HAND DUG WELLS ON THE KARAMOJA-TESO BORDER NE UGANDA

BGS Meeting 25th September 2001

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Together with Brian Hardcastle and John Holloway of CED

Kara - Teso Water Project

Undertaken :

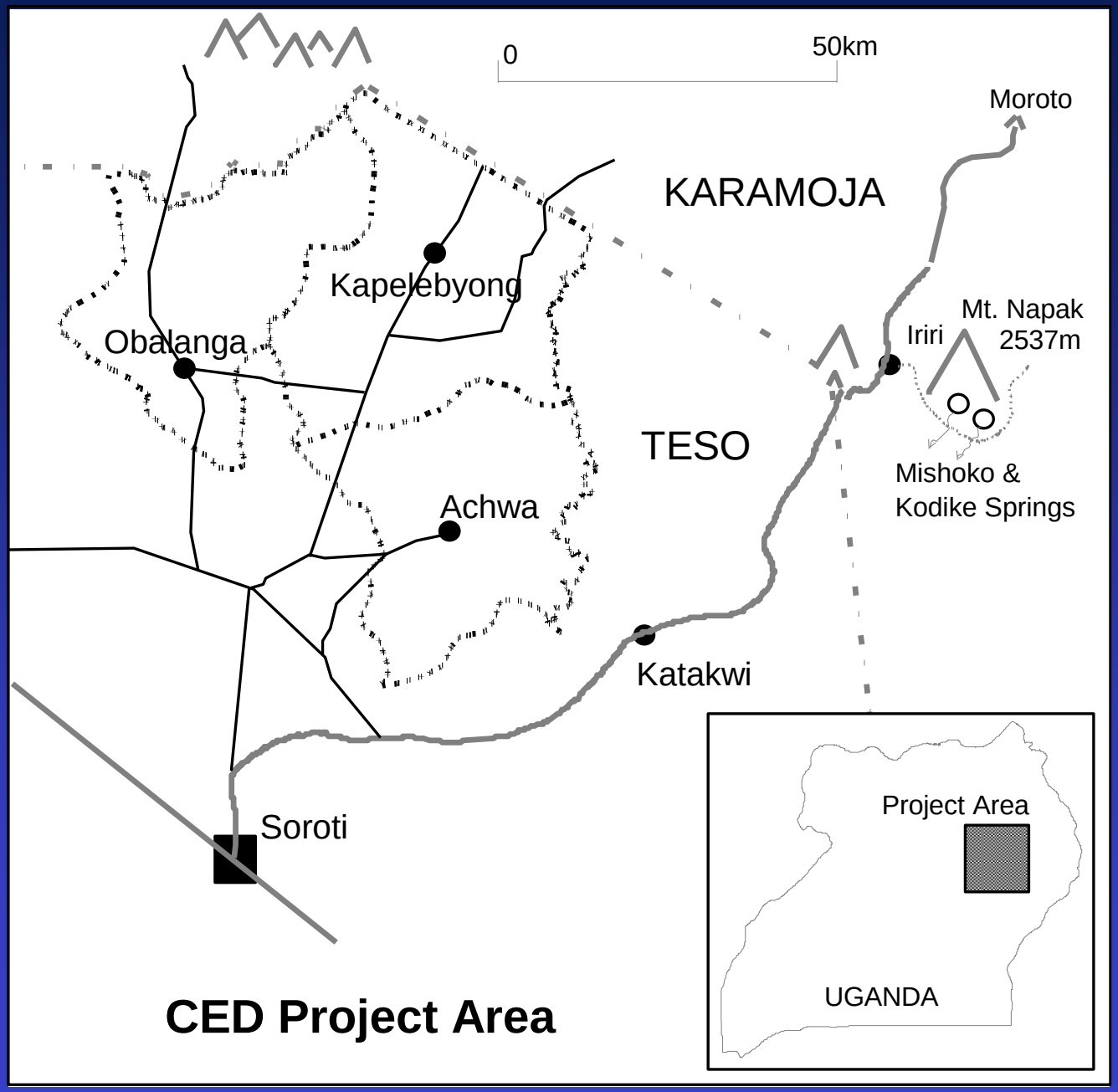
- in partnership with CHIPS
- with funding from ODA (now DiFD) and other sources
- as part of wider development programme

Included:

- Hand dug well programme
- Rehabilitation of 2 earth valley dams
- Spring protection and gravity pipeline scheme

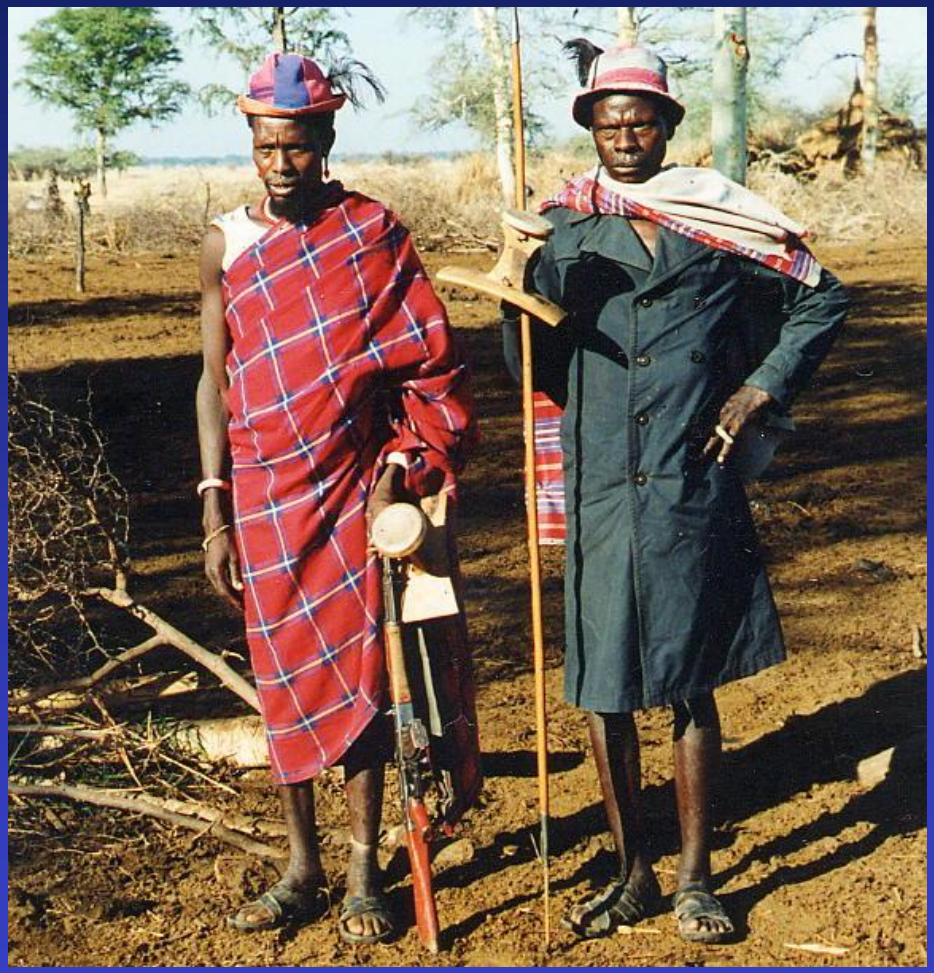
Presentation Outline

- Background - including social and geographical setting
- Development philosophy
- Well construction method
- Problems and solutions
- Project evaluation


0
50km
Moroto
KARAMOJA
Kapelebyong
Obalanga
Iriri
Mt. Napak
2537m
TESO
Mishoko &
Kodike Springs
Achwa
Katakwi
Soroti
Project Area
UGANDA
CED Project Area

Karamojong Migration

Traditional Karamojong



CHIPS/CED water projects secondary aim to facilitate peacemaking

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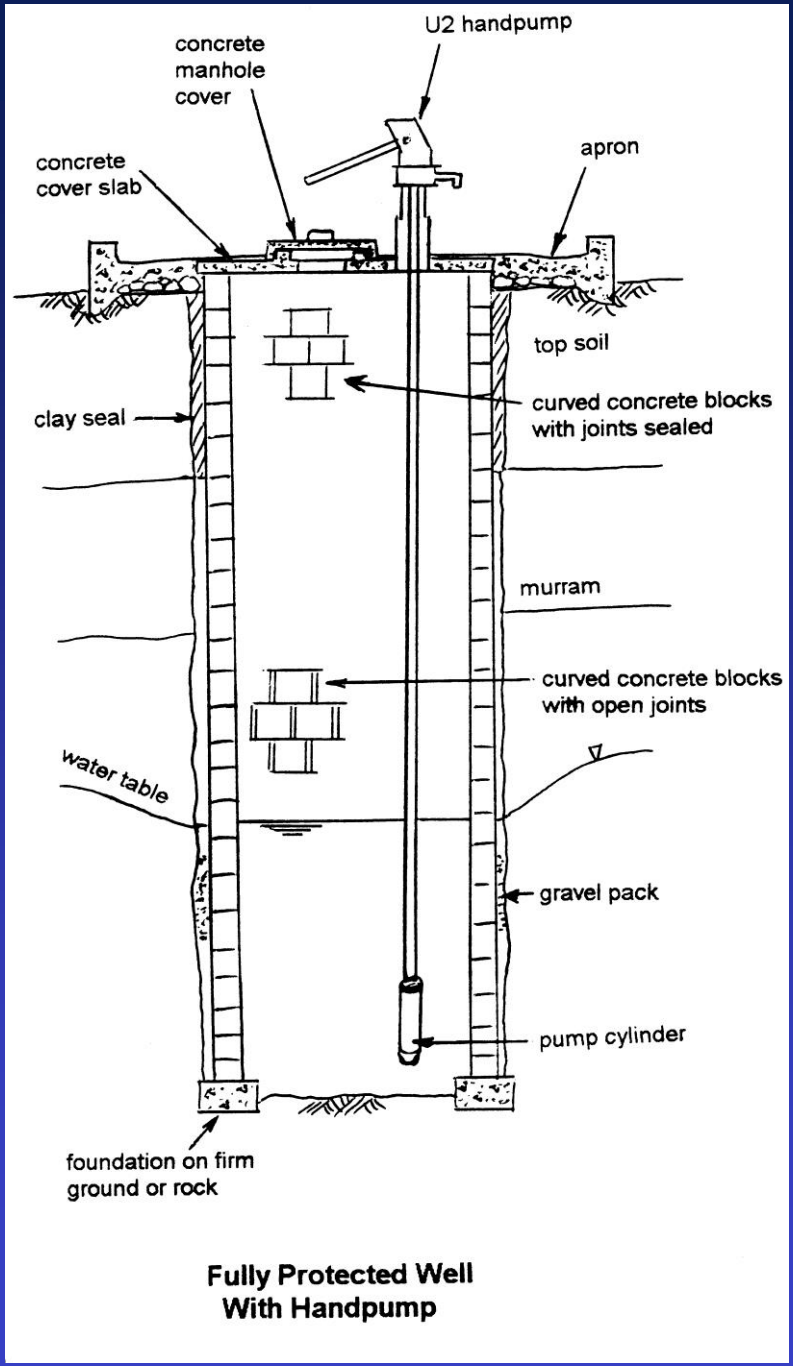
View of Kara-Teso Project Area

Development Philosophy

- Community ownership
- Sustainability - maintenance of source
- Replicable construction method
- Maximise other development spin-offs

Traditional waterhole

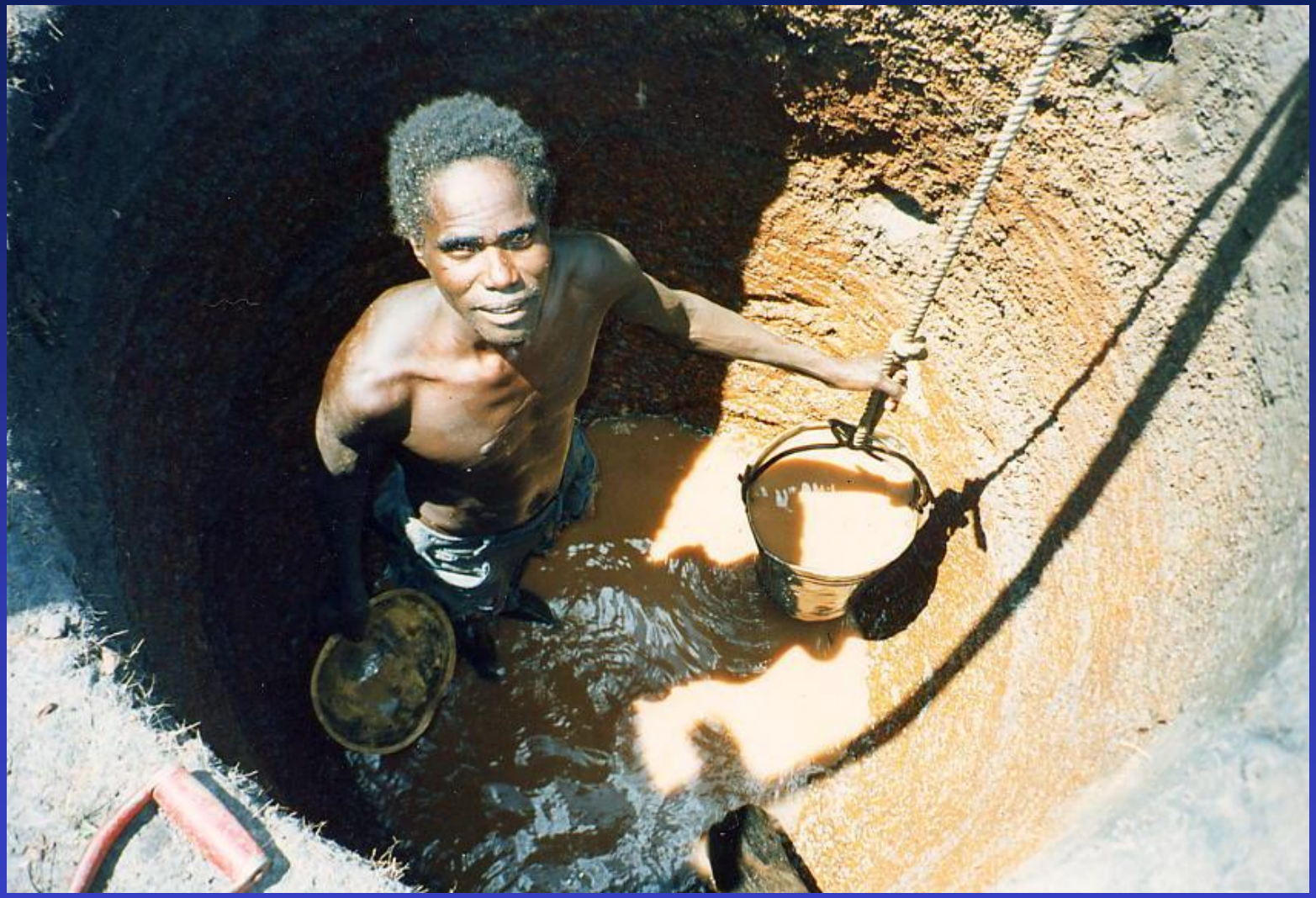


Hand-dug well - typical section

The Regolith Profiles for Wells in the Karamoja-Teso Area

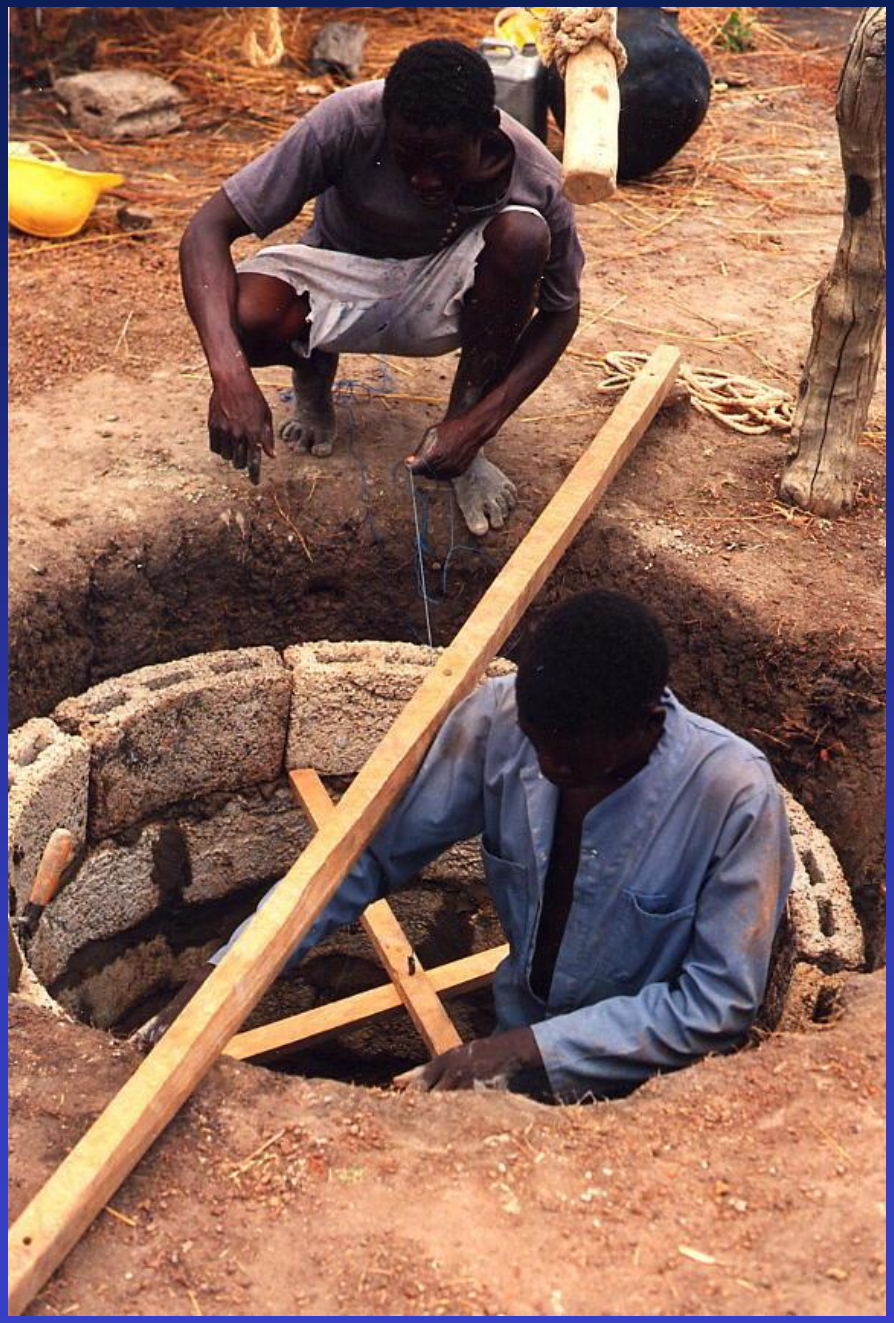
- Topsoil 0.3 – 5.1m. [Sandy clay, brown for the first 0.3 – 0.5m, then Orange brown,with a layer of gravel below.]
- Murrum. 0.3 – 4.0m. [A basal ferruginous laterite concretion.]
- Saprolite 0.2 – 7.0m [Clay often containing silt. Often with sand towards the bottom. Prone to collapse]

Initial well digging



Well shoring system

Windlass used for lowering men and equipment



Well lining using concrete blocks

Well head construction

Hand auger rig

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Well opening celebrations

Causes of Delay

- Waning initial enthusiasm
- Crop planting, harvesting, and cattle migration
- Community occasions such as weddings and funerals
- Delays in supplies promised by other agencies
- Breakdowns of the lightweight submersible pumps
- Disruption by floods and famine
- Transport problems - breakdowns and impassable roads

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Revised Community Agreement

Community agree to:

- Elect an well committee (including 2 women)
- Raise 150,000UShs (£100) to pay their own workers
- House and feed CHIPS well technicians
- Safeguard the site

NGO agree to:

- Administer funds, provide equipment and technicians
- Provide ox cart on loan for collecting sand & murram
- Once complete to hand over to WATSAN maintenance programme
- Provide health and hygiene advice - also provide pit latrine cover slabs (through WATSAN)

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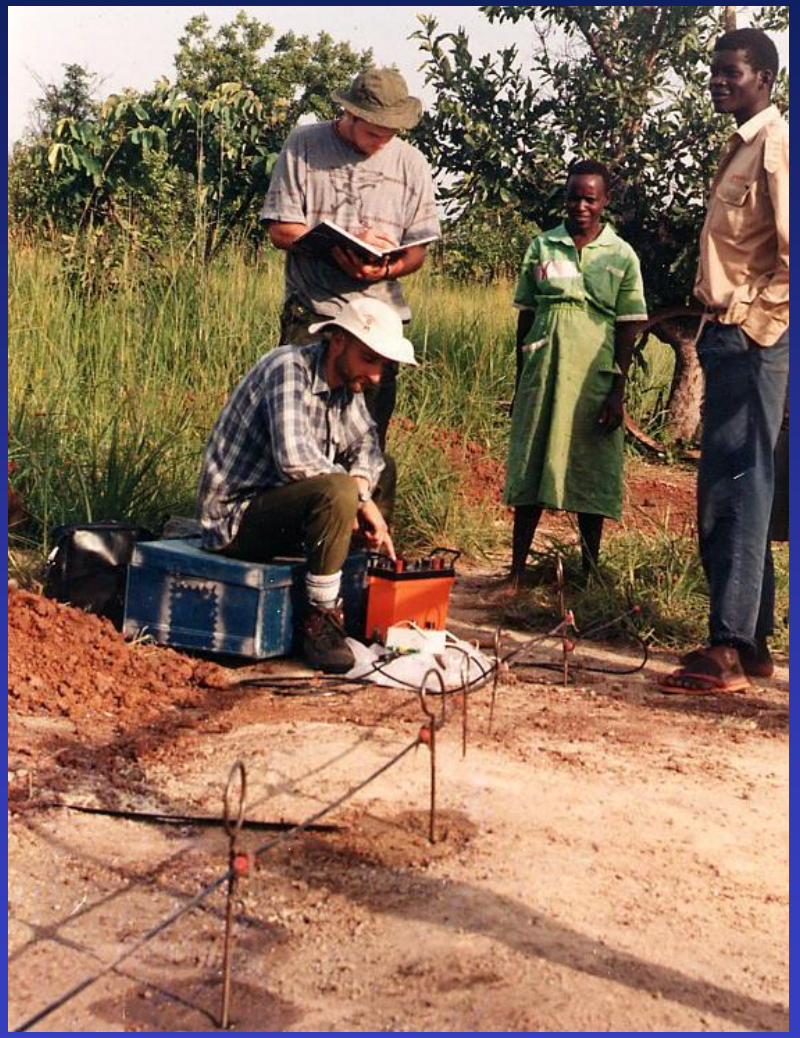
Petrol driven jack hammer

MSc Research - Hydrogeological Survey and Resistivity Surveying



Resistivity survey results

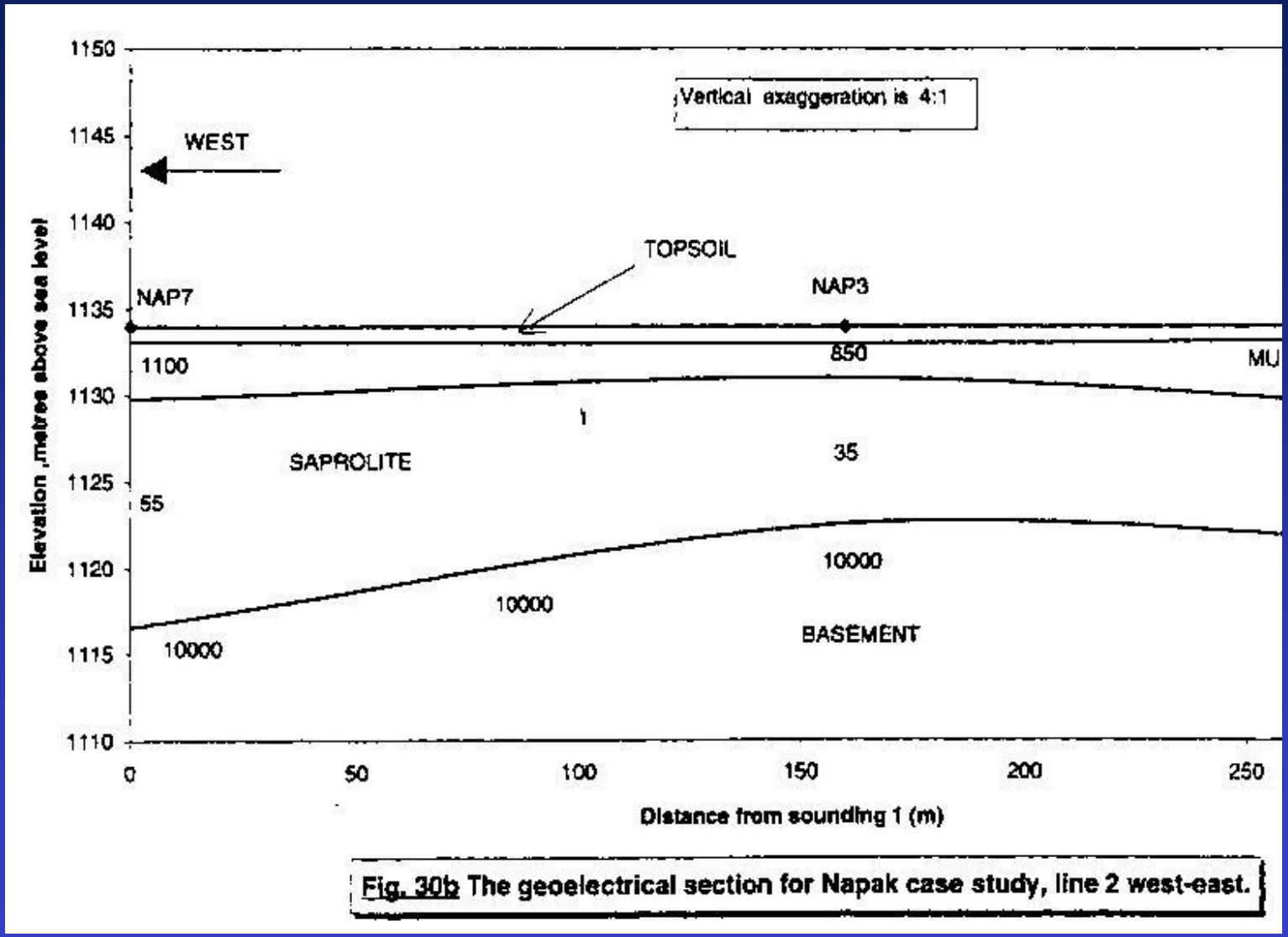
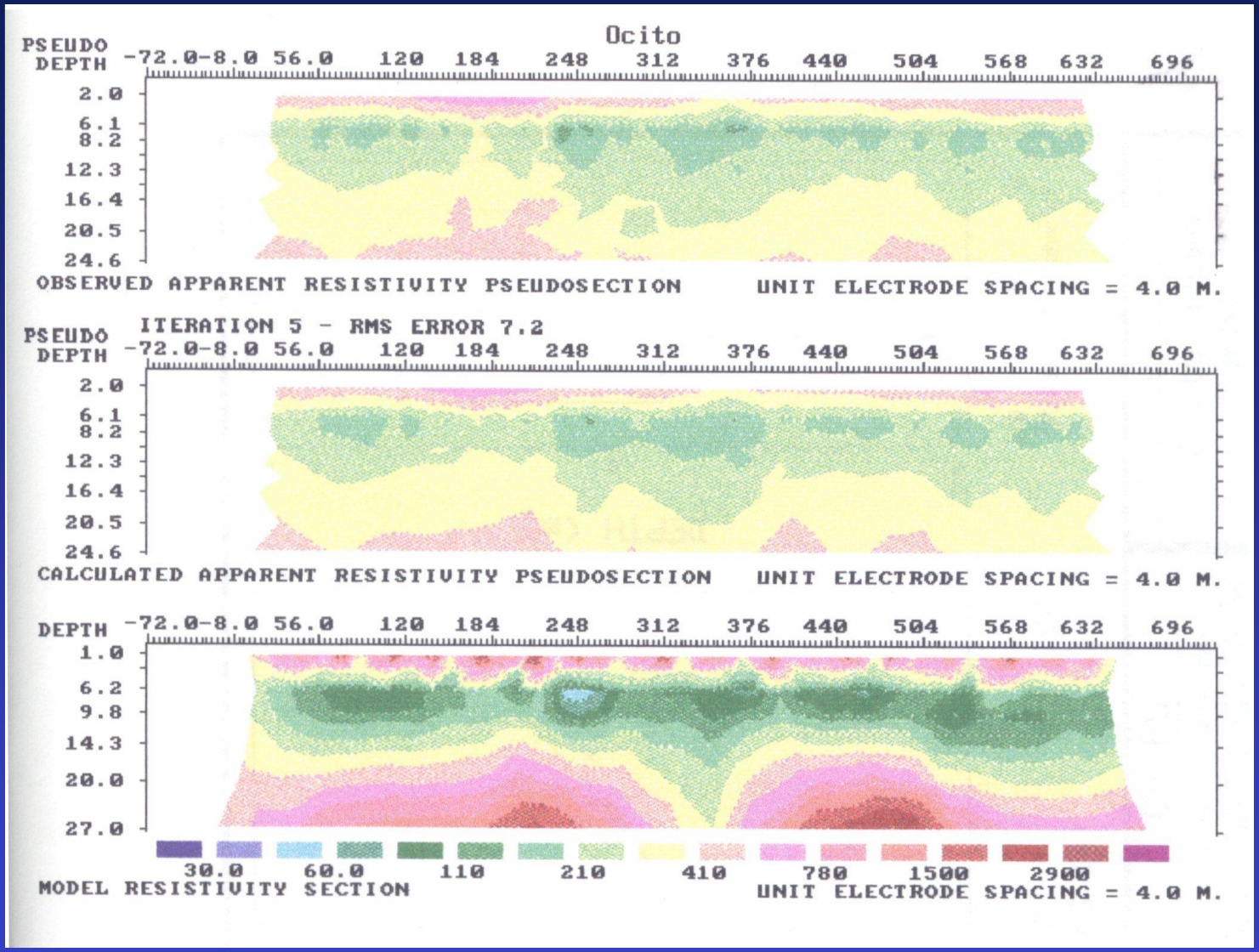


Fig. 30b The geoelectrical section for Napak case study, line 2 west-east.

Ocito Pseudosection



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Project Evaluation

Number of wells started	62
Number abandoned	9
Number sunk	53
Number dry	15
Number successfully completed	38
Success rate	71%

Well Performance

Yield range	25 to 4500 l/hr
Average yield	425 l/hr
Increase in water use:	
- prior to well construction	4 to 10 l/day/head
- post to well construction	15 to 26 l/day/head
No. of people supplied from the 38 new wells:	6000

Water Quality

Thermotolerant (faecal) Coliform counts (TFC/100ml)

	Range	Typically value
Boreholes	**0 – 22**	**zero**
Wells	**0 – 590**	**20**
Surface sources	**40 – 2000+**	**1000+**

Boreholes would be classified as of "low risk"
Wells would be classified as of "Intermediate to high risk"
[Lloyd.B. & Helmer.R.1991]

The average for the wells falls within the range, 8 – 200 TFC/100ml quoted as typical for Uganda
[Cairncross and Feacham]

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Water Storage in Pots

Possible Causes of contamination:

- Ill fitting cover on pots giving access to insects
- Cup for scooping water out used by whole family and often left on the floor
- Multi-use of same jerrycan for different water sources
- Using cupped hands to funnel pumped well water into jerrycans.
- Sanitary surveys carried out at wells indicated that contamination could occur from dirty well sites

Conclusions - hand dug well programme

- Hand dug well programme cost £100,000
- Provided water for 6,000 people
- A reasonable quality water provided
- Water consumption increased
- Time spent collecting water much reduced - giving more time for work in fields or education
- Reduced incidence of disease

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Conclusions - other benefits

- Communities strengthened and able to tackle other development projects
- Women's participation encouraged
- 3 well teams continuing with other NGOs
- Helped progress reconciliation between Iteso and Karamojong
- 4 MSc students contributed valuable reasearch

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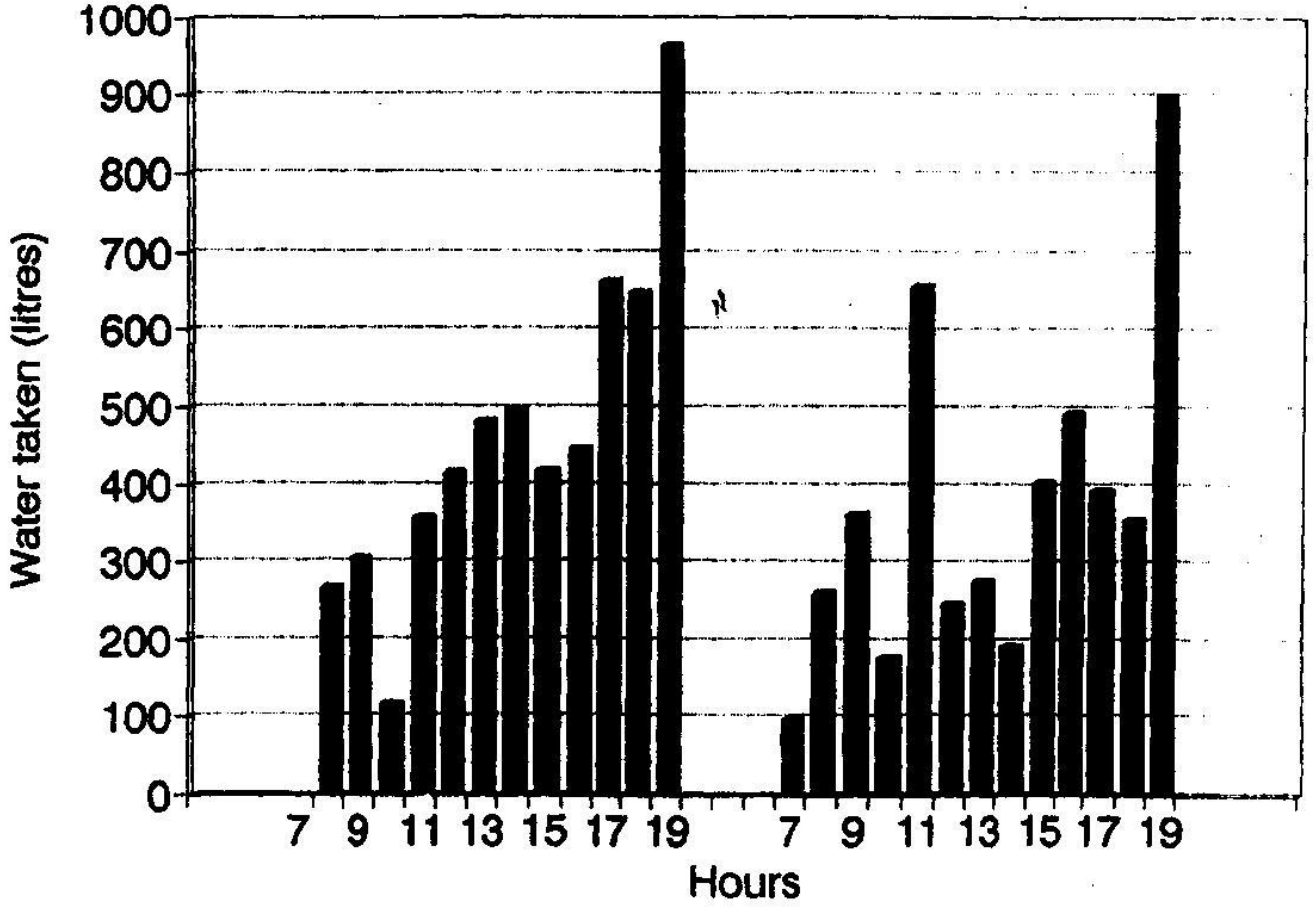
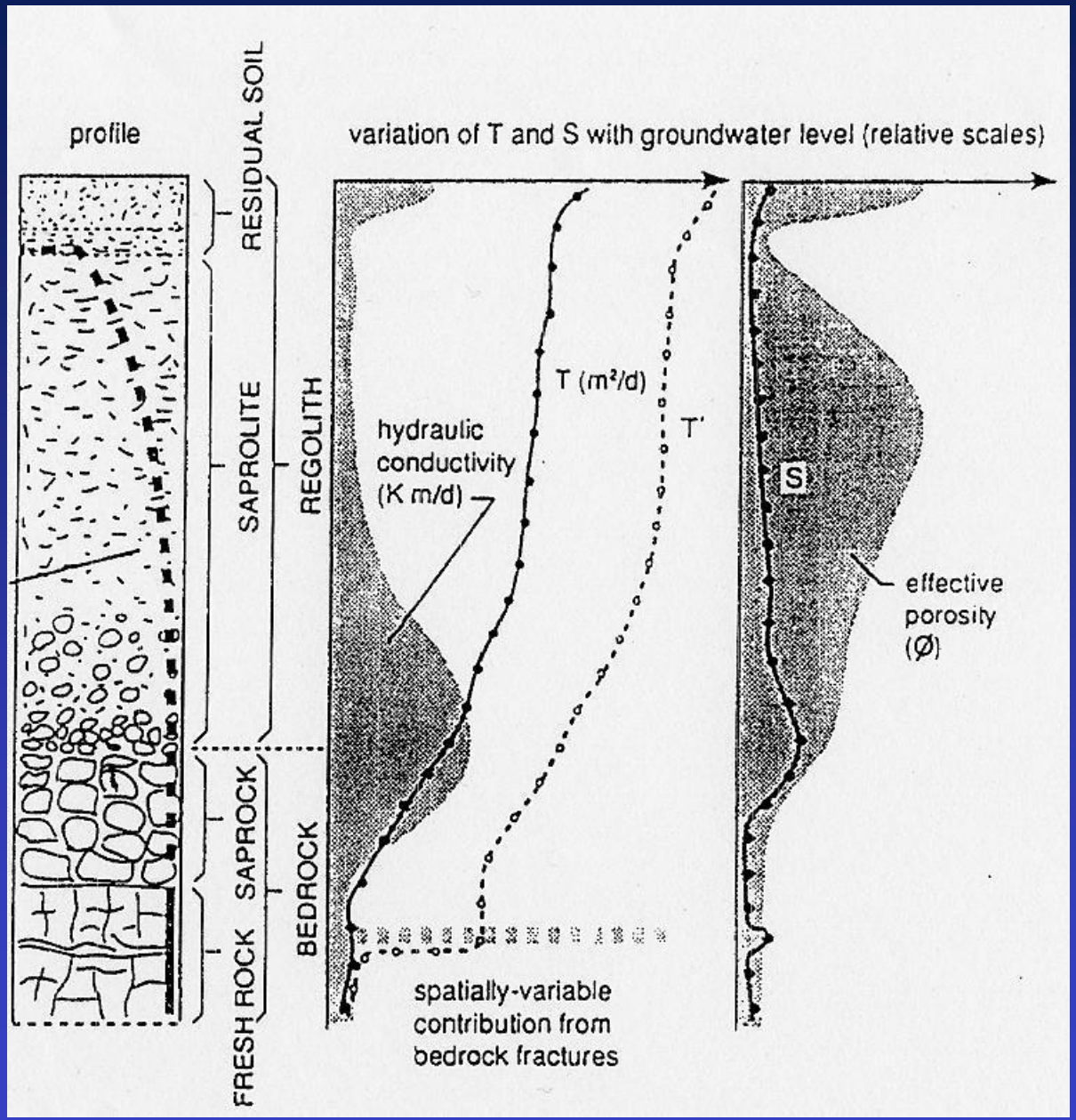
Use of CPW001 well
Kapelebyong



Drainage problems at a borehole



Hydraulic conductivity and porosity verses well depth

After: Chilton & Smith-Carrington 1984; Foster 1984 and Wright 1992; Baker et al 1992 and Hazel et al 1992

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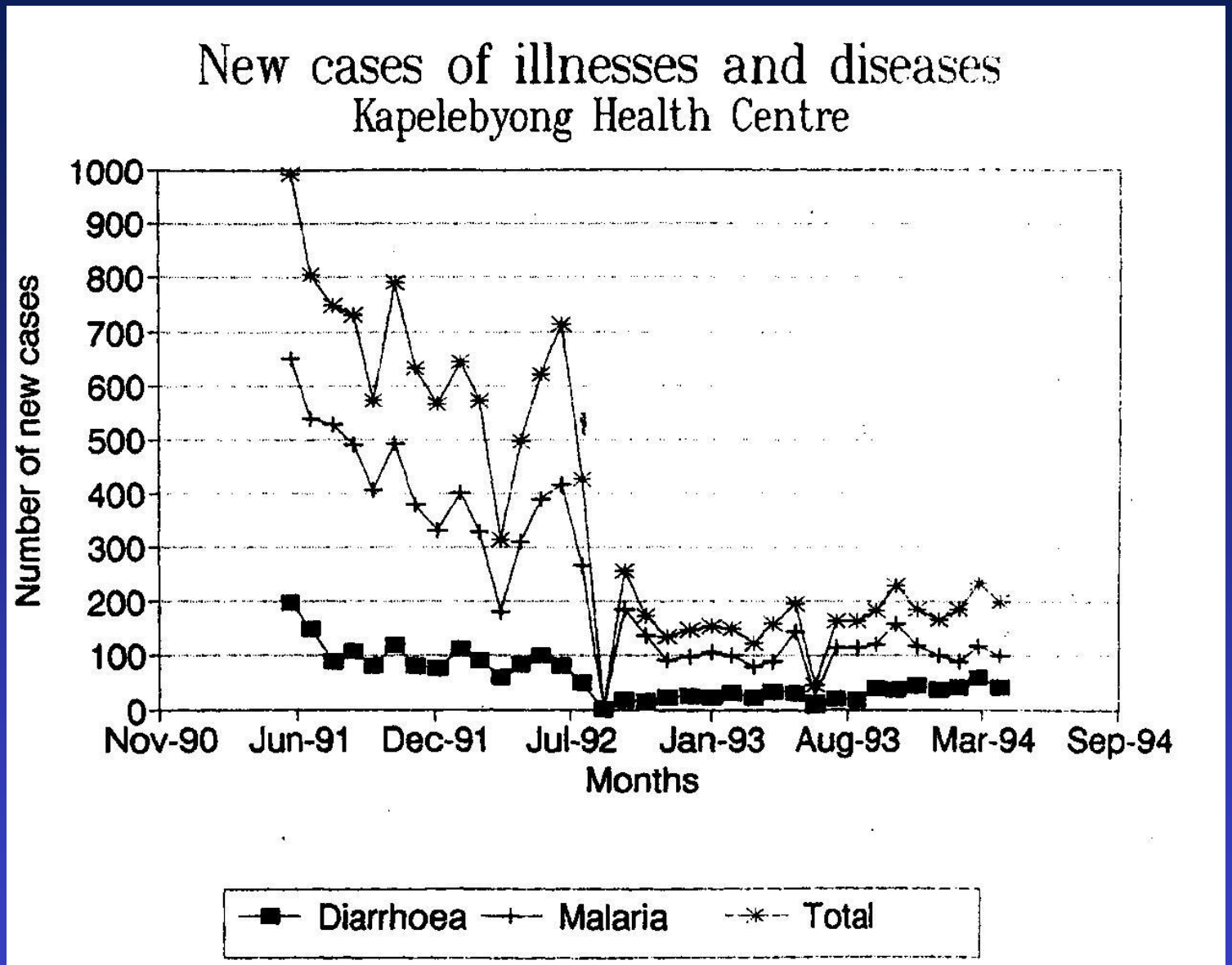
New cases of illnesses and diseases
Kapelebyong Health Centre
Number of new cases
1000
900
800
700
600
500
400
300
200
100
0
Nov-90
Jun-91
Dec-91
Jul-92
Jan-93
Aug-93
Mar-94
Sep-94
Months
Diarrhoea
Malaria
Total

Cutting ring for caisson method

Transport problems

Water quality testing