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UNITED NATIONS DEVELOPMENT PROGRAMME

INTERREGIONAL PROJECT INT/81/047

Development and Implementation
of Low-Cost Sanitation Investment Projects

REPORT ON MISSION

TO

NEPAL

September 15-22, 1984

by

A. K. Roy and R. S. Singh

November 1984

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ABBREVIATIONS AND ACRONYMS

DWSS	Department of Water Supply and Sewerage
HMG	His Majesty's Government of Nepal
IPF	Indicative Planning Figures
TAG	Technology Advisory Group operating under UNDP Project INT/81/047
UNCHS	United Nations Centre for Human Settlements (HABITAT)
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

1. A mission comprising Messrs. A. K. Roy and R. S. Singh visited Kathmandu from September 16-22, 1984, in accordance with telexed terms of reference received from Mr. Richard N. Middleton, Project Manager, United Nations Development Programme (UNDP) Interregional Project INT/81/047.

2. The objectives of the mission were:

- (a) To discuss and resolve with Government officials any remaining issues raised on the Technology Advisory Group (TAG) feasibility study of the eight towns sanitation program.
- (b) To review the progress made by the Government in implementing the initial stages of the program and, in particular, identify constraints to progress and important lessons learned.
- (c) To learn the Government's plans for full-scale implementation of the program and, in particular, Government's intentions in relation to securing the necessary external funding. If appropriate, to assist the Government and the World Bank Resident mission in packaging certain items for inclusion in a possible Bank loan to the sector and, if requested, to assist the Government in discussions with other donors.
- (d) To learn from the Government their intentions on a follow-up feasibility study to develop an urban sanitation program on a wider scale and to ensure linkage to the ongoing feasibility studies being undertaken by PRIL (Proctor and Redfern International Ltd), a private consulting firm.

3. A list of officials met during the mission is in Annex I.

4. **SUMMARY AND FUTURE ACTION**

- (a) In spite of financial constraints, the Department of Water Supply and Sewerage (DWSS) has installed nearly 1,400 demonstration units in the eight towns selected for the preparation of the feasibility report.
- (b) His Majesty's Government of Nepal (HMG) is quite keen to expand the low-cost sanitation program in other towns of the country, as it feels that the country cannot afford to provide sewerage facilities at prohibitive cost.
- (c) The World Bank mission, which visited Kathmandu on September 17-24, 1984, proposes to include seven towns in the package for funding water supply and sanitation projects under the Fourth Project. Of these seven towns, six are included in the TAG feasibility studies.
- (d) HMG is keen for the preparation of a feasibility report by TAG on pilot schemes for low-cost waste water disposal system for four representative towns of the country. This work might be funded by UNDP.

- (e) The project on monitoring and evaluation of the low-cost sanitation project titled, "Appropriate Standards and Technologies for Low-Cost Infrastructure in Nepal," has been approved by the United Nations Centre for Human Settlements (UNCHS). TAG assistance to the project is assumed in the project document.

5. The eight-town feasibility study on low-cost sanitation prepared by TAG was discussed with the Chief Engineer, DWSS, and it was decided that the feasibility study should be printed and sent to the Chief Engineer, DWSS, for presentation to donor agencies.

6. HMG has already spent about NRs. 3 million on the installation of low-cost pour-flush latrines in the eight town up to 1983/84. It has further earmarked a sum of NRs. 1 million for the current year. In addition to the Government contribution, it is estimated that beneficiaries' contributions to the project would be some NRs. 8 million. HMG proposes to install 850 low-cost pour-flush waterseal units during 1984/85 in seven out of eight towns. The progress of installation of the units in Bhairawa town has been poor because of institutional problems. In all, 1,429 units have been installed in these towns. The progress of installation of low-cost sanitation up to 1983/84 and further proposals for the year 1984/85 for the eight towns are shown in Table 1.

Table 1

Name of the town	Installation of low-cost sanitation units before 1983/84 (June 1984)	Proposals for 1984-85 (June 1985)
1. Kirtipur	635	200
2. Ilam	29	50
3. Janakpur	297	200
4. Pokhara	203	200
5. Bhairawa	10	-
6. Birendranagar	81	50
7. Mahendranagar	130	100
8. Doti	44	50
Total	1,429	850

Although DWSS is geared to take up large-scale installation of low-cost latrines in these towns, the desired progress cannot be made because of shortage of funds.

7. The World Bank mission, which visited Nepal September 17-24, 1984, proposed to include seven towns in the package for water supply and sanitation. These towns are Ilam, Janakpur, Pokhara, Bhairawa, Birendranagar, Mahendranagar, and Nepalganj. Of these, the first six are included in the TAG feasibility

report. A feasibility report for Nepalganj has been prepared by PRIL. As regards the remaining two towns covered by the TAG feasibility study, Doti has not been included in the Bank package, as it is not easily accessible and Kirtipur is a village panchayat.

8. PRIL has prepared a feasibility report for augmenting the water supply systems and low-cost sanitation of 20 towns (Mahendranagar, Dhangadhi, Birendranagar, Tribhuwannagar, Bharatpur, Lahan, Rajbiraj, Dhankuta, Ilam, Bhadrapur, Pokhara, Kathmandu, Lalitpur, Biratnagar, Nepalganj, Bhairawa, Butwal, Hetauda, Janakpur, and Dharan). Thus, a feasibility study for low-cost sanitation of five towns has been prepared by both PRIL and TAG. The feasibility study also includes provision for surface drainage schemes in Nepalgunj and Rajbiraj. See Table 2 for summary of feasibility and proposed funding position.

Table 2

Feasibility and Proposed Financing of Low-Cost Sanitation in Nepal

Towns for which PRIL did feasibility studies	Towns for which TAG did feasibility studies	Towns in which World Bank proposes to finance LCS	Towns studied by TAG but not to be included in Bank loan
1. Mahendranagar	1. Mahendranagar	1. Mahendranagar	
2. Dhangadhi			
3. Birendranagar	2. Birendranagar	2. Birendranagar	
4. Tribhuwannagar			
5. Bharatpur			
6. Lahan			
7. Rajbiraj			
8. Dhankuta			
9. Ilam	3. Ilam	3. Ilam	
10. Bhadrapur			
11. Pokhara	4. Pokhara	4. Pokhara	
12. Kathmandu			
13. Lalitpur			
14. Biratnagar			
15. Nepalganj		5. Nepalganj	
16. Bhairwa	5. Bhairwa	6. Bhairwa	
17. Butwal			
18. Hetauda			
19. Janakpur	6. Janakpur	7. Janakpur	
20. Dharan			
	7. Doti		1. Doti
	8. Kirtipur		2. Kirtipur

9. The Governments of West Germany, Japan, and the United Kingdom are the major bilateral agencies helping HMG in its development program. They, as well as the United Nations Capital Development Fund, could be approached for funding Kirtipur and Doti projects.

10. HMG is at present keener on implementing low-cost sanitation projects in the 22 towns for which feasibility studies are available than taking up the feasibility study for another 10 towns proposed earlier by the Chief Engineer, DWSS. On the contrary, DWSS is very eager to find a low-cost solution to the unsanitary situation prevailing in the towns due to flooding, and the consequent stagnation along the streets of the waste water from kitchens and bathrooms. The Chief Engineer, DWSS, requested the mission that TAG should undertake the preparation of a feasibility report on a low-cost waste water disposal system on a pilot basis for Kathmandu and three other representative towns of the country, with the study to be funded by UNDP IPF. The urban sanitation problem in the country and the strategy for its solution in the country's Seventh Five-Year Plan which starts July 1985 were discussed with the Chief Engineer, DWSS. A summary of that discussion is in Annex 2.

11. A request from HMG to UNCHS for assistance in implementing a project on "Appropriate Standards and Technologies for Low-Cost Infrastructure in Nepal" was made on April 9, 1984. Although the project was approved by UNCHS on June 29, 1984, the approval was received by HMG only in August 1984. The scheduled starting date of the Project is 16 September 1984 and the scheduled completion date is February 1986. The project also assumes inputs from UNDP/World Bank in the form of extending the assistance of a sanitary engineer for four man-months during the entire project period. For the success of the project input from a sanitary engineer is necessary. A mission from HABITAT was scheduled during September 1984, but has now been postponed until the end of October 1984.

AKRoy/RSSingh:11

Cleared with and cc: Messrs. MacWilliam, ASPUW; Ahmed, ASADA

cc: Messrs. Sandstrom, ASPUW; Abdi, Hatendi, ASADA; Niwa, UNDP RR, Nepal; Slade, WB RR, Nepal; Roy, Singh, TAG New Delhi

LIST OF OFFICIALS MET**Ministry of Water Resources**

Mr. D. B. Rayamajhi	Chief Engineer, DWSS
Mr. P. M. S. Pradhan	Deputy Chief Engineer, DWSS
Mr. M. L. Chaudhary	Divisional Engineer, DWSS

World Health Organization

Mr. Q. K. Khoshchasm	WHO Sanitary Engineer
Mr. U. San	WHO Sanitary Engineer

The World Bank

Mr. Kedar Mehthema	Programme Officer
Mr. Robert MacWilliam	

United Nations Development Programme

Mr. Mosaddi Mallick	Senior Programme Officer
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United Nations International Childrens Emergency Fund

Mr. M. R. Kennedy	Resident Representative
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CENTRE
BY AND

URBAN SANITATION**NEPAL**
(1985-1990)SUMMARY AND RECOMMENDATION

1. The sanitation situation in the urban areas of Nepal is in a critical stage, resulting in a high incidence of disease affecting the health and manpower of the country.

2. During the International Drinking Water Supply and Sanitation Decade (Decade) (1981-90) His Majesty's Government of Nepal aims at providing 35% of the urban population of the country with sanitation facilities. A sum of US\$11.5 million, or NRs 195.5 million, will be required, of which US\$6.0 million, or NRs 117.3 million, will be the beneficiaries' contribution and the remainder, US\$5.5 million or NRs. 93.5 million, HMG's contribution.

3. Strengthening the existing institutions for the implementation of the program would be necessary.

4. UNDP assistance may be sought for pre-investment studies - for preparing feasibility and preliminary engineering reports for rehabilitation and remodelling of the Kathmandu surface drainage system and pilot surface drainage system for another three towns along with feasibility reports on low-cost sanitation for the remaining 12 towns.

5. Introduction

5.1 HMG is a signatory to the United Nations General Assembly Resolution on the International Drinking Water Supply and Sanitation Decade (1981-90) calling for acceleration of plans and programs in the water supply and sanitation sector by the member countries. Although there are several constraints, in particular financial, as well as the institutional and physical difficulties and logistic problems in reaching the goal, HMG is adhering to the objectives laid down in the resolution to the extent possible. HMG also aims at playing a role in the global objective of promotion of environmental protection and improvement, particularly in the improvement of living conditions of the human settlements and quality of life in general and particularly that of the poor and underprivileged, which are areas of interest of several UN agencies, in particular the United Nations Environmental Programme (UNEP) and UNCHS.

5.2 It has been estimated that more than fifty diseases, including those for high infant mortality, are excreta-related and thus are directly linked to poor or non-existent sanitation. It has also been established that nearly 80% of the diseases could be eliminated by providing proper sanitation.

5.3 The country is facing rapid and unplanned growth in its urban population. The rate of growth in urban population during 1971-81 has been 10.74% per annum. The urban centers have also experienced the expansion of the

economic activities and are playing a vital role in the country's economic growth. The condition of civic services in urban areas is deteriorating fast and has become critical at some places, unless steps are taken to plan, provide, and maintain services for the present and future population, particularly in the core city area where deterioration in the environment threatens the health of the residents.

6. Background and Justification

6.1 In 1981 there were 23 towns covering a population of 958,083. Subsequently 10 more villages were converted into Town Panchayats during 1981-84, thus increasing the number of Town Panchayats in the country to 33. Of these 33 towns, 23 are covered with piped-water supply facilities covering a population of 714,000 (83% of the population of 23 towns having piped-water supply), although the number of people actually benefitting from the piped-water supply may be much less.

6.2 It has been estimated that about 19% of the total urban population (1981) in the country had access either to the sewer systems or septic tanks. Only three (Kathmandu, Bhaktapur, and Lalitpur) out of 33 Town Panchayats have a sewerage system so far. Even in these towns the population coverage by the Sewerage System is only 12 per cent (or about 6,700 households). Based on a household survey conducted for the preparation of the eight-town feasibility report on low-cost sanitation, it has been estimated that about 30 per cent of the population in urban areas have access to bucket latrines or dry pits and that 58 per cent have no latrines and resort to open air defecation. Open drains in the towns not only carry bath and kitchen liquid wastes but also washings of bucket latrines having high content of raw human excreta. This is causing more unsanitary problems in spite of the waste water drainage system in the town.

6.3 HMG has given priority to the expansion of urban water supply during the Sixth Five-Year Plan. Increased investment in providing safe water supply alone will fall short of yielding full benefits if not complemented by a safe excreta disposal system.

7. Sanitation Situation and the Solution

7.1 It has been estimated that there are about 225,000 households in the urban areas of the country. About 14,000 households have access either to the sewerage system or individual septic tanks. Thus, about 211,000 households either have access to bucket latrines or resort to open air defecation. Of these 211,000 about 67,500 households (30% of the total households) have inhygienic bucket latrines.

7.2 HMG, in its program for the International Drinking Water Supply and Sanitation Decade (1981-90) envisages, inter alia, providing sanitation facilities to about 35% of its urban population in the country. During the Seventh Five-Year Plan (1985-90), HMG aims to convert all bucket latrines (67,500) in the country into waterseal latrines.

The water supply situation in almost all the towns is poor and would need considerable improvement before introducing any sewerage system. The eight-town study has shown that in many places there is not enough water even for functioning of the pour-flush waterseal latrines. Therefore, introduction of sewerage systems in towns is not possible for the moment.

7.3 Given the present backlog of provision of satisfactory human excreta disposal systems in the urban and semi-urban areas, infeasible high cost (10 to 12 times the other low-cost options) and high water requirements (7 to 8 times the low-cost options) of the conventional sewerage system, search for other low-cost options appears to be imperative and needs to be developed and introduced. These low-cost options would provide immediate improvement in the present situation and at the same time be constructed and maintained within budgetary and economic constraints.

7.4 Septic tanks with proper effluent disposal is another alternative, but this again is beyond the reach of the majority of people in urban areas of the country. Other low-cost options, such as low-cost pour-flush waterseal latrines and ventilated improved pit (VIP) latrines, depending on social habits and locations, could be introduced widely in almost all the towns of Nepal, and in the fringe areas of the big towns where laying of branch sewers is difficult and costly, as has been demonstrated in the eight town feasibility report on low-cost sanitation.

7.5 The total cost of conversion of 67,500 dry latrines into waterseal latrines at 1983 prices has been estimated at US\$11.5 million. The eight-town feasibility study on low-cost sanitation has indicated that only 40% of the cost of installation of the 1,400 demonstration units was provided by HMG as a grant-in-aid and the remainder (60%) of the cost was borne by the beneficiaries. Thus, for converting 67,500 dry latrines into waterseal latrines, only a sum of US\$5.5 million (NRs 93.5 million) would be needed in the Seventh Five-Year Plan.

7.6 The feasibility study has further revealed that for wide acceptance of low-cost technology it would be necessary to provide greater assistance to the low-income group of people to bring it within their affordable limits. There would be many households which could not afford to provide 60% of the cost of units from their own resources. For such households it may be necessary to provide loans to be recovered in easy installments in such a manner that the monthly repayment is within 1 to 2 per cent of the household's monthly expenditure. The loan recovery could be done by the Water Supply and Sewerage Corporation or the local Town Panchayats.

7.7 The system needs very little foreign exchange as all materials, such as pan, trap, cement, etc., are being produced in the country.

8. National and International Efforts in Achieving the Targets

8.1 As a contribution to the International Drinking Water Supply and Sanitation Decade, the UNDP Project INT/81/047, executed by the World Bank,

assisted DWSS in preparing a feasibility report on low-cost sanitation for eight small and medium towns. These towns are Bhairawa, Birendranagar, Doti, Illam, Janakpur, Mahendranagar, Pokhara, and Kirtipur. The study recommends conversion of about 8,600 individual bucket latrines into waterseal latrines and construction of 17,000 new latrines, including superstructure in those households where there is no latrine at all, including about 1,400 seats in community latrines near bus stands and market places for floating population, at a total cost of NRs 149.00 million. The study also envisaged construction of demonstration units in these eight towns. So far about 1,400 low-cost sanitation units have been constructed in these eight towns. HMG has already provided a sum of NRs 3.28 million up to 1983/84 and is providing an additional sum of NRs 1 million for the current year (1984/85).

8.1.1 The beneficiaries' contribution in the Sixth Five-Year Plan is expected to be NRs 8.0 million. The study reveals that the low-cost technology is well accepted by the people and, with simple care and cleaning by the households, the pour-flush latrine is a very satisfactory and hygienic sanitation system. It can be located inside the house, since the waterseal prevents odor and insect nuisance.

8.1.2 The study further reveals that promotion and health, in particular social education, are very important inputs to the program, but have not been given the needed emphasis.

8.2 The World Bank has assisted HMG in preparing a feasibility report on water supply and sanitation for 20 towns. These towns are: Mahendranagar, Dhangadhi, Birendranagar, Bharatpur, Tribhuwannagar, Dhankuta, Rajbiraj, Ilam, Bhadrapur, Lahan, Pokhara, Kathmandu, Lalitpur, Biratnagar, Nepalgunj, Bhairawa, Butwal, Hetauda, Janakpur, and Dharan. The World Bank is expected to provide assistance for the implementation of the projects for seven towns (Ilam, Janakpur, Pokhara, Bhairawa, Birendranagar, Mahendranagar, and Nepalgunj).

8.3 UNCHS (HABITAT) has also agreed to provide technical assistance to HMG in the implementation of the low-cost sanitation program in the country. The project has the following specific objectives:

- (a) Identify and evaluate socio-cultural aspects of sanitation affecting the implementation of the low-cost sanitation program.
- (b) Establish a system for the monitoring and evaluation of sanitation projects.
- (c) Organize training program for the project staff to enable them to implement the project.
- (d) Demonstrate the feasibility of appropriate technologies for the provision of sanitation services to low-income settlements in Nepal.

- (e) Disseminate information on appropriate sanitation technologies for the provision of sanitation services to low-income settlements in Nepal.

9. Need for Pre-Investment Studies for Low-Cost Sanitation

9.1 Sanitation is a very wide field and includes not only the situation brought about by indiscriminate disposal, or non-existence of any proper human excreta disposal system, but also the insanitary conditions caused by the waste water from kitchens and bathrooms. Garbage disposal, personal hygiene, and food sanitation are all contributory factors for a sanitation program. His Majesty's Government has, in the past, been placing the greatest stress on the development of safe water supplies in the towns and villages. This undoubtedly was the correct approach. In the Seventh Five-Year Plan, HMG, realising the high cost of sewerage proposals for Kathmandu, Bhaktapur, and Lalitpur and the very heavy perpetual burden for their operation and maintenance, felt that it would not be possible in the very near future to provide other towns with sewerage system; at the same time, it appreciated that from social and health points of view some solution has to be evolved for an excreta disposal system for individual houses - a system which is affordable, acceptable, and easily available to the Government, local authorities, and the people at large. It was obvious that small local authorities could not afford to maintain the sewers, even if these were provided free of cost at Government expense. At the same time, with the passage of time, the population pressure was increasing on the urban settlements, the indiscriminate disposal of human excreta was reaching a critical stage, threatening the people with all types of excreta-related diseases. To find a solution to the problem HMG approached the UNDP Global Project (now re-named INT/81/047) in the latter part of 1979 to provide technical assistance to DWSS to find a low-cost solution for safe disposal of human excreta in these towns. UNDP accepted HMG's request and, through DWSS, selected eight towns for preparing a feasibility study for low-cost excreta disposal system for the entire population of these towns. As the proposals in these towns were to be models for testing the replicability of the recommended technology, towns with different physical, geological, hydrogeological, and socio-economic conditions were selected; the construction of nearly 1,400 latrines has proved that a pour-flush on-site sanitation system for disposal of excreta is suited to the needs of the people. It has hardly any maintenance costs and therefore is not a burden on the local authorities. The eight-town study has been further extended by the World Bank consultant to another 14 towns. At the suggestions of HMG, the World Bank is now considering a package program to improve water supply and provide low-cost sanitation in seven towns (Ilam, Janakpur, Pokhara, Bhairawa, Birendranagar, Mahendranagar, and Nepalgunj) as envisaged in the UNDP Project.

9.2 An allied and equally serious sanitation problem is the lack of a system for proper disposal of bathroom and kitchen waste. The sewerage system in Kathmandu requires rehabilitation and remodelling. These sewers were once treated as combined sewerage and entry of waste water at the majority of places is direct to the sewers through a chute resulting in chokage of sewers by entry even of small dead animals and many other solid wastes. There is also a need for a Master Plan and Preliminary Engineering Study for Surface drainage system

for rehabilitating the existing ones and laying new surface drains where necessary. In other towns there are small brick drains but only in small sections of the core areas of the town; elsewhere the waste water stagnates on both sides of the roads presenting an offensive sight besides being a threat to the health of the people. The removal of human excreta will not solve the insanitary problem in its totality unless a suitable comprehensive surface drainage system is evolved which could remove the bathroom and kitchen waste from the midst of habitations. While in the Sixth Five-Year Plan HMG took the step of requesting the UNDP Interregional Project (INT/81/047) to prepare a feasibility study on low-cost sanitation, it is very necessary for the implementation of the Seventh Plan that HMG approach UNDP immediately under the IPF, to provide technical assistance for funding low-cost solutions to the sanitary disposal of liquid wastes from kitchens and bathrooms. The Technology Advisory Group can be requested to find a low-cost solution to the sullage water problems in the urban settlements. His Majesty's Government could select about four towns to start with and get a comprehensive Preliminary Engineering and Feasibility Report on a surface drainage project prepared with UNDP/IPF assistance. This should be taken up immediately so that the implementation could not only be started but substantial progress made during the Seventh Five-Year period.

9.3 Feasibility Studies on the low-cost sanitation project for 22 towns out of 33 towns have been prepared. Along with the above surface drainage schemes, the UNDP could be approached for technical assistance in preparing the feasibility report on the low-cost sanitation for the remaining 11 towns. Since TAG might be involved in finding a low-cost solution to the surface drainage problems, it can simultaneously assist in the preparation of a feasibility report on low-cost sanitation project of the above 11 towns.

9.4 Apart from the several bilateral agencies of the Governments of West Germany, Japan, Norway, and the United Kingdom which might be interested in financing such projects, the United Nations Capital Development Fund might be approached for funding these projects.