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INDIA

Report on mission 12 to Uttar Pradesh (UP-12)

Sector: Rural Water Supply

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

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

water supply

April 1985

R822-2607

Composition of mission UP - 12:

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

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

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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
VT	: vertical turbine

1. INTRODUCTION AND SUMMARY

Indo-Dutch Review Mission UP-12 visited Uttar Pradesh in April 1985. The aim of this mission, which consisted of Mr. R. Trietsch (DHV Consulting Engineers), Mr. A.K. Sen Gupta (Asstt. Adviser, CPHEEO) and Mr. J.A. Speets (Water Supply Coordinator at the Royal Netherlands Embassy in New Delhi) was threefold (see also the Terms of Reference, in Annex A).

First, the mission was to evaluate the progress of the implementation of the so-called Dutch Credit Programme (DCP) schemes in Uttar Pradesh, which are situated in the easterly districts of Rae Bareli, Allahabad and Varanasi.
Secondly, the status-quo of the proposed hand pump schemes under Sub-Project III was to be reviewed.
Finally, a technical appraisal was to be carried out of newly proposed schemes that had been selected as a replacement for the former Sub-Project II schemes.

As was mentioned in report UP-10 of October 1984, the schemes that had originally been proposed under Sub-Projects West-I and East-II had after all not been included in the Dutch-financed projects, as a result of which these Sub-Projects were in fact no longer included in the DCP package. In order to prevent any misunderstandings, it was decided, therefore, to refer to the newly proposed schemes as Sub-Project IV rather than Sub-Project II (new).

After preliminary discussions in New Delhi (see "Itinerary of Mission", Annex B) the mission departed for Lucknow on April 16, 1985.
There the mission had discussions with the Managing Director and senior staff of the Uttar Pradesh Jal Nigam, and then departed for field visits in the Rae Bareli, Allahabad and Varanasi Districts.
A total of 11 schemes under Sub-Project I (East) were visited, as well as a few villages in the area to be covered by the newly proposed schemes (Sub-Project IV). In all districts the progress of the schemes under Sub-Project I was discussed with the field staff (see Annex C for a list of people involved).
In addition, the demographic and technical basis for the newly proposed schemes was discussed extensively, both in the field and in Lucknow.

At the end of the field visits, the mission members returned to Lucknow to discuss the mission's findings, as laid down in the "Conclusions and Recommendations of the Indo-Dutch Review Mission (UP-12) of April 1985 to Uttar Pradesh" (see Annex D).

After the mission's return to New Delhi a debriefing took place at the Ministry of Works and Housing, with the Adviser (PHEE), CPHEEO.

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

a. Although during the previous mission's visit it was indicated that - with a few exceptions - all schemes would be completed by the end of 1984, and be fully commissioned, including increased numbers of

standposts, by March 1985, the mission found that actual progress has again lagged behind expectation.
It is now expected that many of the schemes will not be fully commissioned before July-September of this year, and possibly not before the year 1986.

b. Notwithstanding earlier commitments, the number of constructed standposts has still not been raised to the agreed level. In addition, most of the standposts are still not of the agreed so-called 'vandal-proof' design.

Chapter 2.2. of this report calculates in detail the numbers of public standposts that should be included in the DCP schemes. It appears that the so-called 'increased number of public standposts' is based on predicted 1981 population figures rather than actual present population, let alone future population. As a result of this, the number of presently constructed public standposts is not sufficient to cater for those people that do not have a private connection. Much emphasis should thus be given to constructing the balance of the required standposts.

c. The mission feels that there is a lack of incentive within the U.P. Jal Nigam to commission the schemes in time, and concludes that probably too much attention has been directed towards other schemes (that appear to have been commissioned in record time). The Dutch mission members therefore propose that such incentive be created by promising to withhold reimbursements for expenditures incurred beyond the present year, with the exception of the Udari scheme, where compelling reasons caused earlier delays.

d. Progress with the implementation of the so-called exempted feeders has been disappointing. In 9 cases exempted feeders were either not yet commissioned or inoperable due to theft of wires or too low or too high voltages. It is recommended that the U.P. Jal Nigam contact the State Electricity Board in order to ascertain a speedy implementation, as well as voltages within an acceptable range.

e. Pending the exchange of side letters on Sub-Project III (hand pumps) no further activities have been undertaken by the U.P. Jal Nigam.

f. The mission received a summary report on 9 out of 11 proposed schemes under Sub-Project IV, and analyzed 8 of the corresponding project reports. Although in general the set-up of the schemes is according to that used in Sub-Project I (East), in the mission's opinion the proposed design population was far too low.

After extensive discussions it was agreed that the technical design criteria for all projects and the demographic dat for the Bairi Bisha, Inargaon and Hathi Barni schemes were acceptable to the mission. Higher design populations, however, should be adopted for the remaining schemes.

In addition, the implementation schedule for the schemes should be based upon more realistic assumptions than mentioned in the reports (start by mid-1986 at the earliest; construction period at least 3 years).

The U.P. Jal Nigam promised to have the relevant project design reports adapted, as well as processed internally and by the U.P. State Government, by June 1985. The Ministry of Works and Housing in New Delhi would be able to process the reports within one month's time.

All parties concerned urged the Indian and Netherlands Governments to have the procedures regarding the approval of the Sub-Project terminated within as short a period as possible, as the rural area for which the schemes are intended suffers from severe drought.

During the discussions and field visit it appeared that there is a need for more reliable and field-tested design data on which to base the designs for rural water supply schemes. Especially the fact that in practice such schemes are operated differently (e.g. during less hours per day) than according to the design criteria, has to be taken into account, as this may have far-reaching effects on the effectivity of the schemes themselves.

Important parameters that need to be investigated in more detail (including their effect on financial/economical viability of operation and maintenance of the schemes under rural circumstances) are:

- design period (10, 15 or 30 years, including feasibility of phased implementation)
- population growth rates to be adopted (linear or exponential growth rate; extrapolation of census figures, etc.)
- per capita water demand (40, 50, 55, 70, 90 lpcd?)
- water consumption pattern of rural population under conditions of plentiful water availability; effect of reducing supply hours
- cattle watering provisions (necessary, feasible?)
- effect of selected design period and per capita water provisions on possibility of private connections
- earning capacity of rural population and willingness to pay for water
- feasibility of private connections under rural Indian circumstances
- desirable number of standposts for the population including scheduled castes
- revenue earning capacity of schemes as function of design capacity/per capita water demand

2. SUB-PROJECT I (UP EAST)

2.1. Physical progress

2.1.1. General aspects

During the visit of Mission UP-10 to Uttar Pradesh the commissioning of the various schemes was expected to be as follows:

- Udari scheme (Rae Bareli) : September 1985
- all other schemes : March 1985

The mission, on its arrival in Uttar Pradesh, thus expected to see all schemes except Udari completed, and the Udari scheme in an advanced stage of completion. In fact, however, the progress of schemes, especially in the Rae Bareli district, has been far from satisfactory:

- water sources have been completed in 18 out of 22 schemes
- distribution systems have been completed in 18 schemes
- elevated water reservoirs have been completed in 16 schemes
- the required numbers of public standposts have been constructed in 2 schemes (!)
- 472 out of a total of 2101 completed public standposts have been constructed in accordance with the agreed criteria for a so-called 'vandal-proof' design
- 9 schemes out of a total of 19 have been provided with exempted feeders (the remaining 3 schemes either depend on a power sub-station that has not yet been constructed, or do not require exempted feeders for other reasons)
- in 3 of the commissioned exempted feeders the voltage is frequently outside the range that is suitable for running the pumps (over/under-voltage) or the system is repeatedly out of order due to theft of wires or other reasons

As can be seen from the above list, especially the number of public standposts that has been constructed is far below the required minimum. The main reason for this is that the directive from the U.P. Jal Nigam management, to temporarily 'freeze' the numbers of public standposts in order to boost the number of private connections, that was to be withdrawn as a result of the discussions of mission UP-10, was in fact still in force.
More details about the public standpost situation will be given in paragraph 2.2.

As presently anticipated, most schemes will be commissioned in the period between mid-1985 and end-1985. A number of schemes have been commissioned already, albeit without the required number of public standposts, and not always with exempted feeder. The latter is generally out of the control of the U.P. Jal Nigam, however.

2.1.2. Progress of schemes in Rae Bareli District

During its field trip the mission visited the DCP schemes Udari, Bannamau, Ralpur, Govindpur, Ferozpur and Bhojpur, and discussed the progress of all schemes with the Rae Bareli field staff.

At the time of the mission's visit the water sources (tubewells or cavity wells) had been constructed in all schemes, although TW No. 3 of Jagatpur and TW No. 3 of Behtakalan still had to be developed, and the respective pumps procured and/or installed.

Of the 10 overhead reservoirs, 4 had been completed at the time of the mission's last visit. Presently, 4 OHT have been commissioned, one is under testing, two have been completed for 90%, and the remaining three have been completed for 60% (Thulendi), for 45% (Ashrafpur) and for 20% (Udari).

The slow progress of the OHT construction at Thulendi is attributed to the fact that this structure is still being constructed by a contractor (in most other cases contracts have been rescinded), under the old rates (which - because of the rising costs - are less than attractive for the contractor involved).

In Ashrafpur the lack of progress was attributed to the fact that the site is almost unapproachable for approx. 6 months per year (although this should hold true for the period March-September rather than the period since the last mission's visit).

In Udari the construction of the OHT was deferred until sufficiently promising water sources had been found. In addition, delays were incurred because the soil proved to be aggressive, so that so-called 'soil treatment' became necessary: the foundation plate/raft for the OHT has been cast on a foundation of lean concrete with plastic sheeting to prevent contact between the soil/ shallow groundwater and the structure itself. Similarly a brick retaining wall has been built around the raft, again with a plastic membrane to prevent direct contact between the structure and the surrounding soil.

Commissioning of the OHT at Bannamau and Behtakalan (90% progress) was expected in May 1985.

The distribution systems have been virtually completed in all schemes but Udari, where approximately two-thirds of the system has been laid.

Exempted feeders have been commissioned in Thulendi, Jagatpur and Bannamau. In Bannamau, however, over-voltage problems were experienced (at the time of the mission's visit the Volt meter indicated 435-445 V). According to the Jal Nigam field staff these problems will soon be over, however.
In Ferozpur, Ralpur, Govindpur, Bhojpur and Behtakalan commissioning of the exempted feeders was expected to take place in the month of April 1985 itself, whereas for Ashrafpur commissioning was expected in May

1985. For Udari not even a target date for commissioning had been given by the State Electricity Board, so that commissioning before the end of the year is highly unlikely.

A total of 1059 public standposts had been constructed, or: approx. 57 percent of the calculated requirements (1842 standposts). 310 of these are of the so-called 'vandal-proof' type.

Final commissioning of the schemes in Rae Bareli District is expected in the period May-September 1985, with the exception of Udari (expected commissioning in March 1986).

Detailed, scheme-wise data on the progress of the individual schemes is given in Annex F.

2.1.3. Progress of schemes in Allahabad District

The mission visited the Nidura scheme and discussed the progress of the DCP schemes in Allahabad District with the UP Jal Nigam field staff.

Except for the public standposts and the exempted feeder in Pratappur the schemes have all been commissioned. In Pratappur the month of commissioning of the exempted feeder can not be predicted with accuracy; it is expected somewhere between the end of 1985 and mid-1986. For Urwa no exempted feeder is required.

The total number of constructed public standposts amounts to 248 or: 38 percent of the requirements according to the revised scheme set-up (649 public standposts in total). A total of 162 standposts were reported to be 'vandal-proof'.

Detailed, scheme-wise data are given in Annex F.

2.1.4. Progress of schemes in Varanasi District

In Varanasi District progress has been the most pronounced of the three districts. Whereas at the time of the mission's last visit a number of OHT were still under construction, these have all been completed by now, as have the distribution systems.

Exempted feeders have been commissioned in all schemes except Harhua (back-up power by means of a gen-set) and Vyasnagar (railway crossing still to be approved). In Mirzamurad and Biraonkot the exempted feeders have been re-commissioned, but in the former there is trouble again, due to the presence of dacoits in the area.
In Kandwa the exempted feeder does not provide power for more than 6 - 7 hours a day. According to the Jal Nigam field staff this situation is expected to improve in the near future, however.

The total number of public standposts according to the revised project set-up is 1868. Of these, a total of 794, or: 43 percent, has been constructed, none of which are of the so-called 'vandal-proof' type. Detailed, scheme-wise data on the progress of the individual schemes is given in Annex F.

2.2. Public standposts and private connections

2.2.1. Present public standpost situation

As can be deducted from the above paragraphs on the physical progress of the DCP schemes, public standposts are the major item where progress is unsatisfactory.
In the mission's report UP-10 it was already indicated that the management of the U.P. Jal Nigam had issued a directive to temporarily 'freeze' the numbers of constructed public standposts, in order to boost the number of applications for private connections. The reason for this is the fact that private connections are the only important revenue earners in a rural water supply scheme, and in this way it was hoped to attain at least some degree of financial viability of the operation and maintenance of the schemes.

However understandable this might be, during the visit of mission UP-10 it was agreed that this directive would be withdrawn, and that the required numbers of public standposts would be constructred without further delay.

During the visit of mission UP-12 it became clear, however, that the UP Jal Nigam field staff was as reluctant as ever to construct the additionally required numbers of standposts, and that the earlier mentioned management directive had not been withdrawn either. As a result, the number of constructed public standposts had increased from a total of 1276 at the time of mission UP-10, to 2101 at present, whereas the total required number according to the revised project set-up amounts to 4411. The degree of realization of the target is thus less than 48 percent. This does not even take into account, that the required number of public standposts has been based on estimated, rather than actual population data, and not on the target population or immediate population, not even on the present population, but on the population at the time of the revision of the scheme, i.e. 1981. Actual required numbers of public standposts may thus be even higher!

2.2.2. Private connections

The U.P. Jal Nigam policy to (temporarily) restrict the number of public standposts was aimed at boosting the number of applications for private connections. Presently, the situation regarding private connections in the DCP schemes is as indicated in table 2.1.

Table 2.1 - Private connections in DCP schemes

Scheme name:	Private connections Target Nos.	Realized Nos.	Percent
Ferozpur	380	130	34%
Ralpur	536	97	18%
Govindpur	476	107	22%
Bhojpur	556	300	54%
Thulendi	751	25	3%
Jagatpur	735	70	10%
Ashrafpur	633	40	6%
Udari	687	0	0%
Bannamau	984	90	9%
Behtakalan	1205	85	7%
RAE BARELI	6943	944	14%
Saidabad	337	384	114%
Nidura	300	384	128%
Pratappur	416	120	29%
Urwa	290	355	122%
ALLAHABAD	1343	1243	93%
Mirzamurad	580	554	96%
Tikri	410	450	110%
Sewapuri	215	160	74%
Harhua	550	550	100%
Biraonkot	600	300	50%
Vyasnagar	550	300	55%
Rohania	600	644	107%
Kandwa	555	245	44%
VARANASI	4060	3203	79%
SUB-PROJECT EAST I	12346	5390	44%

It is clear that especially in Allahabad District, and to a lesser extent also in Varanasi District, the targeted number of private connections has almost been reached, and in several schemes even surpassed. Hardly any reasons exist, therefore, to continue with the policy of restricting the numbers of public standposts, apart even from the fact that such policy had been promised to be abolished already at the time of mission UP-10's visit.

2.2.3. Estimate of required numbers of public standposts

The numbers of public standposts as required according to the abovementioned 'revised project set-up' have been calculated in district-wise "Statements of Standposts", that were handed over to the mission on May 5, 1982. These reports showed a break-down of each revenue village in the respective schemes into hamlets and core villages, indicating also the numbers of SC/ST and other population for each of these habitations.

According to the agreed criteria:

- at least one standpost for the SC/ST population and one for the remaining population, at each village or hamlet
- not more than 250 people per tap (with the possibility of multi-tap standposts
- maximum walking distance of 150 meters

the numbers of public standposts as required per scheme were calculated, with the following results:

Table 2.2 - Numbers of standposts according to revised set-up

District	Projected population	Public standposts original estimate	Public standposts revised estimate
Rae Bareli	212555	841	1859
Allahabad	93459	179	677
Varanasi	302115	400	1875
TOTAL	608129	1420	4411

The projected population, when compared with the scheme-wise population projections, appears to be the 1981 population, rather than the target population or even the population at the expected time of commissioning of the scheme.

In order to assess the numbers of public standposts that would be required to cater for the present or expected population under the same criteria as mentioned earlier, a new calculation has been carried out in this report, using the population break-down given in the "Statements of Standposts".

Using the tehsil-wise growth rates in the period 1971-1981 the 1981 population of the individual schemes had already been calculated in report UP-8 of February 1983 (Table 2.1 , page 13-14).

As a rule these calculated population totals differ from those mentioned in the "Statements of Standposts" of May 1982. Therefore, the population data per village or hamlet have been adjusted, with a constant factor per

scheme, in order to bring the total 1981 population at the level mentioned in report UP-8.
Thereafter, the required numbers of public standposts have been calculated, according to the criteria as mentioned before.

Using the annual growth rate as following from the tehsil-wise growth over the period 1971-1981, the total population per scheme has also been calculated for the year of the expected commissioning of the schemes (situation 1986), for 1991, and for the original target year 2011. As no detailed data are available, it has been assumed that each hamlet and village in a particular scheme grows at the same rate. Although the actual situation will undoubtedly be different, it is felt that this approximation is warranted, especially in view of the limited data available.

Table 2.3 shows the results of these calculations. As could be expected, the total number of public standposts required at commissioning of the schemes is larger than according to the so-called revised estimate, viz. 1631 + 3078 = 4709 rather than 4411. It is also clear that, due to the relatively large number of small habitations, the number of required public standposts grows considerably slower than the population of the schemes: whereas the population is expected to grow with a factor 2.02 between 1981 and 2011, the total number of standposts grows with a factor of not more than 1.50. As a result, the average number of people per public standpost would grow from 138 in 1981 to 186 in the year 2011.

Table 2.3 also shows that at all times the average number of people per standpost is smaller for the SC/ST population than for the rest of the people. This may be explained by the fact that the SC/ST people as a rule live in smaller habitations.
This is also shown by the fact that between 33 and 35 percent of the total number of public standposts is planned in SC/ST quarters, although their contribution to the total population is lower: approx. 28 percent.

2.2.4. Comparison of required and realized numbers of standposts

In order to compare the number of standposts that had been constructed at the time of the mission's visit, with the required number according to table 2.3, the requirements per 1986 have been taken as the basis for comparison.

Table 2.4 indicates the 1986 requirements, per scheme, and for the SC/ST and remaining population separately. It also indicates the actual numbers of public standposts (PS) and house connections (HC) as realized at the time of the mission's visit.

In order to calculate the actual requirements it had to be taken into account that a part of the population is served by private connections, so that the actually required number of standposts is lower than indicated for 1986 in table 2.3. A correction of this number was thus determined, by first estimating the number of people that is served by the private connections, and 'translating' that number into numbers of public

Table 2.3 - Determination of required numbers of public standposts

Year:	1981				1986				1991				2011			
	PEOPLE:		STANDPOSTS:		PEOPLE:		STANDPOSTS:		PEOPLE:		STANDPOSTS:		PEOPLE:		STANDPOSTS:	
Scheme name:	SC/ST	rest	SC/ST	rest	SC/ST	rest	SC/ST	rest	SC/ST	rest	SC/ST	rest	SC/ST	rest	SC/ST	rest
Ferozpur	3897	9736	51	71	4313	10776	52	79	4660	11643	52	80	6352	15869	58	92
Ralpur	5492	11588	91	110	6038	12740	92	114	6524	13765	92	115	8890	18759	100	131
Govindpur	5521	12653	44	68	6541	14991	46	83	7067	16197	48	89	9632	22075	58	109
Bhojpur	5632	14539	47	77	6138	15845	47	83	6632	17120	47	91	9039	23333	57	113
Thulendi	7646	12445	81	105	8588	13978	83	110	9371	15252	86	114	13284	21621	97	135
Jagatpur	6348	17340	97	165	7028	19197	97	170	7593	20742	98	170	10349	28269	105	192
Ashrafpur	5319	10685	82	98	7051	14165	86	106	7858	15785	86	112	12119	24345	103	140
Udari	6922	10283	86	118	7796	11581	87	119	8688	12906	89	124	13400	19906	103	141
Bannamau	9500	18751	101	128	10330	20389	102	133	11161	22029	105	142	15211	30023	114	177
Behtakalan	5451	24384	73	149	6102	27297	74	163	6593	29494	75	173	8986	40196	82	210
RAE BARELI	61728	142404	753	1089	69925	160958	766	1160	76147	174933	778	1210	107262	244396	877	1440
	30%	70%	41%	59%	30%	70%	40%	60%	30%	70%	39%	61%	31%	69%	38%	62%
Saidabad	6651	16939	51	118	8234	20971	57	130	9408	23960	61	145	16029	40823	84	202
Nidura	3655	16695	49	96	4272	19513	49	108	4782	21841	50	122	7506	34285	58	165
Pratappur	6163	23108	42	131	7610	28534	45	156	8695	32600	51	172	14813	55541	75	264
Urwa	5595	14672	56	106	7209	18906	64	132	8345	21885	64	137	14985	39295	90	217
ALLAHABAD	22064	71414	198	451	27326	87924	215	526	31230	100286	226	576	53333	169944	307	848
	24%	76%	31%	69%	24%	76%	29%	71%	24%	76%	28%	72%	24%	76%	27%	73%
Tikri	14340	26410	89	118	17528	32281	107	141	19686	36256	126	159	31327	57695	174	243
Sewapuri	6286	15203	39	78	7263	17565	43	89	8157	19728	46	98	12981	31394	64	145
HArhua	12869	25625	96	140	15412	30690	102	162	17311	34469	108	174	27546	54851	149	253
Biraonkot	13900	28191	93	168	16688	33846	109	190	18743	38014	113	203	29827	60492	168	307
Mirzamurad	13000	25671	83	181	15586	30778	92	190	17505	34568	97	198	27856	55007	134	259
Rohania	7244	34427	49	185	8698	41337	55	200	9769	46428	59	219	15546	73882	81	325
Vyasnagar	9004	31655	69	157	10252	36044	72	171	11314	39776	75	184	16779	58989	90	261
Kandwa	6092	32078	69	254	7315	38516	70	258	8215	43259	72	261	13073	68839	85	317
VARANASI	82735	219260	587	1281	98742	261056	650	1401	110700	292498	696	1496	174935	461149	945	2110
	27%	73%	31%	69%	27%	73%	32%	68%	27%	73%	32%	68%	28%	72%	31%	69%
DCP TOTAL:	166527	433078	1538	2821	195992	509930	1631	3087	21877	567717	1700	3282	335530	875489	2129	4398
	28%	72%	35%	65%	28%	72%	35%	65%	28%	72%	34%	66%	28%	72%	33%	67%
	SC/ST	rest	Total		SC/ST	rest	Total		SC/ST	rest	Total		SC/ST	rest	Total	
People/SP:	108	154	138		120	165	150		128	173	158		158	199	186	

Table 2.4 - Comparison of required and actual numbers of standposts

Scheme name:	1986 requirements: PEOPLE: SC/ST	rest	STANDPOSTS: SC/ST	rest	total	min total	Non-SC/ST people per PS	HC	Actual 1985 PS	HC	Corr. PS	Percentage of required PS acc. to calc.	min.	Number of habitations with non-ST/SC population
Ferozpur	4313	10776	52	79	131	100	136	7	48	130	55	42%	55%	48
Ralpur	6038	12740	92	114	206	181	112	7	105	97	111	54%	61%	89
Govindpur	6541	14991	46	83	129	88	181	7	56	107	60	47%	68%	42
Bhojpur	6138	15845	47	83	130	90	191	7	84	300	95	73%	106%	43
Thulendi	8588	13978	83	110	193	156	127	7	65	25	66	34%	42%	73
Jagatpur	7028	19197	97	170	267	243	113	7	160	70	164	61%	67%	146
Ashrafpur	7051	14165	86	106	192	167	134	7	60	40	62	32%	37%	81
Udari	7796	11581	87	119	206	192	97	7	18	0	18	9%	9%	105
Bannamau	10330	20389	102	133	235	207	153	7	240	90	244	104%	118%	105
Behtakalan	6102	27297	74	163	237	168	167	7	223	85	227	96%	135%	94
RAE BARELI	69925	160958	766	1160	1926	1592	139	7	1059	944	1102	57%	69%	826
	30%	70%	40%	60%	100%									
Saidabad	8234	20971	57	130	187	143	161	7	77	384	94	50%	66%	86
Nidura	4272	19513	49	108	157	108	181	7	70	384	85	54%	79%	59
Pratappur	7610	28534	45	156	201	126	183	7	55	120	60	30%	48%	81
Urwa	7209	18906	64	132	196	157	143	7	46	355	63	32%	40%	93
ALLAHABAD	27326	87924	215	526	741	534	167	7	248	1243	302	41%	57%	319
	24%	76%	29%	71%	100%									
Tikri	17528	32281	107	141	248	134	229	7	95	450	109	44%	81%	27
Sewapuri	7263	17565	43	89	132	79	197	7	60	160	66	50%	84%	36
Harhua	15412	30690	102	162	264	173	189	7	130	550	150	57%	87%	71
Biraonkot	16688	33846	109	190	299	207	178	7	110	300	122	41%	59%	98
Mirzamurad	15586	30778	92	190	282	146	162	7	129	554	153	54%	105%	54
Rohania	8698	41337	55	200	255	114	207	7	100	644	122	48%	107%	59
Vyasnagar	10252	36044	72	171	243	121	211	7	70	300	80	33%	66%	49
Kandwa	7315	38516	70	258	328	120	149	7	100	245	111	34%	93%	50
VARANASI	98742	261056	650	1401	2051	1094	186	7	794	3203	913	45%	83%	444
	27%	73%	32%	68%	100%									
DCP TOTAL:	195992	509938	1631	3087	4718	3220	165	7	2101	5390	2317	49%	72%	1589
	28%	72%	35%	65%	100%									

standposts. For estimating the number of people served by private connections, the household size was fixed at 7 persons. For calculating the corresponding reduction in required numbers of public standposts, the average number of people per standpost for the respective scheme, and for the nOn-SC/ST population was taken. The reason for this is that there are relatively large differences in this number, as well between the individual schemes, as well as between the SC/ST and non-SC/ST population. This can easily be seen from the eighth column of table 2.4, where the average number of people per public standpost ranges from a minimum of 97 (Udari scheme) to a maximum of 229 (Tikri).

From table 2.4 it appears that the realized numbers of private connections are equivalent with 216 public standposts, thus bringing the total equivalent number of standposts at 2317, rather than 2101. It must be emphasized, however, that this calculation may be rather optimistic. Although the effect of smaller habitations on the less than proportional variation of the number of standposts has already been partly accounted for by using scheme-wise averages for the population per standpost, the effect of reducing the population to be served by discounting those with a private connection might in individual cases be next to negligible (e.g. when that population is spread evenly over the entire population).

Assuming that those who can afford a private connection will live in more or less the same area, the approach followed may still be considered a realistic one, albeit resulting in minimum requirements.

Comparing the thus calculated required number of public standposts shows that the presently constructed number of standposts is only 49 percent of the required (corrected) total.

According to the policy of temporarily restricting the numbers of public standposts as earlier advocated by the U.P. Jal Nigam, and according to the explications given to the mission then, all SC/ST population should be provided with standposts according to the agreed criteria (hardly any private connections are expected in this group anyhow), whereas for the remaining population at least one public standpost should be erected in each habitation, regardless of its size.

When this approach would be adhered to (which is not the case, as explained earlier), the required number of standposts would be those for the SC/ST population (column 3 of table 2.4) plus the number of villages/hamlets where non-SC/ST population is living (last column of table 2.3), resulting in a total of 3220 public standposts.

Even though the thus calculated number of standposts would constitute the bare minimum, it appears that the actually realized number is even lower: only 72 percent of this, with the lowest percentages being shown for Allahabad District.

2.2.5. Conclusions

From the above it will be clear that constructing the remaining public standposts according to the revised project set-up is strictly necessary, and that in fact the number should still be higher, to take into account the increase in population since 1981.

In view of the attitude of the U.P. Jal Nigam field staff it may be expected that no extension of the number of public standposts will take place in the near future, so that the presently ongoing implementation should preferably result in a number of standposts that is sufficient also for the near future. It seems highly unlikely that that can be realized, however.

Taking the above into account, the mission strongly recommends that both the Indian and the Netherlands Governments emphasize the importance of constructing the agreed numbers of public standposts. It also suggests that no further delays in implementing the DCP schemes under Sub-Project I (East) are agreed with, by deciding to withhold reimbursement of claims related to implementation activities after January 1, 1986.
In view of special circumstances, exceptions could be made for the Udari scheme and for the commissioning of some exempted feeders, however.

2.3. Power supply

In chapter 2.2 for each of the districts the situation regarding the exempted feeders is mentioned. From that information it is clear that in Rae Bareli, where only 3 schemes had been provided with exempted feeders by the time of the mission's visit, for 5 schemes such feeders were expected to be commissioned in the month of April itself, and for one more scheme in May (Ashrafpur). Only in one case no specific month for commissioning the feeder could be given (Udari).

In Allahabad 3 out of 4 schemes require exempted feeders, 2 of which have been commissioned. Only for the Pratappur scheme such a feeder is still required. The probable month of commissioning of that feeder could not be determined more accurately than to be within the period end of 1985 - mid-1986.

For Varanasi, out of 7 schemes, 6 were to be provided with exempted feeders, as the remaining scheme (Harhua) has been provided with a back-up generator set. For 5 schemes the feeders have been commissioned; in two of these even re-commissioned after problems caused by theft of wires. Similar problems still exist in Mirzamurad.
In Vyasnagar commissioning of the exempted feeder awaits permission from the Railway Authority for a railway crossing. The second tubewell of this scheme has power for more than 22 hours daily because of its proximity to a fertilizer factory, however.

Power supply through rural feeders continues to be a problem: in the Pratappur scheme over-all power availability during March 1985 was 380.5 hours, or 12.3 hours per day. Because of problems with either too high or

too low voltages, or because of power on a single phase only, the effective number of hours during which pumps could be run was considerably smaller: 95.9 hours, or: 3.1 hours/day.

Similarly, the availability of power amounted approx. 6 hours/day for the Harhua scheme, 4.2 hours/day for the Bhojpur scheme, and 5.1 hours/day for the Ferozpur scheme.

Problems with incorrect voltages or limited power supply appear not to be restricted to rural feeders, however: also several exempted feeders experienced problems.
In Kandwa the total number of power hours in the month of March 1985, via an exempted feeder, amounted to only 480 (15.5 hours/day), of which only during 258 hours (8.3 hours/day) the power was of the correct voltage.
In Rohania the availability of power over the exempted feeder was 458.5 hours per month in March 1985, or: 14.8 hours/day.
In Mirzamurad power over the exempted feeder was available for only 291 hours in March 1985 (9.4 hours/day), of which only during 224 hours (7.3 hours/day) at the correct voltage.
In Nidura power over the exempted feeder was available for only 564.5 hours during the month of March 1985, or: 18.2 hours/day.

Although the power situation is undoubtedly better when an exempted feeder is available, it is still far from the uninterrupted supply it is supposed to be. Also the fact that over- and under-voltages render the power unsuitable at times for running the pumps is to be taken into account.

This also means that the design conditions of a maximum of 16 hours' pumping per day cannot be met by the majority of DCP schemes, even when provided with exempted feeders. Although this is not as bad as it might appear (16 hours' pumping per tubewell is normally not required before the second half of the design period of the schemes) it is a factor to be taken into account when the feasibility of various ways of ascertaining power supply (e.g. by means of back-up gen-sets) is determined.

It is strongly recommended that the U.P. Jal Nigam maintain frequent contacts with its counterparts of the State Electricity Board, to ascertain as uninterrupted a power supply to the rural water supply schemes as possible. Setting up committees on a district level in which all parties concerned participate (e.g. also the Railway Authority, being the authority to approve railway crossings of pipes and power lines) might be an important step in that direction.

According to information obtained from the U.P Jal Nigam, on April 14, 1985 a task force has been formed by the Uttar Pradesh Chief Minister, in which representatives of the Jal Nigam, the Jal Sansthans and the State Electricity Board participate. According to directives from the Chief Minister, as soon as a site for a tubewell to be used for water supply has been selected, power should be made available by the S.E.B. within 24 hours(!).

Although the latter appears to be wishful thinking rather than realistic, it appears that at least a start has been made with improving the power supply conditions for rural water supply schemes.

2.4. Supply hours

The number of supply hours for the rural water supply schemes is, by definition, influenced by any constraints in the availability of power and hence in pumping hours.

In the Kandwa scheme, pumping hours were thus restricted to 258 hours in March 1985, or: 8.3 hours/day. The total volume of water supplied was approx. 32502 m^3, or: approx. 26 litres per head and per day.

In the Rohania scheme, the total number of pumping hours amounted to 300 in March 1985, which resulted in 135 supply hours, or: 4.35 hours/day. A total volume of approx. 60000 m^3 was supplied, which is equivalent to about 39 lpcd.

In Mirzamurad, the total number of pumping hours (for both tubewells together) amounted to 245 for March 1985. The supplied volume of water, 27930 m^3, was equivalent to approx. 26 lpcd.

Not all restrictions in the number of supply hours are caused by limited availability of power at the correct voltage, however: in many cases the number of supply hours is purposely limited, for a number of reasons. These often have to do with the way in which the schemes are operated, which sometimes is by twice daily filling the overhead reservoir and thereafter allowing water to be abstracted during a period of 3 to 4 hours, one in the early morning and one in the afternoon.

Other reasons given are the fact that water supplied during these limited periods is sufficient, and quite acceptable to the population, provided that water is available at regular times.

Insufficient data is available to either prove or reject these assumptions. It is a fact, however, that they are not in conformity with the design criteria mentioned in the project reports as well as in the "Manual on Water Supply and Treatment" from the Ministry of Works and Housing in New Delhi. That does not necessarily mean that for that reason they are not correct, but it is at the very least inconsistent to design schemes on the basis of criteria that are not valid or followed in practice.

how realistic is it to adhere rigidly to organizing and financing problems?

It is recommended, therefore, that investigations of a more fundamental nature are carried out on design criteria to be used for rural water supply schemes, as mentioned in the "Introduction and summary" (Chapter 1) of this report.

It is also recommended that, pending the establishment of other design criteria, those that have been used in the designs are adhered to, also during operation and maintenance of the schemes. In that way it can be prevented that sizes and capacities of components of the schemes become incompatible with the method of operating the schemes.
An example to that effect may be the size of the overhead reservoirs, that would become insufficient if the number of supply and/or pumping hours would be reduced but the per capita water demand retained.
This aspect has been delt with in more detail in earlier mission reports, e.g. in report UP-8 of February 1983 (paragraphs 2.10 and 2.11).

2.5. Project duration

In spite of the U.P. Jal Nigam's assurance that the estimated months of commissioning of the schemes as mentioned to Mission No. 10 were realistic, and that no more delays were anticipated, commissioning of most schemes will again be later than was estimated at that time.

The main reason for delays has been the backlog in construction of public standposts which, as has been explained before, is due to a Jal Nigam management decision rather than physical constraints during construction. In addition, the delay in commissioning the exempted feeders has delayed the final commissioning of a number of schemes that could otherwise be commissioned.

Table 2.5 shows that most of the schemes are now expected to be commissioned by September 1985, weheras the Udari scheme is expected to take until March 1986 to be completed.

The indicated months of commissioning include most but not all of the additional works such as laboratories, inspection house, etc.

Table 2.5 - Estimated commissioning of DCP schemes

District	Scheme	Probable month of commissioning as estimated per: Original	October 1984	April 1985
RAE BARELI	Ferozpur	3-82	3-85	7-85
	Ralpur	3-82	3-85	7-85
	Govindpur	3-82	3-85	7-85
	Bhojpur	3-82	3-85	7-85
	Thulendi	3-82	3-85	9-85
	Jagatpur	3-82	3-85	7-85
	Ashrafpur	3-82	3-85	9-85
	Udari	3-82	9-85	3-86
	Bannamau	3-82	3-85	5-85
	Behtakalan	3-82	3-85	6-85
ALLAHABAD	Saidabad	3-82	3-85	7-85
	Nidura	3-82	3-85	7-85
	Pratappur	3-82	3-85	7-85*)
	Urwa	3-82	3-85	7-85
VARANASI	Mirzamurad	3-82	3-85	9-85 **)
	Tikri	3-82	3-85	9-85 **)
	Sewapuri	3-82	3-85	9-85 **)
	Harhua	3-82	3-85	9-85 **)
	Biraonkot	3-82	3-85	9-85 **)
	Vyasnagar	3-82	3-85	9-85 **)
	Rohania	3-82	3-85	9-85 **)
	Kandwa	3-82	3-85	9-85 **)

Note: *) commissioning except for exempted feeder
**) assuming that construction of remaining standposts is started forthwith

The mission was disappointed to establish that commissioning of the schemes had again been delayed for most of the schemes and requested the UP Jal Nigam to do its utmost to prevent any further delays.

2.6. Project costs

The quarterly report covering the progress up to March 1985 was not yet available at the time of the mission's visit. As a result of this only the actual expenditures up to January 1985 could be obtained, as shown in table 2.6 below.

The U.P. Jal Nigam promised to make available the financial details of the quarter ending March 1985, as well as a revised disbursement schedule for the remainder of the project implementation period by mid-May 1985.

Although expenditures during the last two quarters of the year 1984 have undoubtedly increased as compared to the quarter ending June 1984, actual expenditures have lagged behind those foreseen at the time of mission UP-10 (Rs 6.7 million for the quarter ending September 1984, and Rs. 12.77 million for the quarter ending December 1984). This reflects the delays in physical implementation of the projects described in earlier paragraphs of this report.

Actual expenditures as well as expenditures expected by the time of the last mission's visit, are shown graphically 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	8,214,949.32	147,619,566.23

The mission scrutinized reimbursement claims for the period ending December 1984 and found no inconsistencies with the physical progress of the schemes.

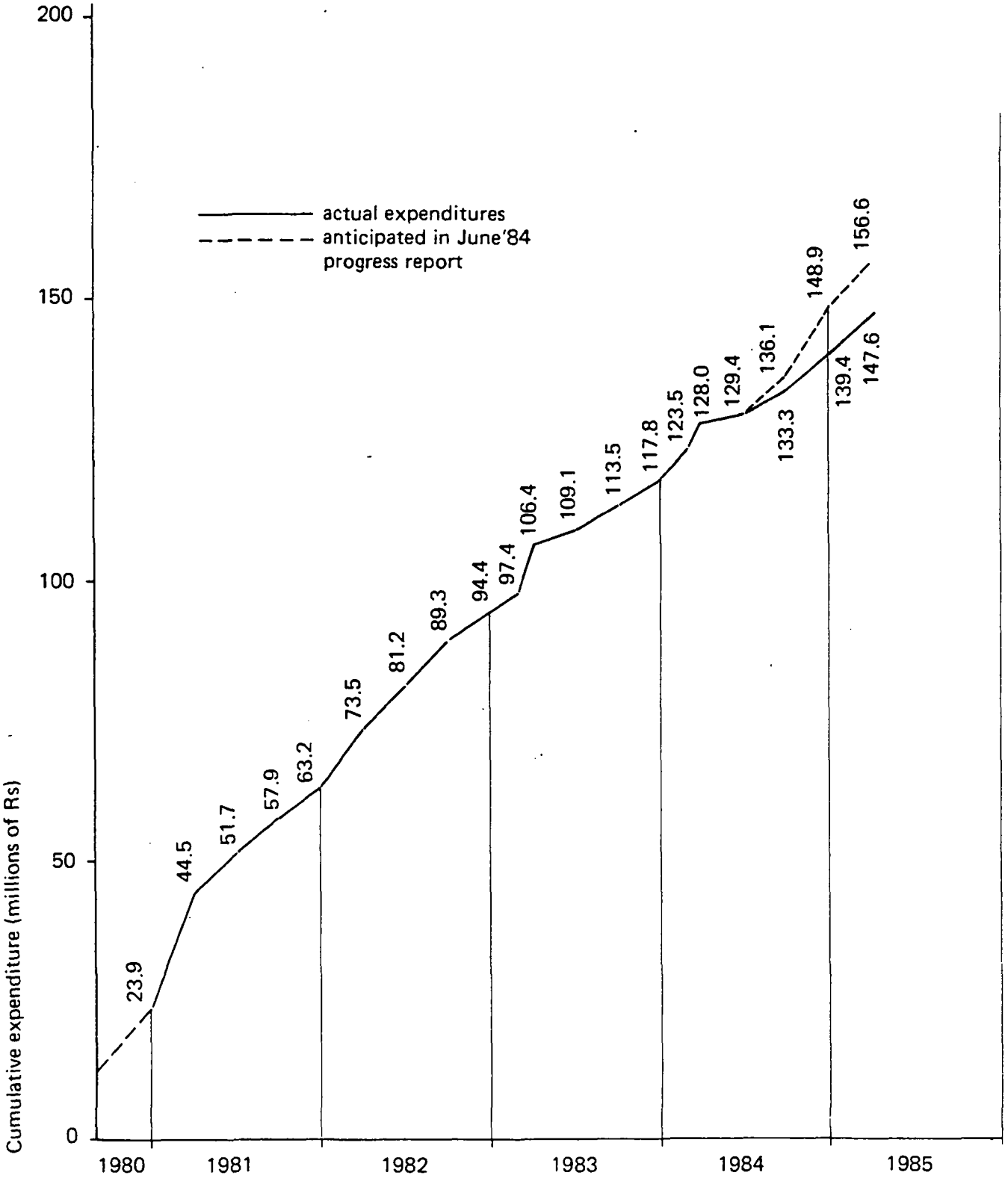

Fig. 2.1. Expenditures Sub-Project I (East), Uttar Pradesh

3. SUB-PROJECT III (HAND PUMP SCHEMES)

3.1. Status of Sub-Project III

The mission was informed that in all villages covered by the proposed hand pump schemes under Sub-Project III (East and West Uttar Pradesh) one or two hand pumps had been placed in each village, as an immediate relief measure. These hand pumps are no part of the proposed Sub-Project, which aims to saturate the respective villages with hand pumps, according to the agreed criteria.

Pending the official approval and exchange of side letters on this Sub-Project, no further action has been taken by the U.P. Jal Nigam.

3.2. Procurement procedures and quality control measures

For the procurement of hand pumps the following procedures are followed by the U.P. Jal Nigam:

- only pumps made according to Indian standard ISI 9301-1984 ("Specification for deep-well hand pumps (Second revision)" are purchased, from manufacturers that are entitled to carry the ISI mark. This means that random sampling is carried out by ISI officers, at the manufacturer's works
- According to a UNICEF circular "Qualified Suppliers of India Mk-II hand pumps and spare parts" the ISI mark is not necessarily sufficient proof of a guaranteed quality of the pumps. Hence an additional inspection is carried out by UNICEF-appointed agencies, in this case first Crown Agents, and presently SGS (Société Générale de Surveillance) of Switzerland
- Upon recipt on site a visual check is carried out by the U.P. Jal Nigam field staff
- Instructions will be given to pay additional attention to the galvanization of the various materials.

Formerly, pre-delivery checks were carried out by Jal Nigam officers at the manufacturer's works, but since there is no guarantee that the same goods that have been checked are sent to the field, this kind of check was replaced by a check upon delivery on-site.

For other materials almost the same procedure is followed, with the difference that no pre-delivery check by a UNICEF-appointed agency is carried out, but that samples of received materials are sent to testing institutes for quality checks.

4. SUB-PROJECT IV (EAST)

4.1. General aspects

During earlier contacts between the U.P. Jal Nigam and the Water Supply Coordinator at the Royal Netherlands Embassy, a summary proposal for 11 rural water supply schemes was handed over, covering the following schemes:

Varanasi District:

9

Gyanpur Tehsil:
- Inargaon scheme - 20
- Kasidaha scheme - 11
- Rohi scheme — 35
- Bairibisa scheme — 17
- Biranpur scheme — 17

} 100 villages

Varanasi Tehsil:
- Jansa scheme — 24
- Hathi Barni scheme - 26
- Awajapur scheme - 16
- Mahadapur scheme — ?

} 66+ ? villages

Allahabad District:

2

Manihanpur Tehsil:
- Chhekawa scheme — 11
- Kosam Khiraj scheme — ?

} ?

Mission Up-12 received a "Report for Pre-appraisal of Sub-Project II (East)(revised), Instalment-I for Varanasi and Allahabad Districts" of April 1985, a copy of which is attached to this report as Annex G.

The report covers the earlier mentioned schemes in Allahabad and Varanasi districts, with the exception of the Mahadapur and Kosam Khiraj schemes, of which the project reports could not be completed in time.

Salient features of the proposed schemes are indicated below:

Table 4.1 - Main data of proposed schemes under Sub-Project IV

No.	Scheme	Villages covered	Design population (2017)	Project costs (Rs millions)
1	Inargaon	20	36500	7.965
2	Kasidaha	11	32630	7.231
3	Rohi	35	38942	8.964
4	Bairibisa	17	36680	7.886
5	Biranpur	17	26800	7.288
6	Jansa	24	25415	6.295
7	Hathi Barni	26	25860	6.313
8	Awajapur	16	19900	6.221
9	Chhekawa	11	26530	9.023
	Total:	202	319600	67.206

4.2. Design criteria

The design criteria used for preparing the proposed schemes are similar to those used in Sub-Project I (East), viz.:

- design period 30 years
- design population: to be discussed separately (paragraph 4.3)
- per capita water demand: 70 lpcd
- water source: at least 2 tubewells per scheme; no tubewell to run for more than 16 hours per day. Tubewells bored in the area, both by the U.P. Jal Nigam and the Irrigation Department, are of reasonable depth (100 - 150 m), giving a safe discharge of 1400 - 2200 litres/minute. The water quality is reported to be within safe limits
- treatment of the water restricted to safety chlorination
- pumping plant of the submersible type
- power supply: based on a feasibility study for the individual schemes, in all cases power supply through exempted feeder proved the most economical. Negotiations with the State Electricity Board on the provision of such exempted feeders have been started already
- centralized storage in overhead reservoirs at the headworks sites, with a minimum capacity equivalent to at least 8 hours' supply
- supply from the OHT to be under gravity, using a simple, branched, distribution network
- to prevent delays in implementation, distribution networks have been laid out in such a way that railway crossings could be prevented
- distribution mains calculated for a peak factor of 2.4, and using the Hazen-Williams formula with C-factors of 100 for galvanized or cast iron pipes, and 120 for asbestos-cement or PVC pipes
- residual water pressures at the periphery of the schemes to be at least 6 m wc
- numbers of public standposts based on one standpost per 250 persons. These are to be provided to the scheduled caste population and the 'weaker section of society' in each village/hamlet, even if the population is less than 250 persons, while ensuring that the users do not have to walk more than 150 m to fetch water from standposts.

  This criterion does not exactly conform with those agreed on (but not yet fully implemented) for Sub-Project East I, in that it leaves open the possibility that the non-SC/ST population in a hamlet or village is not provided with a separate standpost in a smaller village or hamlet (SC/ST population provided with one or more standposts; total number of people less than 250 per standpost, but no standposts for the non-SC/ST people). Although this situation, even if it would occur, would not necessarily be problematic, it might have undesirable effects. A more precise description of the way in which the required number of public

too limited. More comprehensive study of whole problem of cost vs. cost recovery is needed.

standposts is determined may thus have to be included in the relevant side letter.
- all public standposts are to be of the 'vandal-proof' pillar type

Summarizing, the proposed schemes are according to the proven design that is also used in Sub-Project I (East). Only the required numbers of public standposts and the population projections used need to be adapted. Population projections are discussed in the next paragraph.

4.4. Population projections

The determination of the design population to be taken into account for the proposed schemes has been a subject of lengthy discusssions that started even before the end of the year 1984.
At that time Mr. A.K. Gupta, Manager Appraisal, U.P. Jal Nigam, met with Messrs. A.K. Sen Gupta (Asstt. Adviser, CPHEEO) and J.A. Speets (Water Supply Coordinator at the Royal Netherlands Embassy) in New Delhi, to discuss the way in which the target population for the schemes was to be determined.
It was argued that extrapolating the growth experienced in the decade between the 1971 and 1981 census would lead to unrealistically high population figures, and reasons were presented at that time (though not laid down in writing) for adopting a lower growth rate.

It was, therefore, proposed to accept a linear extrapolation of the population growth on the basis of the 1971 and 1981 census data. As no more detailed data were said to be available, tehsil-wise growth figures were to be used as the basis for this forecast. It was further shown that, even when the compound (annual) growth rate following from the 1971 and 1981 census data were to be used, the design populations calculated with the linear-growth method would result in minor reductions in life-time of the schemes, i.e. from 30 years to approx. 25 years.

On the basis of this information it was agreed to accept the proposed method (see also letter No. 133/JS/hm, of January 4, 1985, from the Royal Netherlands Embassy to the Managing Director of the U.P. Jal Nigam).

During the discussions of April 1985 in Lucknow, the mission received information that prompted it not to accept the earlier agreed method.

First, Mr. A.K. Gupta was on leave, and the argumentation presented by him in December 1984 could not be reproduced by any of the other members of the Appraisal Wing of the U.P.Jal Nigam.

Secondly, it appeared that the calculations that had shown that the resulting lifetimes of the schemes were still in the order of 25 years, even when using the compound growth rate, actually referred to remaining lifetime after the year 1981, so in fact showed a picture that was 4 to 5 years optimistic.

Finally, it appeared that for each of the villages in the proposed schemes census data for 1981, 1971, 1961 and in most cases also for 1951 were available, so that more accurate population growth rates than based on tehsil-wise totals could be calculated.

The mission therefore decided to check the influence of adopting these population growth rates on the design population of the schemes, or, conversely, to check what effect adopting the proposed target populations would have on the expected lifetimes of the schemes.

Table 4.2 shows the population of the area to be covered by the proposed schemes, in the years 1951, 1961, 1971 and 1981, in as far as data were available at the time of the discussions in Lucknow. As this was not the case for the Chhekawa scheme (Allahabad), this scheme is not included here.
For each of the three decades 1951-1961, 1961-1971 and 1971-1981 the annual growth rate (compound method) has been calculated. For comparison the tehsil-wise decade growth and the resulting annual growth rate over the last decade have been added.

The table shows that for 5 out of 8 schemes the scheme-wise annual population growth rate over the period 1971-1981 is higher than that according to the tehsil-wise population figures, thus warranting a recalculation of the target population.

Table 4.2 - Growth rates based on scheme population or tehsil

	Scheme-wise Census population				Scheme-wise Annual growth rate			Tehsil-wise growth rate	
Scheme	1951	1961	1971	1981	'51-'61	'61-'71	'71-'81	'71-'81	annual
Rohi	?	10264	12615	17635	?	2.08%	3.41%	33.56%	2.94%
Kasidaha	6693	7163	10267	14774	0.68%	3.67%	3.71%	33.56%	2.94%
Birampur	5656	6674	7702	12129	1.67%	1.44%	4.65%	33.56%	2.94%
Bairibisa	8418	10237	12946	16611	1.98%	2.38%	2.52%	33.56%	2.94%
Inargaon	7275	9899	12374	16393	3.13%	2.26%	2.85%	33.56%	2.94%
Awajapur	6885	7937	8884	11258	1.43%	1.13%	2.40%	21.29%	1.95%
Hathi Barni	8199	8845	10597	13294	0.76%	1.82%	2.29%	26.26%	2.36%
Jansa	6190	7743	9900	13057	2.26%	2.49%	2.81%	26.26%	2.36%

In table 4.3 the actual growth rates used in the project reports have been calculated and compared to growth rates following from the census figures for the villages included in the various schemes.

In order to check the possible influence of extraordinary high population growth in the last decade only, scheme-wise annual growth rates have been calculated for the last 10, 20 and 30 years preceding the 1981 census. Again it is clear that the annual growth rates following from the proposed scheme designs are lower than whatever growth rate is calculated from the census figures, in all but one case (Hathi Barni scheme when compared with the average growth over the period 1951-1981).

Table 4.3 - Comparison of growth rates used

Scheme	Census population 1981	Design population project report 1987	2002	2017	Compound growth rate according to designs '81-'17	census '71-'81	'61-'81	'51-'81
Rohi	17635	21187	30054	38942	2.22%	3.41%	2.74%	?
Kasidaha	14774	17760	25190	32630	2.23%	3.71%	3.69%	2.67%
Birampur	12129	14570	20675	26800	2.23%	4.65%	3.03%	2.58%
Bairibisa	16611	19960	28320	36680	2.22%	2.52%	2.45%	2.29%
Inargaon	16393	19700	28000	36500	2.25%	2.85%	2.55%	2.75%
Awajapur	11258	12700	16300	19900	1.59%	2.40%	1.76%	1.65%
Hathi Barni	13294	15400	20630	25860	1.87%	2.29%	2.06%	1.62%
Jansa	13057	15120	20275	25415	1.87%	2.81%	2.65%	2.52%
Chhekawa	13746	15877	N.A.	26530	1.84%	?	?	?

What the influence of adopting the proposed target population would be on the remaining lifetime of the scheme (after commissioning in 1986), when the actual annual population groth would remain constant at the level of the last 10, 20 or 30 years (calculated from 1981 onward), is shown in table 4.4. It appears that only for the Bairibisa, Inargaon and Hathi Barni schemes the resulting lifetime after commissioning would be in the order of 25 years or more, whereas that of the other schemes would be considerably lower, and thus unacceptable, also when the criteria as discussed in December 1984 would be applied.

Table 4.4 - Remaining technical lifetime of schemes

Scheme	Resulting number of years after 1986 based on annual growth rate '71-'81	'61-'81	'51-'81
Rohi	18.6	24.3	N.A.
Kasidaha	16.8	16.9	25.0
Birampur	12.5	21.5	26.2
Bairibisa	26.8	27.7	30.0
Inargaon	23.5	26.7	24.6
Awajapur	19.1	27.6	29.8
Hathi Barni	24.3	27.7	36.3
Jansa	19.1	20.5	21.8

Lengthy discussions then followed, in the field as well as in Lucknow, about a realistic population growth rate to be adopted. It was argued that the high population growth rates over the last census decade could not continue forever, as effects of family planning were bound to leave their mark. In addition, it was said, the hinterland of the individual villages could not sustain such growth in all cases.

On the other hand, no specific information could be shown that indicated certain restrictions in development potential of the villages. Also, it was argued, providing a better service level in the rural areas (electrification, but also providing water) would curb the migration of rural

population to the cities, and thus even cause an increase in rural population growth. Villages along major roads also were considered to have a more or less unlimited development potential.

Finally, the census figures show that so far population growth per decade has been rising continually, so that it is impossible to predict when, if at all in the near future, a reverse in growth trends would occur.

Taking into account the above arguments, the mission decided on striking a balance between adopting an exponential and a stagnating growth trend. It was agreed that target populations would be calculated by taking the arithmetic average between the population projection using the compound growth method on the basis of the 1971-1981 annual growth, and the linear growth, again based on the 1971 and 1981 census populations.

Table 4.5 shows the calculated 1989 and 2019 populations, on the basis of the compound and the linear growth methods, as well as the selected arithmetic average. The last two columns further show the target population mentioned in the project reports and the difference between the selected averages for 2019 and these target populations, expressed as percentages of the selected averages. The years 1989 and 2019 have been taken as the most likely year of commissioning of the schemes, and the target year, 30 years thereafter.

Table 4.5 shows that only for the Bairibisa scheme the difference between the selected average and the target population proposed is negligible. For the Inargaon and Hathi Barni schemes this difference is 8% and 6%, respectively, whereas for the remaining schemes it ranges from 17% (Awajapur scheme) to 45% (Birampur scheme).

On this basis the mission decided to approve the design populations for the Bairibisa, Inargaon and Hathi Barni schemes only. For all other schemes, including the Chhekawa scheme in Allahabad, the design will have to be recast, taking the selected average for the year 2019 (table 4.5) as the design population.

The U.P. Jal Nigam, recognizing the urgency of having rural water supply schemes implemented in the area covered by the proposed Sub-Project IV, undertook to have the revised project reports ready and appraised, as well as processed by the Uttar Pradesh Government, by June 1985. The Ministry of Works and Housing, in its turn, agreed to have the reports processed within one month after receipt.

Table 4.5 - Selection of design population

Scheme	1971 pop.	1981 pop.	compound annual growth	1989 population compound	1989 population linear	1989 population selected average	2019 population compound	2019 population linear	2019 population selected average	Target population reports	Difference
Rohi	12615	17635	3.41%	23055	21651	22353	62984	36711	49848	38942	-22%
Kasidaha	10267	14774	3.71%	19767	18380	19073	58899	31901	45400	32630	-28%
Birampur	7702	12129	4.65%	17442	15671	16556	68119	28952	48535	26800	-45%
Bairibisa	12946	16611	2.52%	20277	19543	19910	42834	30538	36686	36680	0%
Inargaon	12374	16393	2.85%	20529	19608	20069	47733	31665	39699	36500	-8%
Awajapur	8884	11258	2.40%	13606	13157	13382	27689	20279	23984	19900	-17%
Hathi Barni	10597	13294	2.29%	15938	15452	15695	31467	23543	27505	25860	-6%
Jansa	9900	13057	2.81%	16293	15583	15938	37380	25054	31217	25415	-19%

Table 4.6 - Summary of salient features of proposed schemes

Scheme name	No. of villages	No. of scarcity villages	Design population	Capital cost (millions of Rs.)	Number public stand-posts	of private connec-tions	Capital cost per head (Rs.)
VARANASI DISTRICT							
Rohi	35	12	38942	8.946	160	1669	230
Kasidaha	11	11	32630	7.231	104	1398	222
Birampur	17	17	26800	7.288	18	1157	272
Bairibisa	17	7	36680	7.866	131	1572	215
Inargaon	20	16	36500	7.965	106	1564	218
Awajapur	16	?	19900	6.241	63	853	314
Hathi Barni	26	26	25860	6.313	94	1100	244
Jansa	21	21	25415	6.295	82	1090	248
ALLAHABAD DISTRICT							
Chhekawa	11	8	26530	9.023	83	1137	340
TOTAL	174	118	269257	67.188	841	11540	250

4.4. Implementation schedule

The proposed schemes have a design period of 30 years, with assumed beginning in 1987 and target year 2017. In view of the fact that not even the internal appraisal by the U.P. Jal Nigam had been carried out, let alone processing by the Governments of Uttar Pradesh and of India, after which the procedure with the exchange of side letters between the Governments of India and of The Netherlands would still have to follow, any assumed start of the implementation of the projects before mid-1986 is overly optimistic.

The mission therefore proposed to assume a start of the project not earlier than mid-1986, and an implementation period of 3 to 3.5 years. The U.P. Jal Nigam staff argued that implementation of the newly proposed schemes should be much faster than under Sub-Project I, for a number of reasons:

- the field staff has gained much experience with executing this kind of schemes, including those where OHT are executed departmentally
- tenders for the execution of OHT are combined in packages that may be attractive also for larger contractors, thus resulting in better qualified contractors executing the works, in a shorter period
- exempted feeders for the various schemes have been applied for already, to save time
- the schemes have been grouped together in such a way that railway crossings have been prevented, as these have caused delays in the past
- financing of the DCP schemes has been removed from the District Plans and once again included in the State Plan. In this way delays in the allocation of funds may be largely prevented.

For speeding up the implementation of DCP schemes even further, the Managing Director of the U.P. Jal Nigam contemplated to change the organization in such a way that a Project Manager would be responsible solely for these schemes, without any other tasks. In that way, it was felt, implementation of the works could be carried out within a period of 2 years.

After some discussions it was agreed that for the sake of calculating the design populations of the proposed schemes commissioning by the year 1989 would be assumed.

4.5. Approval procedure

On the basis of the available project documents a pre-appraisal was conducted, as indicated in the previous paragraphs, in line with the terms of reference of the Mission (see als Annex A).

Before the relevant detailed project documents could be made available, short descriptions of each project were presented before the discussions on bilateral assistance between the Governments of India and of The Netherlands, in February, 1985.

The mission studied the reports and paid a few field visits to project areas where without exception severe drought conditions were encountered, and was told that this adverse situation is not of a seasonal nature, but gradually aggravates from year to year.

As is indicated in paragraph 4.3 the main observation point of the mission was created by the non acceptable reduction in the lifespan of the schemes, due to the low population figures adopted. This point, however, was satisfactorily settled, though several projects will have to be revised and project estimates recalculated accordingly.

During the field visits and prolonged discussions with the U.P. Jal Nigam staff, the mission arrived at the opinion that good reasons were available for its recommendation to the Netherlands Government to consider the financing of these projects on the basis of this appraisal only.

Notwithstanding the fact that the mission recognizes that this proposed procedure may deviate from current and previous practice, the mission believes that prevailing specific conditions do justify this recommendation in many respects.

In particular the following aspects were appreciated:

1. All projects do comprise so-called "problem villages" for which it is essential that a speedy implementation can be accomplished, in view of the adverse position of the population.
   For this reason all projects are classified by the U.P. Government as first preference projects, and in principle eligible for accommodation in e.g. the Minimum Needs Programme
2. The project locations are scattered within the boundaries of the same districts as applies for the ongoing (almost completed) Sub-Project I (East).
   This implies that the (technical) nature and set-up of the new projects will be identical to adjacent schemes. The Jal Nigam staff claims to have sufficient experience to complete this kind of project in time (see also paragraph 4.4)
3. Design criteria and cost estimate procedures of all new schemes are in compliance with the previously adopted strategy (see also paragraph 4.2)
4. The documents for five projects are being recast regarding population figures to be applied in the design
5. Two years ago the Comprehensive Review and Appraisal Mission (UP-8) intensively studied all relevant aspects of rural water supply in this area. It is felt, not only by the mission, that many elements of this study are transferable to the new projects and therefore no similar exercise should be contemplated.

Several recommendations of the UP-8 mission have been implemented, such as:

- improvement of geo-hydrological survey (see also paragraph 5.1)
- siting of public taps has improved
- number of public taps has been increased
- a work plan on sanitation, drainage and hygiene education has been formulated and could be implemented simultaneously with the new projects

6. Problems with saline or brackish water are not to be expected, contrary to experiences in U.P. West
7. The anticipated construction period is estimated to be not less than 3 years (see also paragraph 4.4). Any additional activity within the framework of this programme can be identified and implemented within this time period, if so desired.

The mission is convinced that a positive decision for an accelerated approval procedure in this case will contribute significantly to the impetus of the water supply programme in this area.

5. MISCELLANEOUS ASPECTS

5.1. Hydrogeological cell

As has been mentioned in the "Report on mision 10 to Uttar Pradesh (UP-10), a hydrogeological cell had been formed within the U.P. Jal Nigam organization, in conformity with the recommendations of the Comprehensive Review and Appraisal Mission UP-8.

Two electric loggers had been purchased, and a hydrogeologist (on deputation from the Central Groundwater Board) had joined the organization already by that time. During the discussions of April 1985 it transpired that the appointment of the geophysicist (also on deputation from the Central Groundwater Board) had been approved, and that he was expected to join in the second half of April 1985.

An appraisal report "Purchase of Electric Loggers under Indo-Dutch Re-appraisal Mission Scheme" had been prepared, and would be submitted to the Netherlands Government through the Governments of Uttar Pradesh and India, in the month of April itself. The cost of the items mentioned in this report may be summarized as follows:

Table 5.1 - Cost of geohydrological equipment

No.	Item	Estimated costs	Actual costs
1	Electric loggers, 2 units	Rs 1,000,000	Rs 1,050,000
2	Taxes and Excise Duty	90,000	144,000
3	Vans, 2 units	172,000	180,000
4	Fabrication of 2 bodies	64,000	88,000
5	Registration	-	10,000
6	Contingencies	32,280	32,280
	Total	Rs 1,314,280	Rs 1,514,280

5.2. Additional activities

5.2.1. Additional provisions under Sub-Project I

Apart from the purchase of spare pump sets, etc. it had earlier been decided to provide mobile laboratories for the three districts covered by the sub-project. At the time of the mission's visit one mobile van had been purchased and the laboratory equipment ordered. The remaining two vans would be purchased as soon as the laboratory equipment would have arrived.

5.2.2. Computer equipment

The mission visited the computer equipment that had recently been installed at the U.P. Jal Nigam's headquarters. It consists of a mini computer with punch card processing and printing equipment, with a number of terminals. The U.P. Jal Nigam intends to use the equipment for management, administrative and technical purposes.

ANNEX A

RURAL WATER SUPPLY PROJECTS IN
UTTAR PRADESH
(NETHERLANDS ASSISTED PROGRAMME)

TERMS OF REFRENCE FOR REVIEW-AND APPRAISAL MISSION UP-12

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1. OBJECTIVES OF THE MISSION

The mission will evaluate all relevant progress and development in the Netherlands Assisted Water Supply Schemes under execution in three districts in Uttar Pradesh East (UP East I piped supplies).

Analysis of the situation with respect to the actual status of the proposed hand pump programme (UP East/West III) will be carried out (side letter pending).

To conduct an appraissal of new projects as far as their technical viability is concerned, in two districts of Eastern Uttar Pradesh.

2. TASKS OF THE MISSION

The mission will be of an exploratory and informative nature under the following tasks:

a. Discuss the former mission results, with reference to the report UP-10, October 1984.
Specifically of interest will be:
- progress made with the implementation of the so-called vandal-proof standposts
- the siting of the standposts
- the achievements regarding the planned number of house connections and experience so far with the financial results thereof
- the actual situation concerning the finalisation of the project with regard to assumptions made during the mission's last visit.

b. To investigate the position of the additional activities as indicated in report UP-8, viz. the procurement of equipment for, and staffing of a geohydrological section.

c. Review the disbursement claim(s) since the preceding mission.

d. To compare and analyse the financial predictions for the on-going projects UP East I during the last mission against the actual achievements.

e. An examination into the status of the proposed hand pump projects UP III, in view of the progress made with the implementation of pumps by the Jal Nigam organisation in the districts concerned.
The mission will provide its view and advise on any significant changes which are likely to be encountered as a result of the delay incurred.

f. A detailed write-up to be given concerning the quality control measures presently imposed by the Jal Nigam on procurement and installation of hand pumps, taking into account the recently issued Government Specifications Standard.
If desirable in the opinion of the mission, recommendations have to be drafted in which way and by which means an improved quality control system can be developed.
Field visits willbe necessary.

g. The undertaking of a pre-appraisal for the following projects, recently proposed via the Ministry of Works and Housing to the Netherlands Government.

Name of district	nr. of schemes	nr. of villages
Varanasi	9	179
Allahabad	2	23

The aim of this appraisal is mainly to provide a first impression and to examine the essentials of the technical feasibility, which results can serve as a proper guideline for a more extensive appraisal to be conducted hereafter.
This task for the mission will be carried out on the basis of field visits, discussions with staff members and study of project reports, to be made available by the Jal Nigam Organisation.
Exerpts of the above project reports are available with the Water Supply Coordinator, New Delhi.

The pre-appraisal will at least comprise:

- village selection procedure
- design criteria
- population growth figures (with reference to correspondence on this subject)
- technical design features (especially the water source proposed)
- geohydrological aspects (incl. water quality)
- cost estimates
- timing/phasing of the project(s)

h. To table any other subject in the context of the UP projects deemed useful in the opinion of the mission.

3. COMPOSITION OF THE MISSION

Mr. R. Trietsch	Mission leader. Senior Water Supply Engineer, DHV Consulting Engineers, The Netherlands
Mr. A.K. Sen Gupta	Asstt. Adviser CPHEEO, Ministry of Works and Housing, New Delhi

The Water Supply Coordinator at the Royal Netherlands Embassy in New Delhi will accompany the mission part time.

4. DURATION OF THE MISSION

The mission is estimated to last for 10 days, from 15 April up till and including 24 April, 1985, and is programmed as follows:

15.4 - arrival mission leader in India
16.4 - preparatory discussions in Delhi and transfer to Lucknow
17.4 - 22.4 - discussions with Government of U.P., Jal Nigam and possible other institutions; field visits
23.4 - report drafting and final round of discussions Lucknow
24.4 - return to New Delhi

5. REPORTING

The mission will draft preliminary conclusions and recommendations and will have these discussed with the UP Government and Jal Nigam Organisation, as well as with any other local authority concerned, before leaving Uttar Pradesh.

The results of the mission will then be subjected to discussions in New Delhi.

After approval of the draft report, final reporting to the Development Cooperation Department Asia and Multilateral Financial Development Matters of the Ministry of Foreign Affairs in the Netherlands is expected not later than eight weeks after leaving India.
The approved report will be submitted to the Government of India.

ANNEX B

ITINERARY OF MISSION

Sunday, April 14, 1985

Departure of Mission leader, Mr. R. Trietsch, from the Netherlands.

Monday, April 15, 1985

Discussiona at Royal Netherlands Embassy with Water Supply Coordinator, Mr. J.A. Speets.
Discussions at UNICEF (Mr. Bo Elding) and at Ministry of Works and Housing (Messrs. V. Venugopalan, A.K. SenGupta and R. Sethuraman).

Tuesday, April 16, 1985

Departure of Mission, consisting of Messrs. R. Trietsch, J.A. Speets and A.K. SenGupta, by plane from New Delhi to Lucknow (Uttar Pradesh).
Discussions with Managing Director and senior staff of Uttar Pradesh Jal Nigam in Lucknow.

Wednesday, April 17, 1985

Continuation of discussions with M.D. and senior staff of U.P Jal Nigam.

Thursday, April 18, 1985

Continuation of discussions with M.D. and senior staff of U.P Jal Nigam.
Transfer by car from Lucknow to Rae Bareli.
Visit to ARP scheme Ichauli and DCP scheme Udari.
Discussion of progress of DCP schemes in Rae Bareli District with U.P. Jal Nigam field staff.

Friday, April 19, 1985

Visit to DCP schemes Bannamau, Ralpur, Govindpur, Ferozpur and Bhojpur.
Transfer by car from Rae Bareli to Allahabad. On the way visit to DCP scheme Nidura in Allahabad District.
Discussion of progress of DCP schemes in Allahabad District with U.P Jal Nigam field staff in Allahabad.

Saturday, April 20, 1985

Transfer by car from Allahabad to Varanasi. On the way visit to DCP schemes Pratappur, Mirzamurad and Kandwa in Varanasi District, as well as villages Dhanapur (Allahabad District) and Pilkhuna (Rowi group of villages; Varanasi District).
Discussion of design reports for new schemes under Sub-Project IV, with Allahabad and Varanasi field staff and Lucknow design staff, in Varanasi.

Sunday, April 21, 1985

Visit to DCP scheme Rohania, and to Sarnath.
Discussion of progress of DCP schemes in Varanasi with field staff.

Monday, April 22, 1985

Drafting of Mission's "Conclusions and Recommendations".
Meeting with Commissioner, Varanasi District.
Return to Lucknow by air.

Tuesday, April 23, 1985

Discussion of Mission's "Conclusions and Recommendations" with Managing Director and senior staff of U.P. Jal Nigam.
Lunch with Chairman, Managing Director and senior staff of U.P. Jal Nigam.
Return of Mission to New Delhi by plane.

Wednesday, April 24, 1985

Discussions at Royal Netherlands Embassy.
Preparations for mission to Gujarat.

Thursday, April 25, 1985

Discussions at UNFPA (Mr. Lap Le), IBRD (Mr. John R. Hansen) and at Ministry of Works and Housing (Mission members, with Messrs. Venugopalan, Shankaran and Sethuraman).

April 26 - May 4, 1985

Mission to Gujarat.

Sunday, May 5, 1985

Departure of Mission leader from New Delhi.

ANNEX C

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

NEW DELHI

Ministry of Works and Housing

Mr. V. Venugopalan	- Adviser (PHEE), CPHEEO
Mr. T.G. Shankaran	- Deputy Adviser (PHEEO), CPHEEO
Mr. A.K. SenGupta	- Assistant Adviser (PHE), CPHEEO

UNICEF

Mr. Bo Elding	- Regional Water and Sanitation Officer

UNFPA (United Nations Fund for Population Activities)

Mr. Lap Le	- Program Officer

World Bank

Mr. John R. Hansen	- Senior Economist, New Delhi Resident Mission

UTTAR PRADESH

Lucknow

Mr. Kamal Pandey	- Secretary to Government, Housing & 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. V.S. Chauhan	- Chief Engineer (I)
Mr. Rajendra Dayal	- Chief Engineer (II)
Mr. R.P. Khare	- 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. V. Singh	- Chief Accounts Officer
Mr. A. Tripathi	- Secretary (Administration)
Mr. V.K. Gupta	- Secretary (Management)
Mrs. Hira Sharma	- Manager Monitoring
Mr. D.D. Saxena	- Deputy Manager Appraisal
Mr. A.C. Nagar	- Deputy Manager Appraisal
Mr. R.N. Gupta	- Manager Training
Mr. A.K. Gupta	- Manager Appraisal (on leave)
Mr. A.C. Saxena	- 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. R.P. Pande	- E.E., II Constr.Div., Rae Bareli
Mr. Akbar Husain	- 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. Vijay Kumar	- S.E., Temp. Project Circle, Allahabad
Mr. S.C. Jain	- S.E., Mech. Circle, Allahabad
Mr. G.K. Pandey	- E.E., Constr. Division, Allahabad

Varanasi

Mr. R.K. Sharma	- S.E., VII Circle, Varanasi
Mr. S.R. Sharma	- S.E., XVI Circle (E&M), Varanasi
Mr. B.P. Goel	- S.E., Project Circle, Varanasi
Mr. N.N. Agrawal	- E.E., VI Constr. Div., Varanasi
Mr. B.K. Srivastava	- E.E., IV Temp. Constr. Div., Varanasi
Mr. A.K. Ghosal	- E.E., V Temp. Constr. Div., Varanasi
Mr. R.K. Agrawal	- 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 (UP-12) OF APRIL 1985 TO UTTAR PRADESH (Sub-Projects East I, III, IV)

A. SUB-PROJECT EAST I

1. Commissioning of the schemes

The Mission appreciates that, with the exception of the "vandal-proof" public standposts and some exempted feeders, all DCP schemes in Allahabad and Varanasi Districts have been completed.

The Mission was especially pleased with the fact that all OHT in Varanasi District that were still under construction by the time of its last visit, had been commissioned now.
In Rae Bareli District, apart from the Udari scheme (for which commissioning was planned by September 1985), progress on water sources has been lacking in 2 schemes and on OHT in 4 schemes, whereas a relatively large number of exempted feeders had not yet been commissioned. The Mission was informed that for 5 schemes commissioning of these exempted feeders is expected within the month of April 1985 itself.

The Mission strongly recommends the UP Jal Nigam to ensure that:
a. all OHT and water sources for the DCP schemes are commissioned before September 1985;
b. the Udari scheme is fully commissioned by December 1985;
c. all exempted feeders are commissioned and in good working order by September 1985 (apart from Pratappur, where a SEB sub-station is still to be constructed). The UP Jal Nigam is requested to do its utmost to ascertain the required cooperation from the SEB and Railways authorities, and to promote setting up working committees at the District level, in which all relevant parties are represented, to iron out any practical difficulties in this respect.

The Mission requests that monthly summary progress reports be prepared on the implementation of the DCP schems, and forwarded directly to the Government of India (Ministry of Works & Housing) and of The Netherlands (Royal Netherlands Embassy).

The Mission feels that where progress of the DCP schemes has been delayed too often already, whereas the UP Jal Nigam has demonstrated to have the ability of implementing projects much faster, no further extension of the deadline for commissioning the DCP schemes should be allowed.
The Dutch members of the Mission therefore recommend to the Netherlands Government that no funds for reimbursing expenditures of Sub-Project East I be released after January 1, 1986 unless all DCP schemes have been completed in all respects by the time limits mentioned under A.1.a and A.1.b above.

2. Expenditures

The Mission noted that again there have been major discrepancies between planned and actual expenditures. For the quarters ending September 1984 and December 1984 these discrepancies were approx. 50%.
At the risk of repeating itself, the Mission therefore once more requests the UP Jal Nigam to adapt its financial planning and accounting procedures in such a way that reliable prognoses are obtained.

3. Public standposts

The Mission found that the directive from the Management of the UP Jal Nigam on freezing the numbers of public standposts has not yet been officially lifted, and that only in two schemes in Rae Bareli District the target number of public standposts has been achieved. As a result of this, the present number of public standposts is generally far from adequate.
The Mission wishes to reiterate that according to commitments given by the UP Jal Nigam all public standposts (with the exception of those in the Udari scheme) should have been completed by March 1985.

It is stressed that the required number of public standposts refers to the number of taps rather than standposts. In case the population density warrants such, multiple-tap standposts may be constructed, thereby proportionally reducing the total number of standposts required.

The Mission noted that so far existing public standposts have not been replaced by "vandal-proof" ones, and that even a part of the new standposts, erected after the Mission's previous visit, was still of the old type.
The Mission was pleased, however, to have seen at least one "vandal-proof" standpost with a Jayson-type self-closing tap (as agreed upon earlier) during its field visits.

The Mission agrees with UP Jal Nigam's proposal that existing standposts will be converted into "vandal-proof" ones only when they need major repairs. In addition, all taps of existing standposts will immediately be replaced by Jayson-type self-closing taps.
Emphasis will be on constructing the remaining public standposts, which will all be of the "vandal-proof" type.

4. Exempted feeders

The Mission found that, apart from the Udari scheme, in 9 cases exempted feeders were either not yet commissioned or inoperable. In addition it was found that power supply through exempted feeders is often rendered ineffective because of too high or too low voltages. The Mission also received indications that in other cases SEB staff is allowing illegal connections to such exempted feeders, thereby jeopardizing the very character of such feeders, and an uninterrupted supply of power to the waterworks concerned.

The UP Jal Nigam is requested to use its good offices with the SEB and other relevant authorities, to accomplish a speedy implementation of the exempted feeders, as well as an uninterrupted supply of power, at the right voltage, through these feeders (see also A.1.c.).

B. SUB-PROJECT III (Hand pump schemes)

The Mission has assessed the situation with regard to the status of the ongoing hand pump programme, and found that no pumps under the proposed Sub-Project III have been erected either in UP East or UP West, pending the approval of the project by the Indian and Netherlands Governments.

C. SUB-PROJECT IV (Replacing old Sub-Project II)

1. The Mission received a summary report on 9 out of 11 schemes as proposed by the UP Jal Nigam for replacing the original Sub-Project II schemes in UP East and UP West. In addition the Mission scrutinized the relevant 8 project reports and discussed their contents with the Jal Nigam staff.

2. The Mission agrees in principle with the designs of the schemes, especially since their lay-out is based on the same design criteria as adopted for the ongoing schemes (Sub-Project I).
The Mission requests that the following changes be made, however:

   a. design period to remain 30 years, without exception
   b. population growth to be based on the arithmetic average of the linear growth method and the compounded growth method, both related to the scheme-wise population for the years 1971 and 1981 (population census).

   After comparison of the target populations following from the above method and those used in the project reports, it appeared that the target populations used in the project reports could be retained for the Bairi Bisha, Inargaon and Hathi Barni schemes. The financial statements should be modified, however, to take into account a start of the projects by mid-1986, and commissioning by the end of the year 1989.

   For the remaining schemes the project set-up will have to be revised, and to be based on the following population projections:

Scheme	Target population	
	1989	2019
Rohi	22,353	49,848
Kasidaha	19,076	45,438
Birampur	16,559	48,586
Awajapur	13,384	24,002
Jansa	15,941	31,241

For the Chhekawa scheme in Allahabad District not enough data were available to allow the Mission to calculate the relevant target populations. The UP Jal Nigam is requested to apply the arithmetic average of the linear and compounded growth methods (as indicated above) also in this case.

In all cases the projects should be based on an implementation period from mid-1986 to the end of 1989.

3. The Mission urges the Governments involved to ascertain a speedy implementation of the schemes, as the area concerned is a drought-stricken area, where relief from water supply schemes is badly needed.

   The UP Jal Nigam undertakes to prepare a final appraisal report for these schemes on as short a notice as possible, and have it scrutinized by the UP State Government by June 1985, whereas the Ministry of Works & Housing undertakes to have the project cleared within one month thereafter.

   The Governments of India and of The Netherlands are requested to use their good offices to expedite an exchange of side letters on the project, preferably before the end of the year 1985.

4. The Mission requests the UP Jal Nigam to provide at least 7 (seven) copies of the appraisal report to the Governments of India and of The Netherlands to expedite matters.

The Mission wishes to express its gratitude to the UP Jal Nigam and other officials involved, for their hospitality and cooperation.

The Indo-Dutch Review Mission,
April 1985.

ANNEX E

SCHEME-WISE BREAK-DOWN OF REQUIRED NUMBERS OF PUBLIC STANDPOSTS

Legend:

SC/ST	: number of scheduled caste/scheduled tribe population
rest	: remaining population
PS1	: number of public standposts required for SC/ST population
PS2	: number of public standposts required for remaining population

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS FEROZPUR

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Bonda	182	278	3	2	201	308	3	3	218	332	3	3	297	453	3	3
Chabulha	758	1075	5	7	839	1190	6	7	906	1286	6	7	1235	1752	6	8
Ferozpur	107	310	1	2	118	343	1	2	128	371	1	2	174	505	1	3
Furanpur	177	96	3	2	196	106	3	2	212	115	3	2	288	156	3	2
Kasbabadalu	156	251	1	2	173	278	1	2	187	300	1	2	254	409	2	2
Nisigar	460	1157	3	6	509	1281	3	7	550	1384	3	7	750	1886	4	9
Dudhwari	325	1218	3	7	360	1348	3	8	389	1457	3	8	530	1985	4	10
Saidapur	176	587	1	3	195	650	1	3	210	702	1	3	287	957	2	4
Jaghnothpur	20	320	1	2	22	354	1	2	24	383	1	2	33	522	1	3
Mathurpur	222	734	5	6	246	812	5	7	265	878	5	7	362	1196	5	7
Halauli	124	272	2	2	137	301	2	3	148	325	2	3	202	443	2	3
Delpura	158	235	1	1	175	260	1	2	189	281	1	2	258	383	2	2
Rampurkalan	550	1344	16	18	609	1488	16	18	658	1607	16	19	896	2191	16	20
Rawatpurkalan	264	796	2	4	292	881	2	5	316	952	2	5	430	1297	3	6
Alipur	0	93	0	1	0	103	0	1	0	111	0	1	0	152	0	1
Saraikhara	218	970	4	6	241	1074	4	7	261	1160	4	7	355	1581	4	9
Sub-totals:	3897	9736	51	71	4313	10776	52	79	4660	11643	52	80	6352	15869	58	92
Grand total:	13633		122		15089		131		16303		132		22220		150	

Year:	Population:
1971	11962
1981	13965
1986	15089
1991	16303
2011	22220

Growth rate: 1.016 (per annum)

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS RALPUR

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Bheeta	77.	347	1	2	85	381	1	2	91	412	1	2	125	562	1	3
Sagarkheda	400	952	4	6	440	1047	4	6	475	1131	4	7	648	1541	5	8
Deokhera	32	85	1	1	35	93	1	1	38	101	1	1	52	138	1	1
Ramaipurkhurd	189	329	1	2	208	362	1	2	224	391	1	2	306	533	2	3
Ghajiapur	91	181	3	3	100	199	3	3	108	215	3	3	147	293	3	3
Saidapur	246	541	2	3	270	595	2	3	292	643	2	3	398	876	3	4
Berua	460	959	10	12	506	1054	10	13	546	1139	10	13	745	1552	11	14
Sahanipur	163	599	1	3	179	659	1	3	194	712	1	3	264	970	2	4
Chakgor	124	183	1	1	136	201	1	1	147	217	1	1	201	296	1	2
Chablahaswayan	43	87	1	1	47	96	1	1	51	103	1	1	70	141	1	1
Ralpur	621	1965	21	23	683	2160	21	24	738	2334	21	24	1005	3181	21	25
Sidhokhara	246	1041	7	10	270	1144	7	10	292	1237	7	10	398	1685	7	12
Kanjas	376	244	4	4	413	268	4	4	447	290	4	4	609	395	5	4
Gopalikheda	120	450	4	5	132	495	4	5	143	535	4	5	194	728	4	6
Panditkapurwa	357	347	3	3	392	381	3	3	424	412	3	3	578	562	4	3
Ramgaon	141	144	1	1	155	158	1	1	167	171	1	1	228	233	1	1
Kalihegaon	160	740	3	5	176	814	3	6	190	879	3	6	259	1198	3	7
Pusapur	486	806	7	7	534	886	7	8	577	957	7	8	787	1305	7	9
Dibia	174	285	4	4	191	313	4	4	207	339	4	4	282	461	4	4
Udahar	33	185	1	1	36	203	1	1	39	220	1	1	53	299	1	2
Beruahar	143	210	1	1	157	231	1	1	170	249	1	1	231	340	1	2
Chakchourahi	234	291	1	2	257	320	2	2	278	346	2	2	379	471	2	2
Potapur	246	163	4	4	270	179	4	4	292	194	4	4	398	264	4	4
Haibatpur	330	454	5	6	363	499	5	6	392	539	5	6	534	735	6	7
Sub-totals:	5492	11588	91	110	6038	12740	92	114	6524	13765	92	115	8890	18759	100	131
Total:	17080		201		18777		201		20288		201		27649		201	

Year:	Population:
1971	14887
1981	17379
1986	18777
1991	20288
2011	27649

Growth rate: 1.016 (per annum)

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS GOVINDPUR

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Govindpur	625	485	5	3	740	575	5	4	800	621	5	4	1090	846	6	5
Pattikhera	438	1455	6	9	519	1724	6	10	561	1863	6	11	764	2538	6	14
Murdipur	101	500	2	2	120	592	2	3	129	640	2	3	176	872	2	4
Bhawanipur	0	218	0	1	0	258	0	2	0	279	0	2	0	380	0	2
Chamnikhera	102	134	1	1	121	159	1	1	131	172	1	1	178	234	1	1
Dhurikhera	156	269	1	2	185	319	1	2	200	344	1	2	272	469	2	2
Ranikhera	210	893	1	4	249	1058	1	5	269	1143	2	5	366	1558	2	7
Pasankhera	135	255	1	2	160	302	1	2	173	326	1	2	236	445	1	2
Neebi	391	676	2	3	463	801	2	4	501	865	3	4	682	1179	3	5
Hameergaon	514	1287	5	7	609	1525	5	7	658	1647	5	9	897	2245	6	11
Badhupur	220	200	1	1	261	237	2	1	282	256	2	2	384	349	2	2
Bithauli	88	253	1	2	104	300	1	2	113	324	1	2	154	441	1	2
Dulapura	383	793	3	4	454	940	3	6	490	1015	3	6	668	1383	3	7
Raipur	340	691	2	4	403	819	2	5	435	885	2	5	593	1206	4	6
Bahadurpur	270	951	2	4	320	1127	2	6	346	1217	2	6	471	1659	3	7
Tejgawn	765	1504	5	8	906	1782	5	9	979	1925	5	11	1335	2624	7	14
Jhampur	114	489	1	2	135	579	1	3	146	626	1	3	199	853	1	4
Hathnasa	414	1454	3	8	490	1723	4	10	530	1861	4	10	722	2537	5	12
Daribapur	255	146	2	1	302	173	2	1	326	187	2	1	445	255	3	2
Sub-totals:	5521	12653	44	68	6541	14991	46	83	7067	16197	48	89	9632	22075	58	109
Total:	18174		112		21532		129		23265		137		31707		167	

Year:	Population:
1971	17070
1981	19928
1986	21532
1991	23265
2011	31707

Growth rate: 1.016 (per annum)

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS BHOJPUR

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Kathaka	459	253	3	2	500	276	3	2	540	298	3	2	737	406	4	2
Magatpur	142	105	1	1	155	114	1	1	167	124	1	1	228	169	1	1
Bisayahpur	139	639	1	3	151	696	1	3	164	752	1	4	223	1026	1	5
Pathakpur	128	237	1	1	139	258	1	2	151	279	1	2	205	380	1	2
Pathakkhera	119	239	1	1	130	260	1	2	140	281	1	2	191	384	1	2
Mandapur	49	230	1	1	53	251	1	2	58	271	1	2	79	369	1	2
Gosaikhera	270	51	2	1	294	56	2	1	318	60	2	1	433	82	2	1
Makhopur	368	644	5	5	401	702	5	5	433	758	5	5	591	1034	5	7
Purshottampur	0	96	0	1	0	105	0	1	0	113	0	1	0	154	0	1
Bhupatpur	22	166	2	2	24	181	2	2	26	195	2	2	35	266	2	2
Bhojpur	852	2998	5	14	929	3267	5	16	1003	3530	5	16	1367	4811	8	21
Dalipur	177	666	1	3	193	726	1	3	208	784	1	4	284	1069	2	5
Dandi	83	189	1	1	90	206	1	1	98	223	1	1	133	303	1	2
Tasba	0	41	0	1	0	45	0	1	0	48	0	1	0	66	0	1
Mohanpur	126	0	1	0	137	0	1	0	148	0	1	0	202	0	1	0
Kodari	127	878	1	4	138	957	1	4	150	1034	1	5	204	1409	1	6
Kashikhera	83	430	1	2	90	469	1	2	98	506	1	3	133	690	1	3
Jai Gopalganj	0	138	0	1	0	150	0	1	0	162	0	1	0	221	0	1
Tiwari Kalan	37	235	2	2	40	256	2	2	44	277	2	2	59	377	2	2
Tiwari Khurd	77	177	1	1	84	193	1	1	91	208	1	1	124	284	1	2
Ladaikhera	381	423	2	2	415	461	2	2	449	498	2	2	611	679	3	3
Rajapur	0	226	0	1	0	246	0	1	0	266	0	2	0	363	0	2
Haibatpurkhurd	168	421	1	2	183	459	1	2	198	496	1	2	270	676	2	3
Chitakhera	122	408	1	2	133	445	1	2	144	480	1	2	196	655	1	3
Jhulpur	177	357	1	2	193	389	1	2	208	420	1	2	284	573	2	3
Khemankhera	122	332	1	2	133	362	1	2	144	391	1	2	196	533	1	3
Chahetar	382	777	2	4	416	847	2	4	450	915	2	4	613	1247	3	5
Pathak Bharu	25	192	1	1	27	209	1	1	29	226	1	1	40	308	1	2
Durajanpur	98	225	1	1	107	245	1	1	115	265	1	2	157	361	1	2
Gahrauli	387	1754	3	8	422	1912	3	9	456	2065	3	10	621	2815	3	12
Haripur	314	459	2	2	342	500	2	2	370	540	2	3	504	737	3	3
Daulatpur	122	407	1	2	133	444	1	2	144	479	1	2	196	653	1	3
Sadapur	0	146	0	1	0	159	0	1	0	172	0	1	0	234	0	1
Chakati	76	0	1	0	83	0	1	0	89	0	1	0	122	0	1	0
Sub-totals:	5632	14539	47	77	6138	15845	47	83	6632	17120	47	91	9039	23333	57	113
Total:	20171		124		21982		130		23752		138		32372		170	

Year:	Population:
1971	17427
1981	20345
1986	21982
1991	23752
2011	32372

Growth rate: 1.016 (per annum)

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS THULENDI

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Thulendi	1041	2997	6	14	1169	3366	6	16	1276	3673	7	17	1809	5207	10	23
Gujarpur	295	69	2	2	331	78	2	2	362	85	2	2	513	120	3	2
Rasulpur	487	509	3	4	547	572	4	4	597	624	4	4	846	884	4	5
Bahadurpur	90	346	1	2	101	389	1	2	110	424	1	2	156	601	1	3
Umarpur	488	700	6	7	548	786	6	7	598	858	6	7	848	1216	6	8
Malpur	488	1003	8	11	548	1127	8	11	598	1229	8	12	848	1743	10	13
Bharampur	236	357	8	8	265	401	8	8	289	438	8	8	410	620	8	8
Pandirakhurd	143	293	1	2	161	329	1	2	175	359	1	2	248	509	1	3
Ahsan Jagatpur	1042	1128	12	13	1170	1267	12	13	1277	1382	13	13	1810	1960	14	16
Manikpur	154	269	1	2	173	302	1	2	189	330	1	2	268	467	2	2
Jalpur	372	557	2	3	418	626	3	4	456	683	3	4	646	968	3	5
Rampur Moh.	240	309	2	3	270	347	2	3	294	379	2	3	417	537	2	3
Peethan	269	210	2	1	302	236	2	1	330	257	2	2	467	365	2	2
Karanpur	614	1485	3	6	690	1668	3	7	753	1820	4	8	1067	2580	5	11
Panasa	626	1015	7	9	703	1140	7	9	767	1244	7	9	1088	1763	8	11
Udari	400	519	8	8	449	583	8	9	490	636	8	9	695	902	8	9
Panderakalan	230	361	4	5	258	405	4	5	282	442	4	5	400	627	4	6
Kalagarhi	75	89	2	2	84	100	2	2	92	109	2	2	130	155	2	2
Hasva	356	229	3	3	400	257	3	3	436	281	3	3	618	398	4	3
Sub-totals:	7646	12445	81	105	8588	13978	83	110	9371	15252	86	114	13284	21621	97	135
Total:	20091		186		22566		193		24623		200		34905		232	

Year: Population:

1971 17370 Growth rate: 1.018 (per annum)
1981 20681
1986 22566
1991 24623
2011 34905

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS JAGATPUR

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Onikamau	249	471	4	4	276	521	4	4	298	563	4	4	406	768	4	5
Sanboopuau	211	293	3	3	234	324	3	3	252	350	3	3	344	478	3	4
Jagpatti Dam.	88	119	1	1	97	132	1	1	105	142	1	1	143	194	1	1
Jagpatti Kesh.	64	89	1	1	71	99	1	1	77	106	1	1	104	145	1	1
Jagmadipur	104	260	2	4	115	288	2	4	124	311	2	4	170	424	2	4
Jagatpur	321	2365	8	19	355	2618	8	19	384	2829	8	19	523	3856	8	24
Zingna	29	652	2	7	32	722	2	7	35	780	2	7	47	1063	2	8
Ibrahimpur	175	437	1	4	194	484	1	4	209	523	1	4	285	712	2	4
R. Gokulpur	185	452	3	4	205	500	3	5	221	541	3	5	302	737	3	5
R. Bheebhanshah	0	452	0	3	0	500	0	3	0	541	0	3	0	737	0	3
J. Bodhihar	235	150	4	3	260	166	4	3	281	179	4	3	383	245	4	3
R. Tikaria	923	1464	10	15	1022	1621	10	15	1104	1751	10	15	1505	2387	12	18
Poorabgaon	142	1178	3	12	157	1304	3	12	170	1409	3	12	231	1920	3	13
Mouaharganj	179	474	4	6	198	525	4	6	214	567	4	6	292	773	4	6
Shanbaspur	209	436	4	5	231	483	4	5	250	522	4	5	341	711	4	6
Shyambuxpurwa	186	1292	2	8	206	1430	2	8	222	1545	2	8	303	2106	3	10
Hewtaha N.	145	635	1	6	161	703	1	6	173	760	1	6	236	1035	1	7
Nawabganj	161	465	2	3	178	515	2	3	193	556	2	3	262	758	2	5
Jowadi	126	436	4	4	139	483	4	5	151	522	4	5	205	711	4	5
Sidhor	100	402	1	2	111	445	1	2	120	481	1	2	163	655	1	3
Kotia	73	305	2	3	81	338	2	4	87	365	2	4	119	497	2	4
Umari	115	574	4	7	127	635	4	7	138	687	4	7	187	936	4	7
Bhatauli	69	202	2	2	76	224	2	2	83	242	2	2	112	329	2	2
Udwa	344	1386	6	10	381	1534	6	12	411	1658	6	12	561	2260	7	14
Dalautpur	184	398	3	5	204	441	3	5	220	476	3	5	300	649	3	5
Sughapur	390	270	3	3	432	299	3	3	467	323	3	3	636	440	4	3
Bichchiya Badi	174	300	4	4	193	332	4	4	208	359	4	4	284	489	4	4
Taughari	377	457	3	6	417	506	3	6	451	547	4	6	615	745	4	6
Dhobhahabhurd	56	14	1	1	62	15	1	1	67	17	1	1	91	23	1	1
Sami Sri Niwas	0	70	0	1	0	77	0	1	0	84	0	1	0	114	0	1
Paramu Rampur	169	307	3	4	187	340	3	4	202	367	3	4	276	500	3	4
Harpur Halla	565	535	6	5	625	592	6	5	676	640	6	5	921	872	7	6
Sub-totals:	6348	17340	97	165	7028	19197	97	170	7593	20742	98	170	10349	28269	105	192
Totals:	23688		262		26224		267		28335		268		38618		297	

Year: Population:

1971 20790 Growth rate: 1.016 (per annum)
1981 24271
1986 26224
1991 28335
2011 38618

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS ASHRAFPUR

Year:	1981				1986				1991				2011			
	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Village:																
Ashrafpur	920	1280	8	9	1220	1697	9	10	1359	1891	9	10	2096	2916	12	15
Mirchahaar	48	136	1	1	64	180	1	1	71	201	1	1	109	310	1	2
Kolwa	437	778	8	9	579	1031	9	10	646	1149	9	10	996	1773	10	11
Barkhurdarpur	164	936	1	4	217	1241	1	5	242	1383	1	6	374	2133	2	9
Kajipur T.	518	1127	8	9	687	1494	8	10	765	1665	8	10	1180	2568	9	14
Bhelia	542	808	8	8	719	1071	8	8	801	1194	8	9	1235	1841	9	10
Kanta	235	705	8	9	312	935	8	9	347	1042	8	9	535	1606	9	10
Hajipur	145	375	1	2	192	497	1	2	214	554	1	3	330	854	2	4
Banni	236	504	4	4	313	668	4	5	349	745	4	5	538	1148	5	7
Sarai	304	686	5	6	403	909	5	6	449	1013	5	7	693	1563	6	9
Nagdaiyapur	236	384	1	2	313	509	2	3	349	567	2	3	538	875	3	4
Kasimpur	305	470	4	4	404	623	4	5	451	694	4	5	695	1071	5	7
Digha	292	443	6	6	387	587	6	7	431	654	6	7	665	1009	7	7
Kurha	530	1060	13	15	703	1405	14	15	783	1566	14	16	1208	2415	15	17
Arsadpur	20	360	1	2	27	477	1	2	30	532	1	3	46	820	1	4
Purey Niwaj	227	143	3	3	301	190	3	3	335	211	3	3	517	326	4	3
Jawaharganj	0	150	0	1	0	199	0	1	0	222	0	1	0	342	0	2
Tahirpur	2	43	1	1	3	57	1	1	3	64	1	1	5	98	1	1
Chakwalehra	0	30	0	1	0	40	0	1	0	44	0	1	0	68	0	1
Tarapur	158	267	1	2	209	354	1	2	233	394	1	2	360	608	2	3
Sub-totals:	5319	10685	82	98	7051	14165	86	106	7858	15785	86	112	12119	24345	103	140
Totals:	16004		180		21216		192		23643		198		36464		243	

Year: Population:

1971 15330 Growth rate: 1.022 (per annum)
1981 19038
1986 21216
1991 23643
2011 36464

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS UDARI

Year:	1981					1986					1991					2011			
Village:	SC/ST	rest	PS1	PS2		SC/ST	rest	PS1	PS2		SC/ST	rest	PS1	PS2		SC/ST	rest	PS1	PS2
Tandua	653	1702	13	23	0	735	1917	13	23	0	820	2136	13	23	0	1264	3295	14	25
Basauni	119	511	4	7	0	134	576	4	7	0	149	641	4	8	0	230	989	4	8
Kaitpur Mawaia	393	677	6	7	0	443	762	6	7	0	493	850	6	7	0	761	1311	6	8
Jamalpur Haria	410	315	4	4	0	462	355	4	4	0	515	395	4	4	0	794	610	5	5
Mahammadpur N.	141	639	3	6	0	159	720	3	6	0	177	802	3	6	0	273	1237	3	8
Bhadaiya M.	467	1203	6	12	0	526	1355	6	12	0	586	1510	6	13	0	904	2329	8	15
Udari	2045	885	16	16	0	2303	997	17	16	0	2567	1111	18	16	0	3959	1713	23	16
Nigoha	846	1574	12	18	0	953	1773	12	18	0	1062	1976	12	18	0	1638	3047	13	22
Chak Bhur	157	168	1	1		177	189	1	1		197	211	1	1		304	325	2	2
Bagheri	325	315	3	2	0	366	355	3	3	0	408	395	4	3	0	629	610	4	3
Kharoli	243	627	3	4	0	274	706	3	4	0	305	787	3	5	0	470	1214	4	6
Chak Bheshana	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0
Mawai Alampur	785	635	8	8	0	884	715	8	8	0	985	797	8	9	0	1520	1229	10	10
Chakmanta	0	260	0	2		0	293	0	2		0	326	0	2		0	503	0	3
Bajhi Bholamau	75	170	3	3	0	84	191	3	3	0	94	213	3	3	0	145	329	3	3
Nasirabad	137	313	3	3	0	154	353	3	3	0	172	393	3	4	0	265	606	3	4
Jayasswayam	126	289	1	2		142	325	1	2		158	363	1	2		244	559	1	3
Sub-totals:	6922	10283	86	118		7796	11581	87	119		8688	12906	89	124		13400	19906	103	141
Totals:	17205		204			19377		206			21594		213			33306		244	

Year: Population:

1971 14001 Growth rate: 1.022 (per annum)
1981 17388
1986 19377
1991 21594
2011 33306

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS BANNAMAU

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Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Ugabad	268	558	3	4	291	607	3	4	315	656	3	4	429	893	3	6
Dhanabad	169	564	2	3	184	613	2	3	199	663	2	4	271	903	2	4
Kanipur	377	376	4	3	410	409	4	3	443	442	4	4	604	602	4	4
Alampur	220	713	4	6	239	775	4	6	258	838	4	6	352	1142	4	7
Chanda	315	450	3	2	343	489	3	2	370	529	3	3	504	721	3	3
Ramgaon	180	720	4	6	196	783	4	6	211	846	4	6	288	1153	4	7
Yusufpur	264	962	4	6	287	1046	4	7	310	1130	4	7	423	1540	4	8
Bannamau	214	759	2	6	233	825	2	6	251	892	2	7	343	1215	2	7
Taudhakpur	350	350	2	2	381	381	2	2	411	411	2	2	560	560	3	3
Trivedipur	191	192	1	1	208	209	1	1	224	226	1	1	306	307	2	2
Mohamudmau	143	277	2	2	155	301	2	2	168	325	2	2	229	444	2	3
Datauli	358	1172	5	6	389	1274	5	8	421	1377	5	8	573	1877	5	12
Jamubaba	90	590	1	3	98	642	1	3	106	693	1	3	144	945	1	6
Saistabad	240	320	3	2	261	348	3	2	282	376	3	3	384	512	3	3
Mustafabad	283	1442	6	10	308	1568	6	10	332	1694	6	10	453	2309	6	14
Chanda Tikar	505	939	8	9	549	1021	8	9	593	1103	8	9	809	1503	9	10
Fakhruddinpur	177	196	2	2	192	213	2	2	208	230	2	2	283	314	2	2
Rajauli	530	609	7	7	576	662	7	7	623	715	7	7	849	975	8	7
Govindpur U.	200	657	1	3	217	714	1	3	235	772	1	4	320	1052	2	5
Sakhsapur	0	307	0	2	0	334	0	2	0	361	0	2	0	492	0	2
Kan Mau	218	215	1	1	237	234	1	1	256	253	2	2	349	344	2	2
Bahai	2527	3438	21	20	2748	3738	22	21	2969	4039	23	23	4046	5505	25	31
Sondassi	555	1192	6	8	603	1296	6	9	652	1400	6	9	889	1909	7	11
Chichiha	216	404	3	4	235	439	3	4	254	475	3	4	346	647	3	4
Sanatpur	685	515	3	3	745	560	3	3	805	605	4	3	1097	825	5	6
Sowal	0	593	0	4	0	645	0	4	0	697	0	4	0	949	0	5
Rishalpur L.	225	241	3	3	245	262	3	3	264	283	3	3	360	386	3	3
Sub-totals:	9500	18751	101	128	10330	20389	102	133	11161	22029	105	142	15211	30023	114	177
Totals:	28251		229		30719		235		33191		247		45233		291	

Year: Population:

1971 24354 Growth rate: 1.016 (per annum)
1981 28431
1986 30719
1991 33191
2011 45233

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS BEHTAKALAN

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Matehna	120	515	2	4	134	577	2	4	145	623	2	4	198	849	2	6
Khanpur K.	75	75	1	1	84	84	1	1	91	91	1	1	124	124	1	1
Gahri(khas)	580	2340	7	16	649	2620	7	18	702	2830	8	19	956	3857	8	22
Baraha	95	1040	3	5	106	1164	3	7	115	1258	3	7	157	1714	3	8
Haripur(khas)	80	731	2	4	90	818	2	4	97	884	2	5	132	1205	2	6
Purey Oree	50	450	1	2	56	504	1	3	60	544	1	3	82	742	1	3
Dhanipur	100	465	2	2	112	521	2	4	121	562	2	4	165	767	2	4
Sarai Kurai	80	612	2	4	90	685	2	4	97	740	2	4	132	1009	2	5
Rewari P.	160	630	3	4	179	705	3	5	194	762	3	5	264	1039	3	6
Bandai	448	1442	5	10	502	1614	6	10	542	1744	6	10	739	2377	6	13
Behtakalan	755	3735	8	19	845	4181	8	23	913	4518	8	23	1245	6157	10	28
Shajpur	40	418	1	2	45	468	1	2	48	506	1	3	66	689	1	3
Maheshkhera	0	984	0	5	0	1102	0	5	0	1190	0	6	0	1622	0	8
Pratappur	120	105	1	1	134	118	1	1	145	127	1	1	198	173	1	1
Bahrampur	133	430	1	2	149	481	1	2	161	520	1	3	219	709	1	3
Golhamau	0	200	0	1	0	224	0	1	0	242	0	1	0	330	0	2
Gangarkhera	30	50	1	1	34	56	1	1	36	60	1	1	49	82	1	1
Udwamau	70	416	2	4	78	466	2	4	85	503	2	4	115	686	2	4
Sandi	30	135	1	1	34	151	1	1	36	163	1	1	49	223	1	1
Jagatpur M.	210	1285	5	10	235	1439	5	10	254	1554	5	10	346	2118	5	13
Champatpur	75	435	2	3	84	487	2	3	91	526	2	3	124	717	2	4
Bemaura	120	1454	2	8	134	1628	2	9	145	1759	2	9	198	2397	2	12
Jhabra H.	80	940	1	4	90	1052	1	5	97	1137	1	5	132	1550	1	7
Dayalpur	200	215	1	1	224	241	1	1	242	260	1	2	330	354	2	2
Malpur	100	382	1	2	112	428	1	2	121	462	1	2	165	630	1	3
Alampur	40	100	1	1	45	112	1	1	48	121	1	1	66	165	1	1
Dhanabad	40	225	2	2	45	252	2	2	48	272	2	2	66	371	2	2
Mubarakpur	210	360	2	3	235	403	2	3	254	435	2	3	346	593	3	4
Satanpur	120	1545	1	7	134	1730	1	7	145	1869	1	9	198	2547	1	11
Maduri	390	1045	4	7	437	1170	4	7	472	1264	4	8	643	1723	5	10
Purey Bhanwani	80	105	1	1	90	118	1	1	97	127	1	1	132	173	1	1
Kumraura	620	995	6	8	694	1114	6	8	750	1204	6	9	1022	1640	7	11
Dostpur	0	255	0	2	0	285	0	2	0	308	0	2	0	420	0	2
Narsinghpur	200	270	1	2	224	302	1	2	242	327	1	2	330	445	2	2
Sub-totals:	5451	24384	73	149	6102	27297	74	163	6593	29494	75	173	8986	40196	82	210
Totals:	29835		222		33399		237		36087		248		49182		292	

Year: Population:

1971 26479 Growth rate: 1.015 (per annum)
1981 30912
1986 33399
1991 36087
2011 49181

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS SAIDABAD

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Asepur	360	1320	2	9	446	1634	3	10	509	1867	3	10	868	3181	5	15
Binda Chak Mukim	592	1408	3	8	733	1743	4	10	837	1992	4	12	1427	3393	7	18
Saraidisu	524	921	3	6	649	1140	4	6	741	1303	4	6	1263	2220	6	11
Chak Budh Bharti	0	140	0	2	0	173	0	2	0	198	0	2	0	337	0	2
Zirayat R.	54	161	1	2	67	199	1	2	76	228	1	2	130	388	1	2
J. Lalpur	83	887	1	7	103	1098	1	7	117	1255	1	8	200	2138	1	11
Patti Parvat	0	380	0	2	0	470	0	2	0	537	0	3	0	916	0	4
Sangram Patti	267	573	2	4	331	709	2	4	378	810	2	5	643	1381	3	7
Anjana	240	1270	3	8	297	1572	3	9	339	1796	3	10	578	3061	4	15
Bijhauniyan	539	321	3	4	667	397	3	4	762	454	4	4	1299	774	6	4
Hakim Patti	193	237	4	3	239	293	4	3	273	335	4	3	465	571	4	4
Saidabad	176	1784	1	10	218	2209	1	12	249	2523	1	13	424	4299	2	19
Sarai Mansur	292	158	5	4	362	196	5	4	413	223	5	4	704	381	5	4
Dasauti	830	750	5	4	1028	929	6	4	1174	1061	6	6	2000	1807	9	8
Mahuadih	444	906	4	5	550	1122	4	7	628	1282	5	8	1070	2183	6	10
Bhiski	375	585	3	10	464	724	3	10	530	827	4	10	904	1410	5	10
Badera	0	220	0	3	0	272	0	3	0	311	0	3	0	530	0	4
Bajhan Mishran	454	1636	2	10	562	2025	3	10	642	2314	3	11	1094	3943	5	18
Dhokri Upahar	1228	3282	9	17	1520	4063	10	21	1737	4642	11	25	2959	7910	15	36
Sub-totals:	6651	16939	51	118	8234	20971	57	130	9408	23960	61	145	16029	40823	84	202
Totals:	23590		169		29206		187		33367		206		56852		286	

Year:	Population:
1971	19584
1981	25563
1986	29206
1991	33367
2011	56852

Growth rate: 1.027 (per annum)

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS NIDURA

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Nidura	1013	4330	17	27	1184	5061	17	31	1325	5665	17	33	2080	8892	19	43
Lal Gopalganj	63	3074	1	13	74	3593	1	15	82	4022	1	17	129	6313	1	26
Daniyalpur	60	679	1	3	70	794	1	4	78	888	1	4	123	1394	1	6
Kamalpur	267	757	3	4	312	885	3	6	349	990	3	6	548	1555	3	7
Piyari Urf B.	575	1614	6	10	672	1886	6	10	752	2111	6	13	1181	3314	8	18
Akhrajpur U.	154	370	2	3	180	432	2	4	201	484	2	4	316	760	3	5
Akhrajpur K.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Patna Kachar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mirjabhan K.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mirjabhan U.	42	130	1	1	49	152	1	1	55	170	1	1	86	267	1	2
Patna Uprahar	200	560	1	3	234	655	1	3	262	733	2	3	411	1150	2	5
Shyampur	18	90	1	1	21	105	1	1	24	118	1	1	37	185	1	1
Kasimpur J.	27	174	1	1	32	203	1	1	35	228	1	1	55	357	1	2
Chak Jaghubir P.	11	100	1	1	13	117	1	1	14	131	1	1	23	205	1	1
Chak Moti Ram D.	68	250	1	1	79	292	1	2	89	327	1	2	140	513	1	3
Bhikhampur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dhanpur	118	394	1	2	138	460	1	2	154	515	1	3	242	809	1	4
Dhanpur Singh.	0	96	0	1	0	112	0	1	0	126	0	1	0	197	0	1
Arzichak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bhadapur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ibrahimpur	161	482	2	3	188	563	2	3	211	631	2	4	331	990	3	5
Chak R. Urf Ahl.	130	604	1	3	152	706	1	3	170	790	1	4	267	1240	2	5
Khanjahanpur	110	968	1	4	129	1131	1	5	144	1266	1	6	226	1988	1	8
Rawan	145	414	1	2	169	484	1	2	190	542	1	3	298	850	2	4
Parmanandpur	123	549	2	3	144	642	2	3	161	718	2	4	253	1127	2	6
Andhiyari	370	1060	5	10	432	1239	5	10	484	1387	5	11	760	2177	5	13
Chak Shah Hamid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-totals:	3655	16695	49	96	4272	19513	49	108	4782	21841	50	122	7506	34285	58	165
Totals:	20350		145		23785		157		26623		172		41790		223	

Year:	Population:
1971	16960
1981	21249
1986	23784
1991	26622
2011	41790

Growth rate: 1.022 (per annum)

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS PRATAPPUR

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Ghurdauli	309	548	2	3	382	677	2	4	436	773	2	4	743	1317	3	7
Didona	368	1580	2	9	454	1951	2	10	519	2229	3	12	885	3798	4	18
Sarain Hariram	145	1040	1	6	179	1284	1	8	205	1467	1	8	349	2500	2	13
Prathakurain	0	205	0	1	0	253	0	2	0	289	0	2	0	493	0	2
Bhagwara	311	1314	2	8	384	1623	2	8	439	1854	2	9	748	3158	3	14
Januwadih	105	290	1	2	130	358	1	2	148	409	1	3	252	697	2	3
Kandharpur	0	132	0	1	0	163	0	1	0	186	0	1	0	317	0	2
Bibipur U.	231	1675	2	9	285	2068	2	10	326	2363	2	12	555	4026	3	18
Paiypur	296	652	2	4	366	805	2	4	418	920	2	5	711	1567	3	7
Mirzapur	161	546	1	3	199	674	1	3	227	770	1	4	387	1312	2	6
Sultanpur	141	941	1	4	174	1162	1	5	199	1328	1	6	339	2262	2	10
Saron Sultanpur	86	412	1	3	106	509	1	3	121	581	1	4	207	990	1	5
Khanpur	541	1536	3	8	668	1897	4	10	763	2167	4	11	1300	3692	6	17
Thanapur	181	646	1	3	224	798	1	4	255	911	2	4	435	1553	2	7
Thata	75	659	1	4	93	814	1	4	106	930	1	5	180	1584	1	7
Malhipur	58	192	1	1	72	237	1	1	82	271	1	2	139	461	1	2
Soraon	831	2331	4	13	1026	2878	5	16	1172	3289	5	17	1997	5603	9	26
Meerpur	116	505	1	3	143	624	1	4	164	712	1	4	279	1214	2	6
Seudh Soron	138	530	1	4	170	654	1	4	195	748	1	4	332	1274	2	6
Katehri	20	1084	1	7	25	1339	1	7	28	1529	1	9	48	2605	1	12
Babupur Belon	410	601	2	3	506	742	3	5	578	848	4	5	985	1445	5	8
Barasta Khurd	94	990	1	5	116	1222	1	6	133	1397	1	6	226	2380	1	11
Ugapur	202	500	1	3	249	617	1	4	285	705	2	4	486	1202	2	6
Gossesipur	143	129	1	1	177	159	1	1	202	182	1	1	344	310	2	2
Birapur	59	254	1	2	73	314	1	2	83	358	1	2	142	611	1	3
Barasta Kalan	556	1115	3	6	687	1377	3	9	784	1573	5	9	1336	2680	6	15
Bhimpur	120	643	1	3	148	794	1	4	169	907	1	4	288	1545	2	7
Havasabad	161	441	1	2	199	545	1	3	227	622	1	3	387	1060	2	5
Vikramshad B.	128	580	1	4	158	716	1	4	181	818	1	4	308	1394	2	7
Udgi	118	909	1	4	146	1122	1	6	166	1282	1	6	284	2185	2	10
Nevadbasana	59	128	1	2	73	158	1	2	83	181	1	2	142	308	1	2
Sub-totals:	6163	23108	42	131	7610	28534	45	156	8695	32600	51	172	14813	55541	75	264
Totals:	29271		173		36145		201		41295		223		70354		339	

Year: Population:

1971 24238 Growth rate: 1.027 (per annum)
1981 31637
1986 36145
1991 41295
2011 70354

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS URWA

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Chaukhata	235	1362	5	8	303	1755	5	12	351	2032	5	13	629	3648	5	18
Achchola U.	220	814	1	5	283	1049	2	7	328	1214	2	7	589	2180	3	12
Kothari	88	147	2	1	113	189	2	1	131	219	2	1	236	394	2	2
Sarai Kalan	48	146	2	2	62	188	2	2	72	218	2	2	129	391	2	2
Sarai Khurd	143	94	2	2	184	121	2	2	213	140	2	2	383	252	2	2
Imalia Kalan	443	1122	4	8	571	1446	5	9	661	1674	5	9	1186	3005	7	16
Chaukata Gaura	6	594	1	3	8	765	1	4	9	886	1	4	16	1591	1	8
Kewtahi	6	194	1	1	8	250	1	1	9	289	1	2	16	520	1	3
Lehandi	285	1350	2	8	367	1740	2	10	425	2014	2	11	763	3616	4	20
Sikra	110	366	1	3	142	472	1	3	164	546	1	3	295	980	2	5
Akoda	347	787	3	5	447	1014	4	7	518	1174	4	7	929	2108	6	11
Sonbarsa	108	369	2	3	139	475	2	3	161	550	2	3	289	988	2	5
Ghogha	194	433	2	3	250	558	2	4	289	646	2	4	520	1160	4	7
Chorbana	89	554	1	5	115	714	1	5	133	826	1	5	238	1484	1	10
Aunta	968	2466	8	17	1247	3178	8	22	1444	3678	8	22	2593	6605	14	38
Monai	641	956	4	7	826	1232	6	11	956	1426	6	11	1717	2560	9	16
Sonai	392	399	3	8	505	514	3	8	585	595	3	8	1050	1069	5	8
Khamnia	24	444	1	2	31	572	1	3	36	662	1	3	64	1189	1	5
Zera	473	477	3	3	609	615	4	4	706	711	4	4	1267	1278	6	6
Patti Nath Rai	668	984	4	8	861	1268	6	9	996	1468	6	10	1789	2635	9	15
Arazi Akoda	20	65	1	1	26	84	1	1	30	97	1	1	54	174	1	1
Narwar Uparhar	2	334	2	2	3	430	2	2	3	498	2	3	5	895	2	4
Dighia Part.	85	215	1	1	110	277	1	2	127	321	1	2	228	576	1	3
Sub-totals:	5595	14672	56	106	7209	18906	64	132	8345	21885	64	137	14985	39295	90	217
Totals:	20267		162		26115		196		30230		201		54280		307	

Year: Population:

1971 16836 Growth rate: 1.030 (per annum)
1981 22560
1986 26115
1991 30230
2011 54280

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS TIKRI

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Bhagwanpur	450	1750	2	7	550	2139	3	9	618	2402	4	10	983	3823	5	16
Chhittupur	500	1760	2	8	611	2151	4	9	686	2416	4	10	1092	3845	6	16
Shir Gobardhan	750	3230	3	13	917	3948	6	16	1030	4434	6	18	1638	7056	9	29
Daphi	650	400	3	2	794	489	4	2	892	549	6	3	1420	874	7	4
Nawapura	1000	760	4	4	1222	929	8	4	1373	1043	8	5	2185	1660	12	7
Narottampur	750	770	5	4	917	941	5	4	1030	1057	5	5	1638	1682	10	7
Ranna	500	2250	2	9	611	2750	4	11	686	3089	4	13	1092	4915	6	20
Tikri	1200	1500	6	6	1467	1833	6	8	1647	2059	12	9	2621	3277	12	14
Sarai Dagi	600	880	3	4	733	1076	3	5	824	1208	6	5	1311	1922	6	8
Tarapur	350	530	2	3	428	648	3	3	480	728	3	3	765	1158	4	5
Moradih	550	1110	3	5	672	1357	3	6	755	1524	5	7	1202	2425	6	10
Kurhua	350	570	2	3	428	697	2	3	480	783	3	4	765	1245	4	5
Madhopur	100	430	2	2	122	526	2	3	137	590	2	3	218	939	2	4
Balipur	150	200	1	1	183	244	1	1	206	275	1	2	328	437	2	2
Chaitauni	200	920	2	4	244	1125	2	6	275	1263	2	6	437	2010	2	9
Gazadharpur	300	620	2	3	367	758	2	4	412	851	2	4	655	1354	4	6
Bhuwalpur	0	170	0	1	0	208	0	1	0	233	0	1	0	371	0	2
Khanaw	200	660	4	3	244	807	4	4	275	906	4	4	437	1442	4	6
Betwar	350	600	2	3	428	733	2	3	480	824	3	4	765	1311	4	6
Karsara	900	800	4	4	1100	978	6	4	1236	1098	8	5	1966	1748	10	7
Bachhawan	1000	2350	7	10	1222	2872	7	12	1373	3226	7	13	2185	5134	13	21
Audhe	250	560	5	3	306	684	5	3	343	769	5	4	546	1223	5	5
Rampur	340	0	4	0	416	0	4	0	467	0	4	0	743	0	4	0
Amra	800	1080	4	5	978	1320	6	6	1098	1483	6	6	1748	2359	10	10
Susuwahi	600	1380	4	6	733	1687	4	7	824	1894	4	8	1311	3015	8	13
Nuwaon	500	720	5	3	611	880	5	4	686	988	5	4	1092	1573	7	7
Akhari	1000	410	6	2	1222	501	6	3	1373	563	7	3	2185	896	12	4
Sub-totals:	14340	26410	89	118	17528	32281	107	141	19686	36256	126	159	31327	57694	174	243
Totals:	40750		207		49808		248		55942		285		86225		417	

Year:	Population:
1971	35155
1981	44347
1986	49808
1991	55942
2011	89022

Growth rate: 1.023 (per annue)

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS SEWAPURI

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Banauli	500	440	2	2	578	508	3	3	649	571	3	3	1033	909	5	4
Dubeypur	100	200	1	1	116	231	1	1	130	260	1	2	207	413	1	2
Ghoshila	350	670	2	3	404	774	2	4	454	869	2	4	723	1384	3	6
Oderha	500	110	2	1	578	127	3	1	649	143	3	1	1033	227	5	1
Isarwar	300	570	2	3	347	659	2	3	389	740	2	3	620	1177	3	5
Majhiyar	150	313	1	2	173	362	1	2	195	406	1	2	310	646	2	3
Ragunath	350	626	2	3	404	723	2	3	454	812	2	4	723	1293	3	6
Bajardiha	100	234	1	1	116	270	1	2	130	304	1	2	207	483	1	2
Tarapur	0	285	0	2	0	329	0	2	0	370	0	2	0	589	0	3
Harbhanpur	400	753	2	4	462	870	2	4	519	977	3	4	826	1555	4	7
Virhar	100	200	1	1	116	231	1	1	130	260	1	2	207	413	1	2
Bhagwatipur	200	307	1	2	231	355	1	2	260	398	2	2	413	634	2	3
Gopalpur	50	23	1	1	58	27	1	1	65	30	1	1	103	47	1	1
Kapsethi	350	735	2	3	404	849	2	4	454	954	2	4	723	1518	3	7
Birampur	0	410	0	2	0	474	0	2	0	532	0	3	0	847	0	4
Baradih	400	1325	3	7	462	1531	3	8	519	1719	3	9	826	2736	5	12
Jagitpur	200	356	2	3	231	411	2	3	260	462	2	3	413	735	2	4
Bazar Kalika	0	993	0	5	0	1147	0	6	0	1289	0	6	0	2051	0	10
Uperwar	250	692	1	3	289	800	2	4	324	898	2	4	516	1429	3	6
Khillopur	100	188	1	1	116	217	1	1	130	244	1	1	207	388	1	2
Bhitkuri	100	823	1	4	116	951	1	4	130	1068	1	5	207	1699	1	7
Danoopur	0	390	0	2	0	451	0	2	0	506	0	3	0	805	0	4
Rasulaha	0	872	0	4	0	1007	0	5	0	1132	0	5	0	1801	0	9
Narayan	200	371	1	2	231	429	1	2	260	481	2	2	413	766	2	4
Hitapur	0	302	0	2	0	349	0	2	0	392	0	2	0	624	0	3
Maharajpur	550	482	3	2	635	557	3	3	714	625	3	3	1136	995	5	4
Gaharpar	386	0	2	0	446	0	3	0	501	0	3	0	797	0	4	0
Bisahupur	350	1460	3	7	404	1687	3	8	454	1895	3	9	723	3015	4	14
Pachwar	300	990	2	4	347	1144	2	5	389	1285	2	6	620	2044	3	9
Madhopur	0	83	0	1	0	96	0	1	0	108	0	1	0	171	0	1
Chackamilah	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-totals:	6286	15203	39	78	7263	17565	43	89	8157	19728	46	98	12981	31394	64	145
Totals:	21489		117		24827		132		27885		144		44375		209	

Year: Population:

1971 17523 Growth rate: 1.024 (per annum)
1981 22105
1986 24827
1991 27885
2011 44375

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS HARHUA

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Aushanpur	336	1094	3	5	402	1310	3	6	452	1472	3	6	719	2342	3	10
Pandeypur	25	0	1	0	30	0	1	0	34	0	1	0	54	0	1	0
Chakka	109	841	1	4	131	1007	1	5	147	1131	1	5	233	1800	1	8
Karoma	395	577	2	3	473	691	2	4	531	776	3	4	846	1235	4	6
Duniapur	0	185	0	1	0	222	0	1	0	249	0	1	0	396	0	2
Naipura	0	201	0	1	0	241	0	1	0	270	0	2	0	430	0	2
Surwa	18	316	1	2	22	378	1	2	24	425	1	2	39	676	1	3
Barwa	229	429	1	2	274	514	2	3	308	577	2	3	490	918	2	4
Gokulpur	251	265	2	2	301	317	2	2	338	356	2	2	537	567	3	3
Anaura	0	441	0	2	0	528	0	3	0	593	0	3	0	944	0	4
Bajalpatti	99	198	1	1	119	237	1	1	133	266	1	2	212	424	1	2
Dhanasari	2	522	1	3	2	625	1	3	3	702	1	3	4	1117	1	5
Luchhaipur	67	197	1	1	80	236	1	1	90	265	1	2	143	422	1	2
Bhatauli	225	929	1	4	269	1113	2	5	303	1250	2	5	482	1989	2	8
Sahmalpur	0	255	0	2	0	305	0	2	0	343	0	2	0	546	0	3
Sarai Swami	21	24	1	1	25	29	1	1	28	32	1	1	45	51	1	1
Gosainpur	0	47	0	1	0	56	0	1	0	63	0	1	0	101	0	1
Bhagatupur	366	520	2	3	438	623	2	3	492	699	2	3	783	1113	4	5
Mansapur	26	278	1	2	31	333	1	2	35	374	1	2	56	595	1	3
Dasipur	189	672	1	3	226	805	1	4	254	904	2	4	405	1438	2	6
Asiqpur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mahadeopur	4	126	1	1	5	151	1	1	5	169	1	1	9	270	1	2
Harishankarpatti	47	123	1	1	56	147	1	1	63	165	1	1	101	263	1	2
Sarai Kazi	164	1131	1	5	196	1355	1	6	221	1521	1	7	351	2421	2	10
Narainpur	76	224	1	1	91	268	1	2	102	301	1	2	163	479	1	2
Gorwa	130	511	1	3	156	612	1	3	175	687	1	3	278	1094	2	5
Kailhat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Koirajpur Khas	629	1152	4	6	753	1380	4	7	846	1550	4	7	1346	2466	6	11
Harhua	14	951	1	4	17	1139	1	5	19	1279	1	6	30	2036	1	9
Ram Singhpur	81	242	1	1	97	290	1	2	109	326	1	2	173	518	1	3
Singhapur	204	366	1	2	244	438	1	2	274	492	2	2	437	783	2	4
Vishnupur	11	0	1	0	13	0	1	0	15	0	1	0	24	0	1	0
Deonathpur	12	310	1	2	14	371	1	2	16	417	1	2	26	664	1	3
Chandipatti	121	309	2	2	145	370	2	2	163	416	2	2	259	661	2	3
Mohanpur	166	323	1	2	199	387	1	2	223	434	1	2	355	691	2	3
War	155	389	1	3	186	466	1	3	208	523	1	3	332	833	2	4
Balipur	155	199	1	1	186	238	1	1	208	268	1	2	332	426	2	2
Besahipur	0	171	0	1	0	205	0	1	0	230	0	1	0	366	0	2
Rampur	0	309	0	2	0	370	0	2	0	416	0	2	0	661	0	3
Pachhimpur	253	152	2	1	303	182	2	1	340	204	2	1	542	325	3	2
Sahabuddinpur	65	256	1	2	78	307	1	2	87	344	1	2	139	548	1	3
Chanraon	525	0	3	0	629	0	3	0	706	0	3	0	1124	0	5	0
Ganeshpur	399	656	2	3	478	786	2	4	537	882	3	4	854	1404	4	6
Jaitapatti	58	0	1	0	69	0	1	0	78	0	1	0	124	0	1	0
Bhelihe	275	294	2	2	329	352	2	2	370	395	2	2	589	629	3	3
Bazipur	116	677	1	3	139	811	1	4	156	911	1	4	248	1449	1	6
Mirzapur	0	208	0	2	0	249	0	2	0	280	0	2	0	445	0	2
Idilpur	174	89	2	1	208	107	2	1	234	120	2	1	372	191	3	1
Pratap Patti	148	339	1	2	177	406	1	2	199	456	1	2	317	726	2	3
Bahetipur	31	350	1	2	37	419	1	2	42	471	1	2	66	749	1	3
Bachhia	0	212	0	1	0	254	0	2	0	285	0	2	0	454	0	2

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS HARHUA

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Amawar	18	360	1	2	22	431	1	2	24	484	1	2	39	771	1	4
Raisipatti	164	479	1	2	196	574	1	3	221	644	1	3	351	1025	2	5
Namandipur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jaysipatti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Basudeopur	313	149	2	2	375	178	2	2	421	200	2	2	670	319	4	2
Sabhaipur	0	105	0	1	0	126	0	1	0	141	0	1	0	225	0	1
Kharagpur	348	760	2	4	417	910	2	4	468	1022	2	5	745	1627	3	7
Ghamahapur	262	300	2	2	314	359	2	2	352	404	2	2	561	642	3	3
Bhagwanpur	324	482	2	2	388	577	2	3	436	648	2	3	694	1032	3	5
Kauwapur	117	161	1	1	140	193	1	1	157	217	1	1	250	345	2	2
Sikanderpur	81	189	1	1	97	226	1	1	109	254	1	2	173	405	1	2
Ashapur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hariharpur	181	106	1	1	217	127	1	1	243	143	1	1	387	227	2	1
Sirsawa	325	594	2	3	389	711	2	3	437	799	2	4	696	1271	3	6
Madhopur	248	449	1	2	297	538	2	3	334	604	2	3	531	961	3	4
Jamalpatti	57	0	1	0	68	0	1	0	77	0	1	0	122	0	1	0
Madhaipur U.R.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Khari	130	229	1	1	156	274	1	2	175	308	1	2	278	490	2	2
Bhobhi	238	242	2	1	285	290	2	2	320	326	2	2	509	518	3	3
Harirampur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Birampatti	655	1036	3	5	784	1241	4	5	881	1394	4	6	1402	2218	6	9
Chuppepur	400	683	2	3	479	818	2	4	538	919	3	4	856	1462	4	6
Jaipur	159	200	1	1	190	240	1	1	214	269	1	2	340	428	2	2
Kot Khas	104	200	1	1	125	240	1	1	140	269	1	2	223	428	1	2
Undi	99	100	1	1	119	120	1	1	133	135	1	1	212	214	1	1
Indwar	273	308	2	2	327	369	2	2	367	414	2	2	584	659	3	3
Koiran	905	0	4	0	1084	0	5	0	1217	0	5	0	1937	0	8	0
Ahiran	864	0	4	0	1035	0	5	0	1162	0	5	0	1849	0	8	0
Purabhur	188	239	1	1	225	286	1	2	253	321	2	2	402	512	2	3
Sariya	45	156	2	1	54	187	2	1	61	210	2	1	96	334	2	2
Tulsipatti	0	38	0	1	0	46	0	1	0	51	0	1	0	81	0	1
Sub-totals:	12869	25625	96	140	15412	30690	102	162	17311	34469	108	174	27546	54851	149	253
Totals:	38494		236		46102		264		51780		282		82397		402	

Year:	Population:
1971	32539
1981	41047
1986	46102
1991	51779
2011	82397

Growth rate: 1.023 (per annum)

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS BIRAONKOT

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Sarwan	531	1327	5	9	638	1593	5	10	716	1789	5	10	1139	2847	7	15
Mahiepur	501	994	3	7	601	1193	4	8	676	1340	4	8	1075	2133	5	12
Chanbankat	0	96	0	1	0	115	0	1	0	129	0	1	0	206	0	1
Akorha	765	616	4	4	918	740	5	4	1032	831	6	5	1642	1322	8	7
Rasulah	590	878	3	4	708	1054	4	5	796	1184	4	5	1266	1884	7	8
Dandupur	1652	992	8	6	1983	1191	9	8	2228	1338	10	8	3545	2129	17	13
Telwar	236	299	1	2	283	359	2	2	318	403	2	2	506	642	3	3
Koilar	236	406	2	3	283	487	2	3	318	547	2	4	506	871	3	5
Saripur	0	243	0	1	0	292	0	2	0	328	0	2	0	521	0	3
Mazgawan	118	135	1	1	142	162	1	1	159	182	1	1	253	290	2	2
Mazgawan Kalan	295	608	2	3	354	730	2	4	398	820	2	4	633	1305	3	6
Chakia	0	266	0	2	0	319	0	2	0	359	0	2	0	571	0	3
Siahra	47	147	2	1	56	176	2	1	63	198	2	1	101	315	2	2
Sainpur	242	471	3	3	291	565	3	3	326	635	3	3	519	1011	3	5
Tilari	41	119	1	2	49	143	1	2	55	160	1	2	88	255	1	2
Madhu Makia K.	509	830	3	4	611	996	3	5	686	1119	3	6	1092	1781	5	8
Kuru	596	765	5	6	716	918	5	6	804	1032	6	6	1279	1642	7	9
Kodai	326	649	2	4	391	779	2	4	440	875	2	4	700	1393	4	7
Barwapur	0	90	0	1	0	108	0	1	0	121	0	1	0	193	0	1
Hasanpur	415	992	3	5	498	1191	3	5	560	1338	3	7	891	2129	5	10
Changwar	354	952	4	6	425	1143	4	7	477	1284	4	7	760	2043	5	11
Pater	118	420	1	4	142	504	1	4	159	566	1	4	253	901	2	6
Gajapur	34	177	1	4	41	213	1	4	46	239	1	4	73	380	1	4
Ishwarpur	89	265	1	2	107	318	1	2	120	357	1	2	191	569	1	3
Biraonkot	0	798	0	4	0	958	0	5	0	1076	0	5	0	1712	0	8
Sarwanipur	0	188	0	1	0	226	0	1	0	254	0	2	0	403	0	2
Balrampur	590	930	3	5	708	1117	5	6	796	1254	5	6	1266	1996	8	9
Phulwaria	0	334	0	3	0	401	0	3	0	450	0	3	0	717	0	3
Chaturpur	0	450	0	3	0	540	0	3	0	607	0	3	0	966	0	4
Bhita	0	578	0	3	0	694	0	4	0	779	0	4	0	1240	0	6
Vishnathpur	332	649	2	4	399	779	2	4	448	875	2	4	712	1393	4	6
Newada	0	350	0	2	0	420	0	2	0	472	0	2	0	751	0	4
Sonahi	0	127	0	1	0	152	0	1	0	171	0	1	0	273	0	2
Khararia(biraon)	0	367	0	2	0	441	0	2	0	495	0	2	0	788	0	4
Khararia	472	1418	3	7	567	1702	4	7	636	1912	4	9	1013	3043	6	14
Balua	661	1114	5	6	794	1337	6	9	891	1502	6	9	1418	2390	10	15
Kaniar	826	1843	4	9	992	2213	5	10	1114	2485	5	12	1772	3955	9	18
Baulia	184	517	2	3	221	621	2	3	248	697	2	4	395	1109	3	5
Harhhw	45	118	1	1	54	142	1	1	61	159	1	1	97	253	1	2
Chilbila	648	1062	4	5	778	1275	4	6	874	1432	4	6	1390	2279	7	11
Kumbhapur	386	300	2	2	463	360	3	2	521	405	3	2	828	644	4	3
Dinapur	100	343	1	2	120	412	1	3	135	463	1	3	215	736	1	4
Kundi	1076	2361	7	12	1292	2835	9	14	1451	3184	10	15	2309	5066	13	24
Kusuara	472	471	2	2	567	565	4	3	636	635	4	3	1013	1011	6	5
Itha	0	590	0	3	0	708	0	3	0	796	0	4	0	1266	0	6
Fatehpur	413	546	2	3	496	656	3	4	557	736	3	4	886	1172	5	6
Sub-totals:	13900	28191	93	168	16688	33846	109	190	18743	38014	113	203	29827	60492	168	307
Totals:	42091		261		50534		299		56758		316		90319		475	

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS BIRAONKOT

Year:	1981				1986				1991				2011			
	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2

Year: Population:

1971 35667 Growth rate: 1.023 (per annum)
1981 44993
1986 50534
1991 56758
2011 90319

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS MIRZAMURAD

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Gajepur	275	501	2	3	330	601	2	3	370	675	2	3	589	1074	3	5
Shirihara	100	714	1	3	120	856	1	4	135	961	1	4	214	1530	1	7
Narayanpur	203	32	3	1	243	38	3	1	273	43	3	1	435	69	3	1
Shambhoopur	238	248	1	3	285	297	2	3	320	334	2	3	510	531	3	3
Matuka	300	486	2	2	360	583	2	3	404	654	2	3	643	1041	3	5
Kakrahwan	0	535	0	3	0	641	0	3	0	720	0	3	0	1146	0	5
Pratappur	676	1239	4	15	810	1485	4	15	910	1668	5	15	1449	2655	6	16
Chaklola	563	718	4	5	675	861	4	5	758	967	4	5	1206	1539	6	7
Ramdih	160	469	1	2	192	562	1	3	215	632	1	3	343	1005	2	5
Bhikhampur	1050	950	5	5	1259	1139	6	5	1414	1279	6	6	2250	2036	9	9
Kathurwa	225	106	2	2	270	127	2	2	303	143	3	2	482	227	3	2
Arjunpur	740	434	3	2	887	520	4	3	996	584	4	3	1586	930	7	4
Adwanpur	700	637	3	7	839	764	4	7	943	858	4	7	1500	1365	6	7
Puranderpur	150	186	1	3	180	223	1	3	202	250	1	3	321	399	2	3
Nonkhara	0	162	0	1	0	194	0	1	0	218	0	1	0	347	0	2
Katwarupur	47	101	1	1	56	121	1	1	63	136	1	1	101	216	1	1
Sarangpur	0	425	0	2	0	510	0	3	0	572	0	3	0	911	0	4
Khemapur	456	428	3	3	547	513	4	3	614	576	4	3	977	917	5	4
Gorain	505	493	3	2	605	591	3	3	680	664	3	3	1082	1056	5	5
Sumerpur	71	78	1	1	85	94	1	1	96	105	1	1	152	167	1	1
Kardhana	2158	2833	9	13	2587	3397	11	14	2906	3815	12	16	4624	6070	19	25
Domanpur	201	278	1	2	241	333	1	2	271	374	2	2	431	596	2	3
Ramathauna	175	182	3	3	210	218	3	3	236	245	3	3	375	390	3	3
Lalpur	331	404	2	2	397	484	2	2	446	544	2	3	709	866	3	4
Leruai	60	446	2	2	72	535	2	3	81	601	2	3	129	956	2	4
Kharagrampur	30	532	1	4	36	638	1	4	40	716	1	4	64	1140	1	5
Dandrahia	225	442	1	3	270	530	2	3	303	595	2	3	482	947	2	4
Sheorampur	100	230	1	2	120	276	1	2	135	310	1	2	214	493	1	2
Chakarpanpur	373	402	2	2	447	482	2	2	502	541	3	3	799	861	4	4
Mughalbir	0	328	0	4	0	393	0	4	0	442	0	4	0	703	0	4
Lallapur	0	269	0	4	0	323	0	4	0	362	0	4	0	576	0	4
Gurudaspur	0	436	0	3	0	523	0	3	0	587	0	4	0	934	0	5
Badipur	150	471	1	4	180	565	1	4	202	634	1	4	321	1009	2	5
Bharhara	140	79	2	2	168	95	2	2	189	106	2	2	300	169	2	2
Madhukarshahpur	90	157	2	2	108	188	2	2	121	211	2	2	193	336	2	2
Lakshapur	329	748	2	7	394	897	2	7	443	1007	2	7	705	1603	3	8
Nayapur	80	747	2	3	96	896	2	4	108	1006	2	5	171	1601	2	7
Bhikipur	0	447	0	3	0	536	0	3	0	602	0	3	0	958	0	4
Mirzamurad (G.)	330	3653	2	20	396	4380	2	20	444	4919	2	20	707	7828	3	32
Khillispur	270	908	2	6	324	1089	2	6	364	1223	2	6	579	1946	3	8
Amini	588	1149	4	7	705	1378	4	7	792	1547	4	8	1260	2462	6	11
Khalipur	911	1588	4	17	1092	1904	5	17	1227	2138	5	17	1952	3403	8	17
Sub-totals:	13000	25671	83	181	15586	30778	92	190	17505	34568	97	198	27856	55007	134	259
Totals:	38671		264		46364		282		52073		295		82863		393	

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS MIRZAMURAD

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Year:	1981				1986				1991				2011			
	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2

Year: Population:

1971 32724 Growth rate: 1.023 (per annum)
1981 41280
1986 46363
1991 52073
2011 82862

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS ROHANIA

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Parmanandpur	553	1369	3	10	664	1644	3	10	746	1846	3	10	1187	2938	5	12
Uadirajpur	0	509	0	3	0	611	0	3	0	686	0	3	0	1092	0	5
Kholaspur	144	429	1	3	173	515	1	3	194	579	1	3	309	921	2	4
Maniyaripur	0	956	0	5	0	1148	0	5	0	1289	0	6	0	2052	0	9
Tundiya	0	537	0	4	0	645	0	4	0	724	0	4	0	1152	0	5
Lakahpur	0	597	0	3	0	717	0	3	0	805	0	4	0	1281	0	6
Bhulanpur	0	890	0	5	0	1069	0	5	0	1200	0	5	0	1910	0	8
Pandeapur	0	25	0	1	0	30	0	1	0	34	0	1	0	54	0	1
Nathupur	57	865	1	4	68	1039	1	5	77	1167	1	5	122	1856	1	8
Unchagaon	212	1831	1	10	255	2199	2	10	286	2469	2	11	455	3929	2	17
Daudpur	37	416	1	2	44	500	1	2	50	561	1	3	79	893	1	4
Ramraipur	0	465	0	2	0	558	0	3	0	627	0	3	0	998	0	4
Ghasahapur	0	732	0	4	0	879	0	4	0	987	0	4	0	1571	0	7
Lachhimanpur	0	308	0	2	0	370	0	2	0	415	0	2	0	661	0	3
Dayapur	139	1455	1	6	167	1747	1	7	187	1962	1	8	298	3123	2	13
Tulachak	93	84	1	1	112	101	1	1	125	113	1	1	200	180	1	1
Shahabadad	0	627	0	3	0	753	0	4	0	846	0	4	0	1346	0	6
Hariharpur	150	220	2	2	180	264	2	2	202	297	2	2	322	472	2	2
Ghatampur	82	460	1	2	98	552	1	3	111	620	1	3	176	987	1	4
Bishunpur	111	912	1	5	133	1095	1	5	150	1230	1	6	238	1957	1	9
Pilkhini	197	238	1	1	237	286	1	2	266	321	2	2	423	511	2	3
Nerur	67	720	1	3	80	865	1	4	90	971	1	4	144	1545	1	7
Balirampur	0	214	0	1	0	257	0	2	0	289	0	2	0	459	0	2
Fatehgung	0	464	0	2	0	557	0	3	0	626	0	3	0	996	0	4
Bhatthi	410	1175	2	5	492	1411	2	6	553	1585	3	7	880	2522	4	11
Basantpatti	120	1206	1	5	144	1448	1	6	162	1626	1	7	258	2588	2	11
Gopalpur	0	304	0	2	0	365	0	2	0	410	0	2	0	652	0	3
Karota	407	1337	2	7	489	1605	2	7	549	1803	3	9	873	2869	4	12
Darekhu	290	1874	3	11	348	2250	3	11	391	2527	3	12	622	4022	4	18
Rohania	0	618	0	4	0	742	0	4	0	833	0	4	0	1326	0	6
Govindpur	25	361	1	2	30	433	1	2	34	487	1	2	54	775	1	4
Harpalpur	325	1668	3	9	390	2003	3	9	438	2249	3	10	697	3580	4	15
Kesaripur	598	2002	4	10	718	2404	4	12	806	2700	4	12	1283	4296	6	19
Karkatpur	183	564	1	4	220	677	1	4	247	761	1	4	393	1210	2	5
Maheshpur	447	1295	3	6	537	1555	4	7	603	1746	4	8	959	2779	5	12
Chandapur	170	311	1	2	204	373	1	2	229	419	1	2	365	667	2	3
Chandpur	235	1454	1	8	282	1746	2	8	317	1961	2	9	504	3120	3	14
Mandulikhurd	150	897	1	6	180	1077	1	6	202	1210	1	6	322	1925	2	9
Sheodaspur	748	1831	3	8	898	2199	4	9	1009	2469	5	10	1605	3929	7	16
Pratappatti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kansarai	70	829	1	4	84	995	1	4	94	1118	1	5	150	1779	1	8
Asinsrora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tandia	0	170	0	1	0	204	0	1	0	229	0	1	0	365	0	2
Chakdarsan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Karaicha	235	205	1	1	282	246	2	1	317	276	2	2	504	440	3	2
Bikapur	340	150	2	1	408	180	2	1	459	202	2	1	730	322	3	2
Miraban	119	203	1	1	143	244	1	1	160	274	1	2	255	436	2	2
Chakdin	0	169	0	1	0	203	0	1	0	228	0	1	0	363	0	2
Bhitari	530	481	3	3	636	578	4	3	715	649	4	4	1137	1032	5	5
Sub-totals:	7244	34427	49	185	8698	41337	55	200	9769	46428	59	219	15546	73882	81	325
Totals:	41671		234		50035		255		56197		278		89428		406	

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS ROHANIA

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Year:	1981				1986				1991				2011			
	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2

Year: Population:

1971 35315 Growth rate: 1.023 (per annum)
1981 44549
1986 50035
1991 56197
2011 89428

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS VYASNAGAR

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Kabirpur	227	276	1	2	258	314	2	2	285	347	2	2	423	514	2	3
Sultanpur	84	612	1	3	96	697	1	3	106	769	1	4	157	1140	1	5
Gorayan	152	135	2	1	173	154	2	1	191	170	2	1	283	252	2	2
Nathupur	68	858	1	4	77	977	1	4	85	1078	1	5	127	1599	1	7
Bakhra	140	816	1	4	159	929	1	4	176	1025	1	5	261	1521	2	7
Katheria	0	754	0	4	0	859	0	4	0	947	0	4	0	1405	0	6
Dahia	241	173	1	1	274	197	2	1	303	217	2	1	449	322	2	2
Parorwa	174	1245	2	5	198	1418	2	6	219	1564	2	7	324	2320	2	10
Dariyapur	0	265	0	2	0	302	0	2	0	333	0	2	0	494	0	2
Chahia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Govindpur	22	0	1	0	25	0	1	0	28	0	1	0	41	0	1	0
Mannapur	254	378	2	2	289	430	2	2	319	475	2	2	473	704	2	3
Khutha	44	350	1	2	50	399	1	2	55	440	1	2	82	652	1	3
Fatehpur	337	832	2	4	384	947	2	4	423	1045	2	5	628	1550	3	7
Saidpur	0	393	0	3	0	447	0	3	0	494	0	3	0	732	0	3
Vyasnagar	0	639	0	3	0	728	0	3	0	803	0	4	0	1191	0	5
Chanditara	473	794	2	6	539	904	3	6	594	998	3	6	881	1480	4	6
Nibupur	120	927	1	4	137	1056	1	5	151	1165	1	5	224	1727	1	7
Jeodhipur	0	324	0	2	0	369	0	2	0	407	0	2	0	604	0	3
Singhitali	106	515	2	3	121	586	2	3	133	647	2	3	198	960	2	4
Bharsaria	0	67	0	1	0	76	0	1	0	84	0	1	0	125	0	1
Ekauni	90	324	1	2	102	369	1	2	113	407	1	2	168	604	1	3
Airi	8	0	1	0	9	0	1	0	10	0	1	0	15	0	1	0
Airi Kamalapur	124	0	1	0	141	0	1	0	156	0	1	0	231	0	1	0
Khzurgaon	344	973	2	4	392	1108	2	5	432	1223	2	5	641	1813	3	8
Bhozwa	0	142	0	1	0	162	0	1	0	178	0	1	0	265	0	2
Baghi	79	831	1	4	90	946	1	4	99	1044	1	5	147	1549	1	7
Rasulpur	42	30	1	1	48	34	1	1	53	38	1	1	78	56	1	1
Kundikhurd	0	1444	0	6	0	1644	0	7	0	1814	0	8	0	2691	0	11
Bhawanipur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bhaisaundi	580	1229	4	6	660	1399	4	7	729	1544	4	7	1081	2290	5	10
Hatherwa	151	210	1	1	172	239	1	1	190	264	1	2	281	391	2	2
Hridayapur	123	578	2	3	140	658	2	3	155	726	2	3	229	1077	2	5
Puraini	0	503	0	3	0	573	0	3	0	632	0	3	0	937	0	4
Mahabalpur	402	518	2	3	458	590	2	3	505	651	3	3	749	965	3	4
Muhammadpur	100	239	1	1	114	272	1	2	126	300	1	2	186	445	1	2
Satpokhri	174	550	1	3	198	626	1	3	219	691	1	3	324	1025	2	5
Malokhar	180	936	2	4	205	1066	2	5	226	1176	2	5	335	1744	2	7
Kundikala	296	574	3	3	337	654	3	3	372	721	3	3	552	1070	3	5
Malhia	346	162	2	1	394	184	2	1	435	204	2	1	645	302	3	2
Bilaridih	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chahia	0	186	0	1	0	212	0	1	0	234	0	1	0	347	0	2
Jaiserpur	435	640	2	3	495	729	2	3	547	804	3	4	811	1193	4	5
Dhrana	222	1151	2	5	253	1311	2	6	279	1446	2	6	414	2145	2	9
Chittampur	585	912	4	4	666	1038	4	5	735	1146	4	5	1090	1700	5	7
Gobariya	111	176	1	1	126	200	1	1	139	221	1	1	207	328	1	2
Beehupur	0	2301	0	10	0	2620	0	11	0	2891	0	12	0	4288	0	18
Chandasi	407	2340	3	10	463	2664	3	11	511	2940	3	12	758	4361	4	18
Bighauli	0	21	0	1	0	24	0	1	0	26	0	1	0	39	0	1
Harshankarpur	79	802	1	4	90	913	1	4	99	1008	1	5	147	1495	1	6
Tandiya	327	289	2	2	372	329	2	2	411	363	2	2	609	539	3	3

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS VYASNAGAR

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Ledua	188.	1382	2	6	214	1574	2	7	236	1737	2	7	350	2575	2	11
Bhojpur	13	0	1	0	15	0	1	0	16	0	1	0	24	0	1	0
Mahmoodpur	827	1187	4	5	942	1352	4	6	1039	1492	5	6	1541	2212	7	9
Hinauli	329	672	2	3	375	765	2	4	413	844	2	4	613	1252	3	6
Sub-totals:	9004	31655	69	157	10252	36044	72	171	11314	39776	75	184	16779	58989	90	261
Totals:	40659		226		46297		243		51090		259		75767		351	

Year:	Population:
1971	34450
1981	41953
1986	46296
1991	51090
2011	75767

Growth rate: 1.019 (per annum)

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS KANDWA

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Misirpur	120	1158	2	10	144	1390	2	10	162	1562	2	10	258	2485	2	10
Hansapur	34	268	1	2	41	322	1	2	46	361	1	2	73	575	1	3
Saghat	12	859	1	7	14	1031	1	7	16	1158	1	7	26	1843	1	8
Nawapur	57	865	2	5	68	1039	2	5	77	1167	2	5	122	1856	2	8
Khusipur	67	751	1	6	80	902	1	6	90	1013	1	6	144	1612	1	7
Kadirpur	78	687	2	9	94	825	2	9	105	926	2	9	167	1474	2	9
Sadalpur	60	95	2	3	72	114	2	3	81	128	2	3	129	204	2	3
Lathia	171	316	3	2	205	379	3	2	231	426	3	2	367	678	3	3
Jafarabad	20	723	1	6	24	868	1	6	27	975	1	6	43	1552	1	7
Nakain	0	450	0	5	0	540	0	5	0	607	0	5	0	966	0	5
Haraon	281	1234	2	6	337	1482	2	6	379	1664	2	7	603	2648	3	11
Pahari	265	1172	2	10	318	1407	2	10	357	1581	2	10	569	2515	3	11
Baneshpur	0	244	0	3	0	293	0	3	0	329	0	3	0	524	0	3
Kandwa	217	2327	2	12	261	2794	2	14	293	3138	2	15	466	4994	2	22
Avelashpur	96	629	2	5	115	755	2	5	129	848	2	5	206	1350	2	6
Nasirpur	173	625	1	5	208	750	1	5	233	843	1	5	371	1341	2	6
Pura Usar	0	309	0	4	0	371	0	4	0	417	0	4	0	663	0	4
Kakarmatta	199	358	2	4	239	430	2	4	268	483	2	4	427	768	2	4
Bhikharipur	250	1598	3	8	300	1919	3	8	337	2155	3	9	536	3429	3	14
Kanchanpur	168	652	3	6	202	783	3	6	227	879	3	6	361	1399	3	6
Chitaipur	0	369	0	3	0	443	0	3	0	498	0	3	0	792	0	4
Pongalpur	0	254	0	4	0	305	0	4	0	343	0	4	0	545	0	4
Karaundi	378	481	2	6	454	578	2	6	510	649	3	6	811	1032	4	6
Jagatpur	374	939	3	8	449	1127	3	8	504	1266	3	8	803	2015	4	9
Bakhani	0	294	0	3	0	353	0	3	0	396	0	3	0	631	0	3
Hardattpur	653	1135	3	7	784	1363	4	7	881	1531	4	7	1401	2436	6	10
Karnadandi	181	1310	3	8	217	1573	3	8	244	1767	3	8	388	2811	3	12
Bairwan	95	1044	2	5	114	1254	2	6	128	1408	2	6	204	2240	2	9
Panditpur	36	699	1	5	43	839	1	5	49	943	1	5	77	1500	1	6
Bansipur	77	915	2	6	92	1099	2	6	104	1234	2	6	165	1964	2	8
Dholapur	189	248	1	4	227	298	1	4	255	334	2	4	406	532	2	4
Milki Chuck	128	1257	2	8	154	1509	2	8	173	1695	2	8	275	2698	2	11
Dhanpalpur	293	240	2	5	352	288	2	5	395	324	2	5	629	515	3	5
Dalhna	91	921	2	6	109	1106	2	6	123	1242	2	6	195	1976	2	8
Bhadwar	155	518	1	4	186	622	1	4	209	699	1	4	333	1112	2	5
Bandapur	332	1269	2	9	399	1524	2	9	448	1711	2	9	712	2723	3	11
Khalilpur	6	171	1	3	7	205	1	3	8	231	1	3	13	367	1	3
Deora	143	560	1	7	172	672	1	7	193	755	1	7	307	1202	2	7
Kashipur	124	616	1	5	149	740	1	5	167	831	1	5	266	1322	2	6
Saura	151	563	2	4	181	676	2	4	204	759	2	4	324	1208	2	5
Kanpur	18	496	1	5	22	596	1	5	24	669	1	5	39	1064	1	5
Jagardeopur	0	846	0	5	0	1016	0	5	0	1141	0	5	0	1816	0	8
Gangapur	131	464	2	2	157	557	2	3	177	626	2	3	281	996	2	4
Deora Chuck	0	197	0	4	0	237	0	4	0	266	0	4	0	423	0	4
Bhadrasi	120	341	2	4	144	409	2	4	162	460	2	4	258	732	2	4
Nidura	0	165	0	2	0	198	0	2	0	223	0	2	0	354	0	2
Faridpur	149	446	1	4	179	536	1	4	201	601	1	4	320	957	2	4

DETERMINATION OF NUMBERS OF PUBLIC STANDPOSTS KANDWA

Year:	1981				1986				1991				2011			
Village:	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2	SC/ST	rest	PS1	PS2
Lal Chuck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amarpur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nasi Chuck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nai Pura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-totals:	6092	32078	69	254	7315	38516	70	258	8215	43259	72	261	13073	68839	85	317
Totals:	38170		323		45830		328		51475		333		81913		402	

Year: Population:

1971 32347 Growth rate: 1.023 (per annum)
1981 40805
1986 45830
1991 51474
2011 81912

ANNEX F

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 :	48 constructed, out of a total of 124
PRIVATE CONNECTIONS :	130 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
POWER SUPPLY :	approx. 5 hrs/day on rural feeder
EXEMPTED FEEDER :	to be commissioned within month of April, 1985

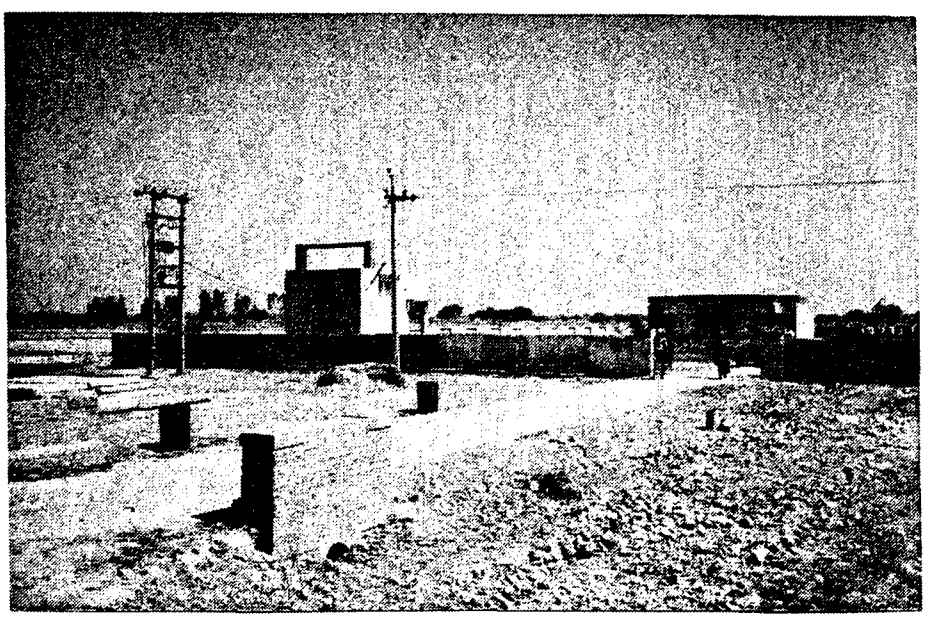
PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME: July 1985
(commissioned except for increased number of public standposts)

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 :	105 constructed, out of a total of 201
PRIVATE CONNECTIONS :	97 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
POWER SUPPLY :	3 to 6 hrs/day on rural feeder
EXEMPTED FEEDER :	lines have been drawn; to be energized before end of April 1985

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : July 1985
(commissioned except for increased number of public standposts)

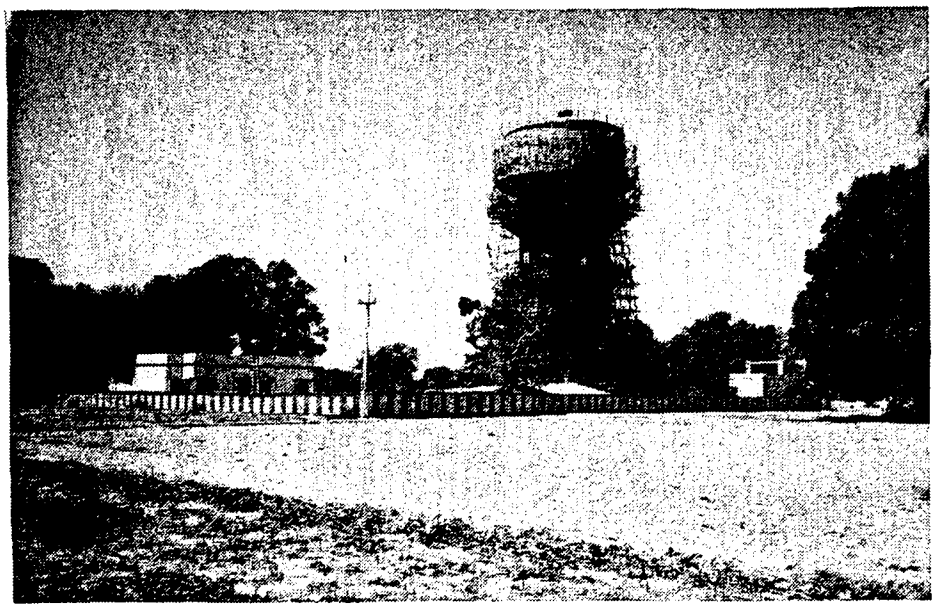
SCHEME NAME :	GOVINDPUR (Rae Bareli District)
TARGET POPULATION :	29,890
TUBEWELLS :	No.1: constructed (discharge less than anticipated)
	No.2: constructed
	No.3: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
	No.3: constructed
PUMPS :	No.1: VT pump/installed
	No.2: submersible pump/installed
	No.3: to be procured
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 :	56 constructed, out of a total of 112
PRIVATE CONNECTIONS :	107 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
POWER SUPPLY :	2 to 6 hrs/day (average: 4.5 hrs/day)
EXEMPTED FEEDER :	lines have been drawn; to be energized before end of April 1985

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : July 1985
(commissioned except for increased number of public standposts)



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: almost 100% (under testing)
DISTRIBUTION SYSTEM :	76 km laid, out of a total of 77.3 km
VILLAGES COVERED :	34 out of 34
PUBLIC STANDPOSTS :	84 constructed, out of a total of 124
PRIVATE CONNECTIONS :	300 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
POWER SUPPLY :	approx. 4 hrs/day on rural feeder
EXEMPTED FEEDER :	lines have been drawn; to be energized before end of April 1985

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : July 1985
(commissioned except for increased number of public standposts)



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: procured
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 :	65 constructed, out of a total of 186
PRIVATE CONNECTIONS :	25 made, out of an estimated total of 751
EXEMPTED FEEDER :	commissioned

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985

SCHEME NAME :	JAGATPUR (Rae Bareli District)
TARGET POPULATION :	35,800
TUBEWELLS :	No.1: constructed
	No.2: constructed (has been abandoned; new TW to be constructed)
	No.3: constructed (not yet developed)
PUMP HOUSES :	No.1: constructed
	No.2: will not be constructed
	No.3: not yet constructed
PUMPS :	No.1: VT pump/installed
	No.2: -
	No.3: -
CHLORINATORS :	No.1: installed
	No.2: -
	No.3: -
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 :	125 km laid, out of a total of 136.15 km
VILLAGES COVERED :	32 out of 32
PUBLIC STANDPOSTS :	160 constructed, out of a total of 265
PRIVATE CONNECTIONS :	70 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
POWER SUPPLY :	4.5 to 17 hrs/day (average: approx. 10 hrs/day)
EXEMPTED FEEDER :	commissioned

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : July 1985
(commissioned except for increased 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 :	25 m laid, out of a total of 550 m
OVERHEAD TANK :	volume: 500 m^3
	staging: 21 m
	progress: 45 % (staging completed)
DISTRIBUTION SYSTEM :	64 km laid, out of a total of 69 km
VILLAGES COVERED :	20 out of 20
PUBLIC STANDPOSTS :	60 constructed, out of a total of 180
PRIVATE CONNECTIONS :	40 made, out of an estimnated total of 633
EXEMPTED FEEDER :	to be commissioned by mid-May 1985 (permission for railway crossing has been obtained)

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985

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: temporary only
	No.2: temporary only
	No.3: temporary only
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 :	340 m laid, out of a total of 350 m
OVERHEAD TANK :	volume: 500 m^3
	staging: 20 m
	progress: 20 % (foundation under construction)
DISTRIBUTION SYSTEM :	65 km laid, out of a total of 91.5 km
VILLAGES COVERED :	16 out of 16
PUBLIC STANDPOSTS :	18 constructed, out of a total of 204
PRIVATE CONNECTIONS :	0 made, out of a total of 687
CHLORINE DOSAGE :	0.6 mg/l
RESIDUAL CHLORINE IN DISTRIBUTION SYSTEM :	0.6 mg/l (so far measured at headworks only; sampling procedure will be changed shortly)
POWER SUPPLY :	6 hrs/day (rostered) through rural feeder
EXEMPTED FEEDER :	SEB has not started any activity yet

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : March 1986
(Direct pumping started in March 1985.)

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: 90% (top dome completed)
DISTRIBUTION SYSTEM :	139.5 km laid, out of a total of 139.5 km
VILLAGES COVERED :	27 out of 27
PUBLIC STANDPOSTS :	240 constructed, out of a total of 240
PRIVATE CONNECTIONS :	90 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; high-voltage problem

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : May 1985

SCHEME NAME :	BEHTAKALAN (Rae Bareli District)
TARGET POPULATION :	45,600
TUBEWELLS :	No.1: constructed (has been abandoned)
	No.2: constructed
	No.3: constructed (to be developed)
PUMP HOUSES :	No.1: constructed (to be used as storage)
	No.2: constructed
	No.3: to be constructed
PUMPS :	No.1: submersible pump/ removed and used elsewhere
	No.2: VT pump/installed
	No.3: not 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% (top dome completed)
DISTRIBUTION SYSTEM :	125.7 km laid, out of a total of 125.7 km
VILLAGES COVERED :	34 out of 34
PUBLIC STANDPOSTS :	223 constructed, out of a total of 223
PRIVATE CONNECTIONS :	85 made, out of an estimated total of 1205
CHLORINE DOSAGE :	0.6 to 0.8 mg/l
RESIDUAL CHLORINE :	0.6 to 0.8 mg/l (measured near pump house!)
POWER SUPPLY :	2.5 to 8.5 hrs/day
EXEMPTED FEEDER :	to be commissioned by end of April 1985

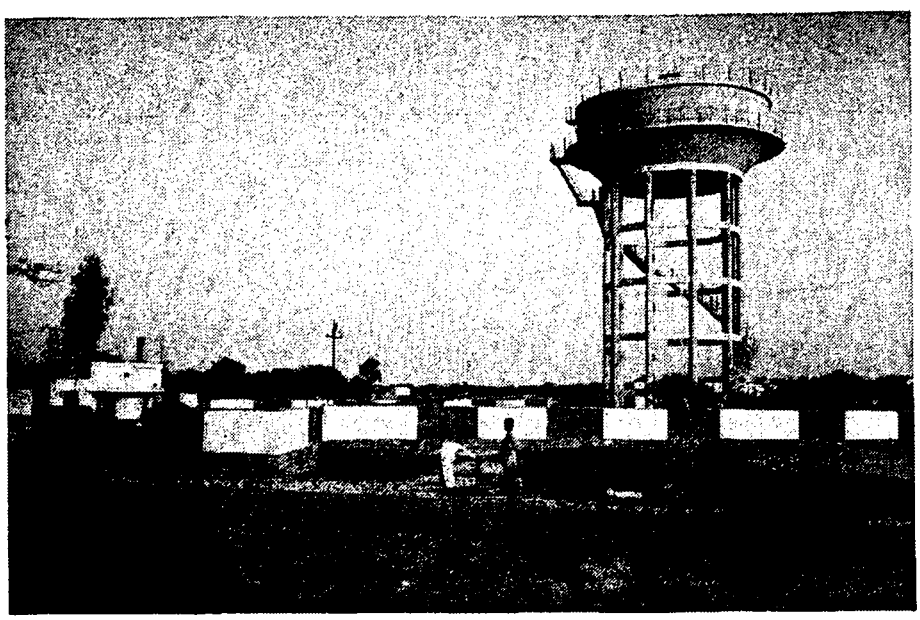
PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : June 1985

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 :	71 km laid, out of a total of 65 km
VILLAGES COVERED :	19 out of 19
PUBLIC STANDPOSTS :	77 constructed, out of a total of 168
PRIVATE CONNECTIONS :	384 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

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : Mid-1985
(commissioned except for increased number of public standposts)

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 :	70 constructed, out of a total of 145
PRIVATE CONNECTIONS :	384 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

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : July 1985
(commissioned except for increased number of public standposts)



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 :	104 km laid, out of a total of 104 km
VILLAGES COVERED :	31 out of 31
PUBLIC STANDPOSTS :	55 constructed, out of a total of 174
PRIVATE CONNECTIONS :	120 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 end of 1985/mid-1986 ?

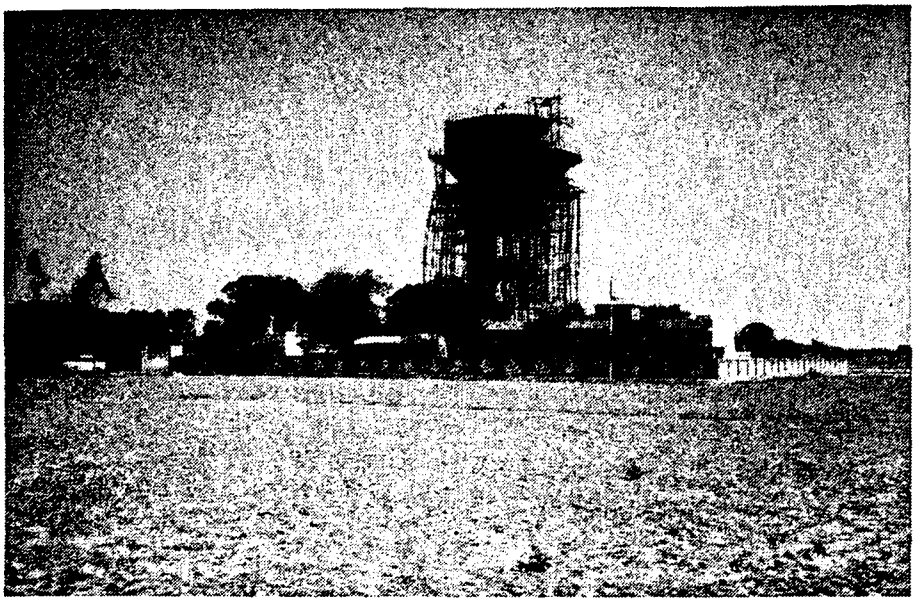
PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : Mid-1985 (except for exempted feeder)

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 :	46 constructed, out of a total of 190
PRIVATE CONNECTIONS :	355 made, out of an estimated total of 290
EXEMPTED FEEDER :	because of power availability of 20 - 24 hrs/day no exempted feeder applied for

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : Mid-1985
(commissioned except for increased number of public standposts)

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 :	129 constructed, out of a total of 266
PRIVATE CONNECTIONS :	554 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
EXEMPTED FEEDER :	re-commissioned by December 1984; trouble again (dacoit-infested area)

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985 ?
(commissioned except for increased number of public standposts)



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 :	95 constructed, out of a total of 209
PRIVATE CONNECTIONS :	450 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

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985 ?
(commissioned except for increased number of public standposts)

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 :	60 constructed, out of a total of 117
PRIVATE CONNECTIONS :	160 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

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985 ?
(commissioned except for increased number of public standposts)

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 :	130 constructed, out of a total of 236
PRIVATE CONNECTIONS :	550 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)

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985 ?
(commissioned except for increased number of public standposts)

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 :	110 constructed, out of a total of 264
PRIVATE CONNECTIONS :	300 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

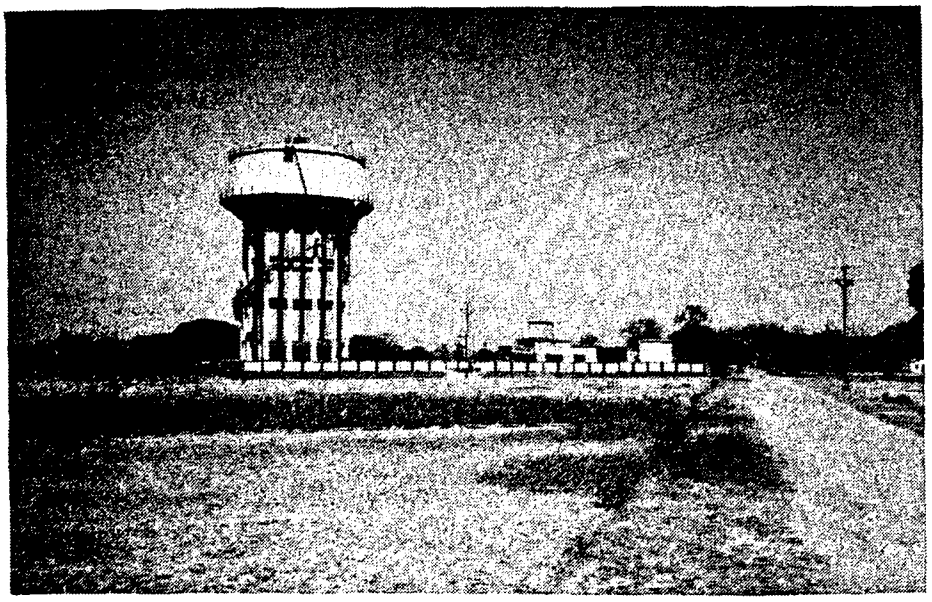
PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985 ?
(commissioned except for increased number of public standposts)

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 :	70 constructed, out of a total of 226
PRIVATE CONNECTIONS :	300 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 :	not yet commissioned because of railway crossing (for TW No. 1; TW No. 2 already has power for approx. 20 hrs/day due to vicinity of fertilizer factory)

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985 ?
(commissioned except for increased number of public standposts)

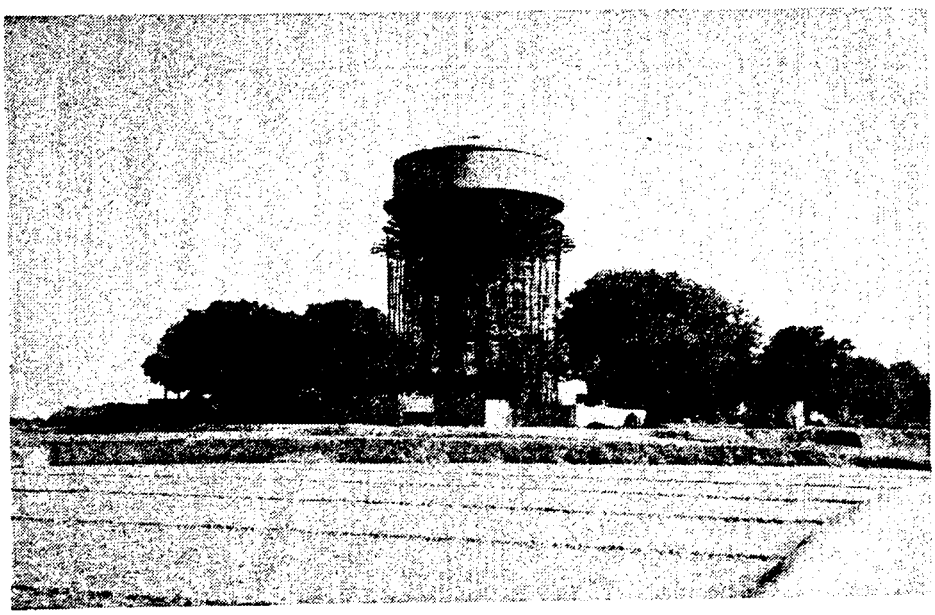
SCHEME NAME :	ROHANIA (Varanasi District)
TARGET POPULATION :	62,507
TUBEWELLS :	No.1: constructed
	No.2: constructed
PUMP HOUSES :	No.1: constructed
	No.2: constructed
PUMPS :	No.1: VT pump/installed
	No.2: VT pump/procured
CHLORINATORS :	No.1: installed
	No.2: procured
RISING MAIN :	250 m laid, out 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 234
VILLAGES COVERED:	41 out of 41
PUBLIC STANDPOST:	100 constructed, out of a total of 234
PRIVATE CONNECTIONS:	644 made, out of an estimated total of 600
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
POWER SUPPLY:	22-24 hrs/day
EXEMPTED FEEDER:	commissioned in March 1984

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985 ?
(commissioned except for increased number of public standposts)



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 :	100 constructed, out of a total of 323
PRIVATE CONNECTIONS :	245 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, but power available for only 6-7 hrs/day (will be increased in near future)

PROBABLE MONTH OF FINAL COMMISSIONING OF SCHEME : September 1985 ?
(commissioned except for increased number of public standposts)



ANNEX G

INDIA

UTTAR PRADESH RURAL WATER SUPPLY PROJECT

DUTCH CREDIT PROGRAMME

REPORT FOR PRE APPRAISAL OF

SUB PROJECT-II (EAST) (REVISED)

INSTALMENT-I

FOR

VARANASI AND ALLAHABAD DISTRICTS

APRIL 1985

UTTAR PRADESH JAL NIGAM

UTTAR PRADESH JAL NIGAM

REPORT

ON PRE-APPRAISAL OF RURAL WATER SUPPLY SCHEMES

UNDER DUTCH CREDIT PROGRAMME

SUB PROJECT - II - EAST (Revised)

INSTALLMENT - I

DISTRICTS VARANASI & ALLAHABAD

April 1985

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Sri WALIULLAH	:	DRAFTSMAN.

UTTAR PRADESH

REPORT ON PRE-APPRAISAL OF RURAL WATER SUPPLY PROJECT UNDER DUTCH CREDIT PROGRAMME SUB PROJECT II - EAST (Revised)-Installment I IN DISTRICTS VARANASI AND ALLAHABAD

1.0 INTRODUCTION

Under the Dutch credit programme sub project-II (east) was originally prepared for 5 rural water supply schemes covering 137 villages and costing Rs. 340 lacs in April 1981 and submitted to the Dutch Govt. In January 1982 as per latest directions of the Govt. of India, the proposals were reconsidered and it was decided to install hand pumps, wherever feasible inplace of piped water supply schemes. Consequently original proposals were recasted and the villages to be covered with hand pumps were included in sub-project-III (east & west) and only one piped water supply scheme covering 25 villages of Allahabad distt. and another 2 schemes of Raebareli district covering 28 villages were included in sub-Project -II (east)and these proposals were still under consideration of Dutch Govt. till recently. However for the reasons of urgancy, these schemes have been executed under other programmes of Govt. of India and Govt. of U.P.

During the discussions held 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 subproject II-East (Revised)

to an amount of the same order as originally proposed for sub project-II (See Mission report- U.P.-10 page 22). Latter on the Dutch Mission indicated that this amount can be further increased by an equal amounts

Accordingly two packages of projects were proposed and submitted as forecast of cast in February 1985 and March 1985 respectively. The first package was christened as Installment-I Covering two districts viz. Varanasi & Allahabad. In Varanasi districts, 9 schemes were suggested covering 179 villages at a tentative cost of Rs. 591.16 lacs and 2 schemes were suggested in Allahabad district covering 23 villages at a tentative cost of Rs. 140.00 lacs.

The second package to be christened as Installment -II was proposed with 15 schemes of Varanasi district duly covering 230 villages at a tentative cost of Rs. 766.17 lacs.

Meanwhile detailed projects for only 8 schemes of Varanasi district, covering 166 villages at an estimated cost of Rs. 581.83 lacs and 1 scheme of Allahabad district, covering 11 villages at an estimated cost of Rs. 90.23 lacs have been prepared and proposed to be included in Installment-I. These projects are under appraisal of U.P.Jal Nigam appraisal cell and slight variations may be expected in their final costs, which can not be ruled out at this stage as a result of an going appraisal of these schemes.

A table showing variation in forecast of cost submitted earlier and the detailed projects is enclosed as annexure I for easy reference.

As regards the preparation of detailed projects of schemes under Installment-II, the work is being started and is expected to be completed in the due course of time.

2.0 PROCEDURE FOR SELECTION OF VILLAGES

The scarcity/problem villages as included in the declared list of scarcity villages as per 1972 assessment and those included in the declared list of scarcity/ problem villages by the District Magistrates of the respective districts in 1984-85, have been selected to be included in the proposed piped water supply scheme. The non-scarcity/problem villages lying with in the economical grouping have also been included.

In some villages few hand pumps were installed. But due to the fact that the quality of water available from these Hand Pumps is not safe for long term human consumption and also due to be reason that the general water table in the area goes down below 20 to 25 metres below ground level, these hand pumps can not be relied upon as a permanent solution to the water scarcity problem especially during the lean summer months. Consequently, instead of going for the saturation of villages with hand pumps, piped water supply schemes are proposed, as it will be clear from the forth-coming

paras that deep tubewells apart from delivering a a good quality of water, can given required quantity of potable water and thus we can find a lasting solution of the drinking water problem.

The villages included in these projects are therefore, selected and included the basis of above criteria.

3.0 DESIGN CRITERIA

3.1 Design Period

The projects are designed to cater the needes of the population for a period of 30 years. The base year being taken as 1987 and design year 2017.

3.2 Design Population

The design populations if projected on compound growth rate basis for the last decades, increases very high and becomes unrealistic. Therefore the future population growth rate was based as those which emerges out from the census of 1971 for the respective tehsils and applied on a linear basis but under the condition that the technical life spane of each project will not be less than 20 years in ease the so called compound growth rate is calculated for. This was confirmed by Mr. J.A.Speets water supply coordinator of Royal Netherlands Embassy, New Delhi vide his letter no. 133/JS/hm dated January 4, 1985.

3.3 Rate of Water Supply

The rate of water supply for individual village is taken as 70 l.p.c.d.

3.4 Source of water supply

Tubewells are taken as source of water supply as these are successful in the area.

It is assumed that it will run for not more than 16 houres a day. Minimum 2 numbers of tubewells are provided even if the requirement is less and is wholly met from one tubewell only.

3.5 Treatment

The source of water being tubewell and water available is normally safe and potable. Hence only chlorination is proposed for disinfection of water.

3.6 Pumping plants

Electric driven borehole vertical turbine / submersible pumping plants are proposed to be installed over the tubewells for the requirement of 15 years only.

3.7 POWER SUPPLY

Three alternatives were explored to find an economic solution of power supply to pumping plants as detailed below :-

1. Power obtained from separate exempted feeder
2. Power taken from rural feeder and increasing number of tubewells and storage capacity of clear water.

3. Power from rural feeder and generators.

A power feasibility report has been prepared for each scheme and attached with its detailed estimate. The most economical alternative has been found in alternative I i.e. power obtained from separate feeder, in each of the schemes under this sub project.

3.8 Rising Main

Economical size of rising main from tubewell to storage reservoir is worked out by calculating the cost of pipes including laying and capitalising the cost of its repairs, maintenance and power consumption charges for different sizes of pipes and depreciation. C. I. pipes upto first 200 m length from tubewell have been used and A.C. pipes for the rest of the lengths.

3.9 Storage reservoir

The minimum storage provided is not less than 8 hours of daily supply at the end of design period as the draw off pattern in rural areas is not very defenite.

3.10 Distribution main

These are designed for peak flow equivelant to 2.4 times the average flow, on the basis of Hazen & William formula allowing the variation in hydraulic head at any node to be maximum of 60 cm. The value of Hazen william coefficient 'c' is taken as 100 for G.I. and C.I. pipes and 120 for A.C. and P.V.C. pipes.

Since the ground conditions are favourable, A.C. & P.V.C pipes have been preferred over C.I.pipes on account of their lower cost, easy availability, transportation and handling. Rigid P.V.C. pipes upto 225 mm outer dia and A.C. pipes of 250 to 300 mm inner dia pipes have been used. For higher diameters C.I. pipes are to be used. The minimum size of pipe is kept as 32 mm outer dia.

3.11 Terminal pressure

As the buildings in the area are mostly single storeyed, a minimum terminal pressure of 6 metres has been kept.

3.12 Stand posts

Vandal proof pillar type stand posts are proposed at the rate of one stand post per 250 persons. These are invariably & seperately provided to the scheduled caste population and the weaker section of society in each village / hamlet even if the population is less than 250 persons. It has also been ensured that the users have not to walk more than 150 m to fetch water from stand posts.

4.0 POPULATION PROJECTION

Population has been projected for 1987 and 2017 inaccordance with para 3.2. of this report. The last decadal growth in Varanasi tehsil is 26.36%, in Gyanpur tehsil 33.56% and in Chandauli tehsil 21.29% so far as the Varanasi district is concerned. In case of Allahabad district the last decadal growth in Manjhanpur tehsil is 25.84%.

The present and design population have been projected on the basis of linear projection of last decadal growth is the tehsil concerned for rural areas through 1971-81.

5.0 TECHNICAL DESIGNS

The schemes have been designed strictly in accordance with design criteria described in para 3.0. of this report.

6.0 GEOHYDROLOGICAL ASPECTS

As already stated in para 3.4. of this report, tubewells are successful in the area according to the information gathered from the Central Ground Water Board. The tubewells already bored in the area by Jal Nigam for other drinking water supply schemes are normally 100 to 150 m deep giving a safe discharge from 1400 l.p.m. to 2200 l.p.m. The irrigation deptt. tubewells are giving a bit more discharge in same areas. The water quality of these tubewells is also reported to be with in safe limits.

It is therefore, clear that tubewells can safely be proposed as reliable source of water supply for these schemes.

7.0 PROJECT COST ESTIMATE

According to the forecast of cost already submitted the tentative cost of sub project II- East (Revised) Installment -I was proposed as below :-

Varanasi district	-	Rs. 591.16 lacs (9 schemes)
Allahabad district	-	Rs. 140.00 lacs (2 schemes)
total :		Rs. 731.16 lacs

So far only 8 detailed schemes of Varanasi district andischeme of Allahabad district could be proposed and are now being proposed under Installment-I. There cost estimates are as below :-

Varanasi district	Rs. 581.83 lac (8 scheme)
Allahabad district	Rs. 90.23 lac (1 scheme)
Total :	Rs. 672.06 lacs

These schemes are still under appraisal of the U.P.Jal Nigam appraisal cell and slight variation in their costs can not be ruled out at the stage as a result of the appraisal.

8.0 TIMING AND PHASING

8.1 It is expected that the final appraisal report to sub project II East (Revised) Installment-I including 8 schemes of Varanasi district and 1 scheme of Allahabad district, will be submitted to Dutch Govt. for approval sometimes in May 1985 and green signal to start the execution of these schemes will be available by July 1985.

It is, therefore, proposed to start the work on these schemes in July 1985 and is proposed to be completed by the end of December 1987.

8.2 The works are proposed under various phases as per essential constructional activities and requirements. The disbursement of funds shall be proposed accordingly in the final Appraisal report.

UTTAR PRADESH RURAL WATER SUPPLY PROJECT

UNDER DUTCH CREDIT PROGRAMME

SUBPROJECT II (EAST) (Revised) INSTALMENT- I

DISTRICT VARANASI & ALLAHABAD

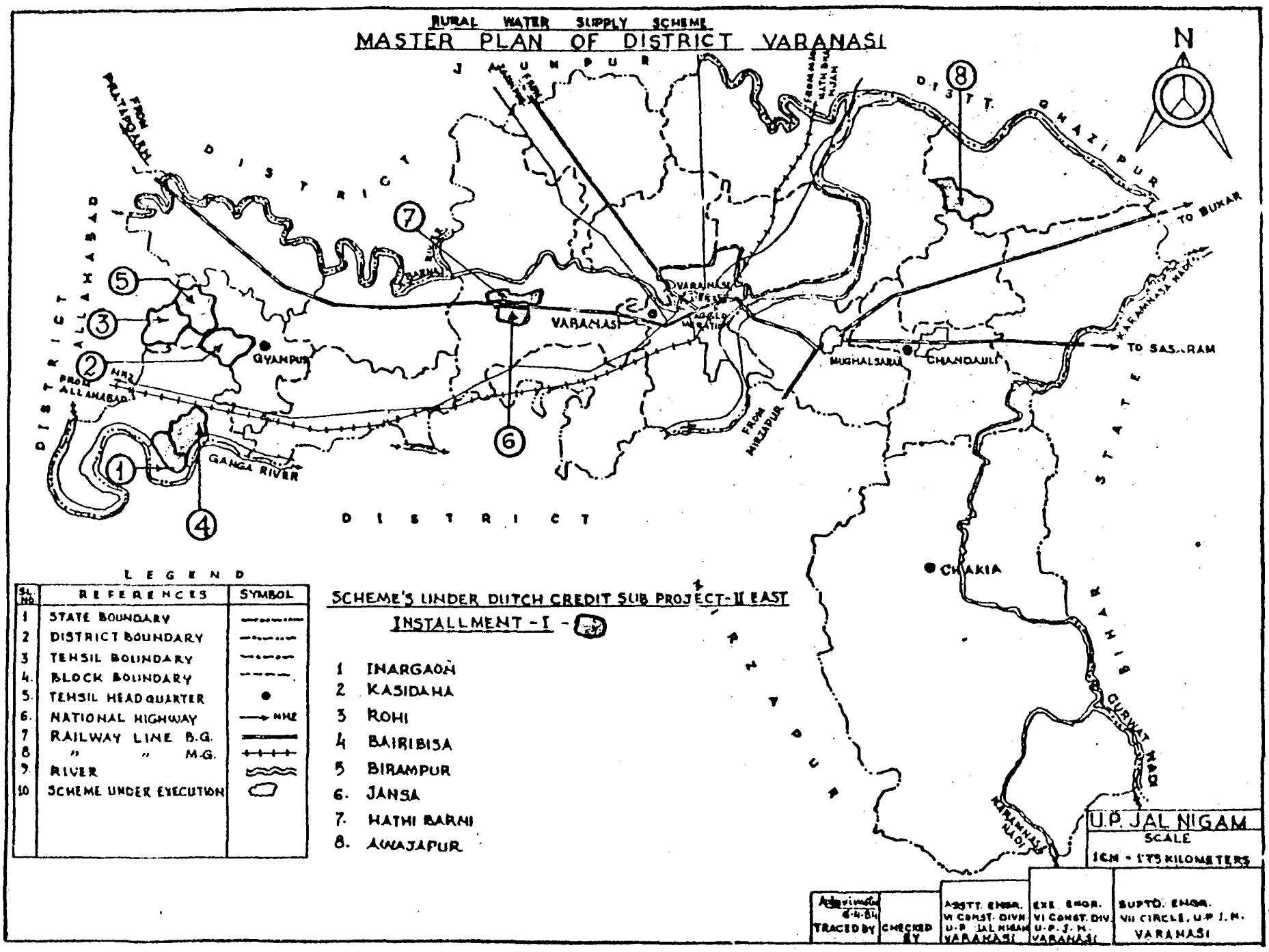
Table showing variation in forecast of cost and detailed project

Sl. No.	Name of Scheme	No.ofvillages covered in fore cast of cost	No.ofvillages covered in Detailed Project	(2017) Design/population of scheme in fore cast of cost	(2017) Design/population of scheme in Detailed Project	Total Project cost Estimate in(Lac.Rs.) forecast of cost	Total Project cost Estimate in(Lac.Rs.) Detailed Project
1	2	3	4	5	6	7	8
	DISTRICT - VARANASI Tehsil : Gyanpur						
1.	Inargaon gr.of vill.W/S scheme	20	20	36500	36500	74.51	79.65
2.	Kasidaha gr.of vill.W/S scheme	11	11	32630	32630	67.34	72.31
3.	Rohi gr. of vill. W/S scheme	35	35	38942	38942	82.97	89.64
4.	Hairi bisa " "	17	17	36680	36680	74.45	78.86
5.	Biranpur " "	17	17	24800	26800	62.00	72.88
	Tehsil : Varanasi						
6.	Jansa gr.of vill. W/S Scheme	24	24	25400	25415	63.50	62.95
7.	Hathi Barni gr.of Vill W/S Scheme	26	26	25860	25860	64.65	63.13

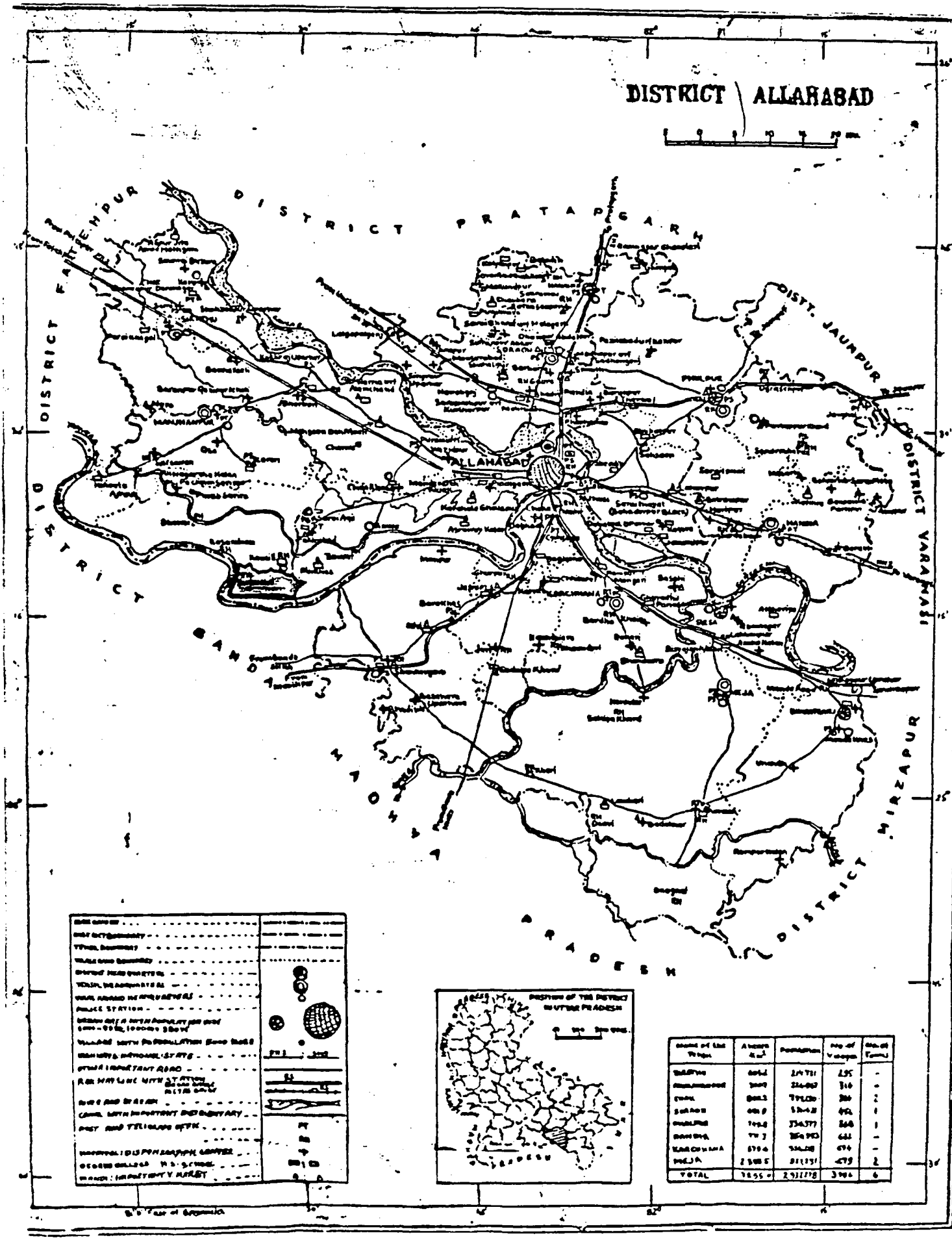
Contd.....2

1	2	3	4	5	6	7	8
	Tehsil : Chandauli						
8.	Awajapur gr.of vill.W/S Scheme	16	16	19900	19900	49.75	62.21
* *9.	Mahadapur gr.of vill.W/S Scheme	13	-	20788	-	51.97	-
	Total for Varanasi District	179	166	263500	242727	591.16	581.83
	DISTRICT-ALLAHABAD						
	Tehsil Manjhanpur						
1.	Chhekwa group of villages W/S scheme	11	11	26530	26530	66.00	90.23
* *2.	Kosam Khiraj group of villages W/S scheme	12	-	29570	-	74.00	-
	Total for Allahabad district	23	11	56100	26530	140.00	90.23
	Grand Total for the sub project	202	177	319600	269257	731.16	672.06

* * Detailed project not prepared and not included in Installment - I.



Sl. No.	REFERENCES	SYMBOL
1	STATE BOUNDARY	
2	DISTRICT BOUNDARY	
3	TEHSIL BOUNDARY	
4.	BLOCK BOUNDARY	
5.	TEHSIL HEADQUARTER	
6.	NATIONAL HIGHWAY	NH2
7	RAILWAY LINE B.G.	
8	" " M.G.	
9.	RIVER	
10	SCHEME UNDER EXECUTION	


DISTRICT ALLAHABAD
DISTRICT PRATAPGARH
DISTT. JAUNPUR
DISTRICT VARANASI
DISTRICT MIRZAPUR
DISTRICT FATEHPUR
ALLAHABAD
PRADESH

ANNEX H

SALIENT FEATURES OF SCHEMES PROPOSED FOR REPLACEMENT OF OLD SUB-PROJECT II (EAST), NOW SUB-PROJECT IV (design population not yet adapted)

Scheme name : ROHI

Block : Gyanpur
Tehsil : Gyanpur
District : Varanasi
No. of villages : 35 inhabited + 5 uninhabited
12 scarcity + 23 non-scarcity
Population : initial stage (1987) : 21187
intermediate stage (2002): 30054
final stage (2017) : 38942
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: 1000 m^3
staging : 20 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
maximum: 19.33 m
Public standpost : 160 Nos.
Private connections (target) : 1987 : 182 Nos.
2002 : 1074 Nos.
2017 : 1669 Nos.
Estimated capital cost: : Rs. 8.946 million
Per capita cost : 1987 : Rs. 423
2002 : Rs. 298
: 2017 : Rs. 230
Annual maintenance costs : 1987 : Rs. 151,600
2002 : Rs. 215,300
2017 : Rs. 298,300
Per capita maintenance costs : 1987 : Rs. 7.15 per annum
2002 : Rs. 7.16 per annum
2017 : Rs. 7.66 per annum
Cost of water per 1000 litres : 1987 : Rs. 0.37
2002 : Rs. 0.37
2017 : Rs. 0.40

Scheme name : KASIDAHA

Block : Gyanpur
Tehsil : Gyanpur
District : Varanasi
No. of villages : 11 inhabited, of which:
11 scarcity
Population : initial stage (1987) : 17760
intermediate stage (2002): 25190
final stage (2017) : 32630
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: 750 m^3
staging : 18 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m

Public standpost		: 104 Nos.
Private connections (target)	: 1987	: 152 Nos.
	2002	: 900 Nos.
	2017	: 1398 Nos.
Estimated capital cost:		: Rs. 7.231 million
Per capita cost	: 1987	: Rs. 407
	2002	: Rs. 287
	: 2017	: Rs. 222
Annual maintenance costs	: 1987	: Rs. 130,600
	2002	: Rs. 200,100
	2017	: Rs. 278,800
Per capita maintenance costs	: 1987	: Rs. 7.35 per annum
	2002	: Rs. 7.94 per annum
	2017	: Rs. 8.54 per annum
Cost of water per 1000 litres	: 1987	: Rs. 0.38
	2002	: Rs. 0.42
	2017	: Rs. 0.45

Scheme name : BIRAMPUR

Block : Gyanpur and Suriyawan
Tehsil : Gyanpur
District : Varanasi
No. of villages : 17 inhabited, of which:
17 scarcity
Population : initial stage (1987) : 14570
intermediate stage (2002): 20675
final stage (2017) : 26800
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: 750 m^3
staging : 20 m
Distribution system:
peak demand rate : 2.4 times average demand
terminal pressure: minimum: 6.00 m
Public standpost : 18 Nos.
Private connections (target) : 1987 : 125 Nos.
2002 : 740 Nos.
2017 : 1157 Nos.
Estimated capital cost: : Rs. 7.288 million
Per capita cost : 1987 : Rs. 500
2002 : Rs. 353
: 2017 : Rs. 272
Annual maintenance costs : 1987 : Rs. 107,000
2002 : Rs. 163,800
2017 : Rs. 237,800
Per capita maintenance costs : 1987 : Rs. 7.34 per annum
2002 : Rs. 7.92 per annum
2017 : Rs. 8.87 per annum
Cost of water per 1000 litres : 1987 : Rs. 0.38
2002 : Rs. 0.41
2017 : Rs. 0.46

Scheme name : BAIRIBISA

Block : Deegh
Tehsil : Gyanpur
District : Varanasi
No. of villages : 17 inhabited + 8 uninhabited
7 scarcity + 10 non-scarcity
Population : initial stage (1987) : 19960
intermediate stage (2002): 28320
final stage (2017) : 36680
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 standpost		: 131 Nos.
Private connections (target)	: 1987	: 171 Nos.
	2002	: 1011 Nos.
	2017	: 1572 Nos.
Estimated capital cost:		: Rs. 7.886 million
Per capita cost	: 1987	: Rs. 395
	2002	: Rs. 278
	: 2017	: Rs. 215
Annual maintenance costs	: 1987	: Rs. 145,700
	2002	: Rs. 221,500
	2017	: Rs. 304,200
Per capita maintenance costs	: 1987	: Rs. 7.30 per annum
	2002	: Rs. 7.82 per annum
	2017	: Rs. 8.29 per annum
Cost of water per 1000 litres	: 1987	: Rs. 0.38
	2002	: Rs. 0.41
	2017	: Rs. 0.43

Scheme name : INARGAON

Tehsil : Gyanpur
District : Varanasi
No. of villages : 20 inhabited + 16 uninhabited
16 scarcity + 4 non-scarcity
Population : initial stage (1987) : 19700
intermediate stage (2002): 28000
final stage (2017) : 36500
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 standpost		:	106 Nos.
Private connections (target)	1987	:	169 Nos.
	2002	:	1000 Nos.
	2017	:	1564 Nos.
Estimated capital cost:		:	Rs. 7.965 million
Per capita cost	1987	:	Rs. 404
	2002	:	Rs. 284
	2017	:	Rs. 218
Annual maintenance costs	1987	:	Rs. 143,100
	2002	:	Rs. 219,100
	2017	:	Rs. 303,600
Per capita maintenance costs	1987	:	Rs. 7.26 per annum
	2002	:	Rs. 7.83 per annum
	2018	:	Rs. 8.32 per annum
Cost of water per 1000 litres	1987	:	Rs. 0.38
	2002	:	Rs. 0.41
	2017	:	Rs. 0.43

Scheme name	: AWAJAPUR		
Block	: Dhamapur		
Tehsil	: Chandauli		
District	: Varanasi		
No. of villages	: 16 inhabited + 1 uninhabited		
Population	: initial stage (1987)		: 12700
	intermediate stage (2002)		: 16300
	final stage (2017)		: 19900
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: 750 m^3			
staging : 18 m			
Distribution system:			
peak demand rate m: 2.4 times average demand			
terminal pressure: minimum			: 6.00 m
Public standpost			: 63 Nos.
Private connections (target)	: 1987		: 109 Nos.
	2002		: 582 Nos.
	2017		: 853 Nos.
Estimated capital cost:			: Rs. 6.241 million
Per capita cost	: 1987		: Rs. 491
	2002		: Rs. 383
	2017		: Rs. 314
Annual maintenance costs	: 1987		: Rs. 113,500
	2002		: Rs. 167,800
	2017		: Rs. 235,200
Per capita maintenance costs	: 1987		: Rs. 8.94 per annum
	2002		: Rs. 10.29 per annum
	2017		: Rs. 11.82 per annum
Cost of water per 1000 litres	: 1987		: Rs. 0.46
	2002		: Rs. 0.54
	2017		: Rs. 0.62

Scheme name	: HATHI BARNI		
Block	: Sewapuri		
Tehsil	: Varanasi		
District	: Varanasi		
No. of villages	: 26 inhabited + 2 uninhabited		
	26 scarcity		
Population	: initial stage (1987)		: 15400
	intermediate stage (2002)		: 20630
	final stage (2017)		: 25860
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: 750 m^3			
staging : 18 m			
Distribution system:			
peak demand rate m: 2.4 times average demand			
terminal pressure: minimum			: 6.00 m
Public standpost			: 94 Nos.
Private connections (target)	: 1987		: 132 Nos.
	2002		: 736 Nos.
	2017		: 1100 Nos.
Estimated capital cost:			: Rs. 6.313 million
Per capita cost	: 1987		: Rs. 410
	2002		: Rs. 306
	2017		: Rs. 244
Annual maintenance costs	: 1987		: Rs. 112,500
	2002		: Rs. 164,900
	2017		: Rs. 213,600
Per capita maintenance costs	: 1987		: Rs. 7.30 per annum
	2002		: Rs. 7.99 per annum
	2017		: Rs. 8.26 per annum
Cost of water per 1000 litres	: 1987		: Rs. 0.30
	2002		: Rs. 0.41
	2017		: Rs. 0.43

Scheme name	: JANSA		
Block	: Sewapuri		
Tehsil	: Varanasi		
District	: Varanasi		
No. of villages	: 21 inhabited + 3 uninhabited		
	21 scarcity		
Population	: initial stage (1987)	: 15120	
	intermediate stage (2002)	: 20275	
	final stage (2017)	: 25415	
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: 750 m^3			
staging : 18 m			
Distribution system:			
peak demand rate m: 2.4 times average demand			
terminal pressure: minimum	: 6.00 m		
Public standpost	: 82 Nos.		
Private connections (target) :	1987	: 130 Nos.	
	2002	: 725 Nos.	
	2017	: 1090 Nos.	
Estimated capital cost:	: Rs. 6.295 million		
Per capita cost :	1987	: Rs. 416	
	2002	: Rs. 310	
	2017	: Rs. 248	
Annual maintenance costs :	1987	: Rs. 118,000	
	2002	: Rs. 171,400	
	2017	: Rs. 215,500	
Per capita maintenance costs :	1987	: Rs. 7.80 per annum	
	2002	: Rs. 8.45 per annum	
	2017	: Rs. 8.48 per annum	
Cost of water per 1000 litres :	1987	: Rs. 0.40	
	2002	: Rs. 0.44	
	2017	: Rs. 0.44	

Scheme name	: CHHEKAWA		
Block	: Kaushambi		
Tehsil	: Manihanpur		
District	: Allahabad		
No. of villages	: 11 inhabited, of which: 8 scarcity + 3 non-scarcity		
Population	: initial stage (1987)	: 15877	
	final stage (2017)	: 26530	
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: 650 m^3
staging : 16 m

Distribution system:
peak demand rate m: 2.4 times average demand
terminal pressure: minimum : 17.14 m
maximum : 6.00 m

Public standpost			: 83 Nos.
Private connections (target)	:	1987	: 136 Nos.
		2002	: 757 Nos.
		2017	: 1137 Nos.
Estimated capital cost:			: Rs. 9.023 million
Per capita cost	:	1987	: Rs. 568
		2002	: Rs. 425
		2017	: Rs. 340
Annual maintenance costs	:	1987	: Rs. 113,700
		2002	: Rs. 170,500
		2017	: Rs. 233,900
Per capita maintenance costs	:	1987	: Rs. 7.16 per annum
		2002	: Rs. 8.04 per annum
		2017	: Rs. 8.82 per annum
Cost of water per 1000 litres	:	1987	: Rs. 0.28
		2002	: Rs. 0.31
		2017	: Rs. 0.35