

APPENDIX 5 OTHER RELEVANT DATA/INFORMATION

5-1 Operation and Maintenance Situation of Existing Water Supply Facilities with Japanese Assistance

5-2 Results of Socio-Economic Survey

5-3 Questionnaire Used for Sample Household Survey

5-4 Results of Geophysical Survey

Appendix 5-1 Operation and Maintenance Situation of Existing Water Supply Facilities with Japanese Assistance (1992-1994)

| Site No. | Village Name | Completion Year | Population in BD Design | Pump Operation Hours | Existence of Water Committee | Water Committee Members | | Collected Water Fee Tariff | | Annual Balance | Method of Fee Safekkeeping | No. and Salary of Operators and Tap Caretaker | Method of Diesel Procurement | Problems and Requests on Facilities Operation | Experiences in Facilities Repairs |
|----------|-----------------|-----------------|-------------------------|--|------------------------------|-------------------------|-------|--|--|--|----------------------------|--|--|--|-----------------------------------|
| | | | | | | Men | Women | Humans | Livestock | | | | | | |
| N-1 | Njaba Kunda | 1994 | 3,560 | Dry season: 7:00-12:00 Rainy season: 15:00-19:00 | Yes | 9 | 4 | D10/pers/yr (Married men & women) D15/pers/yr (Single men & women over 18 yrs) | D5/head/yr (Farming livestock) D2/head/yr (Breeding cattle, dry season only) | Income: D75,360 (2003 record) Expenditure (fuel costs): D1,800/120 lit/9 days | Bank account | Operator: 1 (D300/mon) Tap Caretaker: 1/tap (No salary) | Request solar system, cause fuel cost for O&M too high, and maintenance of generator difficult. Restrictions in operation hours and insufficient usable water due to O&M cost deficits | Replacement of battery and pipes; maintenance of generator (From Jan. to Aug. 2003, total D9,200 spent for facilities repair and O&M) | |
| N-2 | Fass Omar Sahor | 1993 | 2,200 | Dry season: 7:00-10:00 17:00-19:00 Rainy season: 7:00-11:00, 17:00-20:00 | Yes | 8 | 6 | D42/pers/mon (over 12 yrs) | D7/head/yr (Breeding cattle) D2/head/yr (Farming livestock, and small livestock such as sheep and goats) | Income: D73,280/yr Expenditure (fuel costs): D32,000/2,000 lit | Bank account | Operator: 1 (D400/mon) Tap Caretaker: 1/tap (No salary) | Shortage of taps due to population increase. Request solar system, cause fuel costs high, difficult to continuously pay running costs, and O&M costs increase due to deterioration of generator. Usable water shortage due to limited operation hours (using existing shallow well with handpump and open shallow wells) | Paid D70,000 in 2001 for generator repair. Also in 2003, used O&M fee to replace pump (Grundfos SP17-7) | |
| N-3 | Katchang | 1995 | 3,630 | 10:00-14:00 | Yes | 17 | 0 | D60/pers/yr (Married men and women) D30/pers/yr (Married women) D25/pers/yr (Single men & women over 15 yrs) | D10/head/yr | Income: D40,000-50,000 (Also receive support from village workers and loans) Expenditure (fuel costs): D6,000/2 barrels (about 320 lit)/mon | Save in | Operator: 2 (D1,000/pers/yr) Tap Caretaker: 1/tap (No salary) | Request solar system, cause fuel costs high, shortage of operation hours to create shortage of usable water. Residents don't have information on contractor for repairs Leakages in pipes and damages in tapstands | In Sep. 2003, pipe leakage repaired by residents. | |
| N-4 | Ndungu Kebbheh | 1995 | 3,140 | 10:00-16:00 | Yes | 10 | 5 | D30/pers/yr | D12/head/yr | Income: D73,280/yr Expenditure: D21,482/yr (maintenance contract fee, others) | Bank account | Operator: 1 (D300) | None | None | |
| L-5 | Baro Kunda | 1995 | 3,060 | 2 days a week | Yes | 7 | 0 | Since a rich individual has paid fuel cost for the last 2 years, fees not collected from residents. | | | | Operator: 2 (No salary) | Request solar system, because from 4 years ago, cannot operate daily due to difficulties in savings for fuel cost (during facilities construction period, operated twice per day at 6:00-10:00 and 17:00-20:00). Now, use together with open shallow well. Damages in taps and valves. Due to deterioration of generator, need more fuel to fill storage tank. | Repaired generator in July 2003. Cost of D9,000 collected from 7 clans making up the village. Repair done by private company in Banjul. | |
| L-6 | Tomiatoba | 1994 | 2,740 | 9:00-11:00, 14:00-17:00 | Yes | 3 | 9 | D5/pers/mon (Men) D2.5/pers/mon (Women) | | Income: D800/mon | | Operator: 1 (No salary) | Request solar system, because from last year, can't operate only during dry season from Oct. to June due to high fuel costs. Now, use together with handpump equipped shallow well. | None | |
| L-7 | Bureng | 1993 | 2,500 | 17:00-24:00 | Yes | 6 | 0 | D75/pers/yr (Adult men); if insufficient, reset fee and collected again | D2/head/yr (Cattle, donkey, horse) | Income: D310/20 lit/day + spare fuel 2 lit/day | VISACA | Operator: 2 (D250/pers/yr) | Request solar system, because daily operation bought from DWIR in Banjul, and repaired. Replaced cracked pipe by area mechanic (responsible for O&M of handpump well), and paid by residents. | Spare parts for generator bought from DWIR in Banjul, and repaired. Replaced cracked pipe by area mechanic (responsible for O&M of handpump well), and paid by residents. | |
| M-1 | Mamut Fana | 1994 | 2,150 | 7:00-11:00, 17:00-19:00 | Yes | 6 | 6 | D17/pers/water-fetching (Married women) for drinking D2/pers/water-fetching (Married women) for washing clothes | During facilities construction, D17/head/yr was collected, but since many households could not pay, now take livestock to lake in Casamance area of neighboring Senegal) | Income: D250/20 lit/day | VISACA | Operator: 2 (D1,500/pers/yr) Tap Caretaker: 1 woman/tap (D15/pers/week) Tap caretaker collects water fee from users for each tap every day. Every week, WIC confirms fee for saving. | Request solar system, because daily operation difficult due to high fuel costs. Leakages in pipes. When repairs are requested to DWIR, response takes long time (usually 3 weeks to one month after request). If changed to solar system, can contract with private maintenance company. | Repaired pipeline twice by DWIR in Banjul. Costs were D2,000 ad D2,100. | |
| M-3 | Brikama Ba | 1994 | 3,510 | 4 days a week | Yes | 6 | 6 | D5/pers/mon (Women) Also, collection from shop owner of periodic market | | Income: D600/32 lit/week (8 lit/day x 4 days/week) | Bank account | Operator: 1 (D350/mon) Tap Caretaker: 9/tap (No salary) | Request solar system, because from one year ago, the village is expanding due to intense population influx, and so existing water supply facilities cannot meet the demand. Request solar system, because daily operation difficult due to high fuel costs. Now, using together with existing handpump equipped shallow well and open shallow wells. When repairs are requested to DWIR, response takes long time (usually 4 weeks to one month after request). If changed to solar system, can contract with private maintenance company. | Repaired pipeline twice by DWIR in Banjul. Costs were D2,000 ad D2,100. | |
| M-4 | Madina Urmally | 1995 | 2,780 | Every other day | Yes | 6 | 6 | D100/pers/yr (Compound head) D50/pers/yr (Married men) D10/pers/yr (Married women) Other than above, remittance from out of village workers | | Income: D22,000 Expenditure (fuel costs): D1,800/120 lit/18 days | Bank account | Operator: 2 (no salary) Tap Caretaker: 10/tap (No salary) | Request solar system, because from one year ago, daily operation is difficult due to high fuel costs (D1,100/200 lit to D3,000/200 lit). Presently, on non-operation days, necessary water is stored the day before. Cracks in pipes. Increase in fuel consumption due to generator deterioration. | Pump fell down the borehole, so asked DWIR in Banjul to remedy the situation. | |

VISACA: Village Savings and Credit Association

APPENDIX 5-2 RESULTS OF SOCIO-ECONOMIC SURVEY

1. Survey Objectives

Aimed the followings, the socio-economic survey was conducted under supervision by the consultant in charge of socio-economic survey/ operation and maintenance plan. The survey was partly sub-contracted to a local consultant specialised in social development in the Gambia.

- (1) to survey socio-economic conditions of the target area in order to extract social conditions to be paid an attention to for planning the project.
- (2) To assess their willingness and capacity to improve living conditions as well as their problems and needs related to water and sanitation for the community members in the target area.
- (3) To survey problems related to operation and maintenance of water supply facilities.
- (4) To collect baseline data of indicators to be used for impact evaluation of the project.

2. Contents and Methodologies of the Survey

Three methods were applied for the socio-economic survey in accordance with the survey purpose.

| Type of Survey | 1. Key Informant Interview | 2. Sample Household Survey | 3. Participatory Assessment |
|-----------------------------|---|--|--|
| Main Topics of Survey | General socio-economic conditions of the village Types of existing water and sanitation facilities and conditions of operation and maintenance Communal activities Needs to improve water supply facilities and willingness for operation and maintenance Support from external agencies for improvement of living conditions | Problems and behaviour of residents on water and sanitation Conditions of livelihood Perceptions of operation and maintenance of water supply facilities, willingness to pay for O&M costs, and affordable amount for the households | Natural and social resources of the village Type, usage and problems of existing water and sanitation facilities Hygiene behaviour Daily routine of men and women, access and control of resources by men and women |
| Responsible Person | Japanese consultant and motivators of DWR | Enumerators of the local consultant | |
| Survey Sites | 20 sites for construction of new water supply facilities, 9 sites for conversion of pumping system to solar-powered one | 20 sites for construction of new water supply facilities | 6 sites out of 20 for construction of new water supply facilities |
| Method | Semi-Structured Interview | Structured Interviews using Questionnaires | PRA |
| Target Person of the Survey | Village heads, members of Village Development Committee (VDCs), existing VWCs, and other community leaders | 30-70 households sampled according to size of each site, 1000 households in total | Residents of survey sites (Divided into 6-7 members of groups of adult men, adult women and youth per site) |

3. Results of Household Survey

The household survey was conducted by Afri Consult, a local consultant specialised in social development, at 20 sites for construction of new water supply facilities as a scope of sub-contract on socio-economic survey. Enumerators of the local consultant visited sample households and interviewed to residents with questionnaires. The questionnaire was prepared by the Japanese consultant and finalized after a review with the local consultant. A form of the questionnaire is attached hereafter in Appendix 5-3.

The people in the Gambia communicate each other with local languages instead of using English which is the official language of the country. Since each ethnic group use its own language, enumerators well acquainted with those local languages were appointed for the survey. They translated questions in the questionnaire orally and recorded responses in English. These enumerators and facilitators of PRA exercises were trained prior to commencement of the field survey in order to make consensus on survey methods, translation of the questions, and other important points on conducting the survey.

(1) Sampling Method

1,000 samples in total were collected from the targeted 20 sites. Number of samples per site was basically 50 and adjusted according to size of the total number of households in the village. (Table 1) The survey primarily aimed with assessing present situation of use of water sources and problems and needs of the community members on water and sanitation environment. In the light of this point, with dividing each village into 5 sections, i.e. south, north, east, west and central part, sample households were selected so that the samples contained various households in terms of types of existing water sources they used and conditions of accessibility.

Table 1 Distribution of Samples in the Survey Sites

| Division | Site No. | Name of Survey Site | No. of HH*1 | No. of Sample HH | Ratio of Sample HH/Total No. of HH |
|----------|----------|---------------------|-------------|------------------|------------------------------------|
| LRD | L1 | Nema | 134 | 50 | 37 |
| | L3 | Dumbutu | 96 | 30 | 31 |
| | L8 | Jali | 119 | 50 | 42 |
| | L9 | Pakali Ba | 141 | 50 | 35 |
| | L10 | Massembe | 110 | 50 | 45 |
| | L11 | Wellingara Ba | 170 | 70 | 41 |
| CRD | M2 | Piniai | 49 | 30 | 61 |
| | M5 | Saruja | 182 | 50 | 27 |
| | M6 | Dankunku | 143 | 70 | 49 |
| | M8 | Sami Pachonki | 148 | 50 | 34 |
| | M9 | Sukuta | 120 | 50 | 42 |
| | M10 | Galleh Manda | 144 | 50 | 35 |
| | M11 | Jakhally | 167 | 50 | 30 |
| | M12 | Nianija Bakadagy | 64 | 30 | 47 |
| NBD | M13 | Sambang Complex | 158 | 50 | 32 |
| | N9 | Tuba Kolong | 153 | 70 | 46 |
| | N10 | Medina Sering Mass | 157 | 70 | 45 |
| WD | N11 | Nawleru | 56 | 30 | 54 |
| | W1 | Sohm | 109 | 50 | 46 |
| | W2 | Sutusingjang | 151 | 50 | 33 |
| | | 計 | 2,571 | 1000 | 41 |

1 : estimated from population growth rate per district and average household size provided by the provisional data of 2003 census and final data of 1993 census of the Gambia.

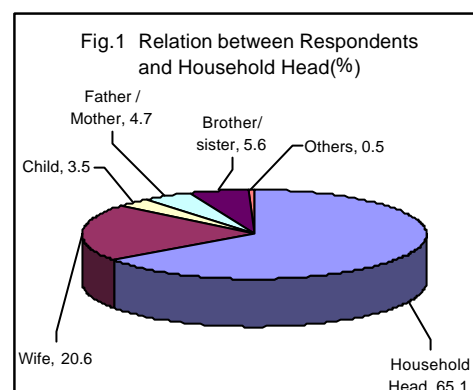
(2) Characteristics of Respondents

Ratio of sex of the respondents is 70% for male and 30% for female as shown in Table 2. 65% of the respondents are household heads followed by wife of the household head (20.6%), brother or sister of household head (5.6%), father or mother (4.7%) and child (3.5%). (Fig. 1) While an effort was made to obtain female respondents as much as possible in order to consider perceptions and opinions of females in the survey, the enumerators were faced with difficulties to interview to women. It was the farming season in August and September when the survey was conducted. Most of women in the target area were in the field for transplantation of rice in the daytime, which was generally regarded as a role of women in rural society of the Gambia. Nevertheless, in case wife of the household head was at home, she was requested to be a par of interviewee so that information on which women are familiar with such as water use and diseases infection could be shared.

Table 2 Distribution of Respondents per Sex and Age

| Age | Male | | Female | | Total | |
|----------|-------|------|--------|------|-------|------|
| | Count | % | Count | % | Count | % |
| Under 19 | 13 | 1.3 | 7 | 0.7 | 20 | 2.0 |
| 20 - 29 | 56 | 5.6 | 76 | 7.6 | 132 | 13.2 |
| 30 - 39 | 107 | 10.7 | 89 | 8.9 | 196 | 19.6 |
| 40 - 49 | 144 | 14.4 | 54 | 5.4 | 198 | 19.8 |
| 50 - 59 | 155 | 15.5 | 36 | 3.6 | 191 | 19.1 |
| 60 - 69 | 118 | 11.8 | 23 | 2.3 | 141 | 14.1 |
| 70 - 79 | 77 | 7.7 | 9 | 0.9 | 86 | 8.6 |
| 80 - 89 | 27 | 2.7 | 3 | 0.3 | 30 | 3.0 |
| Above 90 | 5 | 0.5 | 1 | 0.1 | 6 | 0.6 |
| Total | 702 | 70.2 | 298 | 29.8 | 1000 | 100 |

1000 valid cases, no missing case



1000 valid cases, no missing case

(3) Characteristics of Sample Households

Ratio of sex of household is 92.3% for male and 7.7% for female. Average age is 53 with 19 at lowest and 98 at highest. (Table 3, Fig. 2) 94% of the household heads were married as of the survey period and 54% of them have polygamous households. (Table 4, Fig. 3) Size of sample household varies from less than 5 members to more than 30. Representative number is 12 members per household (median), which can further be analysed per Division as 12 in NBD, 10 in WD, 11 in LRD and 14 in CRD.

Table 3 Distribution of Household Heads by Sex and Age

| Age | Male | | Female | | Total | |
|----------|-------|------|--------|------|-------|-----|
| | Count | % | Count | % | Count | % |
| Under 19 | 1 | 100 | 0 | 0 | 1 | 100 |
| 20 - 29 | 48 | 90.6 | 5 | 9.4 | 53 | 100 |
| 30 - 39 | 145 | 89.5 | 17 | 10.5 | 162 | 100 |
| 40 - 49 | 249 | 93.3 | 18 | 6.7 | 267 | 100 |
| 50 - 59 | 219 | 92.8 | 17 | 7.2 | 236 | 100 |
| 60 - 69 | 173 | 92.0 | 15 | 8.0 | 188 | 100 |
| 70 - 79 | 68 | 93.2 | 5 | 6.8 | 73 | 100 |
| 80 - 89 | 16 | 100 | 0 | 0 | 16 | 100 |
| Above 90 | 4 | 100 | 0 | 0 | 4 | 100 |
| Total | 923 | 92.3 | 77 | 7.7 | 1000 | 100 |

1000 valid cases, no missing case

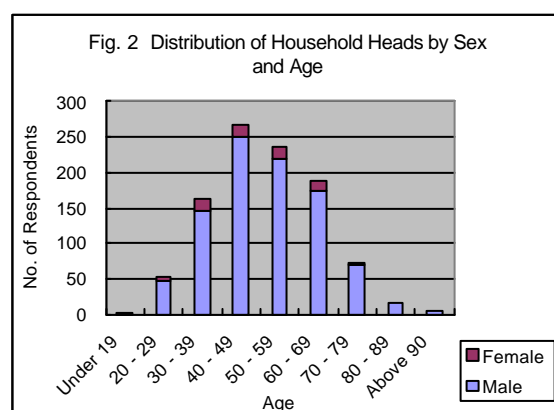
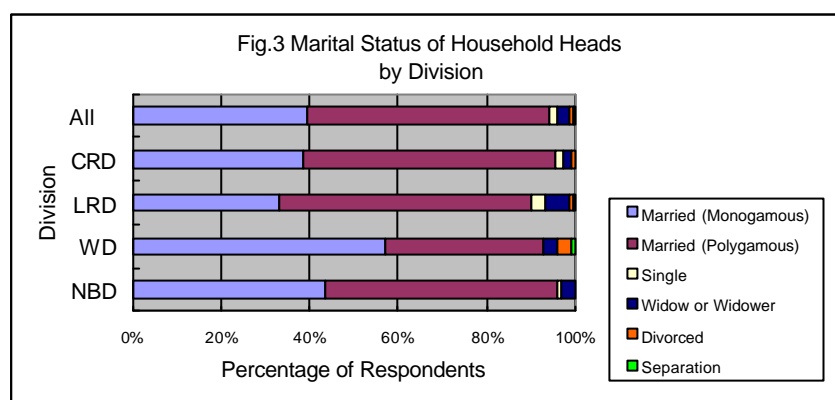


Table 4 Marital Status of Household Heads by Division

| Marital Status | NBD | | WD | | LRD | | CRD | | All | |
|----------------------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|
| | Count | % | Count | % | Count | % | Count | % | Count | % |
| Married (Monogamous) | 74 | 43.8% | 57 | 57.0% | 89 | 33.0% | 177 | 38.4% | 397 | 39.7% |
| Married (Polygamous) | 88 | 52.1% | 36 | 36.0% | 155 | 57.4% | 264 | 57.3% | 543 | 54.3% |
| Single | 2 | 1.2% | 0 | 0.0% | 8 | 3.0% | 8 | 1.7% | 18 | 1.8% |
| Widow or Widower | 5 | 3.0% | 3 | 3.0% | 14 | 5.2% | 8 | 1.7% | 30 | 3.0% |
| Divorced | 0 | 0.0% | 3 | 3.0% | 3 | 1.1% | 4 | 0.9% | 10 | 1.0% |
| Separation | 0 | 0.0% | 1 | 1.0% | 1 | 0.4% | 0 | 0.0% | 2 | 0.2% |
| Total | 169 | 100.0% | 100 | 100.0% | 270 | 100.0% | 461 | 100.0% | 1000 | 100.0% |

1000 valid cases, no missing case



(4) School Attendance of Children and Adult Literacy

Sample households have 3-4 children at school age on average and 80% of these children were attending school as of the survey period. Ratio of boy child (81%) is slightly higher than the one for girl child (79%). Among household members at 18 years and above, those who can read letters and newspapers without a difficulty is 46% in total. Literacy rate of men (60%) is well over than the one for women (31%).

(5) Livelihood

The most important income source for the residents in the survey sites is farming from which about 90% of sample households earn a their livelihood. It is followed by trading and remittance from family members who are working outside their villages. Others are cattle rearing, gardening and pension while households depending on salary from employment are the smallest group. Especially NBD and LRD have larger number of households than other Divisions which depend on income from agriculture. On the other hand, percentage of households which are involved in trading is higher in WD compared with other Divisions since the survey sites in WD are located on the outskirts of Brikama where is the administrative centre of the Division and near from Banjul. (Table 5, Fig. 4) 70% of the sample households have more than two income sources. In case of the farming households, 80% of them have income sources like trading and remittance in addition to the farming. (Table 6, Fig. 5)

Table 5 Distribution of Main Income Sources per Division (Multiple Answer)

| Income Source | NBD | | WD | | LRD | | CRD | | All | |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Count | % | Count | % | Count | % | Count | % | Count | % |
| Farming | 161 | 44.7% | 68 | 33.8% | 226 | 40.9% | 455 | 36.0% | 910 | 38.3% |
| Trading | 32 | 8.9% | 49 | 24.4% | 65 | 11.7% | 254 | 20.1% | 400 | 16.8% |
| Salary | 15 | 4.2% | 10 | 5.0% | 44 | 8.0% | 95 | 7.5% | 164 | 6.9% |
| Pension | 34 | 9.4% | 27 | 13.4% | 45 | 8.1% | 173 | 13.7% | 279 | 11.7% |
| Remittance | 68 | 18.9% | 19 | 9.5% | 88 | 15.9% | 156 | 12.3% | 331 | 13.9% |
| Others | 50 | 13.9% | 28 | 13.9% | 85 | 15.4% | 131 | 10.4% | 294 | 12.4% |
| Total | 360 | 100% | 201 | 100% | 553 | 100% | 1264 | 100% | 2378 | 100% |

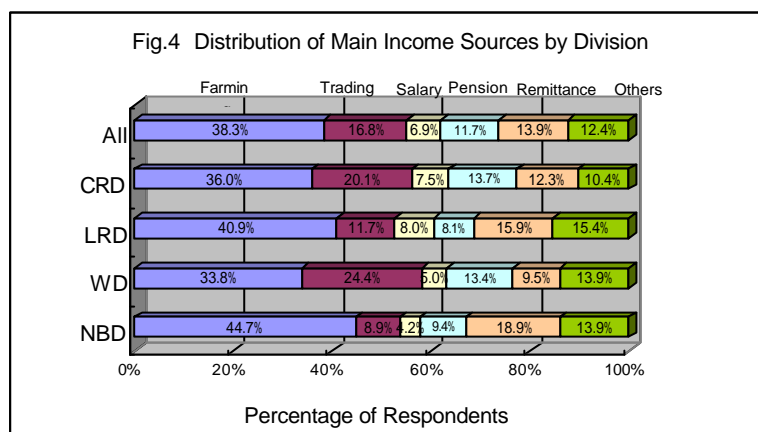
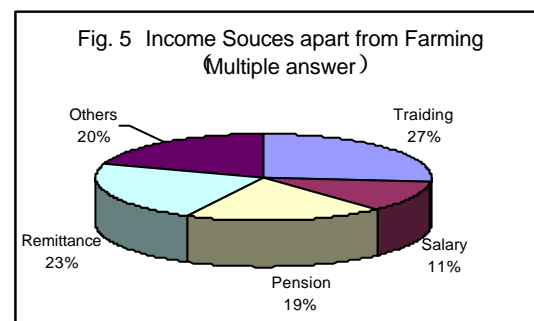


Table 6 Number of Income Source (Only for farming households)

| No. of Income Source | NBD | WD | LRD | CRD | All |
|----------------------|--------|--------|--------|--------|--------|
| Only farming | 27.3% | 22.1% | 26.1% | 15.4% | 20.7% |
| 1 apart from farming | 41.0% | 50.0% | 43.8% | 35.8% | 39.8% |
| 2 apart from farming | 23.0% | 20.6% | 20.4% | 19.8% | 20.5% |
| 3 apart from farming | 6.2% | 4.4% | 8.8% | 19.1% | 13.2% |
| 4 apart from farming | 0.6% | 0.0% | 0.0% | 5.9% | 3.1% |
| 5 apart from farming | 1.9% | 2.9% | 0.9% | 4.0% | 2.7% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

910 valid cases, no missing case



Only for 910 households depending on farming on their main income source, no missing case, 1333 responses in total from the valid cases

The monthly mean income per household is GMD2,300 (median GMD1,350) according to the results of the sample household survey though it is difficult to know the actual situation of the livelihood. Level of the monthly mean income by source is GMD690 from farming, GMD1,600 from trading, GMD1,000 from salary, GMD1,100 from pension, and GMD800 from remittance. Since they depend on their main income source on farming, amount of income changes according to the harvest season. However, many households take a measure to avoid excessive decrease of household income by keeping several income sources. Therefore, 80% of the sample households responded that they had cash income throughout the year in some way. Meanwhile, the other households cannot secure cash income during the farming season from May to September. Especially, their livelihood is strained most severely in August. On

the other hand, compared with such lean months, they can earn cash income easily by selling agricultural products such as groundnuts, which is the most important cash crop in the target area, during a period from end of October to March. (Fig.6)

While a period when they have a difficulty to earn cash income, they generally depend on the remittance from their family members who live in urban areas of the Gambia or outside the country. Other alternative measures are trading in specific period, participation in income generating activities apart from farming, and selling livestock. Also, some households responded that they had to curtail their living expenses. (Table 7)

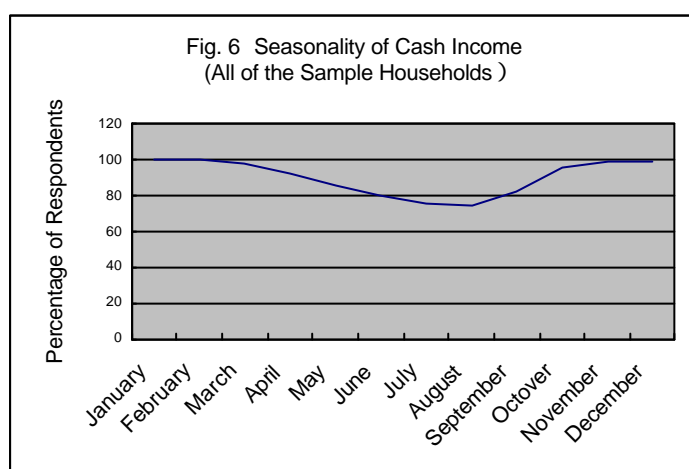


Table 7 Alternative Measures While No Cash Income

| Alternative Measures | Frequency | Percent(%) | Valid(%) |
|--------------------------------------|-----------|------------|----------|
| Depending on remittance | 101 | 10.1 | 29.3 |
| Selling farm products | 46 | 4.6 | 13.3 |
| Trading | 42 | 4.2 | 12.2 |
| Save expenditures | 38 | 3.8 | 11.0 |
| Income generating apart from farming | 35 | 3.5 | 10.1 |
| Selling livestock | 30 | 3.0 | 8.7 |
| Credit | 27 | 2.7 | 7.8 |
| Day labour | 26 | 2.6 | 7.5 |
| Sub-total | 345 | 10.3 | 100 |
| Not Applicable | 655 | 65.5 | |
| Total | 1000 | 100 | |

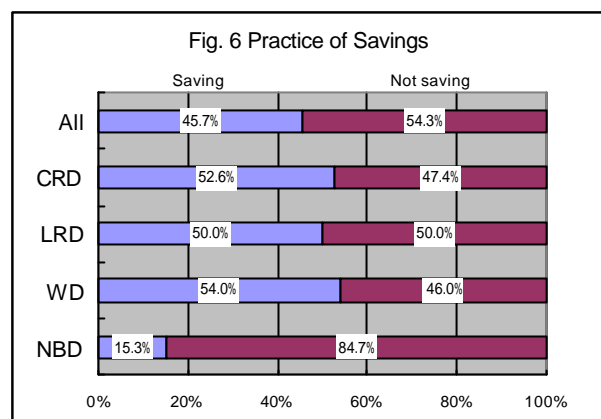
Regarding the household expenditures, 96% of the sample households answered that costs for feeding is the biggest item. Those who raised other items such as cloths, education, medical expense, sundries, agricultural implements, and ceremonial expenses was less than 1% of the respondents. Monthly mean expenditures of these items are GMD400-600 for food, GMD100-300 for cloths, GMD 100-150 for education, GMD 100 for medical cost, and GMD 100-200 for sundries. Transport (approximately GMD150) and ceremonial expenses (GMD20-50) are also included in the expenditure.

About half of the sample households are saving some funds for household emergency measures which are to be utilised when the household requires a certain amount of expenditure apart from the daily items mentioned above. However, 15% of households who practice saving in NBD is extremely lower than other Divisions. (Table 8, Fig. 7) 57% of households which practice savings are keep it in the house while 25% save it at the bank or credit union and 18% keep it at shop keeper or neighbour.

Table 8 Practice of Savings by Division

| Division | Saving | | Not Saving | | Total | |
|----------|--------|-------|------------|-------|-------|------|
| | Count | % | Count | % | Count | % |
| NBD | 26 | 15.3% | 144 | 84.7% | 170 | 100% |
| WD | 54 | 54.0% | 46 | 46.0% | 100 | 100% |
| LRD | 135 | 50.0% | 135 | 50.0% | 270 | 100% |
| CRD | 242 | 52.6% | 218 | 47.4% | 460 | 100% |
| All | 457 | 45.7% | 543 | 54.3% | 1000 | 100% |

1000 valid cases, no missing case



Apart from the savings, livestock is an important resource of the sample households traditionally. Especially, the cattle rearing is one of their valuable sources of cash income while they also use cattle as draft power for farming and transport. In Fula communities mainly living in CRD, the cattle rearing is widely implemented and number of cattle owned is larger than other ethnic groups. Also, there is a custom that other ethnic group such as Mandinka leaves their cattle in Fula's care who are good at rearing cattle. Horses and donkeys are also used as animal draft power for farming and transport. As small ruminants, goat, sheep and chickens are common.

(6) Present Situation of Water Supply

Types and Usages of Existing Water Supply Facilities

In 20 villages where the construction of new piped water schemes are requested, 90% of the sample households are using shallow wells with handpumps as the source of drinking water. (Table 9) Other 10% are in use of concrete lined open wells as the main water source. Little households use stream, pond or rainwater for drinking.

Table 9 Distribution of Main Sources for Drinking Water

| Division | Stream/ Pond | | Concrete Lined Well | | Rainwater | | Shallow Well with Handpump | | Borehole with handpump | | Total | |
|----------|--------------|---------|---------------------|---------|-----------|---------|----------------------------|---------|------------------------|---------|-------|---------|
| | Count | Percent | Count | Percent | Count | Percent | Count | Percent | Count | Percent | Count | Percent |
| NBD | 0 | 0% | 16 | 9.5% | 0 | 0% | 154 | 90.5% | 0 | 0% | 170 | 100.0% |
| WD | 0 | 0% | 1 | 1.0% | 0 | 0% | 99 | 99.0% | 0 | 0% | 100 | 100.0% |
| LRD | 0 | 0% | 32 | 11.9% | 0 | 0% | 238 | 88.1% | 0 | 0% | 270 | 100.0% |
| CRD | 1 | 0.2% | 50 | 10.8% | 1 | 0.2% | 407 | 88.5% | 1 | 0.2% | 460 | 100.0% |
| All | 1 | 0.1% | 99 | 9.9% | 1 | 0.1% | 898 | 89.8% | 1 | 0.1% | 1000 | 100.0% |

1000 valid cases, no missing case

42% of the sample households use separate water source(s) from drinking for other purposes such as washing dishes and cloths, watering to the garden and livestock, and building houses while 58% use a single water source for all purposes. (Table 10) In case of shallow wells with handpumps which is the most common

source for drinking water for the sample households, distribution of percentages between the group using a single water source and the one separating sources according to usage is almost same with the survey result for the whole samples mentioned above. (Table 11)

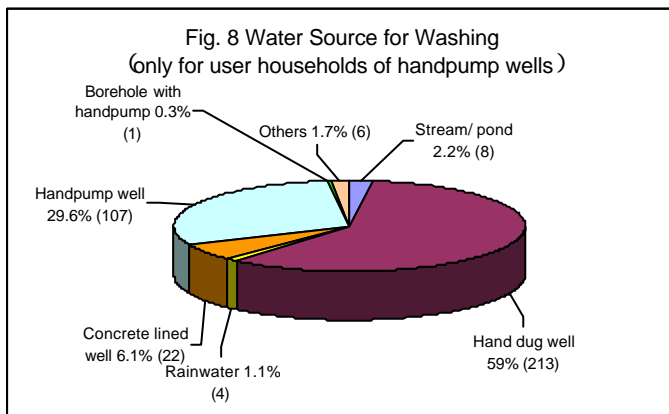
Most of the households using several water sources utilise traditional hand dug wells such as concrete lined shallow wells and unprotected wells without any protection measures such as a lid for washing and gardening. (Fig. 8-9) Regarding animal watering, percentage of use of stream and pond is larger than other purposes. (Fig. 10)

Table 10 Use of Different Water Source per Usage
(All Sample Households)

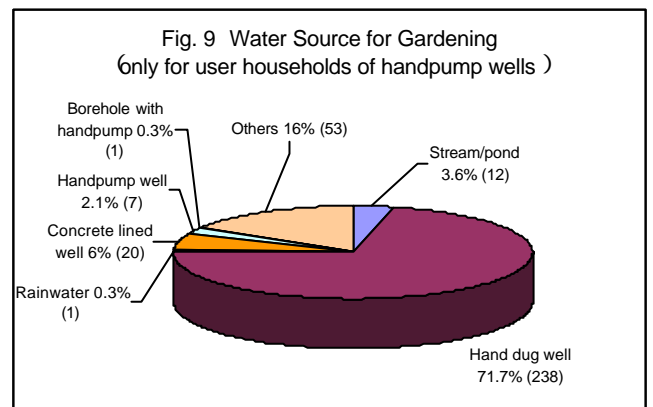
| | Frequency | Percent | Valid Percent |
|---|-----------|---------|---------------|
| Use a single water source for any purpose | 578 | 57.8 | 58.1 |
| Use different source per usage | 417 | 41.7 | 41.9 |
| Sub-total | 995 | 99.5 | 100 |
| Missing case (no answer) | 5 | 0.5 | |
| Total | 1000 | 100 | |

Table 11 Use of Different Water Source per Usage
(Only Households Using Shallow Wells with Handpump as Main Source of Drinking Water)

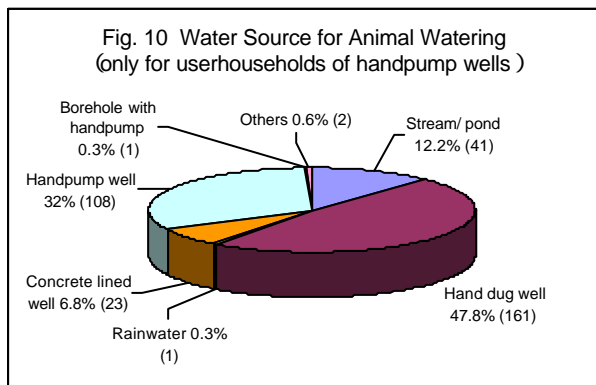
| | Frequency | Percent | Valid Percent |
|---|-----------|---------|---------------|
| Use a single water source for any purpose | 506 | 56.3 | 56.6 |
| Use different source per usage | 388 | 43.2 | 43.4 |
| Sub-total | 894 | 99.6 | 100 |
| Missing case (no answer) | 4 | 0.4 | |
| Total | 898 | 100 | |



361 valid cases, 27 missing cases (no answer)
Breakdown of the valid cases is indicated in the brackets above.
"Others": communal or household wells at garden



332 valid cases, 56 missing cases (no answer)
Breakdown of the valid cases is indicated in the brackets above.
"Others": communal or household wells at garden



337 valid cases, 51 missing cases (no answer)
Breakdown of the valid cases is indicated in the brackets above.
"Others": communal or household wells at garden

Perceptions of Residents on Present Situation of Water Supply

Regarding reliability of existing sources for drinking water, a survey on perceptions of the sample households on safety of water quality and stability of water supply revealed that a feeling of satisfaction of households mainly using shallow wells with handpumps was higher than the one for users of other water sources. 80percent of the user households of shallow wells with handpumps answered that the water quality of the existing source was good while only 35% of the households mainly using concrete lined open wells responded it. (Table 12) About 50% of these households using concrete lined wells have perception that water quality from the wells is acceptable since they can use safer water compared with the one from the traditional hand dug wells without any protection measures of the water point. However, contamination of water with coliform was confirmed at the existing wells with handpumps which the communities were using as a water source through the water quality analysis in the field survey. From this point of view, a gap exists between perceptions of the residents on safety of the water source they daily use and actual conditions.

On the other hand, 57% of households using concrete lined wells and 78% of user households of handpump wells perceive that water supply from the existing sources is sufficient throughout the year. 25% of the sample households stated that water supply from the sources was seasonal or insufficient all year round. In case that they cannot secure enough water from the main water sources, they cope with such difficulties by allowing well water to settle and increase in volume, travelling to distant places to fetch water, or re-digging the well by themselves or with paying to contractors. Especially, they experience water shortage at the hand dug wells and concrete lined wells during the period from March to June, which coincides with the peak of the dry season.

Table 12 Perceptions of Water Quality and Stability of Water Sources (All Sample Households)

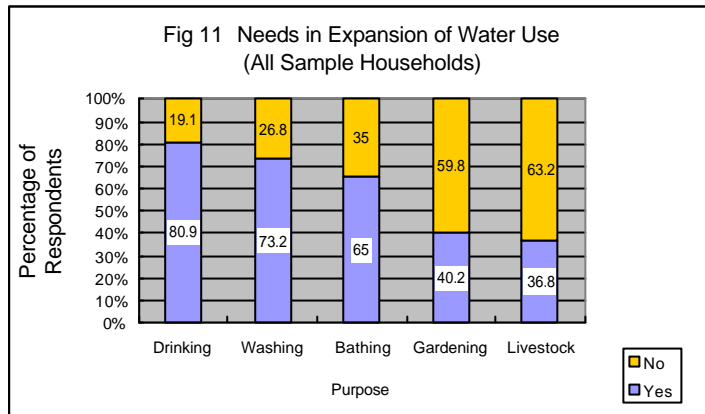
| Type of Water Source | Water Quality | | | | Stability of Water Supply | | | |
|-----------------------------|---------------|------------|-------|--------|---------------------------------|----------|----------------------------------|--------|
| | Good | Acceptable | Bad | Total | Sufficient through out the year | Seasonal | Insufficient throughout the year | Total |
| Stream/ Pond | 100.0% | 0.0% | 0.0% | 100.0% | 100.0% | 0.0% | 0.0% | 100.0% |
| Concrete lined shallow well | 34.3% | 55.6% | 10.1% | 100.0% | 57.6% | 33.3% | 9.1% | 100.0% |
| Rainwater | 0.0% | 100.0% | 0.0% | 100.0% | 0.0% | 0.0% | 100.0% | 100.0% |
| Shallow well with handpump | 82.7% | 12.9% | 4.3% | 100.0% | 78.5% | 6.5% | 15.0% | 100.0% |
| Borehole with handpump | 100.0% | 0.0% | 0.0% | 100.0% | 100.0% | 0.0% | 0.0% | 100.0% |
| Total | 77.9% | 17.2% | 4.9% | 100.0% | 76.4% | 9.1% | 14.5% | 100.0% |

1000 valid cases, no missing case

Quantity of Water Use

Quantity of water used for domestic purpose such as drinking, cooking, washing and bathing is estimated as 15-25 lit/person/day at present from the quantity of

water fetching per day per household. 55% of the sample households perceive this amount is enough while other 45% think insufficient. If they can use more water compared with the present status by improving the water supply facilities, their needs on increase of water use for drinking is the highest, followed by washing and bathing. (Fig.11)



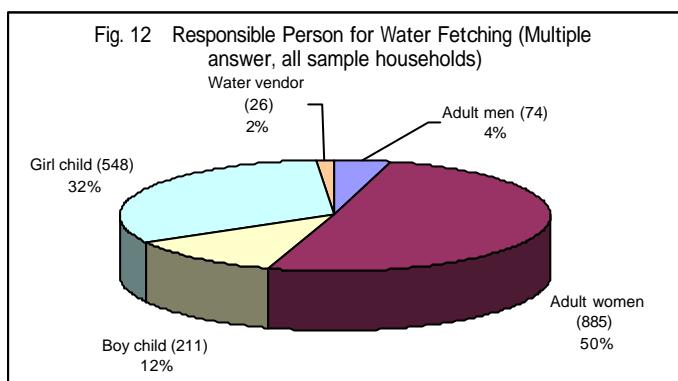
1000 valid cases, no missing case

Burden of Water Fetching

Water fetching for domestic use is a daily chore done by adult women and children. Girl child is involved in the water fetching more than boys. (Fig. 12) Adult men mainly do water fetching for animal watering and construction of houses. Buying water from water vendors is not common in the Gambia.

Time of water fetching is 2-3 times in a day for domestic use. Especially from 6:00 to 9:00 and 15:00 to 18:00 are the peaks in terms of number of users at water sources. 80% of the sample households can access to their main water sources within 15 minutes. However, they have to wait in a queue for fetching water at the source for 15-30 minutes or 30-60 minutes. Therefore, time taken for water fetching at once can be estimated as 30-90minutes. (Table 13, Fig. 13) They have to often wait for more than one hour in the morning and evening when number of users is many. Some respondents pointed out problems of quarrel and acts of violence at the water source over waiting for his/her turn to come around.

Also, women expressed their perceptions on problems of the existing water supply facilities through PRA that overcrowding at the existing wells with handpumps and their overuse often caused breakdown of the handpumps, hence difficulty in continuous use of the facilities. Others raised a problem of heavy workload to pump up water manually. Further, the community members concern a risk for children to fall into the wells when they fetch water from the concrete lined open wells with wide diameter.

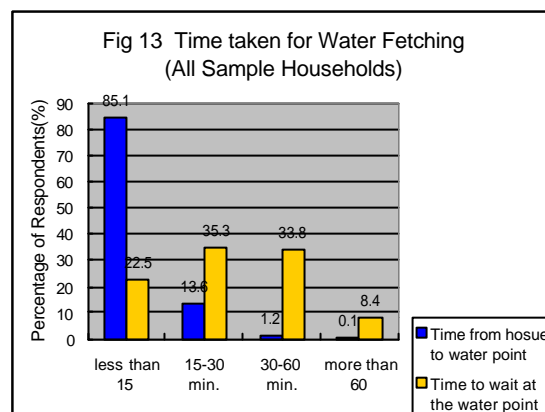


929 valid cases, 71 missing cases (no answer)
 Total 1744 responses from the valid cases
 Breakdown of responses is indicated in brackets above.

Table 13 Time for Water Fetching (All Sample Households)

| Time (min.) | Time Taken from House to Water Source | | | Time Taken to Wait in a Queue | | |
|--------------|---------------------------------------|-------------|-----------|-------------------------------|-------------|-----------|
| | Case | Percent (%) | Valid (%) | Case | Percent (%) | Valid (%) |
| Less than 15 | 851 | 85.1 | 85.1 | 225 | 22.5 | 22.5 |
| 15-30 | 136 | 13.6 | 13.6 | 353 | 35.3 | 35.3 |
| 30-60 | 12 | 1.2 | 1.2 | 338 | 33.8 | 33.8 |
| More than 60 | 1 | 0.1 | 0.1 | 84 | 8.4 | 8.4 |
| 計 | 1000 | 100 | 100 | 1000 | 100 | 100 |

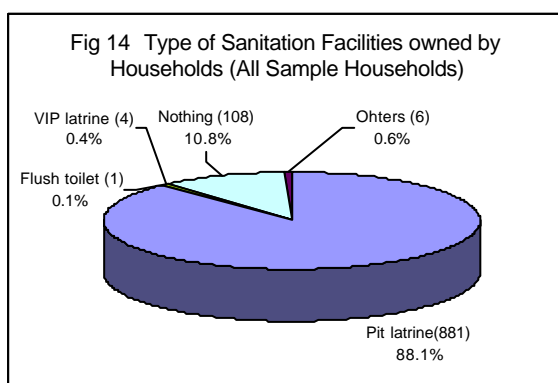
1000 valid cases, no missing case



(7) Status of Existing Sanitation Facilities and Hygiene Behaviour

Type and Use of Sanitation Facilities in Households

Traditional pit latrines are the most commonly used facility among the various types of sanitation facilities. 88% of the sample households claimed to have pit latrines. (Fig. 14) However, about 10% of the households have no latrine in their households. Members of such households use the nearby bush, back yards or their neighbours' latrines.



1000 valid cases, no missing case
 Breakdown of the valid cases is indicated in brackets above.

Knowledge, Attitudes and Practices on Hygiene

Regarding the hygiene practice at fetching water and its transportation from water sources to houses, 80% of the respondents claimed that they used container or bucket with a lid. (Table 14) Further, more than 90% of the sample households (994 households) storage drinking water in a jar inside the house with a cover.

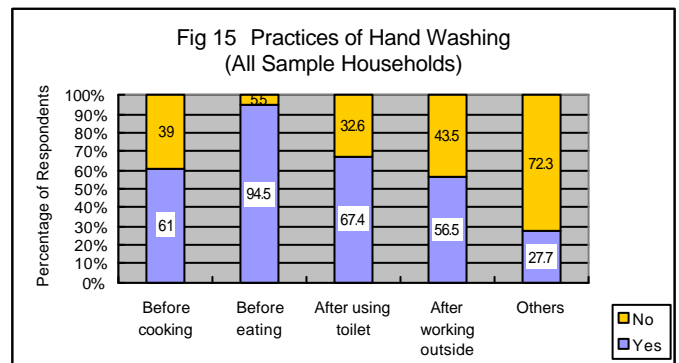
Water is commonly treated in one of two ways according to 75% of the respondents. The majority (about 98%) of them said they treat water by filtering it. This method involves placing a piece of clean cloth on the top of the jar and pouring water through the cloth into the jar. The other method of water treatment mentioned by 2% of the respondents is simply allowing the water to settle before use. Of those who practice the method, it is commonly done during the dry season when water shortage is fairly common. However, practices of boiling water or treating with chorine are not seen in the responses.

In terms of hand washing practices, it is common in the sample households to wash their hands before eating while practices of hand washing before cooking, after using latrine facility or after working outside varies. (Fig. 15) The most common method of hand washing is to wash their hands inside a basin. Drawing water from a basin with a small cup is not yet common in the communities though it is facilitated in the hygiene education programme. (Fig. 16)

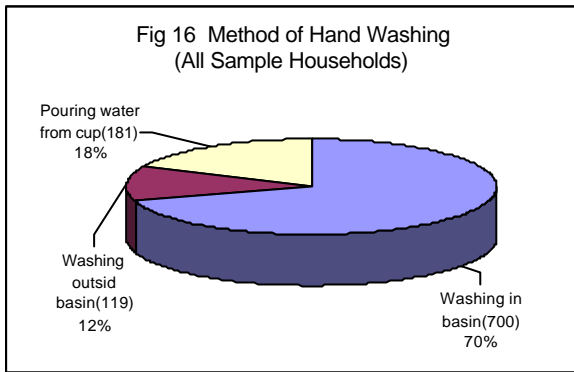
Regarding practices on household hygiene, 45% of the sample households dispose of their household rubbish at a collection point in the village or compound, whilst 25% dispose rubbish by burying it in the yard, and 18% throw it in the back yard. (Fig. 17)

Table 14 Type of Utensils for Fetching, Transportation and Storage of Drinking Water

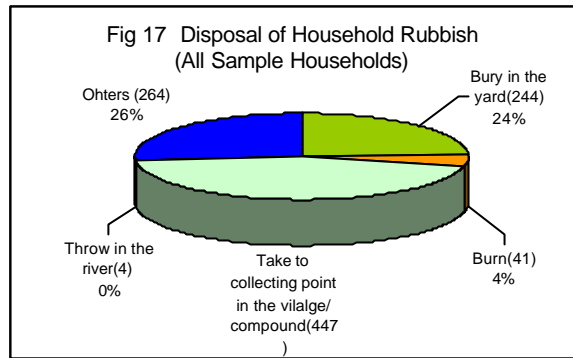
| Type of Utensils | Frequency | Percent | Valid Percent |
|-------------------------|-----------|---------|---------------|
| Container with a lid | 422 | 42.2 | 42.2 |
| Container without a lid | 369 | 36.9 | 36.9 |
| Bucket with a lid | 16 | 1.6 | 1.6 |
| Bucket without a lid | 103 | 10.3 | 10.3 |
| Wash basin | 88 | 8.8 | 8.8 |
| Others | 2 | 0.2 | 0.2 |
| Total | 1000 | 100 | 100 |



1000 valid cases, no missing case



1000 valid cases, no missing case
Breakdown of the valid cases is indicated in brackets above.



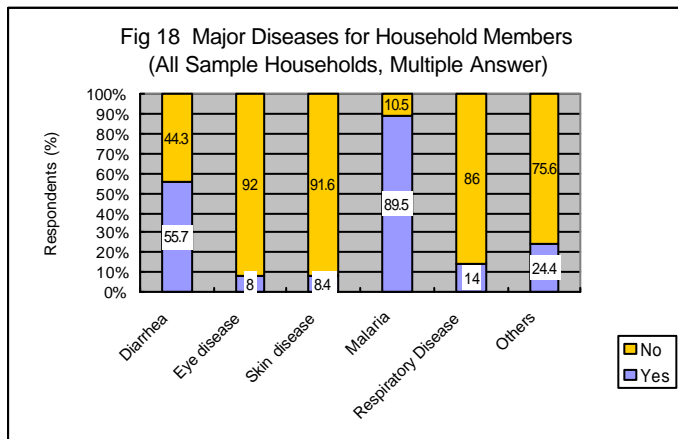
1000 valid cases, no missing case
Breakdown of the valid cases is indicated in brackets above.
"Others": "Throw in the back yard. (17.9%)", "Dispose at dumping site located outside the village. (8.5%)

(8) Health Status of the Household Members

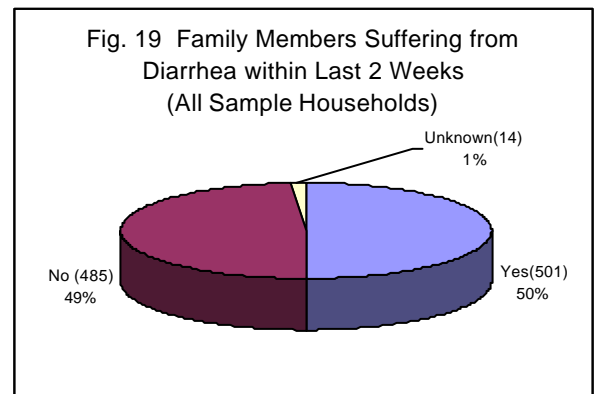
Infection Diseases and Protection of Water Borne/ Related Diseases

Top 3 major diseases for the members of the sample households are 1) malaria, 2) diarrhoea, and 3) respiratory diseases. (Fig. 18) Regarding prevalence of diarrhoea, about 48% of the sample households indicated that diarrhoea occurred in their households within the last two weeks. (Fig. 19) It happened more in children at age between 3 and 17. Compared between the groups of adults and children including infants below 3 years, percentages of incidences of diarrhoea are nearly at same level. (Fig. 20)

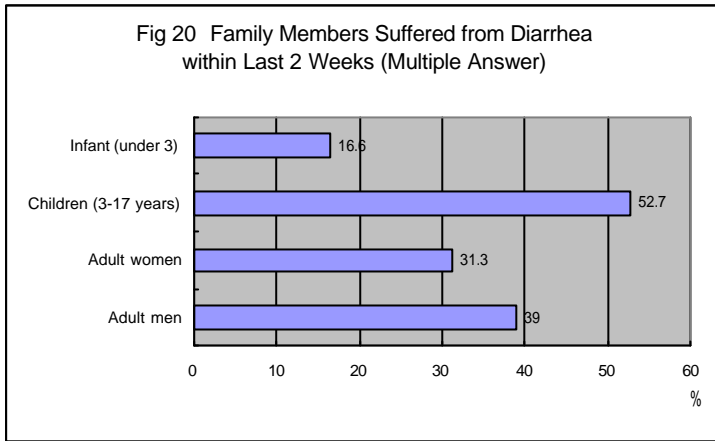
For treatment of diarrhoea, the vast majority uses the existing health facilities such as PHCs, rural health centres, and hospitals, followed by measures to give medicines or Oral Dehydration Salt (ORS). Meanwhile, the sizeable minority that still gives traditional herbs or takes the patient to the traditional healer is also observed.



984 valid cases, 16 missing cases (no answer)
Total 2000 responses from the valid cases

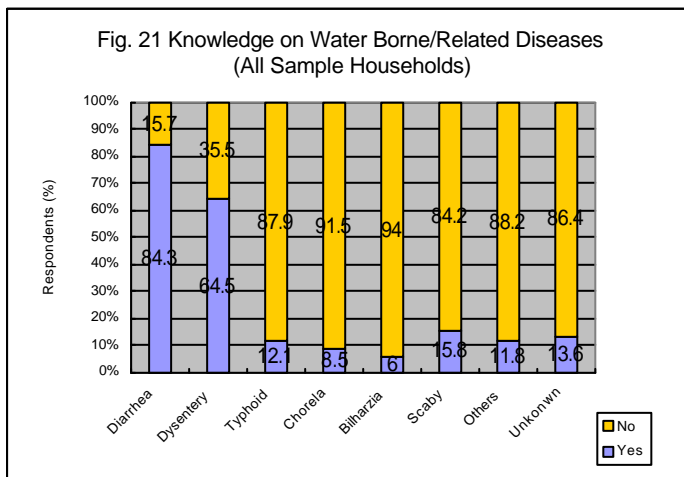


1000 valid cases, no missing case
Breakdown of the valid cases is indicated in brackets above.

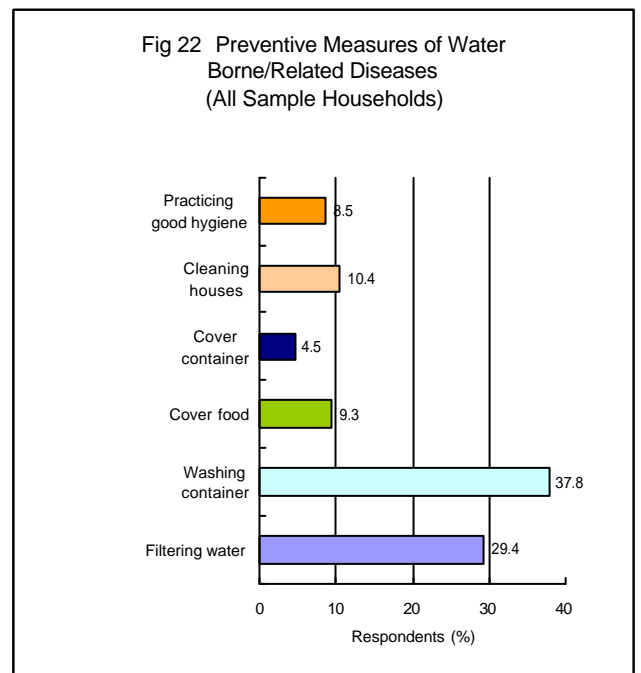


495 valid cases, 505 missing cases (not applicable or no answer)
Total 691 responses from the valid cases

Regarding knowledge of the residents on water borne/related diseases, they are far more knowledgeable about diarrhoea and dysentery than others. (Fig. 21) These diseases are well known by the residents since these are common in the rural areas of the Gambia and infection rate is high. However, about 10 % of the sample households responded that they do not know any water borne/related disease. It is observed that these households do not have adequate knowledge on relations between environmental sanitation including water use of the household and diseases infection. Among the households claiming that they somehow have knowledge on water borne/related diseases, the majority take preventive measures such as washing containers/ bucket before fetching water and filtering water before drinking. (Fig. 22)



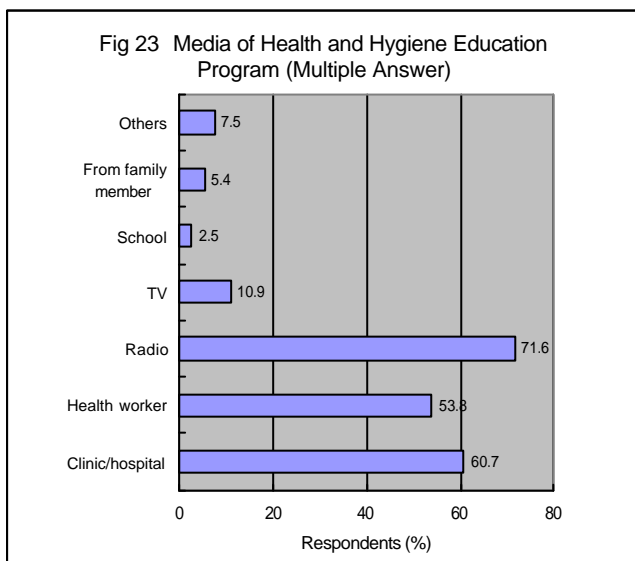
1000 valid cases, no missing case



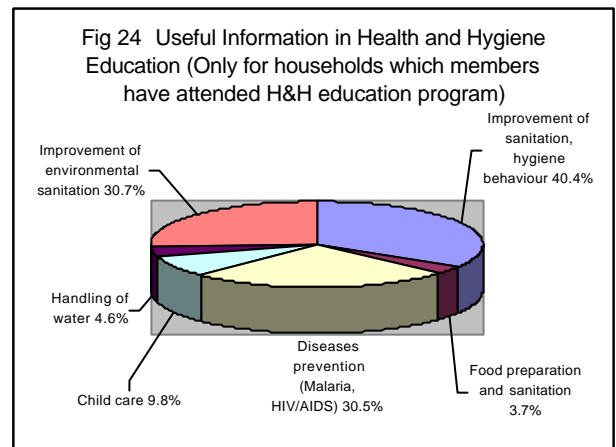
828 valid cases, 172 missing cases (not applicable or no answer),
Total 949 responses from the valid cases

Experiences of Health and Hygiene Education Programs

Any household members of 95% of the sample households have experiences in receiving some form of health and hygiene education. The radio, health facilities and the health workers were the main sources of the hygiene education for them. Though the percentage is low, some cases are also observed that they received information on health and hygiene through family members who attended a hygiene education programme or through school curriculum. (Fig.23) These households recognise that topics such as improvement of sanitary environment and hygiene behaviour, prevention of malaria and HIV/AIDS, and improvement of environmental sanitation were useful information for them. (Fig.24)



924 valid cases, 76 missing cases (not applicable or no answer)
Total 1963 responses from the valid cases



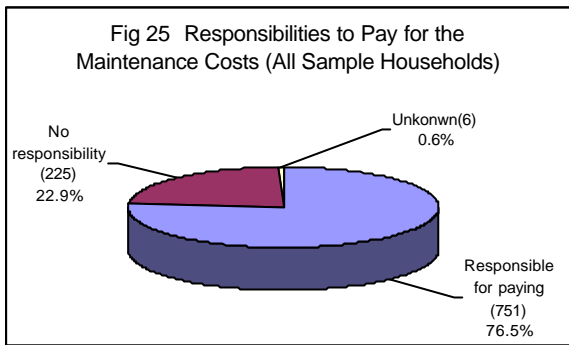
783 valid cases, 217 missing cases (not applicable or no answer)
Total 937 responses from the valid cases

(9) Operation and Maintenance of Water Supply Facilities

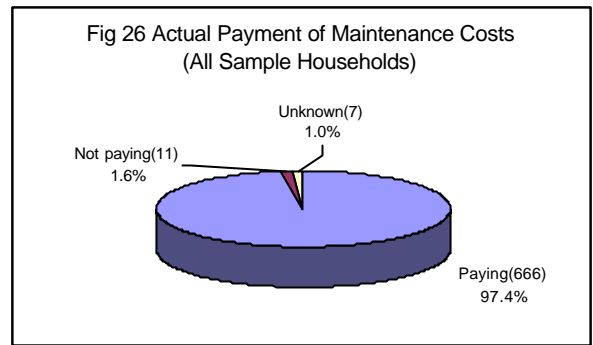
Payment of Maintenance Costs of Existing Water Supply Facilities

Shallow wells with handpumps which are main water source for the sample households and concrete lined open wells are usually constructed as the communal water sources for the communities with support of the government, external donor agencies and NGOs. 76% of the sample households recognise that they are supposed to pay for maintenance costs of those existing water facilities. (Fig. 25) Further, 97% of them claimed that they actually paid for the maintenance costs. (Fig. 26) For animal watering, they use river, ponds and paddy fields nearby their villages in rainy season while the communal water sources are used in dry season when water from these natural sources is in short. 12% of the sample households claimed that they were also supposed to pay for use of water for livestock in addition to the water fee for the domestic consumption.

Amount of water fee they pay for the domestic consumption is GMD10-35/person/year while on average GMD12/head/year for animal watering, especially for cattle.



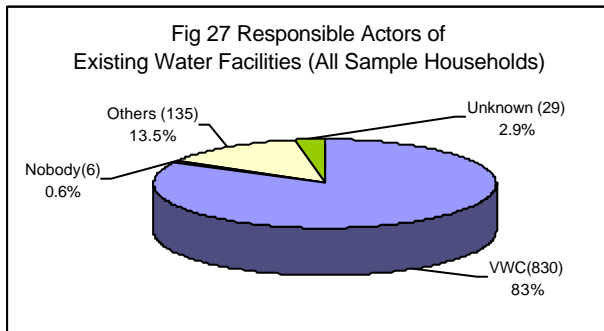
1000 valid cases, no missing case
Breakdown of the valid case is indicated in brackets above.



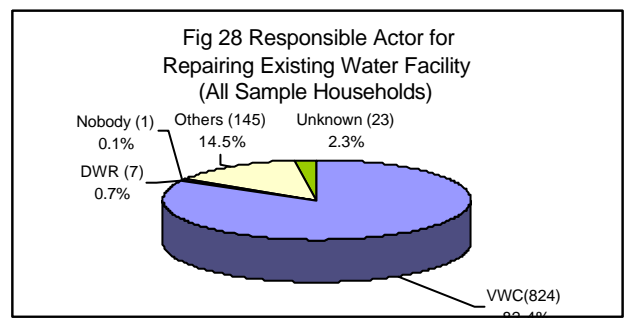
1000 valid cases, no missing case
Breakdown of the valid case is indicated in brackets above

Responsible Actors of Operation and Maintenance Activities

More than 80% of the sample households recognize that the responsible actor of the daily operation and maintenance activities is VWCs. (Fig.27, 28) On the other hand, around 10 % of the respondents perceive that village head, rich people in the village, the government or external donors are to be responsible for it, which implicates that operation and maintenance of communal property is not firmly understood by the community members.



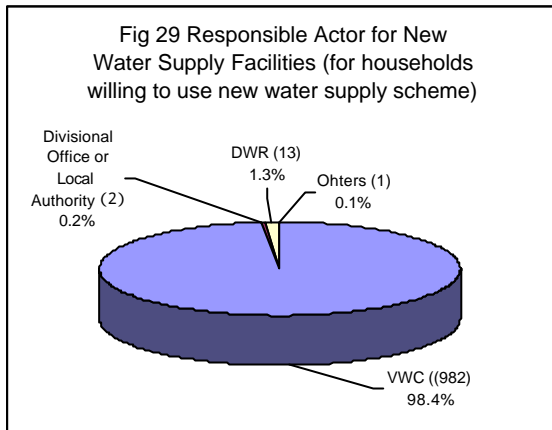
1000 valid cases, no missing case
Breakdown of the valid cases is indicated in brackets above.
"Others": village head, school, owner of the well, government/ donor



1000 valid cases, no missing case
Breakdown of the valid cases is indicated in brackets above.
"Others": village head or rich people, rural health centre, school, owner of the well, government/ donor

Willingness to Contribute to the Operation and Maintenance of the New Water Supply Facilities

In case that water use from the public taps is realised through construction of new piped water schemes in the villages, 99% of the sample households are willing to utilise the facilities and 98% of them perceive that VWCs will be responsible for daily operation and maintenance. (Fig. 29) All of the households willing to utilise the new water supply facilities are also willing to bear the operation and maintenance costs. Affordable amount for them varies from less than GMD10/household/month to more than GMD90/household/month according to size of the households. GMD50/household (median) is the representative amount as the affordable amount for the sample households.



989 valid cases, 2 missing cases (not applicable)
Breakdown of the valid cases is indicated in brackets above.

4. Summary of Findings from Participatory Assessment

Participatory assessment with using PRA was conducted at 6 villages, mentioned below, selected from 20 villages for construction of new water supply schemes.

NBD : Medina Sering Mass, Tuba Kolong

LRD : Nema, Pakaliba

CRD : Saruja, Sukuta

(1) Perception on Existing Water Supply and Sanitation

Type and Usage of Water Sources

Shallow wells with handpumps which are main water sources for the target villages are regarded as reliable water source in terms of quality and quantity by the community members and have large number of users. As mentioned in the results of the sample household survey, the shallow wells with handpumps are usually used as the water sources for cooking and drinking. Communities perceive the source safe since the wells are protected and chlorinated at the construction of the wells. No observation was made by the participants of PRA exercise regarding the organic contamination at the water source and relation with the management of environmental sanitation at surrounding area of the source. Meanwhile, concrete lined wells and traditional hand dug wells are mainly used for gardening, washing, bathing and animal watering, which the users compromise water quality compared with for drinking and cooking.

Table 15 shows different types of existing water sources in the village and its usage based on an analysis by the community members in Pakaliba. They use a shallow well with handpumps, concrete lined wells, hand dug wells and rainwater as the water source for domestic consumption. Among those existing water sources, shallow well with handpumps are preferred most by the participants. They assess the source provide relatively stable water supply around a year and is

protected to prevent contamination. They rely on this water source for various usages apart from gardening and bathing. However, some participants mentioned that they also use water from concrete lined wells and hand dug wells for drinking and cooking due to limited number of the shallow well with handpump against the sizable users.

Table 15 Matrix showing different types of water source and its usage

| Usage | Water Sources | | | |
|-----------------|-----------------------|------------------|-------------------|----------------|
| | Well with hand pump | Well with pulley | Unprotected Well | Rainfall |
| Cooking | | | | - |
| Drinking | | | | |
| Bathing | | | | |
| Animal Watering | | | | |
| Gardening | - | | | - |
| Washing | | | | |
| Construction | | | | - |
| Preference | | | | - |
| Reason | Covered and Protected | Tasteful | Easily accessible | Gift of nature |

(Source: Results of PRA in Pakaliba in LRD)

Seasonal Variations of Living Environment of the Communities

The seasonal calendar seeks to find out seasonal variations of water availability, rainfall, labour, food availability and disease prevalence. It revealed that there are four local seasons as indicated by the participants of PRA namely; “Samaa” (rainy season June, July and August), “Kunchamaroo” (ripening period of upland crops September, October and November), “Sanjanoo” (harvest period December, January and February) and “Tilikando” (dry season March, April and May).

Table 16 shows a seasonal calendar prepared by the participants of PRA exercise in Pakaliba. They receive rain from June to August and the rainfall becomes small towards February and the dry season starts from March. The participants indicate that the availability of water is more during the rainy season than other seasons of the year. This difference is attributed to the heavy down pour of rains and re-charges capability of wells. Also, alternative water sources such as stream and pond other than wells are also available though these sources may not be quite safe for drinking. Meanwhile, in the latter stage of the rainy season in April and May, available water sources get reduced due to dry up of some wells. Seasonality of water level of wells is observed even at the shallow wells with handpumps.

The analysis of food availability shows that there is little food available during July to October. Since most of the households in the target villages rely on farming for their livelihood, attention is to be paid that the household income is also low in this season.

The seasonal calendars on water borne/related diseases shows that diarrhoea, malaria and dysentery are the commonest disease during the period from June to December. Typhoid is also fairly common during the said period according to the analysis conducted in other target villages.

Seasonality of labour for farming is also to be considered for planning and implementation of communal activities and community sensitisation programmes in the target villages. Generally community members are fully involved in farming in rainy season and have much difficulties to spare time for other communal activities compared with other period. Especially, women work for rice transplantation from early morning till evening in the rainy season. Children assist their parents on the farm in the farming season as well as harvest season from December to February. Hired labour from various places including neighbouring countries is also available in these periods.

Table 16 Seasonal Calendar

| Variables | J | F | M | A | M | J | J | A | S | O | N | D |
|-------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Rainfall | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Water | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Labour | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Food Availability | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Disease: | | | | | | | | | | | | |
| • Diarrhoea | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| • Dysentery | | | | | | | | ■ | ■ | ■ | ■ | ■ |
| • Respiratory | | | | | | | | | ■ | ■ | ■ | ■ |
| • Scabies | ■ | | | | | | | ■ | ■ | ■ | ■ | ■ |
| • Cold | | | | | | | | ■ | ■ | ■ | ■ | ■ |
| • Malaria | ■ | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| • Eye Disease | | | | | ■ | ■ | | | | | | |

(Source: Results of PRA in Pakaliba in LRD)

(2) Perception on Health and Hygiene

In the Focused Group Discussions by adult men, adult women and youth, respectively, the participants identified the following to be contributing factors to the causes of diarrhoea diseases:

- Children defecating in the open without being thrown away for disposal,
- Plenty of grasses in compound yards and surroundings,
- Stagnant waters in compounds and surroundings,
- Water flow from compounds to streets causing unclean environments,
- Refuse dumping close to cooking places and wells,
- Location of latrines close to dwelling places and wells,
- Uncovered toilets,
- Living with animals in the same places,
- Drinking unclean waters due to lack of access to safe and clean water,
- Eating of cold and rotten left over food as well as eating uncovered and

contaminated foods,

Examining the above mentioned factors, there are some factors such as stagnant water and plenty of grasses in compounds related to malaria instead of diarrhoea. It is required to improve proper understanding of the community members on causes of the water borne/related diseases and prevention of these diseases. Meanwhile, the participants seem to have understanding on necessity of proper management of environmental sanitation. Therefore, the significant point in health and hygiene education is that how practice of proper hygiene behaviour should be facilitated.

In the health and hygiene education, adult women will be main target group with considering that all the domestic chores including general cleanliness of the compound and child care are responsibility of women. On the other hand, men are generally responsible for deciding on the location of wells and pit latrines. Consequently any health and hygiene education programme dealing with environmental sanitation should also target adult men. Further, participants including youth group of the focused group discussion are also interested in health and hygiene education programmes directly targeted to children.

(3) Access and Control of Household Assets

Table 17 shows situation of access and control of household assets by adult men and adult women. Most of the assets apart from small ruminants are generally owned by men. Regarding cash, it is owned and controlled by those who earned it.

Table 17 Access and Control by Men and Women to Household Assets

M: Men, W: Women

| Household Assets | Ownership | Control | Access |
|-----------------------------|-----------|---------|--------|
| Livestock (cattle) | M | M | M |
| Livestock (small ruminants) | W/M | W/M | W/M |
| Foods | M | W | M/W |
| Household utensils | M | W | M/W |
| House | M | M | M/W |
| Land | M | M | M/W |
| Cash | M/W | M/W | M/W |
| Agricultural implements | M | M | M/W |

(Source : Results of PRA in Nema in LRD)

(4) Gender Tasks

Table 18 is a result of the gender task analysis by adult men and women in a target village in terms of responsible person of each task in the household. Adult women are responsible for both overall domestic chores and farming with help from children while adult men are mainly involved in farming and construction/repair of buildings. Based on this demarcation of the roles and tasks in the household, Table 19 summarises each daily routine for adult men, adult women and children,

which narrates that the workload of adult women and children is overwhelmingly heavier compared with adult men. Especially, girl child is supposed to be socialized through assisting her mother for the domestic chores.

Table 18 Analysis of Gender Roles/Tasks

| Tasks | Adult Women | Adult Men | Children |
|------------------------|-------------|-----------|----------|
| Cleaning | ✓ | | ✓ |
| Cooking | ✓ | | ✓ |
| Water fetching | ✓ | | ✓ |
| Washing cloths | | | ✓ |
| Firewood collection | | ✓ | ✓ |
| Child care | ✓ | | ✓ |
| Grazing of livestock | ✓ | ✓ | ✓ |
| Digging wells | | ✓ | |
| Pottery | ✓ | | |
| Farming | ✓ | ✓ | ✓ |
| Construction of house | | ✓ | |
| Fencing | | ✓ | |
| Brick making | | ✓ | |
| Transplantation (rice) | ✓ | ✓ | |
| Fishing | | ✓ | |
| Gardening | ✓ | | ✓ |

(Source : Results of PRA in Nema in LRD)

Table 18 Daily Routine Diagram of Adult Men, Adult Women and Children

| Time | Task | Adult Women | Adult Men | Children |
|-------------|---|-------------|-----------|----------|
| 5am 8am | Water fetching | W | | |
| | Pounding serials | W | | |
| | Preparing breakfast | W | | |
| | Sweeping | W | | C |
| | Praying | W | M | C |
| | Grazing of livestock | W | | C |
| | Serving breakfast | W | | C |
| 8:30 11:30 | Preparing lunch | W | | |
| | Washing cloths | W | | C |
| | Farming | W | M | C |
| | Child care | W | | C |
| | Going to school | | | C |
| | Serving lunch | W | | |
| 11:45 7:pm | Farming | W | M | C |
| 4.45 5:00 | Going home | | M | C |
| 5.00 5.30 | Animal watering | | | C |
| 7:00 7:30 | Going home | W | | |
| | Bathing children | W | | C |
| | Praying | W | M | C |
| | Cleaning | W | | C |
| | Pounding serials | W | | |
| 7.30 9.30 | Preparation of supper | W | | C |
| 9.30 10.30 | Supper | W | M | |
| 10.30 12.00 | Preparation of breakfast for next morning | W | | C |

(Source : Results of PRA in Nema in LRD)

(4) Needs for Improvement of Living Conditions

The PRA syntheses based on the six communities identified 10 to 25 needs of the communities. Subsequent priority ranking of the needs by the participants indicate the following:

- Adequate supply of safe drinking water was ranked as number one priority need in all the six communities.
- Labour saving devices for women was ranked number two priority in four of the six communities.
- Access to adequate health services was ranked number three in four of the six communities.

Despite differences between the various PRA groups (adult men, adult women and youth, respectively), adequate drinking water, labour saving devices and adequate health services surfaced as top priorities in all the communities.

Other subsidiary priorities were equally identified by the groups, based on their individual group discussions. Needs such as vegetable gardens, improved health and health facilities and improved telecommunication mainly featured in the prioritized needs of women. Conversely, the youth groups identified and prioritized other issues such as football pitches, staff and drugs for the existing health facilities, and telecommunication, whilst the men's identified priorities centred on access to clean and adequate water, labour saving devices and improved telecommunications.

Understandably, telecommunication and access roads featured prominently with most of the groups, considering their locations and distance to nearby towns and urban areas. Other issues identified such as vegetable gardens, credit support, and labour saving devices have implications for providing the participants significant opportunities to earn extra disposal incomes.

(5) Existing Community Based Organisations

Every target village has various community based organisations formed for each purpose and active in the community. As a result of institutional analysis of the existing community based organisations in Medina Sering Mass in NBD, the participants identified 9 existing organisations. These institutions can be broadly divided into two groups: the religious oriented groups and development oriented groups. Role of the religious group is mainly to promote Islamic causes, values and tradition. This indicates the strong and influential role of Islam and the Islamic clergy has to play in the affairs of the community. Their membership comprise almost of all sections of the society, men, women, boys and girls.

The rest of the groups are more development inclined, however of varying degrees. The main ones being: Village Development Committee (VDC), youth society, and micro finance groups which have a predominantly female membership. It should be noted that all these groups interact with the VDC and amongst themselves. These groups for developmental activities receive support from the external support agencies such as government organisations (Department of Education, Medical and Health Department, Department of Agricultural Services, Department of Community Development, and Area Council), support agencies for micro finance (Gambia Women's Finance Association and National Women's Farmers Association), and donor (EDF).

As the target villages of the project have existing community based organisations formed by the community members according to their needs and problems or with a support from the external agencies, it is required in the project to identify roles and responsibility, capacity, human resources of these groups and relation among the groups in order to utilise their experiences and available resources and capacities as much as possible.

Integrated Water Use Project (Phase 2) in the Republic of The Gambia

Questionnaire for Sample Household Survey

Serial No. _____

Date of Interview ____/____/ 2003

Name of Interviewer _____

(Day) (Month)

Name of Village _____

Site No. _____

Name of District _____

Name of Division _____

Section A. Personal Information of the Respondent

| | | |
|---|--|--|
| A-1. Name of Respondent | _____ | |
| A-2. Sex of Respondent | Male1 Female2 | Answer [] |
| A-3. Age of Respondent | _____ years | |
| A-4. Relationship of Respondent to the Household Head | Household Head 1 Father or Mother 2 Child3 Brother or Sister 4 Others5 | Answer [] If answer is "5. Others", please specify. _____ |

Section B. Information of the Household

| | | |
|---|--|--|
| B-1. Sex of Household Head | Male1 Female2 | Answer [] |
| B-2. Age of Household Head | _____ years | |
| B-3. Marital Status of Household Head | Married (monogamous)1 Married (polygamous)2 Single/ never married3 Widow/Widower4 Divorced5 Separated6 | Answer [] |
| B-4. How many people usually live in your household? | Adult men (age 18 and above) [] Adult women (age 18 and above) [] Boy children (age 3-18) [] Girl children (under 3-18) [] Babies (boy) (under 3) [] Babies (girl) (under 3) [] | |
| B-5. How many people can read letter or newspaper without difficulty among the persons age 18 and over in your household? | Men [] Women [] | |
| B-6. Are there other persons not living in your household for working away from home? | Yes1 No2 | Answer [] If answer is "1. Yes" => B-7 |
| B-7. How many persons are working away from home? | _____ persons | |
| B-8. How many children are at school-age in your household? | Boy [] Girl [] | |
| B-9. How many children are attending school among the ones stated in B-8? | Boy [] Girl [] | If some children are out of school, → B-10 |
| B-10. What is the reason for children not attending school, if any? | _____ _____ | |

Integrated Water Use Project (Phase 2) in the Republic of The Gambia

Section C. Existing Water Source for the Household

| | | |
|---|--|--|
| C-1. Does your household have access to safe water source for drinking? | Yes1 No2 | Answer [] |
| C-2. What is the main water source for drinking and cooking for members of your household? | Stream/River/Pond.....1 Unprotected well2 Rainwater collection3 Well with windlass and bucket ...4 Well with handpump5 Borehole with handpump6 Public taps7 Piped into yard8 Piped into house9 Others10 | Answer [] If answer is “10. Others”, please specify. _____ |
| C-3. Whose property is the main water source which your household usually uses? | Own property1 Community2 Neighbour3 Others4 | Answer [] If answer is “4. Others”, please specify. _____ |
| C-4. What is your perception on the quality of water from the source selected in C-2? | Good1 Acceptable2 Bad3 | Answer [] If answer is “3. Bad” => C-5 |
| C-5. If the answer to C-4 is [3] Bad, why do you think so? | Water is salty.1 Water is muddy.2 Water is rusty.3 Others4 | Answer [] If answer is “4. Others”, please specify. _____ |
| C-6. What is your perception on quantity of water from the source selected in C-2? | Sufficient throughout a year1 Seasonal2 Not sufficient throughout a year3 | Answer [] If answer is “2. Seasonal” => C-7&C-8 |
| C-7. If the answer to C-6 is [2] Seasonal, which month is the water available? <i>(Please tick the box.)</i> | | J F M A M J J A S O N D |

Integrated Water Use Project (Phase 2) in the Republic of The Gambia

| | |
|---|---|
| | |
| C-8. If the answer to C-6 is [2] Seasonal, how does your household get drinking water during the period apart from the month(s) indicated in C-7? | _____ |
| C-9 What time does your household fetch water normally? <i>(multiple answer)</i> | Before 6:001 Answer [] 6:00 – 9:002 9:00 – 12:003 12:00-15:004 15:00 – 18:005 After 18:006 |
| C-10. How long does it take to reach to the water source from your house? | Less than 15 minutes1 Answer [] 15-30 minutes2 30-60 minutes3 More than 60 minutes4 |
| C-11. How long do you have to queue up before you get your turn to fetch water? | Less than 15 minutes1 Answer [] 15-30 minutes2 30-60 minutes3 More than 60 minutes4 |
| C-12. Why do you prefer this source of drinking water? | Distance1 Answer [] Time2 If answer is “6. Others”, please specify. Water quality3 No better alternative4 Financial5 Others6 |
| C-13. Do you fetch water for washing, gardening, and for livestock from the same source with drinking water stated in C-2? | Yes1 Answer [] No2 If answer is “1. Yes” → continue from C-17 If answer is “2. No”, → continue from C-14 |
| C-14 If answer to C-13 is [2] No, what is the main source of washing ? | Stream/River/Pond.....1 Answer [] Unprotected well2 If answer is “10. Others”, please specify. Rainwater collection3 Well with windlass and bucket ...4 Well with handpump5 Borehole with handpump6 Public taps7 Piped into yard8 Piped into house9 Others10 |

Integrated Water Use Project (Phase 2) in the Republic of The Gambia

| | | |
|--|--|--|
| <p>C-15. If answer to C-13 is [2] No, what is the main source of gardening?</p> | <p>Stream/River/Pond.....1 Unprotected well2 Rainwater collection3 Well with windlass and bucket4 Well with handpump5 Borehole with handpump6 Public taps7 Piped into yard8 Piped into house9 Others10</p> | <p>Answer [] If answer is “10. Others”, please specify. _____</p> |
| <p>C-16. If answer to C-13 is [2] No, what is the main source of drinking water for livestock?</p> | <p>Stream/River/Pond.....1 Unprotected well2 Rainwater collection3 Well with windlass and bucket4 Well with handpump5 Borehole with handpump6 Public taps7 Piped into yard8 Piped into house9 Others10</p> | <p>Answer [] If answer is “10. Others”, please specify. _____</p> |
| <p>C-17. Does the water source for livestock have perennial water supply?</p> | <p>Yes1 No2</p> | <p>Answer []</p> |
| <p>C-18. What kind of vessel does your household use to fetch and carry water?</p> | <p>Container with a lid1 Container without a lid2 Bucket with a lid3 Bucket without a lid4 Wash basin5 Others6</p> | <p>Answer [] If answer is “6. Others”, please specify. _____</p> |
| <p>C-19. How much water does your household use per day on average?</p> | <p>Drinking/ cooking [] containers/ buckets Washing [] containers/buckets Gardening [] containers/buckets Bathing [] containers/buckets</p> | |
| <p>C-20. Is the quantity of water enough for drinking and cooking purposes?</p> | <p>Yes1 No2</p> | <p>Answer []</p> |
| <p>C-21. If you can get more water, would your household extend your water use?</p> | <p>Yes1 No2</p> | <p>Answer [] If answer is “1. Yes”, → C-22</p> |
| <p>C-22. If yes to C-21, for which purposes would your household extend water use? (multiple answer)</p> | <p>Drinking/ cooking1 Washing2 Gardening3 Bathing4 Cattle watering5 Others6</p> | <p>Answer [] If answer is “6. Others”, please specify. _____</p> |
| <p>C-23. Who usually collect water in your household? (multiple answer)</p> | <p>Adult men1 Adult women2 Boy child3 Girl child4 Water vendors5 Others6</p> | <p>Answer [] If answer is “6. Others”, please specify. _____</p> |
| <p>C-24. Could you briefly describe problems you and your household members are encountered related to present water supply condition?</p> | <p>_____</p> <p>_____</p> <p>_____</p> | |

Integrated Water Use Project (Phase 2) in the Republic of The Gambia

Section D. Existing Sanitation Facilities and Hygiene Practices of the Household

| | | |
|---|---|--|
| D-1. Which type of sanitation facility does your household have? | Pit latrine1 VIP latrine2 Pour flush latrine3 Flush to sewage system or septic tank ..4 Nothing5 Others6 | Answer [] If answer is “5. Nothing”, → D-2 If answer is 1,2,3,4,,or 6 → D-3 |
| D-2. If the answer to D-1 is [5] Nothing, where do you and your household members go to toilet? | In yard1 Bush2 Neighbour’s latrine3 Others4 | Answer [] If answer is “4. Others”, please specify. |
| D-3. Where does your household dispose the rubbish? | Buried in the yard1 Burned2 Collection point in the village/ Compound.....3 River4 Others5 | Answer [] If answer is “5. Others”, please specify. _____ |
| D-4. When do you and your household members normally practice hand washing? <i>(multiple answer)</i> | Before cooking1 Before eating2 After going to the latrine3 After working outside.....4 Others5 | Answer [] If answer is “5. Others”, please specify. _____ |
| D-6. How is it done? | In the basin1 Outside the basin2 Pour water from a cup3 Others4 | Answer [] If answer is “4. Others”, please specify. |
| D-7. How does your household keep drinking water in your house? | In a jar inside the house with a cover1 In a jar inside the house without a cover2 Others3 | Answer [] If answer is “3. Others”, please specify. |
| D-9. Is water treated before drinking in your household? | Yes1 No2 | Answer [] If answer is “1. Yes”, → D-10 |
| D-10. If Yes to D-9, how is it treated? | Filtering1 Allowing it to settle2 Putting chlorine.....3 Boiling4 Others5 | Answer [] If answer is “5. Others”, please specify. _____ |

E. Health Status of Members of Household

| | | |
|---|---|--|
| E-1. What are the major diseases affecting members of your household? <i>(multiple answer)</i> | Diarrhoea1 Eye diseases2 Skin diseases3 Malaria4 Respiratory Diseases5 Others6 | Answer [] If answer is “6. Others”, please specify. _____ |
| E-2. During the past two weeks, did any member of your household have diarrhoea? | Yes1 No2 Unknown3 | Answer [] If answer is “1. Yes”, → E-3, E-4 & E-5 |
| E-4. If Yes to E-2, who had diarrhoea? <i>(multiple answer)</i> | Adult men1 Adult women2 Children (age 3-17)3 Baby (under 3)5 | Answer [] |

Integrated Water Use Project (Phase 2) in the Republic of The Gambia

| | | |
|---|--|--|
| E-5. If Yes to E-2, how was it treated? <i>(multiple answer)</i> | Give medicine1 Give ORS2 Give traditional herb3 Take to PHC/clinic/ hospital ...4 Take to traditional healer5 Others6 | Answer [] |
| E-6. Do you know any diseases which cause by drinking and using contaminated (unsafe) water source? <i>(multiple answer)</i> | Diarrhoea1 Dysentery2 Typhoid3 Cholera4 Bilharzias5 Scabies6 Others7 Unknown8 | Answer [] If answer is “7. Others”, please specify. _____ |
| E-7. How would you protect yourself and your household members from getting these diseases? | _____ | |
| E-8. Have you and/or your household members ever received health and hygiene education programme by any organisation? | Yes1 No2 | Answer [] If answer is “1. Yes”, → E-9 & E-10 |
| E-9. If yes to E-8, where did you receive the programme? <i>(multiple answer)</i> | At clinic/ hospital1 From health worker2 From radio3 From TV4 At school5 From family member6 Others7 | Answer [] If answer is “7. Others”, please specify. _____ |
| E-10. If yes to E-8, what was the useful information for you and your household? | _____ | |
| E-11. Could you briefly describe problems you and your household members are encountered in relation with health and hygiene? | _____ | |

Section F. Maintenance of Water and Sanitation Facilities

| | | |
|---|--|---|
| F-1. Is your household supposed to pay for operation and maintenance cost of the water facility which your household uses for drinking water? | Yes1 No2 Unknown3 | Answer [] If answer is “1. Yes”, → F-2 & F-3 |
| F-2. If yes to F-1, how much is your household supposed to pay? | D_____ per person or household per month or year <i>(please tick person or household and month or year)</i> | |
| F-3. If yes to F-1, does your household actually pay for the cost? | Yes1 No2 Unknown3 | Answer [] If answer is “2. No”, → F-4 |
| F-4. If no to F-3, what is the reason for your household not to pay for the cost? | _____ | |
| F-5. Is your household supposed to pay for drinking water for livestock (cattle) as well? | Yes1 No2 Unknown3 | Answer [] If answer is “1. Yes”, → F-6 |

Integrated Water Use Project (Phase 2) in the Republic of The Gambia

| | | |
|-------|--|---|
| F-6. | If yes to F-5, how much is your household supposed to pay? | D _____ per _____ per month or year <i>(please tick month or year)</i> |
| F-7. | Who is usually maintaining water source which your household uses for drinking water? | Village Water Committee1 Answer [] Nobody2 If answer is “3. Others”, please Others3 specify Unknown4 |
| F-8. | Who is responsible for repairs of the water facility when it breaks down? | Village Water Committee1 Answer [] Area Council.....2 If answer is “5. Others”, please Department of Water Resources3 specify Nobody4 Others5 _____ Unknown6 |
| F-10. | Would your household be willing to use <u>communal water tap</u> if the piped water scheme is constructed in your village? | Yes1 Answer [] No2 If “1. Yes”, → F-11, F-12 If “2. No”, → F-13 |
| F-11. | If yes to F-10, who do you think would be responsible for repair of the water scheme if it breaks down? | Village Water Committee1 Answer [] Area Council2 If answer is “5. Others”, please Department of Water Resources3 specify Nobody4 Others5 |
| F-12. | If yes to F-10, would your household be willing to contribute in cash for maintenance of the new water scheme? | Yes1 Answer [] No2 If “1. Yes”, → F-14 |
| F-13. | If no to F-10, what is the reason for your household not to use the new water scheme? | _____ |
| F-14. | If Yes to F-12 how much could your household pay as a maintenance fund for improved communal water supply scheme? | D _____ per month/ year <i>(Please tick month or year)</i> |

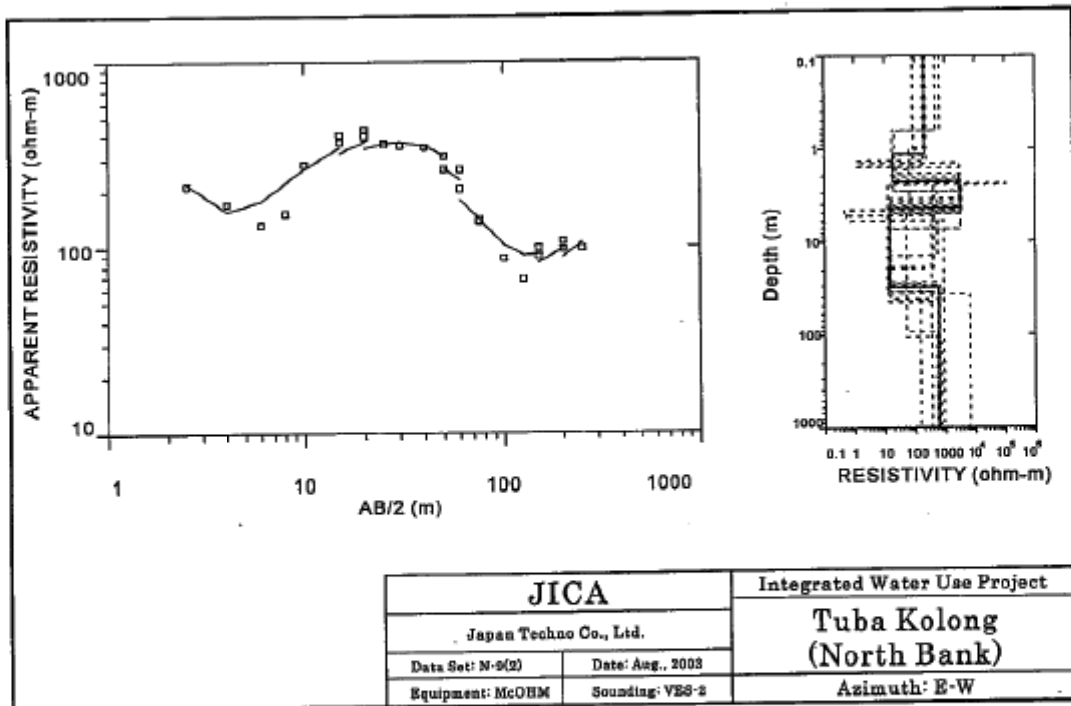
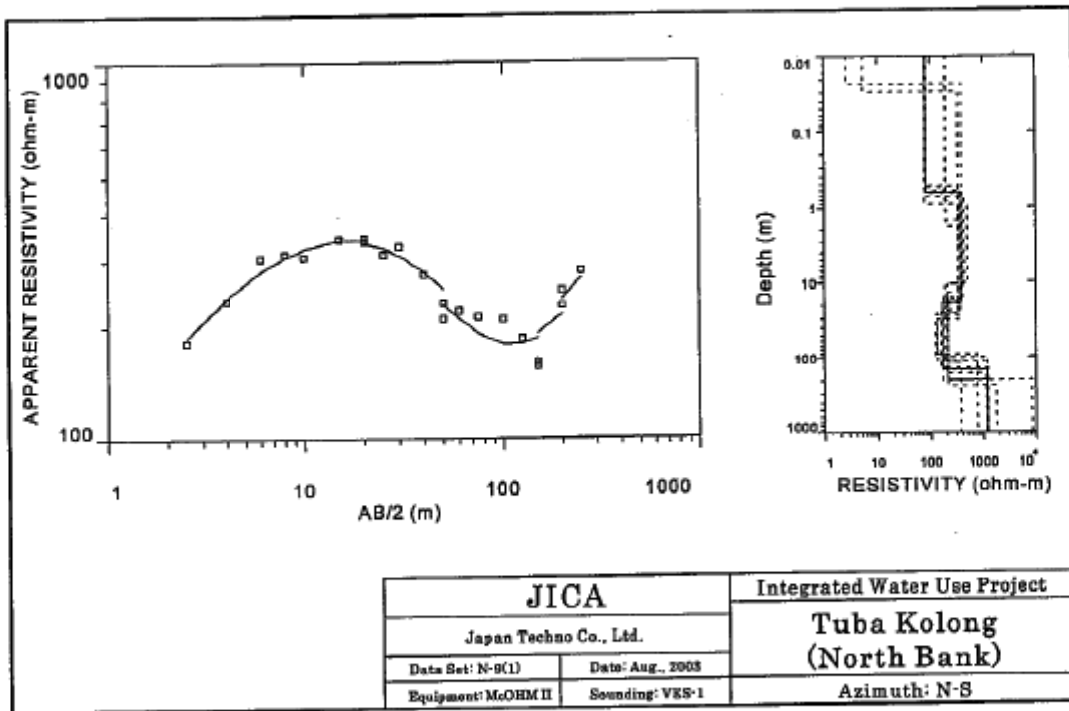
Section G. Economic Status of the Household

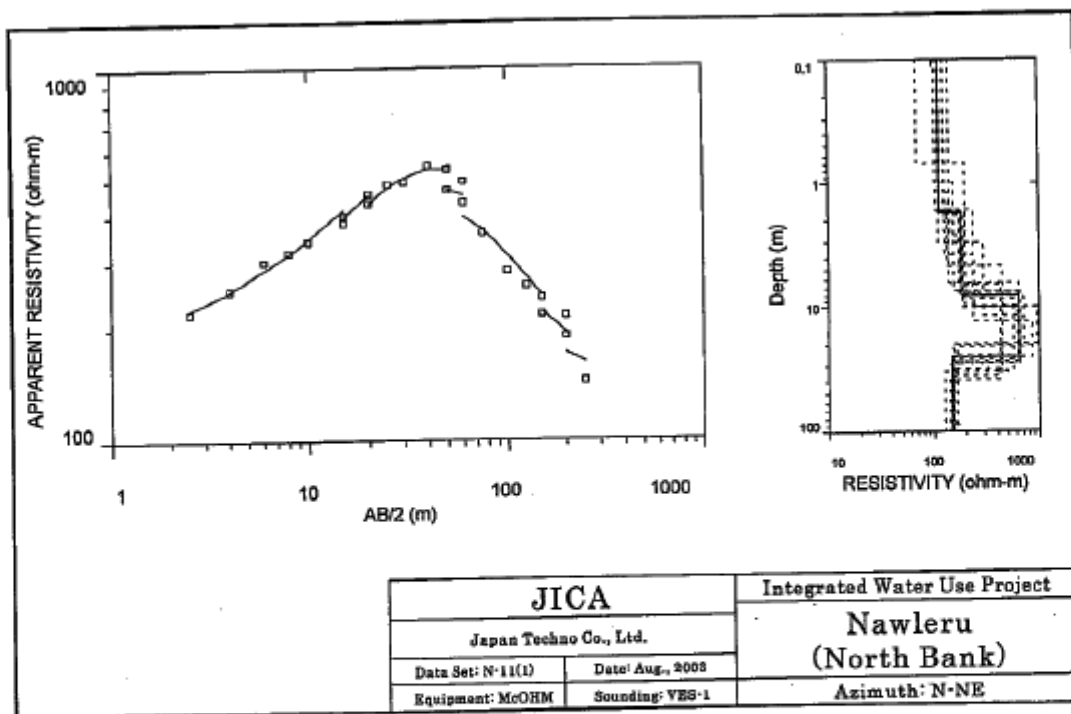
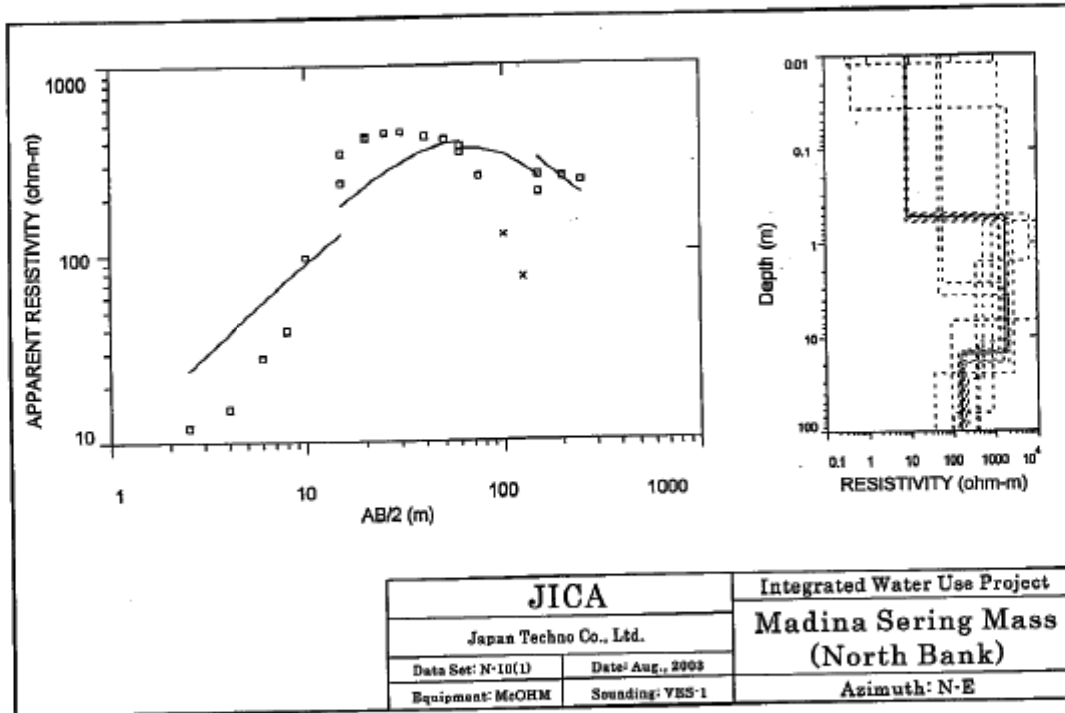
| | | |
|------|---|---|
| G-1. | What are the main income sources of your household which bring cash income? Please indicate average amount of income per month. <i>(multiple answer)</i> | Farming D _____ Trading D _____ Salary from employer D _____ Pension D _____ Remittance from family working elsewhere D _____ Others (Specify _____) D _____ Others (Specify _____) D _____ |
| G-2. | When can you get cash income in a year? <i>(Please tick in the box)</i> | J F M A M J |

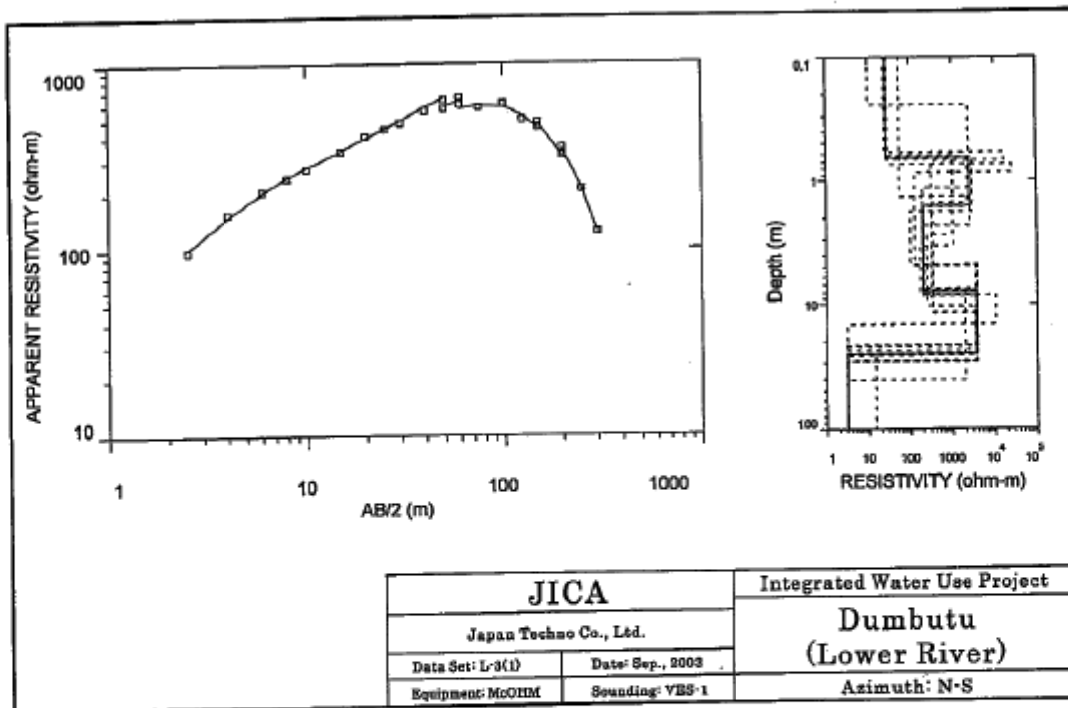
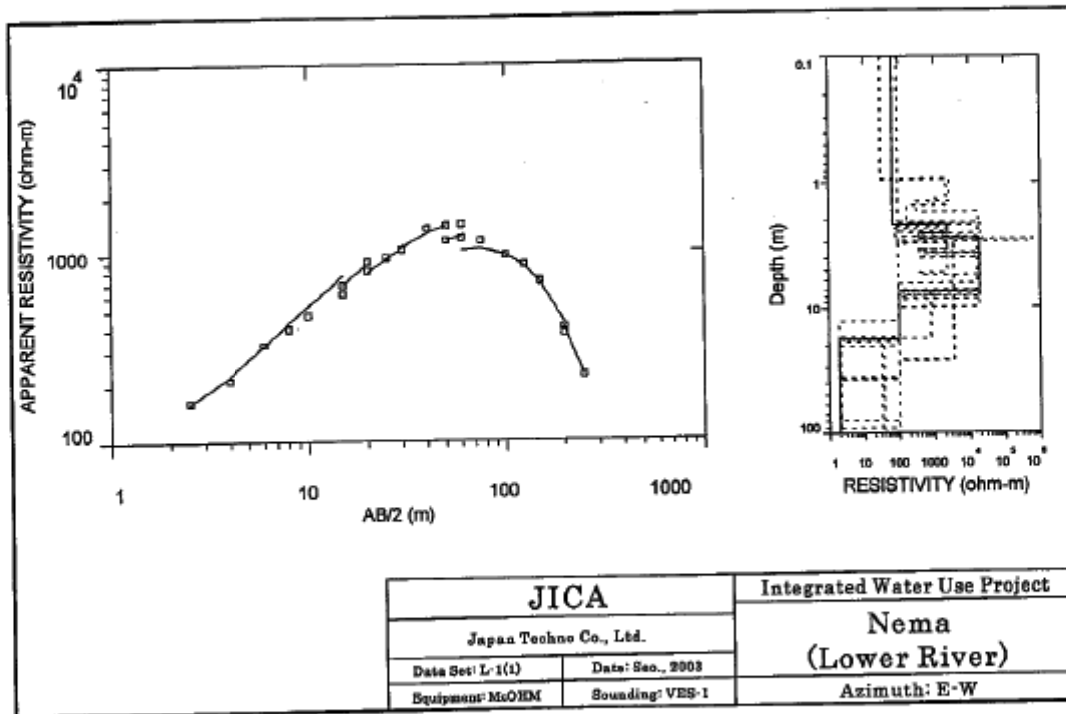
Integrated Water Use Project (Phase 2) in the Republic of The Gambia

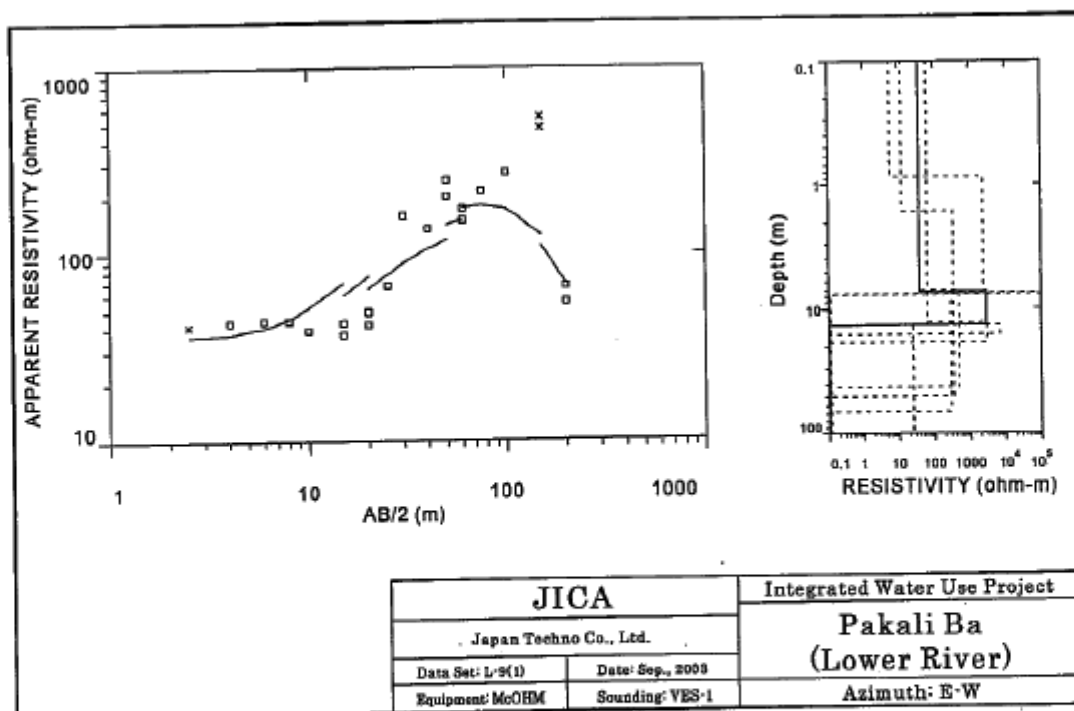
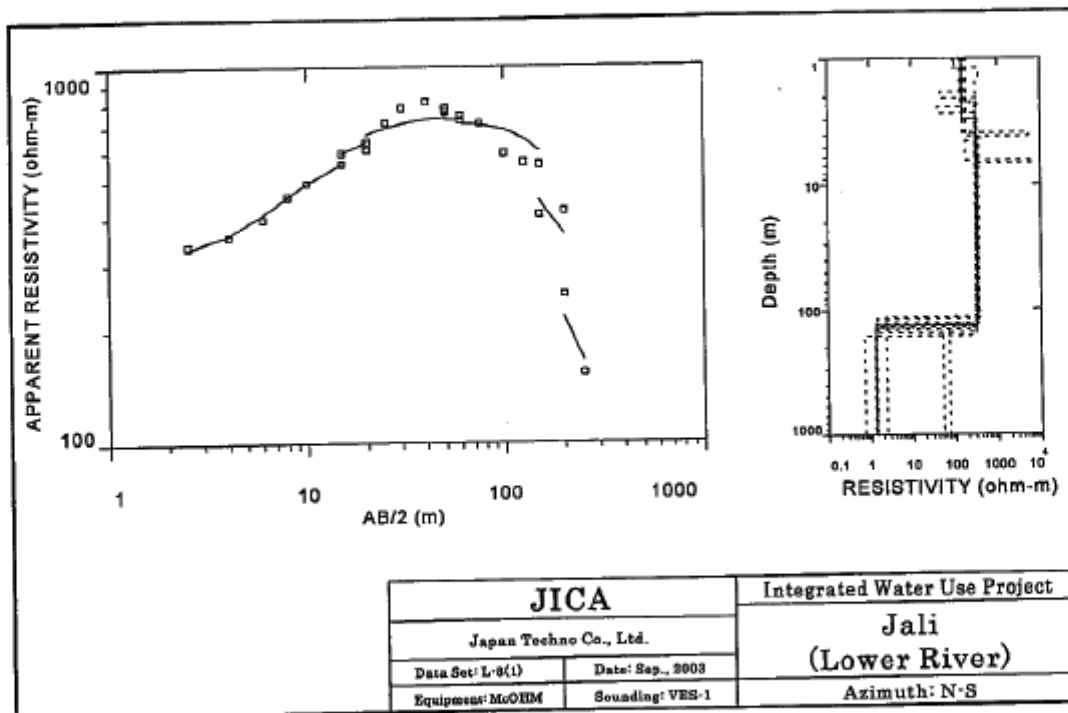
| | | |
|--|---|---|
| | J A S O N D | |
| G-3. How do you earn a living during the period apart from the month(s) indicated in G-2? | _____ | |
| G-4. What is the most costly thing in your household expenses in a month? Please indicate five items from the most costly one. | 1. _____ D _____ 2. _____ D _____ 3. _____ D _____ 4. _____ D _____ 5. _____ D _____ | |
| G-5. Does your household keep any savings or cash for the emergency? | Yes1 No2 | Answer [] _____ |
| G-6. Where does your household keep savings or cash? | Bank1 Co-op2 Household3 Others4 | Answer [] _____ If answer is "5. Others", please specify _____ |
| G-7. How many livestock does your household own? | Cattle [] _____ Donkey [] _____ Horse [] _____ Goat [] _____ Sheep [] _____ | |
| G-8. How many members in your household earn a living? | [1] Adult men [] _____ [2] Adult women [] _____ [3] Boy child [] _____ [4] Girl child [] _____ | |

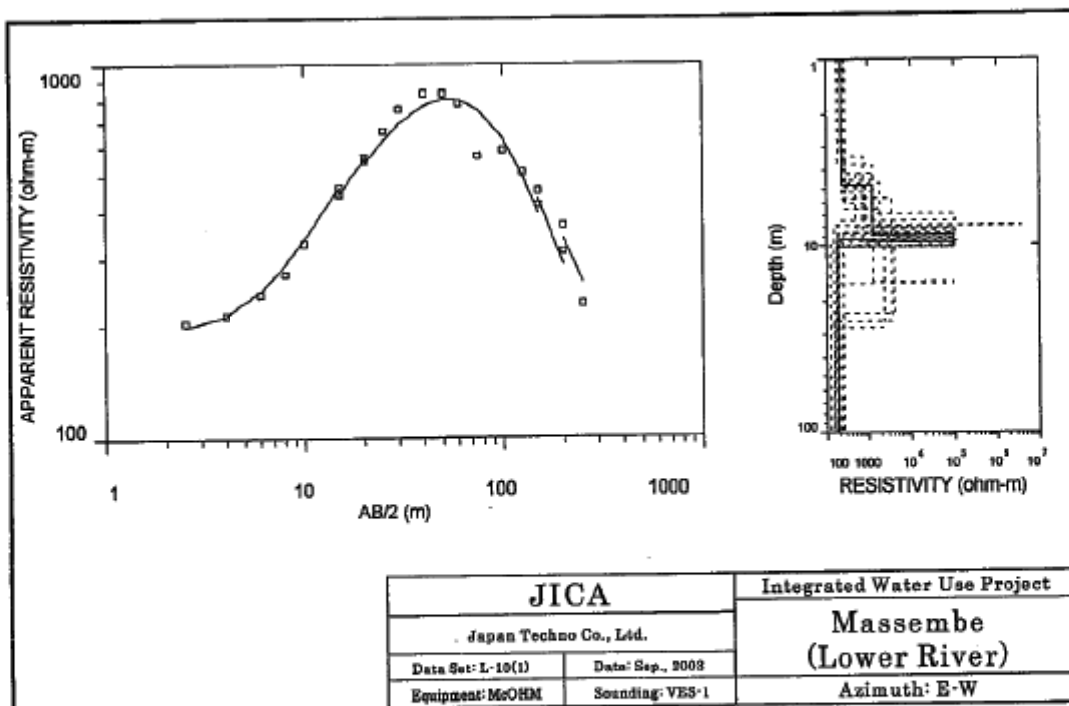
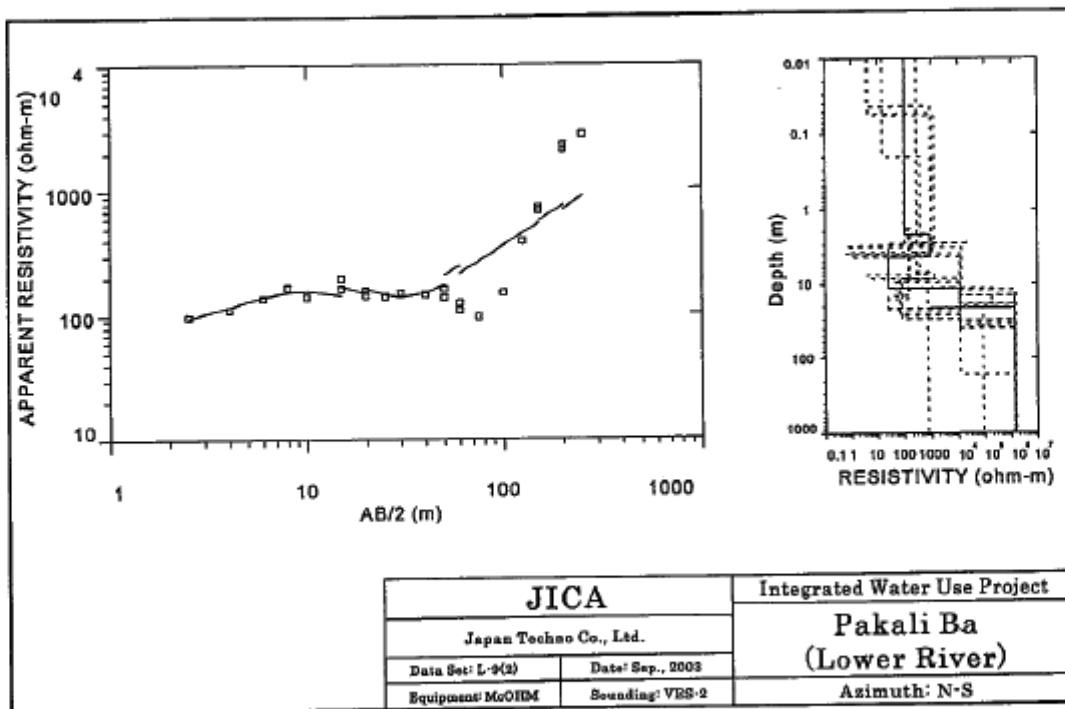
APPENDIX 5-4 RESULTS OF GEOPHYSICAL SURVEY

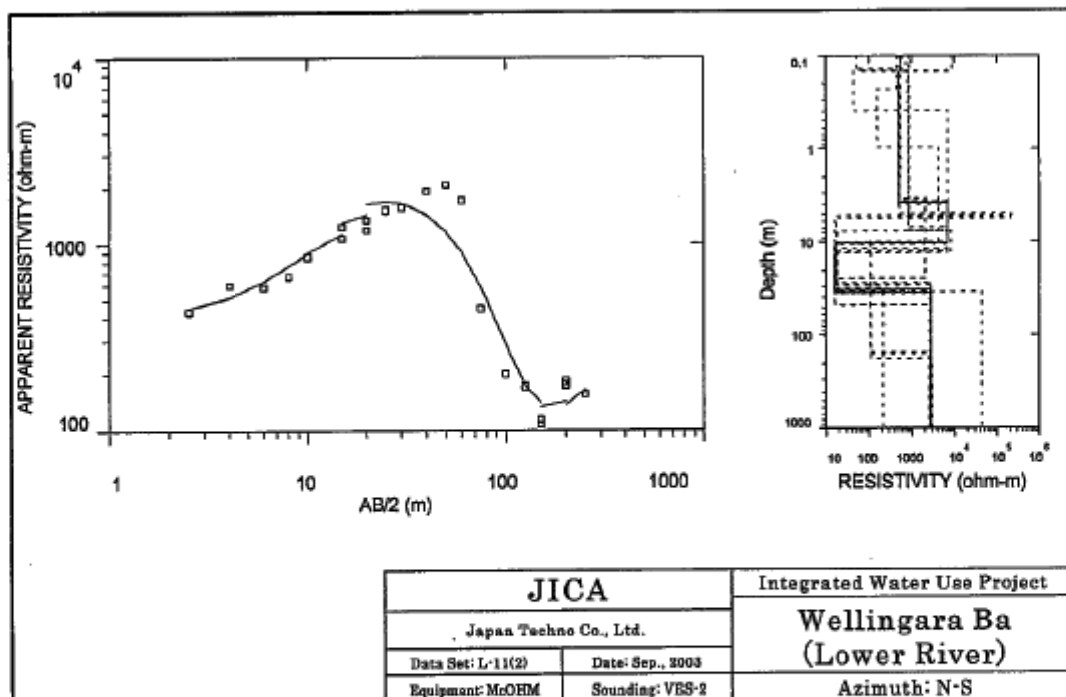
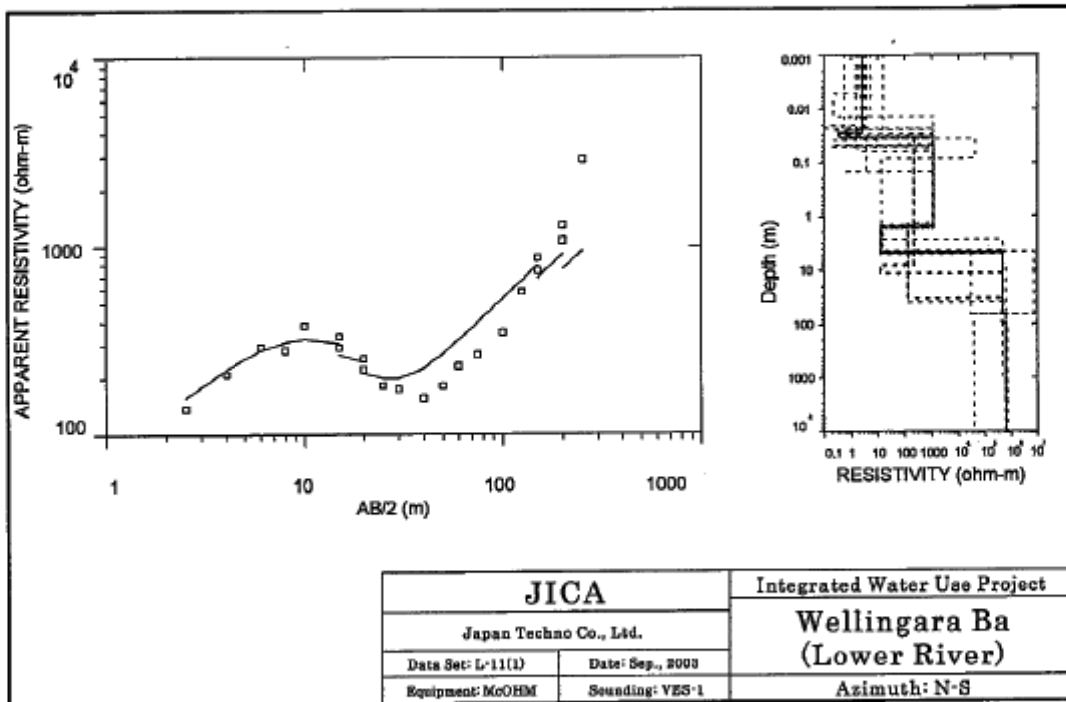


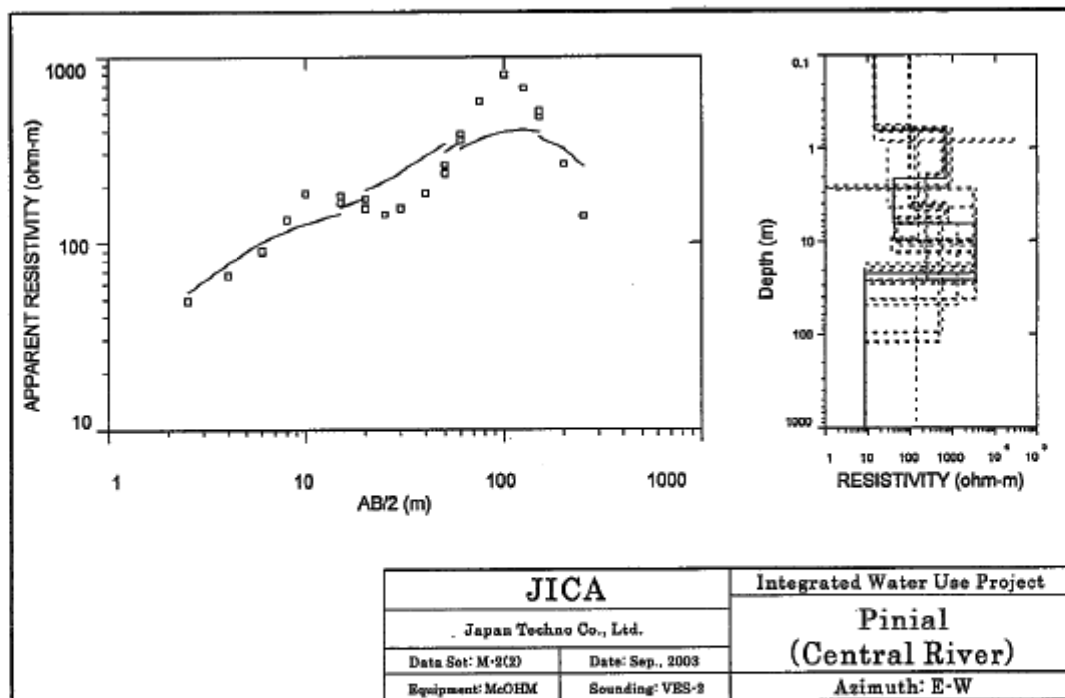
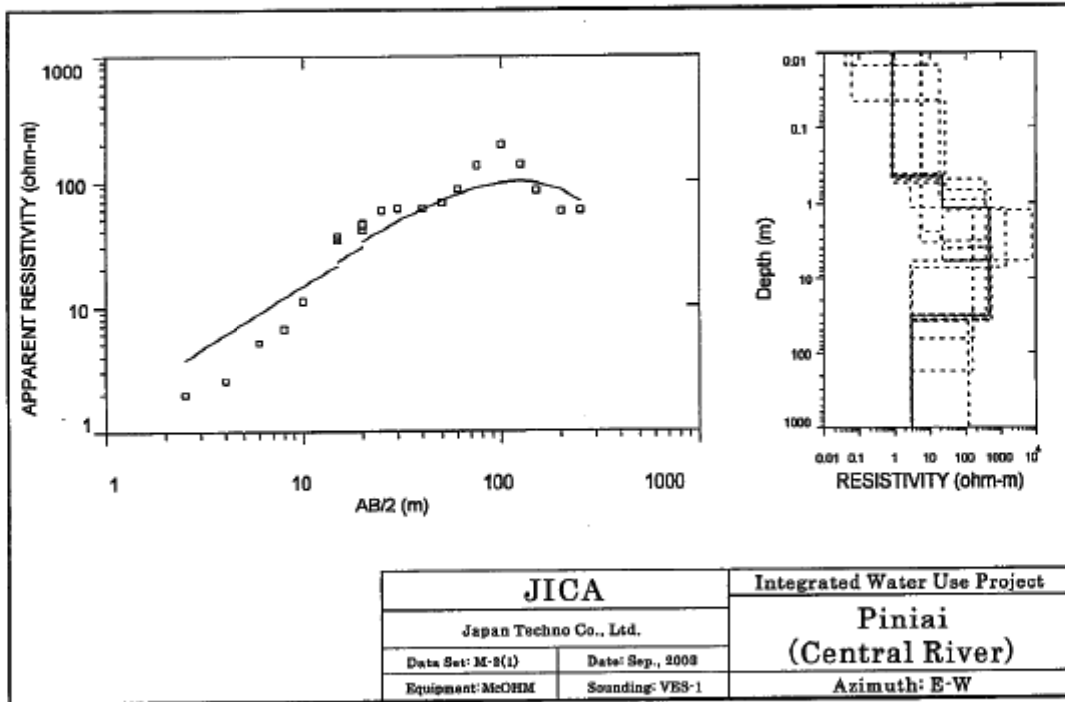


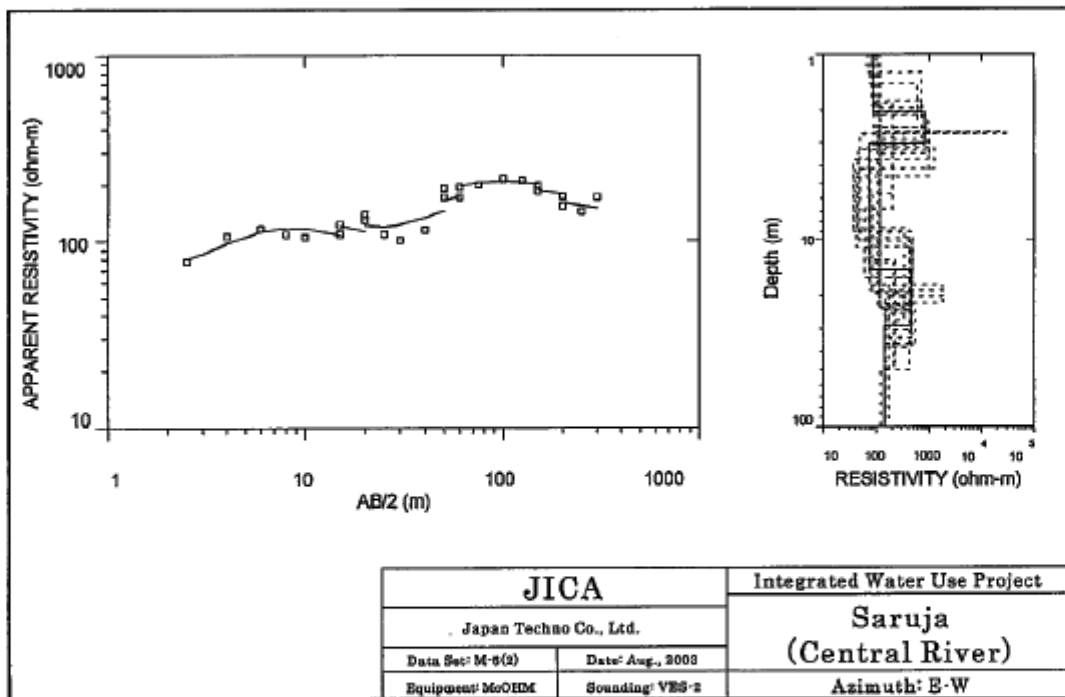
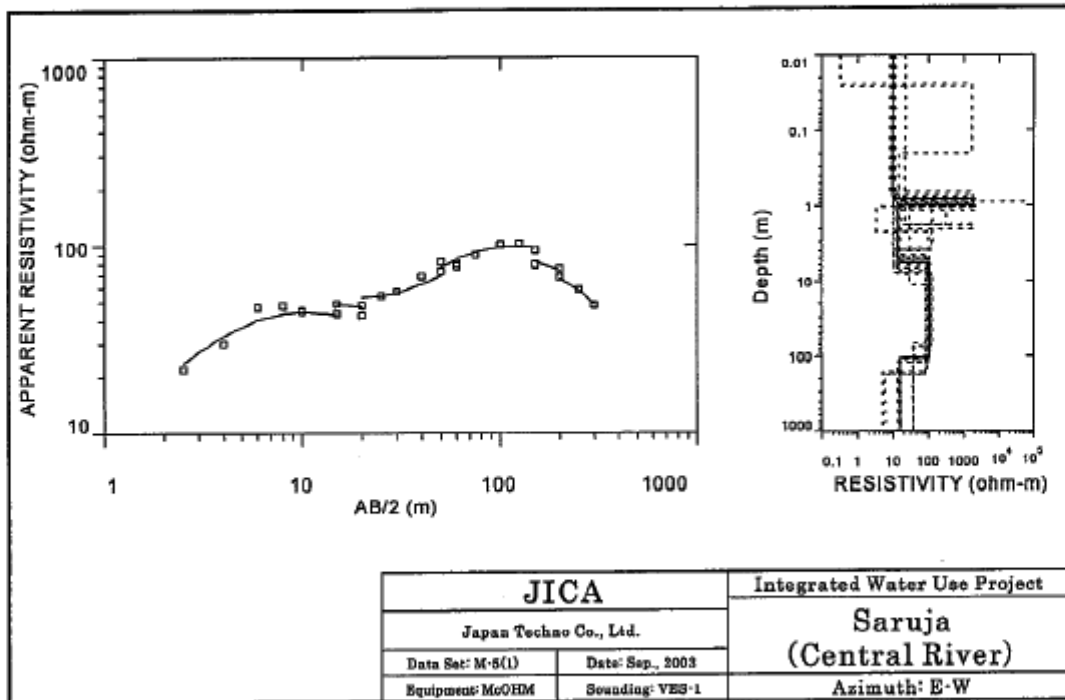


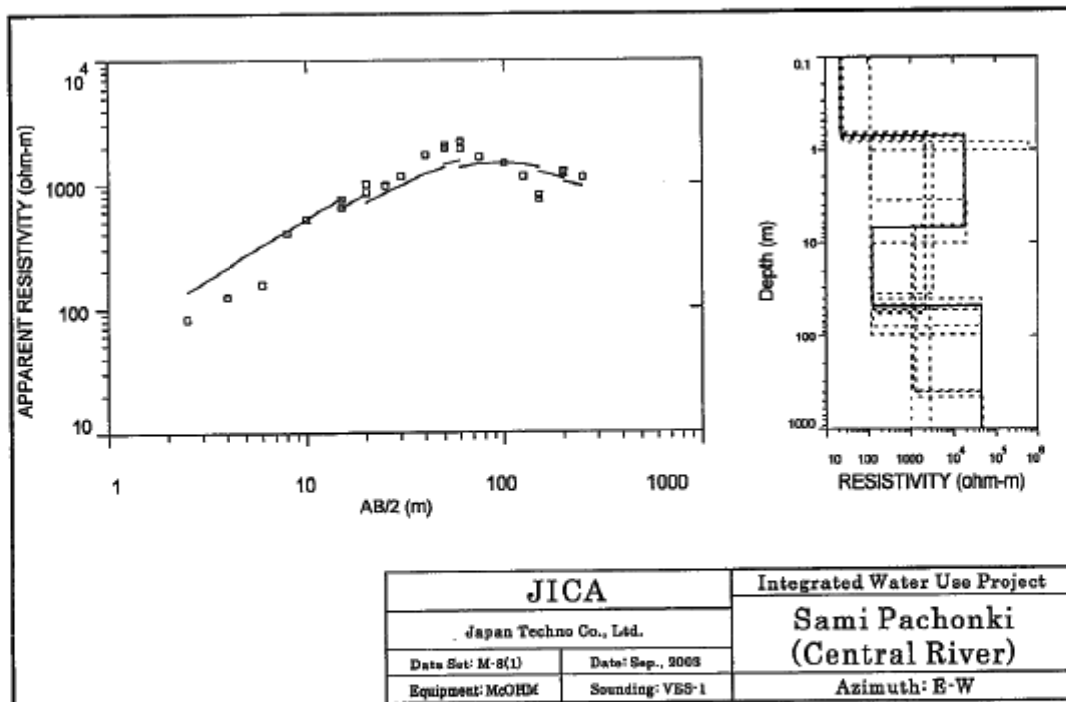
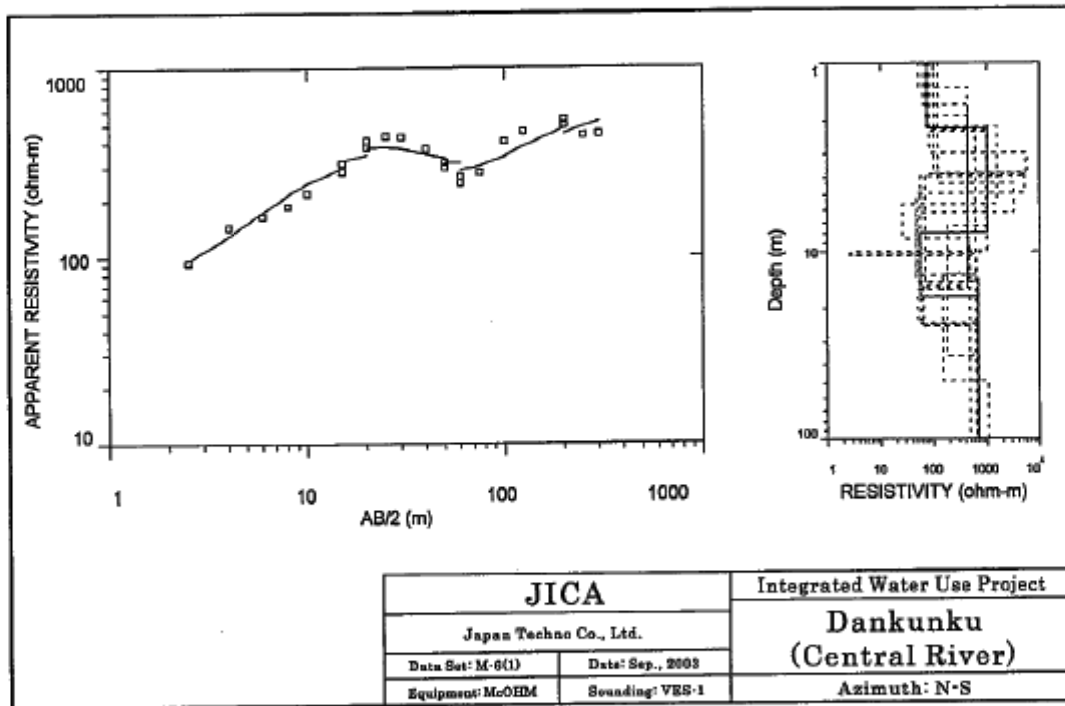


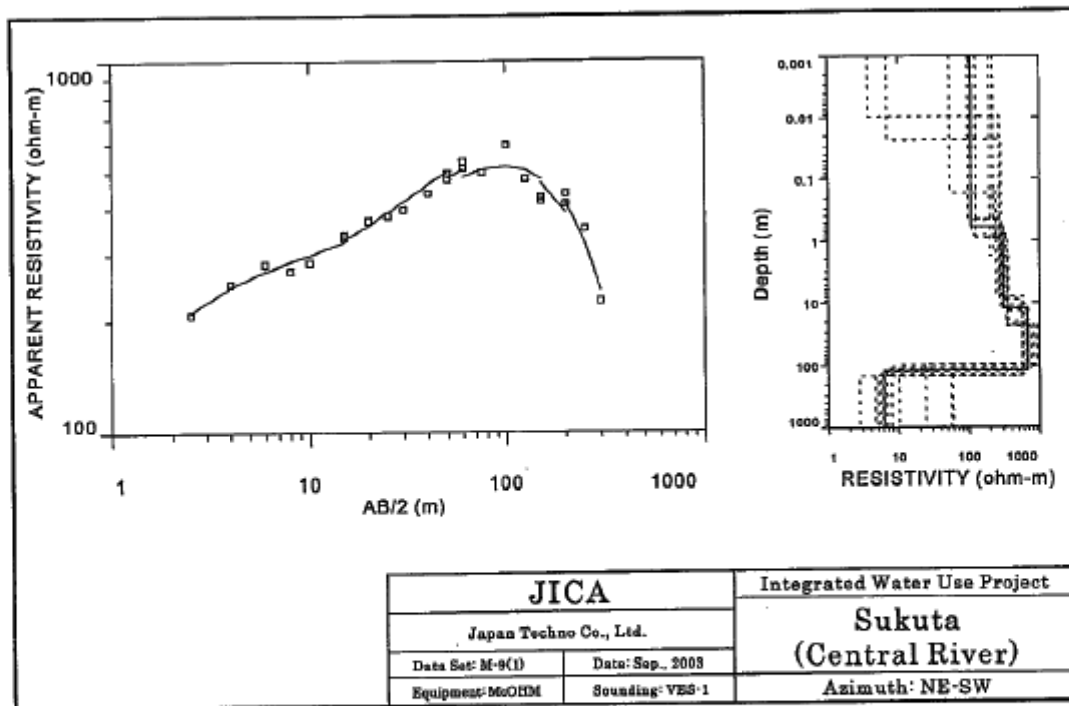
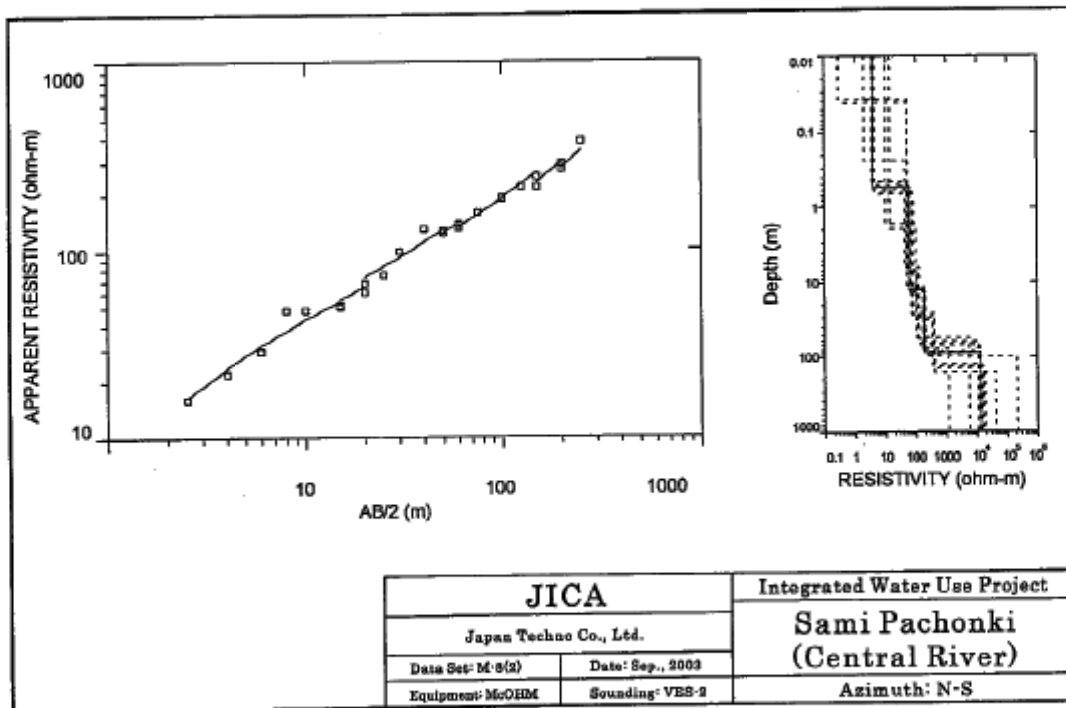


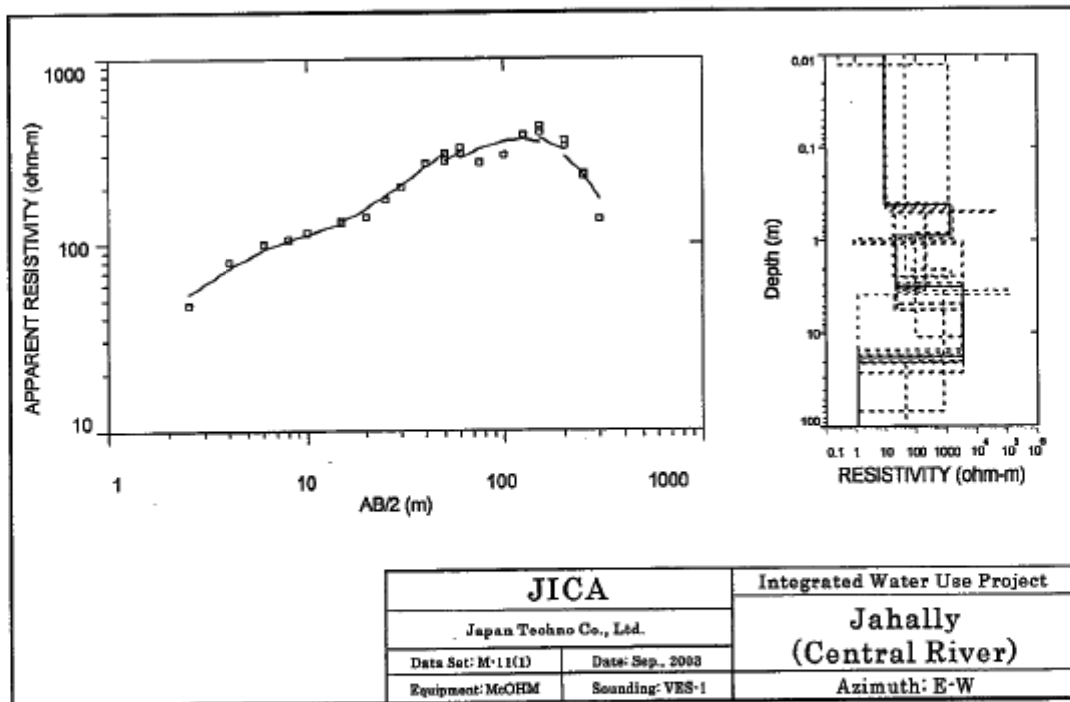
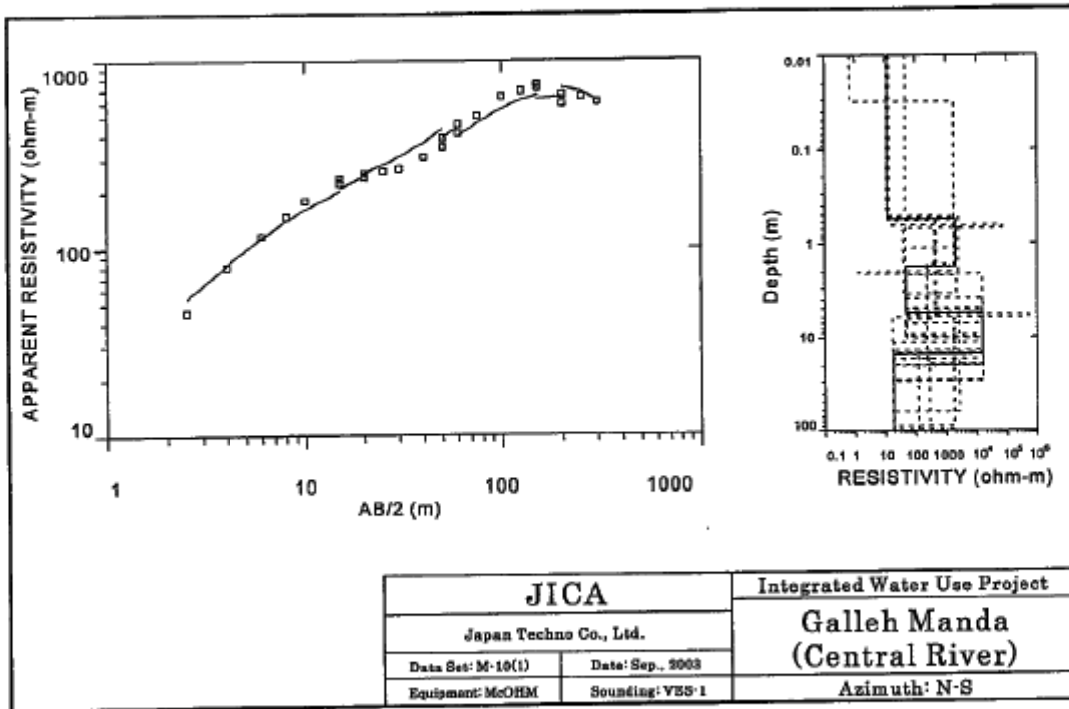


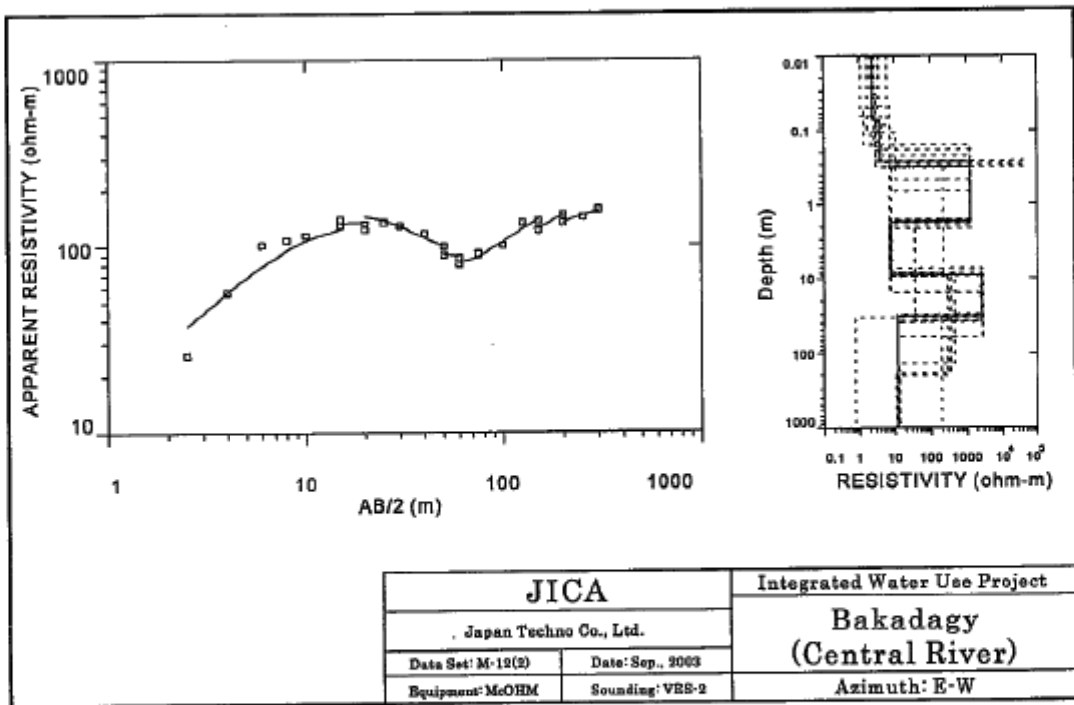
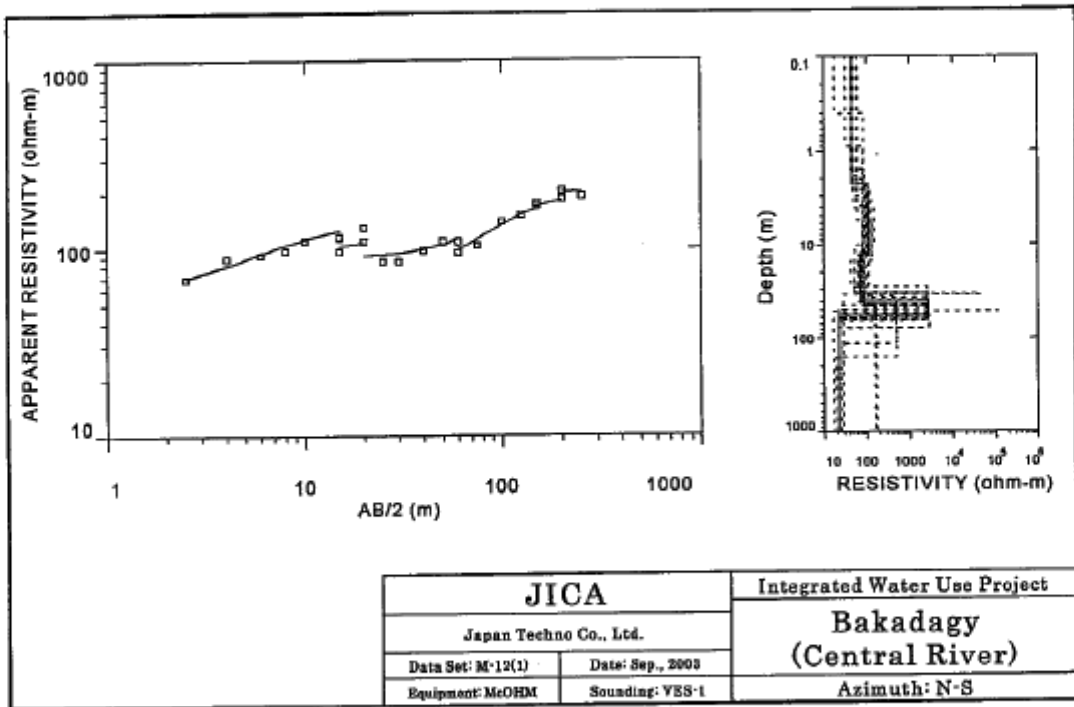


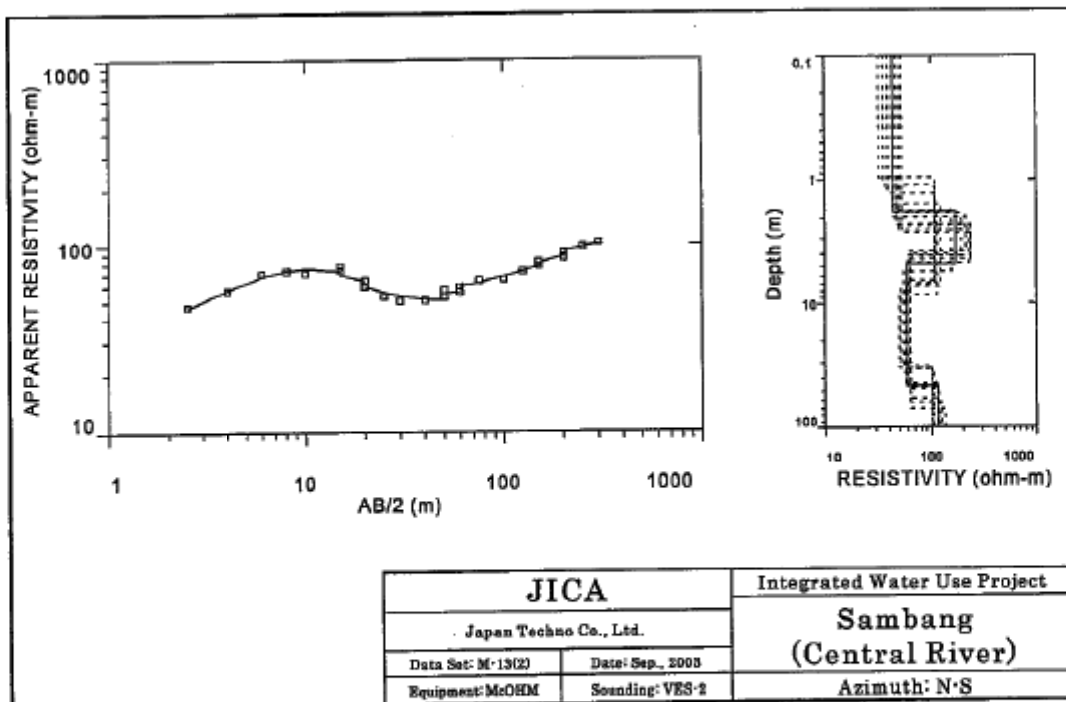
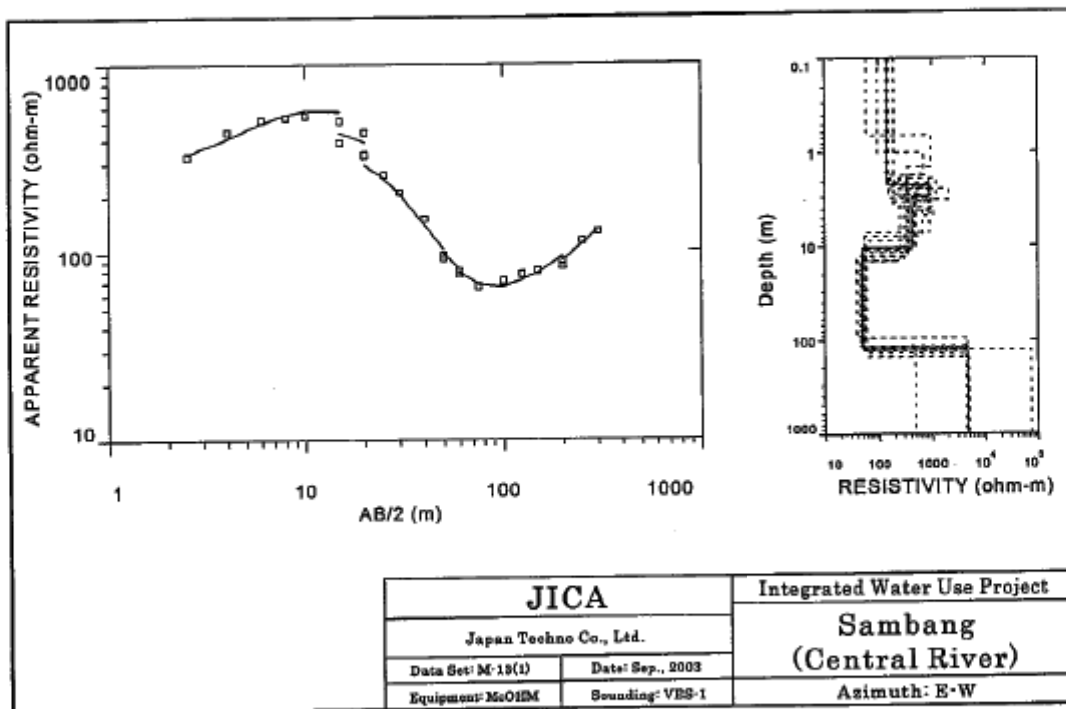


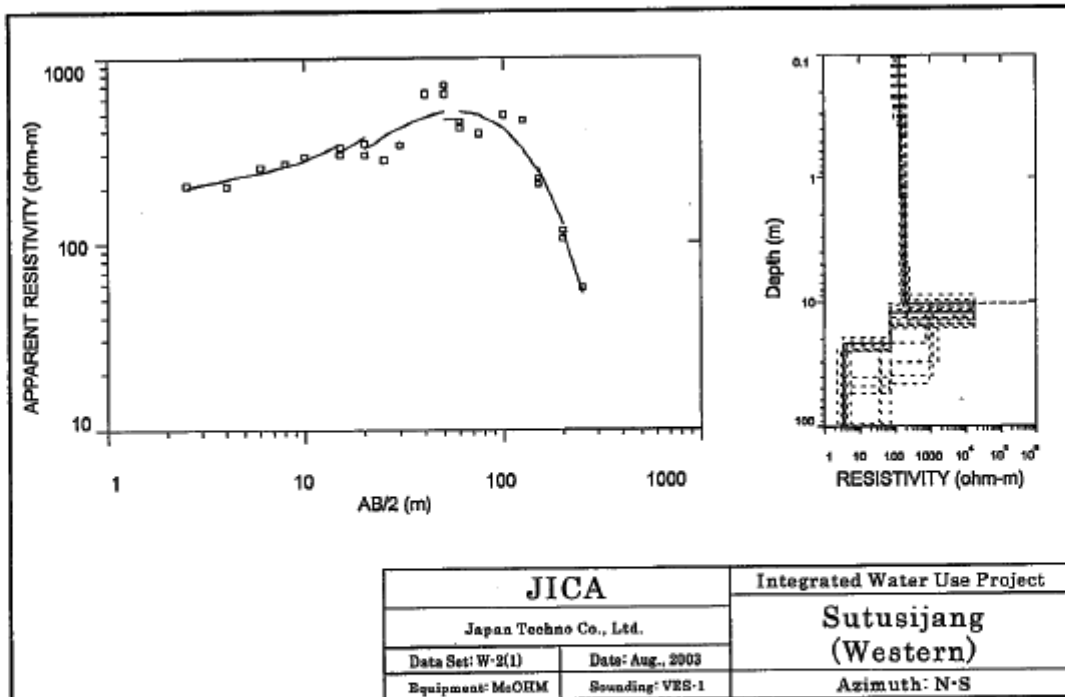
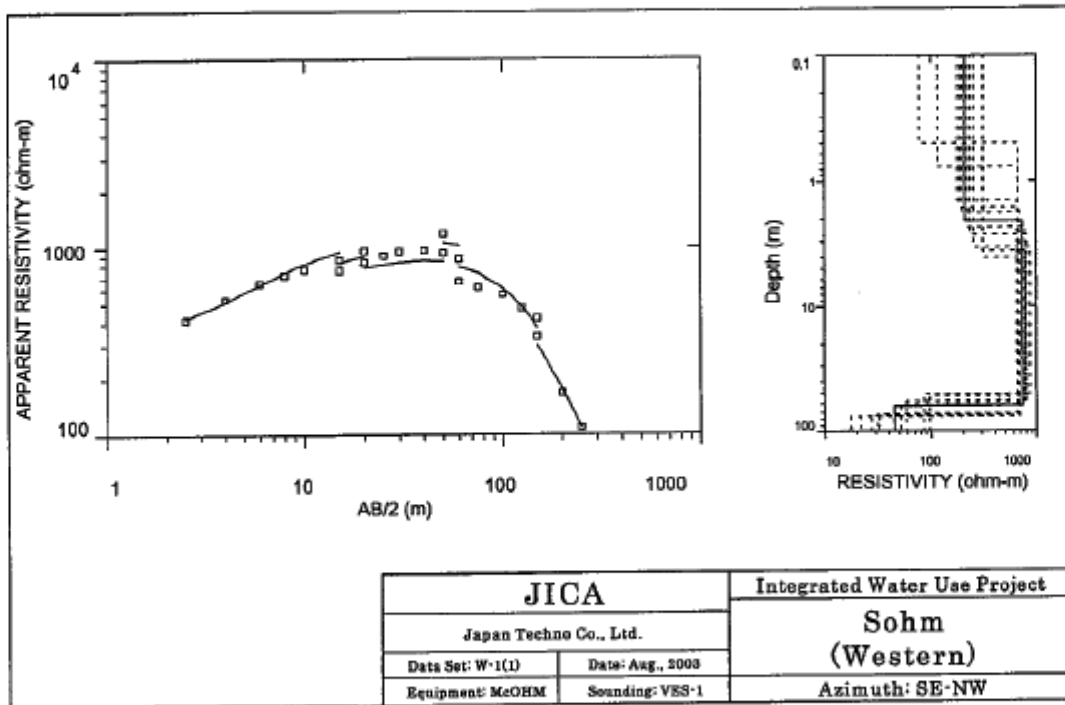


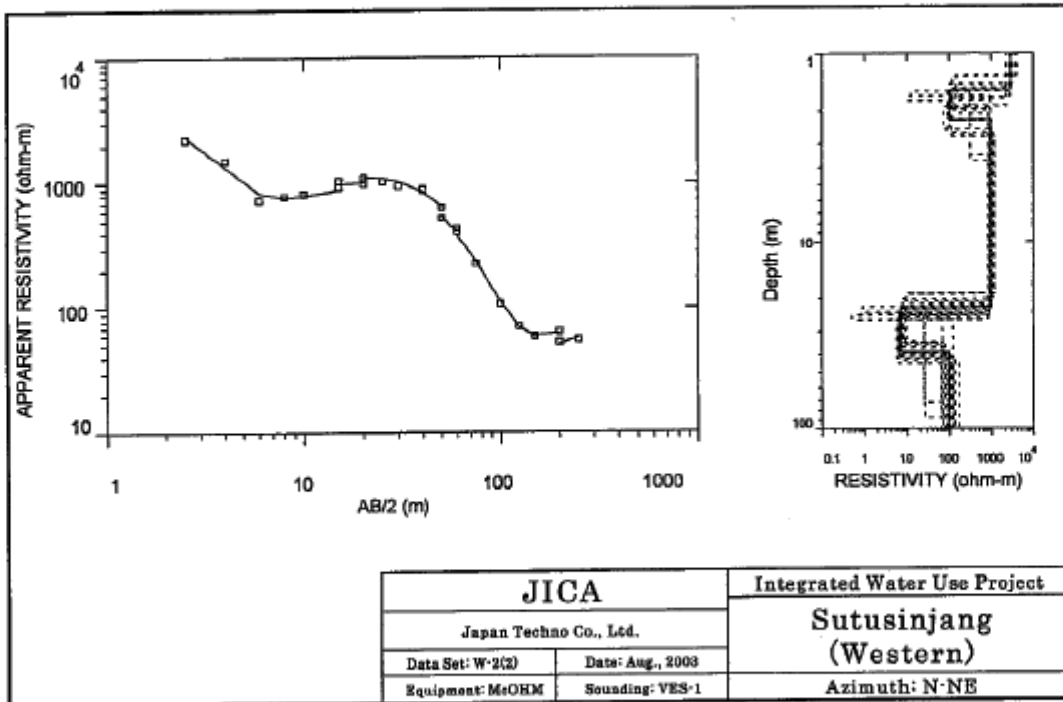












APPENDIX 6 REFERENCES

| No. | Title | Publisher | Published Year |
|-----|---|--|----------------|
| 1 | The Gambia Incorporated.Vision 2020 | Government of The Gambia | 1996 |
| 2 | Poverty Reduction Strategy Paper and Joint IDA-IMF Staff Assessment | World Bank | 2002 |
| 3 | National Energy Policy Action Plan | Department of State for Trade, Industry and Employment | 2002 |
| 4 | National Energy Policy Policy and Strategies Part Two | Department of State for Trade, Industry and Employment | 2001 |
| 5 | Estimates of Recurrent Revenue And Expenditure with Development Expenditure | Department of State for Finance and Economic Affaire | 2003 |
| 6 | The Second Strategy for Poverty Alleviation(SPA) | World Bank | 2002 |
| 7 | Consultant's Study on The Rural Water Supply and Sanitation Project | United Nation | 2003 |
| 8 | The review of Drinking Water Supply Criteria, Norms, and Indicators for Access to Drinking Water Supply and Preparation of T.O.R for a Water Resources Policy Study | Department of Water Resources | 2003 |
| 9 | KERJARIGA/KUNTAIR/MEMMEH Site Documentation Solar Water Distribution System | Department of Water Resources | 1995 |
| 10 | Consultancy Framework Contract .Solar Energy Programme | Ministry of Finance and Trade | 1998 |
| 11 | Managing Water Energy Service for Poverty Eradication in Rural Gambia | United Nations Department of Economic And Social Affairs | 2003 |
| 12 | State of the Environment Report – The Gambia | National Environment Agency | 1997 |
| 13 | Local Government Act 2002 | Government of The Gambia | 2002 |
| 14 | A Field Guide to the Integrated Training Manual for Extension Workers in The Gambia | Department of Community Development | 2000 |
| 15 | An Integrated Training Manual for Extension Workers (The Gambia) | Department of Community Development | 2000 |
| 16 | The Gambian Improved Pit Latrine Construction Manual | Water and Sanitation Working Group & UNICEF | 2000 |