

SIDA: SWACH EVALUATION

RAJASTHAN: INDIA

DRAFT FINAL REPORT

APPENDICES 1 - 15

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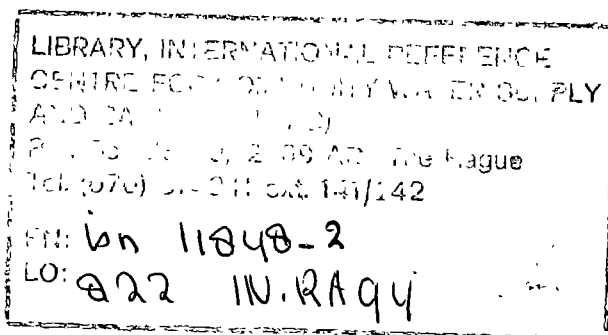


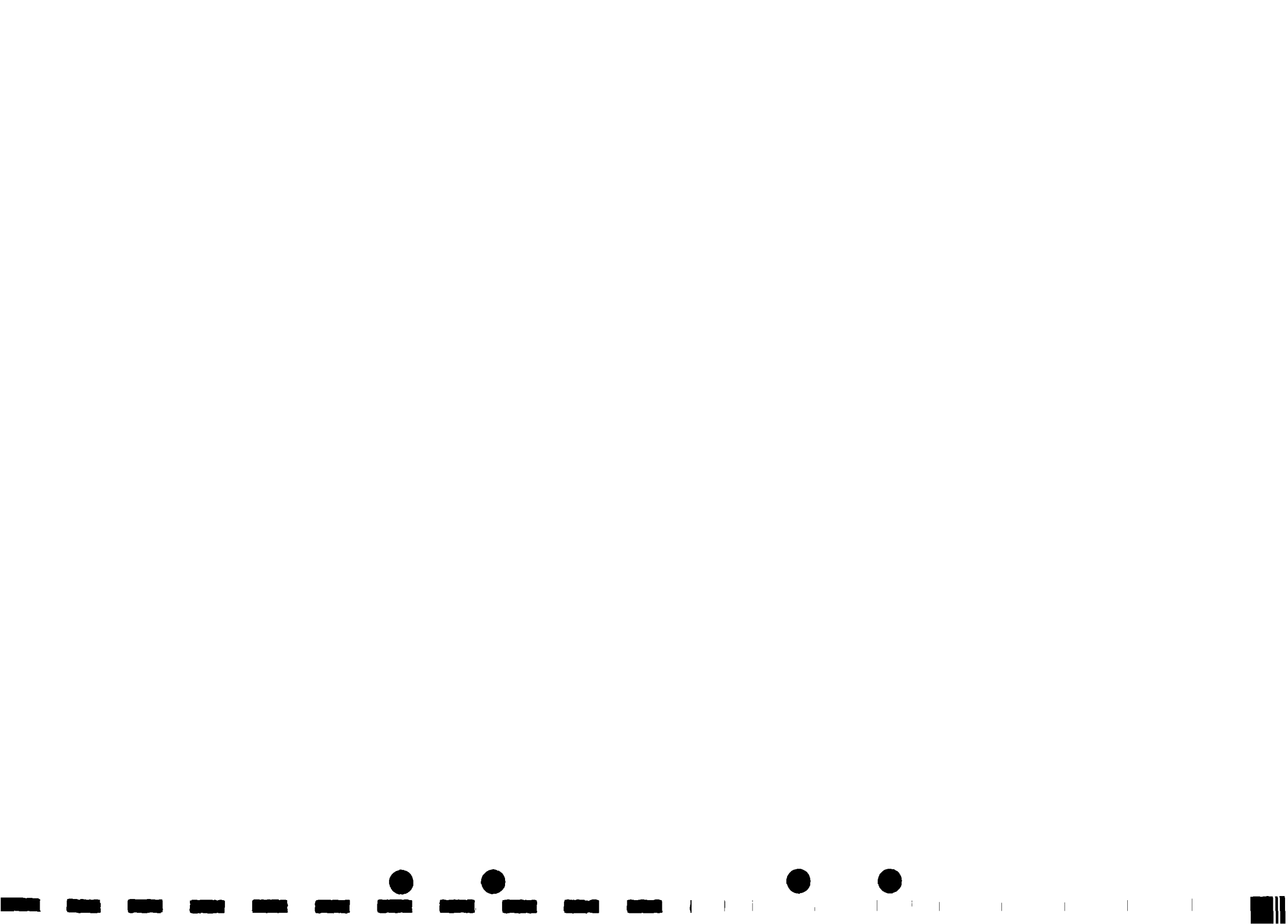


APPENDICES

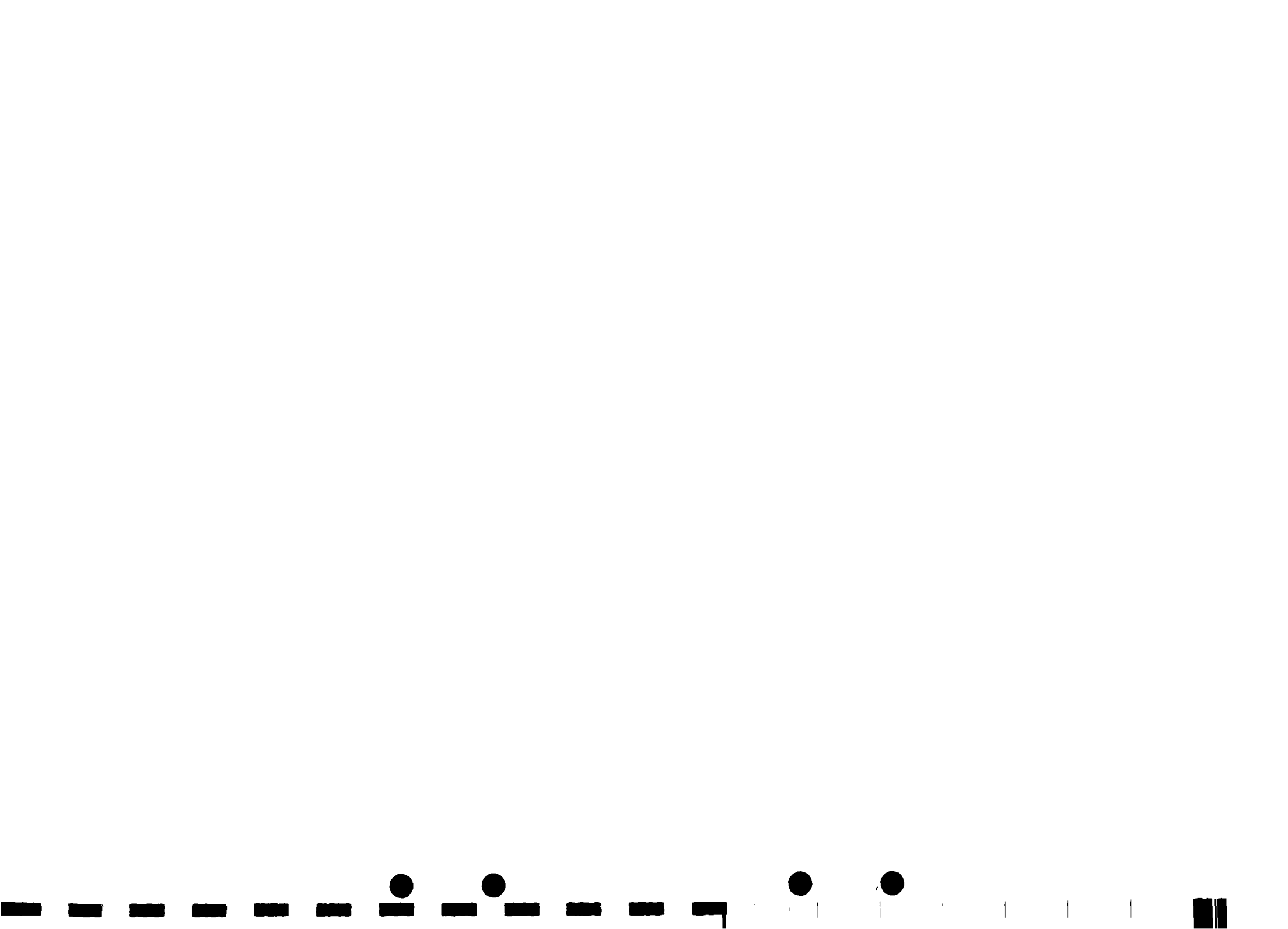
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not in





APPENDIX 1
BIBLIOGRAPHY



BIBLIOGRAPHY
SWACH EVALUATION: NOVEMBER 1993

DOCUMENTATION CONSULTED

(Numbering in brackets refers to original numbering on list of documents given by UNICEF, Delhi)

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Annexures

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Study, Sarada, (Udaipur) 1992

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APPENDIX 2

TERMS OF REFERENCE FOR STUDY BY WATER ENGINEER



Evaluation of SWACH, November 1993

Survey of Quality, Maintenance and Operation of Installations

Selection of clusters to visit will be done in conjunction with the PRA exercise. The characteristics of interest include the following:

Length of intervention:	Banswara/Dungarpur	Udaipur
Accessibility from the Project Office:	Easy	Difficult
Type of rock formation:	Hard	Very hard
(see Annexure 8 in Plan of Action 1987)		
A=Alluvial; B=Limestone; C=Phyllite & Schist;		
D=Granite & Granite Gneisses; E=Biolite Schist;		
F=Calc Schist & Calc Gneisses; G=Quartzite; H=Other		
Type of rig/Drilling crew:	PHED	UNICEF
Handpump mechanics:	Trained before SWACH	During SWACH
		Male Female

If possible we should also identify whether different maintenance strategies (tiers) have been tried cluster by cluster so that we can compare performance with each strategy. Bicchiwada Block in Dungarpur probably provides the best place for comparison of maintenance strategies.

A. SOURCES OF WATER

Make a sketch map of the village including areas where S.Castes and S.Tribes live and mark all water sources. For each source determine:-

1. Type of installation:
Well -> Step / Converted step / Open draw / Covered
Handpump -> Mark II / Mark II converted / Mark III
Pond / Water harvesting?
2. Use: Drinking & cooking / Washing / Animals
3. Ownership: Public / Private
4. Access:
If Private: Can anyone other than the household use it?
If Public: Which households use this source? Check for SC/ST
5. Consumption:
Number of: Households using each source for drinking
People using each source for drinking
Animals using each source
6. Seasonal fluctuations:
Does this source provide water year round?
IF NO, ASK: For which months is it unreliable or dry ...
usually
in a period of poor rains

7. Has the water table fallen since tubewells were installed?
IF YES: Have any of the tubewells dried up?
IF YES: Have they been deepened?
IF YES: When? By whom? Cost? Who paid?

8. Quality of drinking water sources:
Is the water quality (taste or colour) satisfactory?
Does the water quality vary? Describe.

B. PHYSICAL FEATURES OF WELLS AND THEIR SURROUNDINGS

9. Surrounding area:

Where are human waste and animal waste disposed of?
Within 50 metres of the well, are there:
houses or buildings?
latrines, or animal compounds, or compost pits?

10. Is there drainage of surface water away from well or handpump?
11. Is the top 3 metres lined to prevent contamination from surface waters?
12. Physical dimensions of the well (diameter, depth to the water, depth of the water)
13. For covered wells: Is the well completely sealed?

C. CONSTRUCTION AND INSTALLATION

14. For each converted step well, find out which agency carried out the original work (before SWACH or after).

Have subsequent maintenance and repairs been needed?

IF YES: Have they been carried out?

IF YES: By whom? When (date)? Cost? Who paid?

IF NEEDED REPAIRS NOT DONE: Who is responsible?

Why have repairs not been done?

15. For each handpump (by type), find out which agency carried out the original installation (before SWACH or after).

For Converted Mark IIs: Which agency did the conversion?
When (date)? Cost?

16. For drainage platforms, washing slabs and cattle troughs:

Which agency constructed each one? When (date)?

Estimated Cost?

Amount paid by each contributing body:

(GOR/SWACH/Other Project/Community/Other)

Within budget?

Within estimated time to complete the work?

Present structural condition: is repair needed?

17. For any motor pumps, are they self-priming?

C. OPERATION

18. What is the present condition of the installations?
Appearance? In need of maintenance/repair? Cleanliness?
19. Who is responsible for maintenance of structures? (not pumps)
20. Has the water quality of the (well or handpump) been tested for bacteriological contamination after (installation/repair)?
IF YES: What method of testing? (type of kit)
When was the last time it was tested?
Who did the testing?
What was the result?
IF QUALITY WAS UNSATISFACTORY: What happened?
21. For wells and handpumps eligible for disinfection, find out:-
a) what disinfectant is supposed to be used? (powder/tablets)
b) when was (bleaching powder/chlorine/etc) last added?
c) who is responsible for disinfection?
d) who provides the (bleaching powder/tablets)? Cost?
22. When was the last time any of the stepwells was infested with Guinea worm larvae (cyclops)? How long ago?
Was it treated with Temephos then?
IF YES: How many times (every ___ days for ___ weeks)
Who is responsible for doing the Temephos treatment?

D. HANDPUMP MAINTENANCE AND REPAIR

23. Is there a HP Mistry in this village? Male___ Female___
(number of each)___
IF NO: Where is the HP Mistry for these handpumps based?
24. How long does it take to inform HP Mistry that a repair is needed (hours/days)?
Who is responsible for informing the Mistry?

After reporting the problem HP, how long is it before the Mistry comes?
25. When was the last time each HP was out of order?
IF WITHIN LAST 12 MONTHS: For how long was it out of order?
FIND OUT WHY IT WAS NOT WORKING,
AND REASONS FOR ANY DELAY IN REPAIR.

IF SPARE PARTS WERE NEEDED: Who should provide them?
Were they available?
LIST WHAT SPARES WERE NEEDED AND FIND OUT THE COST.
26. Is preventive maintenance done.. by Mistry? by Block team?
YES/NO YES/NO
IF YES: How many times per year? ___ ___
When was the last time preventive maintenance was carried out?

27. Training, Employment and Payment of HP Mistries:
- a) By whom was each one trained?
 - b) Date of starting work
 - c) Whether employed by Panchayat Samiti
 - d) Wage or salary per month
 - e) Number of villages covered
 - f) Number of HPS covered
 - g) Travel time to cover all HPS
 - h) Days worked on HP maintenance/repair last month

Name	Sex		a		b	c	d	e	f	g	h	
	M	F	PHED	SWACH								mm/yy

E. MOTOR PUMP OPERATION, MAINTENANCE AND REPAIR

28. For each, ask:
- Is it working?
 - IF NO: How long has it been out of order?
 - What is the problem? (Broken? Cost of fuel? etc)
 - Who maintains it?
 - How much for repairs? Who pays?
 - How much fuel (type) per day/week/month? Who pays?

F. BLOCK AND DISTRICT LEVEL

We want to follow up at Block level, then at District level, then at Project Office and finally State and UNICEF in Jaipur, any aspects of support (eg honoraria, maintenance, repairs, spare parts) and supervision that emerge from the village visits.

A clear picture from each level of:

WHO expects WHOM to do WHAT, for each each necessary task is the objective, with comment on the interrelationships and on the quality of rural water supply.

This means that staff from Gram Panchayat, health services (Sub-Health Centres and PHCs) as well as water specialists may be involved (eg for water testing and quality, and for treatment with Temephos). Any non-government involvement should also be explored.

APPENDIX 3

SIDA'S TERMS OF REFERENCE FOR THE EVALUATION



**TERMS OF REFERENCE - EVALUATION OF THE SWACH-
PROGRAMME IN RAJASTHAN, INDIA****1.0 Background**

As part of its overall support to the national rural water supply and sanitation programme in India, UNICEF has assisted the SWACH programme in Rajasthan since its inception in 1986. The role of UNICEF has been to provide direct professional, financial, and administrative support to the Government of Rajasthan, with major funding by the Swedish Government through SIDA.

SWACH (being the acronym for Sanitation, Water, And Community Health) means "clean" in Hindi. It is an area based integrated rural water and sanitation Project with an operational focus on Guineaworm control due to the high infestation rate in the area. The Project started in Dungarpur and Banswara Districts of Rajasthan in 1986 as a five-year Project. In 1988 SWACH was expanded to include the neighboring Districts of Udaipur and Rajsamand. It thus covered almost all of the Tribal Area Sub-plan with its shared socio-economic features and with its high prevalence of Guineaworm. In formal terms the expansion was launched as a separate Project, utilizing the existing SWACH infrastructure and increased staff.

At the time of its inception SWACH was a unique Project in the context of the GOI/UNICEF/SIDA collaboration in the water supply sector. Its organizational and operational set-up reflected an emphasis on popular participation, bottom-up approach, and an active involvement of women. The organizational basis for the Project was a semi-autonomous NGO, with the Project establishment as the planning and coordinating centre for an implementation primarily carried out by the existing line departments (Medical, Health and Family Welfare, Public Health Engineering, Rural Development, and Women and Child Development). It was also the first major area based Project supported by UNICEF in this sector, and was as such expected to provide a dynamic influence on the overall national programme support.

The aims of SWACH are, as stated in the original Plan of Action:

- to improve the quality of life and socio-economic conditions in tribal areas with particular reference to women and children;
- to promote community involvement and self-reliance in the planning, implementation and maintenance of drinking water supply;
- to promote and sustain health behavior among the target population;
- to lower the incidence of water related diseases.

These aims were retained, with minor modifications, also in the subsequent expansion and extension of the Project.

A basic SWACH approach was to increase the capacity of the villagers to improve their health and general well-being. These improvements were through integrated interventions in the fields of safe drinking water supply, environmental sanitation and health/hygiene education/awareness. A further basic SWACH approach was to build skills, methods and organizational capacity within the Project and the participating agencies. The Project attempted to plan and execute all interventions with the active participation and consent of the community concerned, and in particular, that of women.

The Project area covers 23.800 km² in the 4 Districts of Banswara, Dungarpur, Rajsamand and Udaipur in southern Rajasthan. Due to Udaipur's large area, in 1990, the Government of Rajasthan split Udaipur District in half with Rajsamand to the north and Udaipur to the south. There are 4 blocks in Dungarpur, 8 in Banswara and 9 each in Rajsamand and Udaipur Districts. In the 1991 census, the 4 Districts' population totalled 4.8 million. The Project area is mainly tribal, poor, remote and under-serviced with basic community amenities.

2.0 The Evaluation: Purpose and Objectives

The overall purpose of this evaluation is to provide all involved parties (i.e. GOI, GOR, UNICEF, and SIDA) with an independent assessment of the performance and achievements of SWACH so far. It will also provide an important input to the contents of the next phase of the SWACH Project, and to its possible replication elsewhere.

The focal points of the evaluation should include an analysis of:

- The **relevance** of the SWACH approach in meeting the Project goals;
- The level of **goal attainment** reached by the Project to date;
- The **efficiency and effectiveness** of the investment made so far;
- The long-term **sustainability** of Project impacts and approach;
- The **lessons learned** from Project implementation.

The Evaluation shall be made from a gender perspective i.e. analysis made, statistics and results presented shall consider both potential for involvement of both men and women as well as impact and consequences for men and women and their respective roles.

The main tasks shall cover, but not necessarily be limited to:

a) Field outputs:

- the quality, maintenance and operation of all physical installations supported by SWACH;
- the effectiveness and role of Guineaworm control measures;

b) Local involvement and impact:

- the quality, momentum, and sustainability of all activities aimed at promoting an effective local involvement in Project implementation;

c) Project Establishment, Management, and Organization:

- the relevance, quality, and content of the monitoring and information system availed of or established by the Project;
- the relevance, effectiveness, and possible replicability of the organizational set up and administrative routines, particularly with respect to the relations between the SWACH Project establishment, the regular government line departments, the zonal/national UNICEF programme, and NGOs;

- the role of, and pattern of support to, such village level voluntary cadres as have been mobilized to facilitate Project activities;
- the range and focus of Human Resources Development and training supported by the Project, particularly those aimed at enhancing the capacity of the participating departments and institutions;
- the extent and nature of dissemination of information and experiences gained to relevant other bodies (e.g. GOR, GOI, UNICEF, other donor agencies, NGOs, etc);

c) Financial and Economic Issues:

- the cost efficiency and cost effectiveness of field interventions in relation to the aims and objectives of the Project;
- the long term financial and economic implications of investments made, physical as well as human and institutional, particularly with respect to resource mobilization and cost-sharing.

A list of possible specific issues to be taken up during the course of the evaluation is included in Appendix A.

Given the exploratory nature of SWACH as a whole, the evaluation is expected to provide important information to the executing as well as supporting agencies (GOI, GOR, UNICEF, SIDA) in their ongoing development of operational policies for the sector.

3.0 Methodology and Output

The evaluation will be carried out in a dual and coordinated manner along two parallel approaches: one focussing on the Project and its performance (operations, establishment, economics), and the other on the experience of and impact on the villagers.

3.1 Project Evaluation

Apart from a thorough analysis of existing records as well as interviews with management and field staff of all participating agencies, it will involve a focal survey of the quality and service level of water and sanitation installations generated by the Project.

SIDA and UNICEF will make available to the Consultant copies of all relevant documents

produced by SWACH, UNICEF, GOI, GOR, and SIDA. These documents will inter alia include all work plans, progress reports, annual reviews, steering committee minutes, NICD Guineaworm surveillance reports, UNICEF and GOR financial reports, SWACH special studies, the Mid-Term Evaluation Report, etc.

3.2 Progress/impact Evaluation

It is foreseen that this will be carried out by a local institution. The basic methodology employed should be the PRA (Participatory Rural Appraisal) developed to assist rural development Projects that emphasize local involvement and decision making.

3.3 Reporting

Prior to the Team Leader's final departure from India, the Consultant shall present its main findings and recommendations to SIDA, UNICEF, and GOI/GOR.

Within three weeks after the departure from India the Consultant shall submit a Draft Report to SIDA, New Delhi in 10 copies, and in 5 copies to SIDA, Infrastructure Division, Water Section, Stockholm.

SIDA, Government of Indian and Government of Rajasthan shall submit their comments on the Draft Report to the Consultant within three weeks after the receipt of the report.

The final report, which will be submitted to SIDA, GOI/GOR, and UNICEF in five copies each, not later than four weeks after receiving the comments from India and SIDA, Stockholm, shall comprise both the Project and the process/impact analysis as outlined above and shall reflect all issues raised in this Terms of Reference along with such other points as the Consultant deems required and/or has been agreed to in the final joint debriefing. While it is expected that the evaluation could be an important input to the next phase of SWACH, the Report needs not assume a continuation of the Project in its conclusions and recommendation.

4.0 Evaluation Team

The evaluation team shall be headed by an international Team Leader who will be responsible to SIDA for all aspects of the evaluation. The team will comprise expertise in:

- social science/organizational development (international expert, team leader)
- economics
- primary health care (international exp)
- water supply and sanitation engineering

5.0 Time Schedule

The work on the evaluation shall begin not later than one month after signing the contract and be completed within 4 months of the same date. The Consultant shall prior to commencing the work present to SIDA a detailed work schedule, including such recurrent debriefings as may be required to ensure that both parties share an understanding of the ongoing evaluation.

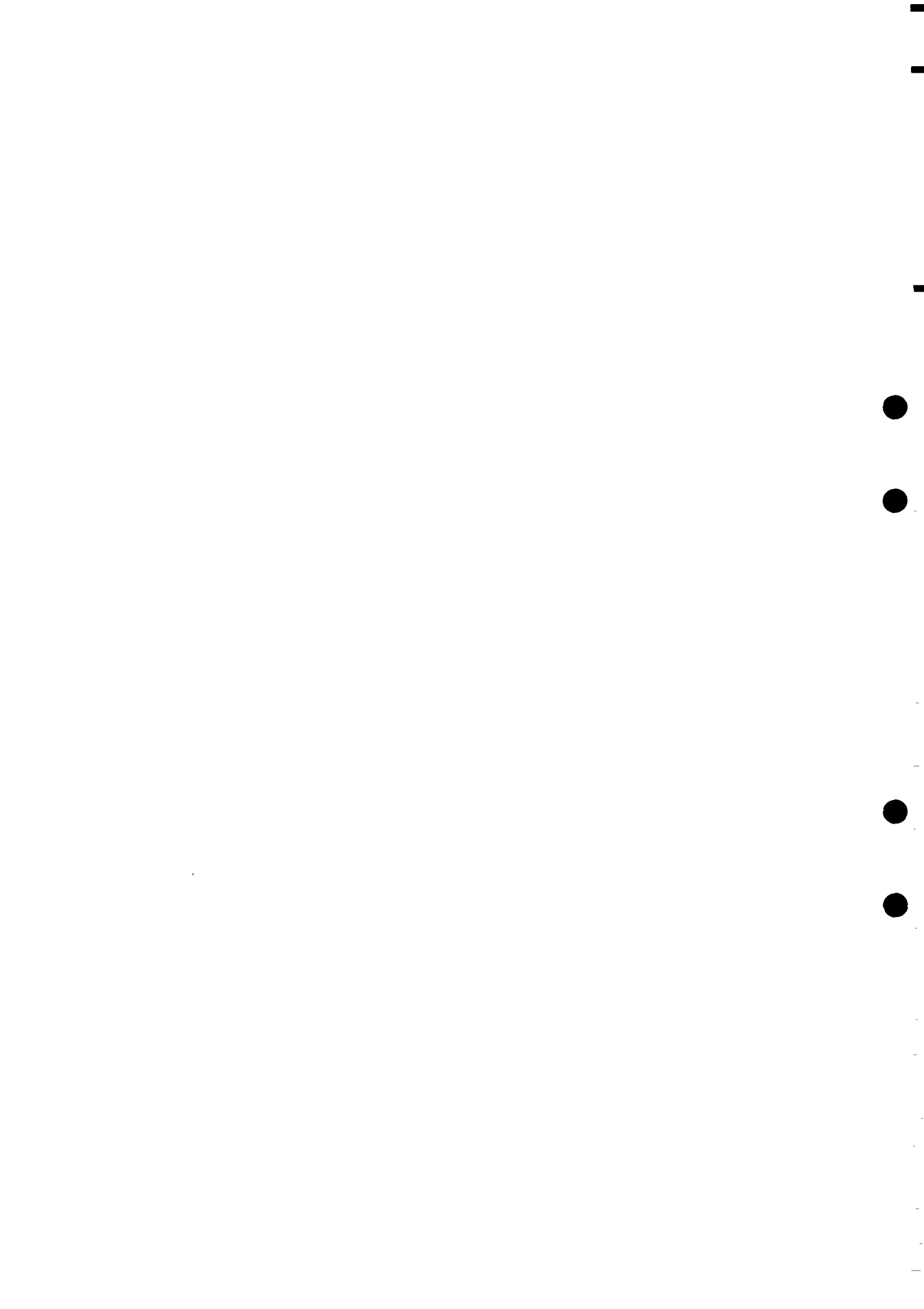


LIST OF POSSIBLE SPECIFIC ISSUES TO BE TAKEN UP
DURING THE COURSE OF THE EVALUATION

The Evaluation Plan could include the following suggested work tasks that would determine to what extent:

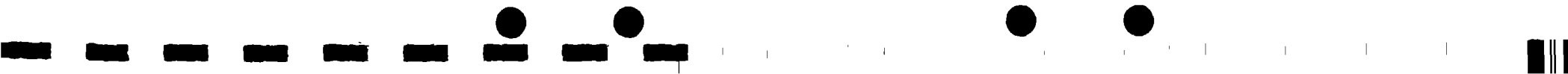
- There were adequate resources (local/expatriate consultancies, facilities, equipment, personnel, funds) and timing for all planned activities.
- There were positive health behaviour changes among the targeted population, especially concerning water-use practices.
- There was positive community participation (cost, planning and labour-wise) in sustainable community development.
- There was qualitative and quantitative improvements in safe water for drinking and cooking purposes for the targeted villagers.
- SWACH adequately serviced the targeted rural Guineaworm-affected villagers with its interventions.
- Domestic and environmental sanitation (especially school latrines and town drainage systems) benefited their users.
- There is adequate, sustainable maintenance of public/school latrines and town drainage systems).
- SWACH interacted with the Government of Rajasthan ministries and how the government infrastructure benefited.
- The investment in the water and environmental sanitation infrastructure resulted in improved health on the targeted population.
- SWACH Guineaworm eradication interventions were cost/programme effective and sustainable, as compared to sample Guineaworm-affected villages outside the project area.

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APPENDIX 4

ORGANOGRAM FOR THE PROJECT ORGANISATION



ORGANIZATIONAL STRUCTURE

Project Coordinator
Commissioner TAD

Project Director	Project Advisor (UNICEF)
Assistant Project Director	Project Officer (UNICEF) (Community Education and Participation)
Assistant Project Director (Education & Communication)	Project Officer (UNICEF) (Organizational Develop- ment & Technical Support)
Assistant Project Director (Technical)	Senior Programme Assistant (UNICEF) (MNIO/New Delhi)
Statistical Assistant	
Accountant	
Supporting Staff	

District Udaipur-I

Project Officer
Assistant Project
Officer (Technical)
Assistant Project
Officer (Education &
Communication)

Assistant Project Officer (Medical)

Technical Assistant
(Hydrogeologist)

Statistical Assistant

Junior Engineers

Health Educators
(Female)

Junior Accountant

Support Staff

District Udaipur-II

Project Officer
Assistant Project
Officer (Technical)
Assistant Project
Officer (Education &
Communication)

Technical Assistant
Hydrogeologist

Statistical Assistant

Junior Engineers

Health Educators
(Female)

Junior Accountant

Support Staff



APPENDIX 5.1

COMPOSITION OF THE COMMITTEE OF DIRECTION



Composition of the Committee of Directions

Commissioner, Tribal Area Development	Chairman
Representative of UNICEF, State Office, Jaipur	Member
Project Advisor (UNICEF)	Member
Project Officer (UNICEF)	Member
Director, Medical & Health Services, Jaipur	Member
Chief Engineer, PHED, Jaipur	Member
Pramukh, Zila Parishad, Banswara	Member
Pramukh, Zila Parishad, Dungarpur	Member
Collector, Banswara	Member
Collector, Dungarpur	Member
Director, WDP, Jaipur	Member
Superintending Engineer, PHED, Udaipur	Member
Dy. Director, Medical Health, Udaipur	Member
Dy. Director, Education, Udaipur	Member
Dy. Director, Ayurved, Udaipur	Member
Director, Directorate of Extension, Sukhadia University, Udaipur	Member
Director, TRI, Udaipur	Member
Project Officer, Banswara	Member
Project Officer, Dungarpur	Member
Representatives of NGOs involved	Member
Project Director	Member-Secretary
Representative of SIDA	Observer



APPENDIX 5.2

COMPOSITION OF THE DISTRICT PROJECT IMPLEMENTATION
COMMITTEE



Composition of the District Project Implementation Committee

Collector	Chairman
Pramukh, Zila Parishad	Member
Addl. Collector (Development)	Member
UNICEF Representative	Member
Pradhan	Member
C. M. H. O.	Member
Executive Engineer	Member
District Project Officer, WDP	Member
Project Director (DWACRA)	Member
District Education Officer	Member
Dy. Ccnservator of Forest	Member
Vikas Adhikaris (BDOs)	Member
Representatives of NGOs involved	Member
Project Officer	Member-Secretary



APPENDIX 6

TOTAL TARGETS AND ACHIEVEMENTS FOR SWACH TO MARCH 1993



**THE INTEGRATED SANITATION WATER, GUINEAWORM CONTROL
AND COMMUNITY HEALTH PROJECT, UDAIPUR
TOTAL TARGETS & ACHIEVEMENTS**

SWACH PROJECT - UDR & DPR/BNS PROJECT

(UPTO MARCH,93)

S. NO.	ACTIVITY (HARDWARW)	UDAIPUR		DPR/BNS	
		TARGET	ACHIEV -EMENT	TARGET	ACHIEV -EMENT
1	Conversion of Stepwells	3900	4987	3600	4164
2	Construction of Sanitary Wells		15		27
3	Repair of Old Converted Stepwells		134		100
4	Selection of Handpump Sites	4706	4532	5036	4724
5	Drilling of Boreholes - Total	4706	4282	5036	4723
	Drilling of Boreholes - Successful	4000	3690	4300	4278
6	Installation of Handpump	4000	3591	4300	4257
7	Improvement of India Mark II Handpump	1000	1000	1000	976
8	Construction of Washing Platform	3100	4320	2850	3327
9	Construction of Cattle Water Trough	3000	3397	2600	2850
10	Reconstruction of Washing Platform		55		50
11	Reconstruction of Cattle Water Trough		80		148
12	Drainage Improvement of Existing HP	9000	10088	5700	5539
13	Repair of old Drainage Improvement		182		49
14	Repair of Broken HP Platform	750	1357	1500	1631
15	Piped Water Supply Village Drainage	12	16	12	18
16	Construction Latrines - Institutional	1000	874	600	713
17	Construction Latrines - Animator		132		152
18	Construction Subsidised Latrines	1100	4561	600	2274



APPENDIX 7

ESTIMATING ANNUALIZED COSTS FOR CAPITAL RESOURCES



APPENDIX 7

ESTIMATING ANNUALIZED COSTS FOR CAPITAL RESOURCES

The **cost categories** below are shown in a skeleton cost matrix, with the categories down the left hand side and the sources of funding (or resources in kind) along the top.

Recurrent or Operating Costs	Capital Costs
Personnel - salaries	Buildings
- benefits	Vehicles
Training	Equipment
Materials & Supplies	Other
Transportation	
Maintenance	
Other	

Expenditure on capital investments such as buildings, equipment and vehicles must be adjusted to obtain an estimate of the portion of total capital outlay to be included in annual costs. For accounting and tax purposes, there are many algorithms to choose from when depreciating capital assets. For cost-effectiveness analysis, one of two methods is usually chosen:

- (a) Straight line depreciation
- (b) Amortize costs at a constant annual rate
(the annuity equivalent method)

Both methods give a constant annual cost over the lifetime of the building or equipment, regardless of the individual item's age at the time of the costing exercise. Considerations which may influence the choice of method are discussed in (c) below. Both calculations use the following three variables:

- 1) The initial cost or purchase price, C.
- 2) The expected working life, n. Common assumptions are:
 - 25 years for buildings
 - 5-15 years for equipment
 - 5 years for vehicles
- 3) The share (S) of time, space, mileage, etc. attributable to the activity being costed.

The annuity equivalent method uses a fourth variable, the rate of interest (see (b) below).

As the useful life of capital items varies (even within types of cold box: an RCW25 lasts longer than a Model II), it should be clear that capital cost calculations must be kept **disaggregated**, devoting a separate line for each type of item with a different purchase price and use life. It would not be correct to add up all capital costs and apply the formulae to total capital expenditure.

a) Straight Line Depreciation

To calculate annual capital cost (X) of an item, divide the initial cost by the expected working life:

$$X = \frac{C}{n}$$

If the item is used by several programmes, but the cost analysis does not include all these activities, the annual capital cost is multiplied by the proportional share of the item's use (S) that should be assigned to the costed activities:

$$\text{Annual Cost to Programme} = X * S \quad \text{where } S = \text{share to programme.}$$

b) Annuity Equivalent Method (using Amortization)

Calculating the annuity equivalent method uses the present worth factor (PWF), derived from the formula below. The PWF is determined by the number of years of working life (n) and the rate of interest (r). For discussion of the appropriate rate of interest to use, see (c) below.

C = initial cost of the item
n = number of years of working life
r = rate of interest
X = constant annual income or expenditure

$$C = \sum_{t=1}^n \frac{X * t}{(1+r)^t} = X * \left[\frac{1 - (1+r)^{-n}}{r} \right] = X * \text{PWF}$$

$$\text{Therefore } X = \frac{C}{\text{PWF}}$$

The calculation is completed by multiplying annual cost X (=C/PWF) by the proportional share of the item's use (S) that should be assigned to a programme:

$$\text{Annual Cost to Programme} = \frac{C}{\text{PWF}} * S \quad \text{where } S = \text{share to programme.}$$

The PWF can be obtained from the table at the end of this Appendix, or from the spreadsheet on diskette which accompanies this report. The Lotus formula for calculating PWF appears on the screen as follows, with "^" indicating "raised to the power of":

For this example,

r (rate of interest) is in Cell R3
n (the item's uselife) is in Cell H76

LOTUS FORMULA for PWF: $(1 - (1 + \text{RS}3)^{-\text{H76}}) / \text{RS}3$

c) Choice of Method for Annualizing Capital Costs

Some analysts use straight-line depreciation, which has the merit of simplicity. Others amortize capital costs to recognize the investment value of funds tied up in assets which last longer than the year of purchase. Annual capital costs estimated with a positive rate of interest are always higher than those obtained using straight-line depreciation. In accounting text books, the interest rate accounts for the income that could have been earned if the money had been invested, rather than spent on construction, vehicles or equipment. Economists refer to this notional income as the opportunity cost of tying the funds up in capital items.

The rate of interest (r) advised for use in economic evaluation is that used for economic appraisal of public investments; in the absence of better information, an interest rate of $r=10\%$ is often used. (However, in Somalia and Zambia, where the inflation rate exceeds the interest rate, the real rate of interest is negative.) Cost benefit analysis was developed for assessing large scale investments in dams and roads, whose benefits are indirect spill-over effects throughout the area or the economy. Is it appropriate to use a rate of interest for cost-effectiveness analysis, which tends to cover a shorter time span (usually one year out of a five-year plan), less capital-intensive projects, and segments of sectors rather than the entire economy? The purpose of CEA is frequently to make relatively short-term strategic plans and budget projections. If CEA is used to help make better use of scarce resources (eg should more be allocated for new equipment, or for maintenance and spares?), what is the most appropriate way to amortize capital costs?

For programmes that depend upon imported vehicles and equipment, the cost of replacement should be considered. For several reasons (inflation in the manufacturer's economy, declining value of local currency) straight line depreciation underestimates the replacement cost of capital items. Thus it is recommended that a positive rate of interest be used, to reflect the annual amount that would need to be set aside year after year to maintain the existing level of capital resources.

The following table illustrates the effect on capital cost estimates of the two methods of estimation, for two different assumptions about the useful life of vehicles (uselife assumptions can be updated on the basis of field experience). The table also uses two rates of interest, to show the influence of this variable.

ANNUAL COST OF VEHICLES IN TWO DISTRICTS, USING TWO METHODS
OF ESTIMATION AND DIFFERENT ASSUMPTIONS ABOUT USELIFE

D I S T R I C T S

	RABAUL		LAE	
		% of		% of
Purchase price of vehicles (1988)	15,900		34,631	
<u>Useful life of 3 years:</u>	(a)		(a)	
a) Straight line depreciation	5,300	100%	11,544	100%
b) Amortized (i) at r = 5%	5,839	110%	12,717	110%
(ii) at r = 12%	6,620	125%	14,419	125%
<u>Useful life of 5 years:</u>				
a) Straight line depreciation	3,180	100%	6,926	100%
b) Amortized (i) at r = 5%	3,672	115%	7,999	115%
(ii) at r = 12%	4,411	139%	9,607	139%

Table of Present Values of an Annuity (Present Worth Factor)

Use- Life	Discount Rate (r)							
	1%	2%	3%	4%	5%	6%	7%	8%
n								
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181
21	18.8570	17.0112	15.4150	14.0292	12.8212	11.7641	10.8355	10.0168
22	19.6604	17.6580	15.9369	14.4511	13.1630	12.0416	11.0612	10.2007
23	20.4558	18.2922	16.4436	14.8568	13.4886	12.3034	11.2722	10.3711
24	21.2434	18.9139	16.9355	15.2470	13.7986	12.5504	11.4693	10.5288
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748
n	9%	10%	11%	12%	13%	14%	15%	16%
1	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621
2	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257	1.6052
3	2.5313	2.4869	2.4437	2.4018	2.3612	2.3216	2.2832	2.2459
4	3.2397	3.1699	3.1024	3.0373	2.9745	2.9137	2.8550	2.7982
5	3.8897	3.7908	3.6959	3.6048	3.5172	3.4331	3.3522	3.2743
6	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845	3.6847
7	5.0330	4.8684	4.7122	4.5638	4.4226	4.2883	4.1604	4.0386
8	5.5348	5.3349	5.1461	4.9676	4.7988	4.6389	4.4873	4.3436
9	5.9952	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716	4.6065
10	6.4177	6.1446	5.8892	5.6502	5.4262	5.2161	5.0188	4.8332
11	6.8052	6.4951	6.2065	5.9377	5.6869	5.4527	5.2337	5.0286
12	7.1607	6.8137	6.4924	6.1944	5.9176	5.6603	5.4206	5.1971
13	7.4869	7.1034	6.7499	6.4235	6.1218	5.8424	5.5831	5.3423
14	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021	5.7245	5.4675
15	8.0607	7.6061	7.1909	6.8109	6.4624	6.1422	5.8474	5.5755
16	8.3126	7.8237	7.3792	6.9740	6.6039	6.2651	5.9542	5.6685
17	8.5436	8.0216	7.5488	7.1196	6.7291	6.3729	6.0472	5.7487
18	8.7556	8.2014	7.7016	7.2497	6.8399	6.4674	6.1280	5.8178
19	8.9501	8.3649	7.8393	7.3658	6.9380	6.5504	6.1982	5.8775
20	9.1285	8.5136	7.9633	7.4694	7.0248	6.6231	6.2593	5.9288
21	9.2922	8.6487	8.0751	7.5620	7.1016	6.6870	6.3125	5.9731
22	9.4424	8.7715	8.1757	7.6446	7.1695	6.7429	6.3587	6.0113
23	9.5802	8.8832	8.2664	7.7184	7.2297	6.7921	6.3988	6.0442
24	9.7066	8.9847	8.3481	7.7843	7.2829	6.8351	6.4338	6.0726
25	9.8226	9.0770	8.4217	7.8431	7.3300	6.8729	6.4641	6.0971



APPENDIX 8.1

PROJECT OFFICE ACCOUNTING DEPARTMENT LINE ITEMS GROUPED
INTO COST CATEGORIES



APPENDIX 8

8.1 Project Office Accounting Department Line Items Grouped into Cost Categories

The following groupings indicate how the Project Office's accounting line items have been clubbed for the analysis of costs. It should be noted that the numbers do not correspond to codes used in the project accounts. Multiple codes indicate descriptions which seem to refer to very similar categories so a separate line was not made.

PERSONNEL (Project staff)

Salaries, bonus, pension

- 1 Salary
- 2 Medical Allowance
- 4 Pension contribution
- 5 Bonus
- 6 Employer's Provident Fund

Allowances

- 24 Deputation allowance
- 25 Project/Incentive Allowance
- 26 House rent Allowance

TRAINING & ORIENTATION

Project staff, Workshops, Seminars

- 31 Training of Project Team/selected P.staff
- 44,45,46 Holding Project Workshops/Seminars/Functions
State, District, Block, PHED
- 28 Orientation of Senior Officers
- 29 Orientation of District functionaries
- 30 Orientation of PHED staff
- 32 Training of District Training Teams
- 33 Training of Block staff
- HP Mechanics, New & Refresher
- 35 Training of Handpump Mechanics usp/new
- 36 Refresher Trg of Handpump Mechanics old
- Village Contact Teams
- 34 Training of Village Contact Teams
- Animators, Women's Camps
- 37 Training of Social Animators
- 39 Training of Women Camp & Health Sanit.
- Anganwadi/School/Other
- 40,41 Training of Anganwadi workers/VHGs
- 42,43 Education of children/Trg of teachers

PROFESSIONAL SERVICES, CONSULTANCY

Payment of Professional Services

- 48 Payment of Professional Services
- Development of Trg & Commun. Material
- 49 Development of Trg & Commun. Material
- Monitoring & evaluation
- 50 Monitoring & evaluation

APPENDIX 8 (continued)

OUTREACH ACTIVITIES, MOBILISATION

- Intensive awareness campaigns
- 17 Intensive awareness campaigns
- Exhibitions, Health mgmt, Vol.Action
- 18 Mobile exhibitions
- 20 Health Mgmt in Diarrhoea, Imm & Nutrition
- 21 Support for Volunt.Action in Health & Sanit
- Medical camps, honoraria (Anim & Sct)
- 19 Medical camps/Preventive & curative camps
- 22 Support Temephos application
- 38 Honorarium to Animators
- Medical items, filters & Temephos

TRANSPORTATION

- Travelling allowance (per diem)
- 23 Travelling allowance (per diem)
- Operation & maintenance of vehicles
- 52 Operation & maintenance of vehicles
- Vehicles (annualised cost)

PROJECT SUPPORT & ADMINISTRATION

- Office administration, Project
- 3 Office rent
- 47 Refreshment in Meetings
- 53 Office rent, rates & taxes
- 54 Telephone
- 55 Water & Electricity
- 56,57 Stationery, Printing & Postage
- 58,59 Publicity and publications/Sundry Office exp.
- Office Supplies & Equipment
- Miscellaneous
- 27 Ashram Vidhyalaya (DRDA)
- 51 Miscellaneous

CONSTRUCTION

- Construction, annual expenditures
- 7 Conversion of Stepwells
- 8 Construction of latrines
- 9 Hydrogeological mapping
- 10 Installation of HP on boreholes
- 11 Repair of broken HP platform
- 12 Construction of washing platforms
- 13 Construction of cattle water troughs
- 14 Drainage improvement (to existing HPs)
- 15 Village piped water scheme (drainage impr.)
- 16 Construction of anicut
- Construction Equipment & Spares

APPENDIX 8.2

ASSUMPTIONS ABOUT USEFUL YEARS OF LIFE FOR CAPITAL ITEMS
FROM UNICEF



APPENDIX 8.3

ASSUMPTIONS ABOUT EXCHANGE RATES

APPENDIX 8 (continued)

8.2 Assumptions about Useful Years of Life for Capital Items from UNICEF

Handpumps, connecting rods, spares	10
Drilling wells: rigs & vehicles	10
Vehicles	6
Office Supplies & Equipment	5
Medical equipment	10
Medical items, filter cloths, Temephos	0

8.3 Assumptions about Exchange Rates

1986/87	Rupees 12/US\$
1987/88	Rupees 14/US\$
1988/89	Rupees 15/US\$
1989/90	Rupees 16/US\$
1990/91	Rupees 17/US\$

APPENDIX 9

COSTS BY LINE ITEMS (A) BANSWARA/DUNGARPUR (B) UDAIPUR

1



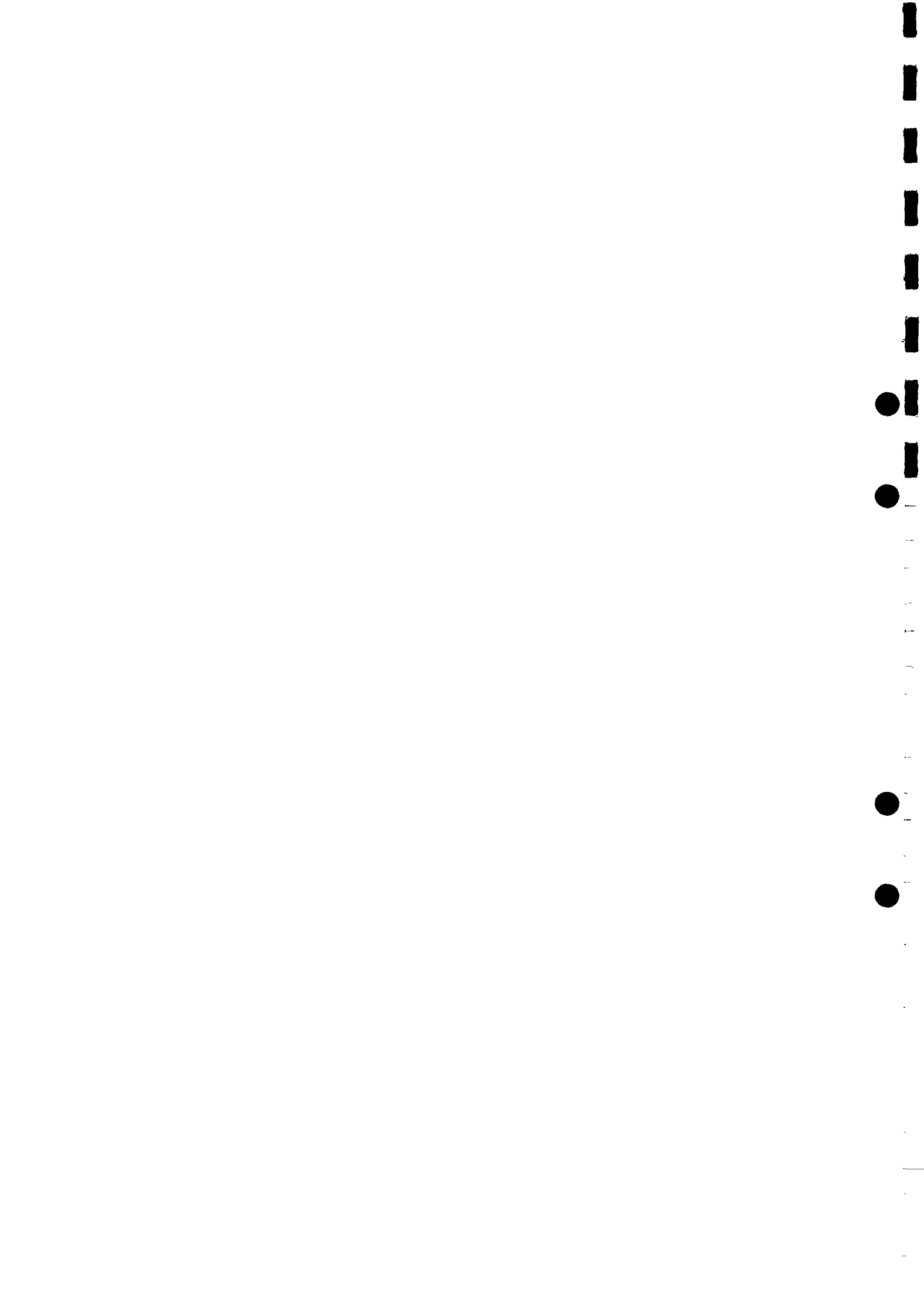
Banswara and Dungarpur	FY86/87		FY87/88		FY88/89		FY89/90	
	Total	%	Total	%	Total B&D	%	Total B&D	%
PERSONNEL (Project staff)		4%		7%		8%		7%
Salaries, bonus, pension	328,824	3.5%	926,394	5.8%	1,062,548	6.4%	1,184,249	6.0%
Allowances	89,622	1.0%	172,375	1.1%	234,825	1.4%	267,136	1.3%
TRAINING & ORIENTATION		4%		1%		6%		0%
Project staff, Workshops, Seminars	36,203	0.4%	25,526	0.2%	108,073	0.6%	6,722	0.0%
State, District, Block, PHED	53,811	0.6%	5,366	0.0%	55,722	0.3%	6,691	0.0%
HP Mechanics, New & Refresher	30,791	0.3%	30,939	0.2%	67,053	0.4%	20,456	0.1%
Village Contact Teams	289,572	3.1%	74,083	0.5%	436,460	2.6%	10,791	0.1%
Animators, Women's Camps	3,036	0.0%	40,825	0.3%	238,574	1.4%	15,204	0.1%
Anganwadi/School/Other	0	0.0%	60,109	0.4%	9,917	0.1%	18,306	0.1%
PROFESSIONAL SERVICES, CONSULTANCY		2%		3%		6%		3%
Payment of Professional Services	151,606	1.6%	263,692	1.7%	346,949	2.1%	548,870	2.8%
Development of Trg & Commun. Material	64,651	0.7%	150,997	0.9%	657,319	4.0%	9,507	0.0%
Monitoring & evaluation	0	0.0%	0	0.0%	0	0.0%	0	0.0%
OUTREACH ACTIVITIES, MOBILISATION		3%		5%		2%		2%
Intensive awareness campaigns	249,163	2.7%	400,284	2.5%	3,798	0.0%	382	0.0%
Exhibitions, Health mgmt, Vol.Action	647	0.0%	11,055	0.1%	1,532	0.0%	8,143	0.0%
Medical camps, honoraria (Anim & Sct)	26,946	0.3%	94,032	0.6%	282,691	1.7%	420,888	2.1%
Medical items, filters & Temephos	44,400	0.5%	291,200	1.8%	0	0.0%	65,600	0.3%
TRANSPORTATION		6%		6%		8%		6%
Travelling allowance (per diem)	41,387	0.4%	127,346	0.8%	148,822	0.9%	128,913	0.6%
Operation & maintenance of vehicles	289,130	3.1%	416,306	2.6%	577,357	3.5%	450,800	2.3%
Vehicles (annualised cost)	186,214	2.0%	425,645	2.7%	545,434	3.3%	585,999	2.9%
PROJECT SUPPORT & ADMINISTRATION		6%		6%		7%		5%
Office administration, Project	257,993	2.8%	279,418	1.8%	497,738	3.0%	341,703	1.7%
Office Supplies & Equipment	159,668	1.7%	352,892	2.2%	512,670	3.1%	599,534	3.0%
Miscellaneous	141,561	1.5%	259,428	1.6%	178,675	1.1%	97,630	0.5%
CONSTRUCTION		74%		72%		64%		76%
Construction, annual expenditures	4,113,509	44.1%	7,081,398	44.5%	4,230,346	25.4%	7,325,739	36.8%
Construction Supplies & Equipment	2,776,605	29.7%	4,437,131	27.9%	6,444,356	38.7%	7,777,131	39.1%
TOTAL	9,335,341		15,926,438		16,640,859		19,890,393	

	FY90/91		FY91/92	
	Total B&D	%	Total B&D	%
PERSONNEL (Project staff)		5%		6%
Salaries, bonus, pension	1,190,927	4.2%	1,449,552	5.0%
Allowances	245,313	0.9%	209,389	0.7%
TRAINING & ORIENTATION		2%		1%
Project staff, Workshops, Seminars	15,328	0.1%	185,353	0.6%
State, District, Block, PHED	65,134	0.2%	50,046	0.2%
HP Mechanics, New & Refresher	35,580	0.1%	45,017	0.2%
Village Contact Teams	292,926	1.0%	0	0.0%
Animators, Women's Camps	116,257	0.4%	19,383	0.1%
Anganwadi/School/Other	37,885	0.1%	121,452	0.4%
PROFESSIONAL SERVICES, CONSULTANCY		2%		2%
Payment of Professional Services	227,263	0.8%	54,848	0.2%
Development of Trg & Commun Material	259,471	0.9%	350,873	1.2%
Monitoring & evaluation	133,116	0.5%	73,017	0.3%
OUTREACH ACTIVITIES, MOBILISATION		9%		7%
Intensive awareness campaigns	658,219	2.3%	85,837	0.3%
Exhibitions, Health mgmt, Vol.Action	509,297	1.8%	65,514	0.2%
Medical camps, honoraria (Anim & Sct)	652,494	2.3%	1,465,243	5.0%
Medical items, filters & Temephos	772,552	2.7%	515,596	1.8%
TRANSPORTATION		5%		6%
Travelling allowance (per diem)	142,981	0.5%	188,683	0.6%
Operation & maintenance of vehicles	557,095	1.9%	810,861	2.8%
Vehicles (annualised cost)	667,487	2.3%	706,751	2.4%
PROJECT SUPPORT & ADMINISTRATION		6%		4%
Office administration, Project	893,865	3.1%	691,865	2.4%
Office Supplies & Equipment	712,927	2.5%	520,355	1.8%
Miscellaneous	170,619	0.6%	84,261	0.3%
CONSTRUCTION		71%		74%
Construction, annual expenditures	7,579,595	26.5%	7,973,653	27.3%
Construction Equipment & Spares	12,669,921	44.3%	13,508,734	46.3%
TOTAL	28,606,251		29,176,282	

Udaipur	FY88/89		FY89/90		FY90/91		Per- cent	FY91/92	
	Total Udaip	%	Total Udaipur	%	Total Ud	%		Total Udaipur	%
PERSONNEL (Project staff)		5%		6%		6%		6%	6%
Salaries, bonus, pension	766,011	3.6%	1,234,226	4.7%	1,458,680	4.8%	1,670,434	4.7%	4.7%
Allowances	205,855	1.0%	302,447	1.2%	329,990	1.1%	285,210	0.8%	0.8%
TRAINING & ORIENTATION		1%		7%		1%		2%	2%
Project staff, Workshops, Seminars	3,360	0.0%	87,882	0.3%	73,371	0.2%	7,412	0.0%	0.0%
State, District, Block, PHED	0	0.0%	72,601	0.3%	29,729	0.1%	46,447	0.1%	0.1%
HP Mechanics, New & Refresher	0	0.0%	35,366	0.1%	72,917	0.2%	188,463	0.5%	0.5%
Village Contact Teams	36,262	0.2%	1,230,025	4.7%	0	0.0%	47,250	0.1%	0.1%
Animators, Women's Camps	96,568	0.5%	193,641	0.7%	232,485	0.8%	185,616	0.5%	0.5%
Anganwadi/School/Other	0	0.0%	128,289	0.5%	14,016	0.0%	264,784	0.8%	0.8%
PROFESSIONAL SERVICES, CONSULTANCY		0%		1%		0%		1%	1%
Payment of Professional Services	3,194	0.0%	130,764	0.5%	9,046	0.0%	37,498	0.1%	0.1%
Development of Trg & Commun Material	1,350	0.0%	141,034	0.5%	95,012	0.3%	358,779	1.0%	1.0%
Monitoring & evaluation	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0.0%
OUTREACH ACTIVITIES, MOBILISATION		4%		2%		5%		12%	12%
Intensive awareness campaigns	142	0.0%	61,808	0.2%	247,116	0.8%	154,079	0.4%	0.4%
Exhibitions, Health mgmt, Vol Action	219,859	1.0%	86,551	0.3%	133,044	0.4%	315,276	0.9%	0.9%
Medical camps, honoraria (Anim & Sct)	151,000	0.7%	356,498	1.4%	677,493	2.2%	1,293,896	3.7%	3.7%
Medical items, filters & Temephos	492,000	2.3%	65,600	0.3%	571,200	1.9%	2,525,690	7.2%	7.2%
TRANSPORTATION		2%		4%		3%		3%	3%
Travelling allowance (per diem)	50,798	0.2%	191,368	0.7%	111,225	0.4%	180,995	0.5%	0.5%
Operation & maintenance of vehicles	97,111	0.5%	397,350	1.5%	428,830	1.4%	482,925	1.4%	1.4%
Vehicles (annualised cost)	338,935	1.6%	364,372	1.4%	387,145	1.3%	409,918	1.2%	1.2%
PROJECT SUPPORT & ADMINISTRATION		3%		4%		3%		3%	3%
Office administration, Project	133,908	0.6%	489,248	1.9%	288,797	0.9%	364,473	1.0%	1.0%
Office Supplies & Equipment	399,470	1.9%	545,498	2.1%	596,145	2.0%	631,213	1.8%	1.8%
Miscellaneous	34,893	0.2%	46,196	0.2%	57,359	0.2%	12,706	0.0%	0.0%
CONSTRUCTION		86%		76%		81%		73%	73%
Construction, annual expenditures	10,917,151	51.0%	11,626,809	44.5%	14,468,655	47.4%	14,688,432	41.7%	41.7%
Construction Equipment & Spares	7,455,900	34.8%	8,349,405	31.9%	10,217,018	33.5%	11,072,876	31.4%	31.4%
TOTAL	21,403,768		26,136,979		30,499,272		35,224,370		



APPENDIX 10
VILLAGES VISITED

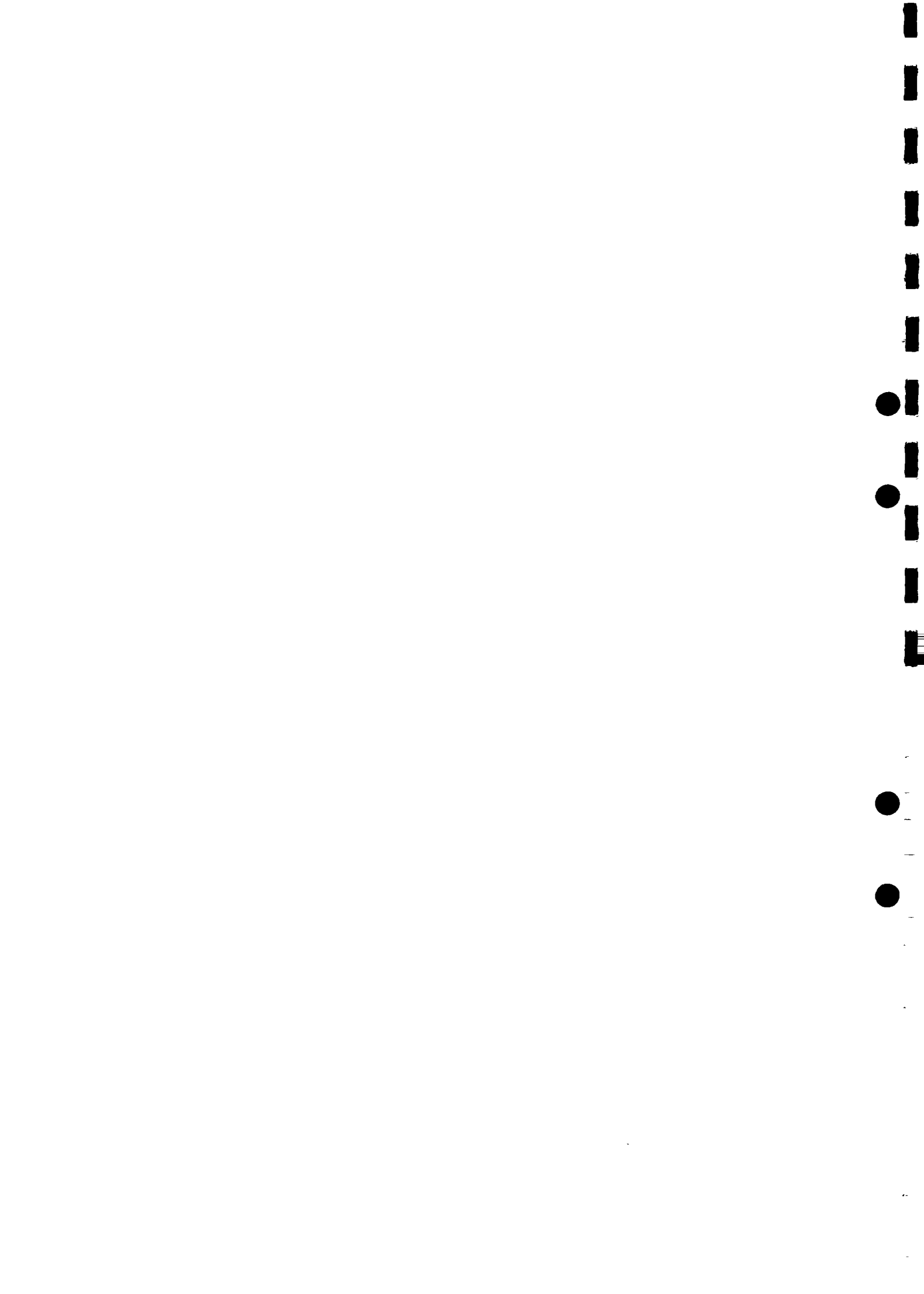


APPENDIX 10

VILLAGES VISITED

This Table shows number of respondents in the 15 sample villages interviewed by the Health Consultant.

Type of respondents	Udaipur	Banswara	Dungarpur	Total
No. of sample villages	7	5	3	15
No. of H.H. Heads interview (Male/Female)	214	138	97	449
No. of schools (visited)	6	6	2	14
No. of KVI's	23	16	8	47
No. of MPW's (M/F)	4	4	3	11
No. of Sachetak/Scouts	9	40	7	56



APPENDIX 11

EXTRACTS FROM ENGINEER REPORT



REPORT ON THE VISIT OF A FEW VILLAGES IN SWACH PROJECT AREAS WITHIN THE DISTRICTS OF UDAIPUR, DUNGARPUR AND BANSWARA IN RAJASTHAN

Introduction:

A contract between, Centre for Development Studies, University College of Swansea, Wales UK, represented by Dr. David Marsden and AFPRO represented by K.N. Dewangan was signed on 26.11.93 under the agreed terms of reference. Accordingly the report is being submitted on hardware aspects associated with the water and sanitation components of SWACH programme undertaken in the areas identified.

General :

Field visits were made during 5th - 18th of Dec.'93 which includes collection of relevant data from field by meeting the user groups and officials of various departments in blocks and district headquarters. It was not a very tight schedule but while working in field it was realized that little more time should have been apportioned to meet the concerned staff especially the fitters and mechanics in Panchayat Samithis who are responsible for repair and maintenance of handpumps and possess the important data. More so when they did not have prior intimation of our visit. It was also not possible to visit all the drinking water sources or structures constructed with an objective to improvise upon existing sanitation conditions, within the time allotted.

Investigation

Source of water supply:

Handpumps:

Data have been collected from a total of 57 hand pumps.

- Details are enclosed in Annexure I
- Out of the 57 handpumps visited atleast 47 supply water round the year whereas 4 are now totally dried up. Rest supply water except during summer.
- In 22 cases animal waste is dumped within 50 mts of source.
- SWACH began to install India Mark III hand pumps since 1990 onwards. On visual observation in field it is not possible to differentiate between handpumps installed by PHED and SWACH. List of handpumps installed by SWACH in the villages visited is enclosed.
- Major replacements (like pipes, rods, handle etc.) are taken during the so called "Handpump Maintenance Campaign" by PHED at district level normally during March - June every year. Rest through respective Panchayat Samithis as per the need.

Dug wells:

Out of 46 wells visited 36 are described in brief (annexure - II). Selection is on the basis of either use or suspicion of contamination.

- All the 36 wells yield round the year supply of water.
- Bacteriological analysis was conducted in 4 community and 20 individual wells.
- In Nagji S/o Khula's well in Jalapka, block Kherwara, Udaipur district parapet is raised by SWACH, leaving steps as it is. Contamination confirmed.

Piped water supply scheme:

Out of 15 villages visited in 3 (viz. Wassi, Mokhampura and Kupra) piped water supply scheme exists. None are initiated by SWACH. This has however restricted the number of handpumps to be installed.

A. Wassi: Most of the 150 families are non SC/ST. PHED installed a 7.5 HP submersible pump below 21 mts. in the 57 mt. deep bore drilled in the village. Water is supplied for 2 hrs. everyday to 93 families. Alternate supply was made from one energized open well when motor was burnt before 2 yrs. Expenses on management and repair of the system is borne by PHED against charges levied on the users.

B. Mokhampura: Village is identified under IRDP. Under "Panghat Yojna" a submersible pump is installed below 36 mt in a 54 mt deep borewell and water is supplied for 2 hrs. everyday to 65 house holds free of cost. Users are responsible for maintenance and repairs. A village committee has been set up to manage the show. Motor is non-functional since last 3 months. For the same reason it remained defunct last year also when the users shared the cost of repair (Rs. 1800/-). To say in brief facility has been provided to the users and the recurring cost on maintenance and repair is left to be met with by them.

C. Kupra: This is a unique village where people take care of public facilities like drainage, lights, water supply etc. The user's group namely "Vikas Committee" established in 1984. Water is supplied from a community open well for one hr./day to 65 families @ Rs. 10/- per family. Motor operator, sweeper is paid by the committee. Presence of harmful bacteria in well water has rendered it unfit for drinking. Another community well catering to the needs of 40-45 families in SC colony is also unfit for drinking.

Water quality:-

The handpump fitted to the bore wells are either by SWACH or by PHED. SWACH does not conduct any kind of water quality testing in borewell water, nor does PHED. It only executes the task of drilling/handpump installation and does not take responsibility of it's result. A few rapid water testing kits originally devised by Defence Research Laboratory Jodhpur and later modified suitably by others was given to SWACH by Prof. V.C. Dhurve This is to confirm the presence of harmful bacteria in water. These do not seem to be in use by SWACH. However a few more kits were procured from Prof. Dhurve and bacteriological analysis was carried out by the team in case of 31 drinking water source - 7 bore wells and 24 dug wells. While bore well (with handpump) water in 6 cases is uncontaminated, water in 19 dug wells show positive results thereby rendering it unfit for drinking. 3 out of 19 are totally covered and one partially covered (steps left out) by SWACH.

In other words about 2000 people from 334 families (one family is assumed to be consisting of 6 members at an average) and 245 animals drink water from contaminated sources.

Application of Temephos and other disinfectants: In the guinea worm affected project areas of SWACH the Health Department was active even earlier. Frequency of application of temephos by SWACH is 8 times in an year i.e. Feb. to June every month and July to Jan, once in two months. Dungarpur project office however reports 14 times an year. In order to avoid duplicacy, both the offices collaborate in applying temephos. Normally a team comprising of 2 persons i.e. Coordinator from SWACH, and Sanitary Inspector (SI) from Health Department does the job. 1989, 1990 and 1991 were the surveillance years. Last case reported by SWACH in Banswara was in July 1991 therefore SWACH has no more been applying temephos since Jan. '93. Health Department continues to apply temephos even today however without the knowledge of SWACH. Bleaching powder is applied by Health Department only. UNICEF purchases temephos (@ Rs. 651/- per litre) from Cynamide India, Balsad, Gujrat and supplies to SWACH. In Dungarpur Dept. Of Health was applying temophos during 86-89.

Yearwise application by SWACH is as follows

Year	Palwasi		Kolkhanda Khas		Kasha' Magri
	Wells	Litres	Wells	Litres	
1990	8	1.679	8	2.250	No Intervention
1991	8	4.600	1	0.200	
1992	22	17.172	6	7.001	
1993	2	0.473	14	23.734	
Total	40	23.824	29	33.185	
Net Total	69	57.009			

Sanitation:

In order to keep the village environment clean SWACH has taken up the programme of construction of surface water drainage and latrines for individuals, animators and institutions. Subsidy on latrines for individual and animators is Rs. 1200/- and 1800/- respectively. As a sample survey 15 latrines constructed by SWACH were visited. Only 6 are in full use whereas in case of 3 it is partly used by ladies in bathrooms. Rest of 6 are not in use. Pits were opened up for construction of septic tanks by Roopal Bhagora and Parthu s/o Kalia in tribal inhabitation. Parthu dug pits in June '93 as per assurance from SWACH as reported but no subsidy amount was released. He is continuing with the rest of construction of his own. Picture is more gloomy than what it looks from the data. Our enquiries with people have given an impression that more than 40% are unused. Male folks continue to go out for defecation which is normally 300 to 500 mts. away from inhabitation as they find it more "homely", Kids are made to defecate near houses. Although in several cases animal waste is dumped within 30 mts of the bore well, the water is not contaminated.

In two of the villages namely Wassi and Kupra drainage facility is provided by SWACH. In Wassi cleaning of drains was better when Panchayat was alive. Presently the portion of drain opposite to different house holds are being kept clean but dirt has accumulated in the common portions. In underground piped water supply system leakage is noticed atleast in 3 places making it vulnerable to many diseases as the way is dirty due to water and defecation by kids though not very common. School latrine is kept locked for the fear of people using and dirtying it in the areas where people are used to this kind of latrines. As a result students urinate outside. Teachers however use the latrine. Principal's logic behind barring students from using it due to its low capacity tank is not justifiable. It also indicates his ignorance about the functioning of latrine.

In Kupra people Vikas Committee manages the maintenance and repair of public facilities like drainage, street lights, water source and distribution system etc. 10% of total cost of construction of drain shared by the people equally by contributing Rs. 100 from each family. Rs. 10/- from each family is charged per month for supply of water for about 1 hr./day through tapes from a community well. Miscellaneous common expenses are also managed from this fund. Motor operator and Sweeper are being paid Rs. 800/- pm and 200/- pm respectively. Middle school building is also reported to have been constructed on contribution by the village people. Drain does not cover the ST colony by name "Bhilon ki basti" totally thus dirt can be seen lying here and there. People even complained of difference in the frequencies of clearing of garbage in different areas. For so called 'influential' people things are better.

Conversion of wells:-

As per reports from SWACH a total of 189 step wells have been converted in the areas visited. The total cost of conversion is Rs. 11,80,439.45 (@ Rs. 6,245.71 per conversion)

TRAINING, REPAIR AND MAINTENANCE OF HANDPUMPS

Training is imparted to both male and female mechanics. Male mechanics are trained under Tribal Rural Youth's Self Employment (TRYSEM) programme of District Rural Development Agency (DRDA), Govt. of Rajasthan. 3 month's intensive training is conducted which is comprised of 15 days of theory classes in ITIs of respective regions and 2.5 months of field training. Funding is under special scheme for the persons identified under Integrated Rural Development Programme (IRDP). DRDA helps the trained personnel to avail loan from the banks if tool kit is purchased from Rajasthan Agro Industries Corp. on 50% subsidy. Now a days RAIC is not supplying kit but spares only. Wherever Panchayat Samithi needs mechanics it appoints them. Budget allocation is by Zilla Parishad @ Rs. 200/- per pump per year, in which Rs. 67/- is towards spare parts and Rs. 133/- towards salary travel etc. Every mechanic is paid at the fix rate of Rs. 11/- per handpump per month and is normally allotted 40 handpumps. However this number could be more as per the need of the area but the payment is fixed for 40 pumps only i.e. 440/- The balance amount from the purchase of spare parts was earlier paid to mechanic but since April '93 it has been stopped. The mechanics receive their payments from the respective Panchayat Samithis.

Training of female mechanics is by SWACH with outside resource persons if necessary. Every lady mechanic when employed is paid @ Rs. 150/- per month. SWACH also imparts regular refresher courses for 3 days to mechanics. Rassi Devi of Nathara who was trained by SWACH in 1991 alongwith 24 others was paid for one month only. 90 handpumps were allotted to Rassi Devi and two other trained who moved together to do the task. After some time the tool kit given to them was taken back by SWACH with the assurance of giving it back once they are employed by Panchayat Samithi. Rassi Devi is however ready to be working for Rs. 150/- per month.

Whenever the pump goes out of order normally people, sometimes the ward member intimates the mechanic within 2-3 days. He may also come to know of it in casual visits or in the gram panchayat meeting (twice a month). He comes within 2-3 days and takes up repair. In case of any replacement spare is obtained from Panchayat Samithi after the damaged part is deposited there. It takes about 2 days more. The handpump remains defunct for about a week in general. This period however varies from place to place depending upon dependence of people over the handpump, attitude of the mechanic and his rapport with the panchayat samithi. It is least in case of Kupra (same or one day) and longest in Jalapka (5 months) The major replacements like those of pipes, rods handle bearing etc are done during the handpump maintenance campaign normally once in a year during summer (March - June).

Earlier to the network of mechanics, information about non functioning of handpumps was sent to Panchayat Samithi by one responsible person identified by them in agreement to villagers.

Not much emphasis is given to preventive maintenance.

Discussions at different levels:-

Hand pump repairs exists under the system of 3 tiers - village level, block level and district level. As mentioned earlier one mechanic normally looks after 40 handpumps installed in 8-10 villages sometimes in more than one panchayat. Discussions were held at different levels (with fitters, handpump mechanic and users). The period for which handpump is lying defunct indicates towards the gaps existing among different links of the chain operating the system.

At many places people told about some remuneration to the mechanic towards his labour by sharing the amount. it varies from Rs. 30/- to Rs. 150/- . They even complained that mechanics demand in some cases and handpump is not attended to when their demand is not met with. (Jalapka for example) People even contact any other mechanic if approachable and get the work done by making payments. There are cases

when they have met the cost of spare parts. On the other hand in some villages people even said that why should they pay to mechanic for repair when it is his job and he gets salary for that.

Mechanics after they reach the village to repair handpumps they do not find any male to help them as they are out for their routine jobs. In many cases though people are present they shirk their responsibilities on one another. In one or two cases they felt some difficulty in getting spares from Panchayat Samithis, and that visiting samithis for this purpose many times is uneconomical and impractical. They suggested some spare parts be left with them. They can be accountable. Hand pump repair is not full time job for few of them. their engagement in other activities also results in delayed repairs.

Removal of riser pipes for any check in IM III is a very difficult task and needs 10-12 persons. Otherwise repair is more convenient than that of IM II SWACH has. No of IM III installed in the areas visited is less hence no comments can be made.

Fitters in Panchayat Samithi are responsible for supplying spares and keeping record on every handpumps condition feel that leaving spare parts with them will simply open up a window for mismanagement. They however felt no problems in getting the parts from PHED or Rajasthan Agro Industries Corp. whenever needed.

Leakage in the riser pipe was reported by mechanics and people in many villages. They get rusted and contaminate water. Even very small chips of iron were reported. The team happened to see a few of such pipes removed from the bore and kept. This speaks about the quality of the pipe used.

Observations:

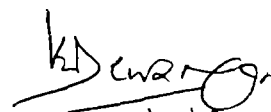
1. People prefer water from handpump for safety reasons.
2. Provision of installing Hand pump on dug wells as done in Bagayacha and being done in Palwassi is widely welcome by the people as they do not have to bring their own bucket/rope to draw water.
3. Lack of awareness on proper operation results in loosening of water tank nut bolts, de-linking of rods etc.
4. SCs are normally allowed to take water from handpumps not within their settlement.
5. People do not mind taking water from other sources like lake or open well or even step well if traditionally practiced without any harm but they understand the reasons for spreading of guineaworm.
6. Lining in drinking water converted wells is not adequate atleast in 10 cases.
7. Preventive maintenance is not emphasized upon.
8. The only bore at Bagayacha has been lying defunct since June '93. After having repaired just before election remained functional for a few days only. It was told that people reported the matter to SWACH staff on his visit on 13.12.93 but the fate of the hand pump remains unchanged.
9. Frequent problems in handpumps, normally 2-3 times an year, are wear and tear of pumps buckets (washers), rubber sheeting, less frequent is disconnection of rods, leakage through riser pipes, damage to the guide valves (No comments on IM III as these are very few in the areas visited). Water table fell deep below in 4 cases after installation (reported).

10. For repairs most of the people do not mind paying money and getting it done from any mechanic. They even share the cost of spares.
11. Mechanics also exploit the people (e-g : Bagayacha). In most of the cases people feel it obligatory on their part to remunerate mechanics monetarily, though the latter does not demand.
12. Handpumps are running very efficiently (3-5 yrs) without any repairs where people have taken special care to operate it properly. (Kolkhanda Khas)
13. It was not possible to meet women mechanics except at one place (Nathara) where a group of 3 women mechanics together were taking care of repair of 90 handpumps. They could do it for one month only as tools were taken back by SWACH.
14. Structures like platform, washing slab, drain, cattle trough etc. are not maintained properly in most of the cases by the people despite good cattle trough made people use their own devices to feed water to animals. Trough lies dirty. Washing slabs are widely used.
15. Latrine is perhaps not peoples' priority. These provisions are left unused for small reasons. On general enquiry it was noted that most of the people went for subsidised latrines as it is almost free of cost and that it can be used by ladies for bathing. Latrines not in use for the want of doors only indicates their inadequate inclination towards shift from the traditional ways. People are not used to defecate within closed walls. At Mokhampura however most of the latrines are in use. Wherever there is no door, adhoc arrangements are made.
16. Latrines in schools are not left open at the places where other people are used to it for the fear of villagers using and dirtying it. In some cases these are open during school hours. Students rarely need to use latrines but mostly urinals.
17. There is no latrine for Karatphala (Palwassi) primary school. Male/female teachers and students especially the farmers find it inconvenience to use open space on nature's call.
18. Although there is good rapport existing between SWACH and Health Dept. their every movement for temephos application is not well communicated.
19. No bacteriological analysis of water is attempted by SWACH despite having kit developed locally.
20. Water samples were analysed from 7 borewells for bacterial contamination. Result showed no contamination except one bore well in Jalapka where the surrounding is dirty.
21. Bacteriological analysis conducted for 24 wells (4 community and 20 individual) indicate the presence of harmful bacteria in 19 (3 community and 16 individuals). That means about 2000 people (334 families) drink water from the contaminated sources.
22. Atleast 30 families (about 180 persons) use contaminated water from stream/tank bed for drinking at Nathara, Bagayacha and Suliya.

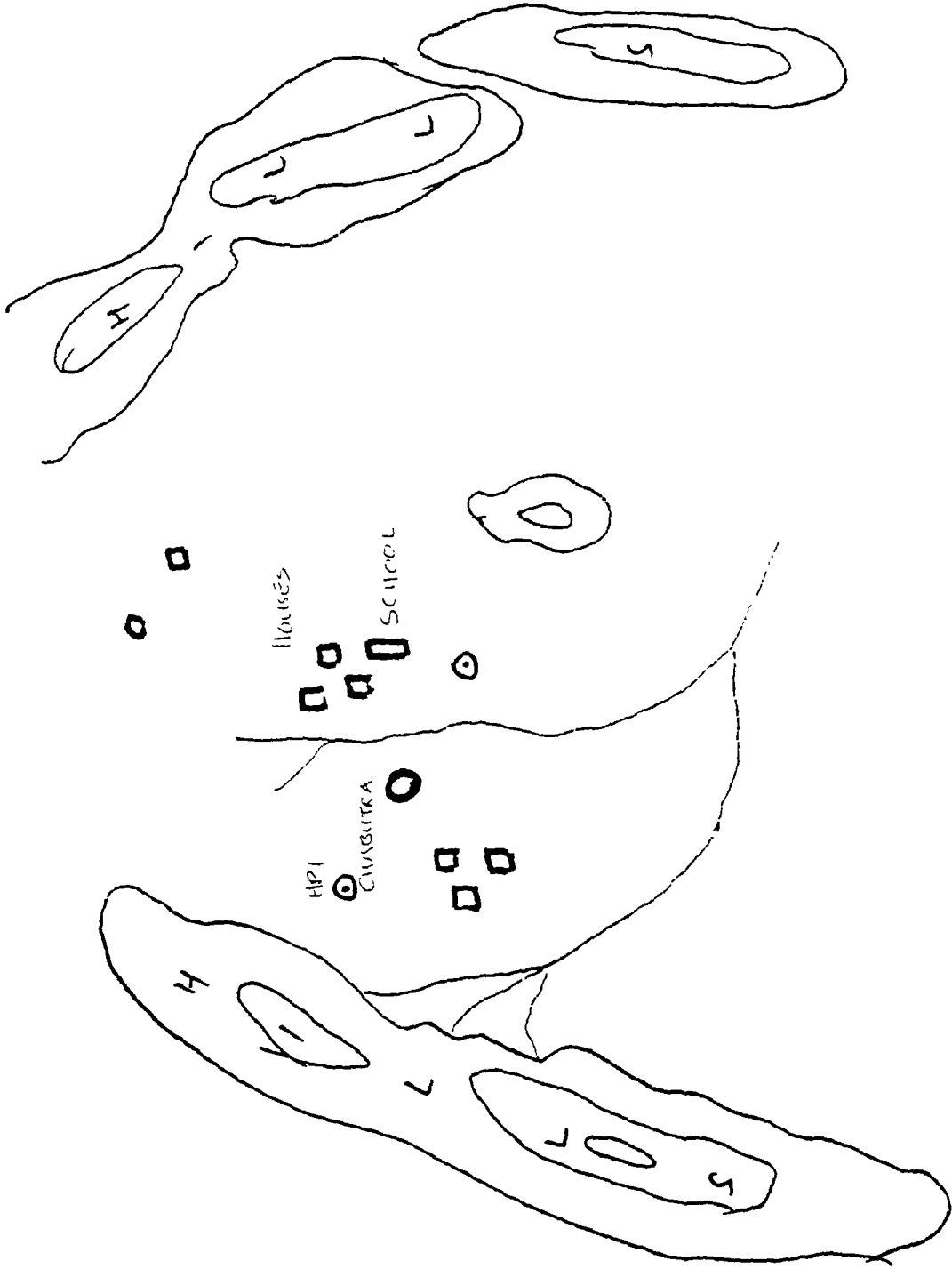
Suggestions :

1. Wherever feasible handpumps can be fitted on the converted dug wells. People find it convenient as they do not have to bring their own rope and bucket to draw water. Repair, if needed, is simpler as the length of pipe used would be normally less.

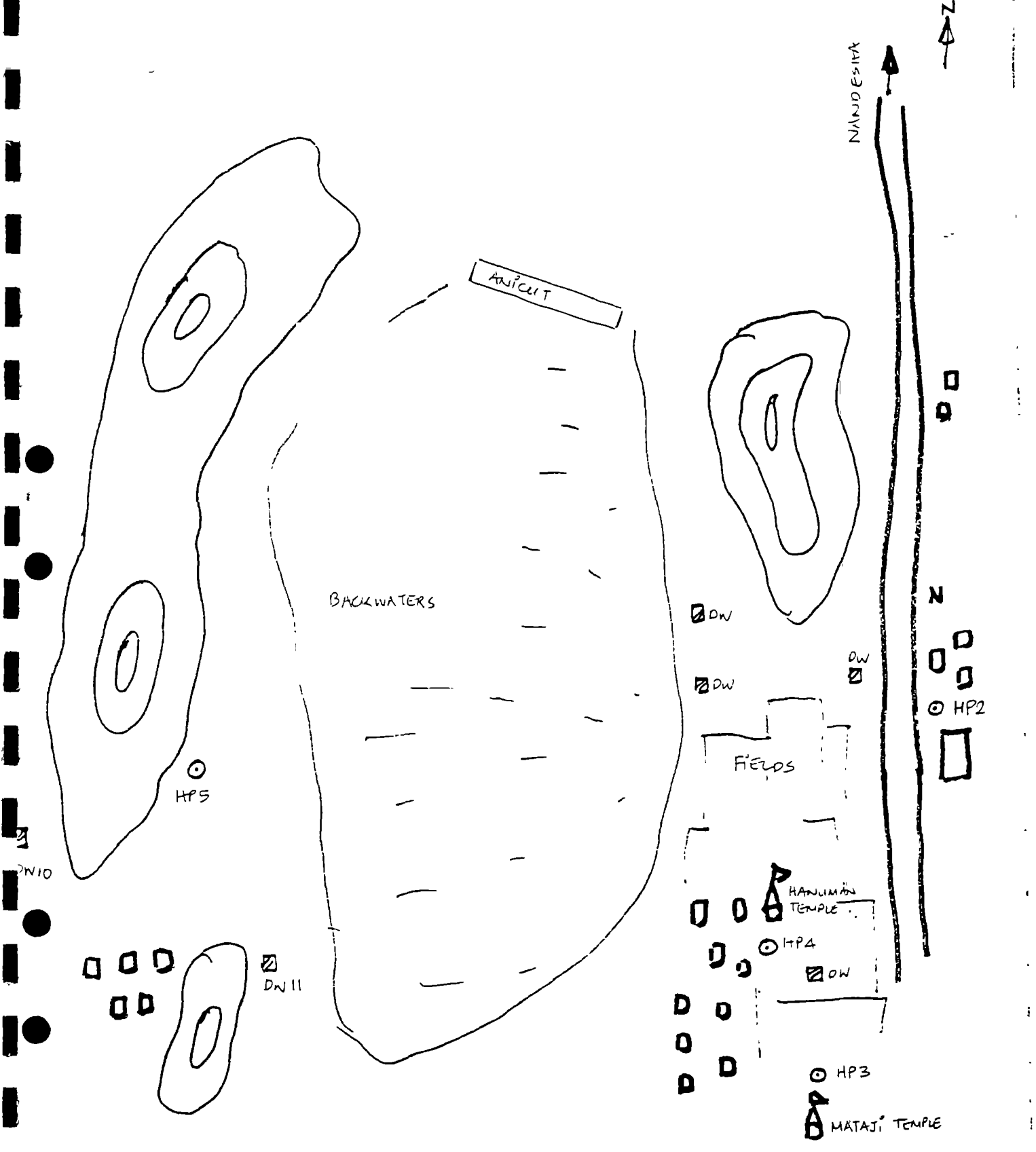
2. The kind of system which is operates upon repairs has a number of links (mechanics, Panchayat Samithi, PHED). Any lethargy in the part of any link renders the whole system ineffective. Therefore some kind of time bound communication and completion of the task required should be enforced with the knowledge of the users group. This would help in pinpointing the responsibilities in carrying out the task on time. Users group can be formed which takes up the responsibilities of timely communication and rendering help during repairs.
3. Most needed and chief spare parts (washers, nuts and bolts, rubber sheeting etc) along with spanners, grease and bleaching powder could be left under the charge of Gram Panchayat to avoid delay. Maintenance of hand pump also would improve.
4. Nominal contributions can be collected from the beneficiaries availing water resource facilities towards maintenance of structures like drain, platform, washing slab etc. This may inculcate a sense of care they should exercise towards maintenance. Users group may also see to it that no dirt accumulates in the surrounding of Hand pump. The group should also teach the people on how to operate the pump and damages caused by faulty operation.
5. Use of latrines is an important part of sanitation aspect but this does not seem to be people's priority. Therefore more care should be exercised in selecting the beneficiaries. SWACH should also follow up to, and motivating people to accept the programme releasing the materials and balanced subsidy amount so that the structure is complete and ready for use. (Perhaps he may be asked to keep the frame and door ready during construction of structure which could be covered under subsidy latter if possible)
6. It is important that safety of water should be ascertained in case of every drinking water source by carrying out bacteriological analysis and disinfectants used accordingly.


27/12/93

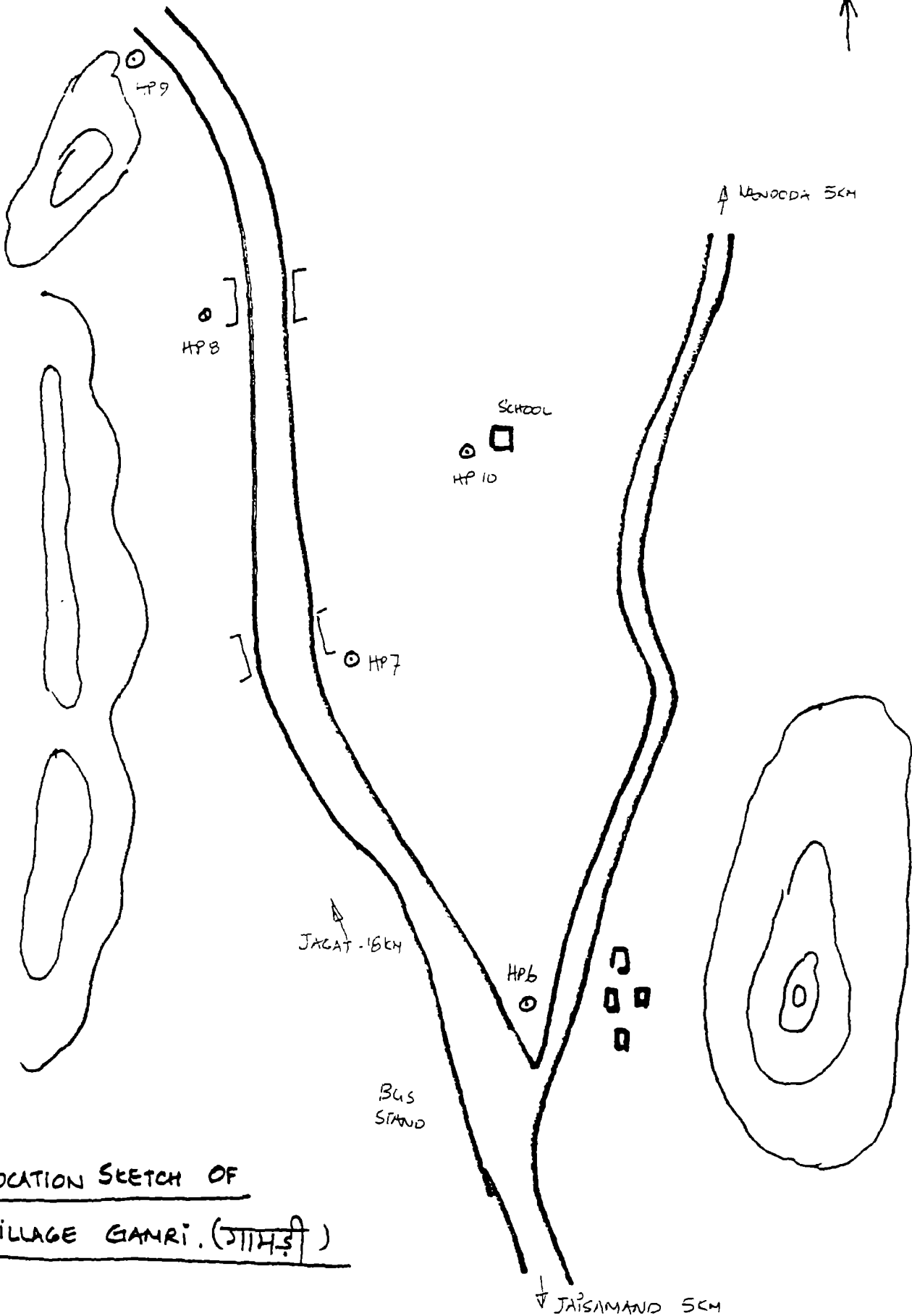
**OFFICER-IN-CHARGE
AFPRO FIELD UNIT
UDAIPUR**



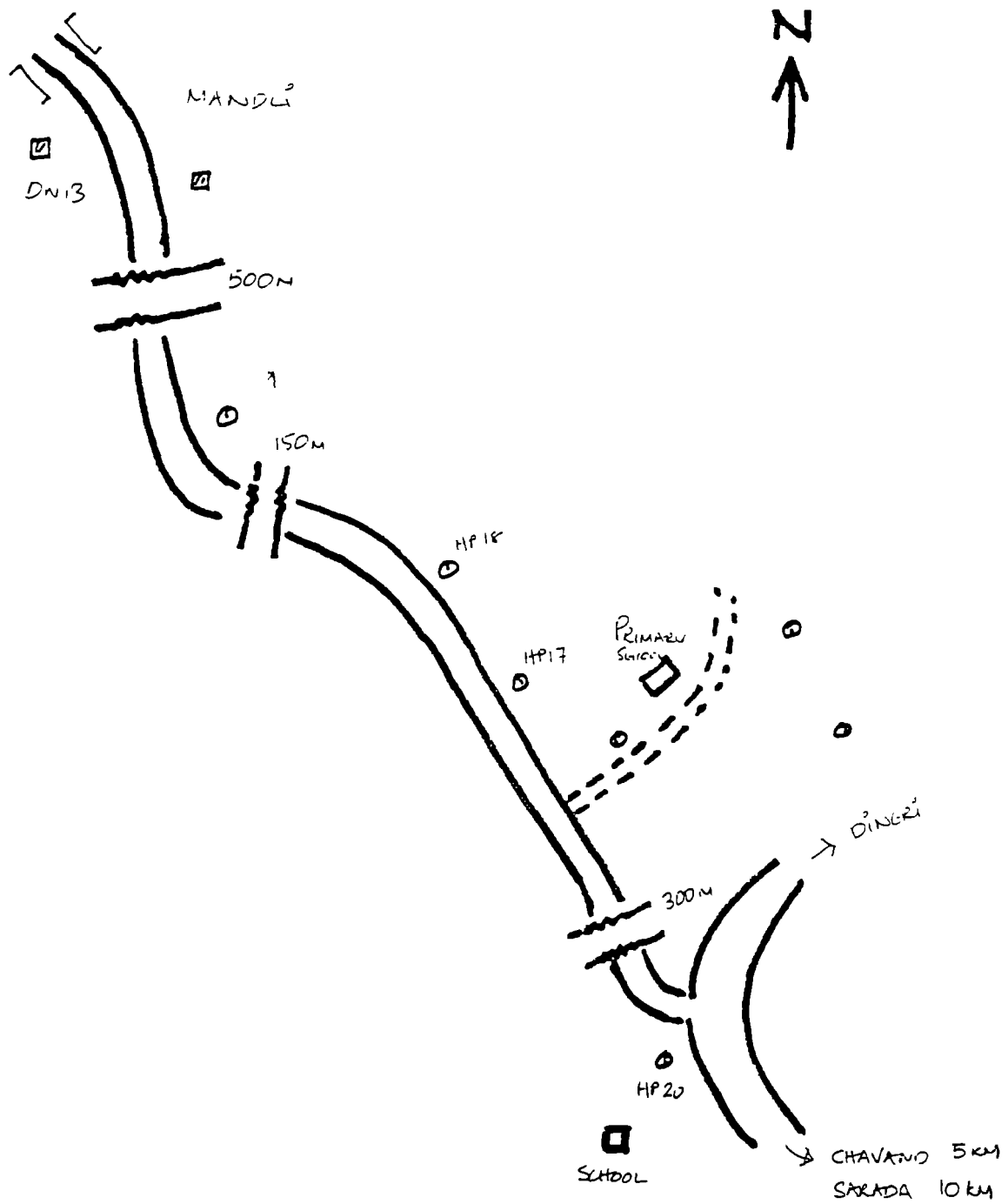
LOCATION MAP OF KUNDAU VILLAGE.
(क्षेत्र)



LOCATION SKETCH OF VILLAGE SUTHAR MAORA
 (सुथार मादरा)

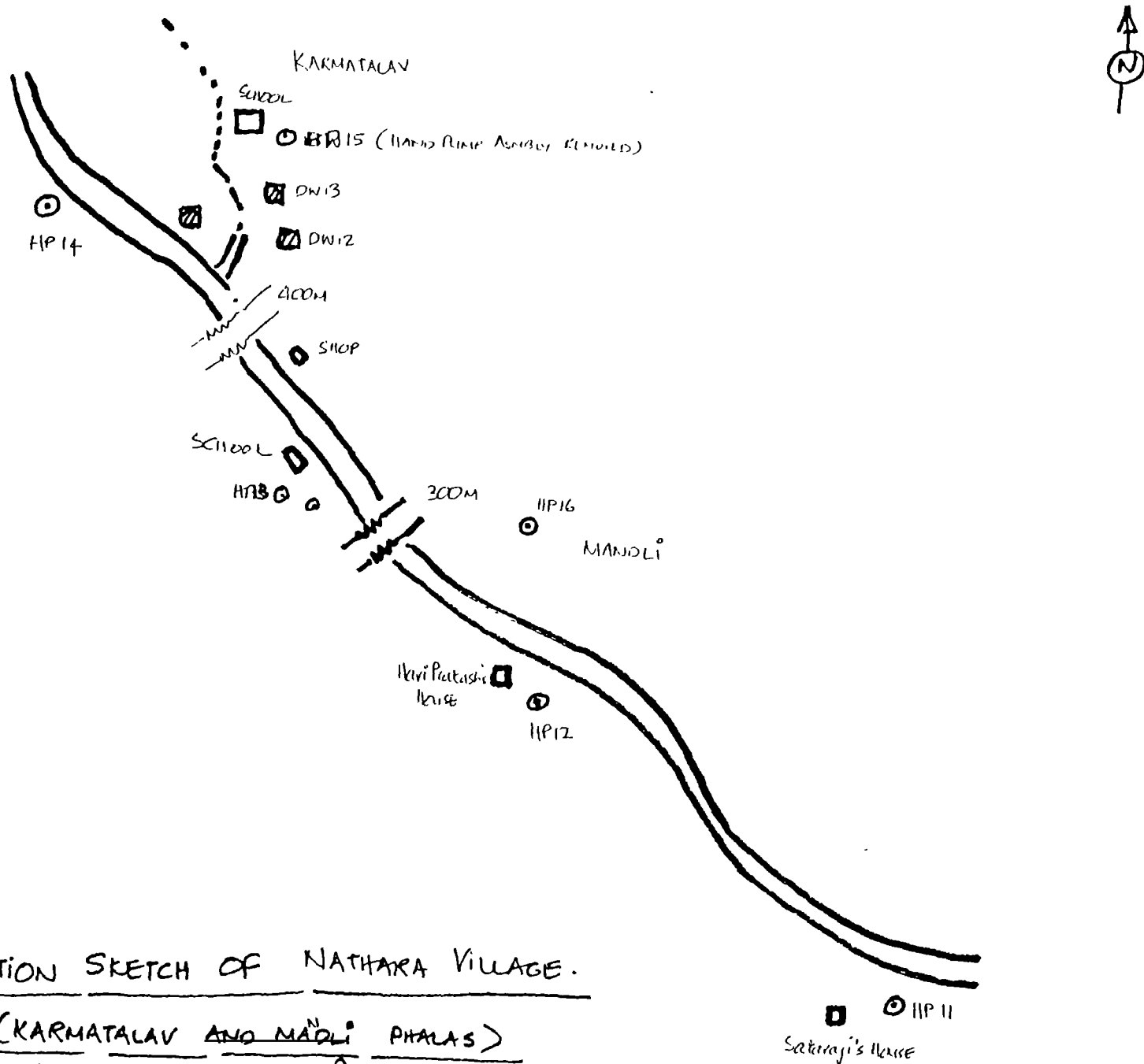


LOCATION SKETCH OF
VILLAGE GANRI. (गानरी)



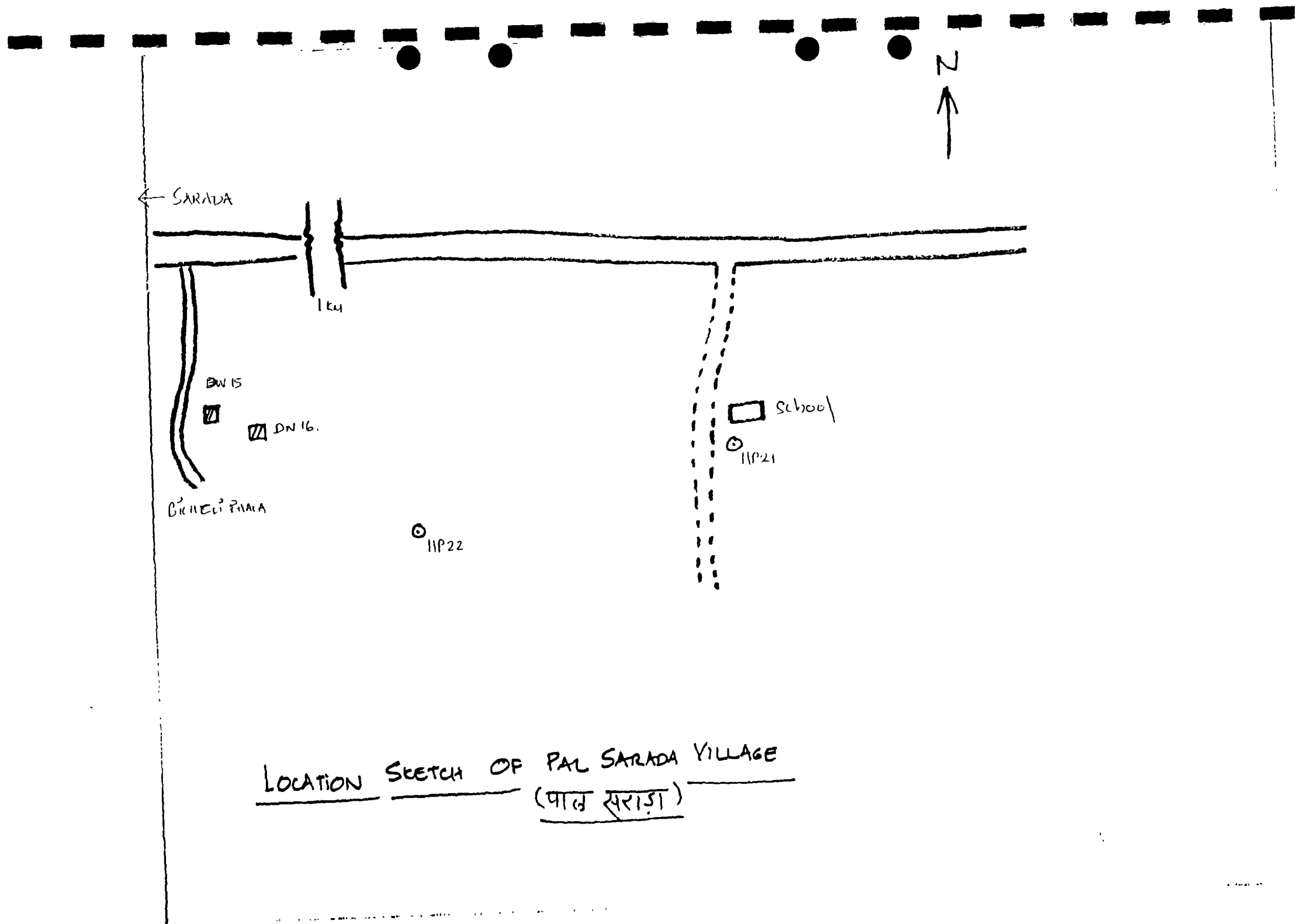
LOCATION SKETCH OF NATHARA VILLAGE
(नथारा)

(मोकट फला / मंडली)

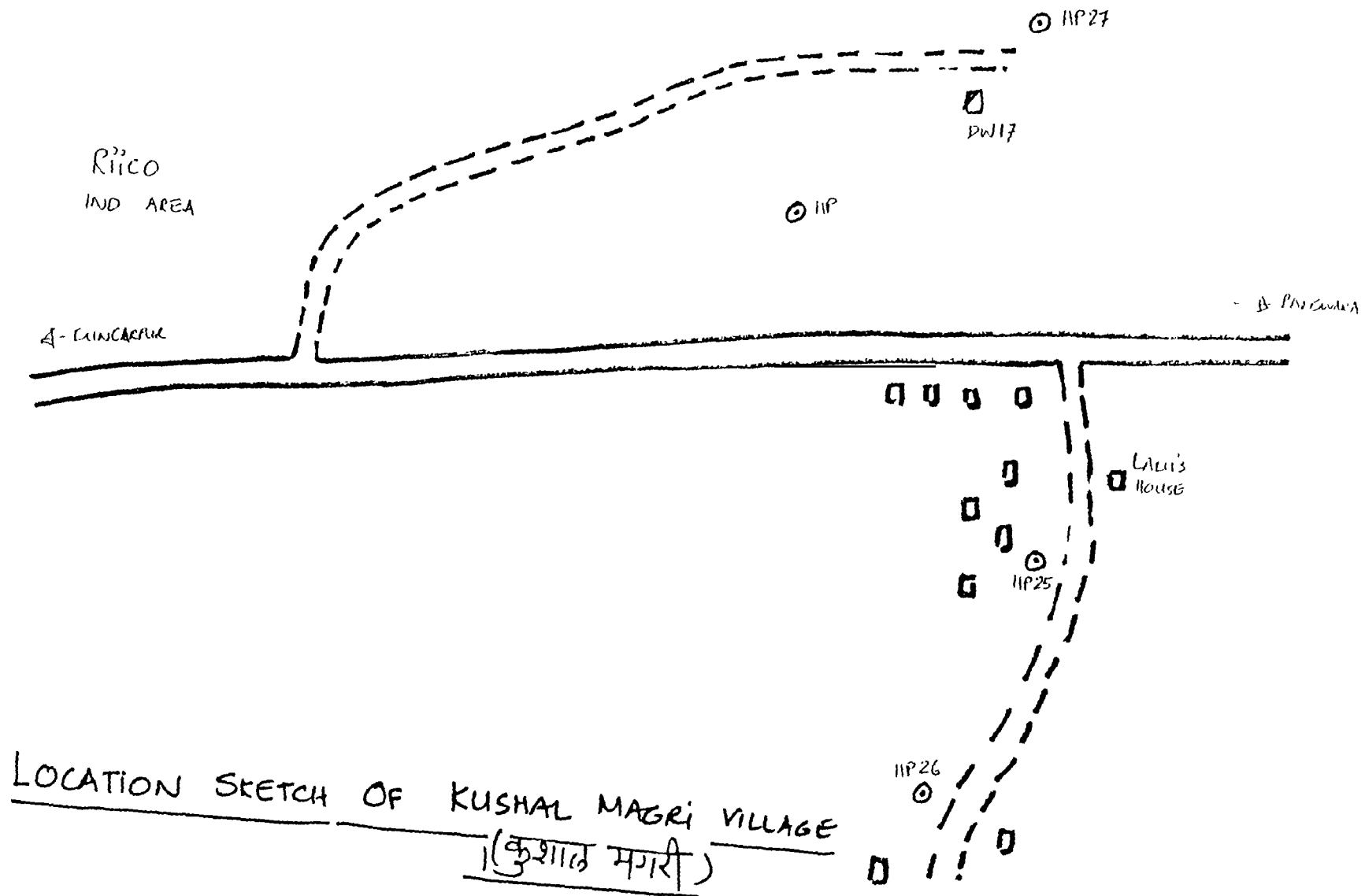


LOCATION SKETCH OF NATHARA VILLAGE.

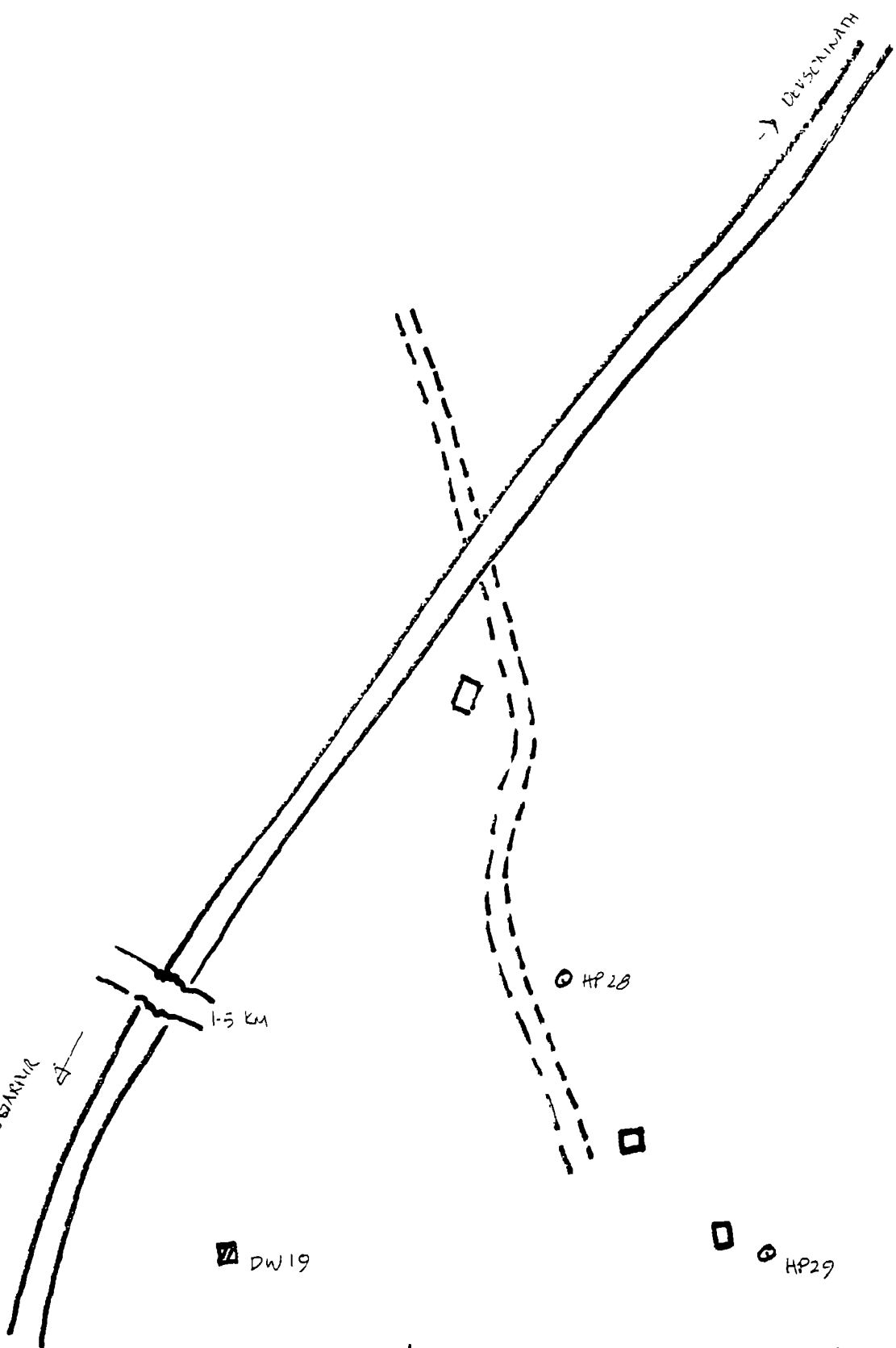
(KARMATALAV AND MANDLI PHALAS)
करमातालाव मंडली



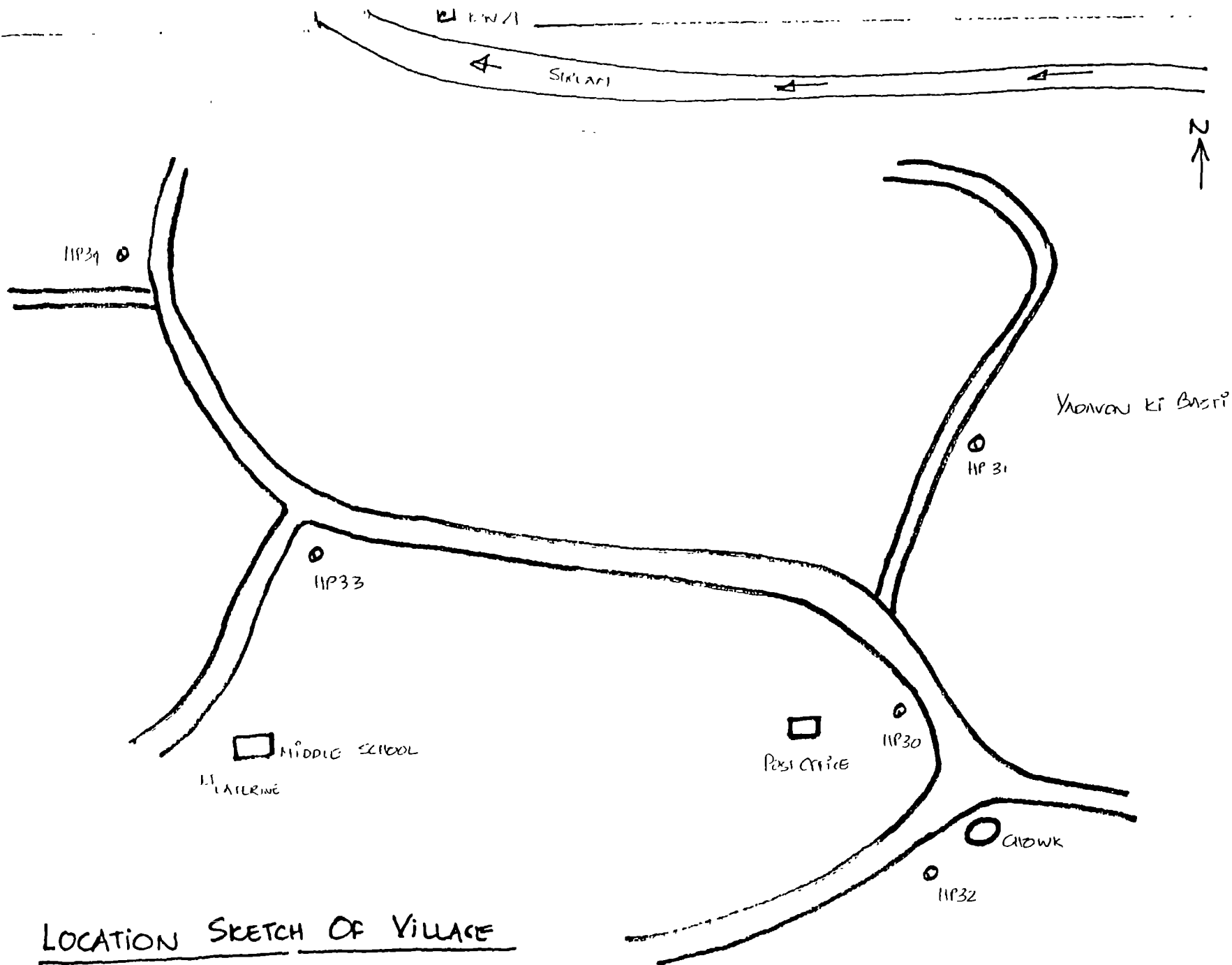
LOCATION SKETCH OF PAL SARADA VILLAGE
(पाल सराडा)



LOCATION SKETCH OF KUSHAL MAGRI VILLAGE
 (कुशल मगरी)

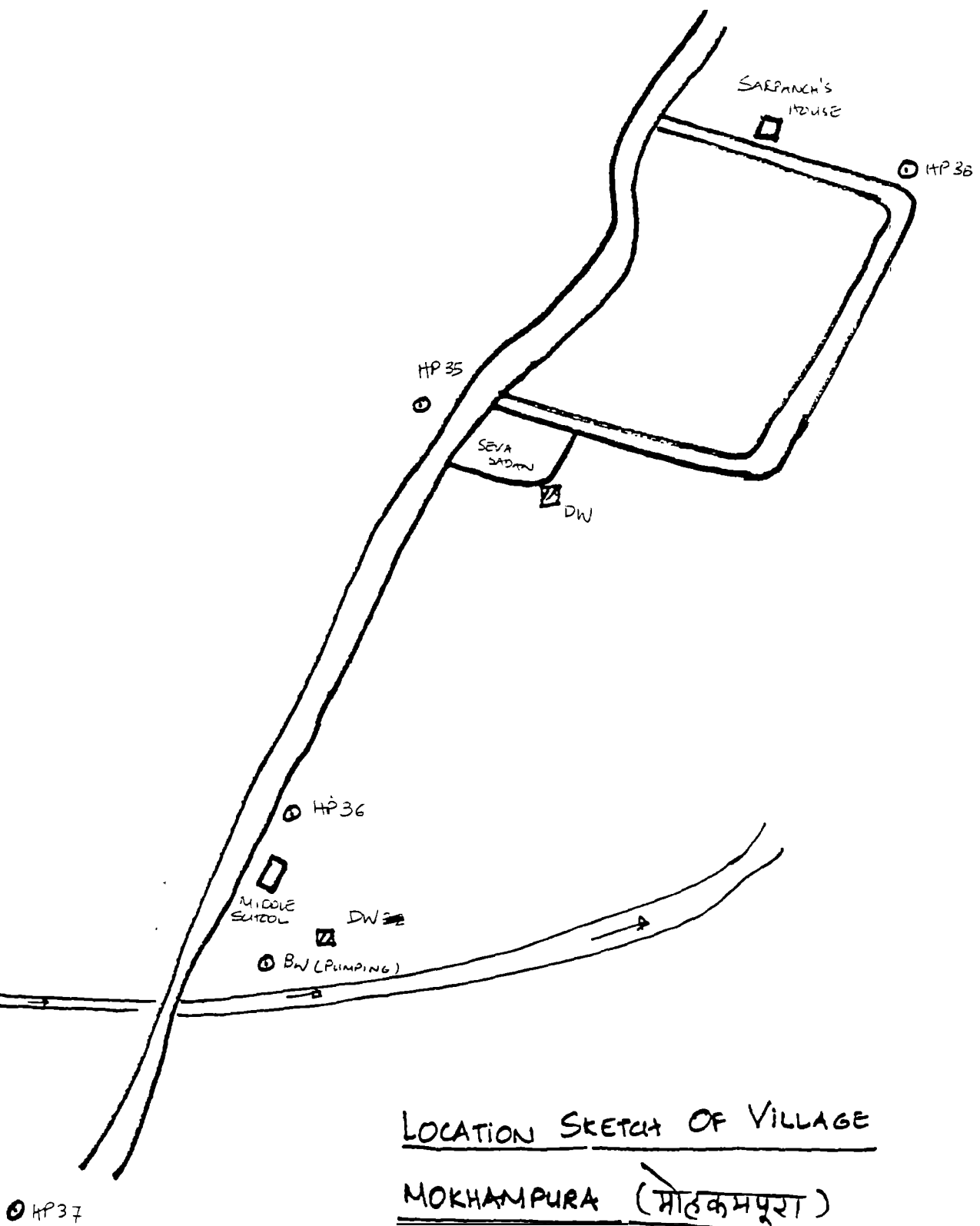


LOCATION SKETCH OF VILLAGE
PALWASSI (पाळवस्सी)



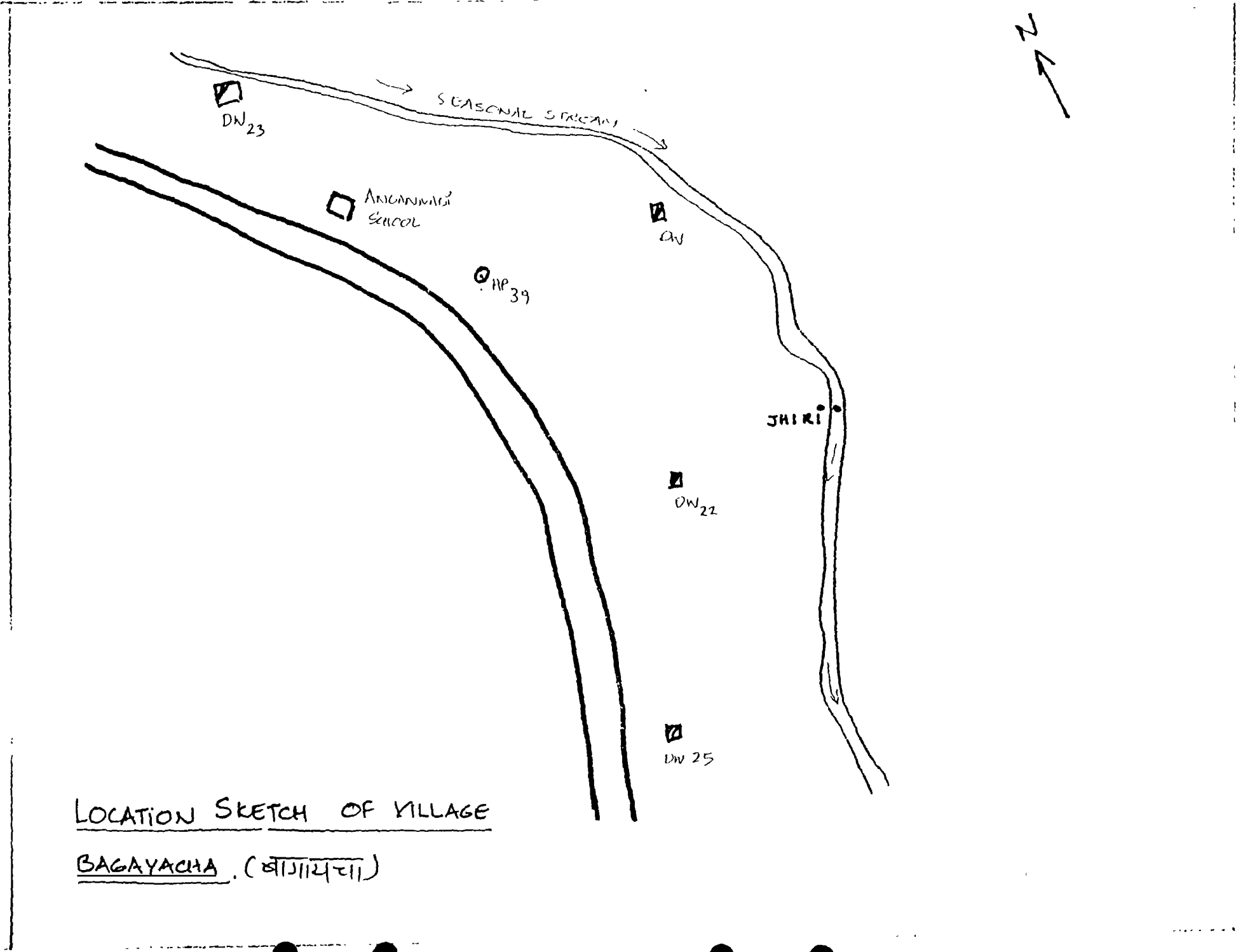
LOCATION SKETCH OF VILLAGE

KOLKHANDA KHAS (कोलखंडा खाल)



LOCATION SKETCH OF VILLAGE

MOKHAMPURA (मोहकमपुरा)



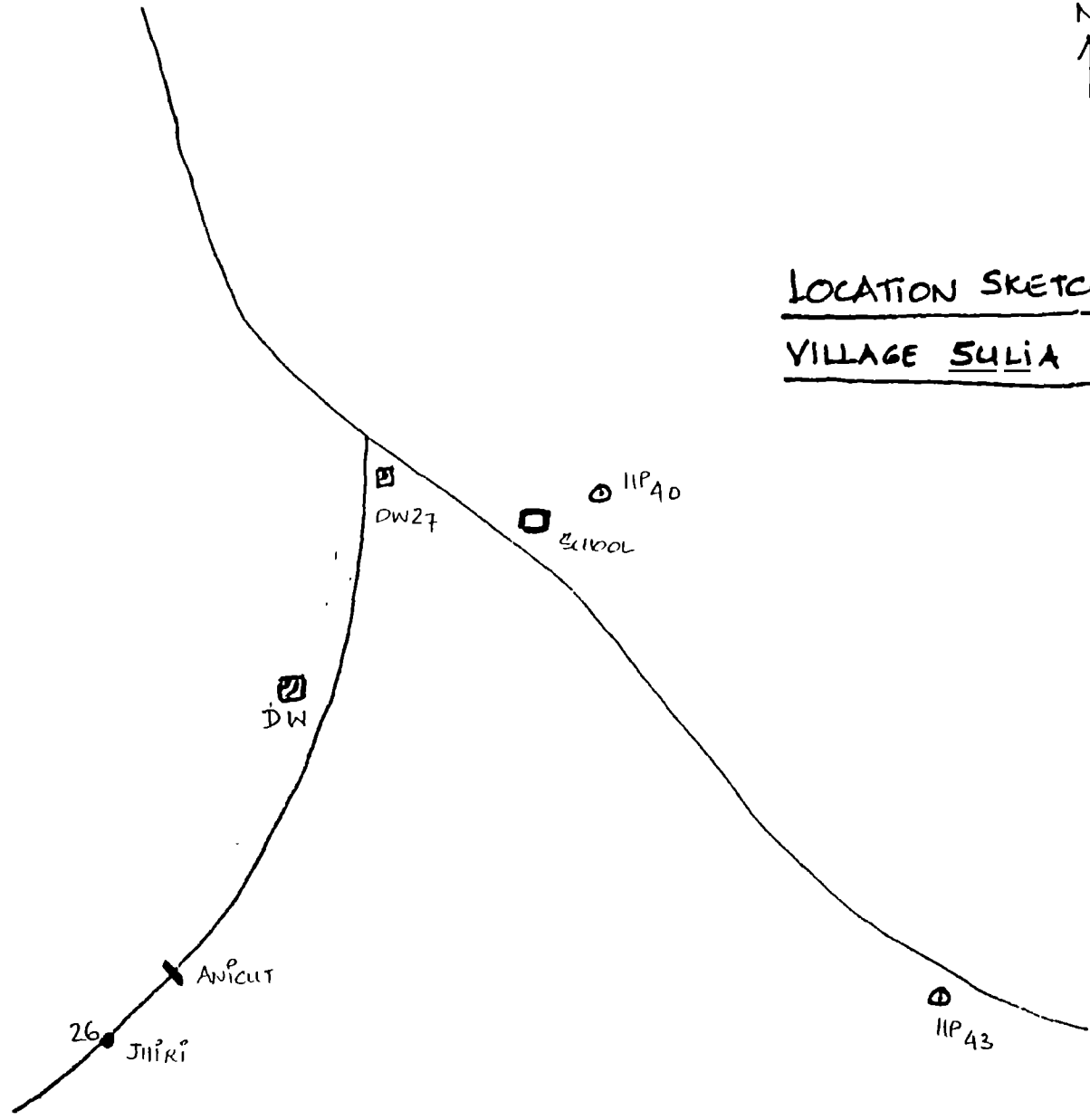
LOCATION SKETCH OF VILLAGE

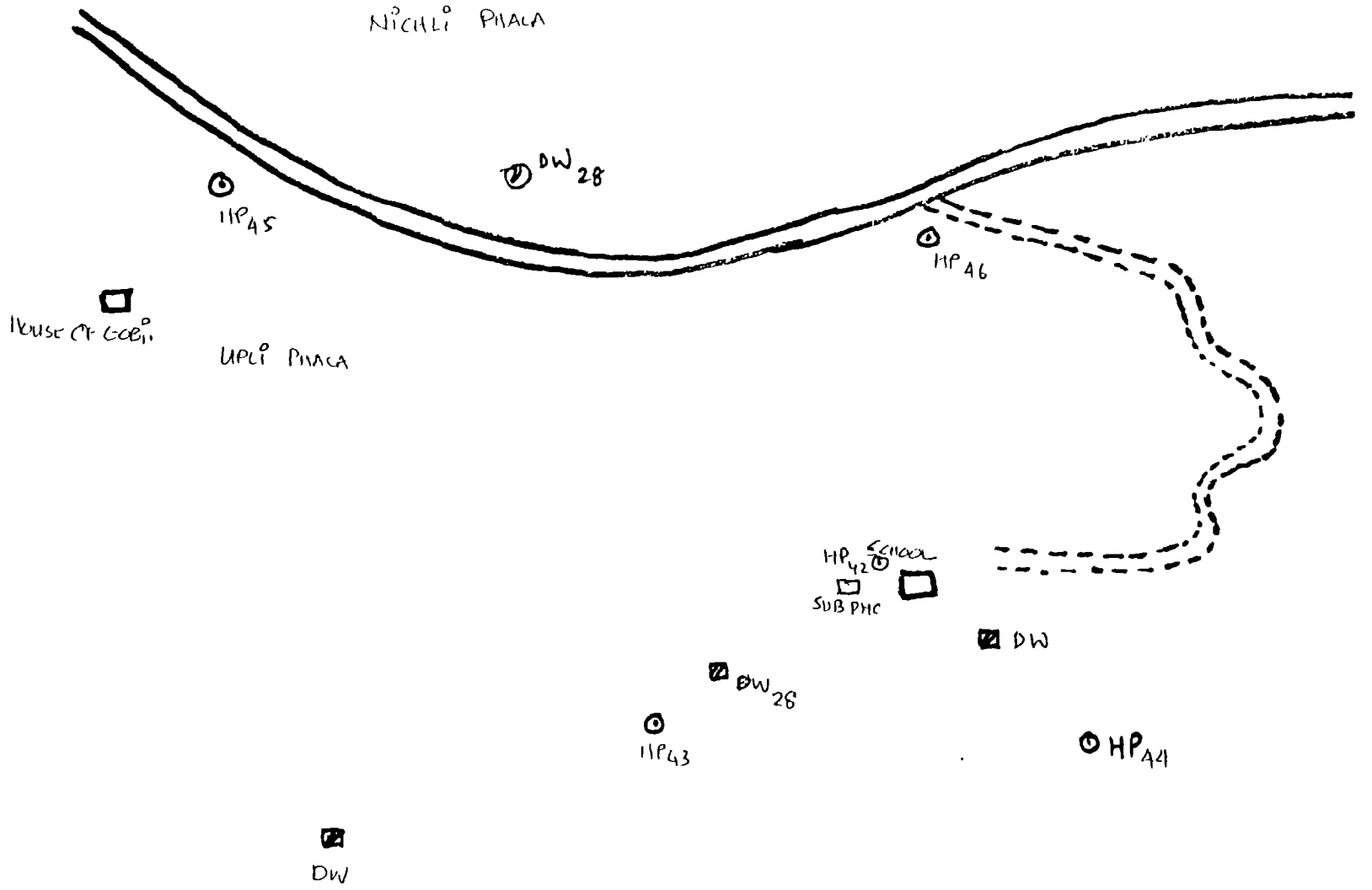
BAGAYACHA (बागायचा)





LOCATION SKETCH OF
VILLAGE SULIA (सुलिया)

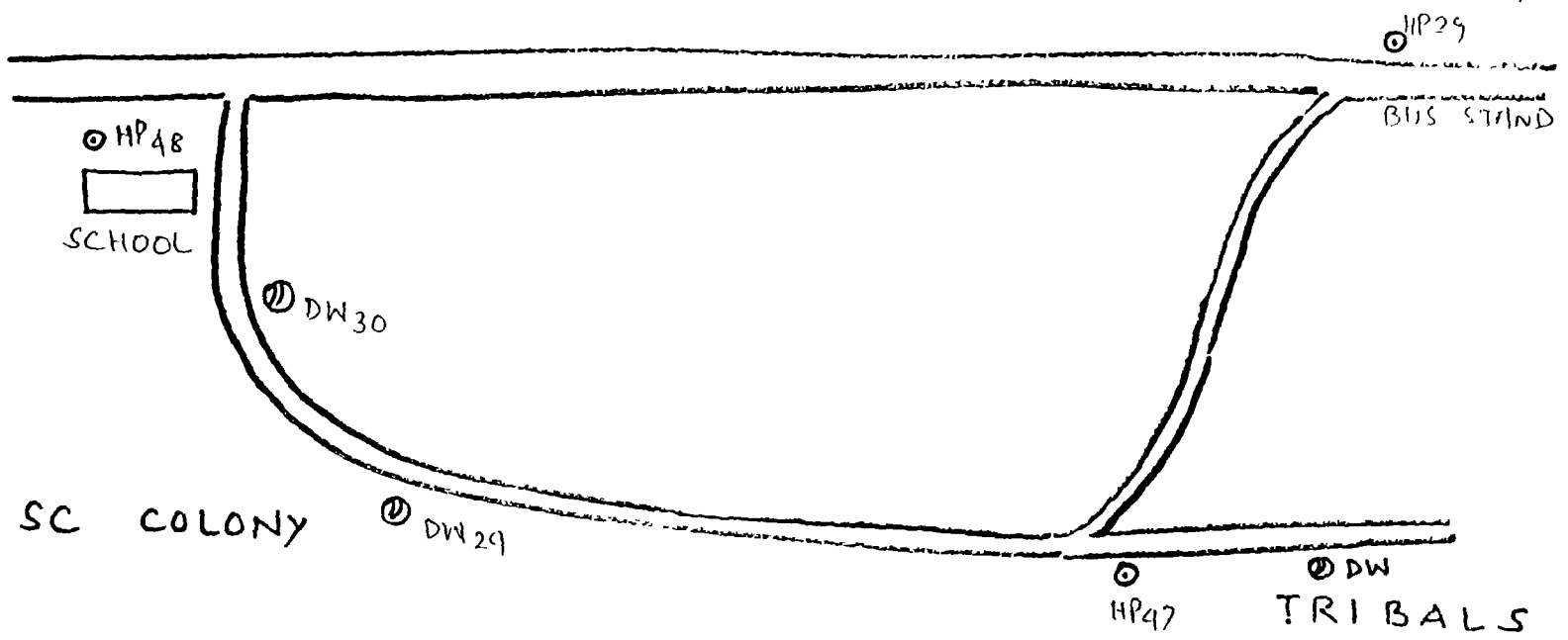




LOCATION SKETCH OF MAHUDI. (महूडी)

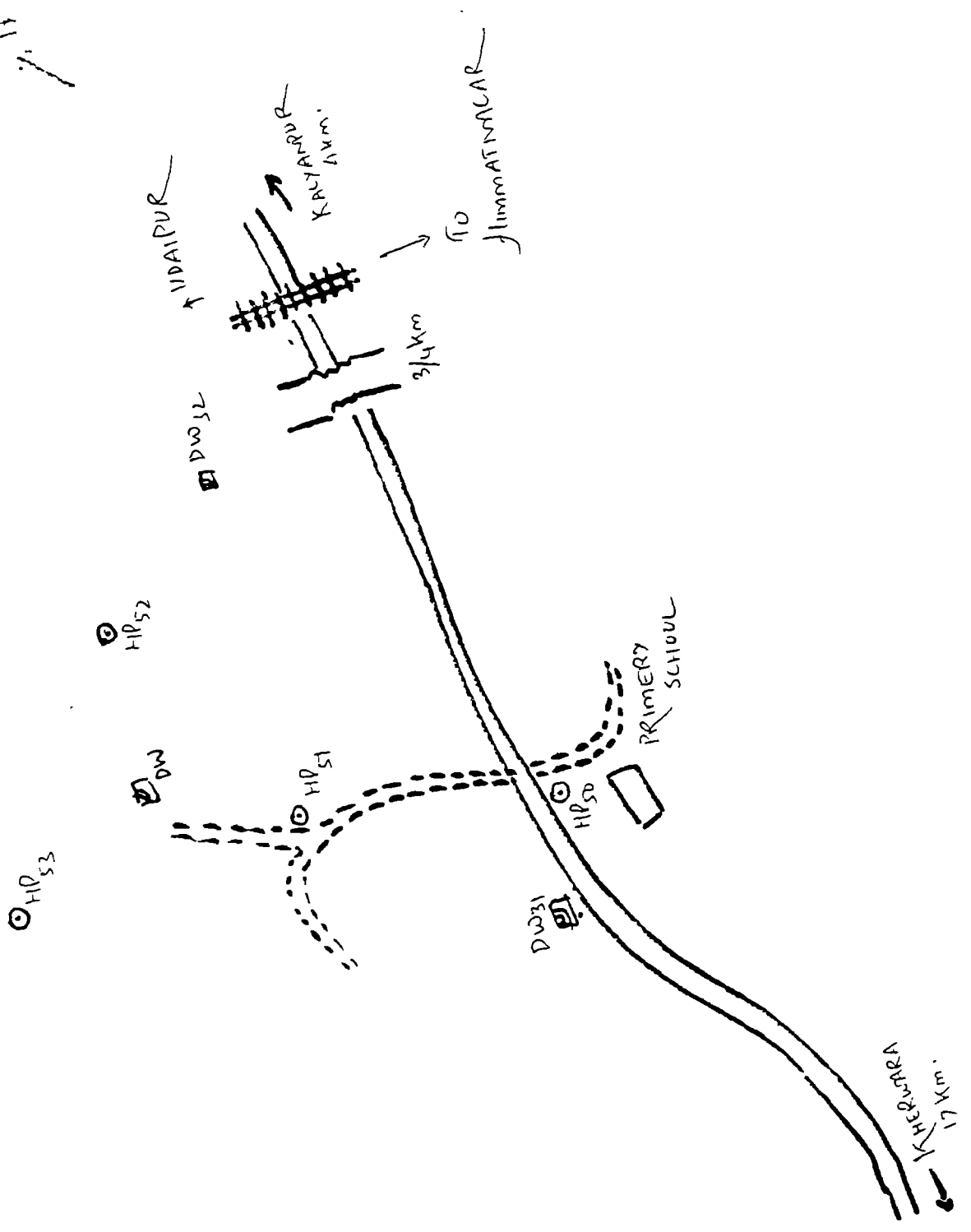
← BANSWAKA BKMS

TANMALA RD. →

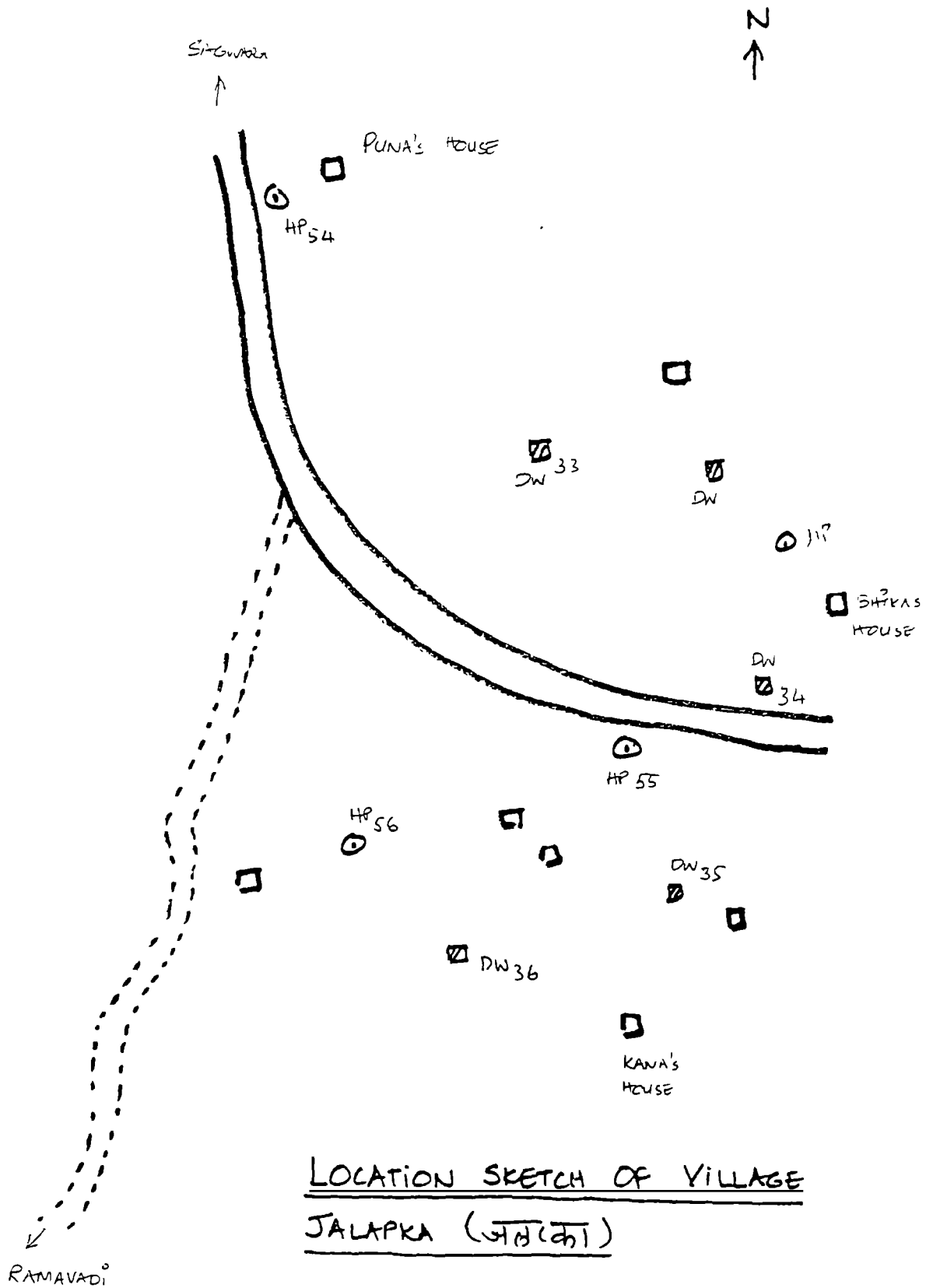


LOCATION SKETCH OF KUPPA (M.D.)

11/11



LOCATION SKETCH OF VIDAI PUR

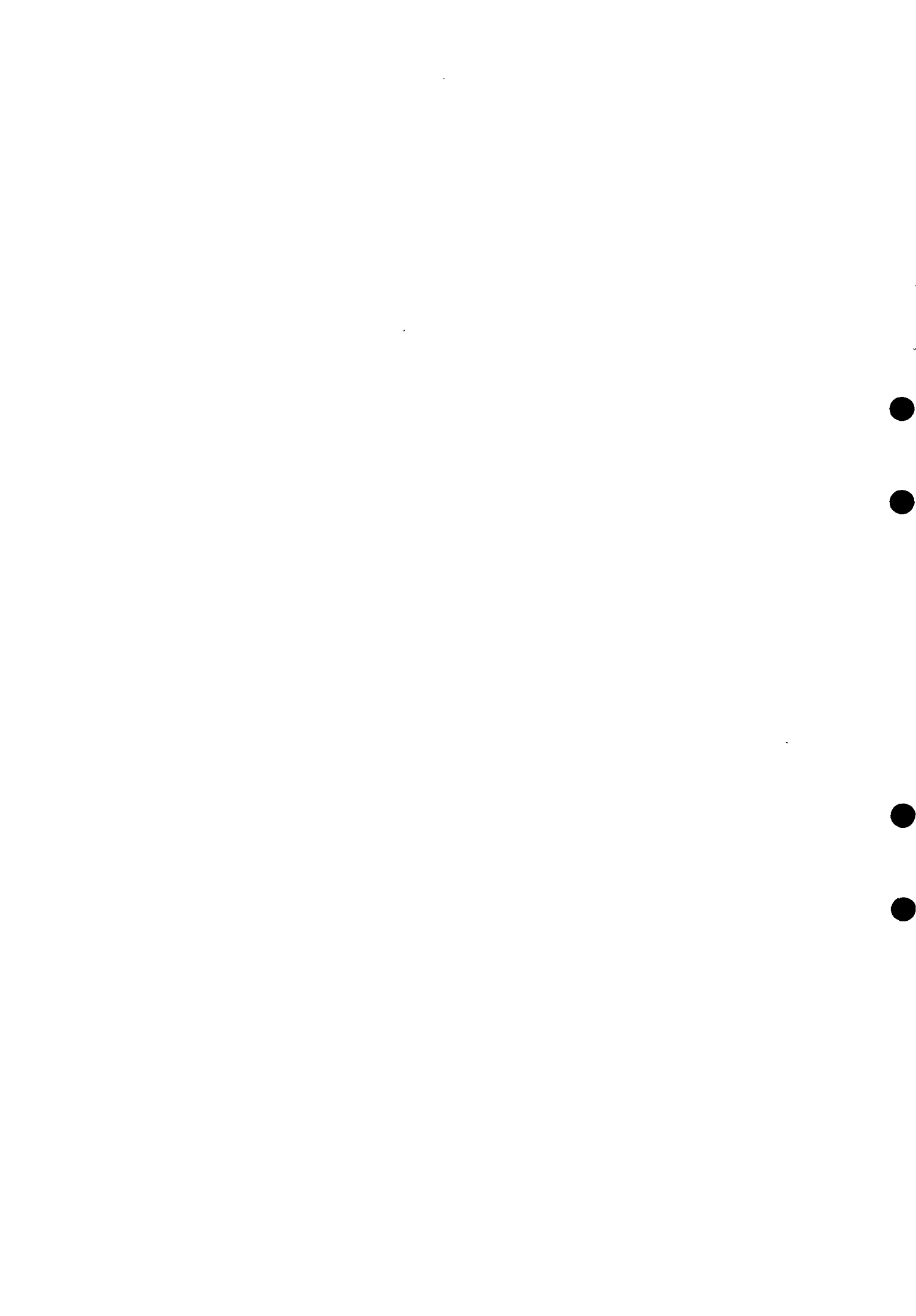


LOCATION SKETCH OF VILLAGE
JALAPKA (जालका)



APPENDIX 12

**SUGGESTIONS FOR ADAPTING COST EFFECTIVENESS ANALYSIS
TECHNIQUES TO RURAL WATER SUPPLY PROJECTS**



APPENDIX 12

Suggestions for Adapting Cost Effectiveness Analysis Techniques to Rural Water Supply Projects

1. Introduction

Resource constraints always affect plans and performance. In low and middle income countries it is especially important that the available resources are used as effectively as possible. Analysis of costs (inputs) and effectiveness (measured by indicators of output or outcome) enables planners and managers to determine whether the use of resources can be improved. Cost-effectiveness analysis (CEA) may be used to compare alternative strategies for reaching the same objective, or to compare the performance of similar units of service delivery. The analysis can go beyond assessing whether performance can be increased, to show where and how resources can be used better. To do this, the design of the CEA study must be based on a thorough understanding of the programme's operations.

This appendix describes what CEA means, emphasising its connection with operational performance and its application for improving effectiveness and choosing the best mix of strategies. Most of the examples are taken from work prepared for UNICEF's Eastern and Southern Africa Regional Office (1) and from evaluations of the Area Health Projects supported by DANIDA (2). Some illustrations indicate where the technique might be applied to SWACH activities and the recommendations suggest steps for adapting CEA to rural water supply projects.

2. What is Cost Effectiveness Analysis?

The term "cost analysis" is sometimes understood to include both cost-effectiveness analysis and cost-benefit analysis. However, the study design and type of data required vary considerably, depending upon the type of analysis. So when planning a study of costs, it is important to be aware of the full spectrum of analysis involving costs, which ranges from financial analysis through unit costing and cost-effectiveness analysis, to cost benefit analysis. Within this spectrum, the following distinctions can be made:

Cost analysis involves obtaining the historic cost or value of all inputs used to implement an activity. Thus it differs from a budget analysis (which leaves out "old" and undocumented inputs) and from cost projections (which do not necessarily represent the inputs that will actually be used).

The cost analysis is usually designed to aggregate all costs related to a specified activity or project (eg animators' training) for an identifiable unit (eg a village, Block or District). The cost per unit is often reported showing the percentage share of costs in each cost category (as in Chapter 4, Tables 5 and 6).

The unit costs may then be accumulated or divided to estimate costs for larger or smaller units. For example, animator training costs estimated for a sample of locations could be used when estimating animator training costs per District.

Conversely, the training cost per location could be used when estimating cost per trained animator. All of these measures are costs per unit.

For unit costs, the units are assumed to be of uniform quality. Thus the cost per trained animator treats all participants as equally ready and able to fulfil their intended role.

Cost-effectiveness analysis introduces a defined component of quality; it links costs to the result or outcome, measured by a variety of non-financial indicators. For animators, indicators which reflect the purpose of their training (e.g. increasing awareness of how to avoid Guineaworm) would incorporate a quality component. Evaluation of animators' activities suggests that "meetings held" are simply units without any indication of quality. An assessment of whether the animators are capable of conducting effective meetings (eg their own knowledge, and whether they can communicate it to others) would enable the analyst to construct a better indicator of outcome.

Cost-benefit analysis links economic costs to the impact of the intervention, assessed in the same coin as the costs. The analyst must make assumptions about the monetary value of outcomes expressed in physical or qualitative terms (eg years of healthy life gained). This type of analysis was developed for assessing large scale public investment projects such as dams and highways, whose effects would be felt throughout the economy.

The last type of analysis is clearly long term. It is vulnerable both to the influence exerted by the analyst's assumptions for converting qualitative or physical results into monetary values, and to exogenous factors (eg drought) which may counteract any positive impact and make the benefit difficult to measure.

3. Use of CEA in Analyzing Operational Performance

A cost-effectiveness study can highlight important points concerning operations (eg the lack of information about logistics considered essential for efficient planning). It can also pursue the analysis to illustrate variations in performance, either

- (a) between service delivery strategies, or
- (b) within a given strategy.

Analysis of variations in cost-effectiveness at the micro level, among similar types of units (eg crews installing handpumps) gives programme managers an indication of the economic implications of above-average and below-average performance. The best performing cost centres provide a natural example of what can be achieved by that type of unit in that setting - Block, District or State. This is one of the most powerful applications of the technique. To be capable of supporting operational analysis for use by programme managers, the study must be designed to meet this objective; the design of CEA studies is discussed in Section 4 below.

Information on the process of implementation and on outcome sometimes reveals unexpected outcomes. Project staff for a water and malaria control project in Kenya found that in addition to the planned work, the community had designed and built a cattle

dip using waste water from the official scheme. Another unexpected benefit was that all the cows producing one litre per day had been replaced by stock with eight times higher yields, apparently due to the increased availability of water. To recognize the value of these outcomes, the analysis could go beyond cost-effectiveness (eg cost per household access to water, or cost per 100 litres of potable water) to assess the overall benefits of the project, including labour saved by not carrying water, increased yields, and improved nutrition and/or income.

4. Study Design

a) Objectives

Before any study can be designed the purpose must be specified and agreed. For a CEA this includes identifying the outputs that are to be assessed; then the inputs (resources) used to produce each output are specified. The measures of output should contain a quality component in order to embrace the concept of effectiveness. As discussed in Section 8, someone who has completed a training course but who is not functioning as intended cannot produce the intended quality of output. When the objective of the study is clear, the subsequent details of sample design, choice of cost centres and data collection can be addressed.

b) Sampling Strategies

A stratified sample, designed to represent specific features (such as accessibility from the administrative nucleus, or type of rock), or a purposive sample based on specific aspects of performance (eg villages covered by female handpump mechanics) may be more enlightening than a strictly random sample. If insufficient data exist for determining the best, worst and average cost centres in advance (see (c) below), then the data collected should include indicators such as volume of activity, percent of eligibles covered, and travel time to nearest supervision and supply depot. These data will enable the analyst to assess retrospectively what the sample represented.

c) Choosing Cost Centres

A cost centre is a unit for which the analyst decides to estimate costs. If the study objective includes analysis of managerial performance, the cost centre selected should be an organisational nucleus of the programme's activity. In Rajasthan, the Block is a natural cost centre for some aspects of the water projects (eg handpump maintenance and repair), which use this administrative level as their organizational focus. Costs from a sample of service delivery points (eg workshops) can be taken within the Block, then used as part of the data for the Block as a whole. A sample of Blocks representing the range of both logistical accessibility and performance will provide a robust estimate of District costs.

For other activities, the District might be a more appropriate cost centre. If the District is large or contains a diverse array of service delivery points, a two-tier sample might strengthen the analysis.

At the micro level of analysis, smaller units such as health centres or handpump maintenance workshops could be chosen as cost centres.

d) Field Data

The most informative study design is one which collects the data from the field, obtaining operational information from the records, registers, reporting system, on-the-spot inventories, and discussions with local staff and beneficiaries. Field visits always reveal a wide variety of staffing patterns, out-of-order equipment, arrangement of services, and unanticipated local information. In contrast, cost analysis based on desk studies of reported data will be flawed to the extent that few programmes keep up-to-date records showing precisely what resources are involved in producing a given activity or output. For example, inventories showing equipment (i) in place, (ii) in working order and (iii) in use, are not the same as (iv) equipment supplied, which is the information usually available in the files.

Information on costs should be collected in the form which is most convenient for field work, rather than in the form required for the calculations. After some pilot work on operational detail has been completed, standard formats should be developed. This will help to ensure that all necessary data are collected in a clear and unambiguous manner. Formats should always be pretested and revised before fieldwork begins.

e) Time and Budget

The analysis is constrained by time and budget, so care must be taken to collect accurate data efficiently, from a well chosen sample. The size of the sample will usually be affected by how much time and budget are available; this is usually an iterative process of decision making.

5. Sources of Data on Costs

The analyst must have a thorough understanding of a programme's operations, as this helps in identifying all resources used during implementation. Most of the data on expenditure will come from financial records (see Section 6 below).

a) Prices and Quantities

Purchase prices should all refer to the same year (usually "last year"), and the cost of imported items should include freight and insurance. Invoices and shipping reports are invaluable sources of this type of information, but care must be taken to identify the cost per item, as supplies are often procured in bulk.

Some analysts recommend using shadow wages and prices (i.e. what the price might be in the absence of market distortions). Choosing the right shadow wage introduces an extra layer of assumptions into the analysis, and reduces the clarity of the calculations. Staff who are paid very low wages often seem to have adjusted their level of effort, or hours of work, accordingly, so increasing the value of their time might be quite inappropriate. Incentives paid to nationals should be included as a cost, and making a further adjustment to their salaries would overestimate staff costs.

b) Community Resources

If the study is to compare inputs with outputs, all sources of costs should be included. It is not appropriate to base the analysis on government and donor funding alone, if inputs from other sources are also required to make the programme work.

Donated labour (as in construction projects) can be costed at an appropriate wage rate. Items obtained at less than the local market price, through bulk purchase or low cost procurement (eg essential drugs; filters) should be costed at their purchase price. For cost-effectiveness analysis of programmes such as SWACH, using the prices actually paid is advocated rather than the use of shadow prices.

An example from Kenya illustrates that plans for implementation must take into account the value of resources provided by the community.

In 1988 in Kisii, attendance for immunization at health centres was lower than expected. The mothers from the surrounding villages explained that bus fares had increased so much that they could not afford the trip. This cost should be included in a cost analysis, which could be used to explore the case for providing outreach services: would it be more effective to send one or two health staff to the community (possibly every 6 weeks instead of once per month), than to expect all the eligibles to travel to the health centre, given the cost of transport?

c) Exchange Rates

When the official exchange rate differs substantially from the market rate, there may be some delicacy about which rate to use. The analyst can show costs calculated at both rates in a sensitivity analysis, which demonstrates how sensitive the cost estimates are to this variable. If a computer spreadsheet is used for working out the costs, one cell should be used for the exchange rate, and all currency conversions performed by referencing this cell (see Appendix 8). Then the sensitivity analysis can be accomplished by changing one number.

6. Comments on Using Financial Records for Cost Analysis

For a number of reasons, financial records must be carefully analysed before being used for cost data:

- a) The allocated codes are not necessarily specific enough for the analyst to assume that all expenditure with a particular activity code was actually used for that activity. This problem has already been highlighted in Chapter 4 where the absence of a line item corresponding to the target and achievement of improving India Mark II handpumps was noted (see Table 9 and following discussion).
- b) It is essential to distinguish between the amount issued on call forwards and the amount actually expended (ie recorded in the accounts as spent). Previous

work has shown that expenditure as a percentage of the call forward issued can vary from 0% to more than 100%.

- c) Programmes and projects often procure supplies in bulk, and these may exceed the amount used in one year or in one cost centre. Cost-effectiveness analysis measures the resources actually used to implement an activity, so it would be incorrect to include all expenditure on an item (eg Temephos) without checking on the quantity of supplies actually used during the period and in the cost centre being analysed.

If analysis of cost-effectiveness is planned, one way of solving the lack of specificity in codes on call forwards and line items is to issue a separate call forward or use a separate line item for each activity. Thus animators' honoraria could be distinguished from scouts' honoraria. This approach would substantially increase the volume of paperwork in the supply and finance departments. The alternative is to go back to the accounting department's records and extract the details required from original invoices.

Financial monitoring and budget analysis are quite distinct from cost-effectiveness analysis. Systems designed for accounting purposes do not necessarily serve the needs of CEA, and financial summaries should not be regarded as the ultimate source of cost data. For most activities, inputs come from more than one source; an inventory is a reliable way of identifying the inputs actually used. For items supplied by UNICEF, shipping reports provide the best source of information on cost per item; freight and insurance should be included as part of the cost, worked out per item.

7. Estimating the Cost of Resources

After fieldwork, the information on resource inputs is divided into categories. Resources that are used within one year are treated as recurrent costs; these include personnel (including benefits and housing allowance), training, supplies, and transportation (fuel, oil, lubricant, fares, spares), social mobilization, and surveys. Resources such as buildings, vehicles and equipment which are expected to last for more than one year are capital costs which have to be converted into an annualized cost. (Start-up training costs can be regarded as an investment and treated as capital costs.) The cost categories are shown in Chapter 4 and in Appendix 8. Techniques for estimating annualized capital costs are given in Appendix 7.

There are several manuals which give considerable detail about cost estimation (3,4,5,6). If the analysis is to be used subsequently for identifying operational features of interest to programme managers, two points must be emphasized:

- a) The cost calculations must be **transparent**; it will save time and error if each assumption behind the calculations is stated, and incorporated as a variable in the arithmetic if possible. If better information becomes available, the analyst will find it much easier to refine the assumptions and to update the estimates if the cost calculations are transparent from the outset.

- b) The calculations should be kept as **disaggregated** as possible. For summary purposes, the costs of each major category can be shown, but for producing operational analysis of factors associated with high output at low cost (or the worst combination, low output at high cost), data on each cost centre will be needed. For this analysis, ranges and variation are more useful than averages.

Several sections of a spreadsheet (or several spreadsheets) should be set up to hold the disaggregated data and the step by step calculations.

8. Indicators of Outcome

Cost analysis shows the value of resources used in a project or activity, but needs to be linked to the outcome in order to assess cost-effectiveness. The choice of outcome indicators is affected by what can be measured and quantified. For example:

UCI has the objective of preventing six diseases. Because of the difficulty of measuring the long-term effect upon morbidity, or analysing the community's level of immunity, intermediate indicators which reflect the programme's output are often used to assess cost-effectiveness, such as number of fully immunized children.

The essential drugs programme (EDP) provides the supplies for treating morbidity. Measuring effectiveness in terms of treatments involves complex epidemiological interpretation, because patterns and levels of disease vary. Using an intermediate indicator of the process of implementation - distribution of supplies - provides a simple measure of whether the programme was providing the drugs needed for treatment.

The choice of indicators should also be influenced by the stage of the programme's development. Indicators which are appropriate during the early phases of implementation may fail to discriminate between better and worse performance in an established programme.

In Somalia, project staff suggested that an appropriate indicator of EDP supply to community level would be the number of community health workers (CHWs) supplied with drugs at least once in the year. If the analysis had used the number of supervision and supply visits per month, all CHWs would have scored zero, so this indicator would fail to distinguish between them.

Some indicators of project activity should be available from the reporting systems used by project managers. The analytical process of collecting the data and comparing records with independent counts or inventories (eg handpumps installed; handpumps working; handpumps with potable water) usually reveals a wealth of information for improving operations. Even the observation that expected information was not available can alert programme managers to the need for action.

A case study in Somalia included analysis of the value of warehouse stock from two sources: the Stock Book (\$95.6 million), and an inventory corrected during visits to the warehouse (\$195,634). The finding that stock records were so

inaccurate indicated that it was impossible to monitor the programme properly. The task of keeping stock records correctly was proposed as a central responsibility for warehouse staff, to be discussed when incentives were renegotiated.

In Zambia's UCI costing study, the number of children fully immunized before their first birthday could not be identified from the programme's reports, records, or registers at the cost centres surveyed. Instead, number of FICs was estimated as the number of children receiving DPT3, the least popular antigen. Programme managers and health staff ought to have been monitoring, on a monthly basis, the number of children completing their immunizations on schedule. The finding that this indicator was not available indicated that eligibles' use of services was not being actively monitored.

Indicators of effectiveness should reflect not only numerical achievement, but also the desired quality of implementation. Continuing the immunization example: fully immunized before first birthday is a much more stringent indicator than fully immunized with age unspecified. Use of the latter will obscure the inefficiencies in a programme which gives late doses.

Project targets that have created distorting incentives should not be used as indicators; for example if there has been great effort to train the targeted number of TBAs (in spite of recruitment difficulties and resistance to new delivery practices), the numerical target may have been met without making any real progress towards the programme objective of increasing safe deliveries. Sometimes a special data collection effort (or direct observation) is needed to obtain indicators which incorporate the quality component; for TBA training, an evaluation could assess how many of the participants (i) completed the training; (ii) achieved the training objectives; (iii) have the necessary supplies with them (eg sterile razor blade and cord tape); (iv) practised safe delivery techniques as defined in their curriculum. The last indicator of practices can be measured by information on whether the cord was cut and tied in the approved manner (eg sterile blade and two ties with cord tape).

When these very simple indicators were used in an evaluation in Tamil Nadu, they revealed that although training targets had been met, none of the trained TBAs surveyed had the knowledge or supplies to enable her to conduct aseptic deliveries.

It would appear that similar indicators can be developed to provide an output indicator for SWACH that incorporates essential elements of quality, such as the provision of safe drinking water. Provision of handpumps may be necessary but it is not sufficient. The handpumps have to work (which involves competent maintenance) and the water has to be uncontaminated. By disaggregating all the elements involved in providing this output, the analysis will identify the weak and strong links in the chain of implementation: site selection, drilling, installation, maintenance and repair, and the users' contributions to the outcome. The successes provide useful insights into how to avoid problems in the future.

Linking operational performance to costs is straightforward when applied to activities with standard technical inputs and outcome (eg eight doses of vaccine, and a fully immunized child). The linkage is more complex if technical inputs vary widely, depending on the

particular setting. Provision of water supply depends on existing water sources, and the cost of different technologies varies widely. The lowest cost technology is not necessarily feasible throughout the project area. The output produced may also differ between sites; one may have hand pumps, another stand pipes, and a third protected wells. Qualitative or physical indicators of outcome, such as households with access (to be carefully defined) to safe water, can be used to build up experience of the cost-effectiveness of different approaches, including their sustainability.

9. Conclusions

The project, District or scheme with the lowest cost per outcome is not necessarily a model for all to follow. For example, where population is denser, cost per output should be lower; the conclusion is not that sparsely populated areas should be ignored, or settlement patterns altered. Careful interpretation of CEA results should indicate the factors influencing costs, and thus help identify the best strategy for each location and situation. The temptation to regard the strategy with the lowest cost per output as the most appropriate for all is too simplistic and should be resisted.

It is neither necessary nor desirable to rely upon one unit cost, nor upon one indicator of effectiveness. Different units and indicators reflect specific aspects of output; for example mobile or campaign strategies for immunisation may have lower cost per dose than health centres, but the fixed facilities usually have greater continuity of service so cost per FIC (within the target age) may be lower. The cost analysis shows the resources needed to support each strategy. Comparisons of unit cost and cost-effectiveness between similar types of cost centre show where resource use and performance can be improved. Finally, the optimal combination of strategies can be mapped out, only using the high cost/low output strategies where there is no feasible alternative.

Refining the combination of strategies is an iterative process which involves making connections between CEA, planning, monitoring of implementation and qualitative assessment of activities. If this is done in the early stages of implementation, the benefit of applying lessons learned and adjusting strategies should produce a more cost-effective result.

Cost-effectiveness analysis is time-consuming. Quick and dirty analysis produces flawed results, which give a misleading impression of cost-effectiveness and may be used to support incorrect strategic decisions. Unfortunately there is as yet no statistical method for checking the degree of precision obtained in cost analysis, as there is for survey research. (The hypothesis is that cost estimates are likely to be biased low due to the analyst's failure to identify relevant costs.) Thus it is essential that the analyst understands the operational details of the activity being costed, and uses this understanding in the interpretation of the data. Then the results are more likely to be useful in planning, implementing and evaluating projects.

10. Recommendations

The level of resources committed to providing safe water and the known variations in performance regarding handpump installation and maintenance suggest that water supply projects would benefit from being exposed to cost-effectiveness analysis.

The first step is to clarify the expectations of the analysis: what are the concerns of the programme managers? Do these concerns address those of the engineers, Block and village level officials, mechanics and users? Can these concerns be addressed by CEA based on a strong operational input? This discussion will shape the objectives for the CEA.

As mentioned in Section 4 above, discussion of objectives should also involve consideration of output indicators, including the quality components.

Given SWACH's focus on involving the community in many aspects of rural water supply, any CEA should be designed to take account of this input when assessing the factors associated with better or worse performance and outcome.

The more detailed the prior knowledge about the geographic and geological features of the project area, and of the installations completed (by whom and when), the better informed will be discussions about sampling strategy and the logistics of data collection. For optimum usefulness of feedback it is recommended that any CEA study should include a comparison of formal records kept by the authorities with data collected from the field. In this way the CEA also serves as a partial management audit. It is expected that this would be particularly useful when applied to whether handpumps were working reliably, regularity of maintenance, and promptness of unscheduled repairs.

It is recommended that the interest in applying CEA techniques to rural water supply should be followed up by preparing terms of reference based on the discussions of objectives outlined above. In light of the complex technical considerations involved in both the operational detail of water supply engineering and CEA, a multidisciplinary team should be formed to carry out the study.

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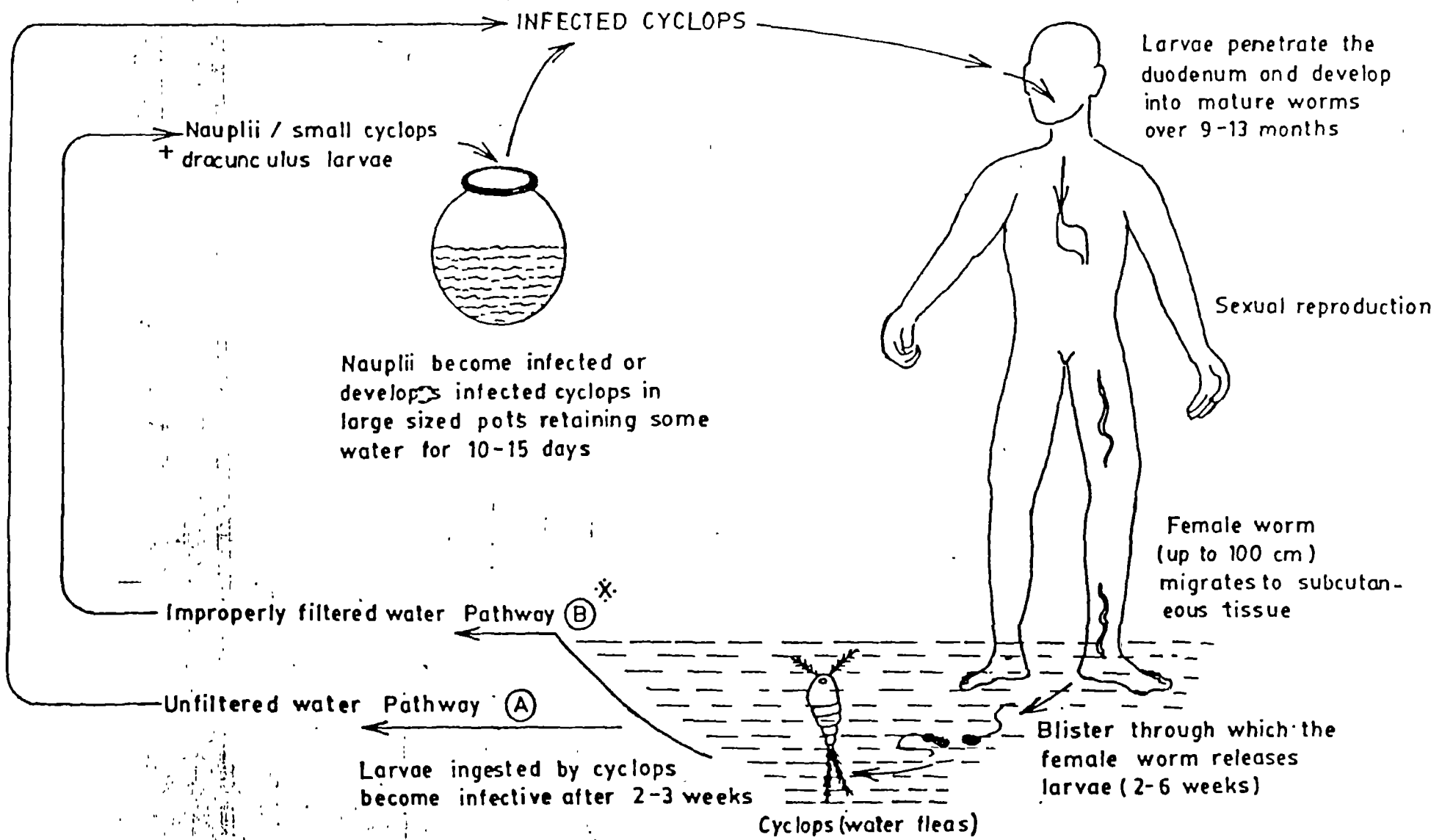


APPENDIX 13

LIFE CYCLE OF GUINEAWORM (DRACUNCULUS) AND POSSIBLE PATH
WAYS OF INFECTION IN TRIBAL AREAS



4 LIFE OF WORM (Dracunculus) AND POSSIBLE PATHWAYS OF INFECTION IN TRIBAL AREAS



* Dracunculus larvae from source water reaches to Pitcher without failure even when the fine cloth is used to filter water



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DETAILS OF HANDPUMPS VISITED IN SWACHH PROJECT AREAS

SI	Location	Year of Install.	Type	Service period Month/Yr	Used by number of Families	number of Animals	Access to SC / ST	Animal waste disposal	Result of Bact analysis	Lying defunct How long	in last 1 year Why ?	Remarks	
HP 1	Udaipur (Gogunda block) Kundau village (approachability during rains difficult)	1988	TH	11	12	30	15	No	15 mts.	analysis not done	6 months	not known	Presently defunct since last 6 months No cattle trough or washing slab. Pedestal rusted.
HP 2	Sulhar Madra Behind primary school All seasons motorable road	1988	do	12	50	100	for STs	50 mts.	do	2 days	washers worn out	Supplies water to major part of village and ongoers 4 nuts/bolts of water tank missing.	
HP 3	Near Mataji temple	1983	do	4-5	05	Nil	do	30.40 mts	do	4-5 months	leakage through pipe	Dry during Feb - July. Water comes with difficulty. Washers worn out/pipe leak	
HP 4	Opp. Udallal's house	1981	do	-	-	-	-	very close	do	-	not in use	Not in use since several years. Water stinks. Possibility of seepage of animal waste.	
HP 5	SC Colony	1983	do	12	40	-	only for SC	beyond 50 mts.	do	-	no information	Yield reduces during summer. Animals also go to anicut for water. 4 nuts/bolts missing. No cattle trough, channel or washing slab	
HP 6	Sarada block (Gamri) (approachability during rains difficult) Near Bus stop	1978	do	12	100	less	for all	do	do	4 days (Sept. '93)	pipe leakage	Animals take water from lake. Chain cover missing, drain length inadequate. Cylinder below 18 mts.	
HP 7	Near Khana's house	1986	do	12	48	80	for all	25 mts	do	7 days in Nov '93	washer worn out	Handle damaged. Soil below platform eroded away water stagnates nearby. Cylinder 16 mts.	
HP 8	300 mt North of HP 7	1986	do	12	60	150	for all	beyond 50 mts.	do	6 months	pipe leakage, washer worn out	Pedestal rusted, water stagnates nearby, soil below platform & drainage eroded away, 2 bolts missing. Cylinder below 15 mts	
HP 9	200 mt. North of HP 8 Opp. Khana's house	1986	do	12	25	100	for all	20 mts	do	-	-	Cylinder below 18 mts, water stagnates, supply reduces in summer	
HP 10	Near the school	1988	do	-	-	-	for school	beyond 50 mts.	-	5 years	Water table deep ?	Cylinder below 39 mts. After installation it was functional for only 3 months. Dry as per mistries report. Villagers deny. Little water comes after long pumping. Perhaps washers are worn out.	
HP 11	Nethara Motorable in all seasons. Opp. Satrajai's house	1989	do	12	15	50	for all	15 mts.	do	6 months	washers	Yields brackish, rusty water in summer. Platform, drain need repair. No chain cover, no bolts.	
HP 12	Opp Hariprakash's house 200 from HP 11	1985	do	12	18	50	for STs	beyond 50 mts.	Negative fit for drinking	15 days (in 1992)	pipe leakage	Cylinder below 17 mt. Water level 13.5 mt. Supply reduces during summer. Chain weak, bolts missing, no cattle trough. Chain cover missing.	
HP 13	Near Middle school	1991	11	12	170 students + families	few	for school	do	not tested	1 month	Riserpipe detached and chain delinked	Cattle trough, washing slab, drain all missing. Taste of water is good. Roots have choked the bore. Could not measure water level or cylinder depth, water is hard. Tea splits were brackish in summer	
HP 14	In Karan talav phola by the road side	-	11	12	30	100	for STs	do	not tested	-	not reported	Soil below platform is eroded away. No complete nuts/bolts, drain length inadequate, water stagnates, no cattle trough, washing slab or soak pit.	

										SCHOOL			
HP 16	200 mts North of HP12	1990	11	12	-	-	for STs	-	not tested	2 months	Reason unknown	-	months got defunct Was lying as such for 5 years later pipes and other assemblies were removed Presently the bore is filled with stones.
HP 17	Near Primary School Karatphala	-	11	12	25-30	few	for STs	beyond 50 mts	not done		washers damaged	Platform needs repair, no cattle trough, chain cover missing Round the year supply.	
HP 18	NW of HP 17 at 120 mts.	-	11	12	35	50	for STs	do	do		pipe leakage	Handle bearing out of order, water stagnates nearby, drain length inadequate (0.5 mt). no washing slab or cattle trough, load is more during summer.	
HP 19	N E of HP 18 at 200 mt		11							2 years		Pedestal totally rusted. Cylinder at 12 mt. Chain cover removed head and tank assemblies open. Filled up with stones in 1991	
HP 20	Near bus stop	1988	11	12	25 + 150 students	few	for all	beyond 50 mts	not done			Pipes are rusted, drainage 1.5 mt, water stagnates, water is rusty in summer. Even small iron pieces are reported	
HP 21	Pal Sarada (Granite gneiss) Motorable in all seasons. Behind Middle school	1980	11	12	20	200	for all	beyond 50 mts	do	2 months 1 year	- washer - pipes replaced	Cylinder below 24 mt. In the morning tastes slightly repelling, rusty	
HP 22	250 mts. HP 21 near house of Shankar S/o Gangu	1986	11	12	20 (when in use)	100	for STs	30 mts.	do	1/2 2 years	lack of initiative	Depth reported 60 mt. Yield reduces during summer. Rod/pipe assembly removed drain damaged. Matter reported to the then J.En. PHED Sarada by the mistry. The expects village to contribute. People seem to be ready. No follow up due to no face to face discussion	
HP 23	Near Primary School Karatphala	-	11	12	25	200 + 54 students school + 5 families	for STs	beyond 50 mts	do	2 months	chain, washer replacement	Pump working efficiently.	
HP 24	Inside Karatphala	-	11	12	30	200	for STs	at 30 mts.	do	-	-	Pump working efficiently.	
HP 25	DUNGARPUR BLOCK Kushal Magri Near Haradu Ramji's house (motorable in all seasons)	1988	11	12	15	100	for STs	-	not done	Sept. '93	Rod detached	Water stagnates nearby, no washing slab, drain length inadequate. Cylinder reported below 21 mts.	
HP 26	SSW of HP 25 at 150 mts	1986	11	12	10	80	for STs	30-40	not done	not defunct since a year		Cylinder below 30 mts. . Before 3-4 years two pipes were removed due to leakage.	
HP 27	Near Vaja's house	-	11	12	15	100	for STs	30-40	-	-	-	Water stagnates nearby, soil below platform is eroded away, drain needs repair. No chain cover.	
HP 28	Palvasi (Phyllite) (approachability difficult in rainy season) Opp Middle School, Karatphala	-	11	12	20	150	for all	beyond 50 mt	not done	before one year	washers worn out	Handle replaced in Nov '93. Riser pipes fell down before 1 year and retrieved later	
HP 29	Opp to Balvadi's	-	11	12	25	150	for STs	beyond 50 mt	not done	before 1 yr	washers worn out	During repair head assembly and pipes were being taken away by PHED but people forcefully retained as they inform. No handpump at Kizkhande phals for 40 families. People demanded a handpump.	
HP 30	Kolkhande khas:- (Phyllite) (approachability difficult in rainy season) Near Post Office	1993	11	12	25	100	No	10 mts	do		not defunct	Water is slightly brackish. Except drinking used for other purposes. For drinking families go to a nearby closed well. Drain inadequately, pedestal shakes, no washing slab or cattle trough	
HP 31	Yadavo ki basti	1987	11	12	60	300	for SCs	40 mt	do	never defunct before		No cattle trough or washing slab, water stagnates nearby needs repair. During rains water consumption.	

HP 32	Near Vaniranj's house																	chain missing (replaced to m. 27 & repaired) water tastes as reported
HP 33	Near Toda Chand's house	1987	11	12	25	200	for STs	40 mts	do	few days	chain broken							No chain cover, no drain, washing slab or cattle trough water slightly brackish but potable. Stagnation on road, yield reduces in summer few families go to nearby HP or closed well
HP 34	Near Gotam's house	1991	11	12	50	300	for STs	30 mts	do	never defunct earlier								Cylinder below 39 mts, soil from below the platform eroded away. No cattle trough or washing slab, platform needs repair. People take special care in operation.
BANSWARA DISTRICT																		
Kushalgarh block (Mokhampura)																		
(Basalt) Motorable - all season																		
HP 35	Opp to Anganwadi	1983	11	12	40	few	No	40 mts	do	Nov. '93	pipes fell down							Cylinder below 39 mts. hard to pump bore depth 57 mts. Water slightly hard. Water to animals during rainy seasons, sometimes
HP 36	Near middle school	-	11	12	60	250	No	beyond 50 mts	do	last year	washer rubber sheet worn out							Cylinder at comparatively shallow level, pump runs smooth. Cattle trough not in use as it is dirty. Washing cloth on platform is also in practice. Water to animals during summer only
HP 37	Tribal Basti	-	11	12	15	150	for STs	beyond 50 mts	do	last year	chain, washer replaced							Platform, slab, drain all damaged, trough is in good condition but not in use. Chain cover missing, cylinder below 30 mts
HP 38	Near Ramji Mandir	1981	11	-	-	-	No	20 mts	do	since 1 yr	water tastes appalling							Initially had good water, platform was damaged after washing began on that, drain damaged. No cattle trough.
HP 39	Bagayacha (Basalt) Motorable in all seasons. Opp Lulu's house	-	11	12	18	150	for all	beyond 50 mts	not done	6 months	rod detached							Reported depth 54 mt, water struck 13 mt, collapsed below 28 mts before 3 yrs. Repaired just before election i.e. Nov. '93 but now defunct. Reason could be wear and tear of washer or chocking of cylinder due to inadequate space below it. Platform partly damaged, no washing slab
HP 40	Salra (basalt) (Approachability difficult in every season) Near Primary school	1985	11	12	30	400	for all	do	do	4-5 days	washers worn out							Drain damaged. No slab or trough. Water stagnates. Depth to cylinder 24 mt (reported). Yield/test good. Head assembly shakes (bolts loose). Out of 60 rest of 30 families fetch water from dug/step wells or stream base flow.
HP 41	Opp. Gagal Lala's house	1991	11	12	30	400	for all	do	do	-	-							Depth reported 45 mt. Drilled in Dec. '91, HP filled in May '92. Yield very little since beginning. People had other site in mind and objected to this. People complained to PMCD immediately. No follow up.
Kushalgarh block																		
Mahudi (basalt)																		
(approachability difficult in rainy season)																		
HP 42	Near Middle school	1993	11	12	15	few	for all	beyond 50 mts	not done	2-3 days	pipe leak, rod slipped							Cylinder below 36 mt. Intermittent supply in summer, no taste change. Rod slipped before 10 days, before 1 yr pipe leakage reported.
HP 43	SW of HP 38 at 300 mts	-		12	60	600	for all	do	do	3-4 days	washer							Cylinder below 24 mt. 2 bolts missing. June '93 washer and Sept. '93 handle replaced. Tastes appalling (rusty) in summer.
HP 44	East of HP 39 at 250 mt	1982	11	12	18	200	for STs	40 mts	do	3 years	not known							Reported enough yield while drilling. Cylinder at 42 mts. Handle and head in bad shape, need replacement. No chain cover
HP 45	N 60 W of middle school at 800 mts. Northern part of Opp. Lala's.	1984	11	12	20	200	for STs	beyond 50 mts	do	1 week	washers worn out							Water tastes good. Chain cover missing. Pipe leakage before 6 months and washer wear & tear before 1 yr. reported

HP 46	Near Transformer by the road side	-	11	9	10 + ongoers	50	for STs	do	do	not reported	Cylinder below 36 mts (reported). No cattle trough Leakage in two pipes noticed before 3-4 months. Removed	
HP 47	Kupra (basalt) (motorable in all seasons) Near LAMPs office	-	11	12	50	few	No	beyond 50 mts	Positive unfit for drinking	1-2 days	nut bolts and washers worn out, pipes dethreaded.	Cylinder below 9 mt. HP is heavily loaded resulting in frequent break downs (every 3 months). People take care of repair/report Canal's flow during Nov - March. Animal take water from canal. Nearby tank gets dried up during summer. Adequate and properly managed water supply.
HP 48	Within Middle school premises	-	11	12	10 + 200 students	n/a	for all	human waste at 40 mt.	Negative, fit for drinking	2-3 days	washer worn out	Little water stagnates at 10 mt. 2 bolts missing. Cylinder at 12 mt. Ex-student of school, trained of HP takes up repairs
HP 49	Near bus stand	1987	11	12	15 + ongoers	50	for all	beyond 50 mts	Negative fit for drinking	2-3 days	washer rod slipped	Water stagnates nearby, platform partly damaged. Rod slipped before 1 year corrected. Animals take water during summer.
HP 50	Udaipur dist. (Kherwara block) Gura (motorable in all season)	1988	11	12	30 + students	250	for all	beyond 50 mts	Negative fit for drinking	2 days	washers worn out	Head assembly shakes, 3 bolts missing, water stagnation noticed. Cylinder below 24 mts. People share cost of minor spare parts. Last repaired Oct '93.
HP 51	HW of school at 200 mts	1988	11	12	15	200	for STs	30 mts	not tested	-	leaking riser pipe removed.	Cylinder below 27 mts, trough is not in use. Last repair before 2 months taken up by mistry on peoples complaint about reduced supply.
HP 52	N 30 E of HP 51 at 200 mts (by CASA)	1991	11	12	4	20	for STs	30 mts	do	No repair so far	No trough, slab or chain cover, pedestal not very firm. No chain bolt (high tension). Limited use. Other families go to nearby dug well.	
HP 53	N 60 W of Naji's well at 150 mts.	1988	11	12	10	50	for STs	40-50 mts	Not done	-	-	Cylinder below 36 mts. Difficult to operate. Washers worn out. Checked by mistry in Oct '93. Not replaced. Tastes rusty.
HP 54	Jelapka (phyllite) (approachability difficult in every season) Near Puna S/o Moga's house	1985	11	12	10	40	for STs	8 mts	Negative fit for drinking	6 months	pipe + cylinder fell	Water stagnates at 6 mts. Slab to be repaired. Cylinder below 15 mt. Summer yield reduces. Reddish rusty water is reported. Mistry visits 2-5 month after complaint. General complaint with washers and pipes (leakage).
HP 55	By road side, 100 mts south of Thavra Lala's well	-	11	12	10	50	for STs	beyond 50 mts	Not done	5 months	pipe detached	4 water tank bolts and chain cover missing. Despite complaint unattended by mistry, though visited.
HP 56	HW of Ambava Nathu's well at 80 mts. in Nichlaphala	-	11	12	12				Positive unfit for drinking	3 months	connecting rod slipped	Pedestal shakes, no proper platform, no drain, trough or slab. Chain cover missing. Cylinder below 12 mt. All the 4 pipes leak. Water stagnates. People use self made wooden trough. Bacteriological contamination is wild.
HP 57	Near Ambava Nathu's house at Nichlaphala	-	11	-	-		for STs	beyond 50 mts	not done	2.5 years	deep water level	Low supply in the beginning. Bore reportedly yields good. Supply stopped subsequently. Cylinder may have to be lowered. No slab or trough. Other 3 HP in Nichlaphala supply good amount of water.

Note:-

INFORMATION ON FEW OF THE DRINKING WATER WELLS VISITED

S/	Location	Owner	Type	No of family using	Result of Bacteriological analysis	Remarks
DW 1	Gogunda block - Kondau 100 mt West of School	Khem Singh	Covered	10	Contaminated	Lining 0.75 mt. (This 5 ft deep well caters to the drinking needs of 60-70 animals. W.L. is 3.3 mt. below ground level) Round the year supply. Washing slab in condition.
DW 2	100 mt. East of School	Sardar S/o Bheru	Covered	2-3	Not tested	Lining 1.2 mt, and W.L. 11.7 mt, depth 20.5 mt. Water for 20-30 animals. Round the year supply. Washing slab in condition.
DW 3	250 m SW of school	Sarup Singh S/o Guman	Covered	Nil	Contaminated	Lining 2.0 mt. W.L. is almost upto ground level due to proximity to stream. Shallow depth (1.1 mt) 20-30 animal take water. Washing slab in condition.
DW 4	300 mt S 50 mt. W of school	Dhalla Singh S/o Jai Singh	Covered	75	Contaminated	Lining 2.1 mt. W.L. 3.1 mt. Depth 5.4 mt. Dirt lies near washing slab water for 50-60 animals. Round the year supply.
DW 5	100 mt SSW of School	Bhur Singh	Covered		not tested	Lining 1.6 mt. W.L. 1.4 mt. Depth 4.4 mt. Round the year supply. Washing slab in condition.
DW 6	200 mt NW of school	Kishan Singh	Covered	Nil	not tested	Lining 2.0 mt. Depth 2.7 mt. Water for 100 animals. Washing slab in condition.
DW 7	400 mt NE of 'Chabutara'	Bheru Singh	Covered	15	do	Lining 0.75 mt. W.L. 11.8. Depth 16.9 mt. Water for 100 animals also. Round the year supply. Washing slab in condition.
DW 8	400 mt. NNE of School	Bhawani Singh S/o Kishan Singh	Covered	5	Contaminated	Lining 0.75 mt. W.L. 0.5 mt. Depth 3.7 mt. Water for 30 animals. Washing slab in condition.
DW 9	500 mt. NNE of School	Xanna S/o Manna	Open	3	Contaminated	Not lined with cement but loose stone masonry only. Depth 7.4 mt. Water for 15 animals. Contamination is mild, however is unsafe for drinking.
(IN NONE OF THE ABOVE CASES ANIMAL WASTE LIES WITHIN 50 MT FROM SOURCE)						
DW 10	Suthar Madra 150 mts West of handpump in SC colony	Sarana	Open	5	no test done	Well is in use only when the handpump is defunct. Depth 11.2 mt. Lining varies 0.8-2.2 mt. Does not dry in summer. Used by SCs.
DW 11	Eastern part of SC colony Sarada block Gauri	Sava	Open	15	do	Depth 10.6 mt. Lining varies 1.0-5.0 mt. Used for drinking in emergency under the influence of anicut. Does not dry in summer. Used by SCs. No dug well in this village. People normally get drinking water from handpumps only. In case of emergency they go to adjacent lake (Jaisamand).
DW 12	Nathara Karmatalav	Dhanji	Covered	5-6	no test done	Converted in 1992 by SWACH. Temphos not used. Lining (3.4 mt) adequate. Supplies water through out the year.
DW 13	Karmatalav	Hurji	Covered	10-15	no test done	Converted in March '93 by SWACH. Temphos not used. Lining (4.2 mt) adequate. Depth 7.8 mt. Never gets dried up.
DW 14	Mandli 150 mts from culvert	Dhalji	Covered	10-15	no test done	No seasonal fluctuation in W.L. Last guineaworm case to the users before 2 years. No case of guineaworm in any of the 12 hamlets since last 2 years. 10 families take drinking water from the sources located east of the village. Surrounding is dirty.
DW 15	Palsarada Bichaliphala	Veerji	Covered	8-10	no test done	Lining by owner, 0.7 mt parapet by SWACH in 1991. Last guinea worm case in 89-90. Depth 8.8 mts. Round the year supply.

DW 16	do 1 km from School towards West	Ramesh	Step	1	positive not fit for drinking	Bacterial infection is less. Temephos applied every 2 months. Last applied in 16 08 93. On careful observation under bright sunlight movement of cyclopes is noticed in water.
DW 17	Dungarpur block Kushal Nagar	Vaja	Open	1	Negative fit for drinking	Well water is used for drinking since last 16 yrs. Guinea worm never reported. Earlier steps were used to fetch water. Now pumped by motor. No temephos applied before.
DW 18	Palwasi Near the field of Hanji Kalia	Community	Step	15-20	Negative	Conversion by SWACH is in progress. Handpump to be installed. Lining is adequate. Well is suspected to have been breeding station of cyclopes. Temephos is applied regularly.
DW 19	Mai Basti	Kaladi S/o ...	Step	8-10	Negative	Guinea worm infection was reported till 1992. Temephos applied regularly. Fishes observed in the well.
DW 20	Kolkhandu Khas Behind School		Covered	25-30	Negative	Although the well is shallow (6.2 mt), does not get dried up in summer (4.0 mt). Closed in 1987-88. Expected to supply water to more number of families.
DW 21	Bahri Phaja	Teju S/o Yela	Step	8-10	Positive unfit for drinking	Shallow well (5.3 mt.) but does not dry in summer, was infected with guineaworm in the past.
	Banswara district Kushalgarh block Mokhampura					No water sample was analysed for bacteria. For drinking, people either use handpump or piped water supply. Sometimes they fetch water from Church well (protected). 3 uncovered wells are used in emergency and water drawn by buckets.
	Begraycha					
DW 22	SE of Anganwadi at about 300 mts.	Nar Singh S/o Hukia	Step	15	Positive	Although diesel engine is used for pumping, people also use steps to fetch water. Never dries up in summer.
DW 23	On the stream bed NW of Anganwadi	Community	Covered	20	Positive	Used for drinking in emergency. Water overflows during floods. Yield reported good, water very dirty. Well to be desilted. Can be used by raising parapet by 1.5 mt and fitting handpump over it. Reported to be lined down to bottom.
DW 24	Jhiri (Pit on the stream bed)		Open	5	Positive	Water is fetched almost for 8 months in a year by a few.
DW 25	Southern part of village by road side Sajjangarh block Sultya	Yeesia S/o Punja	Covered	20	not tested	Covered by Seva Sadan. (Church at Mokhampura) and handpump fitting. Washing slab, animal trough constructed by SWACH.
26	Jhiri		Open	15	Positive unfit for drinking	Jhiri is opened up on the streambed 750 mts from school towards SE. 30 Human being (5 families) and 50 animals drink water from the same open, shallow source.
DW 27	West of school at 150 mts	Hanji S/o Galiya	Open		not tested	Presently collapsed. Initial depth 9 mt. Not in use since owner has another well for irrigation. After desilting this well is proposed for constructing parapet fitting handpump and use.
	Mahudi					
DW 28	Nichalaphala by the road side	Rajia	Step	10-12	Positive unfit for drinking	Another open well of Bhura S/o Vaja is also contaminated with harmful bacteria.
	Banswara block					
DW 29	Kupra (SC colony)	Community well	Covered	40-45	Positive	Lining 2.5 mt. parapet strong. Pulley is used to draw water. WL 3.5 mt. Depth 9.9 mt. supplies water even in summer to major part of SC population. Summer WL 6.5 mt.
DW 30	At the village entrance	Community pumping	covered	65	positive	Lining 4.0 mt. WL 4.0 mt. Depth 10.0 mt. Water stagnates in the surrounding. Piped water supply scheme by pumping around the year.

DW 31	Kherwara block Gura 40 mt. SW of school	Shankar S/o Mangraj	Steps	30	positive	Steps provided to this 9.7 mt deep pumping well Used for drinking in emergency Does not dry in summer
DW 32	W Ern part of village	Kasra S/o Dharama	Steps (halfway through)	20	positive	This 11 2 mt deep well is used for drinking and irrigation both. Does not dry in summer
DW 33	Jalapa S 60 E of Puna Moga's well at 200 mts.	Thavra S/o Lala	Open	7	Negative fit for drinking	Wooden stairs is used to fetch water from this 4.9 mt deep well which does not dry even in summer.
DW 34	Kekariya Phala 80 mts. ENE of road side hand pump	Kurilal S/o Ambavaji	covered	10	Positive unfit for drinking	The well by the side of a stream only parapet is lined by SWACH underlain by loose stone masonry People bath in stagnant water Does not dry in summer.
DW 35	Nichaliphala South of Kekariyaphala handpump at 120 mts , ,	Nagji S/o Khula	Steps	10	Positive unfit for drinking	Provision of well built steps to fetch water. SWACH have constructed the parapet only followed by loose stone masonry This shallow well (7.0 mt) does not dry in summer Temephos is applied regularly.
DW 36	Nichaliphala S 60 W of , , at 170 mts	Ambava S/o Mathu	open	2-3	positive	Unlined on three sides, easy to get down Used for drinking since last year after cleaning



TRAININGS / REPAIRS / PAYMENTS															
Sl	Village Name	Mechanic's name	Working since	Based at	Training by	Paid by	No of villages	No of H P	Travel time	Workdays last month	Any trained Mechanic earlier	Information By	Time	Repair time	Remarks
01.	Kundau	Bhuralal Ganethi	1984	Girayi	DRDA	Panchayat Samithi (PS) Gogunda	15	55	1 hr	12	None	People	8 days	3 days	Washer, nut bolts, rubber sheet, pipe sockets wear & tear.
02.	Suthar Madra	Prem Singh	1983-84	Tirool	DRDA	do	18	47	1 hr	-	None	-	-	-	-
03.	Gamri	Basantlal Sharma	1987	Simal (at 13 km.)	DRDA	Panchayat Samithi Sarada	10	50	1 hr	7	None	People	2-3 days	3 days	People do not help during repairs.
04.	Nathara	Rassi Devi	1991	Nathara	SWACH	SWACH (for 1 month)	01	30	Paid only for initial one month back after she is employed by PS. No work since then.		Tool kit taken away by SWACH. Assured to give the kit				
		Yela Ram	1985	-	DRDA	P.S. Sarada	04	35	1.30 hr	-	None	People	15-30 days	-	-
05.	Palasarada	Faiz Mohammed	1984	Sarada	DRDA	P.S. Sarada	06	52	1.30 hr	12	None	People	2 days	3 days	Visits regularly 2-3 times in a month. People do no help while repairing.
06.	Palwasi	Bhem Chand S/o Hakraji	December 1992	Maitali (at 8 km)	DRDA	P.S. Dungarpur	03	40	1.30 hr	12-15	Hanji	People	1-2 days	8-10 days	Tools old and partly damaged, needs some major tools.
07.	Kolkhanda Khas	Devilal S/o Hurji Parmar	1987-88	Local	DRDA	P.S. Dungarpur	01 (7 hamlets)	40	1/2 hr	3	Labji Verma (from Punali)	People	-	4-5 days	People complained much delay in repair
		Laxmi	1992	-	SWACH	Left the village.	Works in Ahmedabad now.								Worked alongwith Devilal.
08.	Mokhampura	Magan Singh Devra	-	Wishnavat	DRDA	P.S. Kushalgarh	17	39	1.15 hr. (7 km)			People	3-4 days	1-2 days	Two mistries work together Looks after 6 wells out of his charge. 3 days refresher training by SWACH.
09. 10.	Bageyacha and Suliya	Devchand	-	Kalinjara	DRDA	P.S. Kushalgarh.	-	38	-	-	-	People	2-3 days	some days	Information partly obtained from PS. Could not meet Mechanic.
11.	Mahadi	Hausingh	1988	Mandli chhoti	DRDA	P.S. Sajjangarh	2	35	1 hr.	-	Samuel (Trained '82) or Ward member	People	8-10 days	-	-
12.	Kupra	Hotilalji		Nichala Ghantala (at 10 km)	DRDA	P.S. Talwara	10	44	1 hr.		None	People or member	same day	-	Sometimes member of ward or Vikas Samithi takes initiative inform about non functioning of HP to mechanic. Cost of minor spares shared by people, others arranged by Mechanic
13.	Gura	Laxman Lal Meena	1984	Dhelana (at 2 km)	DRDA	P.S. Kherwara	7	52	1 hr	10	None	People or member	5-15 days	2 days	Mechanic comes to know of non functioning of HP in meetings, held at Gram Panchayat or on visits sometimes Takes up repairs. Sometime people buy spares of their own.
						P.S.	6	-	-	-	None	People	2-3 days	1-5	Repair on handpumps too much delayed as people report. Even



SANITATION

Sl.	Name of village	No. of latrines SWACH record	Latrines Visited	Constructed by	Condition of structure	Whether in use	Remarks
01.	Kundsu	Nil	Nil	-	-	-	People go to defecate at 300- 400 mts. Children do it close to the houses
02.	Suthar Madra (S C Colony)	Nil	Nil	Panchayat	damaged	no	Four latrines constructed by Panchayat area left incomplete And not in use.
03.	Gamri	Nil	Nil	-	-	-	No intervention by SWACH.
04.	Nathara	01	01	SWACH	good	no	Latrine for school is not preferred by students other than as urinal. Staff uses No repairs so far
05.	Palsarada (Ranaphala)	Nil	01	SWACH	not complete	no	In 6 individual latrines no seat, door or roof therefore not in use Assurances given but no work done. School latrine is in use by teachers mostly.
06.	Kushalmagri	Nil	Nil	All private	complete	yes	No intervention by SWACH. All individual private latrines
07.	Palwassi	02	03	SWACH	incomplete	occasionally	Total number of latrines reported 8. Individual latrines used for bathing by ladies Used as latrines in emergency (Dhola S/o Gama, Manu S/o Kalia) Thana S/o Homa uses it as bathroom Willing but not able to use due to technical fault in construction School latrine at Wassa remains locked.Used by staff.Students mostly go out if kept unlocked dirtied by villagers as teachers complain
08.	Kolkhanda Khas	01	01	SWACH	good	yes	In middle school latrine is used. In primary school of Durgaphala only urinal is used.
09.	Mokhampura	12	04	SWACH	good	yes	Total number of latrines reported 36. 2 individual, 2 institutional latrines visited. All in use. Total number of latrines 36, as per scout.
10.	Bagnyacha	Nil	Nil	-	-	-	People go for defecation 300 - 500 mts. Kids near houses
11.	Sulia	Nil	Nil	-	-	-	People go to nearby seasonal stream or forest, 200 - 400 mts away from inhabitation. Kids near houses.
12.	Mahadi	Nil	01	SWACH	-	occasionally	4 year old school latrine not in use since 3 5 year after somebody broke to door and chocked the seat Urinal is used. Chhaganji does not use. Rameshji uses for bathing and Lal Singh uses for both the purposes as reported.
13.	Kupra	Nil	04	SWACH	good/incomplete	yes/no	Latrines in boy's and girl's middle schools are used. 3 latrines by SWACH are incomplete.
14.	Gara	Nil	01	Panchayat	incomplete	no	No roof or door. Garbage dumped inside People go to 300 - 500 mts. for defecation. Kids near houses
15.	Jalapha	Nil	Nil	-	-	-	Not even private latrines. People go to 200 - 300 mts to seasonal stream or forest for defecation. Kids near houses.



APPENDIX 14
GLOSSARY AND ACRONYMS



GLOSSARY AND ACRONYMS

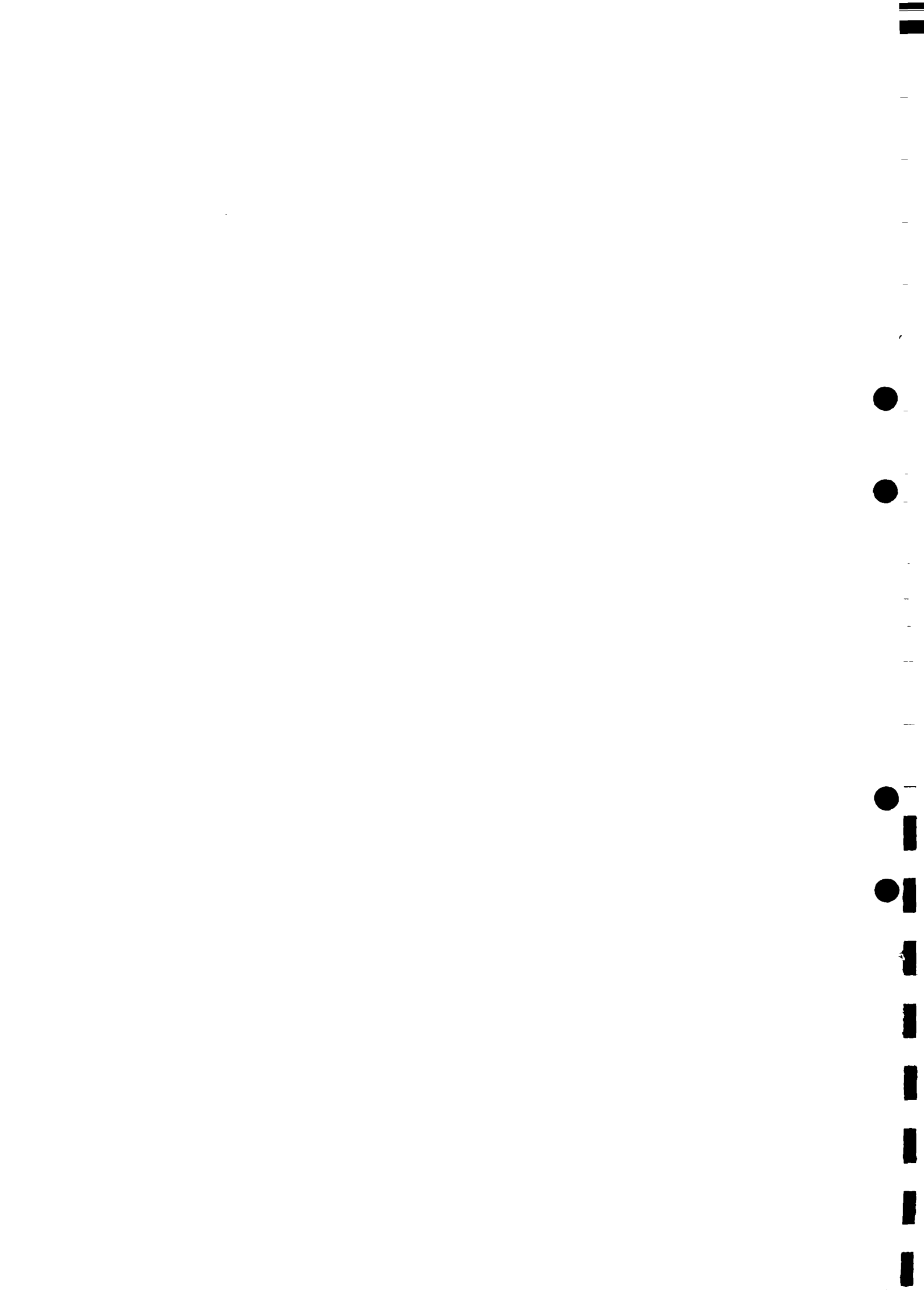
Adivasi	Scheduled Tribes
Anganwadi	Kindergarten, preschool nursery in ICDS
ANM	Auxiliary (or Assistant) Nurse Midwife
APO	Assistant Project Officer
ARI	Acute Respiratory Infections
Balwadi	Kindergarten, preschool nursery
BDO	Block Development Officer (Vikas Adhikari)
CBCS	Community Based Convergence Services
CDD	Control of Diarrhoeal Diseases
CDPO	Child Development Project Officer
CE	Chief Engineer
CMHO	Chief Medical and Health Officer
COD	Committee of Directions
Cyclops	Water flea; infective vector of Dracunculus by ingesting larvae
Dai	Traditional birth attendant
DEE	Department of Extension Education, Rajasthan College of Agriculture
DLO	District Level Officer
DMHS	Director of Medical and Health Services
DPIC	District Project Implementation Committee
Dracunculus	Guineaworm
DTT	District Training Team
DWCRA	Development of Women and Children in Rural Areas
EPI	Expanded Programme on Immunisation
GOI	Government of India
GOR	Government of Rajasthan
Gram Panchayat	Village level local self government
GWD	Ground Water Department
HP	Handpump
HRD	Human Resources Development
ICDS	Integrated Child Development Services
IEC	Information, Education and Communication
IGEP	Integrated Guinea Worm Eradication Project
ITI	Industrial Training Institute
KAP	Knowledge, Attitudes and Practices
Kawads	Local folkart medium for narrating mythological/religious stories
MHFWSD	Medical, Health and Family Welfare Services Department
MLA	Member of Legislative Assembly
MNIO	(UNICEF) Middle and North India Office
MPW	Multi-Purpose (health) Worker
NGO	Non-Government Organisation
NGWEP	National Guinea Worm Eradication Programme
NHEES	Nutrition, Health Education and Environmental Sanitation Project
Nirikshak	Supervisor of Animators (Sachetaks)
NYK	Nehru Yuvak Kendra; Nehru Youth Centres
ORS	Oral Rehydration Salts
Panchayat Raj	Department of Local Self Government
Panchayat Samiti	Block level local self government
Parwari	Village level revenue official
PD	Project Director
PEDO	People's Education Development Programme (Bichhiwada Block, Dangarpur)

GLOSSARY AND ACRONYMS

Adivasi	Scheduled Tribes
Anganwadi	Kindergarten, preschool nursery in ICDS
ANM	Auxiliary (or Assistant) Nurse Midwife
APO	Assistant Project Officer
ARI	Acute Respiratory Infections
Balwadi	Kindergarten, preschool nursery
BDO	Block Development Officer (Vikas Adhikari)
CBCS	Community Based Convergence Services
CDD	Control of Diarrhoeal Diseases
CDPO	Child Development Project Officer
CE	Chief Engineer
CMHO	Chief Medical and Health Officer
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Cyclops	Water flea; infective vector of Dracunculus by ingesting larvae
Dai	Traditional birth attendant
DEE	Department of Extension Education, Rajasthan College of Agriculture
DLO	District Level Officer
DMHS	Director of Medical and Health Services
DPIC	District Project Implementation Committee
Dracunculus	Guineaworm
DTT	District Training Team
DWCRA	Development of Women and Children in Rural Areas
EPI	Expanded Programme on Immunisation
GOI	Government of India
GOR	Government of Rajasthan
Gram Panchayat	Village level local self government
GWD	Ground Water Department
HP	Handpump
HRD	Human Resources Development
ICDS	Integrated Child Development Services
IEC	Information, Education and Communication
IGEP	Integrated Guinea Worm Eradication Project
ITI	Industrial Training Institute
KAP	Knowledge, Attitudes and Practices
Kawads	Local folkart medium for narrating mythological/religious stories
MHFWSD	Medical, Health and Family Welfare Services Department
MLA	Member of Legislative Assembly
MNIO	(UNICEF) Middle and North India Office
MPW	Multi-Purpose (health) Worker
NGO	Non-Government Organisation
NGWEP	National Guinea Worm Eradication Programme
NHEES	Nutrition, Health Education and Environmental Sanitation Project
Nirikshak	Supervisor of Animators (Sachetaks)
NYK	Nehru Yuvak Kendra; Nehru Youth Centres
ORS	Oral Rehydration Salts
Panchayat Raj	Department of Local Self Government
Panchayat Samiti	Block level local self government
Parwarī	Village level revenue official
PD	Project Director
PEDO	People's Education Development Programme (Bichhiwada Block, Dangarpur)

APPENDIX 15

PROGRAMME OF VISITS AND MEETINGS AND LIST OF PEOPLE MET
BY EVALUATION TEAM



APPENDIX 15

PROGRAMME OF VISITS AND MEETINGS AND LIST OF PEOPLE MET

- 9.11.93 Arrival of CDS Team in Dehli, briefing with Minty Pande
- 10.11.93 Meeting with UNICEF and SIDA
- 11.11.93 Study of SWACH Documentation material
- 12.11.93 Meeting with UNICEF and SIDA
- 13.11.93 Meeting with Anil Chaudhary (PRA Team Manager)
Departure Udaipur
- 14.11.93 Meeting with SWACH Programme Director, Assistant Project
Officers (APOs) and SWACH staff
- 15.11.93 SWACH Project Office, meeting staff and researching material
- 16.11.93 SWACH Project Office, meeting staff and researching material
David Marsden In Jaipur
- 17.11.93 SWACH Project Office, meeting staff and researching material

David Marsden In Jaipur
- 18.11.93 Field visits arranged by SWACH to villages of Sarada Block,
Udaipur district
- 19.11.93 Rachel returns Dehli - preliminary debrief to UNICEF and SIDA
on financial and economic aspects
- Meetings with:
Divisional Commissioner, TAD (Tribal Area Development) Mr
Dharam Singh Sagar
Deputy Chief Medical Health Officer (CMHO), Health & Family
Welfare Dept. Dr M.L. Jain
Superintendent Engineer, Public Health & Engineering Dept.
(PHED) Udaipur Mr Jai Kishan Mirchandani
Director, Bhartiya Lok Kala Mandal, & Hony, Secretary Mr Bhano
Bharti & Mr Riyaz Tehsin
Water Engineer, AFRO, Member of Evaluation Team
Mr K N Devangan
- 20.11.93 Meetings with:
NGO - Sewa Mandir, Udaipur:-
Mr Jagat S Mehta, President
Mr Ravi S Bhandari, Secretary, Finance & Administration

Dr G C Lodha, Director Health Education & PHC
Dr R Bakshi, Health Unit
Mr Alok Rathore, Health Unit
Mr N K Sharma, Asst. Secretary, Kherwada Block
Mr H R Bhati, Asst. Secretary, Jhadol Block
Ms Neelima Khetan, Asst. Secretary, People's Management School

Meeting of Professors in Mr Mohanty's Office:-

Prof B C Mehta, Professor, Economics
Prof M K Singhvi, Asst. Prof Psychology
Prof R N Vyas, Associate Prof Geography
Dr L L Sharma, Asst. Prof Dept of Liminology & Fisheries
Dr Dinesh Agarwal, Associate Prof Dept. of Community Health
Mr H S Bhatia, President Rajasthan Age Care Society
Dr Harish Mathur, PSM, SMRATI, Udaipur
Dr R K Menaria, Associate Prof Economics
Dr M S Bedi, Principal, Udaipur School of Social Work

NGO - ASTHA, Udaipur
Mr Om Srivastava & Mr N L Pande

- 21.11.93 Study of SWACH Documentation
- 22-24.11.93 Field visits to villages in project area in all three Districts: Udaipur, Dungarpur and Banswara
- 25.11.93 Meeting with Water Engineer Mr Devangan & Health Consultant Dr Dinesh Agarwal
- 26.11.93 Debriefing meeting with Programme Director SWACH
- Departure of CDS Team to Dehli
- 27.11.93 Meeting with SIDA
- Preparation of Aide-Memoire
- 28.11.93 Preparation of Aide-Memoire
- 29.11.93 Presentation of Aide-Memoire to SIDA and UNICEF
- Departure CDS Team London

- 5-18.12.93 Field visits by local evaluation team members to the 15 selected villages in the Project Districts.
- 10-18.12.93 Field visits by PRA Team Members in three groups to the 15 villages
- 20-30.12.93 Preparation of reports by local team members
- 3.1.94 Local Team Manager Minty Pande arrives CDS, Swansea with reports
- 4-14.1.94 Preparation of Draft Final Report
- 14.1.94 Despatch of Draft Final Report by DHL to SIDA Sweden & SIDA Dehli



