INDIA

Report on mission 13 to Uttar Pradesh (UP-13)

Sector: Rural Water Supply

Purpose: — Progress evaluation of rural water supply projects under Sub-Projects I and III
— Final appraisal of recast water supply schemes for Sub-Project IV

Commissioned by: Development Co-operation Department Asia (DAL) of the Netherlands Ministry of Foreign Affairs

water supply

October 1985

Composition of mission UP - 13:

R. Trietsch	- DHV Consulting Engineers, leader of the mission
A.K. Ghosh	- Asstt. Adviser (PHE), CPHEEO - RWS
J.A. Speets	- Water Supply Coordinator, Royal Netherlands Embassy

INDIA

Report on mission 13 to Uttar Pradesh (UP-13)

Sector: Rural Water Supply

Purpose: — Progress evaluation of rural water supply projects under Sub-Projects I and III
— Final appraisal of recast water supply schemes for Sub-Project IV

Commissioned by: Development Co-operation Department Asia (DAL) of the Netherlands Ministry of Foreign Affairs

October 1985

Edited by:
R. Trietsch — DHV Consulting Engineers — Amersfoort, The Netherlands

TABLE OF CONTENTS PAGE

ANNEXES:

A. Terms of Reference for Review Mission UP-13 to Uttar Pradesh
B. Itinerary of mission
C. List of authorities visited/senior staff involved in implementation of the schemes
D. Conclusions and Recommendations of the Indo-Dutch Review Mission of October 1985 to Uttar Pradesh (UP-13)
E. Scheme-wise summary of data (Sub-Project East-I)
F. Short history of Sub-Projects I, II, III, IV
G. Salient features of schemes proposed for Sub-Project IV

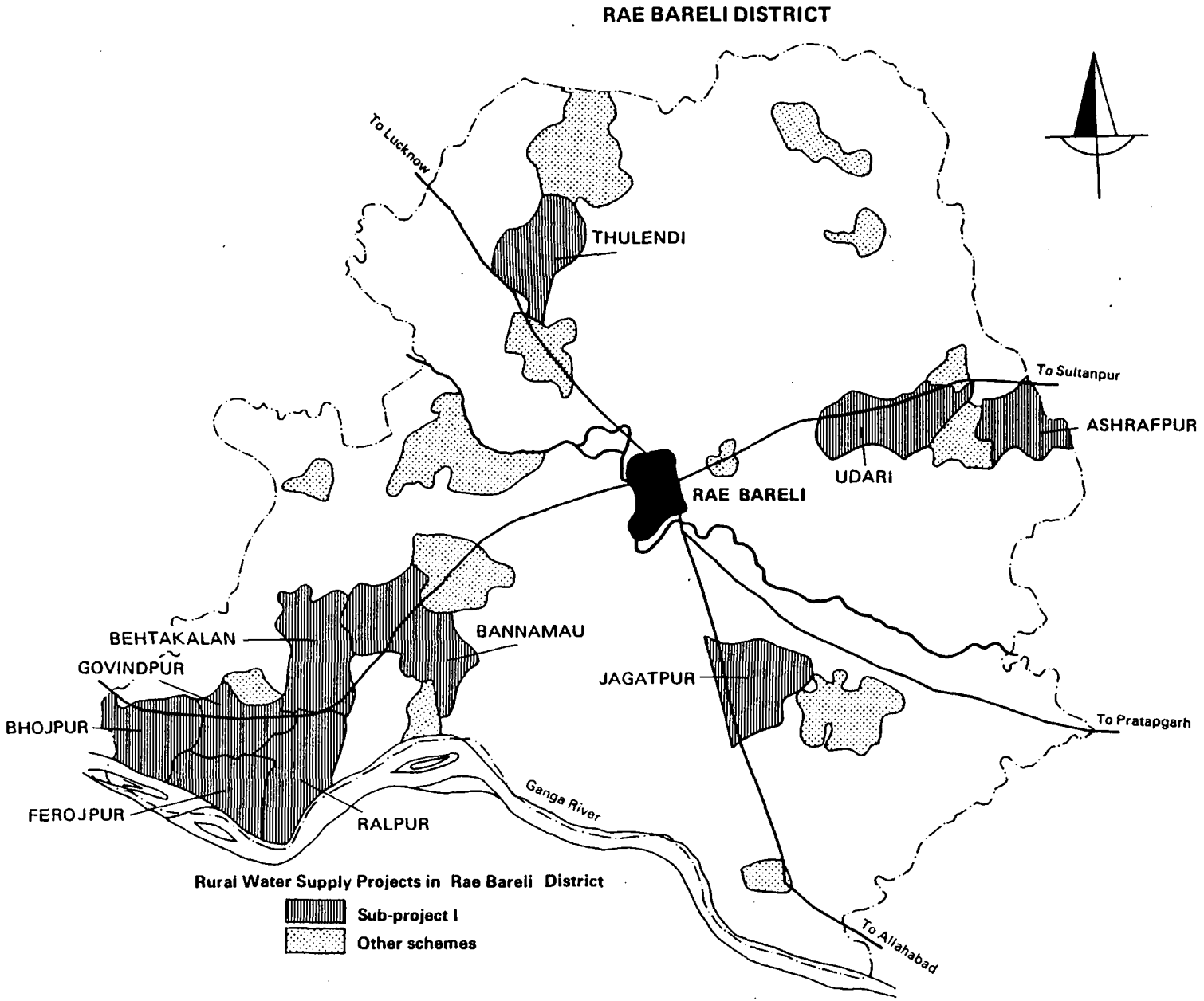
LIST OF RURAL WATER SUPPLY REPORTS, UTTAR PRADESH

Report No.	Dated	Subject	Sub-Project
UP-1	November 1978	Appraisal	East-I
UP-2	March 1979	Appraisal	West-I
UP-3	November 1979	Reappraisal	East-I
UP-4	April 1981	Progress evaluation Reappraisal	East-I West-I
UP-5	December 1981	Progress evaluation Reappraisal	East-I East-II
UP-6	March 1982	Hydro-geological appraisal 2, Preliminary Report,	West-I
UP-7	May 1982	Progress evaluation	East-I, -II
UP-8	February 1983	Comprehensive review and appraisal	East-I, -II West-I, -II
UP-9	October 1983	Progress evaluation	East-I
UP-10	October 1984	Progress evaluation	East-I, -II, -III West
UP-11	March 1985	Work plan for sanitation, drainage and health activities	East-I, -III, -IV
UP-12	May 1985	Progress evaluation Appraisal	East-I East-III, -IV
UP-13	October 1985	Progress evaluation Re-appraisal	East-I, -III East IV

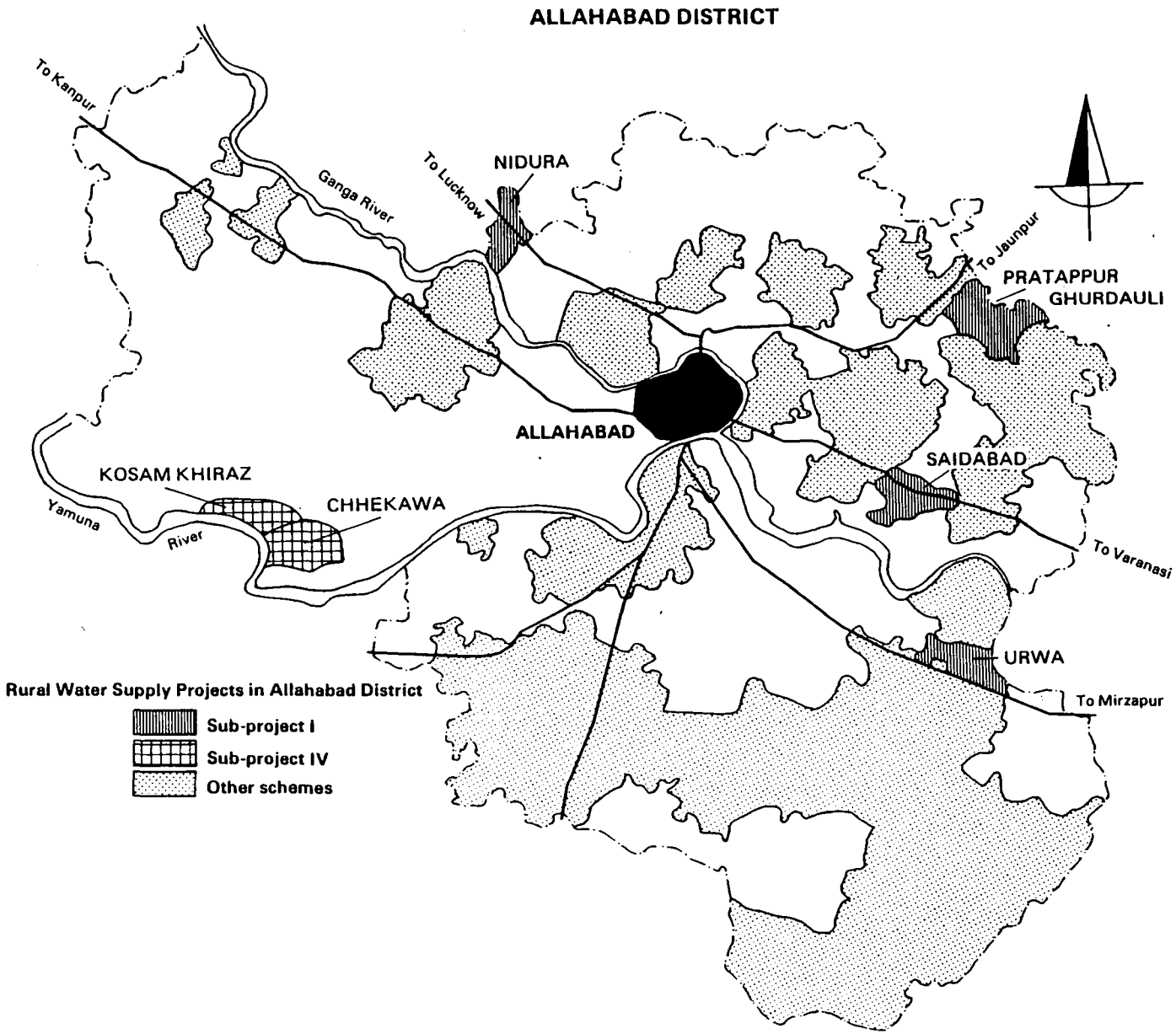
LIST OF ABBREVIATIONS

AC	: asbestos cement
AE	: assistant engineer
CE	: chief engineer
CI	: cast iron
CPHEEO	: Central Public Health & Environmental Engineering Organization
DCP	: Dutch Credit Progamme
EE	: executive engineer
E&M	: electrical and mechanical
ESR	: elevated service reservoir
GoI	: Government of India
HC	: house connection
HDPE	: high-density polyethylene
lpcd	: litres per capita and per day
O&M	: operation and maintenance
PA	: personal assistant
PHC	: Public Health Circle
PHE	: Public Health Engineering
PHMechC	: Public Health Mechanical Circle
PHPC	: Public Health Project Circle
PHSSubDiv	: Public Health Sanitary Sub-Division
PHWDiv	: Public Health Works Division
PPRD	: Project Preparation, Research and Development
PR	: public relations
RCC	: reinforced (cement) concrete
SC/ST	: scheduled castes/scheduled tribes
SE	: superintending engineer
SEB	: State Electricity Board
TW	: tubewell
UP	: Uttar Pradesh
UPJN	: Uttar Pradesh Jal Nigam
V.P.	: 'vandal-proof'
VT	: vertical turbine

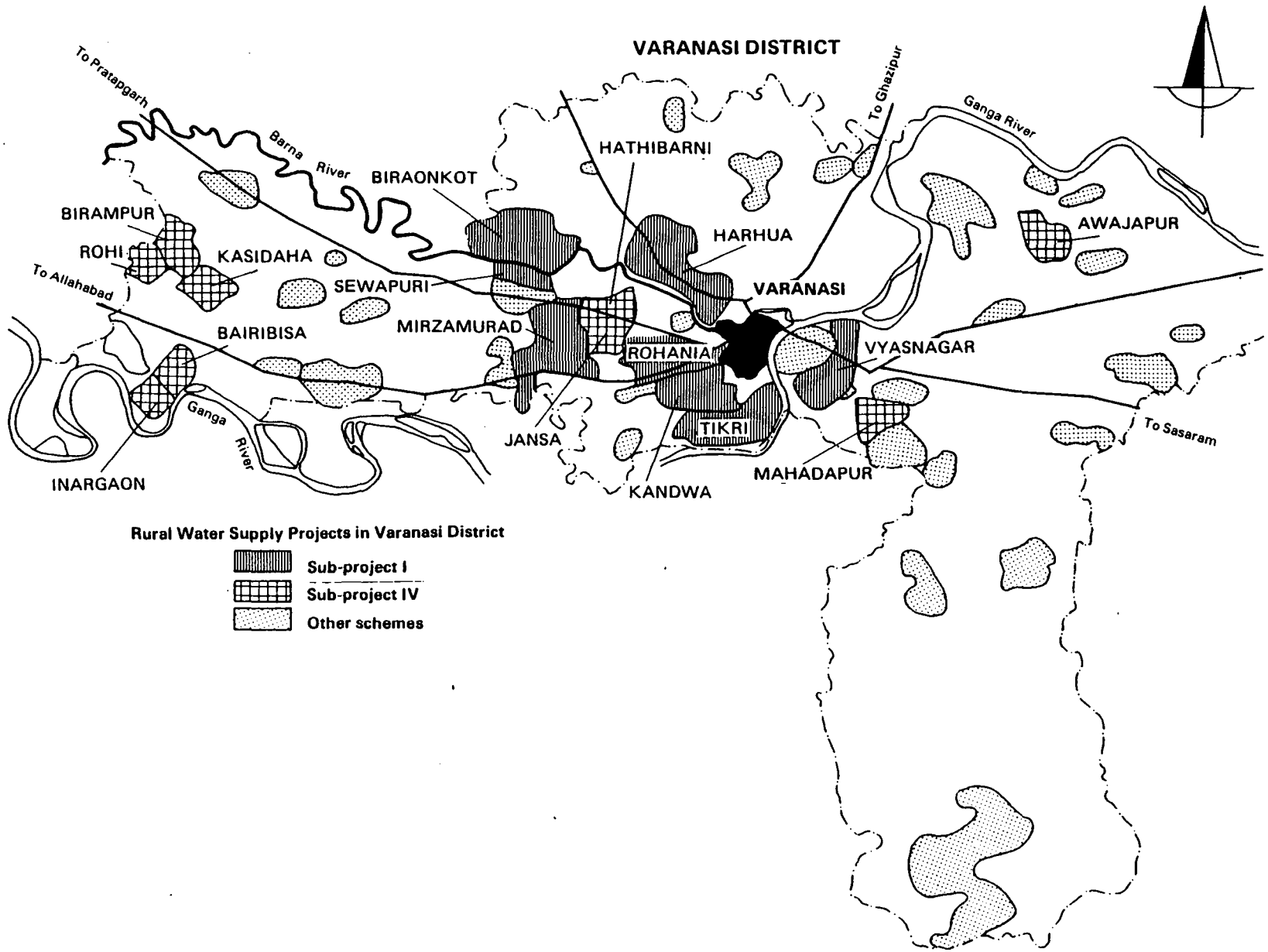

UTTAR KASHI
DEHRA DUN
TEHRI GARHWAL
CHAMOLI
PITHORA GARH
SAHARAN DUR
PAURI GARHWAL
ALMORA
MUZAFFAR NAGAR
BIJNOR
NAINI TAL
MELRUT
MORADA BAD
RAM PUR
PILIBHIT
BULAND SHAHR
BAREILY
KHERI LAKHIM PUR
BADAUN
SHAHJAHAN PUR
ALIGARH
ETAH
BAHRAICH
MATHURA
FARRUKHA BAD
SITA PUR
HARDOI
GONDA
GORAKH PUR
BASTI
AGRA
MAINPORI
LUCKNOW
BARA BANK
DEORIA
ETAWAH
UNNAO
FAIZABAD
KANPUR
RAEBARELI
SULTAN PUR
AZAM GARH
JALAUN
FATEH PUR
PRATAP GARH
BALLIA
JAUN PUR
GHAZI PUR
JHANSI
HAMIR PUR
BANDA
ALLAHABAD
VARANASI
MIRZA PUR
LALIT PUR
UTTAR PRADESH
INDIA


RAE BARELI DISTRICT
To Lucknow
THULENDI
To Sultanpur
ASHRAFPUR
UDARI
RAE BARELI
BEHTAKALAN
BANNAMAU
GOVINDPUR
JAGATPUR
BHOJPUR
To Pratapgarh
Ganga River
FEROJPUR
RALPUR
To Allahabad
Rural Water Supply Projects in Rae Bareli District
Sub-project I
Other schemes

UP 13


ALLAHABAD DISTRICT
To Kanpur
Ganga River
To Lucknow
NIDURA
To Jaunpur
PRATAPPUR
GHURDAULI
ALLAHABAD
SAIDABAD
KOSAM KHIRAZ
CHHEKAWA
Yamuna
River
To Varanasi
URWA
To Mirzapur
Rural Water Supply Projects in Allahabad District
Sub-project I
Sub-project IV
Other schemes

UP13


VARANASI DISTRICT
To Pratapgarh
Barna River
BIRAONKOT
HATHIBARNI
To Ghazipur
Ganga River
BIRAMPUR
ROHI
KASIDAHA
SEWAPURI
HARHUA
AWAJAPUR
VARANASI
To Allahabad
BAIRIBISA
MIRZAMURAD
ROHANIA
VYASNAGAR
Ganga River
JANSA
TIKRI
To Sasaram
INARGAON
KANDWA
MAHADAPUR
Rural Water Supply Projects in Varanasi District
Sub-project I
Sub-project IV
Other schemes

UP13

1. INTRODUCTION AND SUMMARY

In October 1985 the Indo-Dutch Review Mission UP-13 visited the State of Uttar Pradesh. This was the first visit of a review mission after the reorganization of the Ministry of Works and Housing, whereby this was divided into separate departments for urban and rural development, under different ministries. As a result of this, a new representative of CPHEEO participated in the mission, viz. Mr. A.K. Ghosh, Assistant Adviser CPHEEO-RWS. The other mission members were: Mr. J.A. Speets, Water Supply Coordinator at the Royal Netherlands Embassy, and Mr. R. Trietsch of DHV Consulting Engineers, as mission leader.

The mission had the following main tasks (see Annex A, Terms of Reference, for a detailed description):

1. To review the physical progress of Sub-Project I (East), with emphasis on the following aspects:
   - implementation of public standposts
   - policy regarding house connections vs. public standposts
   - financial procedures regarding financing of the project
2. To review the progress of Sub-Project III (hand pump schemes)
3. To check the project reports on the revised projects under Sub-Project IV

After its arrival in Lucknow the mission had extensive discussions with the Chairman and senior staff of the Uttar Pradesh Jal Nigam. In addition, discussions were held with the Minister of State for Housing and Urban Development, Mrs. Padma Seth, and with the Secretary to Government, Housing & Urban Development, Mr. Kamal Pandey.

Thereafter, the mission visited the three Districts involved: Rae Bareli, Allahabad and Varanasi (for the mission's itinerary see Annex B). Because of a number of holidays, the mission did not return to Lucknow directly after the field trip. The mission leader therefore had a separate session with the Managing Director and senior staff of the U.P. Jal Nigam in Lucknow, to discuss the mission's "Conclusions and Recommendations", after his participation in a mission to Gujarat.

The main conclusions of the mission may be summarized as follows:

1. <u>Progress of Sub-Project I (East)</u>

   Progress in especially Rae Bareli District has suffered badly from a combination of three factors:
   a. severe drought
   b. severe floods
   c. unprecedented shortage of funds available to the Uttar Pradesh State Government

   As a result of these, a shortage developed in manpower and funds for carrying out the ongoing activities. In Rae Bareli the available capacity was concentrated on the Udari scheme, which had the

most severe backlog, in order to get the schemes in the District at approximately the same level of completion.

In the Allahabad and Varanasi Districts almost all schemes have been commissioned in the meantime.

2. Public standposts

Most of the required number of public standposts (or: taps) have been constructed, especially in the Allahabad and Varanasi Districts, but their designs were found to be different in each of the Districts. As the public standposts are the most important means of direct contact between the consumer and the water supply undertaking, they should be of a very durable construction, and preferably tamper-proof. The mission was of the opinion that more attention should be paid to the structural aspects and standardization of the public standposts. For the new schemes under Sub-Project IV it was, therefore, recommended to have all cost calculations based on 'vandal-proof' standposts in reinforced concrete, with adequate drainage facilities. Also for the ongoing schemes in Rae Bareli District the standposts that still have to be constructed should be of a similar design.

The Jal Nigam undertook to prepare, at short notice, a table showing the planned and realized numbers of public standposts, as well as the present numbers of private connections, for each of the hamlets and villages of the schemes under Sub-project I.

In addition, field surveys will have to be carried out as to the actual yield of public standposts/taps, and actual water consumption per head, under field conditions. On the basis thereof, new requirements in terms of numbers of single- or multiple-tap standposts may have to be established, and the actual achievements checked against these.

3. Power supply

In Rae Bareli District, and to some extent also in Allahabad District, power that reaches the schemes through exempted feeders is not always of the correct voltage, so that the pumps cannot be operated during part of the time that power is available. The mission recommends that in these schemes voltage stabilizers be installed to overcome this problem. The costs involved are in the order of Rs. 50,000 per scheme.

4. Sub-Project III

The mission informed the U.P. Jal Nigam that the side letter on this project had been exchanged. The U.P. Jal Nigam undertook to start work on this Sub-Project immediately.

5. Sub-Project IV

The mission checked the revised project reports on all schemes under this Sub-Project. The calculation of the required numbers of public standposts needs to be corrected, as is the case for the implementation schedule. The mission therefore requested the Jal Nigam to prepare an Addendum to the Appraisal Report on Sub-Project IV that would cover the following aspects:

- revised estimate of numbers of standposts
- revised unit cost per standpost, on the basis of a 'vandal-proof' design in reinforced concrete, with sufficient slab dimensions and drainage facilities
- brief financial summary (one page) of the Sub-Project.

In addition, the Jal Nigam undertook to present a more realistic disbursement schedule for this Sub-Project, on the basis of Pert-type diagrams for each of the schemes, preferably with the aid of the computer facilities that it now has available. This information should be available well in advance of the next mission to Uttar Pradesh (expected in mid-April).

6. Financial procedures

The financial situation regarding the D.C.P. schemes in Uttar Pradesh during the last 6 months illustrates the ease with which funds that have been earmarked for bilateral projects are put to other use, at the sole discretion of the State Government, and with potentially disastrous effects to the progress of such projects.
The mission is of the opinion that a more direct relation between the work in the field and the bilateral financing, whereby funds provided for bilateral assistance projects in the State Plan Funds can be used for that purpose only, would be beneficial. It recommends that the Ministry of Finance, Department of Economic Affairs, of the Government of India study the matter in order to provide a solution to this problem.

2. SUB-PROJECT I (UP EAST)

2.1. Physical progress

2.1.1. General aspects

In April 1985, at the time of mission UP-12's visit, commissioning of the schemes in Rae Bareli was expected by July-September of 1985, except for the Udari scheme, which was expected to be ready by March 1986. For Allahabad District, all schemes were expected to be ready by July 1985, except for the exempted feeder to Pratappur, and for Varanasi District all schemes should be ready by September 1985 (provided that construction of the remaining standposts could start forthwith).

This target could not be realized as the result of a combination of three factors:

a. unprecedented drought conditions in part of the State
b. unprecedented floods in part of the State, especially the area of Lucknow and Rae Bareli District
c. an unprecedented shortage of funds at State level, caused by an overdraft of approx. Rs. 2,000 million of Central Govt. funds.

The effect of the first two factors, viz. a drain on manpower and funds, not only for the State in general, but more specifically for the Jal Nigam, was thus compounded by the fact that at State level funds were re-directed to combat the effects of the drought and floods, later followed by an almost complete drying up of all funds.
This situation has effectively hampered progress during most of the 6-month period since the visit of mission UP-12, especially in Rae Bareli District. As a division of the meagre resources over all ongoing projects would have had little effect, it was decided to concentrate on the scheme with the most severe backlog, i.e. the Udari scheme, to get the D.C.P. schemes in the district more on one line.
Consequently, what little progress there has been in Rae Bareli, has been in the Udari scheme. For the other schemes in the district, the expected month of commissioning has been effectively delayed by 6 months.

Since these factors were completely beyond the control of the implementing organization, it is the mission's opinion that the earlier recommendation made by mission UP-12, not to reimburse project expenditures for works executed after 1 January 1986, be reconsidered by the Netherlands Government. A time expansion of 6 months should be granted.

In Allahabad District all schemes have either been commissioned, or will be before the end of the year. In Varanasi District all schemes have been commissioned, albeit on the basis of a revised estimate of the required numbers of public standposts. This will be dealt with in more detail in chapter 2.2.

2.1.2. Progress of schemes in Rae Bareli District

The mission visited the D.C.P. schemes Thulendi, Ashrafpur, Udari and Jagatpur, a selection that was based mostly on accessibility, as parts of the rural areas could not be reached because of the floods (which had only just started to recede).

None of the schemes in Rae Bareli has been finally commissioned yet, because either the required number of public standposts has not been achieved, or other parts of the schemes are still under construction.

In 5 schemes the overhead tank is still under construction: in Bannamau and Behtakalan the tanks are all but finished, whereas in Udari, Ashrafpur and Thulendi the progress is between 35 and 60 percent. In Thulendi (progress: 60%) the contractor had virtually stopped working and has not even given the final payment to the local population that was hired as labourers. The contract has now been rescinded, and the work will continue departmentally, as is the case in all other schemes.

In Govindpur and Bhojpur the required numbers of public standposts have been constructed, but either the tubewells are not yet finished (Govindpur: 3rd tubewell not yet operational) or part of the distribution system is still missing (Bhojpur: 1.3 km of pipeline still to be laid). In Jagatpur the 3rd tubewell is not yet operational either, as is the case in Behtakalan.

Of the total requirement of 1859 public standposts, 1312 (or: 71%) have been constructed, whereas 17% of the planned number of private connections (1155 out of 6943) have been realized.

Except for Udari, where the required downpayment still has to be deposited, all exempted feeders have been commissioned. The power supply is still not reliable, however, because of voltage fluctuations that regularly render the operation of pumps impossible even though power is present. It is therefore recommended that all schemes in Rae Bareli, and possibly also in Allahabad, are equipped with voltage stabilizers. These are expected to cost approx. Rs. 20,000 apiece.

The mission recommends that the public standposts that still have to be constructed, are equipped with a reinforced concrete slab and adequate drainage facilities, in the same way as is recommended for Sub-Project IV (see paragraph 2.2.2.). It is also recommended that the planned inspection bungalow at Rae Bareli be constructed according to the standards that have been used e.g. in constructing the Public Works guest house there, and be provided with at least 3 suites.

The Superintending Engineer in charge of the works in Rae Bareli has undertaken to try and finalize the schemes, including the provision of voltage stabilizers and enhanced public standposts, within the available budget. The mission requests the Netherlands Government to allocate additional funds in case these measures would result in a cost overrun,

however. The Jal Nigam will present an estimate of the costs involved.

Final commissioning of the schemes in Rae Bareli District is expected by December 1985 (7 schemes) and March 1986 (2 schemes). The Udari scheme is now expected to be commissioned by June 1986. It is not yet clear, however, whether the exempted feeder to Udari will be ready by that time.

Detailed scheme-wise data on the progress of the schemes is given in Annex E. The expected months of commissioning mentioned there refer to the complete schemes (unless otherwise indicated), with the exception of the private connections, however, since their realization is not entirely in the hands of the Jal Nigam.

2.1.3. Progress of schemes in Allahabad District

The mission visited the Nidura and Saidabad schemes, and had discussions with the U.P.J.N. field staff on the progress of Sub-Project I as well as on the planned schemes for Sub-Project IV.

The schemes in Allahabad District have been commissioned in all respects, with the exception of the Pratappur scheme, where the required number of public standposts has not yet been constructed. Also the exempted feeder to this scheme has not yet been realized, as the power sub-station is not yet completed.

Detailed scheme-wise data on the progress of the schemes is given in Annex E.

2.1.4. Progress of schemes in Varanasi District

In Varanasi Districts the D.C.P. schemes Rohania and Kandwa were visited, the progress of the ongoing schemes was discussed, and the project reports on the schemes as proposed for Sub-Project IV were studied by the mission.

All schemes in Varanasi District have been commissioned in the meantime, whereby the number of standposts has been based on the original requirements, but with a deduction for the number of private connections that have been realized. A total of 1539 standposts, with 1782 taps, have been constructed, against a required number of taps of 1762. This will be discussed in more detail in chapter 2.2.

All exempted feeders have been commissioned, whereby it should be noted that the originally planned exempted feeder for Vyasnagar has been replaced by a connection to the regular feeder. This shows hardly any power interruption at all, because it feeds a local fertilizer plant. As a railway crossing would be involved in providing an exempted feeder here, with the inherent time-consuming process of obtaining permission from the railway authorities, it was decided to abolish the plans for a separate feeder. The trouble with the exempted feeder in Mirzamurad (dacoit-infested area) is continuing.

Detailed scheme-wise data on the progress of the schemes is given in Annex E.

2.2. Public standposts and private connections

The implementation of the required numbers of public standposts, of good quality, remains one of the major concerns of the mission. This subject, which has been discussed extensively at every visit of the mission, in the field as well as at the U.P.J.N. headquarters in Lucknow, is therefore dealt with in detail also in this report.

2.2.1. Public standposts realized

Table 2.1. (columns 1 through 11) shows the targetted and actual numbers of public standposts. A distinction is made between 'normal' and 'v.p.' ('vandal-proof') standposts, whereby the latter type should be that as recommended by earlier missions: constructed in reinforced concrete, with the piping fully enclosed in the concrete, with Jayson-type waste-not valves of sufficient capacity, and with adequate drainage facilities. Although not all these specifications have always been met, the 'vandal-proof' type as found in the field is undoubtedly superior to the 'normal' type. It had therefore been agreed upon, at an earlier stage, that whenever major repairs would be required for 'normal' public standposts, these would be replaced by the 'vandal-proof' type. The summary given in Table 2.1. is a preliminary one, however, as it was not always clear whether standposts were of the 'vandal-proof' type or not.

Compared with the required numbers of public standposts, the coverage is highest in Varanasi (87%), followed by Allahabad (76%) and Rae Bareli (71%). It is noted, however, that the coverage was not calculated in the same way for the different districts: for Rae Bareli the number of standposts has been used, for Allahabad the number of taps, and for Varanasi the number of taps while taking into account reduced targets because of the coverage by private connections.
It is clear that the total number of taps rather than the number of standposts is important, as a 2-tap public standpost obviously has a higher capacity than a 1-tap one. For that reason also the numbers of taps have been displayed (column 10). Comparing this number of taps with the required numbers of standposts (assuming that one tap can cater for a maximum of 250 persons, so that the number of taps may be substituted for the required number of public standposts, the following picture emerges (see column 11 of table 2.1):

Rae Bareli	coverage of	98 %
Allahabad	coverage of	94 %
Varanasi	coverage of	101 %

or: an over-all coverage of 99 %.

Table 2.1. *Situation of public standposts and private connections*

Scheme name:	Number of public standposts realized: single normal	single v.p.	double v.p.	total normal	total v.p.	TOTAL ALL	Standposts: Target	Standposts: completion (%)	Taps: Total	Taps: completion (%)	Old target	People/ S.P.	People/ H.C.	New target	S.P. Compl. (%)	Taps Compl. (%)	House connections: Target	House connections: Actual	House connections: (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ferozpur	48		15	48	15	63	124	51%	78	63%	124	136	10	113	56%	69%	380	150	39%
Ralpur	85		35	85	35	120	201	60%	155	77%	201	112	10	188	64%	83%	536	148	28%
Govindpur	80		32	80	32	112	112	100%	144	129%	112	181	10	106	106%	136%	476	115	24%
Bhojpur	84		40	84	40	124	124	100%	164	132%	124	191	10	103	120%	159%	556	400	72%
Thulendi	65		35	65	35	100	186	54%	135	73%	186	127	10	184	54%	73%	751	25	3%
Jagatpur	100	11	80	100	91	191	265	72%	271	102%	265	113	10	257	74%	105%	735	90	12%
Ashrafpur	60	2	25	60	27	87	180	48%	112	62%	180	134	10	177	49%	63%	633	45	7%
Udari	25		15	25	15	40	204	20%	55	27%	204	97	10	204	20%	27%	687	2	0%
Bannamau	111	6	129	111	135	246	240	103%	375	156%	240	153	10	234	105%	160%	984	92	9%
Behtakalan	122	6	101	122	107	229	223	103%	330	148%	223	167	10	218	105%	152%	1205	88	7%
RAE BARELI	780	25	507	780	507	1312	1859	71%	1819	98%	1859	139	10	1783	74%	102%	6943	1155	17%
Saidabad	79		46	79	46	125	169	74%	171	101%	169	161	10	141	89%	122%	337	458	136%
Nidura	77		34	77	34	111	145	77%	145	100%	145	181	10	122	91%	119%	300	410	137%
Pratappur	133			133	0	133	173	77%	133	77%	173	183	10	165	81%	81%	416	150	36%
Urwa	92		35	92	35	127	162	78%	162	101%	162	143	10	134	95%	121%	290	403	139%
ALLAHABAD	381	0	115	381	115	496	649	76%	611	94%	649	167	10	562	88%	109%	1343	1421	106%
Mirzamurad	147	20	31	147	51	198	229	86%	229	100%	266	162	10	230	86%	100%	580	589	102%
Tikri	142	21	26	142	47	189	215	88%	215	100%	209	229	10	187	101%	115%	410	495	121%
Sewapuri	60	17	21	60	38	98	119	82%	119	100%	117	197	10	108	91%	111%	215	185	86%
Harhua	236			236	0	236	216	109%	236	109%	236	189	10	204	116%	116%	550	605	110%
Biraonkot	202	12	25	202	37	239	264	91%	264	100%	264	178	10	241	99%	110%	600	416	69%
Vyasnagar	75	23	60	75	83	158	218	72%	218	100%	226	211	10	208	76%	105%	550	382	69%
Rohania	106	20	39	106	59	165	204	81%	204	100%	234	207	10	199	83%	103%	600	731	122%
Kandwa	194	21	41	194	62	256	297	86%	297	100%	323	149	10	274	85%	99%	555	341	61%
VARANASI	1162	134	243	1162	243	1539	1762	87%	1782	101%	1875	186	10	1676	92%	106%	4060	3744	92%
T O T A L :	2323	159	865	2323	865	3347	4270	78%	4213	99%	4383	165	10	4020	83%	105%	12346	6320	51%

Note:
1. v.p. = 'vandal-proof'
2. H.C. = house connection/private connection
3. S.P. = public standpost

The above comparison raises the following question, however: may the number of taps indeed be substituted for the number of public standposts, or:

1. is the capacity of one tap sufficient to cater for 250 persons?
2. are the multiple-tap standposts located in such a way that they can replace more than one standpost, or would the walking distance become too long/would people from different hamlets or different sections of the population have to use the same standpost, contrary to the original set-up?

Capacity of standpost taps

The capacity per tap is obviously important, as the number of public standposts is determined partly by the criterion that no more than 250 people should have to rely on one standpost. With a per capita consumption of 40 litres per day, any standpost should thus be able to provide 10,000 litres per day at the actual supply pressure. Assuming a total number of supply hours of between 6 and 8 per day, a standpost should thus be able to supply an average of between 20 and 30 litres per minute under maximum-load conditions. Earlier calculations (see report of mission UP-12, pages 16 and 17) show that the average number of people per public standpost is only between 120 and 160, so that the required supply capacity could be proportionally lower: between 10 and 20 litres per minute.

During the field visit of mission UP-13 to Varanasi District several spot checks were carried out on the actual supply capacity of public standposts and private connections. At that time it was found that the supply capacity per tap ranged from 12 to 14 l/min for public standposts and 6 - 8 l/min for private connections. It was also found, however, that the use of two taps of one standpost drastically reduced the output per tap: whereas in one case a single tap provided 12 l/min, opening the second tap reduced this to 7 l/min, thus resulting in a total supply of 14 l/min, only 17% higher than before.

Based on admittedly meagre data, the first impression would thus be that the average supply capacity per tap is only barely sufficient, and that a double-tap standpost yields hardly more than a single-tap one. It was found, however, that most standposts are provided with some kind of ferrule to reduce the outflow. This could be modified or removed, to allow a higher capacity per tap. No hard data is available on this subject, however, and the U.P. Jal Nigam is requested to provide additional information in this respect, to allow a determination of the actual capacity of the standposts as used in the field.

Location of multiple-tap standposts

Even if the capacity of standpost taps were to prove sufficient to cater for the normal demand, with or without modifications, the additional numbers of taps could only be taken into account when the originally required number of standposts would be in the same locality, catering for

the same section of the population (i.e. either SC/ST or the remaining population). Even in that situation, using one multiple-tap standpost rather than a number of single-tap standposts would only be warranted when this would not result in a walking distance in excess of 150 m, as has been agreed upon earlier. These aspects will have to be checked for the ongoing projects under Sub-Project I (East), and the Jal Nigam has been requested by the mission to provide updated versions of the lists with population data per hamlet and village, upon which the calculations of the required numbers of public standposts have been based. These lists would have to show the actual numbers of single- and multiple-tap standposts provided in each locality, together with the actual number of private connections, again per locality. Taking into account the number of people supplied through these private connections, the actually required number of standposts could then be checked.

In Table 2.1. the required numbers of public standposts are shown in column 8. As has been mentioned above, for Rae Bareli this target has been used for determining the degree of coverage, which is shown in column 9. For Allahabad District the required number of standposts was determined on the basis that each tap could provide 250 persons as a maximum, in fact translating 'standpost' by 'tap'. The resulting coverage is almost 100%, except for Pratappur. Would the same method be applied for Rae Bareli, the degree of completion there would be 98%.

For Varanasi District the numbers of people that are supplied through private connections have been taken into account. Whereas according to the local field staff the actual number of people supplied per private connection is in the order of 15, the table is based on an average of 10 persons per private connection. The allowable reduction of the required number of public standposts has been based furthermore on the average number of people per public standpost as following from the calculations mentioned in report UP-12, and as shown in column 13 of the table. The revised number of required public standposts is given in column 15. Column 16 shows the coverage in case only the number of standposts is taken into account, whereas column 17 shows the coverage in case each tap is assumed to be able to replace one public standpost according to the original criteria.

The over-all coverage in the first case is 83%, in the latter case: 105%. For Varanasi the latter approach has been followed, and the information to be provided by the Jal Nigam will have to indicate whether this approach is justified, especially regarding the aspects of geographical distribution of the standposts and supply capacity per tap.

A summary of the degree of coverage according to the 3 methods described above (compared with number of standposts, number of taps, or reduced number of taps after subtracting people with private connections) is given in Table 2.2.:

Table 2.2. Meeting of standpost targets, different methods

District	Degree of completion on the basis of:			
	Number of standposts	Number of taps	Modified number of standposts on basis of no. of HCs.	Modified number of taps
Rae Bareli	71 %	98 %	74 %	102 %
Allahabad	76 %	94 %	88 %	109 %
Varanasi	87 %	101 %	92 %	106 %
TOTAL	78 %	99 %	83 %	105 %

Even though this table indicates that the targets would have been reached on the basis of he modified number of taps required (taking the Districts as a whole), it is as yet doubtful whether this method may indeed be used. In addition, the situation per individual scheme may differ from the over-all result, as is shown in Table 2.1.

For that reason it is recommended that the construction of public standposts in Rae Bareli District continues on the basis of the required number of standposts rather than taps, unless it can be proven that using multiple-tap standposts would fulfill the original criteria in terms of supply capacity, separate standposts for the various social groups, and walking distance.

Also for the other Districts, a justification of the calculation method used will have to be provided by the U.P. Jal Nigam.

2.2.2. Types and construction of public standposts

Various types of public standposts have been used in the past, and even during the execution of the D.C.P. schemes the type of standpost to be used has been modified a few times. With the present set-up of the schemes, with their large numbers of public standposts, these constitute the most important part of the water supply schemes, as far as the consumers are concerned. With a design life of 30 years for the scheme as a whole, also the structural aspects of the individual public standposts should be such that a long life can be guaranteed. It is almost certain that this is not the case for the 'normal' type of standposts, which still account for 69 % of all standposts that have so far been constructed in the D.C.P. schemes. For that reason it was agreed earlier that whenever major repairs would be required for the 'normal' type of public standpost, these would not be carried out, but the standpost would be replaced by one of the so-called 'vandal-proof' types.

Designs for 'vandal-proof' standposts have been discussed by earlier missions, and various modifications of these have been used in the field, as is illustrated on pages 22 through 24.

A 'vandal-proof' standpost should conform to the following specifications:

- piping completely embedded in (reinforced) concrete
- provided with tamper-proof taps of sufficient capacity to supply water to a maximum of 250 people at the normal number of supply hours per day (e.g. Jayson-type taps)
- provided with a reinforced concrete slab (base plate) of sufficient dimensions (e.g. 2 m x 2 m), with a rim or gutter around it for channelling waste water to the drain
- provided with adequate drainage facilities, e.g. an open drain of at least 10 m length, leading to an area where the surplus water can be discharged without endangering the environment/ resulting in pools or muddy places, etc.

The types of 'vandal-proof' standposts that have been constructed so far meet these requirements only partly. Especially the slabs are often rather small, and never of reinforced concrete, while drainage facilities are grossly inadequate in most of the cases. After discussions on these aspects the U.P. Jal Nigam agreed to construct the remaining standposts in Rae Bareli according to the specifications mentioned above and also for the new Sub-Project IV these specifications would be used, to determine revised project costs (see chapter 4.2.).

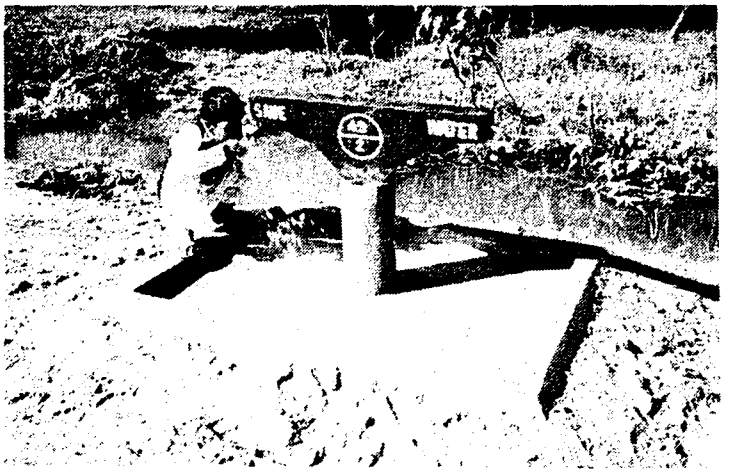
2.2.3. Private connections realized

The targetted and realized numbers of private connections are shown in columns 18 through 20 of Table 2.1. It is clear that there is a direct connection between the degree of completion of the individual schemes and the degree of realization of the target number of private connections: especially the schemes in Rae Bareli that lag behind in implementation show low numbers of private connections, whereas the results in the Districts Allahabad and Varanasi are much better. Over-all, the realization of the targetted numbers of private connections is only 17 % in Rae Bareli, as compared to 106 % in Allahabad and 92 % in Varanasi.

Especially after water has become regularly available in a particular scheme, requests for private connections are received in numbers, as is shown in the example of the Saidabad scheme in Allahabad (present coverage approx. 136 %):

1982/83	88 private connections
1983/84	162 private connections
1984/85	384 private connections
present	458 private connections

* risk of overdemand HCs ?
+ would group connections reduce this ?

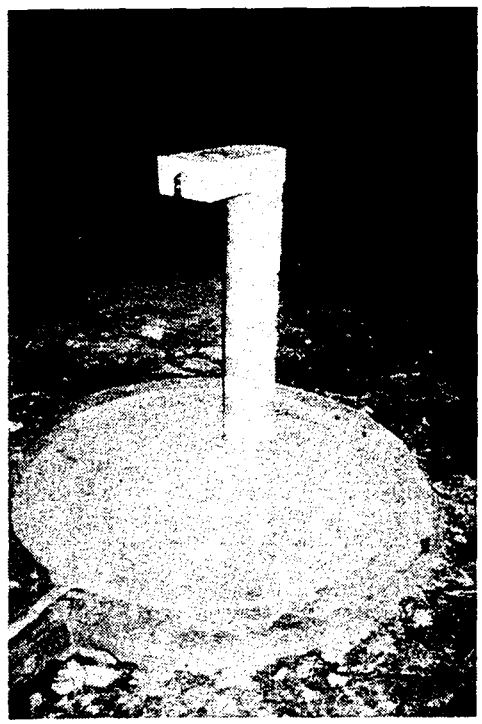


Thulendi scheme; 'vandal-proof' public standpost note identification number

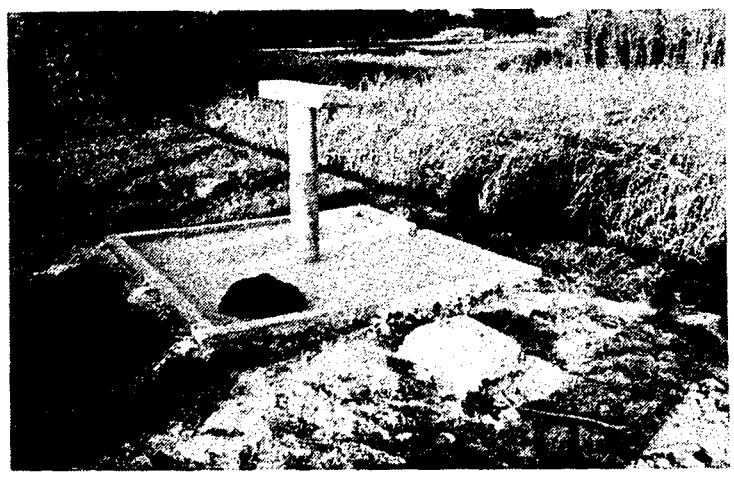
Thulendi scheme; 'Vandal-proof' public standpost

Thulendi scheme; 'vandal-proof' public standpost

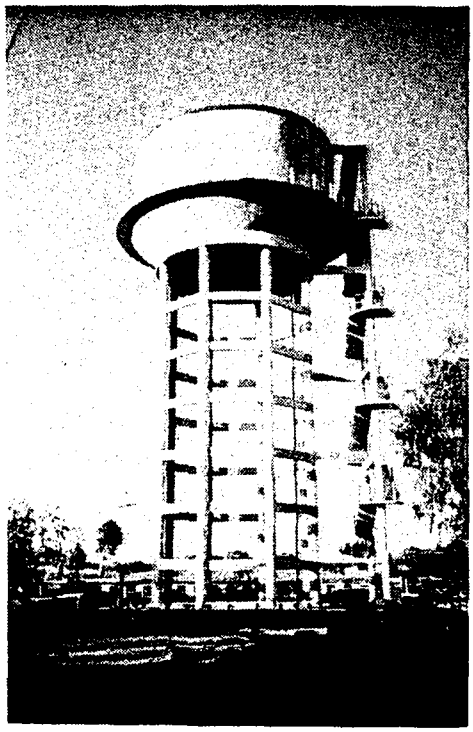
Ashrafpur scheme; stock of prefab public standposts



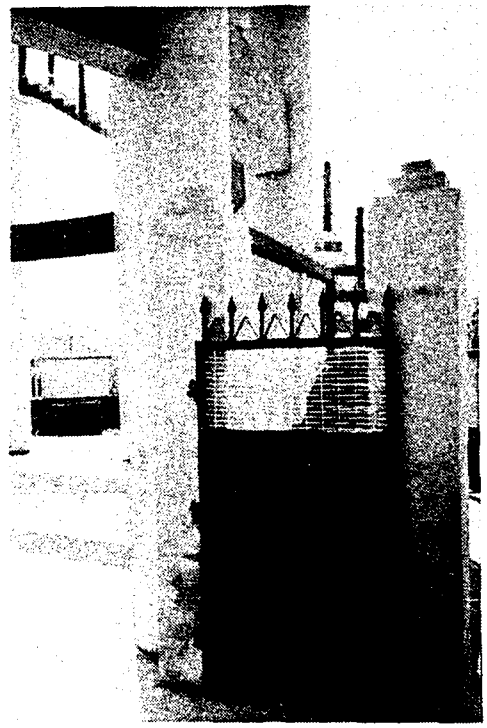
Saidabad scheme; 'vandal-proof' public standpost



Kandwa scheme; public standpost

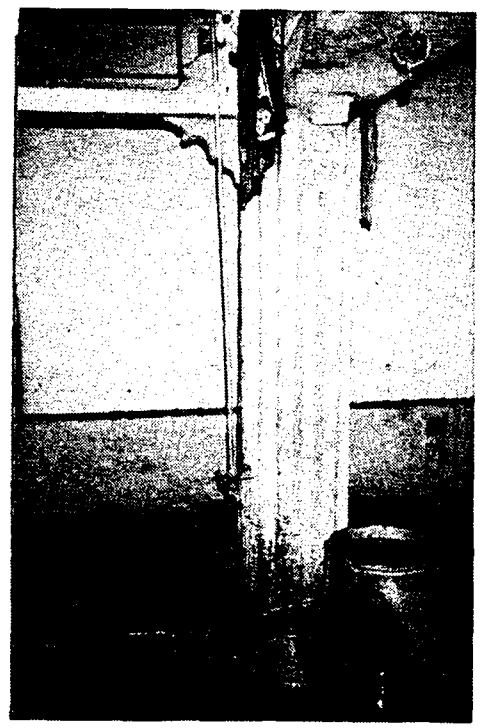


Jagatpur scheme; overhead tank



Rohania scheme; entrance to overhead tank restricted to waterworks staff

Kandwa scheme; checking yield of public standpost



Kandwa scheme; private connection supply up to 1st floor!

2.2.4. Income generation from private connections

One of the reasons mentioned by the U. P. Jal Nigam staff for advocating private connections is that they are in fact the only sources of revenue in the rural water supply schemes, thereby ensuring a financially more or less viable operation and maintenance of the schemes. At the request of the mission, figures relating to the actual income from these connections, as well as actual O&M expenditure have been collected by the U.P. Jal Nigam, as illustrated in Table 2.3. (next page).

This table clearly illustrates the relatively higher income from private connections in Allahabad as compared to Varanasi, which can be explained by the fact that in Allahabad all schemes have been supplying water (first through direct pumping) for several years already, whereas in Varanasi most schemes have been commissioned in the course of this year only.

In Allahabad District the actual income from private connections amounts to approximately one-third of the actual expenses; the remainder of the O&M costs is borne by the State Government. It is also obvious that in the case of Pratappur the lower income is caused at least partly by the fact that the exempted feeder has not yet been commissioned, thus reducing the incentive for the local population to apply for private connections.

Whereas the over-all income for the Allahabad schemes amounts to 28 % of the O&M costs, this figure is only 17 % in Varanasi, for the reasons as explained earlier.

The actual consumption of water through private connections in the Mirzamurad and Sewapuri schemes in Varanasi District is as follows:

Table 2.4. *Water consumption through private connections*

Scheme name:	Mirzamurad	Sewapuri
Minimum billed water consumption (m^3/month per private connection) :	13.42	13.42
Total number of private connections billed :	245	118
No. with less than min. consumption:	102	50
No. with minimum consumption :	77	46
No. with higher than min. cons. :	66	22
of which: 25 - 40 m^3/2 months *) :	21	11
40 - 50 m^3/2 months *) :	19	5
50 - 100 m^3/2 months *) :	20	4
100 - 140 m^3/2 months *) :	6	2

Note: *) ranges are approximate; slightly different per scheme

Table 2.3. *Expenditure/revenues, rural water supply schemes UP-EAST*

I. ALLAHABAD DISTRICT

No.	Name of the scheme	Present population (1985)	No. of H.C. up to 9/85	No. of stand posts	Actual expenditure in last 6 months (4/85 - 9/85)	Actual income in last six months (4/85 - 9/85)	Water production in m³ in in last six months (4/85 - 9/85)	Average cost of production (Rs/m³)
1	2	3	4	5	6	7	8	9
1	Saidabad W/S scheme	25,854	450	169	49,511.32	16,205.10	288,360	0.17
2	Nidura W/S scheme	23,865	410	145	40,896.00	15,289.00	255,060	0.16
3	Pratappur (G) W/S Scheme	30,584	150	133	48,300.00	4,803.40	210,900	0.23
4	Urwa W/S scheme	17,252	403	151	42,119.53	13,915.50	268,950	0.16

Note: H.C. = house connection

II. VARANASI DISTRICT

No.	Name of the scheme	Present population (1985)	No. of H.C. Aug/Sep 1985	No. of stand posts	Actual expenditure per month Aug - Sep 1985	Actual income per month Aug - Sep 1985	Water production in m³ per month Aug - Sep '85	Average cost of production (Rs/m³)	Average consumption (lpcd)
1	2	3	4	5	6	7	8	9	10
1	Mirzamurad W/S scheme	42,615	577	179	15,182.38	3,323.00	44,000	0.34	34 *)
2	Tikri W/S scheme	45,264	495	145	15,703.68	2,851.00	32,000	0.19	59
3	Sewapuri W/S scheme	37,737	183	68	12,875.60	1,051.00	70,100	0.18	61
4	Biraonkot W/S scheme	46,479	413	206	14,811.15	2,376.00	97,250	0.15	69
5	Harhua W/S scheme	33,562	605	236	15,782.90	3,485.00	67,250	0.24	66
6	Vyasnagar W/S scheme	44,119	364	95	14,794.05	2,093.50	101,650	0.15	76
7	Rohania W/S scheme	46,037	716	141	15,934.55	4,121.00	119,150	0.14	85
8	Kandwa W/S scheme	42,173	334	221	16,186.00	1,920.50	111,350	0.15	87

Note: *) Due to non-availability of exempted feeder: reduced production/increased unit cost.

At the prevailing water rates (Rs. 8 per month, per private connection (with ferrule), with a rebate of 10 % in case of timely payment), the actual costs per private connection are not covered only in those cases where the monthly consumption is more than 30 - 40 m^3, depending on the actual costs per m^3. As Table 2.4. shows, such high consumption is more or less exceptional (Mirzamurad: approx. 20 % of the total number of private connections; Sewapuri: approx. 10 %). This means that even in the case of a flat rate system, the private connections as a group pay more than their share, as has been the intention from the start.

For those schemes with water meters (which have to be installed in all D.C.P. schemes, according to the project set-up) the rate is Rs. 0.50 per m^3, which is more than sufficient to cover the actual costs, which range from Rs. 0.14 to Rs. 0.36 per cubic metre, as shown in Table 2.3.

2.2.5. Conclusions

From the preceding paragraphs the following conclusions can be drawn:

a. New standposts will have to be of an even better design, to guarantee a sufficiently long useful life and prevent unhygienic situations from developing around them;
b. The fulfilment of the required numbers of standposts will have to be checked on the basis of the geographical distribution of the standposts over the schemes, their coverage of the various groups of the population, the resulting maximum walking distances, the actual water consumption per head at the public standposts, and the actual supply capacity per standpost and/or per tap;
c. The ferrules found in most public standposts may have to be removed or exchanged, to meet the objectives; alternatively, the number of supply hours may have to be increased;
d. Water meters will have to be installed in all private connections, as agreed upon at the time the schemes were originally appraised;
e. When the abovementioned requirements are met, the private connections certainly contribute to meeting the O&M expenses, also of at least a part of the public standposts.

Due to shortage of time of the mission in relation to the complexity of the subject regarding higher capital investment for private house connections schemes, as indicated in Annex A: Terms of Reference, item 2.2. (c), the mission could not tackle this issue to a satisfactory extent, it is recommended to include this socio-economic topic in the study of design features as initiated in report UP-12, page 8.

2.3. Power supply

Exempted feeders have been commissioned in all but 4 of the D.C.P. schemes under Sub-Project I. In Udari (Rae Bareli) the required downpayment still has to be deposited (commissioning of the project is not expected before June 1986), in Pratappur (Allahabad) the required sub-station is still under construction, and in the two remaining schemes in Varanasi other solutions have been found: in Harhua a generating set has been installed; in Vyasnagar the reliability of the power supply via the regular feeder is such (almost 24 hours/day) that no additional measures are necessary.

In Rae Bareli District, and probably also in Allahabad District, the power, even when obtained through an exempted feeder, is not always suitable for driving pumps, as over- and under-voltages do occur. For that reason the mission agreed to recommend the use of voltage stabilizers in all D.C.P. schemes in Rae Bareli and Allahabad. According to the information supplied by the Varanasi field staff, no such problems do occur there.

The cost per voltage stabilizer is estimated at Rs. 15,000 - 20,000. In principle the U.P. Jal Nigam will try to meet these extra costs from contingencies, but a cost estimate (including other additional costs) will be prepared and submitted for approval by the Governments of India and The Netherlands, in case the contingencies prove to be inadequate.

During its field visit, the mission checked the power availability at a number of schemes. With hardly any exception, power was available at the time of the mission's visit. Excerpts from log books kept at the scheme headworks give the following picture:

Ashrafpur

Exempted feeder suffered break-down due to heavy floods. As approaching the area is next to impossible, repairs could not yet be carried out and power is obtained from the rural feeder.

In the period from 1 October to 17 October 1985, power has been completely absent for 2 days; for the remaining days power has been available between 2.45 hours and 10.40 hours per day, with an average of approx. 6.30 hours/day. Though far from being acceptable as a rule, this situation is reasonable in view of the existing emergency situation because of the floods.

Saidabad

July:
average : 11.36 hours of power per day
minimum : 5.50 hours of power per day
maximum : 21.40 hours of power per day
maximum voltage : 460 V
minimum voltage : 380 V
average number of pumping hours: 11.13 hours/day

August:	average	: 14.23 hours of power per day
	minimum	: 4.20 hours of power per day
	maximum	: 21.20 hours of power per day
	maximum voltage	: 460 V
	minimum voltage	: 380 V
	average number of pumping hours: 13.49 hours/day	
September:	average	: 15.11 hours of power per day
	minimum	: 4.05 hours of power per day
	maximum	: 21.15 hours of power per day
	maximum voltage	: 460 V
	minimum voltage	: 380 V
	average number of pumping hours: 13.51 hours/day	

According to the U.P. Jal Nigam field staff, the sub-station that feeds the exempted feeder often does not get power continuously itself. This situation is obviously undesirable, and contrary to the very essence of an exempted feeder. The U.P. Jal Nigam is therefore requested to again contact its counterparts of the U.P. State Electricity Board, and request an uninterrupted supply on these exempted feeders.

In case such a guarantee cannot be obtained, the matter of power supply to the schemes may have to be re-examined, especially for schemes that still have to be built, or for which the exempted feeder still has to be installed.

2.4. Operation and maintenance

Now that most schemes have been or will commissioned within a short time, the aspect of operation and maintenance merits special attention. Aspects that need special emphasis are the matter of the supply hours, and the monitoring of the functioning of the works in total.

2.4.1. Supply hours

The D.C.P. schemes have been designed on the basis of a maximum of 16 hours' pumping per tubewell, and continuous supply of water throughout the day. In practice the first is not yet required, and the latter is not realized as the number of supply hours is purposely restricted. This is done partly to reduce operational expenses, and partly to reduce wastage of water at public standposts.

According to the field staff, the local population will not collect water for long periods of the day, as they are engaged in agricultural activities. A block supply of water would thus also suit the population, apart from the other reasons for deciding on such a supply.

The consequences of deciding on an operational schedule that clearly differs from that used in the design, are in practice a reduction in available capacity because actual peak loads are higher than those taken into account at the time of designing the scheme. This matter has been dealt with in more detail in report UP-8 (pages 19 and further).

An additional problem is the fact that the reduction in number of supply hours jeopardizes the supply to the consumers also in the sense that the public standposts may not be able to cope with the demand in the limited time that water is supplied.

The calculation given in paragraph 2.2. clearly shows that at a total of 6 to 8 supply hours per day the capacity per public standpost may become insufficient. When confronted with this problem, the U. P. Jal Nigam field staff mentioned that in case the capacity of the public standposts really would be inadequate, this would be indicated by long queues of people waiting for their turn. Though this situation was not encountered by the mission, it cannot be construed as proof that the present arrangement is indeed adequate. The U.P. Jal Nigam is therefore requested to check the actual consumption of the rural population, in terms of litres per capita and per day, by field observation at a number of standposts. The results of such spot checks could later be used to decide to what extent a reduced number of supply hours is indeed acceptable.

2.4.2. Monitoring of scheme operation

One of the most direct ways of checking that the schemes are operating to the satisfaction of the local population, is to have the operation monitored on a very regular basis. This implies that not only the field staff in charge of operating the headworks and maintaining the distribu-

tion system should regularly check the situation in all villages under the scheme, but also U.P. Jal Nigam staff of a higher level will have to monitor the performance of their subordinate staff, by carrying out spot checks on the physical appearance, supply pressure and water quality of the public standposts and other parts of the distribution system in the various schemes, whenever they are on inspection visits. It is recommended, therefore, that such staff be equipped with residual chlorine comparators, to perform spot checks on the level of chlorination.

In some cases action has already been taken to this effect, but a stricter and more general enforcement may be required, possibly linked with an incentive drive to upgrade the appearance and operation of rural water supply systems in general. A bonus system for well-operated schemes may also prove beneficial to the over-all effect of the water supply.

The mission noted that in several schemes the public standposts had been given identification numbers, which facilitates reporting malfunctions and reporting on the situation of individual standposts (see also page 22). It is recommended that this is done in all schemes under the Dutch Credit Programme.

Checking the water quality, other than the residual chlorine level, on a regular basis, will have to be institutionalized. Regional laboratories are being constructed under Sub-Projects I and IV of the D.C.P. programme, and it is important that they are made operational within as short a period as possible. No final dates for commissioning of these laboratories could yet be given, however.

2.5. Project duration

In chapter 2.1. the physical progress of the schemes under Sub-Project I has been described, as well as the reasons for delays in commissioning. Apart from the question whether the calculation of the revised standpost targets will prove to be acceptable, all schemes in varanasi and all but one schemes in Allahabad have been commissioned, whereas commissioning of the schemes in Rae Bareli will take up to June 1986.

Table 2.5. indicates the presently expected months of commissioning:

Table 2.5 *Estimated commissioning of DCP schemes*

District	Scheme	Probable month of commissioning as estimated per: Original	Oct.'84	Apr.'85	Oct.'85
RAE BARELI	Ferozpur	3-82	3-85	7-85	12-85
	Ralpur	3-82	3-85	7-85	12-85
	Govindpur	3-82	3-85	7-85	12-85
	Bhojpur	3-82	3-85	7-85	12-85
	Thulendi	3-82	3-85	9-85	3-86
	Jagatpur	3-82	3-85	7-85	12-85
	Ashrafpur	3-82	3-85	9-85	3-86
	Udari	3-82	9-85	3-86	6-86
	Bannamau	3-82	3-85	5-85	12-85
	Behtakalan	3-82	3-85	6-85	12-85
ALLAHABAD	Saidabad	3-82	3-85	7-85	READY
	Nidura	3-82	3-85	7-85	READY
	Pratappur	3-82	3-85	7-85	11-85
	Urwa	3-82	3-85	7-85	READY
VARANASI	Mirzamurad	3-82	3-85	9-85	READY
	Tikri	3-82	3-85	9-85	READY
	Sewapuri	3-82	3-85	9-85	READY
	Harhua	3-82	3-85	9-85	READY
	Biraonkot	3-82	3-85	9-85	READY
	Vyasnagar	3-82	3-85	9-85	READY
	Rohania	3-82	3-85	9-85	READY
	Kandwa	3-82	3-85	9-85	READY

The indicated months of commissioning refer to the completion of the schemes including the required numbers of public standposts (with the provisions as mentioned in paragraph 2.2.), but excluding the private connections, regional laboratories, and possibly the exempted feeder.

2.6. Project costs

Table 2.6. shows the expenditures for Sub-project I. As the reimbursement claim over the period ending June 1985 was not available to the mission, the expenditures over that quarter are approximate only, as are the anticipated further expenditures. The expenditures over the project period are graphically represented in Fig. 2.1.

Table 2.6. *Expenditures Sub-Project I (East)*

Claim dated	Claim No.	Period ending	Claimed (Rs.)	Cumulative (Rs.)
../../..	1	Dec'80	23,874,003.32	23,874,003.32
10/09/81	2	Mar'81	20,626,368.34	44,500,371.66
18/09/81	3	Jun'81	7,237,917.75	51,738,289.41
05/12/81	4	Sep'81	6,151,065.86	57,889,355.27
20/04/82	5	Dec'81	5,276,059.25	63,165,414.52
15/06/82	6	Mar'82	10,371,068.29	73,536,482.81
01/10/82	7	Jun'82	7,634,362.72	81,170,845.53
21/12/82	8	Sep'82	8,147,685.13	89,318,530.66
09/03/83	9	Dec'82	5,036,836.79	94,355,367.45
26/03/83	10	Feb'83	3,044,948.71	97,400,316.16
03/06/83	11	Mar'83	9,043,650.96	106,443,967.12
03/10/83	12	Jun'83	2,665,345.71	109,109,312.83
09/12/83	13	Sep'83	4,377,681.78	113,486,994.61
13/02/84	14	Dec'83	4,358,212.73	117,845,207.34
02/04/84	15	Feb'84	5,613,486.94	123,458,694.28
19/05/84	16	Mar'84	4,546,211.71	128,004,905.99
24/08/84	17	Jun'84	1,420,427.15	129,425,333.14
15/11/84	18	Sep'84	3,911,116.39	133,336,449.53
15/03/85	19	Dec'84	6,069,167.38	139,405,616.91
01/05/85	20	Mar'85	8,213,949.32	147,619,566.23
../../85	21	Jun'85	1,029,433.77	148,649,000.00
../../..	22	Sep'85	2,368,000.00	151,017,000.00
../../..	23	Dec'85	2,500,000.00	153,517,000.00
../../..	24	Mar'86	3,087,800.00	156,604,800.00

Note: the amounts of claims 22 and later are anticipated.

To the total project cost according to the existing estimates, the cost of upgrading the remaining public standposts and of providing voltage stabilizers may have to be added, in case these costs cannot be met from the contingencies. A cost estimate will be prepared by the U.P. Jal Nigam.

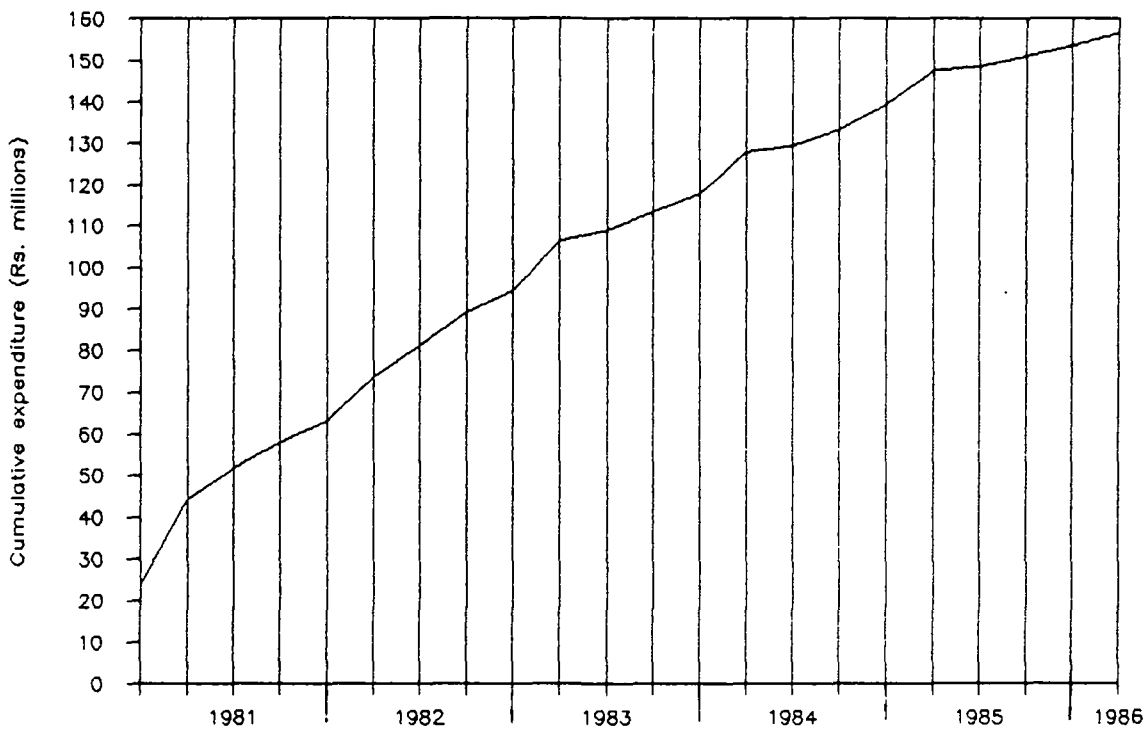


Fig. 2.1. *Expenditures Sub-project I (East), Uttar Pradesh*

(Expenditures after June 1985 are anticipated)

3. SUB-PROJECT III (HAND PUMP SCHEMES)

The mission informed the U.P. Jal Nigam that the side letter on this Sub-Project had been exchanged. The U.P. Jal Nigam undertook to start activities on this project forthwith, including ordering the required hand pumps.

4. SUB-PROJECT IV (U.P. EAST)

4.1. Appraisal report

4.1.1. General

In April 1985 mission UP-12 received a "Report for pre-appraisal of Sub-Project II (East) (revised), Instalment-I for Varanasi and Allahabad Districts". On the basis of this report and the available project documents (those for the Mahadapur and Kosam Khiraz schemes were not available at the time), the design criteria and other aspects of the schemes were discussed.

The schemes were set up according to the same, accepted, criteria that have been used for Sub-Project I. For that reason the mission could accept the schemes in principle, but with two important exceptions:

a. the design population
b. the implementation schedule.

The mission was of the opinion that the population growth rates were too low in comparison with those found by comparing the 1971 and 1981 census data. In addition, the implementation schedule used was based on a commencement of activities for Sub-Project IV in mid-1985, which was considered unrealistic.

For that reason the U.P. Jal Nigam was asked to recast the project designs for all schemes except Bairibisa, Inargaon and Hathi Barni, where the resulting design period (after taking into account a more realistic population growth) was still acceptable.

The projects have been adapted accordingly, and an "Appraisal Report Sub-Project IV, Districts Allahabad and Varanasi" of June 1985 has been prepared by the U.P. Jal Nigam. However, at the time of mission UP-13's visit, only the representative from CPHEEO was in the possession of a copy of the report. Notwithstanding very specific promises given by the U.P. Jal Nigam earlier, no copies of the report had been sent to the Royal Netherlands Embassy.

The result of this was twofold:

- during the bilateral negotiations between representatives from the Governments of India and of The Netherlands, no hard information was available on the projects under Sub-project IV, although these negotiations were meant to decide on new projects to be included in the Dutch assistance package. This rendered it impossible to have an appraisal carried out on behalf of the Netherlands Government, and resulted in an unnecessary delay in processing the proposed schemes.
- the mission had no possibility to study the appraisal report on the revised projects until after sufficient copies had been made available, only just before the start of the mission's

field trip.
Also in this case unnecessary delays are the result of this non-availability of information.

This and earlier missions have repeatedly requested the U.P. Jal Nigam to send progress reports, appraisal reports, and other documents well in time, to give the Netherlands Government as well as appraisal missions the relevant information as early as possible, a situation that can only speed up the further administrative processing of the projects.

For reasons that are not entirely clear to the mission, the U.P. Jal Nigam has always been hesitant to send this kind of advance information. Although the mission agrees that the official channels have to be used in the final processing of the projects, advance information, sent directly from the U.P. Jal Nigam to the Royal Netherlands Embassy, will certainly speed up the process, as preparatory action can already have been taken at the moment the official reports reach the Embassy.
This matter has been taken up also with the Joint Secretary, Ministry of Agriculture and Rural Development, Mr. A.K. Rastogi, who fully endorsed the (unofficial) direct sending of reports etc. to the Royal Netherlands Embassy. The U.P. Jal Nigam is therefore requested to follow that course of action in the future, to prevent unnecessary delays.

The mission has studied the Appraisal Report on the recast schemes under Sub-Project IV, and in general agrees with the set-up. A few minor aspects will still have to be covered, which could be done in an Addendum to the Appraisal Report, to be submitted by the U.P. Jal Nigam as soon as possible. This will be dealt with in some detail in paragraph 4.2.

The main points for rejection of most of the original schemes, viz. the population projections and the implementation schedule, are discussed in the following paragraphs.

4.1.2. Population projections

Revised population projections have been made for all of the schemes that had to be recast. The mission checked all project reports and found the new calculations acceptable. A summary of these new data, as well as revised cost estimates, are given in Table 4.1. on the next page.

More detailed descriptions of the newly recast schemes are given in Annex G to this report.

Table 4.1. *Summary of salient features, Sub-Project IV*

Scheme name	No. of inhabited villages	No. of scarcity villages	Design population 2019	Numbers of stand-post taps	Numbers of private connections	People per stand-post	Capital cost (Rs. millions)
VARANASI							
Rohi	35	35	49,850	116	192	193	11.033
Kasidaha	11	11	45,400	86	164	222	8.939
Birampur	17	17	48,600	81	142	205	10.170
Bairibisa	17	7	36,680	93	171	215	9.298
Inargaon	20	20	36,500	97	169	203	9.117
Mahadapur	13	13	21,520	63	115	213	7.416
Awajapur	16	16	23,980	69	115	194	7.400
Hathi Barni	26	26	25,860	97	132	159	7.214
Jansa	21	21	31,270	84	137	190	7.766
ALLAHABAD							
Chhekawa	11	8	30,810	83	240	199	10.556
Kosam Khiraz	12	10	33,660	91	267	202	15.132
T O T A L	199	184	384,000	960	1,844	199	104.041

4.1.3. Public standposts

The mission checked the numbers of public standposts as mentioned in the revised project documents, and found that they had been based on the total population per village, rather than on the population for each individual village or hamlet. As a result of this, the total number of standposts incorporated in the project reports is too low, in the opinion of the mission. After discussions on this aspect, the U.P. Jal Nigam agreed to calculate the required numbers of public standposts in exactly the same way as had been done for Sub-Project I, and to provide lists with a hamlet-wise breakdown of population and the resulting numbers of public standposts.

As preparing such lists is expected to take some time, which would again delay the further processing of Sub-project IV, it was agreed that a calculation of the cost consequences would be based on the following:

a. total required number of public standposts to be determined on the basis of one public standpost per 150 persons, this being the over-all ratio as calculated for Sub-Project I (see report UP-12, page 16).

b. unit cost per public standpost to be based on the 'vandal-proof' design as discussed in paragraph 2.2.2.

4.1.4. Implementation schedule

The new implementation schedule assumes a start of the project per mid-1986, and commissioning by the end of the year 1989. Although this appears to be a realistic time schedule, the mission stressed the importance of a tight monitoring of the progress of the schemes, to prevent the delays that have plagued Sub-Project I from happening also in Sub-Project IV. The mission therefore recommended that the U.P. Jal Nigam prepare Pert-type diagrams for each of the schemes, and use these diagrams for monitoring purposes also. The use of the computer equipment that is now available at the Jal Nigam headquarters could facilitate such monitoring enormously.

The disbursement schedule given in the Appraisal report is shown graphically in Fig. 4.1. below. The figure illustrates that the assumed disbursements are almost linear in time, which is hardly possible. The U.P. Jal Nigam was therefore requested to use the Pert-type diagrams also for establishing a more accurate disbursement schedule. This was agreed upon.

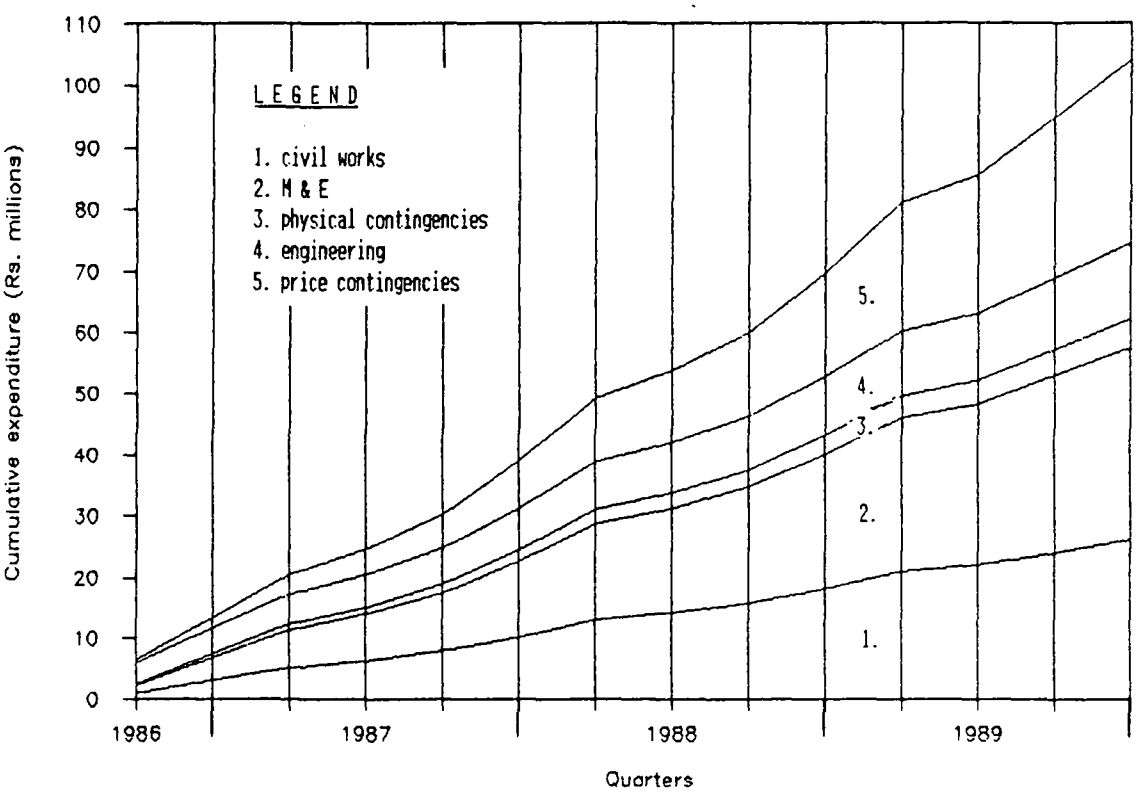


Fig. 4.1. Anticipated disbursement schedule Sub-Project IV

4.2. Addendum to Appraisal Report

As has been mentioned earlier, some additional information is required before the Appraisal Report on Sub-Project IV can be accepted entirely. The mission therefore agreed with the U.P. Jal Nigam that the latter would prepare an Addendum to the Appraisal Report, to be reviewed as one entity with the report itself, rather than prepare a completely new report.

The addendum should contain the following information:

1. a corrected estimate of the required numbers of public standposts. For the addendum itself this could be done on the basis of an over-all average of 150 people per public standpost. Later on, final calculations, based on a break-down of actual population per village and hamlet would be required
2. revised unit costs per public standpost, on the basis of the enhanced 'vandal-proof' design mentioned in paragraph 2.2.2.
3. an indication of the planned locations of inspection bungalows and laboratories included in Sub-projects I and IV
4. a brief financial summary, based on the total cost of all schemes together, taking into account the additional costs because of the larger number of standposts, with higher unit costs, according to the format shown in the addendum to the mission's "Conclusions and Recommendations" (see Annex D).

Note: The 'Appraisal Report' referred to above, is the report prepared by the Appraisal Cell of the Uttar Pradesh Jal Nigam, as the result of their scrutinizing the project documents submitted by the field staff.
In addition, a separate appraisal may be carried out on behalf of the Netherlands authorities.

5. FINANCIAL PROCEDURES

While describing the progress of the schemes, especially those in Rae Bareli District, it was mentioned that, due to a number of reasons, funds that had been earmarked for the D.C.P. schemes where either in fact not available or had been used for other purposes.

However understandable rechannelling funds may be in case of emergencies, the fact that droughts and floods are an almost annually recurring phenomenon in Uttar Pradesh, renders this system a potentially severe constraint for the realization of the D.C.P. projects.

Especially the fact that the bilateral assistance funds are incorporated in the regular Plan Funds for the State, renders them liable to being used for other purposes, at the sole discretion of the State Government. As the donor agency only reimburses expenses on the basis of reimbursement claims, and even then only to the Government of India, there is hardly any directly visible link between the ongoing activities and the bilateral financing.

Even though there has been an improvement in the sense that the D.C.P. have been removed from the District Plans, and put back in the State Plan, the mission is of the opinion that a more direct linking between the allocation of funds by bilateral donor agencies and the actual projects is beneficial. Preferably a system should be set up, whereby the funds that have been earmarked for bilateral asistance projects can be used only for those projects, even when they are included in the regular State Plan Funds.

The Ministry of Finance, Department of Economic Affairs, of the Government of India may look into this matter, to provide a solution to the abovementioned problem.

ANNEX A

TERMS OF REFERENCE FOR REVIEW MISSION UP-13 TO UTTAR PRADESH

1. O B J E C T I V E

The mission is to evaluate and to report on the position of the so-called 'Dutch Credit Programme' in Uttar Pradesh.
In particular the attention will be on the relation between physical achievements and the process of providing funds to the projects.

2. T A S K S

2.1 General

The description of the mission's task hereunder is to be regarded as indicative and not exhaustive. Therefore the mission is expected to initiate any relevant subject deemed directly useful in the present context of the water supply programme.

2.2 Detailed description

(a) Review the physical progress in the sub project East I.

(b) With regard to the previous review/appraisal report no. UP-12, the mission will discuss and come to a final agreement with the UP Jal Nigam management and field staff on the aspects of the number, location and type of design of public standposts. This issue has to be interrelated with recent developments in the implementation of 'private connections'.

(c) The mission will report on their own findings and the experience of the Jal Nigam field staff so far acquired, in execution of house connections, merits and de-merits will be described as well as first impression as to the financial feasibility (higher investment cost against revenue to be collected) of the policy towards 'house connections'.

(d) The mission will evaluate existing financial procedures as to the pre-financing of the projects on state level.
Possible improvements and streamlining of these procedures may be recommended in consultation(s) with the local administration and be specifically aimed at benefitting the newly proposed programme (vide report UP-12).

(e) Under the assumption that de side letter for the sub project III (handpumps) has been exchanged, the mission will provide a summary of activities taken up by the Jal Nigam for the start of this project.

(f) In pursuance of the initiative for a comprehensive study of design parameters for rural water supply as briefly indicated in report UP-12, page 8, the mission will have discussions with parties concerned (e.g. Ministry of Works & Housing, Jal Nigam staff, other donors).

(g) The mission will have a final check of the recast project reports (11 projects) for the sub IV programme with regard to proper inclusion of design criteria as agreed upon during the previous mission's visit (UP-12, april 1985).

(h) Review of disbursement claims since the previous mission.

3. A D D I T I O N A L R E M A R K S

The definition of the tasks for the mission under point 2 does indicate that the main emphasis is focussed towards institutional and design matters rather than to a detailed review of projects progress. It is therefore justified to reduce the timeconsuming field visits to a minimum in favour of the other aspects.

4. T E A M C O M P O S I T I O N

Mr R. Trietsch - team leader, senior water supply engineer, DHV Consultants, the Netherlands

Mr A.K. Sen Gupta - assistant adviser CPHEEO (Ministry of Works and Housing).

The Water Supply Coordinator residing at the Royal Netherlands Embassy in New Delhi, Mr J.A. Speets, will accompany the team on a part-time basis.
The Water Supply Coordinator has to be consulted before additional expertise and/or services can be added to the mission, if so required.

5. T I M I N G

Most likely the mission starts its activities by October 7th, 1985 and will last approximately one week. Detailed data however will have to be established yet, depending on the availability of the missionleader.
Returning from Uttar Pradesh will not be later than 13th October, 1985 in order to enable Mr R. Trietsch to participate a few days as a senior adviser to the comprehensive evaluation appraisal mission for the Gujarat Water Supply Programme.

6. R E P O R T I N G A N D C O N T A C T S

The mission will draft its main conclusions and recommendations while in Uttar Pradesh and ascertain that the same is discussed with the competent authorities before leaving. De-briefing sessions with ministries involved and at the Royal Netherlands Embassy in New Delhi are part and parcel of the mission's programme. The main report will be constituted in the Netherlands and presented to the Development Cooperation Department Asia of the Ministry of Foreign Affairs in the Netherlands, not later than six weeks after departure from India, whereafter the report can be submitted to the Government of India.
It has to be observed by the mission that contacts with Governmental organisations preferably be made through the Royal Netherlands Embassy.

ANNEX B

ITINERARY OF MISSION

Monday, 7 October 1985

Arrival of Mission leader, Mr. R. Trietsch, in India.
Discussions at Royal Netherlands Embassy with Water Supply Coordinator, Mr. J.A. Speets.
Discussions at Rural Development Department, CPHEEO-RWS, with Messrs. V. Raghu, M.M. Datta, L.K. Bhargava, A.K. Ghosh and C. Ganapathy.
Discussions at Ministry of Finance, with Undersecretary, Department of Economic Affairs, Mr. Madhav Lal.

Tuesday, 8 October 1985

Discussions at Ministry of Agriculture & Rural Development, with Joint Secretary Mr. A.K. Rastogi, Deputy Secretary Mr. Ajai Shankar, and other senior officers.
Studying available reports and correspondence at Royal Netherlands Embassy.

Wednesday, 9 October - Tuesday, 15 October 1985

Mission to Andhra Pradesh.

Wednesday, 16 October 1985

Departure of Mission, consisting of Messrs. A.K. Ghosh, J.A. Speets and R. Trietsch, by plane from New Delhi to Lucknow (Uttar Pradesh).
Discussions with Chairman and senior staff of Uttar Pradesh Jal Nigam.
Discussions with Minister of State for Housing & Urban Development, Mrs. Padma Seth.
Discussions with Secretary to Government, Housing & Urban Development, Mr. Kamal Pandey.

Thursday, 17 October 1985

Continuation of discussions with UPJN staff.
Return of Mr. Speets to New Delhi.

Friday, 18 October 1985

Departure by car for Rae Bareli and Allahabad, and discussions with UPJN field staff. On the way, inspection of DCP schemes Thulendi, Ashrafpur, Udari and Jagatpur in Rae Bareli District, and Nidura (Allahabad District).

Saturday, 19 October 1985

Daparture by car for Varanasi. On the way inspection of DCP schemes Saidabad (Allahabad) and Rohania (Varanasi).
Return of Mr. Ghosh by plane to New Delhi.
Inspection of public standposts and private connections in villages of DCP scheme Kandwa
Discussions with UPJN field staff Varanasi.

Sunday, 20 October 1985

Studying available project documents on Sub-Project IV, and subsequently discussions with UPJN staff in Varanasi.
Return by plane to New Delhi.

Monday, 21 October 1985

<Public Holiday>
Drafting of Mission's "Conclusions and Recommendations" by Mission members Ghosh and Trietsch.

Tuesday, 22 October 1985

<Public Holiday>
Departure of Mr. R. Trietsch to Ahmedabad, for participation as 'resource person' in Mission GU-13.

Wednesday, 23 October 1985

Return by plane from Ahmedabad to New Delhi.

Thursday, 24 October 1985

Departure of Mr. R. Trietsch by plane from New Delhi to Lucknow. Discussion of Mission UP-13's "Conclusions and Recommendations" with Managing Director and senior staff of UP Jal Nigam.
Return by plane to New Delhi.

Friday, 25 October 1985

Discussions at World Bank Agricultural Division, New Delhi, with Messrs. Richard G. Grimshaw, John Greenfield, Harbans Singh and N. Patnaik.
Debriefing on missions to Andhra Pradesh and Uttar Pradesh at Ministry of Agriculture and Rural Development, with Joint Secretary Mr. A.K. Rastogi, Deputy Adviser (PHE) Mr. V. Raghu, and Assistant Advisers (CPHEEO/RWS) Messrs. L.K. Bhargava and A.K. Ghosh .

Saturday, 26 October 1985

Return by plane from New Delhi to Amsterdam.

ANNEX C

LIST OF AUTHORITIES VISITED/SENIOR STAFF INVOLVED IN IMPLEMENTATION OF THE SCHEMES

NEW DELHI

Royal Netherlands Embassy

Mr. H.M.S. van Bemmelen	- First Secretary
Mr. J.A. Speets	- Water Supply Coordinator

Ministry of Agriculture and Rural Development

Mr. A.K. Rastogi	- Joint Secretary
Mr. Ajai Shankar	- Deputy Secretary, Rural Water Supply
Mr. Arvind Suri	- Undersecretary, Rural Water Supply
Mr. V. Raghu	- Deputy Adviser (PHE), CPHEEO-RWS
Mr. M.M. Datta	- Deputy Adviser (PHE), CPHEEO-RWS
Mr. L.K. Bhargava	- Assistant Adviser (PHE), CPHEEO-RWS
Mr. A.K. Ghosh	- Assistant Adviser (PHE), CPHEEO-RWS
Mr. C. Ganapathy	- Assistant Adviser (PHE), CPHEEO-RWS

Ministry of Finance

Dr. J.S. Brara	- Deputy Secretary, Department of Economic Affairs
Mr. Madhav Lal	- Undersecretary, Department of Economic Affairs

UTTAR PRADESH

Lucknow

Mrs. Padma Seth	- Minister of State for Housing and Urban Development
Mr. Kamal Pandey	- Secretary to Government, Housing and Urban Development, Lucknow

Varanasi District

Mr. D.S. Bagga	- Commissioner, Varanasi Division

Uttar Pradesh Jal Nigam

Lucknow

Mr. Indra Mohan Sahai	- Chairman
Mr. S.K. Sharma	- Managing Director
Mr. R.S. Singh	- Chief Engineer (I)

Lucknow (continued)

Mr. Rajendra Dayal	- Chief Engineer (II)
Mr. L. Singh	- Chief Engineer (Appraisal)
Mr. S.S. Shrivastava	- Zonal Chief Engineer (West)
Mr. R.M. Nigam	- Zonal Chief Engineer (East)
Mr. D.P. Singhal	- Addtl.C.E. (PPRD)
Mr. K.N. Khandelwal	- Finance Director
Mr. S.C. Dangwal	- Chief Accounts Officer
Mr. A. Tripathi	- Secretary (Administration)
Mr. V.K. Gupta	- Secretary (Management)
Mrs. Hira Sharma	- Manager Monitoring
Mr. M.K. Chaturvedi	- Deputy Manager Appraisal
Mr. A.C. Nagar	- Deputy Manager Appraisal
Mr. R.N. Gupta	- Manager Training
Mr. A.K. Gupta	- Manager Appraisal
Mr. V.P. Jindal	- Manager Appraisal

Rae Bareli

Mr. S.H. Zaheer	- S.E., XX circle, Faizabad
Mr. N.C. Saxena	- E.E., I Constr.Div., Rae Bareli
Mr. B.N. Saran	- E.E., II Constr.Div., Rae Bareli
Mr. S.K. Garg	- E.E., E&M Div., Rae Bareli
Mr. A.L. Taneja	- E.E., II Constr.Div., Sultanpur (hand pump programme)

Allahabad

Mr. S.R. Dikshit	- S.E., II Circle, Allahabad
Mr. D.C. Garg	- S.E., Temp. Project Circle, Allahabad
Mr. R.L. Shah	- S.E., Mech. Circle, Allahabad
Mr. Piyush Kumar	- E.E., Constr. Division, Allahabad
Mr. A.C. Saxena	- G.M., Ganga Action Unit, Allahabad
Mr. S.C. Srivastava	- E.E., VII Temp. Constr. Div. Allahabad
Mr. M.P. Srivastava	- A.E., VI Temp. Constr. Div., Allahabad
Mr. G.P. Gupta	- A.E., Addl. Constr. Div., Allahabad

Varanasi

Mr. S.R. Sharma	- S.E., XVI Circle (E&M), Varanasi
Mr. B.P. Goel	- S.E., Project Circle, Varanasi
Mr. C.K. Nayak	- E.E., VI Constr. Div., Varanasi
Mr. A.K. Srivastava	- E.E., IV Temp. Constr. Div., Varanasi
Mr. A.K. Ghosal	- E.E., V Temp. Constr. Div., Varanasi
Mr. A.K. Seth	- E.E. (E&M), II Constr. Div., Varanasi
Mr. V.P. Gupta	- E.E., III Temp. Constr. Div., Varanasi

ANNEX D

CONCLUSIONS AND RECOMMENDATIONS OF THE INDO-DUTCH REVIEW MISSION OF OCTOBER 1985 TO UTTAR PRADESH (UP-13)

1. SUB-PROJECT I (East)

1.1. Progress of the schemes

The Mission was informed that - due to a combination of unprecedented floods as well as an unprecedented total lack of funds from the State Government for almost half a year, the implementation of the works under Sub-Project I had been virtually stopped.
As a result, all schemes under Sub-Project I in Rae Bareli District will be commissioned approx. 6 months later than was anticipated in April 1985.
The schemes in the Allahabad and Varanasi Districts have been (virtually) completed, however.

1.2. Public Standposts

The Mission recommends that in Rae Bareli all public standposts that still have to be constructed, are provided with an apron of reinforced concrete, rather than unreinforced concrete, along the lines as agreed upon for the standposts to be constructed under Sub-Project IV.
The Mission requests the UP Jal Nigam to submit a list showing a breakdown of both the required and constructed numbers of standposts, per village and hamlet, with an indication of the standpost type (vandal-proof or not; single of double tap standpost).
The same list should also indicate the actual number of private connections.

1.3. Voltage fluctuations

The Mission recommends that voltage stabilizers are provided in those DCP schemes where under- or over-voltage problems are experienced.

1.4. Additional funds

The UP Jal Nigam is requested to provide a cost estimate of the items mentioned under 1.2 and 1.3 above, at short notice.
Although the Mission was informed that most probably at least part of the cost can be met from contingencies, the Government of the Netherlands is recommended to allocate the necessary funds in case these contingencies prove not to be sufficient.

1.5. Operation and Maintenance

The Mission recommends that each public standpost be given an identification number, and that all standposts are regularly checked on water pressure, physical appearance and water quality (residual chlorine content, etc.). It is recommended that for that purpose a roster of inspec-

tion visits is prepared by the respective Superintending Engineer, and that log books showing the inspection results are kept at the scheme headworks and at the Divisional headquarters of the UP Jal Nigam.

2. SUB-PROJECT III

The Mission informed the U.P. Jal Nigam that the side letter on Sub-Project III had been exchanged. The Jal Nigam undertook to start the implementation of this Sub-Project forthwith.

3. SUB-PROJECT IV

3.1. Appraisal report

The Mission regrets that, firm commitments from the side of the UP Jal Nigam notwithstanding, the project documents on the revised schemes under Sub-Project IV have not been submitted in time to either the Netherlands Government or the Mission. As a result, considerable delays have been incurred in the procedures required for sanctioning this Sub-Project.

3.2. Addendum to the Appraisal Report

The Mission requests the UP Jal Nigam to prepare an addendum to the Appraisal Report, with the following contents:

a. A corrected estimate of the required numbers of public standposts, along the lines followed for Sub-Projet I.
To save time, this estimate may initially be based on an over-all average of 150 persons per standpost for the intermediate (1989) situation. Eventually, a complete break-down per village and hamlet will be required, however.

b. Corrected unit costs for public standposts, based on the so-called 'vandal-proof' design, but with reinforced concrete platform/apron, and with an average of 10 m of drain per standpost.

c. An indication of the numbers and locations of laboratories and inspection bungalows, as included in both Sub-Projects I and IV.

d. A brief financial summary, based on the total cost of all schemes together, and including the cost of the items mentioned under a. and b., according to the attached format.

The UP Jal Nigam is requested to submit this addendum within the first half of November 1985, as the Appraisal Report and the addendum will be taken into consideration as one package.

3.3. Project planning and monitoring

The UP Jal Nigam undertakes to prepare a PERT-type diagram for each of the schemes under Sub-Project IV, as well as an indication of cash flows, both per scheme and for the entire Sub-Project, based on these PERT-type diagrams.

The UP Jal Nigam is requested to have the above finalized well in time before the Mission's next visit (probably mid-April 1986), and to especially investigate the possibilities of using its computer facilities for this purpose.

The Mission wishes to express its gratitude to the Government of Uttar Pradesh, and in particular to the Uttar Pradesh Jal Nigam, for its hospitality and co-operation in carrying out this mission.

The Indo-Dutch Review Mission (UP-13)
Lucknow, October 24, 1985.

UTTAR PRADESH RURAL WATER SUPPLY PROJECT

DUTCH CREDIT PROGRAM

ALLAHABAD AND VARANASI DISTRICT

SUBPROJECT IV

SUMMARY OF PROJECTCOST (Rs in lakhs)

No.	DESCRIPTION	SUB TOTAL	TOTAL
1	2	3	4
1.	PREPARATORY WORKS sitecleaning, landacquisition, access roads etc.		
2.	CIVIL WORKS - Pumphouses incl. tubewells - Transmission mains - Distribution network - Storage - Standposts - Facilities		
3.	MECHANICAL/ELECTRICAL WORKS - Pumpsets - Electrical provisions - Equipment & Tools		
4.	PHYSICAL CONTINGENCIES		
5.	PRICE ESCALATION		
6.	ENGINEERING CONTINGENCIES - Design - Research & Development - Constr. Supervision		
7.	GRAND TOTAL		

Note: total projectcost based on assumption that works will start by July, 1985. Any delay involves a price increase of appr. 10 perc. per annum.

ANNEX E

SCHEME-WISE SUMMARY OF DATA (Sub-Project East I)

SCHEME NAME:	FEROZPUR (Rae Bareli District)
TARGET POPULATION:	20,600
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: VT pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	500 m laid, out of a total of 500 m
OVERHEAD TANK :	volume: 350 m^3
	staging: 21 m
	progress: 100 % (commissioned)
DISTRIBUTION SYSTEM :	51.5 km laid, out of a total of 51.5 km
VILLAGES COVERED :	16 out of 16
PUBLIC STANDPOSTS :	63 constructed, out of a total of 124:
	48 single-tap
	15 double-tap, vandal-proof
PRIVATE CONNECTIONS :	150 made, out of an estimated total of 380
CHLORINE DOSAGE :	0.8 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.2 - 0.8 mg/l, depending on distance between samlping point and headworks
EXEMPTED FEEDER :	commissioned; voltage stabilizer required

PROBABLE MONTH OF FINAL COMMISSIONING: December 1985
(commissioned except for required number of public standposts)

SCHEME NAME :	RALPUR (Rae Bareli District)
TARGET POPULATION :	32,000
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: submersible pump/installed
	No.2: submersible pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	375 m laid, out of a total of 375 m
OVERHEAD TANK :	volume: 500 m^3
	staging: 22 m
	progress: 100 % (completed)
DISTRIBUTION SYSTEM :	88.8 km laid, out of a total of 88.8 km
VILLAGES COVERED :	24 out of 24
PUBLIC STANDPOSTS :	120 constructed, out of a total of 201:
	85 single-tap
	35 double-tap, vandal-proof
PRIVATE CONNECTIONS :	148 made, out of an estimated total of 536
CHLORINE DOSAGE :	0.8 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.2 - 0.8 mg/l, depending on distance between sampling point and headworks
EXEMPTED FEEDER :	commissioned; voltage stabilizer required

PROBABLE MONTH OF FINAL COMMISSIONING: December 1985
(commissioned except for required number of public standposts)

SCHEME NAME :	GOVINDPUR (Rae Bareli District)
TARGET POPULATION :	29,890
TUBEWELLS :	No.1: constructed (discharge less than anticipated)
	No.2: constructed
	No.3: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
	No.3: constructed
PUMPS :	No.1: VT pump/installed
	No.2: submersible pump/installed
	No.3: installed
CHLORINATORS :	No.1: installed
	No.2: installed
	No.3: procured
RISING MAIN:	375 m laid, out of a total of 375 m
OVERHEAD TANK :	volume: 500 m^3
	staging: 20 m
	progress: 100% (completed)
DISTRIBUTION SYSTEM :	82.5 km laid, out of a total of 82.5 km
VILLAGES COVERED :	19 out of 19
PUBLIC STANDPOSTS :	112 constructed, out of a total of 112:
	80 single-tap
	32 double-tap, vandal-proof
PRIVATE CONNECTIONS :	115 made, out of an estimated total of 476
CHLORINE DOSAGE :	0.8 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.2 - 1.0 mg/l, depending on distance between sampling point and headworks
EXEMPTED FEEDER :	commissioned; voltage stabilizer required

PROBABLE MONTH OF FINAL COMMISSIONING: December 1985
(commissioned except for 3rd tubewell pumping plant)

SCHEME NAME : BHOJPUR (Rae Bareli District)
TARGET POPULATION : 30,547

TUBEWELLS : No.1: constructed
No.2: constructed
PUMP HOUSES : No.1: constructed
No.2: constructed
PUMPS : No.1: VT pump/installed
No.2: submersible pump/installed
CHLORINATORS : No.1: installed
No.2: installed
RISING MAIN : 375 m laid, out of a total of 375 m
OVERHEAD TANK : volume: 500 m^3
staging: 20 m
progress: 100%
DISTRIBUTION SYSTEM : 76 km laid, out of a total of 77.3 km
VILLAGES COVERED : 34 out of 34
PUBLIC STANDPOSTS : 124 constructed, out of a total of 124:
84 single-tap
40 double-tap, vandal-proof
PRIVATE CONNECTIONS : 400 made, out of an estimated total of 556

CHLORINE DOSAGE : 0.8 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM : 0.4 - 0.8 mg/l, depending on distance between sampling point and headworks

EXEMPTED FEEDER : commissioned; voltage stabilizer required

PROBABLE MONTH OF FINAL COMMISSIONING: December 1985
(commissioned except for 1.3 km of pipeline)

SCHEME NAME :	THULENDI (Rae Bareli District)
TARGET POPULATION :	29,911
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: submersible pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	375 m laid, out of a total of 375 m
OVERHEAD TANK :	volume: 500 m^3
	staging: 21 m
	progress: 60 % (staging for tank wall under progress)
DISTRIBUTION SYSTEM :	77 km laid, out of a total of 78.25 km
VILLAGES COVERED :	19 out of 19
PUBLIC STANDPOSTS :	100 constructed, out of a total of 186:
	65 single-tap
	35 double-tap, vandal-proof
PRIVATE CONNECTIONS :	25 made, out of an estimated total of 751
EXEMPTED FEEDER :	commissioned; voltage stabilizer required

PROBABLE MONTH OF FINAL COMMISSIONING : March 1986

SCHEME NAME :	JAGATPUR (Rae Bareli District)
TARGET POPULATION :	35,800
TUBEWELLS :	No.1: constructed
	No.2: constructed (further development test to be carried out before final decission on possible abandoning will be taken)
	No.3: constructed
PUMP HOUSES :	No.1: constructed
	No.2: will not be constructed
	No.3: under construction
PUMPS :	No.1: VT pump/installed
	No.2: -
	No.3: procured
CHLORINATORS :	No.1: installed
	No.2: procured
	No.3: procured
RISING MAIN :	50 m laid, out of a total of 375 m
OVERHEAD TANK :	volume: 650 m^3
	staging: 20 m
	progress: 100% (completed)
DISTRIBUTION SYSTEM :	128 km laid, out of a total of 136.15 km
VILLAGES COVERED :	32 out of 32
PUBLIC STANDPOSTS :	191 constructed, out of a total of 265:
	100 single-tap, normal
	11 single-tap, vandal-proof
	80 double-tap, vandal-proof
PRIVATE CONNECTIONS :	90 made, out of an estimated total of 735
CHLORINE DOSAGE :	0.8 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.2 - 0.6 mg/l, depending on distance between sampling point and headworks
EXEMPTED FEEDER :	commissioned; voltage stabilizer required

PROBABLE MONTH OF FINAL COMMISSIONING: December 1985
(commissioned except for required number of public standposts)

SCHEME NAME :	**ASHRAFPUR** (Rae Bareli District)
TARGET POPULATION :	26,460
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: submersible pump/ installed
	No.2: submersible pump/ installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	500 m laid, out of a total of 500 m
OVERHEAD TANK :	volume: 500 m^3
	staging: 21 m
	progress: 45 % (staging completed)
DISTRIBUTION SYSTEM :	65 km laid, out of a total of 69 km
VILLAGES COVERED :	20 out of 20
PUBLIC STANDPOSTS :	87 constructed, out of a total of 180:
	60 single-tap, normal type
	2 single-tap, vandal-proof
	25 double-tap, vandal-proof
PRIVATE CONNECTIONS :	45 made, out of an estimnated total of 633
EXEMPTED FEEDER :	commissioned; broken down due to heavy floods; approach difficult/impossible; power on rural feeder only at night

PROBABLE MONTH OF FINAL COMMISSIONING : March 1986
(commissioned except for required number of public standposts)

SCHEME NAME :	UDARI (Rae Bareli District)
TARGET POPULATION :	25,030
TUBEWELLS :	No.1: constructed (cavity well)
	No.2: constructed (cavity well)
	No.3: constructed (cavity well)
PUMP HOUSES :	No.1: constructed
	No.2: constructed
	No.3: constructed
PUMPS :	No.1: submersible pump/ installed
	No.2: submersible pump/ installed
	No.3: submersible pump/ installed
CHLORINATORS :	No.1: installed
	No.2: installed
	No.3: installed
RISING MAIN :	350 m laid, out of a total of 350 m
OVERHEAD TANK :	volume: 500 m^3
	staging: 20 m
	progress: 35 % (up to 2^{nd} bracing
DISTRIBUTION SYSTEM :	65 km laid, out of a total of 91.5 km
VILLAGES COVERED :	16 out of 16
PUBLIC STANDPOSTS :	40 constructed, out of a total of 204:
	25 single-tap
	15 double-tap, vandal-proof
PRIVATE CONNECTIONS :	2 made, out of a total of 687
CHLORINE DOSAGE :	0.6 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.6 mg/l
POWER SUPPLY :	6 hrs/day (rostered) through rural feeder
EXEMPTED FEEDER :	Amount yet to be deposited

PROBABLE MONTH OF FINAL COMMISSIONING : June 1986

SCHEME NAME :	**BANNAMAU** (Rae Bareli District)
TARGET POPULATION :	41,945
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: submersible pump/installed
	No.2: submersible pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	400 m laid, out of a total of 400 m.
OVERHEAD TANK :	volume: 800 m^3
	staging: 24 m
	progress: 95% (testing completed)
DISTRIBUTION SYSTEM :	139.5 km laid, out of a total of 139.5 km
VILLAGES COVERED :	27 out of 27
PUBLIC STANDPOSTS :	246 constructed, out of a total of 240:
	111 single-tap, normal type
	6 single-tap, vandal-proof
	129 double-tap, vandal-proof
PRIVATE CONNECTIONS :	92 made, out of an estimated total of 984
CHLORINE DOSAGE :	0.6 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.4 - 0.6 mg/l, depending on distance between sampling point and headworks
EXEMPTED FEEDER :	commissioned; voltage stabilizer required

PROBABLE MONTH OF FINAL COMMISSIONING : December 1985

SCHEME NAME :	**BEHTAKALAN** (Rae Bareli District)
TARGET POPULATION :	45,600
TUBEWELLS :	No.1: constructed (has been abandoned)
	No.2: constructed
	No.3: constructed
PUMP HOUSES :	No.1: constructed (to be used as storage)
	No.2: constructed
	No.3: under construction
PUMPS :	No.1: submersible pump/ removed and used elsewhere
	No.2: VT pump/installed
	No.3: yet procured
CHLORINATORS :	No.1: not yet procured
	No.2: installed
	No.3: procured
RISING MAIN :	400 m laid, out of a total of 400 m
OVERHEAD TANK :	volume: 800 m^3
	staging: 22 m
	progress: 90% (testing done)
DISTRIBUTION SYSTEM :	125.7 km laid, out of a total of 125.7 km
VILLAGES COVERED :	34 out of 34
PUBLIC STANDPOSTS :	229 constructed, out of a total of 223:
	122 single-tap, normal type
	6 single-tap, vandal-proof
	101 double-tap, vandal-proof
PRIVATE CONNECTIONS :	88 made, out of an estimated total of 1205
CHLORINE DOSAGE :	0.6 to 0.8 mg/l
EXEMPTED FEEDER :	commissioned; voltage stabilizer required

PROBABLE MONTH OF FINAL COMMISSIONING : December 1985

SCHEME NAME :	SAIDABAD (Allahabad District)
TARGET POPULATION :	23,600
TUBEWELLS :	No.1: constructed
	No.2: constructed under previous programme
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: submersible pump/installed
	No.2: submersible pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	423 m laid, out of a total of 423 m
OVERHEAD TANK :	volume: 650 m^3
	staging: 16 m
	progress: 100 % (completed)
DISTRIBUTION SYSTEM :	72 km laid, out of a total of 65 km
VILLAGES COVERED :	19 out of 19
PUBLIC STANDPOSTS :	169 constructed, out of a total of 169:
	79 single-tap
	46 double-tap
PRIVATE CONNECTIONS :	458 made, out of an estimated total of 337
CHLORINE DOSAGE :	1.0 to 1.2 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.2 - 1.0 mg/l, depending on distance between sampling point and headworks
EXEMPTED FEEDER :	commissioned; limited availability of power

COMMISSIONED

SCHEME NAME :	SAIDABAD (Allahabad District)
TARGET POPULATION :	23,600
TUBEWELLS :	No.1: constructed
	No.2: constructed under previous programme
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: submersible pump/installed
	No.2: submersible pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	423 m laid, out of a total of 423 m
OVERHEAD TANK :	volume: 650 m^3
	staging: 16 m
	progress: 100 % (completed)
DISTRIBUTION SYSTEM :	72 km laid, out of a total of 65 km
VILLAGES COVERED :	19 out of 19
PUBLIC STANDPOSTS :	169 constructed, out of a total of 169:
	79 single-tap
	46 double-tap
PRIVATE CONNECTIONS :	458 made, out of an estimated total of 337
CHLORINE DOSAGE :	1.0 to 1.2 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.2 - 1.0 mg/l, depending on distance between sampling point and headworks
EXEMPTED FEEDER :	commissioned; limited availability of power

COMMISSIONED

SCHEME NAME :	NIDURA (Allahabad District)
TARGET POPULATION :	20,400
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: submersible pump/installed
	No.2: submersible pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	380 m laid, out of a total of 380 m
OVERHEAD TANK :	volume: 650 m^3
	staging: 20 m
	progress: 100 % (completed)
DISTRIBUTION SYSTEM :	66 km laid, out of a total of 53 km
VILLAGES COVERED :	20 out of 20
PUBLIC STANDPOSTS :	145 constructed, out of a total of 145:
	77 single-tap
	34 double-tap
PRIVATE CONNECTIONS :	410 made, out of an estimated total of 300
CHLORINE DOSAGE :	0.8 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.4 - 0.8 mg/l, depending on distance between sampling point and headworks
EXEMPTED FEEDER :	commissioned

COMMISSIONED

SCHEME NAME :	PRATAPPUR (Ghurdauli Zone) (Allahabad District)
TARGET POPULATION :	24,200
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: submersible pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	360 m laid, out of a total of 360 m.
OVERHEAD TANK :	volume: 800 m^3
	staging: 20 m
	progress: 100 % (commissioned)
DISTRIBUTION SYSTEM :	105 km laid, out of a total of 104 km
VILLAGES COVERED :	31 out of 31
PUBLIC STANDPOSTS :	133 constructed, out of a total of 173
PRIVATE CONNECTIONS :	150 made, out of an estimated total of 416
CHLORINE DOSAGE :	0.5 - 0.6 mg/l (?)

RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM : 0.2 - 0.6 mg/l, depending on distance between sampling point and headworks

POWER SUPPLY :	average of 13 hrs/day
EXEMPTED FEEDER :	to be commissioned by mid-1986 ? (New sub-station not yet ready)

PROBABLE MONTH OF FINAL COMMISSIONING : November 1985 (except for exempted feeder)

SCHEME NAME :	URWA (Allahabad District)
TARGET POPULATION :	20,300
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: submersible pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	350 m laid, out of a total of 350 m
OVERHEAD TANK :	volume: 500 m^3
	staging: 14 m
	progress: 100 % (completed)
DISTRIBUTION SYSTEM :	69 km laid, out of a total of 64 km.
VILLAGES COVERED :	23 out of 23
PUBLIC STANDPOSTS :	162 constructed, out of a total of 162:
	92 single-tap
	35 double-tap
PRIVATE CONNECTIONS :	403 made, out of an estimated total of 290
EXEMPTED FEEDER :	because of power availability of 20 - 24 hrs/day no exempted feeder applied for

COMMISSIONED

SCHEME NAME :	**MIRZAMURAD** (Varanasi District)
TARGET POPULATION :	57,920
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: submersible pump/installed
	No.2: submersible pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	380 m laid, out of a total of 380 m
OVERHEAD TANK :	volume: 1000 m^3
	staging: 22 m
	progress: 100% (commissioned)
DISTRIBUTION SYSTEM :	100.6 km laid, out of a total of 100.3 km
VILLAGES COVERED :	50 out of 50
PUBLIC STANDPOSTS :	229 constructed, out of a total of 229*) (266)
PRIVATE CONNECTIONS :	589 made, out of an estimated total of 580
CHLORINE DOSAGE :	0.8 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.2 - 0.4 mg/l, depending on distance between sampling point and headworks
POWER SUPPLY :	approx. 4-5 hrs/day on rural feeder
EXEMPTED FEEDER :	re-commissioned by December 1984; trouble continues (dacoit-infested area)

COMMISSIONED

*) revised requirement, taking into account that as an average 15 persons are served per house connection; figure between brackets refers to original estimate of required number of public taps.

SCHEME NAME :	TIKRI (Varanasi District)
TARGET POPULATION :	61,560
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: VT pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	235 m laid, out of a total of 235 m
OVERHEAD TANK :	volume: 1200 m^3
	staging: 22 m
	progress: 100% (commissioned)
DISTRIBUTION SYSTEM :	61.4 km laid, out of a total of 61.4 km
VILLAGES COVERED :	27 out of 27
PUBLIC STANDPOSTS :	215 constructed, out of a total of 215*) (209)
PRIVATE CONNECTIONS :	495 made, out of an estimated total of 410
CHLORINE DOSAGE :	0.6 mg/l
RESIDUAL CHLORINE IN	DISTRIBUTION SYSTEM : 0.2 - 0.6 mg/l, depending on distance between sampling point and headworks
POWER SUPPLY :	18-20 hrs/day
EXEMPTED FEEDER :	commissioned

COMMISSIONED

*) revised requirement, taking into account that as an average 15 persons are served per house connection; figure between brackets refers to original estimate of required number of public taps.

SCHEME NAME :	SEWAPURI (Varanasi District)
TARGET POPULATION :	32,200
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: VT pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	250 m laid, out of a total of 250 m
OVERHEAD TANK :	volume: 600 m^3
	staging: 16 m
	progress: 100% (completed)
DISTRIBUTION SYSTEM :	46.5 km laid, out of a total of 46.5 km
VILLAGES COVERED :	30 out of 30
PUBLIC STANDPOSTS :	119 constructed, out of a total of 119*) (117)
PRIVATE CONNECTIONS :	185 made, out of an estimated total of 215
CHLORINE DOSAGE :	0.8 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.2 - 0.5 mg/l, depending on distance between sampling point and headworks
POWER SUPPLY :	18-20 hrs/day
EXEMPTED FEEDER :	commissioned in January 1984

COMMISSIONED

*) revised requirement, taking into account that as an average 15 persons are served per house connection; figure between brackets refers to original estimate of required number of public taps.

SCHEME NAME :	HARHUA (Varanasi District)
TARGET POPULATION :	57,585
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: submersible pump/installed
	No.2: VT pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	350 m laid, out of a total of 350 m
OVERHEAD TANK :	volume: 1000 m^3
	staging: 18 m
	progress: 100% (commissioned)
DISTRIBUTION SYSTEM :	129.2 km laid, out of a total of 129.5 km.
VILLAGES COVERED :	75 out of 75
PUBLIC STANDPOSTS :	216 constructed, out of a total of 216*) (236)
PRIVATE CONNECTIONS :	605 made, out of an estimated total of 550
CHLORINE DOSAGE :	0.6 - 0.8 mg/l

RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM : 0.2 - 0.6 mg/l, depending on distance between sampling point and headworks

POWER SUPPLY :	Generator set installed and commissioned
	(Average of 6 hours' supply on rural feeder)

COMMISSIONED

*) revised requirement, taking into account that as an average 15 persons are served per house connection; figure between brackets refers to original estimate of required number of public taps.

SCHEME NAME :	BIRAONKOT (Varanasi District)
TARGET POPULATION :	63,130
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: submersible pump/installed
	No.2: VT pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	370 m laid, out of a total of 380 m
OVERHEAD TANK :	volume: 1000 m^3
	staging: 18 m
	progress: 100% (commissioned)
DISTRIBUTION SYSTEM :	132.4 km laid, out of a total of 132.4 km
VILLAGES COVERED :	46 out of 46
PUBLIC STANDPOSTS :	264 constructed, out of a total of 264
PRIVATE CONNECTIONS :	416 made, out of an estimated total of 600
CHLORINE DOSAGE :	0.4 - 0.8 mg/l

RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM : 0.1 - 0.3 mg/l, depending on distance between sampling point and headworks

POWER SUPPLY :	12-14 hrs/day
EXEMPTED FEEDER :	re-commissioned

COMMISSIONED

SCHEME NAME :	**VYASNAGAR** (Varanasi District)
TARGET POPULATION :	61,238
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: VT pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	1300 m laid, out of a total of 1300 (350) m.
OVERHEAD TANK :	volume: 1000 m^3
	staging: 18 m
	progress: 100 % (completed)
DISTRIBUTION SYSTEM :	86.8 km laid, out of a total of 90 km.
VILLAGES COVERED :	52 out of 52
PUBLIC STANDPOSTS :	218 constructed, out of a total of 218*) (226)
PRIVATE CONNECTIONS :	382 made, out of an estimated total of 550
CHLORINE DOSAGE :	0.7 - 0.9 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.1 - 0.7 mg/l, depending on distance between sampling point and headworks
POWER SUPPLY :	6 hrs/day (I); 18-20 hrs/day (II)
EXEMPTED FEEDER :	TW No. 1 connected to same feeder as TW No. 2; TW No. 2 already had power for approx. 20 hrs/day due to vicinity of fertilizer factory

COMMISSIONED

*) revised requirement, taking into account that as an average 15 persons are served per house connection; figure between brackets refers to original estimate of required number of public taps.

SCHEME NAME :	ROHANIA (Varanasi District)
TARGET POPULATION :	62,507
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: VT pump/procured
CHLORINATORS :	No.1: installed
	No.2: procured
RISING MAIN :	250 m laid, out of a total of 250 m
OVERHEAD TANK :	volume: 1000 m^3
	staging: 18 m
	progress: 100 % (completed)
DISTRIBUTION SYSTEM :	89.1 km laid, out of a total of 89.1 km
VILLAGES COVERED :	41 out of 41
PUBLIC STANDPOSTS :	204 constructed, out of a total of 204*) (234)
PRIVATE CONNECTIONS :	731 made, out of an estimated total of 600
CHLORINE DOSAGE :	0.8 mg/l
RESIDUAL CHLOEINE IN DISTRIBUTION SYSTEM :	0.2 - 0.6 mg/l, depending on distance between sampling point and headworks
POWER SUPPLY :	22-24 hrs/day
EXEMPTED FEEDER :	commissioned

COMMISSIONED

*) revised requirement, taking into account that as an average 15 persons are served per house connection; figure between brackets refers to original estimate of required number of public taps.

SCHEME NAME :	**KANDWA** (Varanasi District)
TARGET POPULATION :	57,255
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: VT pump/installed
CHLORINATORS :	No.1: installed
	No.2: installed
RISING MAIN :	300 m laid, out of a total of 350 m
OVERHEAD TANK :	volume: 1000 m^3
	staging: 18 m
	progress: 100% (commissioned)
DISTRIBUTION SYSTEM :	91 km laid, out of a total of 110 km
VILLAGES COVERED :	48 out of 48
PUBLIC STANDPOSTS :	297 constructed, out of a total of 297*) (323)
PRIVATE CONNECTIONS :	341 made, out of an estimated total of 555
CHLORINE DOSAGE :	0.8 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.2 - 0.6 mg/l, depending on distance between sampling point and headworks
EXEMPTED FEEDER :	commissioned

COMMISSIONED

*) revised requirement, taking into account that as an average 15 persons are served per house connection; figure between brackets refers to original estimate of required number of public taps.

ANNEX F SHORT HISTORY OF SUB-PROJECTS I, II, III, IV
(as derived from Appraisal Report Sub-Project IV, Chapter I)

1. INTRODUCTION

Uttar Pradesh, with a present population of about 11.986 millions, is the most populous State of India. It extends over an area of 295,000 sq km which is about 9 percent of the total area of India. Nearly 82 percent of the State's population resides in 112,561 villages, while the remaining 18 percent of the population lives in 659 towns. Out of 659 towns of the State, 82 towns have a population less than 5000, 510 towns between 5000 and 50,000 and the remaining 67 towns have a population more than 50,000. Till now about 88.8% of the urban population have been served with safe drinking water supply, the coverage of the rural side has not been very significant.

Out of 57 administrative districts of U.P. 18 districts suffer from scarcity of drinking water. It is proposed to supply adequate potable water to about 235 towns and 28,500 villages in the scarcity and hardship area during the next 10 years (1981-90), the International Water Supply and Sanitation Decade. It is anticipated that more than Rs. 1000 crores shall be required to implement this proposed programme. Seeing the limitation of available financial resources, all possible potential resources, inclined to promote the programme, are to be mobilised.

On the request of Govt. of India, the Govt. of The Netherlands has agreed to provide financial assistance for rural water supply projects of some problem villages of Uttar Pradesh; consequently an agreement was entered between the Government of India and the Dutch Govt. The Government of The Netherlands has agreed to provide Dfl. 57 million (Rs. 24.15 crores) as grant for the above purpose and a letter to this effect was received on 27th November 1978. Representatives of the Netherlands Govt, identified the problem villages in the Districts of Allahabad, Varanasi and RaeBareli in eastern U.P., and Districts of Agra, Mathura and Etawah in western U.P. During various visits of the Dutch Mission, the views were exchanged from time to time and were recorded in Mission reports 1 to 10. Accordingly, the schemes for these areas were submitted under the Dutch credit programme as Sub-Project I, II (East), Sub-Project I, II (West) and Sub-Project III (East + West), respectively.

2. THE SUB-PROJECTS

2.1. Sub-Project I (East)

A sub-project comprising 22 schemes, amounting to Rs. 10.70 crores and covering 724 villages in Allahabad, RaeBareli and Varanasi Districts, was submitted to the Govt. of The Netherlands in April 1979, which was later on approved by the Dutch Govt. The cost of this sub-project was revised five times due to various reasons, such as delay in execution, price escalation, non-availability of materials in time, and inclusion

of additional items of works. The Sub-Project revised cost (Vth revision) is Rs. 15.66 crores.

2.2. Sub-Project II (East) & Sub-Project II (West)

5 schemes covering 137 villages of District Allahabad, and costing Rs. 3.40 crores, were submitted to the Dutch Govt. in April 1981 under Sub-Project II (East), and 19 schemes covering 196 villages in Districts Agra, Mathura and Etawah, and amounting to Rs. 6.23 crores, were submitted to the Dutch Govt. in October 1981 under Sub-project II (West).

In January 1982, as per latest directions of the Government of India, the proposals were reconsidered and it was decided to install hand pumps, wherever feasible, in place of piped water supply schemes. Consequently, original proposals for East II and West II were recasted and wherever possible, the piped water supply schemes were transformed to hand pump schemes and included in Sub-Project III.

Accordingly, under revised proposals of East II only one piped water supply scheme of Allahabad District, covering 25 villages, and 2 schemes of RaeBareli district, covering 28 villages, were included. Sub-Project II (West) includes only 4 piped water supply schemes of Agra District, covering 14 villages, and 4 schemes of Mathura District, covering 19 villages. These proposals are still under consideration by the Dutch Govt. However, for reasons of urgency, these schemes have been executed under other programmes of Govt. of India and Govt. of U.P.
During the discussions with mission-10 (U.P.) at Lucknow on October 10th & 11th, 1984 it was agreed upon that U.P. Jal Nigam will put up some fresh proposals under Sub-Project IV (East) to an amount of the same order as originally proposed for Sub-project II (See Mission report UP-10, page 22).

2.3. Sub-Project III

In the meeting held at Delhi on 3.2.82 in connection with the International Water Supply and Sanitation Decade programme (1981-90) in which Chief Engineers and Secretaries of State took part, it was decided that spot sources in scarcity villages be provided with hand pumps. Only in case where hand pumps are not successful, piped water supply be provided. The question of revising schemes under the Dutch Credit programme was referred to the Govt. of India and a meeting was held at Delhi in this connection. The decision was confirmed by the letter No. 3575/East Dutch/23 dated 30.12.82 from Sri S.K. Sharma, the then Chief Engineer (Project & Planning) addressed to Sri V.N. Iyer, Deputy Secretary (U.P.) Govt. of India.

Accordingly, as per directions of the Govt. of India, piped water supply schemes were recasted and included in Sub-Project East III, together with other newly proposed hand pump schemes. All hand pump schemes in U.P. East III and West III combined in one as Sub-Project III (East and West) cover only problem villages as identified in 1972. These revised proposals, including 587 villages of Allahabad, Agra, Mathura and Etawah

Districts, costing Rs. 6.54 crores, were framed to install 3,172 India Mark II hand pumps. The approval of the Dutch Govt. is still awaited.

Later on during bilateral consultations of June 1983 the project fund for U.P was reallocated and almost doubled of the originally submitted Sub-Project II (East & West), viz. Rs. 10 to Rs. 12 crores (Dfl. 30 to 36 million) as also confirmed by Mr. J.A. Speets, Water Supply Coordinator, Royal Netherlands Embassy, vide letter No. 133/J.S./him Dt. 4.1.85. It was also decided to prepare and submit the water supply schemes of district Varanasi and Allahabad in two lots.
The first was to include 9 schemes of Varanasi and 2 schemes of Allahabad Districts, costing Rs. 731.16 crores approximately, and covering 202 villages (179 villages in Varanasi and 23 villages in Allahabad District). Out of the proposed Sub-Project II (East) lot I, 8 schemes of Varanasi and 1 scheme of Allahabad District was prepared and submitted to Dutch Mission-12 (U.P.) for perusal and discussion from 16th April to 23 April 1985. After the discussion it was decided that the Sub-Project II (East) should now be named as Sub-project IV. The criteria for the projection of the design population, execution period of the proposed works, provision of public standposts, etc. were also decided.

Accordingly, first lot of schemes comprising of 9 schemes from Varanasi District and 2 schemes from Allahabad District, costing Rs. 10.404 crores, have been prepared and are being included in this Sub-Project IV. The second lot shall follow as Sub-Project V in due course of time.

As already agreed upon, the assistance will be made available by the Government of The Nethetlands to the Government of India, who will pass it on to the Government of Uttar Pradesh as part of the Government of India Plan resources allocation. The Government of Uttar Pradesh will transfer the sector allocation under the plan including this assistance to the Uttar Pradesh Jal Nigam.

The Uttar Pradesh Jal Nigam was established on 18.8.1975 as autonomous corporation for the development, monitoring and regulation of water supply and sewerage sector in Uttar Pradesh. The Nigam is responsible for the construction, reorganisation and expansion of water supply and sewerage systems in the rural areas. It also maintains and operates water supply systems in such areas as notified by the State Government for this purpose.

ANNEX G

SALIENT FEATURES OF SCHEMES PROPOSED FOR SUB-PROJECT IV

Scheme name : ROHI

Block : Gyanpur
Tehsil : Gyanpur
District : Varanasi
No. of villages : 35 inhabited + 5 uninhabited
12 scarcity + 23 scarcity('84)*)

Population : 1971 census : 12,615
1981 census : 17,635
initial stage (1989) : 22,350
intermediate stage (2004): 33,650
final stage (2019) : 49,850
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 2.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 1250 m^3
staging : 20 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 86 Nos.
double-tap : 15 Nos.
Private connections (target) : 1989 : 192 Nos.

Estimated capital cost: : Rs. 11.033 million
Per capita cost : 1989 : Rs. 494
2004 : Rs. 328
: 2019 : Rs. 221
Annual maintenance costs : 1989 : Rs. 161,200
2004 : Rs. 235,300
2019 : Rs. 322,500
Per capita maintenance costs : 1989 : Rs. 7.21 per annum
2004 : Rs. 6.99 per annum
2019 : Rs. 6.47 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.38
2004 : Rs. 0.36
2019 : Rs. 0.34

Note: *) ('84) refers to list with additional scarcity villages, as prepared in 1984

Scheme name : **KASIDAHA**

Block : Gyanpur
Tehsil : Gyanpur
District : Varanasi
No. of villages : 11 inhabited, of which:
11 scarcity

Population : 1971 census : 10,267
1981 census : 14,774
initial stage (1989) : 19,075
intermediate stage (2004): 29,630
final stage (2017) : 45,400
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 1.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 1000 m^3
staging : 20 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 50 Nos.
double-tap : 18 Nos.
Private connections (target) : 1989 : 164 Nos.

Estimated capital cost: : Rs. 8.939 million
Per capita cost : 1989 : Rs. 469
2004 : Rs. 302
: 2019 : Rs. 197
Annual maintenance costs : 1989 : Rs. 135,200
2004 : Rs. 200,100
2019 : Rs. 270,700
Per capita maintenance costs : 1989 : Rs. 7.09 per annum
2004 : Rs. 6.75 per annum
2019 : Rs. 5.96 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.37
2004 : Rs. 0.35
2019 : Rs. 0.31

Scheme name : **BIRAMPUR**

Block : Gyanpur and Suriyawan
Tehsil : Gyanpur
District : Varanasi
No. of villages : 17 inhabited, of which:
17 scarcity

Population : 1971 census : 7,702
1981 census : 12,129
initial stage (1989) : 16,565
intermediate stage (2004): 28,400
final stage (2017) : 48,600
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 1.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 1250 m^3
staging : 20 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 63 Nos.
double-tap : 9 Nos.
Private connections (target) : 1989 : 142 Nos.

Estimated capital cost: : Rs. 10,170 million
Per capita cost : 1989 : Rs. 614
2004 : Rs. 358
: 2019 : Rs. 209
Annual maintenance costs : 1989 : Rs. 119,000
2004 : Rs. 183,900
2019 : Rs. 26,400.
Per capita maintenance costs : 1989 : Rs. 7.18 per annum
2004 : Rs. 6.47 per annum
2019 : Rs. 5.48 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.37
2004 : Rs. 0.34
2019 : Rs. 0.29

Scheme name : BAIRIBISA

Block : Deegh
Tehsil : Gyanpur
District : Varanasi
No. of villages : 17 inhabited + 8 uninhabited
7 scarcity + 10 non-scarcity

Population : 1971 census : 12,946
1981 census : 16,611
initial stage (1989) : 19,960
intermediate stage (2004): 28,320
final stage (2017) : 36,680
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 1.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 1000 m^3
staging : 20 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 71 Nos.
double-tap : 11 Nos.
Private connections (target) : 1989 : 171 Nos.

Estimated capital cost: : Rs. 9.298 million
Per capita cost : 1989 : Rs. 466
2004 : Rs. 328
: 2019 : Rs. 253
Annual maintenance costs : 1989 : Rs. 141,700
2004 : Rs. 201,400
2019 : Rs. 257,400
Per capita maintenance costs : 1989 : Rs. 7.10 per annum
2004 : Rs. 7.11 per annum
2019 : Rs. 7.02 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.37
2004 : Rs. 0.37
2019 : Rs. 0.36

Scheme name : **INARGAON (BERWAN PAHARPUR)**

Tehsil : Gyanpur
District : Varanasi
No. of villages : 20 inhabited + 16 uninhabited
16 scarcity + 4 scarcity ('84)*)

Population : 1971 census : 12,374
1981 census : 16,393
initial stage (1989) : 19,700
intermediate stage (2004): 28,000
final stage (2017) : 36,500
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 1.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 1000 m^3
staging : 20 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 59 Nos.
double-tap : 19 Nos.
Private connections (target) : 1989 : 169 Nos.

Estimated capital cost: : Rs. 9.107 million
Per capita cost : 1989 : Rs. 462
2004 : Rs. 325
: 2019 : Rs. 250
Annual maintenance costs : 1989 : Rs. 141,600
2004 : Rs. 199,400
2019 : Rs. 249,500
Per capita maintenance costs : 1989 : Rs. 7.19 per annum
2004 : Rs. 7.12 per annum
2019 : Rs. 6.84 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.38
2004 : Rs. 0.37
2019 : Rs. 0.36

Note: *) ('84) refers to list with additional scarcity villages, as prepared in 1984

Scheme name : **MAHADAPUR**

Block : Niymatbad
Tehsil : Chandauli
District : Varanasi
No. of villages : 13 inhabited
13 scarcity

Population : 1971 census : 9,701
1981 census : 11,693
initial stage (1989) : 13,430
intermediate stage (2004): 17,120
final stage (2017) : 21,520
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 1.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 500 m^3
staging : 20 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 47 Nos.
double-tap : 6 Nos.
Private connections (target) : 1989 : 115 Nos.

Estimated capital cost: : Rs. 7.416 million
Per capita cost : 1989 : Rs. 552
2004 : Rs. 433
: 2019 : Rs. 345
Annual maintenance costs : 1989 : Rs. 112,700
2004 : Rs. 152,000
2019 : Rs. 194,100
Per capita maintenance costs : 1989 : Rs. 8.39 per annum
2004 : Rs. 8.88 per annum
2019 : Rs. 9.02 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.44
2004 : Rs. 0.46
2019 : Rs. 0.47

Scheme name : **AWAJAPUR**

Block : Dhanapur
Tehsil : Chandauli
District : Varanasi
No. of villages : 16 inhabited + 1 uninhabited
16 scarcity

Population : 1971 census : 8,884
1981 census : 11,258
initial stage (1989) : 13,380
intermediate stage (2004): 18,060
final stage (2017) : 23,980
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 1.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 650 m^3
staging : 18 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 37 Nos.
double-tap : 16 Nos.
Private connections (target) : 1989 : 115 Nos.

Estimated capital cost: : Rs. 7.400 million
Per capita cost : 1989 : Rs. 553
2004 : Rs. 410
: 2019 : Rs. 309
Annual maintenance costs : 1989 : Rs. 120,900
2004 : Rs. 165,800
2019 : Rs. 206,200
Per capita maintenance costs : 1989 : Rs. 9.04 per annum
2004 : Rs. 9.18 per annum
2019 : Rs. 8.60 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.47
2004 : Rs. 0.48
2019 : Rs. 0.45

Scheme name : **HATHI BARNI**

Block : Sewapuri
Tehsil : Varanasi
District : Varanasi
No. of villages : 26 inhabited + 2 uninhabited
26 scarcity
Population : 1971 census : 10,597
1981 census : 13,294
initial stage (1989) : 15,400
intermediate stage (2004): 20,630
final stage (2017) : 25,860
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 1.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 650 m^3
staging : 18 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 69 Nos.
double-tap : 14 Nos.
Private connections (target) : 1989 : 132 Nos.

Estimated capital cost: : Rs. 7.214 million
Per capita cost : 1989 : Rs. 468
2004 : Rs. 350
: 2019 : Rs. 279
Annual maintenance costs : 1989 : Rs. 113,300
2004 : Rs. 157,100
2019 : Rs. 191,600
Per capita maintenance costs : 1989 : Rs. 7.35 per annum
2004 : Rs. 7.60 per annum
2019 : Rs. 7.41 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.38
2004 : Rs. 0.40
2019 : Rs. 0.39

Scheme name : JANSA

Block : Sewapuri
Tehsil : Varanasi
District : Varanasi
No. of villages : 21 inhabited + 3 uninhabited
21 scarcity
Population : 1971 census : 9,900
1981 census : 13,057
initial stage (1989) : 15,965
intermediate stage (2004): 22,535
final stage (2017) : 31,270
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 1.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 800 m^3
staging : 18 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 60 Nos.
double-tap : 12 Nos.
Private connections (target) : 1989 : 137 Nos.

Estimated capital cost: : Rs. 7.766 million
Per capita cost : 1989 : Rs. 486
2004 : Rs. 345
: 2019 : Rs. 248
Annual maintenance costs : 1989 : Rs. 121,000
2004 : Rs. 169,000
2019 : Rs. 216,000
Per capita maintenance costs : 1989 : Rs. 7.58 per annum
2004 : Rs. 7.50 per annum
2019 : Rs. 6.90 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.40
2004 : Rs. 0.39
2019 : Rs. 0.36

Scheme name : **KOSAM KHIRAZ**

Block : Kaushambi
Tehsil : Manihanpur
District : Allahabad
No. of villages : 12 inhabited, of which:
10 scarcity + 2 non-scarcity

Population : 1971 census : 12,036
1981 census : 15,391
initial stage (1989) : 18,405
intermediate stage (2004): 25,100
final stage (2017) : 33,660
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 2.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 800 m^3
staging : 18 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989) : 91 Nos.
Private connections (target) : 1989 : 267 Nos.

Estimated capital cost: : Rs. 15,132 million
Per capita cost : 1989 : Rs. 822
2004 : Rs. 603
: 2019 : Rs. 450
Annual maintenance costs : 1989 : Rs. 148,000
2004 : Rs. 206,000
2019 : Rs. 260,000
Per capita maintenance costs : 1989 : Rs. 8.04 per annum
2004 : Rs. 8.21 per annum
2019 : Rs. 7.72 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.31
2004 : Rs. 0.32
2019 : Rs. 0.30

Scheme name : **CHHEKAWA**

Block : Kaushambi
Tehsil : Manihanpur
District : Allahabad
No. of villages : 11 inhabited, of which:
8 scarcity + 3 non-scarcity

Population : 1971 census : 10,658
1981 census : 13,746
initial stage (1989) : 16,532
intermediate stage (2004): 22,762
final stage (2017) : 30,810
Rate of water supply: 70 litres per capita and per day
Nature of source : groundwater
Source : tubewell
Treatment : safety chlorination (bleaching powder solution)
dosing capacity: minimum 0.5 mg/l
maximum 2.0 mg/l
Overhead tank: material: reinforced concrete
capacity: 800 m^3
staging : 18 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standposts (1989): single-tap : 53 Nos.
double-tap : 15 Nos.
Private connections (target) : 1989 : 244 Nos.

Estimated capital cost: : Rs. 10,556 million
Per capita cost : 1989 : Rs. 639
2004 : Rs. 464
: 2019 : Rs. 343
Annual maintenance costs : 1989 : Rs. 125,000
2004 : Rs. 174,200
2019 : Rs. 221,000
Per capita maintenance costs : 1989 : Rs. 7.56 per annum
2004 : Rs. 7.65 per annum
2019 : Rs. 7.17 per annum
Cost of water per 1000 litres : 1989 : Rs. 0.30
2004 : Rs. 0.30
2019 : Rs. 0.28