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UNITED NATIONS DEVELOPMENT PROGRAMME

INTERREGIONAL PROJECT INT/81/047

DEMONSTRATION PROJECT IN LOW-COST WATER SUPPLY AND SANITATION

REPORT ON MISSION

TO

NEPAL

NOVEMBER 24-27, 1982

BY

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LIST OF ACRONYMS

- ADB Asian Development Bank
- DWSS Department of Water Supply & Sewerage
- HMG His Majesty's Government of Nepal
- TAG Technology Advisory Group established under  
UNDP Interregional Project INT/81/047
- WB World Bank

CURRENCY

NRs. 13.10 = US\$ 1.00

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## Introduction

1. In accordance with telex No. 3269 dated November 20, 1982, received from the Project Manager INT/81/047, a single member mission (Singh, Sanitary Engineering Adviser-TAG<sup>1</sup>/ Delhi) visited Nepal, November 24-27, 1982. The objective of the mission was to assist the Asian Development Bank (ADB) mission in its reconnaissance mission of the water supply and sanitation sector in Nepal and to take stock of the situation of on-going work in the preparation of the feasibility study on low-cost pourflush latrines in eight towns of Nepal.

2. A list of persons met is attached as Annex I.

## Background

3. A reconnaissance mission of the ADB, led by Mr. Kirch, visited Nepal November 9-27, 1982, to assist the Government of Nepal in the water supply and sanitation sector. The mission reviewed the existing water supply and sanitation situation of Nepal, including the institutional capability of Department of Water Supply and Sewerage (DWSS) and Water Supply and Sanitation Board (WSSB) for improving the existing water supply and sanitation situation of the country. The TAG mission was requested by the team leader to review the first draft report prepared by the sanitation member, Mr. Sidwick, and offer its comments.

## Summary

4. ADB is contemplating providing assistance of about US\$25 million for improving the existing water supply and sanitation situation of the far-western and mid-western region of the country during 1984/85 and 1985/86. Basically, the package will provide assistance for improving urban and rural water supplies of the study area, but will also include a sanitation component to the extent of 15 to 20 percent of the overall assistance.

5. Also, the World Bank is expected to provide assistance for improving the water supply system of five towns with populations of 10,000 or more in the above areas as a result of a UNDP financed engineering study for which the Bank is executing agency. It may include a sanitation component. ADB will not include a sanitation component for any communities which may be covered under any possible World Bank package.

6. DWSS is arranging for installation of demonstration units and collection of municipal data of the remaining seven towns included in the sanitation feasibility report being prepared by DWSS in collaboration with TAG.

## Asian Development Bank Mission Activities:

7. The ADB mission reviewed different sanitation practices being followed in urban and rural areas of Nepal, including the sewerage systems in Kathmandu and Bhaktapur, and the low-cost sanitation system in Kirtipur. The ADB mission was very much impressed with the Bhaktapur and Kirtipur systems.

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<sup>1</sup>/ Technology Advisory Group established under United Nations Development Programme Interregional Project INT/81/047 (executed by the World Bank).

8. The first draft report of the ADB mission provides a package of US\$25 million for two years (1984/85 and 1985/86) for improving water supply and sanitation facilities in mid-western and far-western regions of Nepal. The package would include both urban and rural areas. The TAG mission was given the impression that the package would consist mainly of water supply projects but would also include a small sanitation component (about 15 to 20 percent).

9. Phase I of the ADB package is likely to cover far-western and mid-western regions. This includes the towns of Birendra Nagar, Mahendra Nagar, Doti, Nepalganj and Dadel Dhure and the villages coming in the region.

10. Phase II of the package would comprise the villages falling under western region including the towns of Pokra, Tansen, Bhairawa and Butwal.

11. The TAG mission was told by the Chief Engineer, DWSS, that the World Bank is considering provision of assistance for water supply schemes of the towns of Birendranagar, Mahendranagar, Nepalganj, Bhairawa and Pokhara. However, the World Bank is not committed to any specific provisions for implementing low-cost pourflush waterseal latrine projects in these towns although sewerage and sanitation will be options considered.

12. The ADB mission was of the opinion that it would not be appropriate for it to enter into the areas where the World Bank is already assisting or considering providing assistance. Thus, the five towns of Birendranagar, Mahendranagar, Nepalganj, Pokhara and Bhairawa might be left for DWSS to provide sanitation facilities from its own resources; this appears to be doubtful in view of the meagre resources available in DWSS.

13. The ADB mission (Mr. Howarth) also gave the impression that it would appreciate TAG involvement in its future missions (a technical mission is likely to visit Nepal in January 1983).

14. The first draft report of the ADB mission provides the following priorities for sanitation works:

First : Urban core areas (pourflush latrines connected to the sewerage and sewage treatment-Bhaktapur type).

Second : Urban peripheral areas (pourflush latrines).

Third : Larger rural communities (pourflush latrines).

Fourth : Small and scattered rural areas, (pourflush latrines).

15. The following comments were offered by the TAG mission on the first draft mission report on sanitation of the ADB mission:

- Bhaktapur has a special topographical feature with a steep slope. The pourflush latrines are connected to the sewerage system in which sullage is also tapped. The project is being implemented with the

aid of the West German Government, which provides a 100% subsidy even for construction of toilets inside the household and their connections to the sewerage system. The project has been under implementation for almost one decade, but so far out of a population of 65,000 only about 10,000 have been served with the system. It would be quite interesting to find out the reasons why, even after such a massive assistance, only 16 percent of the population could be served with the system, against 20% in Kirtipur town during the past nine to ten months with twin-pit pourflush waterseal latrines. It was also reported by the ADB mission that the treatment plant is grossly overloaded in spite of the fact that only 16% of the houses are connected to the system. It is therefore necessary to investigate whether proper maintenance is carried out and necessary facilities are available. The TAG mission was given to understand that blockage of sewers has been reported quite often. This clearly indicates that the system may pose a lot of maintenance problems in future. It is, therefore, doubtful if this system would work well in other places, particularly where the terrain is flat. Moreover, the capital and maintenance cost is quite high and may be beyond the affordability of the local authorities. The project engineer of the Bhaktapur project also reported during the last TAG mission (September 2-11) that the project is quite costly, even they themselves are considering to go in for the low-cost sanitation (pourflush waterseal latrines with off-set pits).

- Pourflush latrines have been recommended for village sanitation irrespective of social and cultural differences of the different areas. People in the hilly regions have different cultures to those in the valley region. They use stone, mud balls or grass for anal cleansing. Therefore, pourflush water seal technology may not be feasible in higher altitudes.
- Some changes in the existing design of the Kirtipur system may be necessary to reduce the cost.
- The ADB mission further recommended the provision of communal latrines in cases where people cannot afford private latrines. Maintenance of the community latrines, even in Kathmandu, is very poor. Therefore, any such measure in smaller towns should be ruled out completely. It will not be possible to maintain the community latrine because of non-availability of the necessary scavengers and, in particular, the absence of proper infrastructure for the maintenance of such facilities. In such cases,

even if HMG is to provide 100% subsidy, it would be better to go in for the individual latrines, as space is not a constraint in most of the towns.

16. Eight towns feasibility study:

A schedule for preparation of the eight towns feasibility report for low-cost sanitation (Annex II) was prepared in consultation with the Chief Engineer, DWSS, during the last TAG mission (September 2-11). DWSS has already created a full-fledged sanitation cell under overall charge of a divisional engineer.

Installation of demonstration units in other towns could not make much headway due to non-availability of the pans and traps. The Chief Engineer indicated that the TAG mission might use its good offices in getting at least 100 pieces of squatting pans and traps from Indian suppliers to Kathmandu immediately so that installation of demonstration units would be implemented in other towns. It was decided that DWSS will construct demonstration, in the remaining seven project towns. It was also agreed that DWSS would construct these units in the schools free of cost.

DWSS is arranging to get bids from the Indian manufacturers of pans and traps and it is expected that it will be possible for them to arrange the entire quantity (1500 units) by March, 1983.

The survey in other towns has not been started as yet. But it would commence in December 1982, when the social scientist attached to DWSS will visit the project towns for briefing the DWSS engineers and overseers responsible for collection of the survey data.

PLAN OF ACTION FOR THE PREPARATION OF THE EIGHT  
TOWN FEASIBILITY REPORT ON LOW-COST POUR-FLUSH  
LATRINES OF NEPAL

AIDE MEMOIRE

INTRODUCTION

1. In accordance with the terms of reference dated July 10, 1982, from the Project Manager INT/81/047, a single member mission (Singh, Sanitary Engineering Adviser of the Technology Advisory Group [TAG] from Delhi) visited Nepal, September 2-11, 1982, to assist DWSS in the preparation of the eight towns feasibility report on low-cost sanitation. The mission met the Pradhan Panchayat of Kirtipur village, Government and WHO officials and discussed the plan of action for the preparation of the report. The plan of action was prepared by the mission at the request of the Chief Engineer, DWSS, and is being submitted in form of aide memoire for further action by DWSS. A mission report would follow soon.
2. The existing urban sanitation situation in Nepal is in precarious state, resulting in a high mortality and morbidity rate. For improving the sanitation condition, during the International Drinking Water Supply and Sanitation Decade, HMG intends to increase the sanitation facilities in the country by using inexpensive techniques (low-cost sanitation). The present study envisages introduction of low-cost pour-flush waterseal latrines in 8 towns of the country.

Action taken by DWSS

3. Following actions have been taken by DWSS:
  - (a) Identification of the eight towns to be included in the feasibility report. The towns included are: Illam, Kirtipur and Bhag Shairab, Janakpur, Pokhara, Bhairawa, Doti, Birendranagar and Mahendranagar.
  - (b) House-to-house survey in Kirtipur. The survey data collected have been analyzed by TAG mission for the preparation of the feasibility report.
  - (c) Up to August 1982, 268 pour-flush waterseal units had been installed in Kirtipur, resulting in considerable improvement in sanitation situation of the town. In addition to the above, 10 demonstration units have also been installed Illam (another Project town).
  - (d) Evaluation of the latrine program in Kirtipur has been undertaken by two independent agencies: (1) a local consulting firm; (2) sanitation unit of the health department. The major finding of the

evaluation is that the program showed a high acceptability rate of the pour-flush system.

- (e) Budget provision of NRs. 11.90<sup>1/</sup> lakhs during the current financial year (July 1982 - June 1983) for installation of additional 1450 demonstration units in eight Project towns has been made.

#### Future Action

4. The following further steps are to be taken by DWSS for the preparation of the feasibility report:

#### September 1982 - November 1982

- (a) Strengthening of technical staff and software infrastructure. DWSS proposes to install 1450 demonstration units in the eight towns included in the feasibility study during current financial year. DWSS has already created a sanitation cell at headquarters with an executive engineer (part-time), an assistant engineer (full time) and a full time overseer. The job of the sanitation cell will be to provide technical guidance, prepare standard designs, bill of quantities, estimates, and arrange training in not only the eight towns, but also in other towns of the country, procure materials such as squatting pans, traps, cement and steel and monitor overall performance of the program. With a view to providing full technical support to the program, the following technical staff would be necessary at headquarters and in the field.

#### Headquarters

Executive Engineer	- one (part or full time)
Assistant Engineer	- one (full time)
Sociologist	- one (full time)
Overseer	- two (full time)

#### Project towns

One assistant engineer (part-time) and an overseer (full time) in each Project town.

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<sup>1/</sup> one lakh = 100,000  
1 US\$ = NRs 13.10



October 1982 - August 1983(b) Data Collection

Collection of Nagar<sup>2/</sup> village panchayats<sup>3/</sup> data concerning expenditure, existing staffing pattern with the local authorities, existing sanitation situation regarding sullage and solid waste disposal and house-to-house survey of the project towns by carrying out a selective survey of 20% of the houses to represent the entire community should be conducted in each ward. Details of formats have been provided in TAG mission report TAG/NEP/05. The survey work will be carried out by the DWSS staff posted in different districts. However, before the survey is undertaken the staff should be properly briefed. The sample survey can best be carried out by a statistician or one who has been trained in such a sample survey. The sociologist attached to the project should be the best person to be trained for guiding the overseers to carry out this task.

November 1982 - June 1984(c) Workshop

Continued promotional and educational activities will be needed for wider publicity and acceptance of the program. Along with the communications support, orientation of Nagar Panchayats' Pradhans and training of the engineers and overseers of DWSS and masons of the project and other towns would be necessary. Such orientation and training courses should be held at regular intervals. The object would be gradually to strengthen the local infrastructure, depending less and less on the DWSS for constructing latrines in the individual houses. One such training course is proposed to be held in November 1982 for the Pradhans, Up-Pradhans and engineers and overseers of DWSS responsible for the installation of demonstration units in the project towns. It would also be necessary for both technical as well as software persons assigned to the project, along with the administrators, planners, decision makers to visit neighboring countries where this type of project has proved to be successful, to give them a first-hand knowledge of project formulation, implementation and maintenance.

October 1982 - October 1983(d) Installation of demonstration units

Arrangements have to be made for supply and provision of squatting pans, traps, steel and cement for 1450 demonstration units.

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2/ Town.  
3/ Council.

The program to complete installation of 1450 demonstration units in the eight towns should be finalized, and feedback regarding design, cost, acceptability and affordability be obtained.

January 1983 - May 1983

(e) Legal study

Legal study to examine the adequacies/inadequacies of the existing Village/Town Panchayat Act, Rules and Bye-laws and Rent Control Act with a view to providing legal sanction to the implementation of the program. The sociologist will be able to study the existing situation and collect all necessary information and prepare the model by-laws. He will need guidance and assistance from people experienced in this field.

March 1983 - July 1983

(f) Soil analysis

Soil analysis of the eight Project towns, indicating the percentage distribution of different grain sizes, classification of soil, uniformity co-efficient, effective size (diameter in mm) and permeability of the soil has to be carried out. Since DWSS has no facility available for carrying out the soil analysis, it could seek assistance of the Technical Institute in Kathmandu, the Irrigation Department or the Building & Roads Department. It is expected that the report on soil analysis may be available by July 1983.

December 1982 - December 1983

(g) Monitoring of quality of water

Monitoring of the quality of water at source, stand pipes and individual houses to study the pollution effect on piped water supply due to leaching pits in Kirtipur.

September 1983 - December 1983

(h) Survey data analysis

Analysis of survey data for the preparation of the feasibility report.

November 1983 - March 1984

(i) Evaluation of household latrines  
in the eight Project towns

Evaluation of demonstration units in seven other towns should include response rate, people's participation, acceptability,

affordability, factors influencing acceptability and affordability, workable financing pattern for the program. Technical evaluation should include rate of filling of the pit under different hydrogeological conditions, effect of leaching pits on groundwater and piped water pollution, modifications in the proposed design, etc., if necessary.

January 1984 - June 1984

(j) Completion of the draft feasibility reports of the eight towns.

5. UNDP Project INT/81/047 and UNCHS Input

Subject to the budgetary constraints, the following assistance seems to be essential:

- service of a sociologist (a Nepal national) to help DWSS in survey and data collection, evaluation, education and monitoring of the program.
- technical assistance from TAG headquarters in Washington and the Regional Office in New Delhi for installation of demonstration units and their evaluation, and in preparation of the feasibility report and national plan for urban latrine programs and other activities; and
- visit of administrators, planners, decision makers and engineers of DWSS to India to have a first-hand knowledge of the project formulation, implementation and operation and maintenance of the program.