe living may be needed in an emergency, where nothing may be the same as before. New knowledge is vital for more vulnerable people to survive.

Improved sanitation may not be a recognised priority: There is a fundamental problem for implementing sanitation projects in emergencies and that is that, in contrast to water supply, health and food, sanitation may not be seen as a priority for health and well being. This problem can be overcome partly by education and promotion.

Longer-term low-cost sanitation needs community motivation: Promoting sanitation is usually necessary to ensure participation in (contribution to) longer-term low-cost sanitation.

Community cooperation is essential for most sanitation operations: To achieve specific aims, for example, to persuade people to put their refuse in containers at the side of the road, or to get them to prepare their shelters for spraying

Sanitation in emergency situations

against mosquitoes, to reduce flies breeding in a simple pit latrine by keeping the squat hole plugged, or to keep drainage channels clear around a water point.

Traditional practice is not always sacred: Practice can be changed to fit engineering constraints. But behaviour change should not be used to compensate for bad engineering.

Education may be the only tool available: For the first few days of an emergency, almost the only sanitation tool you are likely to have is your influence on practice concerning such things as defecation, washing, water storage and use. Messages may have to be very crude and directive. It is not always necessary to change people's hygiene beliefs to get them to change their practice.

The source may be a long way from the target: In early emergency work, outsiders tend to be more closely involved in the practical field work than later on. It is likely that foreign aid workers will be the ones involved in giving people information and promoting better hygiene practice. Be aware of the distance between the workers and the people affected by the emergency. How is your agency perceived? Do people trust you?

Effective messages are specific and simple: Base the messages on the health risks and risk-avoiding practices relevant to the situation. Don't embark upon a generalised health education programme because most of the messages may be irrelevant and you may not have had time to find out what people's level of awareness already is.

Effective messages are appropriate to prevailing conditions: Don't try to persuade people to do things they cannot do, like use more water if there is not more water available.

Coordinated messages avoid contradictory advice: Make sure they do not contradict advice being given by other workers and that they do not produce unwanted side effects.

Use all the communications channels available: Use dance, song, drama, radio, practical demonstration, posters etc; at health centres, feeding centres, water points etc. Again, in the early days, focus on the risks and protective measures.

Use existing structures: Use existing networks, organisations and communications channels to get your messages across.

Receivers may need to be targeted: Again, think of who is at risk, whose practice involves risk for others, and try to target these people.

Know your target population as far as possible: Try to understand their situation, their possibilities and limitations for action. Are you talking to individuals, families or a community? Or a crowd?

Staff are people too: Don't forget that staff, as users of water and sanitation facilities and as influential people, are important targets for health education.

Health education is a matter of life and death.

Health education techniques can and should be learned: There are techniques for effective health education which can be learned, and which should be used. Don't ask busy engineers or health staff to carry out health education. It needs dedicated people.

Monitor health education work: The work should be monitored to ensure that messages are relevant, reaching their target, and having a positive impact. There is no point in repeating useless messages or persuading people to do something they already do or which is impossible because of the situation.

Participation in project implementation

Volunteer labour may be cheaper: Excreta disposal in particular involves a lot of labour-intensive construction. Volunteer labour is often cheaper than paid labour, though not always.

Participation in implementation promotes ownership: Ownership encourages responsibility at various levels for maintenance and care.

Participation in implementation may provide a sense of worth: Active involvement and contribution may be a source of self-esteem for people who may have lost their former roles and who may feel unhappy about being passive receivers of aid.

Roles and responsibilities are established early on: The degree to which aid agencies and people affected by emergencies contribute to the provision of improved sanitation helps to establish the degree of dependency and capacity for recovery of the communities affected.

2.14 Assessment, monitoring and evaluation

Claude Rakotomalala, UNHCR

(This paper is taken from the UNHCR PTSS document *Technical Approach: Environmental Sanitation*, dated March 1994, which was distributed to all the workshop participants.)

Needs assessment

Introduction, objectives

The hygienic disposal of human excreta, solid wastes and domestic wastewater as well as the control of disease vectors, are among basic activities which greatly contribute to the prevention of disease transmission and to the promotion of a healthy environment. Health can be restored through curative measures. Water quality can be improved using various methods. Both cannot be safeguarded and promoted if environmental sanitation is overlooked.

This paper aims at providing tools which might help any professional to quickly assess a situation where any delay in responding to the vital needs of people might have tragic consequences. The usefulness of such tools will indeed be maximised if the said professional has a strong technical background combined with a few years of field experience in sanitary engineering.

What to assess in environmental sanitation

Assess not only the needs but also the existing (local) resources. Give priority to immediate needs without overlooking needs in the near future (for example, conditions which seem acceptable during the dry season may become drastically appalling when it rains: adverse topography, soil).

Needs include:

- human excreta disposal: qualitative (appropriate design, private vs communal) and quantitative (coverage so as to create an efficient defense line against contamination of water supply sources, food, etc., with excrements);
- solid waste management: collection, transport, disposal and treatment. Special consideration to be given to medical wastes (classified as hazardous);
- waste water: disposal of domestic wastewater (from showering/laundry/cooking areas), drainage of runoff water, sanitation around water points. Possible discharge of industrial wastewater in the vicinity. Special care about cholera camp outlet if there is any;
- disease vectors: environmental measures (drainage, filling) versus chemical control (target organisms, national policies e.g. malaria control, types of insecticides);
- hygiene: food hygiene (cooking areas, storage of food items in warehouses; indication of potential presence of rodents or other vermin, fumigation, etc.), body hygiene (soap, showers, laundering areas).

Resources include:

- local available building materials (grass, thatch, cement, bricks, planks, timbers, iron bars, pipes) and market prices;
- local hand tools (masonry, carpentry, plumbing) and their price on the local market;
- financial resources from: government, NGOs, Agencies such as UN bodies, EEC, USAID;
- locally available expertise: locals, NGOs, UN, refugees;
- technical and managerial capacity of potential actors (government, NGOs, UN bodies) to deal with environmental sanitation issues.

How to assess environmental sanitation

Basic tools: common sense plus professional experience plus technical background. In addition, there are tools which can be used either separately or simultaneously depending on the situation:

- visual assessment and close checking (particularly inside the shelters, defecation areas, water points, garbage dumping sites);
- meetings: with refugees, leader(s) of the

Sanitation in emergency situations

community, technicians, local authorities (line departments in particular);

- interviews: with family heads, women, other individuals (water attendants, mechanics, cleaners);
- literature research, study of maps (topography, hydrology, geology) and of reports (specific or relating to the subject).

Parameters, criteria

Site characteristics:

- topography: drainage, erosion, siting of sanitary facilities (dumping sites, toilets/showers);
- soil (ground surface and subsoil): permeability, filtration (re. groundwater pollution), stability (lining of pits), design of structures (e.g. raised latrines in rocky areas);
- available space: may be determinant with respect to both the type of facilities to install (individual, semi-communal, communal) and their siting;
- hydrology, hydrogeology, climatology: floodable zones, groundwater table (shallow aquifers), possible contamination of water bodies (e.g. schistosomiasis);
- vegetation: deforestation vs building materials, protection against wind or dust, presence of undesirable vectors (e.g. tsetse fly);

Social, cultural and cultural aspects:

- previous experience of refugees/returnees in sanitation;
- sanitary habits in the country of origin (disposal of wastes including garbage and excreta);
- taboos (water use, reuse of excreta as a fertiliser, gender issues);
- religion(s);
- health education: awareness of linkages between environmental sanitation and health (e.g. water contamination linked to gastroenteritis, soil pollution linked to intestinal parasites);

Specific issues:

- local and national standards in urban, semi-urban and rural sanitation,
- epidemiology and vector control: morbidity and mortality (top diseases and causes), endemic diseases in the area, registered chemicals (e.g. insecticides used by the

national malaria programme), national strategies;

- ongoing projects and programmes directly or indirectly related to environmental sanitation, implemented by government or other bodies;
- living conditions of locals at various levels (national, provincial, district, village) particularly regarding water supply and environmental sanitation.

How to report an assessment of environmental sanitation

Irrespective of its format, the report should fully address all of the Terms of Reference, particularly findings and recommendations. Sketch-maps (with rough contour lines, showing possible breeding sites, etc.) should be appended to the report as well as all relevant data collected during the survey.

Monitoring and evaluation

N.B.: '>>' stands for either 'better than' or 'to be preferred to' as appropriate.

1 General

Local resources >> imported resources. Such a guiding principle should be used throughout any project cycle (from needs assessment to implementation). This applies not only to building materials and equipment but to local expertise as well.

Quality >> quantity: particularly true when it comes to the construction of latrines. There is not much point in installing as many facilities as possible within a very short period of time if no provision has been made to ensure a proper operation and maintenance (O & M) of such facilities.

Whenever possible, the 'soft' package (sensitisation, health education, community involvement and organisation) and the 'hard' one (construction works) are to be implemented simultaneously, if project failure is to be avoided.

May be more important for this sector than for others, community participation should be promoted and encouraged at all stages (planning and design, -implementation, -O & M - evaluation).

2 Specific

Human excreta disposal

Living areas: Family/individual units >> communal units. The latter are usually recommended for public places such as schools, clinics, market, etc.

Essential criteria:

- efficient control of smells and flies (screened vents do, hole lids do not);
- latrine slab: made of concrete for an easy cleaning (durability);
- lifespan (based on .07 m³/ person/ year as the average excreta accumulation rate) 3 years for pit latrines, 1 year for compost and double-vault latrines.

Basic standards: 1 latrine per family or 1 cubicle for 20 persons (if communal facilities are foreseen).

Keep in mind that usual statistics of the number of latrines constructed reveal very little about improvements in the community's sanitary habits.

Solid waste management

Communal systems >> individual pits

Burying (sanitary landfilling) >> burning (incineration). (Incinerators might be advisable for clinics and health centres where medical and other hazardous wastes are to be disposed of in the safest possible manner.)

Minimum standards:

Storage: 1 refuse bin, 100 litre capacity, for 10 families or 50 persons;

Transport: 1 wheelbarrow/ 500 persons; 1 garbage tipper/5000 persons;

Final Disposal: 1 pit (1 x L x D = 2m x 5m x 2m) /50 persons; 1 incinerator + 1 deep pit for each clinic.

Vector control

Environmental measures (filling, drainage, etc.) >> chemical control (i.e. use of chemical pesticides)

Routine and indiscriminate insecticide spraying should be resisted firmly. Pesticides should be used only as a last resort, and their usage, dosage and application carefully adjusted so as to

produce localised and specific effects on the target pests.

A proper management of garbage, excreta (see above as for fly control) and domestic wastewater is definitely more cost-effective than chemical measures, which may result in undesirable effects such as resistance of target organisms to chemicals and/or poisoning of non-target organisms including human beings.

Before spraying activities are launched, protecting workers through provision of adequate training as well as protective clothing is as important (if not more) as the procurement of chemicals and sprayers.

Domestic wastewater management

Absorption trenches + sucking trees (e.g. banana or papaya trees) >> soakaway pits. This should be the guiding principle as for the drainage of spillage around tapstands.

Serviced water (from showers, kitchen, laundering areas) could be used to irrigate vegetable gardens provided that the detergent content of the said water does not exceed permissible levels beyond which health of potential consumers of those vegetables is at risk.

Flexibility

Above standards are to be applied whenever possible. During emergencies various constraints may prevent the implementation of these standards. For instance, it may be advisable to phase the approach and construct, say 1 latrine for every 100 persons in phase I, increase the coverage so as to bring the ratio of latrine to users up to 1:50 during phase II and eventually reach the standard of 1:20 in the final phase.

Flexibility might also be required when deciding on which type of latrine to install. Incremental sanitation should guide the designer of such latrines, which means that rudimentary structures may be acceptable at the outset of the emergency provided that gradual improvement (e.g. ventilation, shift from pit to pour-flush latrines if conditions permit, connection to a small bore sewer network, etc.) is properly thought out and planned for from the very beginning.

Section 3 Working group discussions and presentations

During the workshop, participants split into working groups to discuss particular issues raised during the presentation of papers and plenary discussions. The groups reported back in plenary sessions and the results of the group work and comments from the plenary sessions are presented here.

Some of these working session summaries are in the form of draft guidelines on technical subjects. The guidelines vary in their level of detail and practical usefulness. This reflects the way in which questions for the groups were framed, and the difficulty in producing technical guidelines for a subject area for which there are many different situations for which solutions have to be sought in emergency sanitation work.

During the plenary discussions it was felt that the main area in which agreement on recommended technical approaches is hard to reach, where practical guidance is most lacking in the existing literature (most of which refer to stable situations), and where loss of life because of poor sanitation work is likely to be greatest, is the first phase of an emergency. This was loosely defined during the workshop as having more to do with the state of the situation than time: the 'first phase' may continue for months if the emergency is badly managed. Excess morbidity and mortality due to excreta-related diseases may define the first phase, or it could be said to be the period before semi-permanent structures and systems are put in place.

3.1 Principles for sanitation promotion in emergencies

When the working group discussed this topic, its members felt that having guiding principles for emergency sanitation was a good idea, although much of the wording of the principles developed by the WHO Collaborative Council Working

Group on the Promotion of Sanitation was not suitable for emergencies and not specific enough. The group attempted to make the principles more specific to first-phase emergency sanitation work, and to choose the words so as not to need an explanatory paragraph beneath each principle. (The explanatory paragraphs included here are to demonstrate how the working group arrived at each principle.) The two final principles (11 and 12) were not on the original list.

These are the principles which sanitary designers or planners should bear in mind when they are developing a programme. The chances of being able to observe them all in a programme are small, but they should be considered when doing a sanitation plan.

The plenary group made several comments on the wording of certain of the revised or adapted principles, but no major fundamental changes were suggested.

- 1 Recognise sanitation as an equal priority:** Sanitation is *not* 'water supply and sanitation'. It is sanitation in its own right and should be treated as such. It should not receive any more or any less priority than all the other priorities in an emergency situation.
- 2 Accept that sanitation is the first barrier to faecally transmitted disease:** The first barrier, we believe, is not medicine. The first barrier is sanitation, and that should be accepted as beyond dispute.
- 3 Support human dignity in all interventions:** Sanitation is not only about health. It is about improving the morale and dignity of the people you are working for. Dignity and morale are extremely important within a community to help people to recover after a disaster.
- 4 Recognise the political context:** Refugee camps are very political situations, both internally and externally. When you are developing your programme you cannot

ignore the fact that you are working in a highly political environment and you must allow for the fact in the decisions you make.

- 5 **Set sanitation objectives:** Decide at the beginning what you are actually going to try to do, rather than just go in and do whatever you can. It is important to define objectives and then develop a programme to achieve them.
- 6 **Promote behaviours and facilities together.:** Promote behaviours and facilities together so that the two are linked. It is no good developing behavioural changes if you do not have the facilities to make use of those changes. On the other hand, there is no point in having facilities if people do not use them.
- 7 **Continually promote sanitation at all levels:** Promotion of sanitation is not a one-off effort. It is a continuous process, at all levels: within the community that we are serving, but also at a managerial level within aid agencies, and with the management committees.
- 8 **Build on traditional practices:** Always try to build on traditional practices. This might not always be feasible, but in general, if you can promote a practice that people have used historically, then they will adopt it much more easily.
- 9 **Recognise gender and age needs:** Recognize the needs of different age groups and genders. They make different demands on what you are providing and you should recognize that in what you provide.
- 10 **Encourage user participation:** Encourage user participation, from the very beginning. Remember that eventually we will all go away and somebody has to take over. It is important that the the users – maybe not a community at the beginning of an emergency – will have to be involved in sanitation at some time in the future, and the earlier you can get them involved the better, even if it is only in a very minor way at first. Sow the seed for the future.
- 11 **Consider the needs of residents (local people) as well as affected populations:** Consider the people who live around the camp, as well as those who live within the camp or settlement. Their needs are just as important. You must be sensitive to comparisons

between what is provided in the camp and what local people have or do. Provision need not be the same, but you have to be aware that there are normally other communities in the area, who were there before the camp was set up, and will be there long after it has gone; and it is important that you bear their needs and their problems in mind in whatever you do.

- 12 **Recognise the environmental impact of sanitation:** Recognize the environmental effects of sanitation, and try to minimise any negative impact and maximise positive effects.

3.2 Objectives, techniques, tools, and equipment for first-phase excreta disposal

Experiences

Some experiences of members of the group are:

- Communal latrines are not used when they are dirty.
- Cultural differences have a big influence on the success (or failure) of the technique and system used (eg some communities may refuse to use pit latrines).
- Communal programmes may compromise potentially more successful family-based programmes.
- There may be official resistance to implementing a programme or a system, or to the use of a certain technique. A technique may also be imposed by an authority.
- First-phase emergency sanitation that uses some kind of communal system will need a high level of continuous agency involvement to maintain a certain degree of success.
- Theft and vandalism may hamper the programme as long as other needs of the population are not met.
- People would often prefer to use latrine construction materials (particularly plastic sheeting) for other things, such as housing.
- Act, during the first phase, so as to avoid creating problems for later work.

Objectives

Provide facilities, as soon as possible, that work technically, and are acceptable to the users. Some participants believed that defining objectives in

terms of toilets per 1000 people by a certain time as a global guideline is not strictly relevant, as numbers of people per toilet is just one of a number of factors affecting access to facilities.

Success can be measured in terms of incidence of excreta-related disease; walking distance to a latrine (including defecation field etc); percentage of the population using the facilities.

Techniques to be used (in order of priority)

- 1 Repair of existing infrastructure.
- 2 Improvements on what people already do (as long as it is practical and appropriate in the new situation).
- 3 Any of the following: controlled open defecation; family latrines (pit/bucket etc); trench latrines; package system.

Tools and equipment needed

- 1 Packs of simple tools to help you and the people to do what you want to do more quickly.
- 2 Packs of simple latrine components (slabs, superstructures etc), on a modular basis, rather than very large and specific or comprehensive kits.

Recommendations

- 1 More research should be done on developing kits.
- 2 The possibility of using conventional package wastewater systems in emergencies should be investigated.

3.3 Objectives, techniques, tools, and equipment for second-phase and longer-term excreta disposal

Objectives

Time: for as long as the community may be on the site. This could be for as much as 10 to 15 years.

Coverage: aim should be one latrine per family, depending on availability of land, resources, budget (roughly \$20-30 per latrine), but if not, then a minimum of one latrine per 20 people.

Techniques

- Identify one agency on site as having

responsibility for the excreta-disposal programme.

- Promote the health and welfare rewards of good sanitation, and promote community responsibility for operation and maintenance.
- Develop a team of sanitation workers in the community who can take the programme forward and ensure sustainability.
- During the first phase, avoid working in a way which will make the second phase more difficult (e.g. by creating too much dependency on external inputs).
- Consult the community to find out what is culturally acceptable; how much awareness of sanitation and hygiene the community already has; what techniques people are used to; and how sanitation provision was managed previously.
- Use as many community resources as possible and place as much responsibility for maintaining latrines as possible onto the community.
- Assign the care of latrines to a clearly identified group, such as an individual family or a group of families around a shared latrine.

Tools and equipment

Use good quality tools and equipment and use a system for their management on site.

Latrine slabs are of four different types:

- imported eg Monarflex plastic slab
- traditional log/mud
- sawn timber
- concrete (domed or reinforced)

The choice is dependent on the site, availability of materials, budget, etc.

Recommendations

A comprehensive list of latrine digging and building tools should be drawn up and those tools stocked by agencies in case they are not available in the country where the emergency is taking place.

3.4 Off-site and on-site excreta disposal

The group discussed a number of technologies for excreta disposal (listed below), but concluded that it was not possible to have a general debate about the merits of either on-site or off-site excreta disposal, as all conditions are specific.

Many of the technologies may be used as either on-site or off-site disposal methods.

On-site

- Open defecation field
- Closed defecation area
- Trench latrine: shallow, open; or deep, covered with slab
- Pit latrine: lined, unlined, VIP, square pit, round pit
- Compost latrine
- Septic tank
- Family bag latrine
- Oxfam sanitation unit

Off-site

- Bucket
- Flush pipe to off-site
- Emptiable latrine
- Defecation area off site
- Lagoons and bury pits off-site

The group recommended the development of a tool to help in deciding what technology to select in particular circumstances, depending on the factors listed below.

Site conditions to consider

- Access
- Land available
- Hydrology (inc water table)
- Amount of water available
- Topography (steep/shallow slopes)
- Density of population
- Environmental concerns
- Climate (eg heavy rain, dry, freezing)

Other considerations

- Local resources available: infrastructure, equipment, expertise, materials, local willingness for involvement (refugees and local authorities)
- Behavioural/cultural conditions: privacy, personal security (especially for women)
- Political restrictions eg on refugee labour, on permanency of installations
- Local standards and guidelines
- Cost: capital and recurrent, and the problem of funding falling off after the first phase
- Stage (phase) of the emergency
- Sustainability

3.5 Strategy and flow chart for emergency excreta disposal for a range of site conditions

General considerations

Different technical options may be required at different phases of an emergency. Phases run into each other with no hard boundaries or strict definitions. Appropriate responses may change with each phase, or may go across two or more. The problem is not so much the range of technologies available, as the lack of a logical decision-making tool, which can quickly take into account all the factors important in an emergency. There are no simple 'yes' and 'no' answers.

A planning chart which follows the different phases of an emergency might look like this:

Phase	Activity
Pre-emergency	pre-planning, pre-positioned supplies, financial planning
1st Phase	etc, etc
2nd Phase	
Long-term	

Criteria for choosing technical options

Environmental: soil stability and digability, erosion, slope, terrain, land availability, water table, climate, materials available (wood, thatch etc). What will minimise the environmental impact?

Logistics: roads, trucks etc

Human resources: who's available? how do you pay them? Local human resources, skills, pay; outside human resources

Materials available: plastic sheeting, lime, sand etc

Financial resources

Political factors

Cooperation from authorities

Security

Religious/cultural factors

What toilets people are used to

Health status
Population structure

Technical options available

Open field defecation
Defecation fields (zones/improved)
Trench latrines (shallow/deep)
VIP latrines (drop-hole/pour flush)
Bucket latrine
Borehole latrine
Container type (above ground tank)
Septic tank
Flush sewerage

Flowchart for decision-making

The choice of technical options depends upon general considerations, such as the phase of an emergency; the technical options available, and the criteria for choosing between them, as outlined above. A flowchart is needed to simplify this choice and enable it to be made in a logical way. The first question to ask is 'Is there an acute sanitation-related health risk?' If 'no', then consider what may be appropriate in a later phase; if 'yes', then what are the factors which influence choice of technology?

3.6 Refuse disposal (2 groups)

General

When does refuse become an issue? It is not as immediate a problem as excreta disposal. A matrix for looking at all the issues listed below, by refuse type, would be useful.

Responsibility

Responsibility for different aspects of refuse disposal, at different times in the emergency situation will be shared at three levels: family level, community level, and lead or co-ordinating agency level. In the early stages of an emergency, agencies should provide all necessary facilities; but community involvement and community responsibility for refuse disposal should be promoted. Final disposal (eg in a central landfill site) will remain the responsibility of the agency.

Coordination of responsibility at different stages of refuse disposal (storage, collection, transport and disposal) is needed.

It is vital to create awareness of disease and other problems associated with refuse.

Sources of refuse

The sort of refuse produced, the type of management needed and responsibility for disposal depends on its source:

Dwelling areas: domestic refuse.

Public places: clinics and feeding centres; cholera camps; markets; distribution points; slaughtering areas will produce specific types of refuse. Disposing of **dead bodies** and managing **graveyards** may be a major programme.

Implementation

Investigate systems already in place and any recycling the community carries out.

Tools and equipment: digging tools (need for kits?); wheelbarrows; tractors and trailers, skip trucks; refuse bins (drums etc) or bags; protective clothing for workers (kits?); body shrouds (cf cultural habits).

Techniques (depending on the situation)

- Composting and sorting
- Refuse pits, bins, bags (for individual families or groups of families)
- Recycling
- Incineration (particularly medical waste) (fire risk in living areas. Ashes → latrines)
- Central tip site (sanitary landfill)

Financial aspects

This is always an issue. Refuse disposal should have a specific budget line in project budgets. Incentives for workers should be included in recurrent costs. Recognise the community as a resource. Build in operation and maintenance costs in the beginning of the programme, for medium- and long-term operations.

Possible impact on local population

Consider the balance with local communities when deciding on salaries or incentives to be paid to workers, and the equipment to be provided.

Skills

There is a lack of expertise and recognised approach to solid waste management; and hence, a need for training on a core curriculum. There is also a need to retrieve existing information and lessons learned, for exchange and circulation among agencies, and for a user-friendly information manual or guide, a reference centre, and a support network.

3.7 Hygiene education in first-phase emergencies

Hygiene education must be given priority. This means adequate budget, expertise, and recognition.

Justification for hygiene education

- There is little point in engineers providing clean water if it is then contaminated in dirty buckets.
- Hygiene education alone can sometimes have a greater effect on health than water or sanitation interventions.
- A hygiene education programme can promote effective use of water and sanitation facilities, and participation in water and sanitation programmes.

Responsibility and skills

Who should be responsible for hygiene education? Engineers or health staff or both?

First-phase response

In order to react quickly in an emergency, a core hygiene education package with three or four simple messages crucial to reducing diarrhoeal disease should be used immediately. This can later be evaluated and refined as necessary.

Longer-term hygiene education

Longer-term hygiene education should be done *with the community* and the community should be given the initiative for designing the programme. It is important to give people messages that are appropriate to their situation and which they can act on. Programmes should take account of:

- diseases (special conditions in emergency situations)
- transmission mechanisms
- enabling factors
- beliefs, values, social influence
- message development
- implementation
- what the hygiene educator has to offer, in addition to messages (soap, water supply etc)

Priority messages

1 The importance of hand-washing:

- before eating
- after using the latrine
- before cooking

- after handling baby excreta.
Using water with wood ash or soap if possible.

2 The importance of clean water, and keeping it clean: use a clean container and keep it covered.

3 Latrines: everyone should use them and they should be kept clean. Drop hole should be covered. Babies' stools are dangerous.

4 Other:

- food and utensil hygiene
- environmental hygiene
- specific risks (eg schistosomiasis or hookworm)
- body and clothes washing

Communicating messages

- **Who should communicate:** existing health centres, school staff, health workers (paid or volunteer), employed for hygiene promotion.
- **Target groups:** depends on the message. Include the host population.
- **Materials:** posters, stickers, pamphlets, cards, flipcharts. Pre-test for acceptability.
- **Methods:** meetings and discussions, presentations, home visits, drama, radio.
- **Venues:** water points, health centres, schools.

3.8 Personal hygiene kits

When promoting hygiene in emergencies, it is important that people have the facilities (water, washing facilities, latrines etc), and materials and equipment (soap, buckets etc) in order to practise hygienic behaviour. UNICEF have started to list some of the items to go into infant hygiene kits and family hygiene kits, to be distributed to people in emergencies as one way to help them to avoid disease.

It is impossible to design a definitive kit which is applicable to all geographical and cultural situations. Some items are consumables and others are long-lasting.

Provision of kits is linked to other issues such as refuse management, excreta disposal, and washing facilities.

Infant hygiene kits

Why: to promote infant hygiene in difficult situations where access to services, particularly water supply, is limited

How: safe collection and disposal of babies' excreta; promotion of baby washing; dental care; protection of babies from insect bites; promotion of safe feeding practices.

Family hygiene kit

Objective: Provide items of crucial need in pre-packaged kits which would facilitate the maintenance of personal, household and family hygiene in emergency situations where there is limited access to water, sanitation and health services.

Uses: promote personal hygiene; promote safe storage of food & water; promote safe cooking practices and food handling; facilitate washing of clothes and bedding; promote safe collection and disposal of nightsoil.

All kits should be: country/region/culture appropriate; environmentally friendly regarding packaging, disposal (eg the container can be used for food or water storage with a re-useable lid); provided with simple hygiene messages with illustrations or instructions where needed; provided once to each family/child, with consumable items replenished through local markets or distribution system.

Advantages: pre-prepared kits save time on purchase, transport and distribution.

Proposed lists (UNICEF)

a. Infant hygiene kit (for 0-5 yrs)

20 cotton re-useable diapers and safety pins
2 pairs of plastic pants to go around diapers
1 rubber bed sheet
2 baby towels
1 wash cloth or sponge
1 25-litre baby bath
1 baby potty (chamber pot)
1 rubber hot water bottle (for cold climates)
1 feeding cup with cover, bowl and spoon for baby
1 pair baby nail clippers
1 bar baby soap
1 litre baby shampoo
1 250 g jar zinc ointment for nappy rash
1 baby tooth brush, hair brush, comb
1 wash bottle, spout squeeze type, 1 litre
1 pack 500 g cotton wool
1 set assorted baby toys
1 nylon bag for storing baby items
1 baby cot with mosquito netting

b. Family hygiene starter kit

2 kg laundry soap
1 kg antibacterial body soap
1 litre medicated shampoo
1 nail brush
1 set hair combs (medium and fine tooth)
5 toothbrushes
2 large toothpaste
1 laundry washboard
100 chlorine tablets for water purification
1 drinking water storage bucket with lid and tap
1 pack sanitary napkins/reusable cloths for feminine hygiene
1 jerrican, 20 litres, rigid
1 wash basin, 12 litres
1 litre liquid bleach/disinfectant
1 portable bucket toilet with lid (plastic)
2 sets bath towel/wash cloth
50 sachets oral rehydration salts
1 large plastic food container with recloseable lid
2 mosquito bed nets, chemically treated (for malaria zones)

3.9 Vector control in emergencies (2 groups)

(The work of two different working groups on vector control has been combined, as they came up with very similar ideas and there was a general consensus on most points.)

Institutional issues

Whilst generalists can and should implement environmental control programmes where disease vectors are a problem, chemical control programmes generally need more specialist knowledge. Existing expertise within agencies is generally inadequate, particularly concerning malaria control. This is often not recognised, so ineffective or inappropriate vector control are often implemented.

Vector control specialists are needed:

- in the expertise core of NGOs, along with engineers and health workers
- for initial assessments of emergency situations
- to develop programmes with field-based, more generalist staff.

Increasing expertise within agencies may be achieved by bringing specialists onto the staff or by training existing staff.

There should be a directory of consultants available for vector control work.

Vector control information could be made available in the form of an electronic reference book, if there is sufficient demand (see Madeleine Thomson at Liverpool School of Tropical Medicine).

Specific vectors

Mosquitoes

Malaria is the most important vector-borne disease.

Consider bed nets in a hygiene pack as an immediate measure, particularly where a non-immune population is moving into a malaria area. These could be incorporated in a family hygiene pack. Issues to be looked at are cost, feasibility, fire risk and acceptability.

Get specialist help quickly when malaria is considered to be a risk.

Concentrate on clean water drainage to reduce mosquito breeding.

A spray programme may be needed in any case, as it is virtually impossible to get rid of all mosquito breeding sites.

Immunise against mosquito-borne diseases where possible (eg yellow fever).

Flies

The jury is still out on the disease importance of flies, but in areas of high fly density and incidence of shigella diarrhoea, implement fly control.

For control of flies and dirty water breeding mosquitoes, more research is needed on lids vs vent pipes on latrines, and more trials of bacterial larvicides (eg *Bacillus thuringiensis* - 'Dudustop') in emergency situations.

Lice

When asking the community to improve personal hygiene to control lice, bedbugs etc, give them the means to do it.

Rodents

Improve solid waste control.

Trapping is far preferable to poisoning. If poison is used, it should be dressed with 'Bitrax' to make it unpalatable to humans.

Most of the rodent population is hidden, so estimating numbers is impossible.

If rodents are carrying fleas with flea-borne disease, the fleas and disease must be controlled *before* killing the rodents.

Control strategies

Stages: assessment of vector control needs; design of appropriate programmes; implementation; monitoring and evaluation.

Responsibility for vector control: vector control specialist or sanitary engineer?

Environmental management and health education need general knowledge. Chemical control needs specialist knowledge.

Assessment: when deciding whether or not a vector control programme is needed, look at predisposition to a vector problem; disease statistics; community opinion on the evolution of disease or prevalence of pests.

3.10 Hygiene facilities

For health, water-based hygiene activities are the most important. They are as follows, in order of importance:

1 Washing the hands

Where?

- Near communal latrines
- Within health facilities
- In feeding centres
- In communal kitchens
- In the home
- In the mosque

What is needed?

- Container (with tap at the base preferably)
- Soap
- Water
- High dose chlorination in some circumstances
- Drainage to disposal
- Tapstand (possibly)

2 Body washing

Where?

- Bathing zone if surface water, or other designated area, *only* for bathing
- Next to communal water point
- In a well drained area
- Hospitals
- Feeding centres, orphanages etc
- In the home

What is needed?

- Privacy, either communal or individual
- Water
- Soap
- Bucket
- Hard, free draining surface
- Drainage to disposal

3 Clothes and cooking utensils

Where?

- The same places as communal bathing
- In the home
- Feeding centres, hospitals etc

What is needed?

- Hard, free draining surface
- Water (possibly disinfected in the case of hospitals and feeding centres)
- Soap
- Drying facilities
- Container to carry clothes and utensils

4 Slaughtering facilities

Where?

- Outside of the living area of the camp
- Sited for good drainage and removal of offal
- Access for holding animals
- Close to a point of sale
- In a secure place

What is needed?

- Water for cleaning
- Hard, free draining and impermeable surface
- Drainage to disposal
- Solids collection trap
- Waste disposal facilities

Some of what is needed for all these activities should be provided institutionally at the site, eg water, but others, like soap should not.

3.11 Environmental impact of emergency sanitation programmes

The working group discussed the general environmental impact of displaced people, and not just the impact of sanitation programmes. The discussions centred mostly on situations arising out of complex emergencies, rather than natural disasters, which have significant environ-

mental consequences of themselves. Needs were identified under four headings:

Programme integration

- In the area of-water supply and sanitation; fuelwood/construction (including latrines)/ shelter; soil management.
- Coordinating focal agency to be identified: government; UNHCR; lead NGO.

Information, preparedness, consultation

- There should be an environmental specialist involved in the assessment at the start of any emergency operation, with access to information from existing development programmes, international data centres, Geographic Information Systems etc.
- Early warning systems do exist and should be further developed.
- Predict scenarios: take a long term view in programme planning; look at sustainable numbers in specific locations and try to lobby for numbers to be restricted in sensitive or fragile places; develop national preparedness plans with governments, including planning for refugees and their environmental impact.
- Develop existing appropriate technologies further, eg alternative fuels, plastic latrine slabs, alternative shelter materials.

Agreed procedures and minimum standards

- During assessments, appreciate and respond to national environmental priorities set by governments.
- Establish continuous environmental monitoring by agencies and increasing capacities of local authorities to continue this for the future.
- Minimum standards should be defined in the beginning of an operation by the coordinating body, including water supply, sanitation and related activities.

Realistic planning horizons

Agencies implementing emergency sanitation programmes need to plan for the long term, taking into account the environmental impact of their work, rather than concentrating solely on immediate needs and short-term solutions.

3.12 Sanitation in enclosed centres

Common problems: existing systems overloaded; existing systems in bad condition; lack of space for on-site excreta and solid waste disposal; administrative constraints.

Types of enclosed centres: prisons; hospitals, psychiatric centres; public buildings housing refugees; cholera camps; feeding centres. Difficulty with target population.

Solutions needed

- Simple, sturdy and easy to maintain designs.
- Get the waste out (but in cholera camps, keep the waste in).
- Use flushing systems (but need a lot of water) to get it out.
- Recycle as much as possible.
- As far as possible, have a dual system.
- Prevent solids from entering the sewerage system.
- Desludge by gravity if possible.
- Secondary treatment before disposal if possible (eg lagoons).
- Disposal and treatment of sludge and solid waste.
- Control of vectors (lice and rodents particularly).

Objectives

- Prevent outbreaks of disease and heavy infestation with disease vectors (lice, bugs and rodents).
- Keep the environment as tolerable to live in as possible (helps morale and dignity).

Priority actions (in order)

- 1 Set up hygiene teams with tools and incentives and protective clothing.
- 2 Provide personal hygiene items (soap etc) and education.
- 3 Repair and rehabilitate any existing system.
- 4 Improve existing facilities (kitchens, showers, laundry, toilets) or install new ones.
- 5 Improve management of solid waste, inside and outside the centre.
- 6 Final disposal and treatment of wastewater.
- 7 Look for space to increase the area available.

Techniques and resources

Wastewater disposal and treatment: sewer network → screens → septic tanks → secondary

treatment (lagooning, filters, subsoil absorption); desludging equipment; flushing (water).

Solid waste disposal and treatment: refuse bins → sanitary landfill (preferred) or incineration (difficult to monitor).

Sludge disposal and treatment: dumping sites; sludge drying beds (if there is sufficient space).

Kitchens: improved cooking stoves.

3.13 Preparation and training of relief workers

- Training is crucial to effective emergency sanitation interventions.
- Present competence and capability in emergency sanitation are 'shaky' and need improvement.
- It is critical to build up a *human resource capacity*, starting quickly and setting clear deadlines for achievable objectives, including a training strategy.
- There is a need for training before deployment, and not only on the job.
- The aid industry (as represented by participants in the workshop) should set the agenda for selection and training.
- Training is needed for staff at all levels: senior permanent staff; consultants; international temporary field staff; local staff.
- Training should include methods of training local staff.
- Self-funding by trainees is a possibility. Donors should be called upon to support training.

4 Recommendations and action points

The final afternoon of the workshop was spent in plenary session, discussing how agencies could respond more effectively to the next big emergency involving sanitation; identifying areas which require further work; and making recommendations and agreeing action points among the agencies represented at the workshop. One fundamental and general problem identified was the shortage of competent agencies who could operate successful sanitation interventions in emergencies.

Most of the recommendations relate to work necessary to overcome this problem. It was felt that with successful promotion of sanitation in emergencies and better tools, training, and funding, more agencies would be willing and able to do good sanitation work in emergencies.

The following summary condenses the afternoon's discussion into areas of activity, with recommendations and, where possible, action points. Action points are marked thus ☛. In general, the recommendations here were unanimously agreed upon by the participants present. Where this is not the case, differing views are represented together.

1 Promotion of sanitation in emergencies

Sanitation should be given a higher priority, as a distinct and vital part of any response to emergency situations.

- ☛ All delegates at the workshop to take responsibility for promoting sanitation in emergencies, as a vital part of a public health response, both within and outside their own organisations.
- ☛ WHO to bring the subject of emergency sanitation to the attention of the Water Supply and Sanitation Collaborative Council Working Group on the Promotion of Sanitation and to look into core sets of messages for promoting sanitation in emergencies.

The direct relationship between sanitation and health should be used for promoting sanitation in emergencies.

Agencies should consider how to make sanitation a more interesting and attractive subject. Promoting sanitation requires good marketing skills.

Sanitation in emergencies should be promoted as an important technical area, while also having a strong community participation and health education component.

Issues for advocacy concerning sanitation in emergencies should be recorded and a common set of messages developed.

2 Coordination of developments in emergency sanitation

Developing techniques and guidelines for improved practice in emergency sanitation work should be given higher priority and should be done in a collaborative way.

- ☛ The existing inter-agency Technical Coordination Group to concentrate more on sanitation than in the past.

The membership of this groups should be expanded to include more agencies working in this field.

- ☛ Oxfam to produce draft operating guidelines from the recommendations of the working groups during this workshop, as a basis for development by agencies individually and as a group.

Procedures for coordination of developments in emergency sanitation should be defined.

- ☛ The Inter-Agency Technical Coordination Group to work on guidelines and a flow chart

for effective response for key areas in sanitation in emergencies. This should be a useful tool for field coordination, training, and project design and choice of techniques.

3 Information exchange

The exchange of information on emergency sanitation should be improved.

- UNHCR to initiate a network for the exchange of information on sanitation in emergencies.

Information should be made available and exchanged both at the field level and at headquarters level.

A literature search should be made, as part of a process of assembling and making available information already existing on the subject.

A directory of information should be established.

An inter-agency newsletter dedicated to sanitation in emergencies should be produced, to enhance information exchange.

Existing networks and inter-agency fora should be used where appropriate.

Lessons learned from experience (both good and bad) should be shared between agencies.

4 Initial assessment of emergency situations

Sanitation considerations should be given a higher priority in initial assessments.

- Each agency to try to ensure that sanitation needs and responses are given adequate attention right from the initial assessment of emergency situations, by finding out the intentions of other agencies. UNHCR is the coordinating body for assessments and implementation of sanitation for refugee emergencies

The flow chart and guidelines developed as part of Recommendation 2 should help in assessments.

5 Development of sanitation kits (packages)

Kits or packages of equipment and information should be developed for emergency sanitation work.

Kits of sanitation equipment should be developed for rapid deployment in emergencies. This includes personal hygiene kits; sanitation facility kits (eg latrine slabs); and field test kits (eg mosquito identification kits).

New research is needed to develop new kits and to improve existing ones. The possibility for doing this in collaboration with academic institutions should be pursued.

- Improvement of existing kits and development of new kits to be discussed at the next Inter-Agency Technical Coordination Group meeting. UNICEF should be asked to liaise with governments on the suitability of equipment for different countries.

Directories of products for chemical vector control should be made available for use when selecting chemicals for specific vectors for specific countries.

6 Community participation in emergency sanitation programmes

Community participation in emergency sanitation programmes should be encouraged and practice improved.

Additional skills are needed to enable a more participatory approach to be taken. This may require the provision of training for technical staff, or specialists in this field may need to be brought in at an early stage in an emergency.

Training for awareness and skills development should be undertaken to help field staff to take a participatory approach.

Techniques for applying a community participation approach (and on when to apply such an approach), particularly for the first phase of an emergency, should be developed.

Sanitation in emergency situations

Guidelines should be drawn up to help field staff to choose and apply participatory techniques.

Agencies with established development practice should feed lessons and techniques into emergency sanitation work.

- ☛ RedR, with CRED, Oxfam and SCF(UK), to draft a discussion paper on a consultative framework for participatory tools and approaches to emergency sanitation.

Research in this field should be undertaken by an independent body.

7 Project management tools

Project management tools should be developed to improve sanitation work in emergencies.

Project management tools should be developed to improve emergency sanitation interventions throughout the project cycle, including assessment, implementation, monitoring, and evaluation.

Tools for implementation should include minimum standards for the quality of work done.

- ☛ Tom de Veer said he would produce a draft of his study on monitoring and evaluation by mid-January 1996.
- ☛ Each agency represented at the workshop to investigate their own project management tools.

8 Recruitment and training

Recruitment and training of emergency sanitation workers should be improved at all levels.

- ☛ The Inter-Agency Technical Coordination Group to look at training needs for the sector and report to other agencies. The existing group should possibly be expanded to include other agencies with training needs in this field.
- ☛ Agencies at the workshop to choose focal points for training on sanitation in emergencies.

More funding should be made available for training. A budget provision for training should be included in budgets for emergency sanitation.

Agencies should create proper staff development plans.

Selection criteria for sanitation workers should be reviewed and people in different professions, eg environmental health officers, should be considered.

Recruitment and training should be decentralised to make them more accessible.

Individual agencies may take the lead on specific areas of training, but overall, a collaborative approach should be taken.

- ☛ MSF to make its two-week water supply and sanitation course available to other agencies.

Agencies should try to enable more on-the-job training by allowing less experienced staff to work alongside more experienced colleagues. This may mean employing additional staff at certain times.

9 Early warning systems and information for project planning

Early warning information, and baseline and planning data, should be made more accessible for agencies working on emergency sanitation programmes.

Information giving early warning of emergencies, and information for planning emergency sanitation projects should be collected and made available to interested agencies by a focal agency. (Possibly, but not necessarily, the UNDHA.)

The sort of information needed for planning and implementing emergency sanitation projects should be more clearly defined.

Existing sources of information, such as satellite imagery, aerial photographs, geological, meteorological, and soil data should be investigated.

Local information systems should be reinforced and coordinated in the field.

Agencies should share the information they have which relates to emergencies they are involved in.

10 Funding

More and better-targeted funding should be made available, to enable high-quality sanitation work to be done in emergencies.

- Agencies represented at the workshop to increase the profile of emergency sanitation, to press for more funding for better programmes, and to educate funding staff on the subject.

The proceedings of this workshop should be shared with donors, and they should be encouraged to come to any further such meeting, to involve and educate them.

Donors should be encouraged to fund workshops like this, and to support work on training, development, and research in this field.

A very strong message should go from this workshop to donors, to point out that sanitation in emergencies needs increased financial support if much needed improvements in practice are to be achieved.

11 Further work from the participating agencies

This workshop should not be simply a one-off event, but the start of a process to improve the status and practice of sanitation in emergencies.

Collaborative work has been recommended in several of the preceding sections.

A follow-up meeting of a similar type should be held in about a year's time to review developments and encourage progress on recommendations and action points.

- Oxfam to act as a focal point for general follow-up of this workshop and disseminating ideas and recommendations produced.
- The workshop steering committee to meet in late January to review the workshop and recommendations for follow-up.

Annexe 1 Programme and presentations

Monday 11 December

Working papers

Sanitation kits

Jim Howard

First-phase excreta disposal

Martin Oudman, MSF-Holland

Latrine construction / Slabs

Woldu Mahary, Oxfam UK/I

Excreta disposal on difficult sites

Yves Chartier, MSF-France

Working groups

First phase excreta disposal

Second phase excreta disposal

A strategy for excreta disposal programme development

Off-site / on-site excreta disposal

Tuesday 12 December

Working papers

Vector Control and Pest Control in Food Stores

Lynette Lowndes, IFRC

Refuse management

Bob Reed, WEDC

Personal hygiene and water collection and storage

Eddie Potts, Liverpool School of Tropical Medicine

Water point sanitation and site drainage

Richard Luff, Oxfam UK/I

Working groups

Vector control in emergencies

Malaria control in emergencies

Refuse management in emergencies (2 groups)

Engineering solutions for hygiene practice

Hygiene promotion

Infant and family hygiene kits

Wednesday 13 December

Working papers

Sanitation in enclosed centres

Riccardo Conti, ICRC

The impact of sanitation programmes on the environment

Paul Sherlock, Oxfam UK/I

Principles for sanitation promotion

Dennis Warner, WHO

Selection and training of staff

Bobby Lambert, RedR

Working groups

Sanitation in enclosed centres

The impact of sanitation programmes on the environment

Principles for sanitation promotion in emergencies

Selection and training of staff

Thursday 14 December

Working papers

Community participation

John Adams, Oxfam UK/I

Assessment, monitoring and evaluation

Claude Rakotomalala, UNHCR

Plenary session

Recommendations and action points

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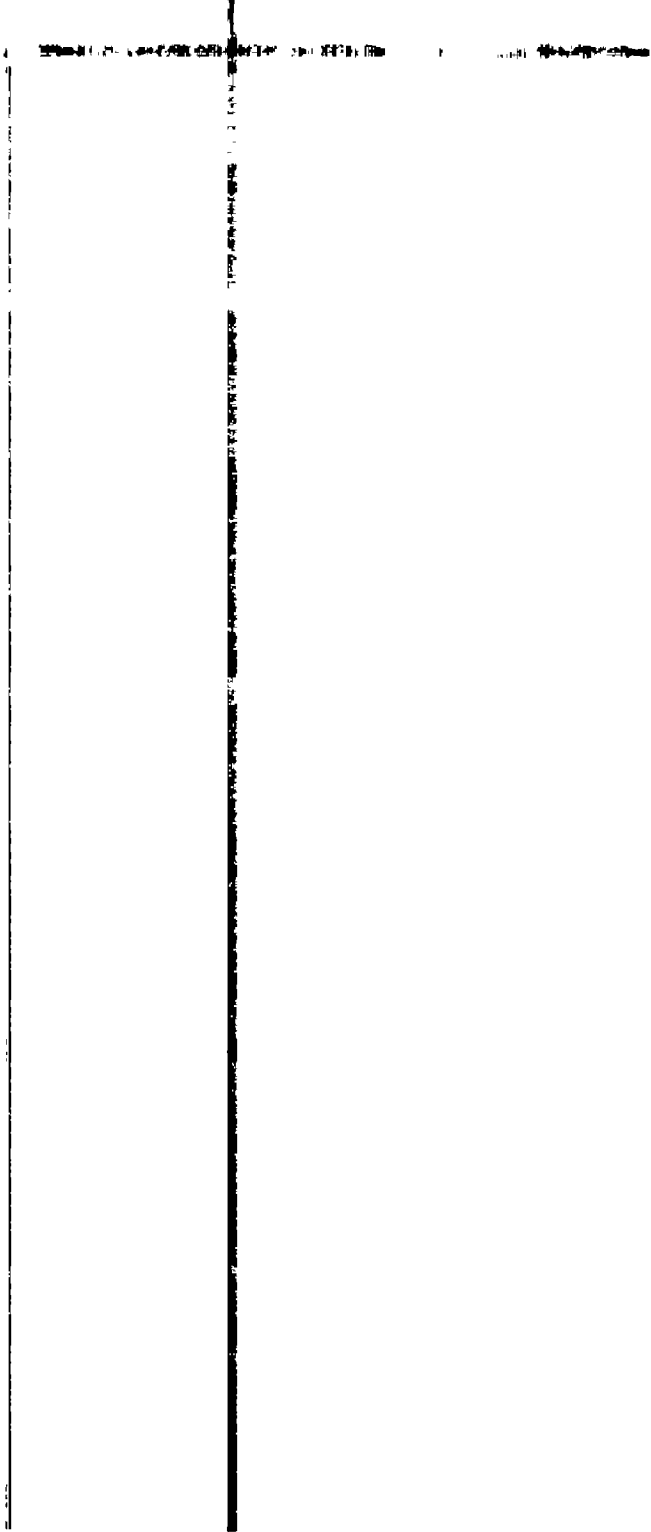
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In December 1995 an international workshop was held in Oxford to consider the technical and organisational problems of sanitation in emergency situations and share experience of good practice. Papers were presented on a variety of topics, and delegates also met in small working groups to discuss specific issues arising from these papers.

Oxfam is publishing the proceedings of the workshop in the Working Paper series because of a belief that it is time to give more attention to sanitation as an essential intervention which can improve public health, control disease, and thus save lives in emergency situations.

The workshop was organised by a steering group representing Oxfam, UNHCR, MSF, ICRC and IFRC. The organisations and institutions sending participants to the workshop included:

Concern Worldwide
CRED/ECHO
Department of Civil Engineering, Leeds University
DROP
ICRC
IFRC
IRC
Liverpool School of Tropical Medicine
London School of Hygiene and Tropical Medicine
MSF: France
MSF: Holland
MSF: Spain
Oxfam
Register of Engineers for Disaster Relief
SCF (UK)
Silsoe College
UNHCR
UNICEF
WEDC Loughborough University
WHO