



Pit Latrine as a strategy for excreta disposal in emergencies - A case study in Bam Earthquake (Bam Town-Iran)

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Keywords: environmental health in disasters, excreta disposal, simple pit latrine, toilet, Bam earthquake

ABSTRACT

The selection of convenient strategy for management of excreta disposal is a key parameter for performance of a successful plan in emergencies. The Bam Earthquake (6.4 degree in Richter Scale, December 2003, Bam Town, Iran) was caused to break around 80% of health services in Bam dwellings. Disposal of excreta during the first hours after disaster in the around of the individual camps didn't cause a pleasant landscape at Bam region and that also was a potential for diarrhea, cholera, and typhoid as big threats of disasters.

The selected strategy by the Environmental Health Group of Fars Province in Bam was "simple pit latrine". It was due to the cultural customs of Bam's habitats. They were living as a Garden-Home format before the earthquake. So, moving the people to big camps was not possible or at least was not so easy.

It was concluded that the simple pit latrine could be a very convenient, rapid and temporary method for dealing with the defecation problems especially at the first hours and days after Bam earthquake and also the control of related diseases. It seems that the Environmental & Occupational Health Office can play a good role in management of these activities during non-emergencies period to make an excellent preparedness for dealing with disasters. Although, the municipalities and red-crescent representatives can joint to this work group for planning and decision-making.

INTRODUCTION

Major health risks are due to inadequate excreta disposal after disasters in urban areas following damage to existing system, or when part of a city receive large numbers of

displaced or homeless people, so putting increased pressure on facilities that may already be under strain.

The immediate response may include establishing or reinforcing sewage tankering services, to bypass blocked sewers or to carry out intensive septic tank or latrine emptying in periurban areas. In interim situation, it may be necessary, as a temporary measure, to discharge sewage directly into a river or the sea, or to hold it in a safe, isolated place.

When section of the population can no longer use their toilets, public facilities may need to be provided, by allowing access to schools, community centers, etc., or by setting up temporary public toilets. If available, chemical toilets may be placed on street corners and emptied by municipal workers. Simple drop-hole latrines can be placed over open inspection covers, allowing excreta to drop straight into a sewer, if the sewer is still in operation and sufficiently flushed with sewage.

If not, then water tanks can be used to flush them one more times per day. Storm drains can also be used for this purpose, but only after careful consideration of the environmental risks [1].

The most conventional methods for excreta-disposal in emergencies' fields include shallow trench latrine; deep trench latrine; simple pit latrine; ventilated pit latrine; and twin-pit latrine (Figure 1).

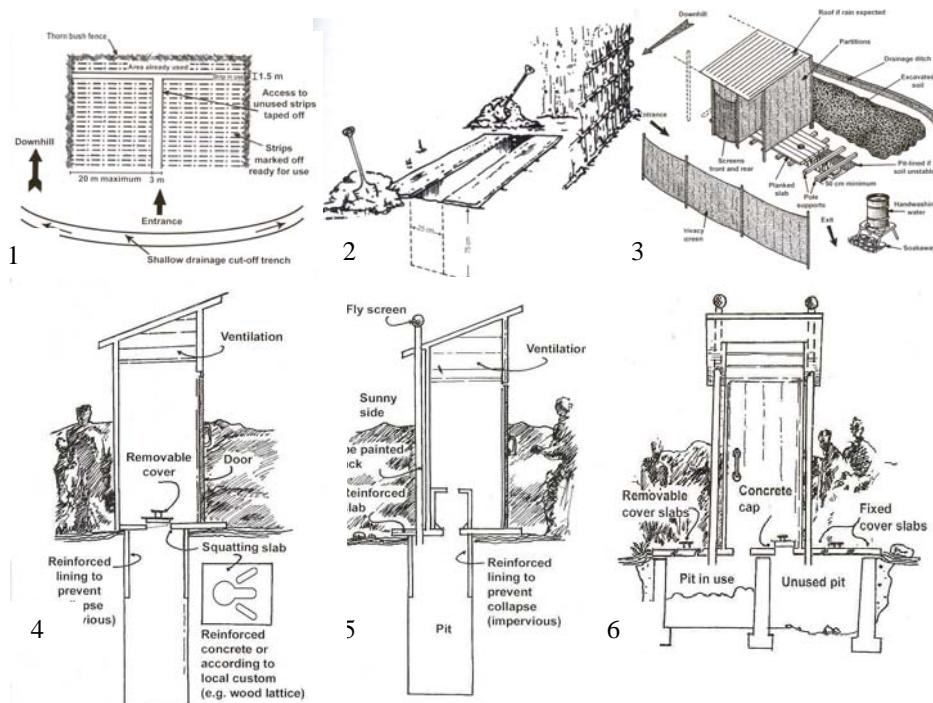


Figure 1. The most conventional methods for excreta-disposal in disasters, including: 1) defecation fields 2) shallow trench latrine; 3) deep trench latrine; 4)

simple pit latrine; 5) ventilated pit; and 6) twin-pit latrine (Source: WHO, UNICEF. *Environmental Health in disasters*. 2000.)

The goal of this paper is to introduce a case study with successful results to all of academic and professional staff that are working for preparedness before disasters in fields of excreta born disease outbreaks, excreta disposal, environmental protection and health, and toilets build up.

METHODS

The Bam town is one of the regions in Kerman Province in Iran. Bam has been located in the south of Kerman with 180 Km interval. An earthquake with severity of 6.4 in Richter scale was occurred in Bam at 5:30 a.m., Friday, 26 September 2003. The population of Bam was around 90,000 person and around 50 % (45,000 persons) were died after this event. Likewise, around 80% of health services in Bam dwellings were destructed [2].

The Environmental Health staffs of Fars were the first group that arrived to Bam to help for installation of toilet. They chose the “simple pit latrine” as the best strategy for excreta disposal.

After digging of trench, the installation of each simple pit latrine in Bam lasted around 15 minutes. The raw materials included: steel pipe (2 piece, each 6 m); galvanized bowel, wooden pallet (120 × 120 cm); cubic-shape wood (2 piece, each 2 m); cover (10 m²). Figure 2 indicates the pit latrine components.

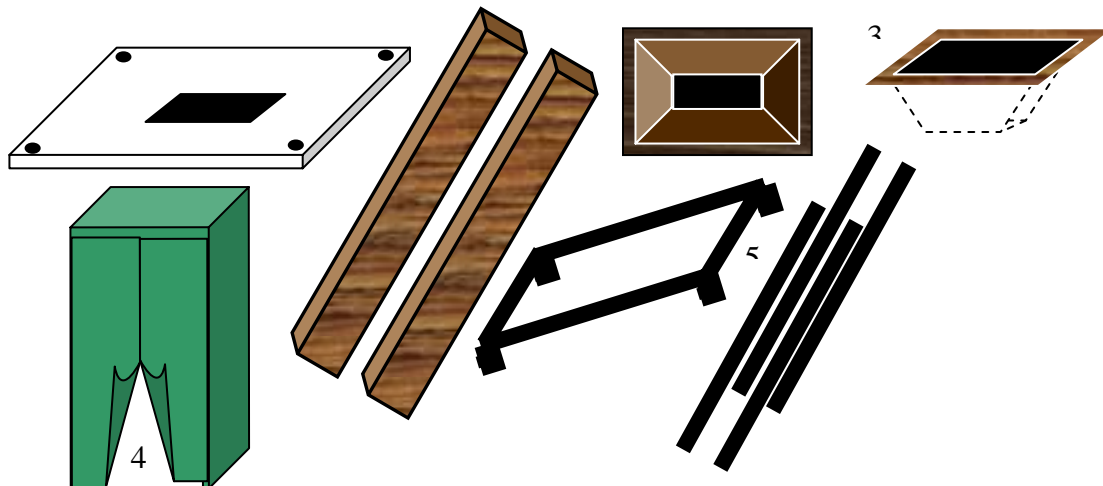


Figure 2. The components of a simple pit latrine used in Bam Earthquake including: 1) wooden pallet (120 × 120 cm); 2) cubic-shape wood (2 piece, each 2 m); 3) galvanized bowel; 4) tarpaulin cover (10 m²); 5) steel pipe (two piece, each 6m) and ceil framework.



The details of trench under each pit latrine are shown in Table 1.

Table 1. Details of trench under pit latrine.

Item	Dimensions
Upper length	3 m
Bottom length	1.5 m
Depth	3 m
Mechanical Digger with Packet No:	No: 40
Earth condition	Falling soil (loose)

RESULTS

The environmental health staff traveled to the disaster-location less than 24 hours after occurring earthquake. Whenever they arrived, they found people who have already established a pattern of excreta disposal, using whatever means are available. While this condition has caused the open defecation around camps with very unpleasant landscape, it could be a potential for spread of diarrhea, cholera, and typhoid major causes of sickness and death in disasters and emergencies.

Therefore, the first measure of environmental health staff was to choice optimum strategy for excreta-disposal. The first option could be to allow using their exiting toilets through temporary repairs. This alternative was refused in Bam earthquake, because all of homes and sanitary installation had been destructed.

In result, “simple pit latrine“ was selected. It was due to the cultured customs of Bam’s habitats. They were living as a garden-home format before the earthquake. So, moving the people to big camps was not possible or at least was not so easy.

During non-emergency periods, the Health Center of Fars, had prepared the components to build up toilets. They had kept them in inventory. Therefore, these components were moved to disaster-location immediately after Bam earthquake. The installation of each toilet lasted around 15-20 minutes. However, before that, a mechanical shovel (digger) was used to make a trench.

The environmental health staff could install around 600 simple pit latrines during two month after earthquake. This project was very effective, so a Spanish NGO volunteered for 50% share in the cast for building around 100 additional units of simple pit latrine in Bam.



DISCUSSION AND CONCLUSIONS

It was concluded that, the simple pit latrine could be a very convenient, rapid and temporary method for dealing with the defecation problems especially at the first hours and days after Bam earthquake and also the control of the related diseases. The Environmental Health Staff of Fars Province achieved a very good experience in this regard after working hard during the two months in Bam. Therefore, they should give these results to all of health experts in other provinces of Iran and even countries abroad. It seems that the Environmental and Occupational Health Office in Iran Ministry of Health can play a good role in management of these activities during non-emergencies period to make an excellent preparedness for dealing with disasters. Although, the municipalities and red-crescent representatives in all of Provinces at Iran can joint to this work group for planning and decision-making.

REFERENCES

1. WHO, UNICEF. Environmental Health in disasters. 2000.
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