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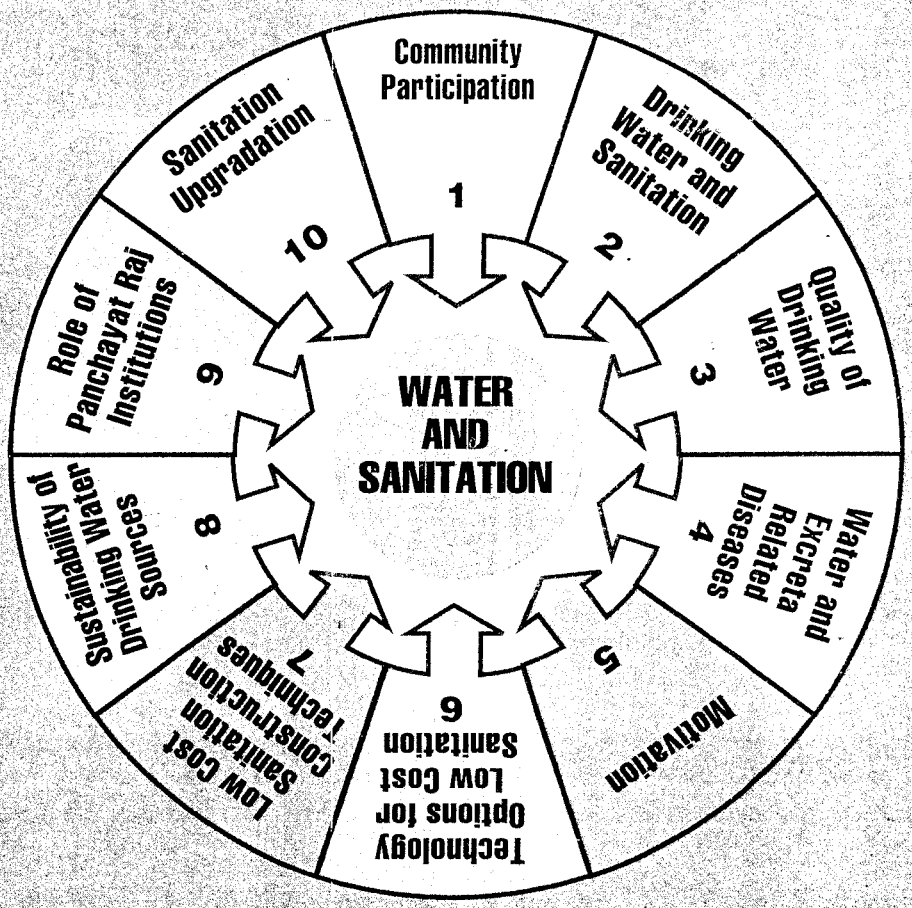
RURAL WATER SUPPLY AND SANITATION PROGRAMME

GUIDE ON LOW COST SANITATION CONSTRUCTION TECHNIQUES

FOR MASONS



RAJIV GANDHI NATIONAL DRINKING WATER MISSION

NATIONAL INSTITUTE OF RURAL DEVELOPMENT

MINISTRY OF RURAL AREAS AND EMPLOYMENT

GOVERNMENT OF INDIA

ABOUT RAJIV GANDHI DRINKING WATER MISSION

Accelerated Rural Water Supply Programme is being implemented rigorously to supplement the efforts of the States/Union Territories. The Rajiv Gandhi National Drinking Water Mission was launched in August 1986 to accelerate the progress of drinking water supply in rural areas and to provide cost effective science and technology inputs to improve the programme implementation in active collaboration and cooperation with the states, local people and institutions.

The Missions' objective is to provide safe drinking water free from chemical and biological contamination as also ensure provision of 40 litres of safe drinking water per person per day (LPCD) in all areas for all human beings and additional 30 LPCD in Desert Development Programme areas for drinking water requirement of cattle. Habitations which are not getting full supply of 40 LPCD are treated as partially covered requiring augmentation facilities to bring them to the level of 40 LPCD.

The Mission's major activities include improvements in the quality of drinking water through the Sub Missions on Eradication of Guineaworm, control of Fluorosis, Removal of Excess Iron and Brackishness, Removal of Arsenic, Water Conservation and Recharge of Aquifers. In addition, other programmes on water quality surveillance, training of villagers and officers/staff involved in the programme, research and development, and information, education and communication for health awareness are being implemented in cooperation with the State/UT Governments. Panchayats and non-Governmental Organisations, with special provisions for SCs and STs.

The Mission has a specialist role to play and has been created by the Ministry of Rural Areas and Employment, Government of India.

ABOUT NIRD

Integrated Rural Development through holistic approach is a national commitment. The goal is to enrich the quality of life of poor by meeting the basic needs and generating employment opportunities on a wider scale through decentralized planning. The Mission of NIRD is to facilitate rural development efforts by improving the knowledge, skills and attitudes of rural development officials and non-officials through training courses, workshops and seminars. Further, improvement of economic and social well-being of people in rural areas with focus on disadvantaged groups through research, action research and consultancy efforts is sought. NIRD is the country's apex body for undertaking training, research, action research and consultancy functions in the rural development sector. It is an autonomous body registered under Societies Act, funded by the Ministry of Rural Areas and Employment, Government of India.

NIRD is given the mandate to (i) conduct and assist in the organisation of training programmes, conferences, seminars and workshops for senior level development managers; (ii) undertake, aid, promote and coordinate research on its own or through other agencies; (iii) analyse and propose solutions to problems encountered in planning and implementation of the programmes for rural development, panchayati raj and similar institutions, and (iv) disseminate information through periodicals, papers and books in furtherance of the basic objectives of the Institute.

The Institute serves as a forum for discussions and debate about issues of common concern, and through its training and research activities, attracts academics and development practitioners from all over the country and abroad.

The Institute disseminates the results of its research studies and recommendations of its various seminars and workshops through a number of publications like the Journal of Rural Development, Panchayat Unnati and NIRD Newsletter.

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Guide on Low Cost Sanitation Construction Techniques for Masons

About the Booklet

This booklet is one of the ten such booklets meant for a variety of Grassroot functionaries, School teachers, Panchayats, Motivators and Masons engaged in the implementation of the Drinking Water and Sanitation Programmes in rural areas.

The booklet is addressed to the rural masons. It specifically seeks to enable them to : (i) Comprehend the implementation of low-cost rural sanitation, (ii) Identify the structural components of on-site and cost-effective excreta disposal systems. (iii) Identify location specific technologies for the local users, (iv) Understand the construction methods for household and community sanitation systems and their upgradation over time, (v) Estimate the quantity of the materials required, their costs and labour components and (vi) Set up small sanitary production centres.

CONTENTS

OBJECTIVES

After the use of the booklet, the target group of masons should be able to :

i) comprehend the importance of low-cost rural sanitation;

ii) identifying the various structural components of on-site, cost-effective excreta disposal systems;

iii) identify location-specific technologies for the user;

iv) understanding the various construction methods for household and community sanitation systems and their gradual upgradation;

v) estimate the quantity of materials required, their costing and labour involved;

vi) initiate setting up of small production centres.

1

Introduction

More than 50 kinds of diseases and 80 per cent of sickness are due to lack of potable water supply and good sanitation facilities for the disposal of human wastes. Indiscriminate open air defecation is the cause for transmission of diseases like cholera, dysentery, typhoid and worm infections. Sanitary disposal of human excreta prevents the transmission of these diseases. This is best done through a sanitary latrine. (Refer booklet on low cost latrines).

To control the transmission of diseases it is necessary to provide a sanitary barrier between the source of infection, i.e., the disease producing organisms in infected excreta and the hosts, the human population. The barrier will prevent faecal matter from coming into contact with man or with his food or drinking water. The function of the sanitary barrier is to prevent contamination from one agent to another like water and soil. The sanitary barrier is nothing but a sanitary latrine.

1.1 Basic Requirements

The following are the basic criteria for safe excreta disposal systems:

a) The excreta should not contaminate drinking water source.

b) The excreta should not be accessible to animals or flies or other insects.

c) There should be no handling of fresh excreta.

d) There should be freedom from odours or unsighty conditions.

e) The method used should be simple and inexpensive in construction and operation.

f) It should ensure privacy and protection against weather.

g) It should suit the habits of the local people. It should be user-friendly: particularly women, children and the aged should be able to use it.

2

Various Types of Low Cost Excreta Disposal Systems for Households

2.1 Types

1. Conventional pit latrine
2. Pour-flush latrine, direct pit latrine, offset pit latrine, 2-pit latrine
3. VIP latrine
4. Septic Tank

2.2 Conventional Pit Latrine

The pit latrine consist of a pit dug on the ground. A platform with a squat hole or seat is directly placed above the pit. Then a superstructure is created around the platform. Excreta is deposited in the pit. When this pit is full the superstructure and squatting place are removed and the pit is covered with a soil then a new pit is dug nearby.

2.3 Pour-flush toilets

The Pour-flush toilet is a low cost sanitation technology that needs much less water than a conventional flush toilet. The pour-flush consist of a squatting pan connected to a 20 mm water seal trap set on a cement concrete floor. This unit is then connected to the pits lined by brick work (honey comb construction). The pour flush toilet is as hygienic as a conventional cistern flush toilet. The pour-flush type can be a single or double pit design. The pour-flush toilet can be direct pit where squatting slab with pan is placed above the pit. It can also be indirect pit where the pan is connected to a single or a double pit located a little away from the pan by means of a pipe via an inspection chamber.

2.4 VIP Latrine

VIP Latrines are hygienic, low cost and useful form of sanitation with minimal fly nuisance: they need only minimal requirements for user care. The pit is slightly offset to make room for external vent pipe. The vent pipe should be painted black and located on the sunny side of the latrine superstructure. The air inside the vent pipe will thus heat up and create

an updraft with a corresponding down draft through the squatting plate. This, any odour emanating from the pit contents are expelled through the vent pipe, leaving the superstructure odour free. The pit may be provided with removable cover section to allow desludging.

The pit ventilators have an important role in reducing fly breeding. The draft discourages adult flies from entering and laying eggs. The fly screen at the top of ventilators cuts down access of flies to the pit content. Nevertheless, some eggs will be laid and eventually adults will emerge. If the vent pipe is large enough to let light into the pit and if the superstructure is sufficiently dark, the adults will try to escape up the vent pipe. The vent pipe, however, is covered by a guage screen so that the flies are prevented from escaping and they eventually fall back to die in the pit.

2.4.1 Ventilated Improved Double Pit Latrine (VIDP)

i) To eliminate the need to construct very deep pits.

ii) To preclude the necessity of constructing another latrine once the pit is full.

A double pit latrine may be recommended. Each pit should be designed to have an operating life of at least one year.

Operation and maintenance of the VIDP is the same as that of VIP. One pit would be used at a time until full and then sealed while the second pit is in use. When the latter is almost full, the first pit would be emptied and put back into use once more. By alteration the two pits can be used indefinitely because of the long residence time (a minimum of one year) of the decompositing excreta in the pit not in use at the time. Pathogenic organism will have been destroyed by the time the pit needs to be emptied. As a consequence, there is no danger of spreading pathogens and excavated humus-like material can be used as soil conditioner or disposed of without fear of contamination.

2.5 Septic Tank Latrines

This kind is too much expensive for use in rural households. Even if it is affordable by some rich family the effluent disposal is often neglected creating gross pollution of surface/ ground water. It also poses logistic as well as health problems in disposal of sludge. Therefore, this is highly discouraged and hence not discussed in this booklet.