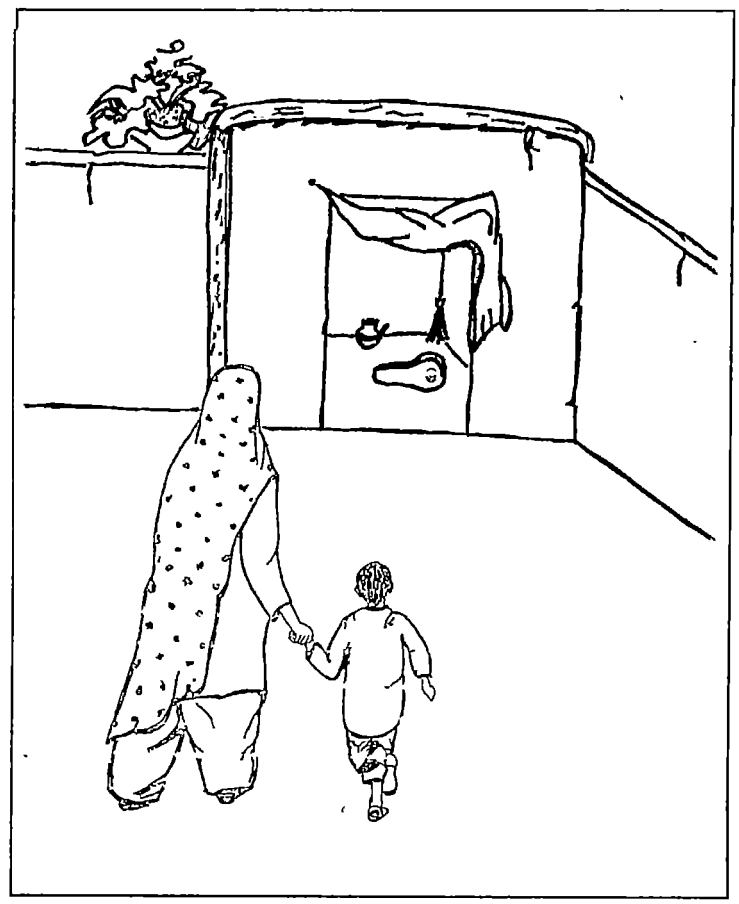
WATER AND SANITATION CELL

LOCAL GOVERNMENT AND RURAL DEVELOPMENT DEPARTMENT QUETTA, BALOCHISTAN

TECHNICAL REPORT No. 2:

LATRINE DESIGN OPTIONS,

USER GROUP DEMAND AND ADOPTION



ABSTRACT

Coverage of sanitation facilities in rural areas of Balochistan is extremely poor. It has proven difficult to overcome existing social, cultural and environmental constraints in providing for the adoption and duplication of facilities by community groups at household or compound level.

From the initial field experiences of the Water and Sanitation Cell (W&S Cell) a number of modifications, in both technical design options and implementation approach, have been identified which may improve the likelihood of initial adoption of latrine facilities and subsequent duplication on a self-help basis.

It is recommended that the Cell introduces a range of designs, from which the most appropriate option can be selected on a case by case basis, bearing in mind the specific needs and constraints of the particular community. As users become familiar with the concept of pit latrines there is the opportunity to adapt from one option to the next over time.

In order to rationalise the limited resources of Local Government and Rural Development Department (LGRDD) at district level it is recommended to rely on interventions which stimulate demand for sanitation facilities from within the community, rather than to rely on extensive hardware installations. This can be achieved by focusing on certain key inputs of the community-based approach such as supporting the existing (and usually higher) demand from village women, harnessing the influence of informal community leaders and using indirect motivational messages.

Once demand can be generated in a community the responsibility for construction of facilities should be shifted from LGRDD on to the villagers by providing adequate skills training, hygiene education and promoting a linkage with improved commercial availability of hardware in local markets.

April, 1994
Quetta

LATRINE DESIGN OPTIONS, USER GROUP DEMAND AND ADOPTION

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1.0 INTRODUCTION

The provision of rural sanitation facilities in Balochistan, as in most development contexts, lags far behind the provision of potable water supplies; current estimates of coverage in the Province are in the range of 2 - 10 % of the rural population[†]. This situation exists in spite of lessons from the past decade or so, which confirm that community health indicators are only improved with the provision of the combination of potable water supplies, hygiene education and adequate sanitation facilities.

The situation in Balochistan may be attributed to both the perception of rural communities, where sanitation facilities are usually recognised as having a lower priority than water supply, and also to local government intervention (assisted or otherwise) which has so far been unable to find practical solutions to the problem of providing adequate numbers of facilities at household or compound level.

As with most rural sanitation programmes the technical choices, while important, are not the most significant factor in determining the success of physical implementation. For rural Balochistan the primary issues to a successful programme may be summarised as follows:

- **Duplication:**

  Local government cannot construct any where close to the required number of facilities; what is the most effective use of government resources? Through outreach and linkage between rural consumers and the private sector? or by approaching and organising communities in order that they construct their own facilities? At what level should this duplication approach be set; community, compound or household?

- **Financial and Resource Costs:**

  How, when and where should local government use resources under it's sanitation programme? Should local government construct demonstration units through sub-contractors or directly with the community? Should local government provide financial subsidies to users as well as hardware subsidies?

  What incentives are there for rural communities to channel a part of their own (scarce) financial resources into self-help sanitation schemes?

[†] BRUWAS Inception Report, March 1993

- **Existing Social Customs:**

  How can sanitation programmes be designed to overcome the constraints of purdah, gender-related practices and existing sanitary habits which make implementation of such programmes very difficult in rural areas of Balochistan?

- **Technical design options:**

  What are the range of design options which can provide affordable, appropriate, and safe sanitation facilities which are easy to construct, conserve scarce water resources and will not contaminate existing ground water supplies? Are the hardware components available on the commercial market as well as through local government?

1.1 EXISTING SANITATION PROGRAMME EXPERIENCES IN RURAL BALOCHISTAN

UNICEF has been the main driving force behind the current rural water and environmental sanitation (WES) programme in Balochistan. During the Demonstration Phase, beginning in 1989, latrines were constructed in the ratio of five for every handpump installed and this ratio was maintained under the subsequent Accelerated and Regular Phases of the programme.

Unfortunately there has been very little in the way of monitoring by UNICEF of the sanitation programme to date. Whilst large numbers of hardware units have been distributed over a total of 22 Districts, very little is known about the exact siting of the latrines and what the impact has been in terms of user acceptance and duplication. Under this programme UNICEF has been providing hardware, LGRDD a further financial subsidy in the form of construction materials and the community input has been in the form of un-skilled labour.

Two key components of the programme which were neglected in the original approach where the demonstration units have been installed are: lack of hardware supply (limited demonstration and commercially available units), and minimal soft-ware inputs (community participation, user motivation and hygiene education). The general result has been to limit the subsequent duplication efforts of local people. The technical design option adopted by UNICEF has been the pour flush latrine (PFL) which has been exclusively introduced in participating districts throughout the Province.

1.2 CURRENT W&S CELL ACTIVITIES

Activities by the W&S Cell have so far been limited to Loralai District where, since late 1993, the community-based approach to water and sanitation provision has been tested under a pilot phase.

1.21 Project Approach

The W&S Cell is currently in the process of expanding the community-based water and sanitation programme to a total of five districts in Balochistan. Under this approach the decision (and financial responsibility) for well improvement and handpump installation is taken at the community level. The decision for participation in the programme also depends upon the community agreeing, in principle, to be involved in a latrine building programme; however the financial and resource costs for building of latrines is subsequently based on a compound or household level decision.

Hardware, technical inputs, construction training and hygiene education components are all built into the latrine building programme. Households or compounds are then responsible for providing construction materials and labour. Two male members of the community are given on-the-job training during construction of the demonstration latrine units, and are then expected to assist other participating compounds or households in the duplication of the programme.

1.22 Financial Subsidy

When the W&S Cell began physical implementation the existing subsidy for household latrines of Rs 600 per unit was still being applied through local government staff in the Districts. This was discontinued in late 1993, and whilst the result for Cell activities in Loralai was to create a certain degree of confusion on the ground, it also provided a good opportunity to gauge how communities in different contexts would respond to initiatives with, and without, a financial incentive on-top of the free provision of hardware. The results of this experience are fully discussed in section 3.2 below.

1.23 Design Options

As the activities of the W&S Cell are clearly stated as being an extension of the UNICEF funded WES programme under the original project agreement the technical approach, in terms of design selection, have been largely based upon the existing design choice of the PFL option.

However after initial field work was under way it was considered by the W&S Cell staff and project TA team that the choice of design should not be limited to only one option in light of a number of factors which are discussed at length in section 2.0 below. As a result a second option was introduced (the indirect pit latrine - IPL) and is currently being installed in a number of communities, in order to assess it's performance and acceptability in comparison with the PFL option.

1.24 Number of Latrine Units

Unlike the existing approach of UNICEF which limited the number of latrine units to a ratio of 5 to every 1 handpump installed, the W&S Cell has the policy of providing as many subsidised hardware units as are requested by the compound or household representatives. This option was considered preferable in order to promote a wider coverage of sanitation facilities within a community user group.

However there are certain pre-conditions which have to be met by the community when signing the communal contract in order for households or compounds to receive hardware units: that the communal well will be completed prior to beginning the latrine programme, that latrine pits will be prepared and that the superstructure (providing for adequate privacy) will be the responsibility of the household or compound users. A minimum of two demonstration units are constructed by W&S Cell staff, in conjunction with community users and the selected latrine "mistri's" who receive on-the-job training.

Although physical implementation of latrine construction has been limited in scope to date, these activities have been closely monitored in order to assess the impact of different components in light of expansion of activities to new Districts (see Annex I for a summary of activities to date).

The following report focuses on two aspects of the programme; the possible technical design options and user group demand and adoption of sanitation facilities in rural communities. The purpose of the report is to analyse feed-back from the W&S Cell's early work with the community-based programme, and to use this information in order to improve the approach to provision of sanitation facilities in rural Balochistan in general.

2.0 TECHNICAL DESIGN OPTIONS

2.1 CHARACTERISTICS OF DESIGN OPTIONS

Population distribution and financial realities in rural communities of Balochistan discount the selection of any type of sewered systems. Even compound level septic-tanks are, in general, prohibitively expensive. For on-site solutions this leaves the range of wet and dry pit latrines, from which the PFL has been selected by UNICEF.

The PFL is a widely adopted design and has been proven to be very successful in many countries. However because of important variations in the Balochistan context (water scarcity, anal cleansing habits, level of awareness of sanitation issues etc), limiting the options to the PFL only was considered to be a constraint.

Currently the W&S Cell is considering three main design options (all roughly similar in terms of the range of cost), in order to improve the feasibility and user acceptance of sanitation facilities. They are:

- pour flush latrine (PFL): alternating twin-pit
- indirect (wet) pit latrine (IPL): single pit
- ventilated improved (dry) pit latrine (VIP): single pit

These are all established and familiar technical options, therefore the design features will not be discussed at length[†]. The comparative characteristics of each option are shown in Table 1 and discussed further below.

2.2 WATER REQUIREMENT AND AVAILABILITY

Considering the semi-arid climate of most areas of Balochistan and the existing availability of water within rural communities, the additional water requirement for proper operation of proposed latrines is one of the most important constraints.

For a household of 7 persons the total minimum water requirement is approximately 100 litres per day (see Annex III for detailed breakdown). The additional requirement for the PFL option is around 3 to 4 litres per person per day, i.e. between 21 and 28% of the total household requirement. This amounts to

[†] See Annex II for specifications of options and technical drawings HHL/PFL/01 and HHL/IPL/01 for further details.

Table 1: Comparative Characteristics of Pit Latrine Options	POUR FLUSH (PFL)	INDIRECT PIT (IPL)	DIRECT PIT (VIP)
WATER REQUIREMENT	- -	-	+ +
RISK OF BLOCKAGE	- -	+	+ +
DRAINAGE REQUIREMENT	- -	-	-/+
EASE OF CONSTRUCTION	-	-/+	+
EXPECTED LIFE SPAN	+ +	- -	- -
OPERATION AND MAINT'NCE	-	-/+	+
COMMERCIAL HARDWARE[†]	- -	-	+
UP-GRADING	+ +	-/+	- -
FLIES/ODOUR	+ +	-/+	-/+

Attribute Key:
+ + very positive
+ positive
-/+ neutral
- - very negative
- negative

[†] Commercial hardware only refers to ceramic w.c. pan and/or trap

an additional 2 or 3 goatskins of water to be collected by household women or children, with the associated time required for transport and filling.

In the case of the IPL the additional requirement is 1 to 2 litres per person per day which can be estimated as between 7 and 14% of normal consumption, meaning at least one extra trip to collect water from the village source.

In most rural communities in Balochistan the task of collecting and transporting water is carried out by the women and children of the user households. Not surprisingly all of the women interviewed in households with newly installed latrines cited the extra water requirement as the main disadvantage (see Annex IV).

Also it is not surprising that the male community members, who are the primary decision-makers, rarely consider the constraint of additional water collection when selecting the PFL option for installation.

One solution to the additional requirements of wet latrine systems would be to promote the re-use of sullage water. This depends upon the motivation of consumers of water (mainly women) and their ability to differentiate between "clean" and "dirty" water requirements. This has been incorporated into the W&S Cell's hygiene education package, for both female and male users, and any positive impacts remain to be seen.

2.2 TRADITIONAL SANITARY PRACTICES

There are two main characteristics of traditional sanitary practices, prevailing in most areas of rural Balochistan, which should be brought into consideration when selecting technical design options.

2.21 Re-use of Composted Human Excreta:

Traditionally one area of the compound is set aside for defecation for women and children, or the sick, when they are unable to leave the compound. Although there are exceptions to the rule, this excreta is normally never re-used as composted material for mulching of crops etc due to cultural attitudes towards handling of excreta.

As such there is no comparative advantage to the PFL (which allows for re-use of digested material) over either the indirect or direct pit options which both prohibit the re-use of excreta.

2.22 Anal Cleansing Habits:

In many areas of the Province use of water for anal cleansing is not the primary method. This is either due to the acute shortage of water in some of the more arid regions, or to customary habits where solid material is preferred. Consequently many people use bulky material such as stone, sticks and corn-cobs for anal cleansing after defecation†. Clearly this can have very damaging impacts on systems which are not designed to cope with bulky objects being put into the w.c. PFL units are especially sensitive to this type of practice, and there have been reports of significant numbers of them failing due to this situation††.

The main draw-back of the PFL in this situation is the trap which can become easily blocked up by bulky materials. In addition the

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† One of the experiences of the project is, however, that this may vary significantly from one village to the next, even in a limited geographical area.

††This observation is based on feedback from the W&S Cell's initial monitoring work of latrines installed under the previous UNICEF coordinated programme in selected core districts only.

ceramic material can be cracked or broken if stones are thrown into the w.c. Conversely the IPL or VIP design options have no such trap and can more easily accommodate bulky material without becoming blocked.

This issue is extremely important for two reasons. Firstly, and purely in practical terms, it is obviously ill-advised to opt for a design choice which can fail easily and will therefore lead to a waste of resources. Secondly, and perhaps more importantly, in rural areas where sanitation facilities are a recent introduction the potential for rapid failure, due to blockage or damage, can lead to an equally rapid rejection of the whole principle of the facilities in the first place. If the technology is seen to fail, people will quickly revert to traditional practices with their inherent health and environmental risks.

In general it is always preferable to adapt the technical design to prevailing hygienic practices, rather than rely on hygiene education to alter behaviour to a significant degree. This is especially true in light of the limited training, time and resources available to LGRDD district staff to follow through with comprehensive hygiene education packages.

An illustrative example from the W&S Cell's work in two adjacent villages can be used to highlight this problem[†]. Both villages had similar existing water supply conditions and Cell staff successfully implemented the communal handpump facility.

However in assessing the latrine programme it was obvious that there was a great disparity between the two communities with respect to existing awareness, motivation for the programme and receptiveness to hygiene education messages. Consequently the PFL was selected for the more responsive and motivated community, whereas the IPL was selected for the second village due to doubts concerning the adoption of anal cleansing with water.

Obviously consideration of this issue should be given high priority in selection of technical design, especially where traditional anal cleansing habits are prevalent and where existing awareness of latrine programmes is low.

2.3 GENDER RELATED ISSUES

On the whole the culture in rural Balochistan can be described as conservative, even taking into consideration the variations between Pashtoon, Baloch and Brahui dominated areas of the province. In general the practice of purdah is strongly adhered to with the result that distinct gender related sanitary habits are exhibited.

[†] Mula Gagul and Dargi Shepelo villages, Mehktar U.C., Loralai.

2.31 Purdah and Gender Related Sanitary Practices:

Younger women are largely restricted to the family compound during day-light hours and are usually only permitted to go outside to defecate either very early in the morning before dawn, or later in the evening after sunset; for older women the situation is somewhat less restrictive. This means that many women are often forced to defecate in a designated area within the compound. The same is true for men if they are sick and cannot leave the compound area.

Most men, on the other hand, are free to leave the compound and will usually defecate in the open land or fields of the village as they carry out their daily activities. For both men and women defecation is an extremely private act. A common response from men when discussing household or compound level latrines is that they would feel embarrassed to be seen entering the facility because other people would know what they were doing, even though they would be unable to see them.

Not surprisingly the result of purdah restrictions is that the demand for latrines inside the compound is almost universally higher from women than it is from men. This issue is further discussed in section 3.1 below.

2.32 Gender Priorities and Technical Design Selection:

Because of their very different circumstances and restrictions males and females will have different priorities and responsibilities when it comes to selecting the technical option for latrines.

Reconsidering parts of Table 1 in terms of the gender related priorities from the community user group perspective the advantages and disadvantages can be re-written as in Table 2 overleaf.

Clearly the main priorities from the male perspective (infinite life span and therefore lower long-term labour and financial costs) would favour the advantages of the PFL. Conversely the main priority of the women (lower water requirement) favours either the IPL or VIP option.

As the primary financial decision makers of the household men will be more likely to continue selecting the PFL on economic grounds, which does not take into account the additional burden for women in terms of operating and maintaining this latrine option. Nor does this choice account for potential blockages resulting from bulky anal cleansing material, which is more likely to have an adverse effect on women who are restricted to the compound.

Table 2: Gender Related Priorities and Responsibilities	POUR FLUSH (PFL)		INDIRECT PIT (IPL)		DIRECT PIT (VIP)	
	♂	♀	♂	♀	♂	♀
WATER REQUIREMENT	-/+	- -	-/+	-	-/+	+ +
RISK OF BLOCKAGE	- -	- -	+	+	+ +	+ +
OPERATION & MAINT'NCE	-	-/+	-/+	-	-/+	-/+
EASE OF CONSTRUCTION	-	-/+	-/+	-/+	+	-/+
EXPECTED LIFE SPAN	+ +	-/+	- -	-/+	- -	-/+
FLIES/ODOUR	-/+	+ +	-/+	-	-/+	-

Attribute Key:
+ + very positive
+ positive
-/+ neutral
- - very negative
- negative

For the technical design to be sustainable, the selection process should take into account these differences in priorities and give preference to the felt advantages of women **especially** in cases where the water source is at some distance from the compound. In the long-term it is women, in their capacity of water collectors and users, who will determine the success of any latrine programme.

2.4 LATRINE DESIGN AND RISK OF GROUND WATER CONTAMINATION

In selecting the most appropriate latrine design due attention must be paid to the risk of contaminating existing ground water sources. In this regard there are several important factors which come into play.

2.41 Soil Type and Permeability:

When considering the implementation of a wet latrine programme there is one obvious criteria with regard to soil type and permeability which must be met: namely that the permeability is high enough to satisfy the leaching requirement of the proposed design. This may appear to be of little importance when considering that most soils in the Province are typified by sands and sandy gravels, however there are certain localised areas where the clay content is quite high. Where this is the case it

is preferable to carefully judge the feasibility of the wet latrine option (especially the PFL with a higher leaching requirement) before selecting this type of design. Soil conditions can be judged by experienced field staff, or by carrying out a simple infiltration test.

The second concern with regard to soil type is the risk of ground water contamination by rapid infiltration of pit effluent below the water table level. In areas with extremely permeable soils, in combination with relatively a high water table, field staff must be certain that the selected design will not contribute to contamination. In general the risks will be higher for the PFL option due to the higher level of effluent production.

2.42 Water Table Level

There are other factors related to the risk of ground water contamination aside from the rate at which effluent will travel through the soil. For example it is preferable to maintain a minimum vertical distance of 2 metres from the pit bottom to the water table. In this case the higher pit depth of the IPL or VIP option may be a negative factor.

If water table levels are exceptionally high, then it may be necessary to raise the pit partially above ground level, however this involves considerable additional work. It is unlikely that villages would be located in areas with water tables at this height (less than 1 - 2 metres below ground level) due to the resulting problems with farming.

2.43 Siting and Population Densities

Obviously the horizontal distance from proposed latrine site to existing ground water source is also of great importance, especially in the case of existing compound wells. It is difficult to calculate, on a case by case basis, exactly what the safe distance will be, therefore the W&S Cell general policy is for a minimum horizontal distance of 15 metres.

Increased population densities will obviously also lead to an increased risk for ground water contamination; however in terms of siting there is little difference between the range of design options. In this case the responsibility rests with the field technician to make a sound decision with regard to the direction of ground water flow and the well selected for improvement in the drinking water supply part of the project cycle.

In areas where the risk of contamination is regarded as very high the PFL option is only recommended if a sand filter is constructed around the leaching pits, thereby reducing the

potential for pathogenic organisms to travel over longer distances[†].

2.5 AVAILABILITY OF LATRINE HARDWARE

For any approach with the objective of facility duplication by community members it is essential to ensure that hardware is available after the demonstration phase is completed. If all hardware relating to the project is to be distributed by LGRDD district staff then household or compound heads must be made aware that these subsidised units are available.

However, even with the proposed 10,000 latrine units provided for under the current Dutch/UNICEF funded project, the potential for significant coverage is still low. The ultimate objective of such a project should be in stimulating demand for sanitation facilities from within user groups, thereby relying on community-based construction for increased coverage.

If this is the case then the availability of hardware at district and sub-divisional level required for separate latrine designs becomes critical. Currently there is little problem with the availability of PVC piping (for drainage and/or venting purposes) in local markets. However w.c. pans with the appropriate trap are less readily available in the quantities that could be required if sufficient demand is generated in rural villages.

Obviously in terms of specialised hardware inputs it is the VIP option which is the most feasible. Materials for reinforced concrete are readily available, and the skills required are already imparted during slab construction for the community handpump installation. On the other hand the PFL requires the most inputs of commercial hardware (and is more complicated to construct) which may prove to be a negative factor in stimulating community-based duplication efforts.

Both the W&S Cell and UNICEF (Balochistan) is currently stressing the need for increasing the availability of latrine hardware through commercial outlets all over the Province which is a positive step towards the wide-spread duplication of sanitation facilities.

2.6 SELECTING THE LATRINE OPTION

In reviewing the factors relating to the provision of sanitation facilities in the context of rural Balochistan it becomes clear that there are many important social, cultural and environmental

[†] For further details see technical drawing HHL/PIT/01

issues which should not be ignored in the range technical design options under consideration. These factors can be summarised as follows:

- water availability
- anal cleansing habits
- gender related priorities and responsibilities
- soil type and permeability
- risk of ground water contamination
- ease of construction
- local availability of hardware

2.61 The Selection Process

Clearly the selection of the most appropriate latrine design should be kept as simple as possible. It is recommended that latrine options should be selected by LGRDD district field staff for a number of reasons:

- It is preferable to select the same design option for a whole village or cluster, in order to simplify construction training, hygiene education messages and allow for bulk purchasing of materials.

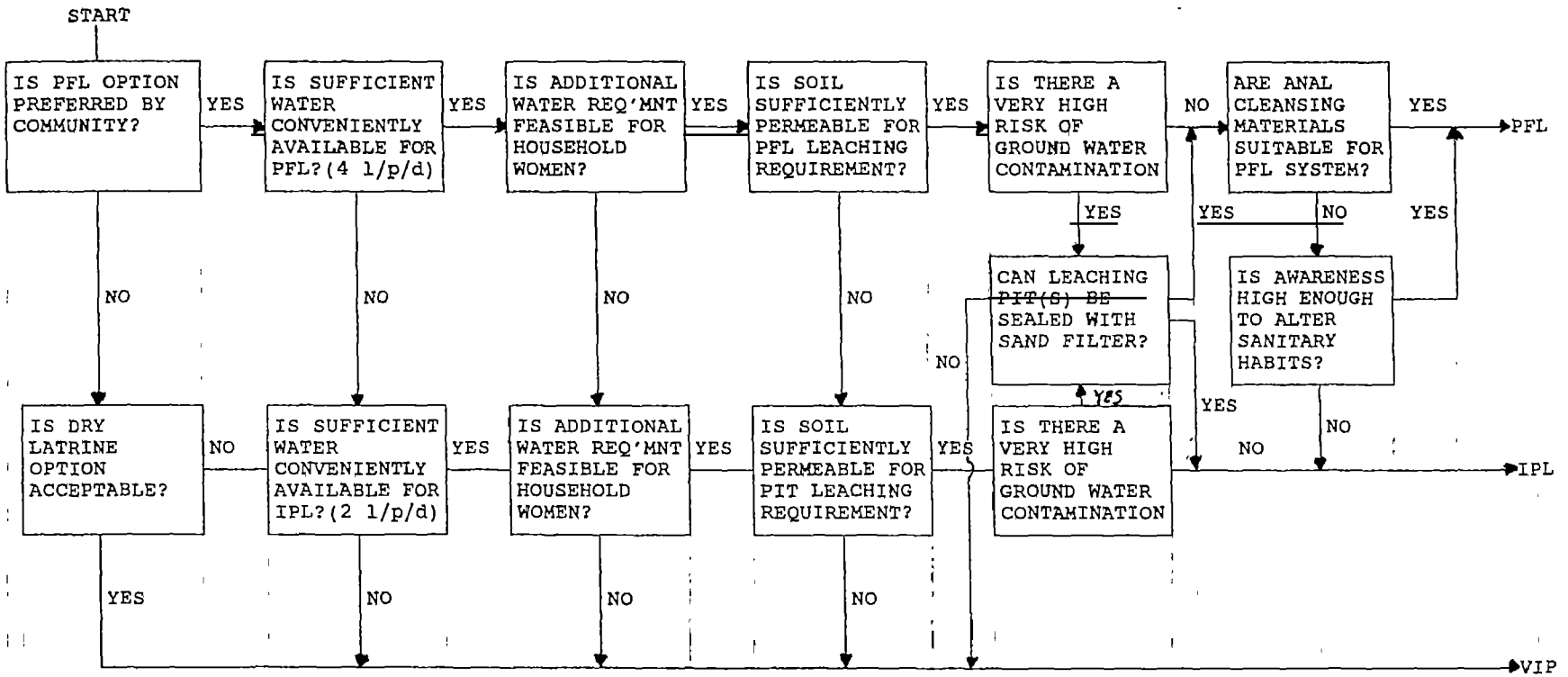
- Outside support must be given to village female priorities by judging if the available water source would be a constraint to meeting increased water requirements.

The selection process should be quick to carry out in the field and the water and sanitation technicians of LGRDD District staff should be given adequate training in assessing a village level design. To this end many of the issues listed above have been included in the W&S Cell's District field implementation manual and in the Quetta based training of master trainers curriculum. Given suitable training, and with field experience, the technician should be able to easily recognise key constraints and advise on the best possible latrine design on a case by case basis.

2.62 Algorithm for Village Level Pit Latrine Selection

An algorithm for the selection of the best latrine option which accounts for important non-technical variables is given in Figure 1 overleaf. Obviously the field technician must use his judgement in evaluating local conditions: for example a "convenient source of water" may mean a surface stream running through a more widely distributed village, or it may mean a single water supply point in a village with more densely concentrated compounds.

Figure 1: Algorithm for Village Level Pit Latrine Selection



3.0 USER GROUP DEMAND AND ADOPTION

Drawing on the initial field implementation experience of the W&S Cell activities in Loralai district, several important factors have emerged which can help in a better understanding of community user group motivation with regard to self-help sanitation programmes.

These can be grouped into two main categories, sanitation as a felt need and financial factors, each of which is presented below with reference to the project field experience.

3.1 SANITATION AS A FELT NEED

During the course of working in the pilot villages it has become clear that the success of the sanitation programme is directly related to the felt need for such facilities within the community user group. This may appear to be an obvious statement, however it is important to understand in which ways community members perceive their felt needs, and why this usually does not include sanitation as a high priority in the context of Balochistan

The need to better understand this process is illustrated by the varying success rate of the project in communities which, on the surface, share many similarities in culture, social structure, environment and so on.

A detailed breakdown of compound latrine survey results on a village basis is given in Annex V. When viewed in conjunction with Annex I this information shows a range of successes in community duplication results from Mula Gagul and Shinglaz Rahkni villages where people copied the demonstration units in a ratio of 2:1 and 6.5:1 respectively, to Shabon Doda and Dargi Shepelo where no latrines were built by the community following installation of demonstration units.

3.11 Water Supply vis a vis Sanitation Facilities

As in most contexts the demand for improved drinking water supply was seen to be far higher than demand for sanitation facilities in the pilot villages. In most of the villages demand for handpumps was based on ease of collection; either by replacing traditional lifting mechanisms, or rehabilitating old wells closer to the village centre, thereby reducing transport distances to pumped irrigation wells in outlying fields.

Due to the general scarcity of water communities have an obvious need to improve their supply. This is rarely the case with sanitation facilities as most villagers see no immediate need for such facilities.

3.12 Existing Level of Awareness

As mentioned above, in section 2.22, one factor in the existing motivation and demand within communities may be the level of past experience with sanitation facilities. In more wealthy villages men are more likely to visit market towns on a regular basis, developing economic and social ties, which may in turn expose them to existing latrines and raise their level of awareness with respect to the importance of sanitation. In the pilot phase experiences it has mainly been the poorer, and more isolated villages which have been the least motivated to become involved in the sanitation programme[†].

Because existing awareness of the link between poor sanitation and poor health is usually very limited (or non-existent) it is possible to utilise indirect, but very relevant, messages which can lead to the same results in terms of raising levels of demand as the more unfamiliar and complex sanitation messages.

Some examples of these motivating messages currently employed in the Cell's approach are as follows:

- Stressing cleanliness from an Islamic viewpoint
- Presenting latrines as (functional) status symbols
- Showing how latrines can reduce flies and smells in the compound

Another solution to this problem may be to implement the latrine programme first and subsequently install the handpump; however there is the constraint of providing for adequate water supply in the first instance for correct use of latrines and hand-washing, even in the case of dry latrines.

3.13 Gender Related Demand

As explained in section 2.31 it is the women of the households who are most restricted in their access to proper sanitation due to the constraints of the purdah system. In every village where the W&S Cell implemented it's programme, demand for compound level latrines was always higher from the women than from the men. However because men are the ultimate decision makers this demand is usually not reflected in the overall response from the community when discussing the latrine programme.

Until the general level of awareness is raised for the village men (through discussions with the LGRDD community organisers, hygiene education messages etc), the demand from women will rarely be heeded, especially as the decision involves a financial cost to (male) head of households.

[†] Shabon Doda, U.C. Tor, Lique, U.C. Poonga & Dargi Shepelo, U.C. Mehktar

3.14 Community Social Structure and Decision Making

There is one very important distinction between the water supply and sanitation components of the W&S Cell package, as implemented through the village community. This is, that while the decision and financial cost for handpump installation is borne by the whole community, the final decision (and financial cost) for constructing latrine units is taken at the compound or household level.

Therefore the decision of whether or not to invest in a communal handpump involves the entire community through a comprehensive (and often heated) decision making process. Conversely the decision to actually construct latrines involves only one (or a small number) of household heads, despite the fact that the whole community may have earlier agreed in principle to the programme. This can lead to social pressures on the household head against agreeing to construct latrines in his compound, either from his peers or from the village leader.

For example in the village of Dargi Shepelo the village maliq was only interested in controlling the latrine subsidy money for the entire village; when the project rejected this idea he used his influence to block the whole programme. As a result no units were duplicated on the basis of the demonstration latrines despite the cash subsidy.

This and other similar experiences quite clearly illustrate the importance of the village leader, and his level of cooperation, to the success of a proposed sanitation programme[†]. Obviously it is better not to be the cause of internal conflict within a community, however relying on the patronage by the maliq to make the right decision in the best interest of his village may not always lead to a positive outcome.

3.15 Population Density and Demand

As would be expected there appears to be a direct link between increased population density and an increased demand for sanitation facilities. Although relatively isolated, the village of Shinglaz Rahkni has a highly concentrated distribution of compound buildings. In this village there was an extremely positive response to the programme with 9 units duplicated from two demonstration latrines and a further request for 5 more units from a second cluster in the village.

When asked why they had built so many units the male community members said that there was little opportunity for them to conveniently defecate outside of their compounds without having

[†] The reverse situation is also possible, as in Mula Gagul and Shinglaz Rahkni, where the maliq has had a very positive impact on the programme.

to walk quite a distance. They also responded that they did not like the smell resulting from open defecation in the compound which was intensified by the close proximity of other buildings.

Similar reasoning and high demand is often given by people in the rural townships which reinforces the conclusion that where **men** cannot easily defecate in the traditional manner (ie: in open fields or land adjacent to their homes), then demand for sanitation facilities at the compound or household level is greatly increased[†].

3.2 COST FACTORS AND SUBSIDIES

3.21 Project Experience To Date

As mentioned in the description of current W&S Cell activities the existing financial subsidy for latrine construction was discontinued part-way through field implementation. This led to 4 villages or clusters implemented with a direct cash subsidy on top of the provision of free hardware, and 4 villages with only a subsidy in the form of free hardware (see Annex I for details).

The results have been somewhat surprising in that only two of the cash subsidised communities went ahead with self-help construction of latrines on the basis of the demonstration units (Mula Gagul clusters 1 and 2). The other two communities refused to participate, despite the fact that the cash subsidy would cover all of the material costs for construction (cement, fired bricks etc).

Conversely in all the 4 villages without a cash subsidy there was an agreement to participate; in Shinglaz Rahkni (clusters 1 and 2) 3 demonstration units were built with a subsequent duplication of 9 units and 5 more planned. In Lique 3 households agreed to participate and in Kharotabad village 8 compound units were requested.

From these responses it is possible to conclude that the demand for latrines built by householders has less to do with any perceived financial gain (through cash subsidies), than with the motivation of community members in perceiving sanitation as a desirable and useful facility.

As discussed above the participating communities were those which already had a greater awareness of sanitation for a variety of reasons, whereas those which rejected the sanitation initiative out-right are typified as being more isolated, relatively poor and as having a very conservative and influential village leader.

[†] Informal interviews in Mehktar and Sinjawi Towns, February 1994.

3.22 Financial, Resource Costs and Design Selection

Because of the discontinuation of the financial (cash) subsidy by LGRDD with regard to latrine construction, the financial and resource costs of constructing each design is now of more pressing concern. The approximate cost estimates of each of the three design options is given in Annex VI, where it can be seen that all three designs are in the same cost range; slightly more or less than Rs 1,000 per unit.

Excavation for each of the three designs is also very similar (being approximately 2.0 cubic metres); however, as discussed earlier, only the VIP design does not require the input of specialised w.c. hardware.

With all initial financial investment costs being roughly equal, it is the long-term savings of the PFL option which makes it the most attractive. Land for relocating of IPL or VIP pits is rarely a constraint for rural compounds in Balochistan, but the costs of building new pits will be a considerable disincentive, even if the cover slab can be re-used.

4.0 CONCLUSIONS AND RECOMMENDATIONS: LESSONS FROM W&S CELL EXPERIENCES

Because the W&S Cell has only been implementing the community based water supply and sanitation approach for a limited time period and in a limited pilot area, it is too early to draw firm conclusions with regard to the overall success rate of the programme[†].

Nonetheless Cell staff have gained a great deal of practical experience, and for the first time in Balochistan community women have been given a specific role in the design and implementation of village programmes.

4.1 TECHNICAL DESIGN OPTIONS AND SELECTION

The objective of the technical design (or range of designs) should be in accommodating for local constraints or preferences, rather than imposing a pre-conceived idea of the "best technology" from an outside perspective. In the first place a rational technical design should lead to increasing the likelihood that latrines will be successfully adopted, and subsequently to the duplication of facilities by the community. Recommendations with regard to technical design and selection in the rural Balochistan context can be summarised as follows:

- Latrine designs offered through LGRDD should not be limited to the PFL. Even though this design has proven to be successful in certain programmes[††], it is not recommended as an exclusive option due to important constraints in many rural areas.

- The two greatest constraints to successful latrine design and adoption are water availability, (implying not only physical availability but also the feasibility and motivation for women in collecting and transporting the water from source to compound), and use of bulky anal cleansing materials.

- A range of designs should be offered which can overcome site-specific constraints; these are the two wet options (PFL and IPL) and the dry option (VIP).

[†] For example there is, as yet, no long-term monitoring of the comparative performance of the PFL versus the IPL latrine design in terms of user satisfaction and technical feasibility (ie: 6 months to one year).

[††] Reference "Low Cost Sanitation Programme" in parts of Quetta city and to a lesser extent UNICEF/LGRDD WES programme.

- This range of options should be considered as a tiered approach beginning with the more robust and less sophisticated VIP and allowing the opportunity for users to adapt from one option to the next over time as they become more familiar with the concept of using latrines.

- The design selection process should be based on both technical criteria (soil permeability, risk of groundwater contamination etc) and non-technical criteria (water availability, anal cleansing habits, existing awareness of sanitation etc). Selection should be made on a case by case basis on what is appropriate to the needs and constraints of the particular community.

- The design selection process should give particular support to village women, whose main priority will be the constraint of any additional water requirement.

- The selection of the most appropriate design should be carried out by LGRDD field staff and should be made on a village or cluster basis, rather than a household or compound basis.

- Where inputs of specialised hardware are required (ie: w.c. pans and traps) provision should be made either through LGRDD or commercial outlets, prior to wide-spread demonstration activities.

4.2 USER GROUP DEMAND AND ADOPTION

The central challenge in improving the chances for a successful sanitation programme in rural Balochistan is in raising the awareness of sanitation as a felt need. If motivation and demand for sanitation can be given a higher priority within the community, then self-help programmes would be a realistic approach to significantly increasing duplication of demonstration units and overall coverage in the Province.

Recommendations from the W&S Cell's field experience can be given for three critical areas as follows:

4.21 Increasing Sanitation as a Felt Need Within Communities:

- Support the existing (higher) demand from women in the community by concentrating on strong motivational messages for men at an early phase of the implementation cycle.

- Use relevant messages to increase demand within communities instead of more complex or unfamiliar approaches; some examples to be employed are:

For women:

- Convenience of being able to relieve themselves in the compound during daylight hours
- Showing how latrines can reduce flies and smell in the compound
- Stress cleanliness in the Quranic context

For men:

- Stress cleanliness in the Quranic context
- Promote latrine as (functional) status symbol and as a modern or "scientific" facility
- Emphasise health improvements, especially for their sons

► Use relevant mechanisms to promote these motivational messages, as well as relying on direct visits; ie: mass media (radio) campaigns, cartoon or picture stories and posters.

4.22 Improving Demand and Decision Making Within Communities:

► Pay special attention to maliq's and other community or religious leaders in order to win over their support from the beginning of the village cycle.

► Explore the possibility of implementing latrine construction at village level as with the handpump part of the programme; ie: insist on community level cost sharing whereby every compound receives an equal number of latrines.

► Explore the possibility of implementing the latrine programme prior to pump installation in villages where the existing water supply is adequate.

4.23 Financial Issues and Subsidies:

► Do not place too great emphasis on the long-term cost benefit of the PFL; if the design fails easily and is rejected by users, the wasted resources (donor, government and community) and disincentive to other potential communities is very high. The long life-span of the PFL option should only be considered as beneficial in situations where it has a high chance of successful adoption.

► It is recommended that the financial subsidy should not be re-instated, as increasing the felt need and demand for facilities is seen to be more effective. In cases where individual households are genuinely too poor to afford construction materials cost-sharing at the village level may prove to be a workable solution.

4.3 ROLE OF LGRDD IN COMMUNITY-BASED SANITATION PROGRAMMES

Due to the limited human, financial and mobility resources of LGRDD at district level it is recommended that there should be a move away from hardware-orientated targets. Over-emphasis on installing hardware would stretch LGRDD beyond it's logistical capacity and merely encourage the disastrous approach of constructing latrines in inappropriate locations.

Instead it is recommended that LGRDD concentrate physical implementation efforts in "demonstration" communities where both water supply and sanitation facilities are provided with full community participation. This approach should be complimented by efforts to create the right conditions within communities (increased motivation, demand and skills training) and in locally based markets (awareness messages and hardware). This approach should stress the shift in responsibility for latrine duplication from LGRDD to the community.

Therefore it is recommended that LGRDD focuses on the following key inputs at various stages of the community-based process:

- Concentrate on raising awareness of sanitation as a felt need, especially with male community members and informal village leaders, through appropriate motivational messages.
- Emphasise construction and skills training for village based mistri's in order to promote duplication and correct operation and maintenance.
- Ensure a well organised supply of subsidised hardware from District stores to village level; do not limit the number of latrine units to a ratio linked with the handpump.
- Promote the linkage between community demand and improved commercial availability of key hardware components in local markets

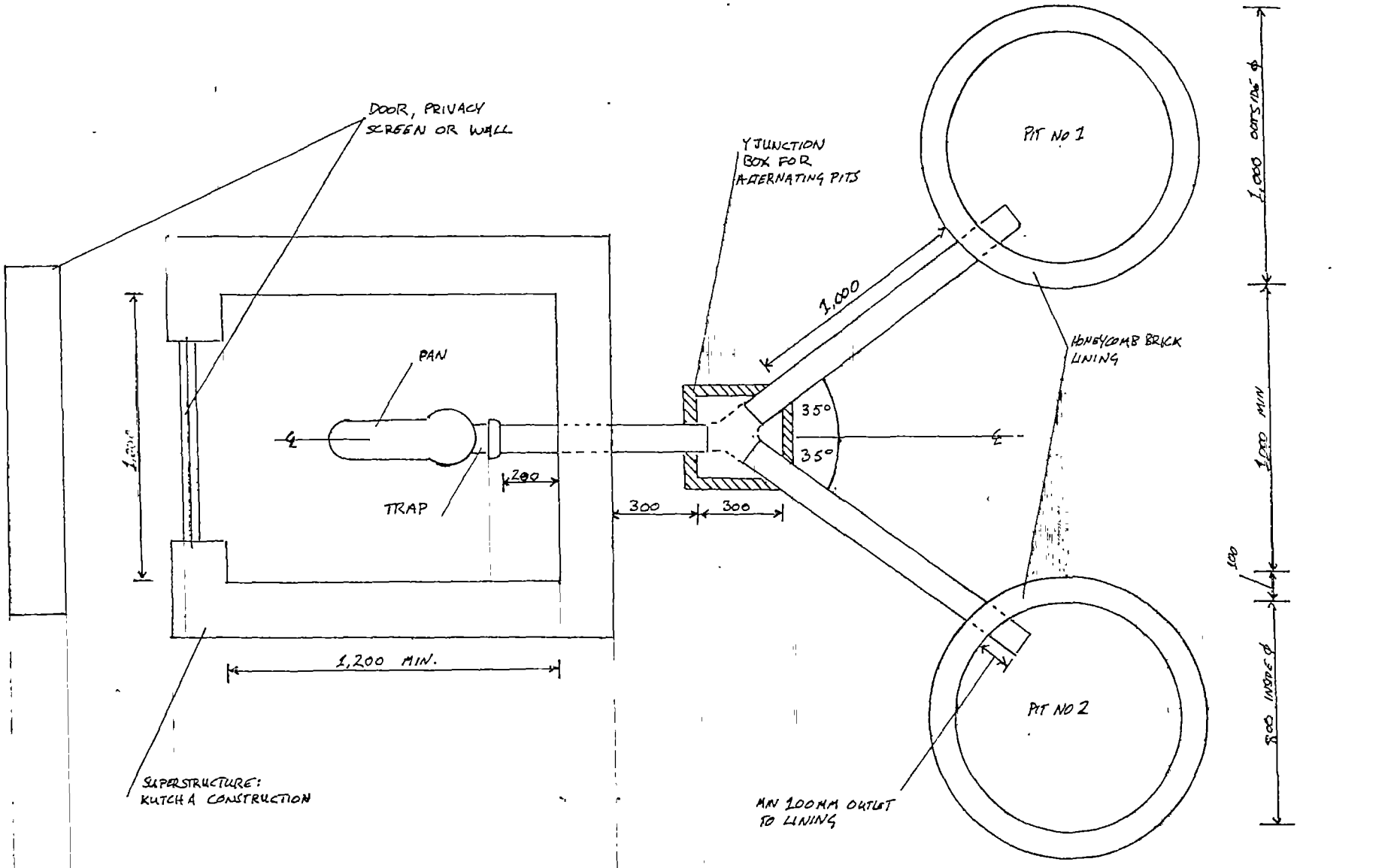
Many of the preceding issues and recommendations have been incorporated into the current W&S Cell field level approach. Whilst the progress of work is at an early stage the results of the latrine programme have been encouraging. Even in cases where communities have rejected participation out-right the lessons learnt can be incorporated into revising this approach over the long-term and can be shared with other programmes operating in Balochistan.

ANNEX I: SUMMARY OF VILLAGE SURVEY RESULTS, LORALAI DISTRICT (TO 15-02-94)

UNION COUNCIL/ VILLAGE:	FINANCIAL SUBSIDY (Y/N)	LATRINE OPTION*	DEMO. UNITS PLANNED	VILLAGE UNITS PLANNED	TOTAL No. HARDWARE UNITS SUPPLIED	DEMO. UNITS CONSTRUCTED	VILLAGE UNITS CONSTRUCTED
U.C. MEHKTAR							
DARGI SHEPELO	YES	IPL	2	6	2	2	0
MULA GAGUL (ONE)	YES	PFL	3	6	9	3	6
MULA GAGUL (TWO)	YES	PFL	2	6	3	2	1
U.C. TOR							
SHABON DODA	YES	IPL	3	9	0	0	0
U.C. SADDAR SAMALAN							
SHINGLAZ RAHKNI (ONE)	NO	PFL	3	9	12	3	9
SHINGLAZ RAHKNI (TWO)	NO	PFL	1	2	3	1	2
U.C. POONGA							
LIQUE	NO	PFL	1	3	0	0	0
U.C. SINJAWI							
KHAROTABAD	NO	IPL	2	6	0	0	0
					TOTAL UNITS CONSTRUCTED:	11	18

* PFL: POUR FLUSH LATRINE
IPL: INDIRECT PIT LATRINE

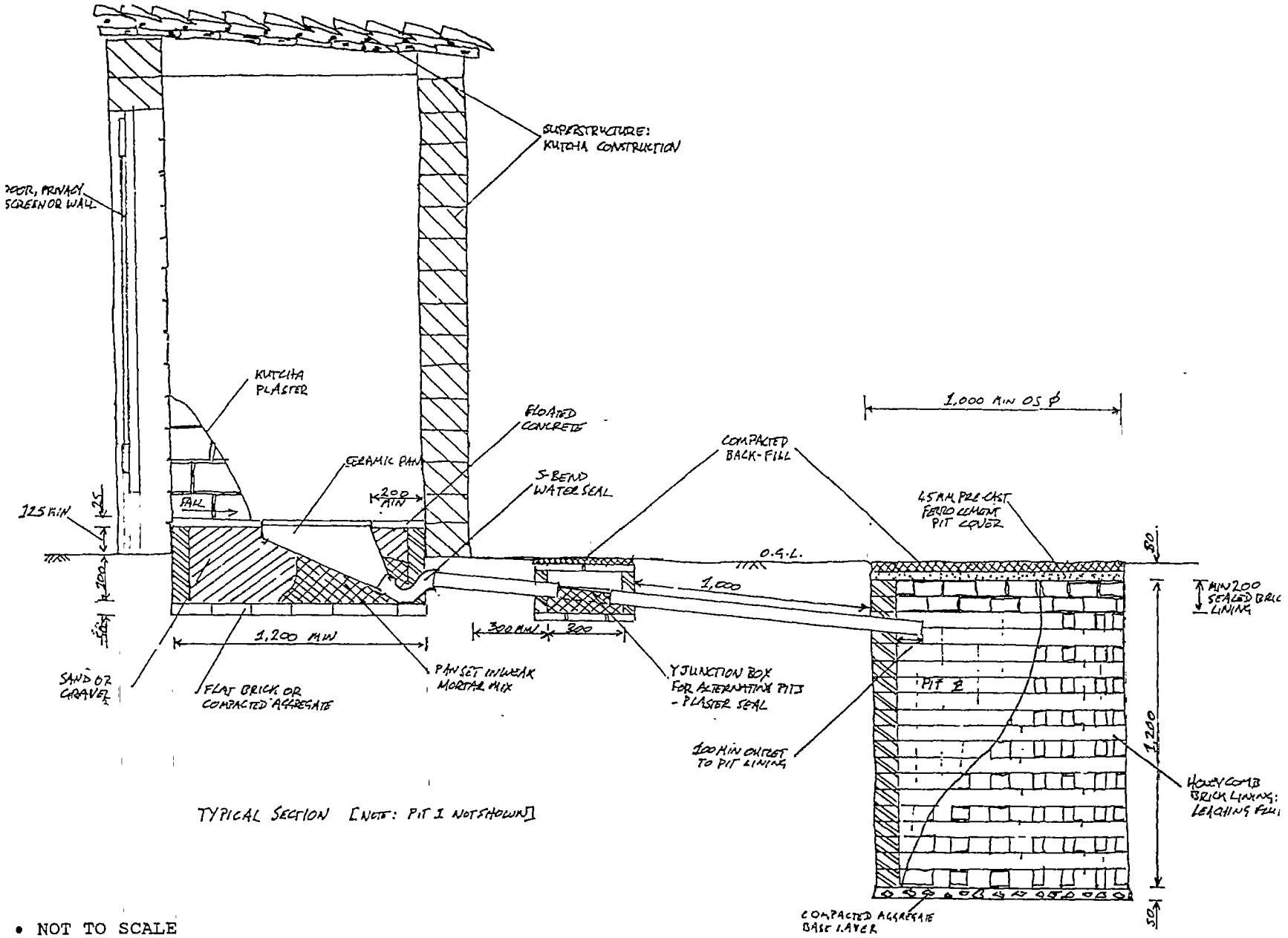
ANNEX II: POUR FLUSH LATRINE: STANDARD SPECIFICATIONS



- NOT TO SCALE
- ALL DIMENSIONS IN MILLIMETRES

[W&S CELL: 1993]

ANNEX II (cont.): POUR FLUSH LATRINE: STANDARD SPECIFICATIONS

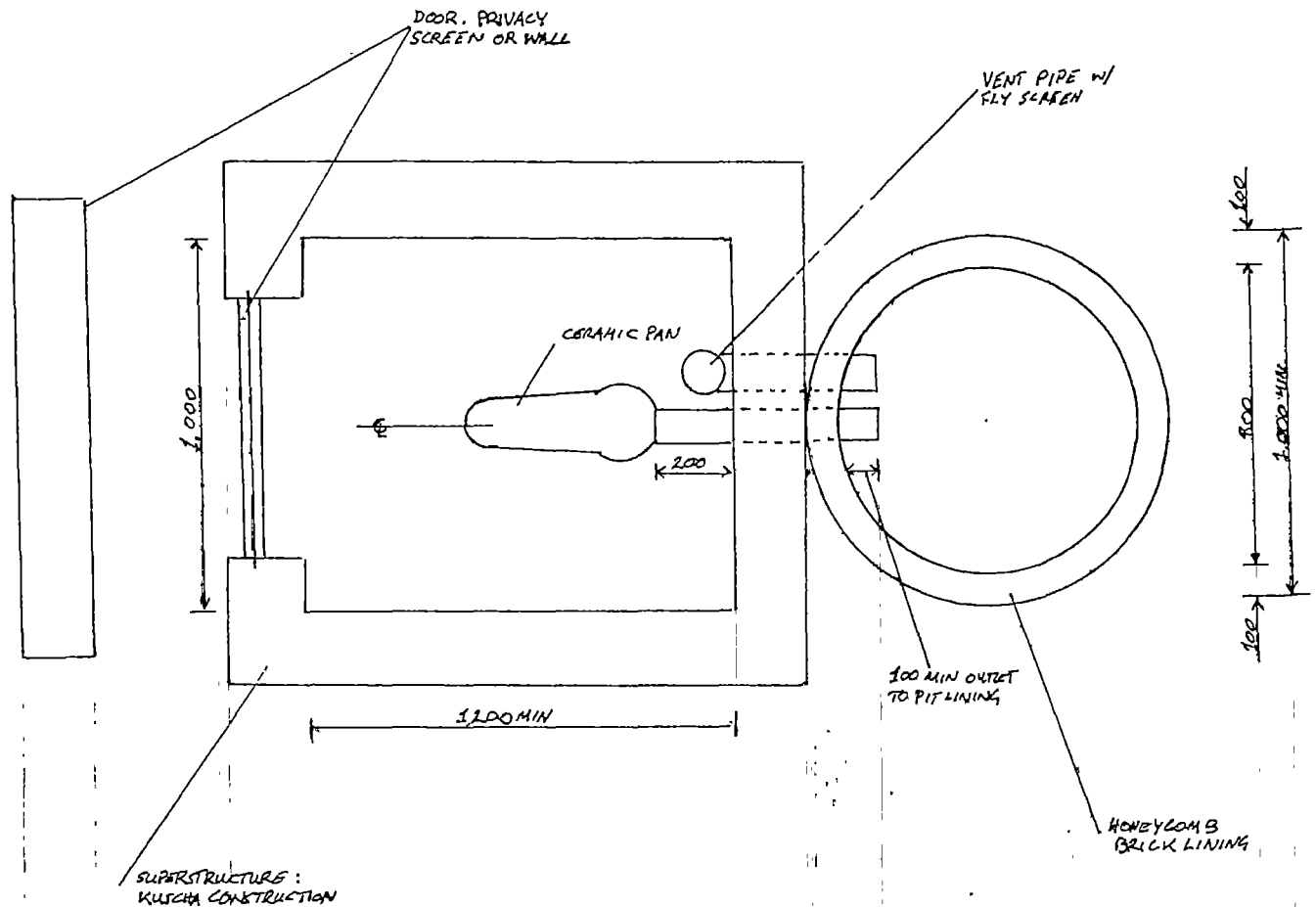


TYPICAL SECTION [NOTE: PIT 1 NOT SHOWN]

- NOT TO SCALE
- ALL DIMENSIONS IN MILLIMETRES

[W&S CELL: 1993]

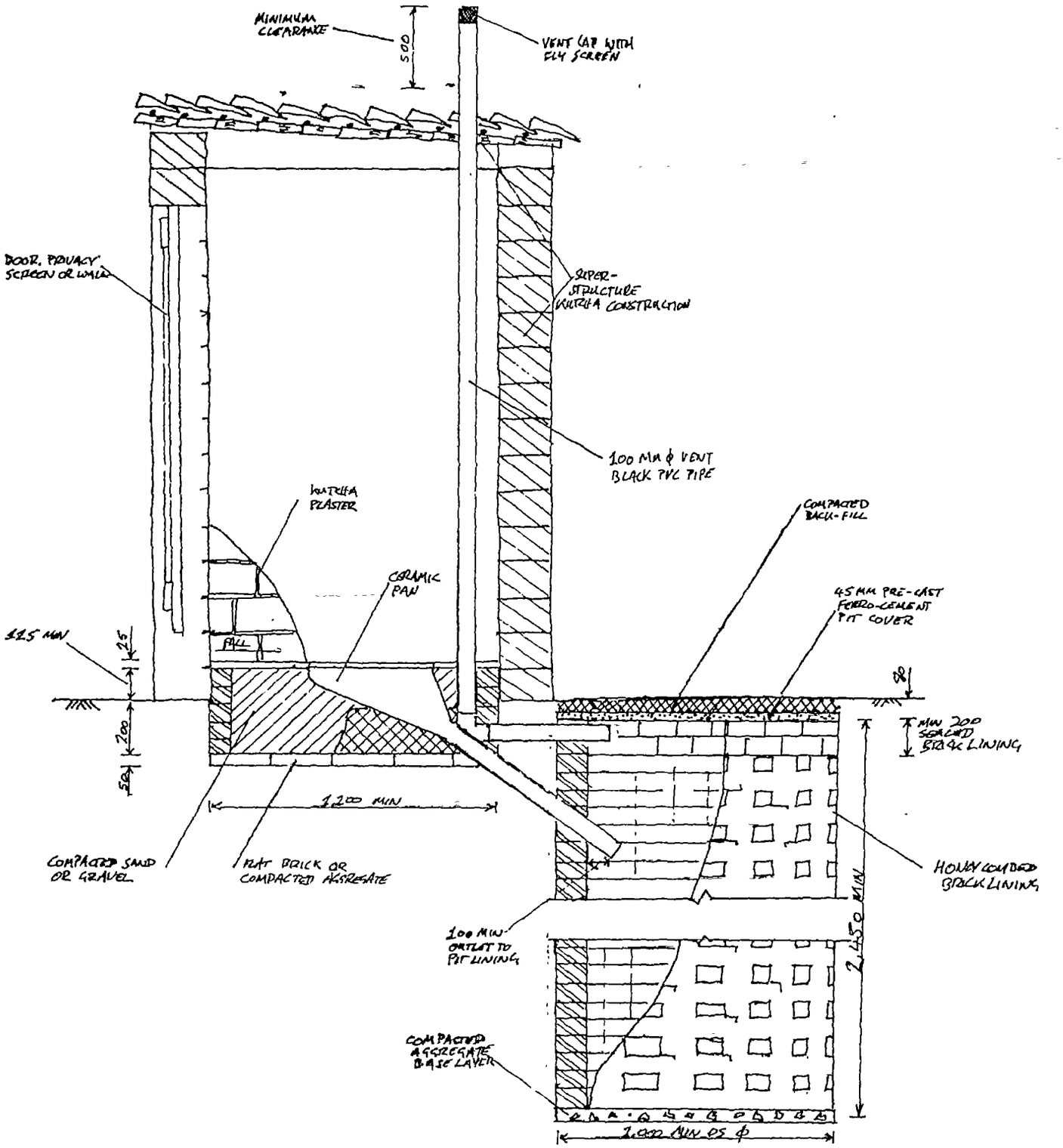
ANNEX II (cont.): INDIRECT PIT LATRINE: STANDARD SPECIFICATIONS



- NOT TO SCALE
- ALL DIMENSIONS IN MILLIMETRES

[W&S CELL: 1993]

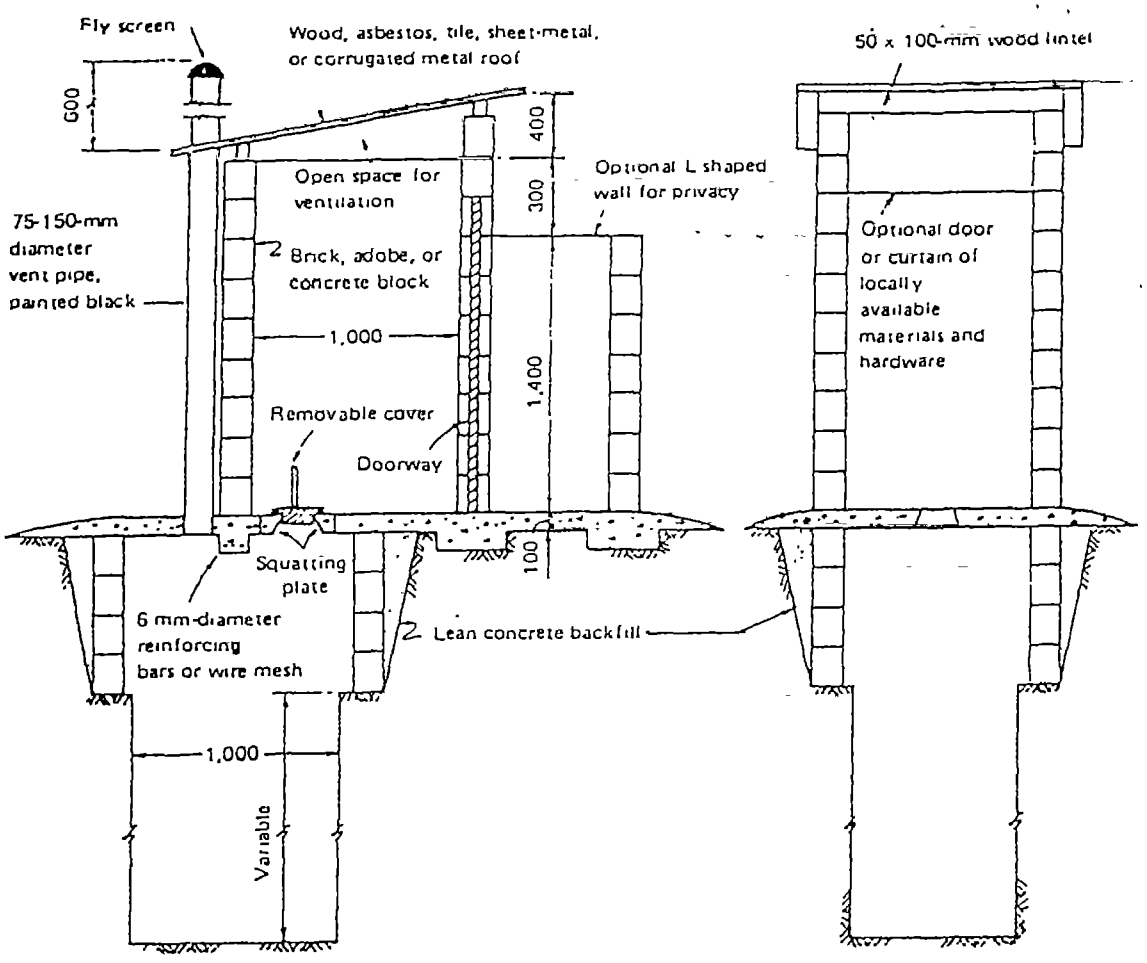
ANNEX II (cont.): INDIRECT PIT LATRINE: STANDARD SPECIFICATIONS



- NOT TO SCALE
- ALL DIMENSIONS IN MILLIMETRES

[W&S CELL: 1993]

ANNEX II (cont.): VENTILATED IMPROVED PIT LATRINE: PROPOSED SPECIFICATIONS



Side view (section)

Front view (superstructure; L-shaped wall and vent not shown)

- NOT TO SCALE
- ALL DIMENSIONS IN MILLIMETRES

[ADAPTED FROM R. CARROLL 1979]

ANNEX III: APPROX. MINIMUM DAILY WATER REQUIREMENT FOR AVERAGE RURAL HOUSEHOLD WITH 7 PERSONS

REQUIREMENT:	VOLUME (ltr):	FREQUENCY:	TOTAL VOLUME (ltr):
COOKING: (food, bread, tea)	13	DAILY	13
DRINKING WATER	12	DAILY	12
DISH WASHING	6	3 X DAILY	18
WASHING HANDS	2	3 X DAILY	6
ABLUTIONS	1.5	5 X DAILY (3 ADULTS)	22.5
BATHING	42	WEEKLY	6
WASHING CLOTHES	25	WEEKLY	3.5
CHICKENS	0.5	DAILY (6 EACH)	3
GOAT OR SHEEP	1.5	DAILY (4 EACH)	6
COW	3	DAILY (2 EACH)	6
DONKEY OR CAMEL	6	DAILY (1 EACH)	6
TOTAL DAILY HOUSEHOLD REQUIREMENT:			102 LITRES

ANNEX IV: FEMALE USER SATISFACTION SURVEY RESULT; MULA GAGUL VILLAGE (CLUSTER ONE), U.C. MEHKTAR, LORALAI DISTRICT

Compound No: 5 Union Council: Mehktar Village: Mula Gagul District: Loralai Type of latrine: one pit/ two pits Female CO: Two pits	Number of women		
How do children like the use of latrine?	10		
How do the man like the use of latrine?	10		
How do the women themselves like the use of the latrine?	10		
Easiness of flushing the latrine	10		
Easiness of cleaning the latrine	10		
Amount of water they need to carry extra estimation: 38 goatskins/mud pots/other... litres.			
Smell	10		

What are the most important advantages of using a latrine?

1 Paraduk.
2 in Compound.
3 Clean.
4

What are the most important disadvantages of using a latrine?

1 Extra water needed
2
3
4

ANNEX V: COMPOUND SURVEY RESULTS; SELECTED PROJECT VILLAGES, LORALAI DISTRICT

DISTRICT: LORALAI		SUB-DIVISION: BORI			UNION COUNCIL: MEHKTAR	
VILLAGE NAME (SURVEY DATE)	COMPOUND No.	TOTAL No. PEOPLE IN COMPOUND	EXISTING COMPOUND WELL (Y/N)	DISTANCE TO PROPOSED LATRINE (M)	EXISTING LATRINE (Y/N)	No. LATRINES REQUESTED
DARGI SHEPELO	1	29	N	--	N	1
	2	10	N	--	N	2
(27-09-93)	3	17	N	--	N	1
	4	11	N	--	N	1
	5	12	N	--	N	1
	6	11	N	--	N	0
	7	11	N	--	N	1
	8	22	N	--	N	1
VILLAGE TOTAL:	8	123	0	n/a	0	8

ANNEX V (cont.): COMPOUND SURVEY RESULTS; SELECTED PROJECT VILLAGES, LORALAI DISTRICT

DISTRICT: LORALAI		SUB-DIVISION: BORI			UNION COUNCIL: MEHKTAR	
VILLAGE NAME (SURVEY DATE)	COMPOUND No.	TOTAL No. PEOPLE IN COMPOUND	EXISTING COMPOUND WELL (Y/N)	DISTANCE TO PROPOSED LATRINE (M)	EXISTING LATRINE (Y/N)	No. LATRINES REQUESTED
MULA GAGUL (CLUSTER ONE) (9-09-93)	1	20	N	--	N	2
	2	17	N	--	N	2
	3	20	N	--	N	2
	4	4	N	--	N	1
	5	9	N	--	N	1
	6	8	N	--	N	1
VILLAGE TOTAL:	16	78	0	n/a	0	9

ANNEX V (cont.): COMPOUND SURVEY RESULTS; SELECTED PROJECT VILLAGES, LORALAI DISTRICT

DISTRICT: LORALAI		SUB-DIVISION: BORI			UNION COUNCIL: MEHKTAR	
VILLAGE NAME (SURVEY DATE)	COMPOUND No.	TOTAL No. PEOPLE IN COMPOUND	EXISTING COMPOUND WELL (Y/N)	DISTANCE TO PROPOSED LATRINE (M)	EXISTING LATRINE (Y/N)	No. LATRINES REQUESTED
MULA GAGUL (CLUSTER TWO) (16-02-94)	1	30	N	--	N	2
	2	10	N	--	N	1
	3	28	N	--	N	3
	4	21	N	--	N	2
VILLAGE TOTAL:	4	89	O	n/a	O	8

ANNEX V (cont.): COMPOUND SURVEY RESULTS; SELECTED PROJECT VILLAGES, LORALAI DISTRICT

DISTRICT: LORALAI		SUB-DIVISION: BORI			UNION COUNCIL: TOR	
VILLAGE NAME (SURVEY DATE)	COMPOUND No.	TOTAL No. PEOPLE IN COMPOUND	EXISTING COMPOUND WELL (Y/N)	DISTANCE TO PROPOSED LATRINE (M)	EXISTING LATRINE (Y/N)	No. LATRINES REQUESTED
SHABON DODA	1	34	N	--	N	3
	2	11	Y	20	N	1
(15-10-93)	3	10	N	--	N	1
	4	21	N	--	N	2
	5	5	N	--	Y	1
	6	24	N	--	N	2
	7	14	N	--	N	1
	8	9	N	--	N	1
VILLAGE TOTAL:	8	128	1	n/a	1	12

ANNEX V (cont.): COMPOUND SURVEY RESULTS; SELECTED PROJECT VILLAGES, LORALAI DISTRICT

DISTRICT: LORALAI		SUB-DIVISION: SINJAWI		UNION COUNCIL: SINJAWI	
VILLAGE NAME (SURVEY DATE)	COMPOUND No.	TOTAL No. PEOPLE IN COMPOUND	EXISTING COMPOUND WELL (Y/N)	DISTANCE TO PROPOSED LATRINE (M)	EXISTING LATRINE (Y/N)	No. LATRINES REQUESTED
KHAROTABAD	1	30	N	--	N	3
	2	29	Y	19	N	3
(14-01-94)	3	12	Y	60	N	1
	4	15	Y	13	N	1
VILLAGE TOTAL:	4	86	3	n/a	0	8

ANNEX V (cont.): COMPOUND SURVEY RESULTS; SELECTED PROJECT VILLAGES, LORALAI DISTRICT

DISTRICT: LORALAI	SUB-DIVISION: SINJAWI			UNION COUNCIL: SADDAR SAMALAN		
VILLAGE NAME (SURVEY DATE)	COMPOUND No.	TOTAL No. PEOPLE IN COMPOUND	EXISTING COMPOUND WELL (Y/N)	DISTANCE TO PROPOSED LATRINE (M)	EXISTING LATRINE (Y/N)	No. LATRINES REQUESTED
SHINGLAZ RAHKNI (CLUSTER ONE & TWO) (15-01-94)	1	16	Y	25	N	2
	2	12	N	--	N	1
	3	10	N	--	N	1
	4	14	N	--	N	1
	5	10	N	--	N	1
	6	9	Y	10	N	1
	7	7	N	--	N	1
	8	10	Y	18	N	1
	9	7	N	--	N	1
	10	10	Y	35	N	1
	11	4	N	--	N	1
	12	8	N	--	N	1
	13	10	Y	28	N	1
	14	11	Y	20	N	1
VILLAGE TOTAL:	14	86	3	n/a	0	15

ANNEX VI: COST ESTIMATE BREAKDOWN; EXCLUDING HARDWARE SUBSIDY (CURRENT 1994 PRICES)

COST TO HOUSEHOLD: POUR FLUSH LATRINE OPTION				
MATERIALS:	**UNIT: ***	**QUANTITY:**	**COST/UNIT: (Rs) ****	**TOTAL COST (Rs)**
NON-LOCAL MATERIALS:				
CEMENT (OPC)	bag	2.5	150.0	375.0
FIRED BRICKS	each	325	1.5	488.0
TRANSPORT COSTS TO SITE:	lump sum	1.0	200.0	225.0
LOCAL MATERIALS:				
SAND	m^3	0.25	250.0	63.0
AGGREGATE	m^3	0.06	180.0	11.0
UN-SKILLED LABOUR:				
ALL WORK	man-days	5.0	50.0	250.0
SKILLED LABOUR:				
ALL-WORK	man-days	1.0	200.0	200.0
TOTAL COST EXCLUDING LOCAL MATERIALS AND LABOUR:				Rs 1,612
TOTAL COST INCLUDING LOCAL MATERIALS AND LABOUR:				Rs 1,088

Note:

* to convert to local units 1 tractor load = approx. 1.5 m^3

** cost per unit is estimate based on current prices excluding transport costs from Quetta to Districts.

ANNEX VI (cont.): COST ESTIMATE BREAKDOWN; EXCLUDING HARDWARE SUBSIDY (CURRENT 1994 PRICES)

COST TO HOUSEHOLD: INDIRECT PIT LATRINE OPTION				
MATERIALS:	**UNIT: ***	**QUANTITY:**	**COST/UNIT: (Rs) ****	**TOTAL COST (Rs)**
NON-LOCAL MATERIALS:				
CEMENT (OPC)	bag	2.5	150.0	375.0
FIRED BRICKS	each	320	1.5	480.0
TRANSPORT COSTS TO SITE:	lump sum	1.0	200.0	200.0
LOCAL MATERIALS:				
SAND	m^3	0.25	250.0	63.0
AGGREGATE	m^3	0.06	180.0	11.0
UN-SKILLED LABOUR:				
ALL WORK	man-days	5.0	50.0	250.0
SKILLED LABOUR:				
ALL-WORK	man-days	1.0	200.0	200.0
TOTAL COST TO H/H EXCLUDING LOCAL MATERIALS AND LABOUR:				Rs 1,579
TOTAL COST TO H/H INCLUDING LOCAL MATERIALS AND LABOUR:				Rs 1,055

Note:

* to convert to local units 1 tractor load = approx. 1.5 m^3

** cost per unit is estimate based on current prices excluding transport costs from Quetta to Districts.

ANNEX VI (cont.): COST ESTIMATE BREAKDOWN; EXCLUDING HARDWARE SUBSIDY (CURRENT 1994 PRICES)

COST TO HOUSEHOLD: VENTILATED IMPROVED PIT LATRINE OPTION				
MATERIALS:	**UNIT: ***	**QUANTITY:**	**COST/UNIT: (Rs) ****	**TOTAL COST (Rs)**
NON-LOCAL MATERIALS:				
CEMENT (OPC)	bag	1.5	150.0	225.0
STEEL REINFORCING	Kg	5.0	17.5	88.0
FIRED BRICKS	each	320	1.5	450.0
TRANSPORT COSTS TO SITE:	lump sum	1.0	200.0	200.0
LOCAL MATERIALS:				
SAND	m^3	0.18	250.0	45.0
AGGREGATE	m^3	0.05	180.0	9.0
UN-SKILLED LABOUR:				
ALL WORK	man-days	5.0	50.0	250.0
SKILLED LABOUR:				
ALL-WORK	man-days	1.0	200.0	200.0
TOTAL COST TO H/H EXCLUDING LOCAL MATERIALS AND LABOUR:				Rs 1,467
TOTAL COST TO H/H INCLUDING LOCAL MATERIALS AND LABOUR:				Rs 963

Note:

* to convert to local units 1 tractor load = approx. 1.5 m^3

** cost per unit is estimate based on current prices excluding transport costs from Quetta to Districts.