CHAPTER 4

ACTUAL CONDITION OF ARSENIC CONTAMINATION IN GROUNDWATER

Main Report

CHAPTER 4 ACTUAL CONDITION OF ARSENIC CONTAMINATION IN GROUNDWATER

4.1 Present Conditions of 300 Existing Wells

4.1.1 Objective of the Survey

To determine the arsenic contamination and physical condition of existing wells, well structure and the arsenic level of well water were surveyed for 300 existing wells in the study area. Also conducted was the water quality analysis, other than the arsenic level, of 30 out of the 300 existing wells. The investigation items regarding well structure include well location (by GPS) and depth, drilling method, diameter, tube shape, screen depth, sealing method, time of construction, water level at time of drilling, target use, and past data on arsenic measurements. In addition, to understand the socio-economic conditions of the villages where the selected wells are located, interviews with village leaders were conducted.

4.1.2 Selection of the 300 Existing Wells

1) Framework of the Target Well Selection

Production wells in Pourashava areas and DPHE tube wells are targeted for this survey because they cover a larger number of users than private tube wells do; especially, production wells serve most of the residents in municipal areas. Therefore, all the production wells (40 in total: Jessore (17)[1], Jhenaidah (17), Chuadanga (6)) were selected as the target for the survey. The rest of the 300 existing wells (total 260) were selected from DPHE tube wells for drinking water supply in rural and urban areas. The steps are threefold: allocate the number of wells to be surveyed (hereafter target well), select 260 Mouzas to narrow down the locations of target wells, and then select one target well in each of the selected Mouzas on site. The detailed steps are described in the following section 2) and 3). Out of the 300 existing wells, 30 wells were selected for the analysis of water properties other than arsenic; its process is described in section 4).

[1] Out of the 17 production wells, 3 were not in use at the time of the survey, but available information was collected.

2) Allocation of Number of Target Wells

Since almost all the Mouzas have DPHE wells, Mouza names were used for selecting the 260 existing wells. Within the Mouza, DPHE staff selected one of the DPHE wells located in the selected Mouza. At first, the number of target wells was allocated to each Union according to the following steps:

(1) Allocate the number of target wells to each district based on the size of its jurisdiction area

(2) Allocate one target well to each Union

(3) Within the district, rank Unions based on the number of Mouzas in the Union and then allocate one more target well to the Unions according to the rank until the remaining target wells for the District become zero

Based on the above steps, 118 target wells (45.34% of the 260 target wells) were allocated to Jessore because of its share of the jurisdiction area among the three Districts: 89 to Jhenaidah and 53 to Chuadanga (see Table 4.1.1). Since there are a smaller number of Unions than the number of target wells in each District, each Union has at least one target well, and some Unions have two target wells. That is, 26 Unions have two target wells and 66 Unions have one target well in Jessore District, as 118 target wells are allocated to Jessore District and there are 92 Unions in Jessore District,

Table 4.1.1 Allocation of Target Wells to the 3 Districts

	3 District Total	Jessore	Jhenaidah	Chuadanga
Jurisdiction Area (km^2)	5,686	2,578 (45.34%)	1,950 (34.29%)	1,158 (20.37%)
Number of Target Wells	260	118	89	53
Total Number of Unions	197	92	72	33
Number of Unions with 2 Target Wells	63	26	17	20
Number of Unions with 1 Target Well	134	66	55	13

The selection of the Unions with two target wells is based on the number of Mouzas in the Union. In case that there are rivalry Unions that have the same number of Mouzas concerning the allocation of the remaining target wells, the ratio of already allocated target wells to the number of Mouzas in the Thana was considered. That is, Unions that are located in Thanas having the lowest ratio of allocated target wells to the number of Mouzas was selected. If the rivalry Unions are located in the same Thana, the Union with the largest jurisdiction area was selected.

3) Selection of the 260 Existing Wells (for Well Structure Investigation and Arsenic Level Analysis)

To specify the location of the target wells, Mouzas were firstly selected based on the following rules:

(1) The Mouza is located along the main road

(2) The Mouza is located at the center of the Union (when two Mouzas are allocated, the Mouza is located at the center of half the area of the Union); however, it does not matter if there are the DPHE wells formerly tested for arsenic contamination

(3) The Mouza has DPHE wells

Then one DPHE well was selected at the site when surveyors visited the selected Mouzas with the help of DPHE staff based on the following conditions:

(1) The hand pump is No. 6 type

(2) The well has a shallow aquifer

(3) The well has the largest number of users in the Mouza.

The names of the 260 Villages where the target wells are located are shown in Table 4.1.2 (in most of the cases, they are the same as the Mouza name).

The process of selecting the 260 target wells for the survey is shown in Figure 4.1.1.

4) Selection of 30 Existing Wells out of the 300 (for General Water Quality Analysis)

Out of the 300 existing wells selected according to the above-mentioned steps, 30 were selected for general water quality analysis. In the study area there are 7 Pourashavas that have production wells; therefore, the production well with the largest water withdrawal in each of the 7 Pourashavas was selected. The rest of the 30 (total 23) wells were allocated to Thanas as follows:

(1) Allocate one target well to each Thana (total 18 target wells)

(2) Allocate one more target well to each of the selected 5 Thanas: 1 in Chuadanga, 2 in Jessore, and 2 in Jhenaidah. These numbers reflect the size of jurisdiction area. Damurhuda (Chuadanga), Manirampur and Jessore (Jessore), and Jhenaidah and Sailkupa (Jhenaidah) are selected so that they are not concentrated in a certain area.

Then one or two Mouzas per Thana were selected from the 260 Mouzas as follows:

(1) The Mouza is located along the main road

(2) The Mouza is located at the center of the Thana (when two Mouzas are selected, the Mouza is located at the center of half the area of the Thana)

Since the 23 target wells for general water quality analysis are selected from the 260 target wells for well structure investigation and arsenic level analysis, once the Mouza is specified, automatically a target well is specified. The process of target well selection for general water quality analysis is summarized in Figure 4.1.2.

5) Selection of 260 Villages for Socio-economic Study

In the Villages having the target wells for well structure investigation and arsenic level analysis, a socio-economic study was carried out through interviews with village leaders to understand current conditions in rural areas (Pourashava areas are excluded). The names of the Villages where the socio-economic study was carried out are also listed in Table 4.1.2. It should be noted that the selected Village name is sometimes different from the Mouza name. This happens because some Mouzas have more than one Village.

Figure 4.1.3 shows locations of the 300 existing wells (40 production wells and 260 DPHE tube wells) for the well structure investigation and arsenic level analysis and locations of the 30 wells for general water quality analysis. Please note that locations of the 260 DPHE tube wells represent approximate locations of the Villages where the socio-economic study was carried out.

4.1.3 Well Structure

1) Survey Purpose

The well structure survey was carried out for the 40 DPHE Pourashava production wells and 260 DPHE shallow tube wells selected by the Study Team. The purpose of the well structure survey is to obtain the actual conditions of existing DPHE wells in the Study Area.

2) Survey Items

The following items were investigated for each well using the survey sheets prepared by the Study Team. These items were surveyed by field measurements (M), interviews with DPHE thana mechanics (H), or existing records (R).

(1) District name, Thana name, Union name, Mouza name, Village name and JL number of the well location.
(2) Owner's name, address, house number
(3) Topography and height from low land
(4) Sketch map of well location
(5) Photographs (taken from short distance and long distance)
(6) Pump type, name, conditions
(7) Platform size, height, structure (M)
(8) Well depth (M, H, R)
(9) Drilling depth (H, R)
(10) Month and year of well installation (H, R)
(11) Drilling method (H, R)
(12) Drilling diameter (H, R)
(13) Type and diameter of casing pipe (M)
(14) Screen type, length and depth (H, R)
(15) Sealing and sealing method, materials (H, R)
(16) Operation and maintenance method
(17) Name of caretaker
(18) Trouble and repair record
(19) Numbers of users and households
(20) Estimated pumping volume per day
(21) Previous arsenic test and its result
(22) Hygiene conditions near the well
(23) Remarks

For the existing production wells, the contractor shall investigate following items:

(24) Pump capacity

(25) Pumping duration per day

(26) Pumping test records

(27) Facilities (pump house, over-head tank, iron removal plant, etc.)

(28) Sketch of well structure and facilities

3) Results

a. Well depth of DPHE shallow wells

It is very important to know the actual well depths of the DPHE existing wells, because arsenic in groundwater is said to occur in shallow aquifers. However, previous arsenic projects such as the DPHE-UNICEF projects and the DPHE-DfID project used well depths from the existing records of DPHE. The well depth data from the existing records may be different from the actual ones due to any mistakes in the records or silting in the borehole.

Therefore, wells with No. 6 pumps, which can be easily removed for measuring the actual well depth, were selected for the investigation. In the field, the groundwater level and well depth were measured after collecting water samples.

Figure 4.1.4 shows the distribution of the well depth of 260 existing DPHE shallow wells by district. In the Study Area, the wells 40 to 45m in depth are most dominant (= 80nos.) as shown in the upper graph of the figure. Subsequently, there are 65 wells having well depths of 35 to 40m and 57 wells having well depths of 45 to 50. The well depths of the existing DPHE shallow wells tend to increase toward the south. In Chuadanga district, 26 wells out of 53 have well depths between 35 and 40m. In Jhenaidah district, wells 40 to 45m in depth are most dominant. In Jessore district, there are 38 wells having well depths between 45 to 50m and 37 wells having 40 to 45m. It is therefore presumed that the distribution of well depth by district is controlled by hydrogeologic conditions such as the depth and thickness of the aquifer, facies of the aquifer, and the occurrence of an aquitard.

b. Characteristics of production wells

There are 41 production wells for Pourashava water supply in the Study Area. The list of the production wells with the results of the field measurements in Jessore Pourashava, Jhenaidah district, and Chuadanga Pourashava are shown in Tables 4.1.3, 4.1.4, and 4.1.5, respectively.

There are 17 production wells in Jessore Pourashava. The well depth ranges from 85.32 to 132.54m. Most of the wells have single screen structure, however, one (1) well has two (2) screens and another well has three (3) screens. The screen length ranges from 13.4 to 47.54m. In Jessore Pourashava, there are 6 over-head tanks (OHT) and 5 iron removal plants (IRP). However, all the IRPs are not functioning at present.

In Jhenaidah districts, 5 Pourashavas have production wells for supplying municipal water. There are 7 production wells in Jhenaidah Pourashava, 3 production wells each in Kaliganj,

Sailkupa, and Kotchandpur Pourashavas, and 2 production wells in Moheshpur Pourashava. The well depth of the production wells ranges from 92.2 to 132.08m based on the available data. All the wells except one well in Sailkupa have a single screen. The screen length ranges from 4.35 to 30.07m. There are three (3) OHTs in Jhenaidah Pourashava, however, there is no OHT in the rest of the Pourashavas. There is no IRP in Jhenaidah district for municipal water supply.

In Chuadanga Pourashava, there are 6 production wells. So far the well structure of 4 wells are known by the existing available data. The well depth of the 4 wells ranges from 102.1 to 133.0m. All the wells have a single screen. The screen length ranges from 24 to 30m. There are three (3) OHTs and no IRP in Chuadanga Pourashava for the municipal water supply.

c. Specific capacity

The Study Team has collected the results of production tests of Pourashava production wells performed at the time of well construction. These data were obtained from DPHE District Offices and DPHE Ground Water Division. So far the data for 34 wells out of 41 wells have been collected. The production test data include date, discharge, static water level, dynamic water level, drawdown, and specific capacity.

The specific capacity (*Sc*) is one of the geohydrologic parameter to evaluate aquifer characteristics as well as the well performance. The *Sc* value can be obtained by:

$$Sc = \frac{Q}{s} \qquad (4.1.1)$$

where *Q* is the discharge rate from the well and *s* is drawdown. Generally large values of *Sc* indicate high productivity of the aquifer.

Figure 4.1.5 shows the distribution of *Sc* values obtained from the production wells. Simple statistical analysis is made to compute logarithmic average (AVG) and logarithmic standard deviation (STD) values for each plot group. The STD value and the range between (AVG-STD) and (AVG+STD) are shown in the figure.

The logarithmic average of *Sc* values for all the production wells in the Study Area is 1,086.0m^2/day. The range of (AVG-STD) to (AVG+STD) is from 607.9 to 1,765.8m^2/day. The AVG values of Chuadanga and Jhenaidah Districts are 1,225.3 and 1,224.4m^2/day, respectively. These are greater than the AVG value of Jessore (= 876.5m^2/day). Chuadanga and Jhenaidah have similar distribution ranges of Sc values in terms of the range of (AVG-STD) to (AVG+STD). However, the distribution range of Jessore is wider, ranging from 446.9 to 1,719.1m^2/day. This is because there are 4 wells having *Sc* values less than 500m^2/day.

It is concluded from the existing production well data that the aquifer productivity of the zone from 60 to 130m in depth is generally high in the Pourashava areas. However in Jessore Pourashava, the aquifer productivity is less in some places.

4.1.4 Groundwater Level

During the 300 existing well survey, groundwater levels of the DPHE shallow wells were measured by removing the hand pump. For the production wells, most of the wells have an observation pipe so that the groundwater levels were measured by inserting the water level sensor through the observation pipe.

For computing the groundwater levels from the mean sea level, ground surface elevation data as shown in Figure 2.3.2 in Chapter 2 were used. The grid elevation data were prepared for a grid 500 x 500m in size based on the SOB data and USGS GTOPO 30 data. Then the ground elevation at each existing well site was interpolated based on its coordinates. The ground elevation of the Study Area ranges from 0.44 to 14.98m above mean sea level. The elevation is lower in the southeast and higher in the northwest of the Study Area.

1) Groundwater Level in Rainy Season

Figure 4.1.6 shows the distribution of the depth to groundwater (DTW) from the ground surface measured at 300 existing wells from June to July 2000. This period is the beginning of the rainy season. The DTW values range from 1.12 to 9.78m in the Study Area. Deep groundwater levels more than 5m from the ground surface are found in the northern part of Jessore District, in the central and the western part of Jhenaidah District, and in the western part of Chuadanga district. On the other hand, the DTW in the southern part of Jessore District is shallower than 3m from the ground surface.

The area having DTW less than 3m has ground elevation of lower than 3m in the southeastern part of Jessore District.

Figure 4.1.7 shows the distribution of groundwater level (GWL) above mean sea level. The GWL values range from -2.65 to 9.50masl in the Study Area. The GWL is high in the northern part of Chuadanga district and declines toward the southeast. The areas having GWL values below 0masl are found from the southern to northeastern parts of Jessore district, covering Keshabpur, Monirampur, Jessore Sadar, Abhoynagar, Bagarpara thanas of Jessore District and Kaliganj thana of Jhenaidah District.

Figure 4.1.8 shows the groundwater flow vectors in the Study Area based on the GWL values said above. General flow directions are from northwest to southeast in the central to eastern part of the Study Area. However, a slight ridge of the groundwater level can be seen from central Chuadanga District to western Jessore District through central Jhenaidah District. On the western side of the ridge, the groundwater flows toward the Indian side. It should be noted that the groundwater flow vectors show only horizontal components, not expressing vertical components of the groundwater flow. The vertical components of groundwater flow can be known by measuring piezometric heads of deeper aquifers.

2) Groundwater Level in Dry Season

Figure 4.1.9 shows the distribution of the depth to groundwater (DTW) from the ground surface measured at 300 existing wells from December 2000 to January 2001. This period is the beginning of the dry season. The DTW values range from 0.65 to 12.99m in the Study Area. Deep groundwater levels more than 5m from the ground surface are scattered in the northeastern part and southwestern part of Jhenaidah District, western part of Chuadanga District, and central to western part of Jessore District. On the other hand, the shallow DTWs less than 3m are distributed from central Chuadanga to central Jhenaidah Districts and southern part of Jessore District. The DTWs of southern to western Keshabpur thana in Jessore District show less than 2m from the ground surface.

Figure 4.1.10 shows the distribution of groundwater level (GWL) in the dry season. The GWL values range from -7.49 to 9.94masl in the Study Area. The GWL is high in the northern part of Chuadanga District and declines toward the southeast. The areas having GWL values below 0masl are found from the southeastern and southwestern parts of Jessore District. The lower GWL values below 0masl are also found in the Pourashava areas of Jessore, Jhenaidah and Chuadanga, showing depressions of the groundwater table. The minimum GWL is recorded in Jessore Pourashava.

Figure 4.1.11 shows the groundwater flow vectors in the Study Area based on the GWL values said above. General flow directions are from northwest to southeast in the central to eastern part of the Study Area. However, a slight ridge of the groundwater level can be seen from central Chuadanga District to western Jessore District through central Jhenaidah District. On the western side of the ridge, the groundwater flows toward the Indian side.

3) Changes in GWL between Rainy Season and Dry Season

Figure 4.1.12 shows the changes in the groundwater level between the rainy season (June to July 2000) and the dry season (December 2000 to January 2001) in the study area. In the rural areas from central Chuadanga District to northern Jessore District, groundwater levels in the dry season are 1 to 3m higher than those in the rainy season. On the other hand, the ground water levels in northeastern Jhenaidah District and southwestern to southeastern Jessore District declined 1 to 2m. Due to this, the area having a GWL below 0masl in the eastern part of Jessore District disappeared, but the GWL in the southern part of Jessore District reached -2 to -3masl.

It should be noted that the western part of the study area was affected by the unusual flooding from late September to October 2000. It is presumed that the groundwater levels might be influenced by the flood even after 2 months from the flooding. It is also expected that the groundwater levels in the study area will decline from November to May next year based on the hydrographs prepared by RGAG & MURG (2000) in Samta village. Therefore, it is possible that the groundwater level from June to July 2000 (= the beginning of the rainy season) is lower than that from December 2000 to January 2001 (beginning of dry season).

Table 4.1.2 List of 300 Existing Wells Surveyed by the Study (1/6)

No.	Well No.	District	Thana	Union	Mouza	Village	JL-No	House#	Well Type	Pump Type
1	EW-JHMg1-R (48)	Jessore	Jhikargachha	Magura	Chavda	Chavda	48	127	Hand Tube	No-6
2	EW-JHHz1-R (138)	Jessore	Jhikargachha	Hazirbag	Matikomra	Matikomra	138	21	Hand Tube	ILLIGIBLE
3	EW-JHSk1-R (146)	Jessore	Jhikargachha	Shankarpur	Ulakol	Ulakol	146	3	Hand Tube	UNICEF NI/79, No-6
4	EW-JHBk1-R (156)	Jessore	Jhikargachha	Bankra	Alipur	Alipur	156	No	Hand Tube	UNICEF BL 80
5	EW-JHPn1-R (93)	Jessore	Jhikargachha	Panisara	Barni	Barni	93	293	Hand Tube	UNICEF NI / 79 No-6
6	EW-JHNh1-R (105)	Jessore	Jhikargachha	Nabharan	Baysa	Baysa	105	No	Hand Tube	UNICEF, EPL No-6
7	EW-JHNh1-R (108)	Jessore	Jhikargachha	Nabharan	Gunenagar	Gunenagar	108	10	Hand Tube	BRDO, No-6
8	EW-JHGg1-R (08)	Jessore	Jhikargachha	Ganganadapur	Ganganadapur	Ganganadapur	8	588	Hand Tube	No-6
9	EW-JHSm 1-R (28)	Jessore	Jhikargachha	Simulia	Simuliagopinathpur	Simuliagopinathpur	28	208	Hand Tube	UNICEF (EPL 76) No-6
10	EW-JHGd1-R (30)	Jessore	Jhikargachha	Gadkhali	Fatepur	Fatepur	30	90	Hand Tube	UNICEF (EPL) 96, No-6
11	EW-JHNs 1-R (124)	Jessore	Jhikargachha	Nibaskhola	Arsingri	Arsingri	124	No	Hand Tube	UNICEF UMI 90 No-6
12	EW-JHJk1-R (35)	Jessore	Jhikargachha	Jhikargachha	Sagarpur	Sagarpur	35	155	Hand Tube	UNICEF, (CEC 84) No-6
13	EW-JHJk1-R (62)	Jessore	Jhikargachha	Jhikargachha	Chanpatala	Chanpatala	62	60	Hand Tube	UNICEF, (NI 82) No-6
14	EW-JSNz1-R (62)	Jessore	Sharsha	Nizampur	Chandurlarghop	Chandurlarghop	62	53	Hand Tube	UNICEF NI /79
15	EW-JSLk1-R (33)	Jessore	Sharsha	Lakshmanpur	Paraikhpur	Paraikhpur	33	99	Hand Tube	UNICEF 75 No-6
16	EW-JSPt1-R (92)	Jessore	Sharsha	Putkhali	Kadamtala	Kadamtala	92	100	Hand Tube	UNICEF No-6
17	EW-JSBn1-R (37)	Jessore	Sharsha	Bahadurpur	Shakharipota	Shakharipota	37	No	Hand Tube	UNICEF SMI6
18	EW-JSBg1-R (126)	Jessore	Sharsha	Bagachra	Samta	Samta	126	211	Hand Tube	UNICEF NI / 78 No-6
19	EW-JSBn1-R (88)	Jessore	Sharsha	Benapole	Bhabarbar	Bhabarbar	88	No	Hand Tube	UNICEF NI / 78 No-6
20	EW-JSKb1-R (132)	Jessore	Sharsha	Kayba	Raghabpur	Raghabpur	132	129	Hand Tube	UNICEF SEPT / 92 No-6
21	EW-JSGg1-R (114)	Jessore	Sharsha	Goga	Kalini	Kalini	114	115	Hand Tube	UNICEF 75, No-6
22	EW-JSSs1-R (75)	Jessore	Sharsha	Sharsha	Narayanpur	Narayanpur	75	198	Hand Tube	UNICEF AFS No-6
23	EW-JSUl 1-R (99)	Jessore	Sharsha	Ulashi	Mathpukuria	Mathpukuria	99	No	Hand Tube	No-6
24	EW-JSDh1-R (01)	Jessore	Sharsha	DiHi	Salkona	Salkona	01	353	Hand Tube	UNICEF, NI / 79 No-6
25	EW-JSDh1-R (8)	Jessore	Sharsha	Dihi	Khalishakhali	Khalishakhali	8	217	Hand Tube	UNICEF, UE 90
26	EW-JKKs1-R (26)	Jessore	Keshabpur	Keshabpur	Mulgram	Mulgram	26	608	Hand Tube	CEC
27	EW-JKKs1-R (72)	Jessore	Keshabpur	Keshabpur	Altapol	Altapol	72	1321	Hand Tube	(H) 93 No-6
28	EW-JKSf1-R (121)	Jessore	Keshabpur	Sufalakati	Nrayanpur	Nrayanpur	121	71	Hand Tube	UNICEF (EPL 76) No-6
29	EW-JKSf1-R (128)	Jessore	Keshabpur	Sufalakati	Giridharmagar	Giridharmagar	128	48	Hand Tube	UNICEFUE 90 No-6
30	EW-JKPj1-R (102)	Jessore	Keshabpur	Pamzia	Raznagar Bankabarsi	Raznagar Bankabarsi	102	278 A	Hand Tube	UNICEF (NI 82) No-6
31	EW-JKMg1-R (97)	Jessore	Keshabpur	Mangalkot	Panchri	Panchri	97	69	Hand Tube	UNICEF (NI 79) No-6
32	EW-JKGr1-R (135)	Jessore	Keshabpur	Gaurighona	Bharchi	Bharchi	135	392	Hand Tube	No-6
33	EW-JKTm1-R (11)	Jessore	Keshabpur	Trimonini	Mirzanagar	Mirzanagar	11	289	Hand Tube	UNICEF, E.P.L No-6
34	EW-JKSg1-R (17)	Jessore	Keshabpur	Sagardari	Gopsona	Gopsona	11	146	Hand Tube	UNICEF, NI No-6
35	EW-JKSg1-R (41)	Jessore	Keshabpur	Sagardari	Chingra	Chingra	41	466	Hand Tube	UNICEF, NI /80
36	EW-JKMj1-R (65)	Jessore	Keshabpur	Majitpur	Bagdaha	Bagdaha	65	124	Hand Tube	UNICEF, NI /79
37	EW-JKBn1-R (51)	Jessore	Keshabpur	Bidyanandakati	Kabilpur	Kabilpur	51	181	Hand Tube	SAFD No-6
38	EW-JKBn1-R (88)	Jessore	Keshabpur	Bidyanandakati	Purchakra	Purchakra	88	8	Hand Tube	UNICEF, 75 No-6
39	EW-JJCr1-R (13)	Jessore	Jessore Sadar	Churamankati	Asannagar	Asannagar	13	125	Hand Tube	UNICEF No-6
40	EW-JJJs1-R (78)	Jessore	Jessore Sadar	Jessore Pourashava	Kholadanga	Kholadanga	78	562-565	Hand Tube	UNICEF No-6
41	EW-JJKc1-R (223)	Jessore	Jessore Sadar	Kachua	Munsef pur	Munsef pur	223	61	Hand Tube	UNICEF NI / 83 No-6
42	EW-JJLb1-R (156)	Jessore	Jessore Sadar	Lebutala	Gobra	Gobra	156	156	Hand Tube	UNICEF No-6
43	EW-JJLb1-R (162)	Jessore	Jessore Sadar	Lebutala	Khajura	Khajura	162	99	Hand Tube	UNICEF No-6EPL
44	EW-JJCc1-R (59)	Jessore	Jessore Sadar	Chanchra	Maidia	Maidia	59	465	Hand Tube	UNICEF GE 93
45	EW-JJKs1-R (113)	Jessore	Jessore Sadar	Kasimpur	Bijaynagar	Bijaynagar	113	383	Hand Tube	UNICEF No- 06
46	EW-JJKs1-R (136)	Jessore	Jessore Sadar	Kasimpur	Baghainagar	Baghainagar	136	No	Hand Tube	UNICEF No- 06
47	EW-JJNp1-R (195)	Jessore	Jessore Sadar	Noapara	Ghurulia	Ghurulia	195	No	Hand Tube	UNICEF UE 89, No- 06
48	EW-JJAr1-R (95)	Jessore	Jessore Sadar	Arabpur	Daulatpur	Daulatpur	95	155	Hand Tube	No-6
49	EW-JJRn1-R (214)	Jessore	Jessore Sadar	Ramnagar	Tola Goldar para	Tola Goldar para	214	163	Hand Tube	UNICEF GE 93 No- 06
50	EW-JJDa1-R (22)	Jessore	Jessore Sadar	Diara	Chandutia	Chandutia	22	15/5	Hand Tube	UNICEF, No- 06

Table 4.1.2 List of 300 Existing Wells Surveyed by the Study (2/6)

No.	Well No.	District	Thana	Union	Mouza	Village	JL-No	House#	Well Type	Pump Type
51	EW-JJDa1-R (38)	Jessore	Jessore Sadar	Diara	Dattapara	Dattapara	38	156	Hand Tube	UNICEF, EW 83 No- 06
52	EW-JJBs1-R (247)	Jessore	Jessore Sadar	Basundia	Jundgal Badhal	Jundgal Badhal	247	No	Hand Tube	UNICEF, 06 / 90
53	EW-JJNp1-R (104)	Jessore	Jessore Sadar	Noapara Shekhhati	Kismat Noapara	Kismat Noapara	104	216	Hand Tube	UNICEF, GE 80 No-6
54	EW-JJNr1-R (240)	Jessore	Jessore Sadar	Narendrapur	Chhilumbaria	Chhilumbaria	104	No	Hand Tube	
55	EW-JJIc1-R (170)	Jessore	Jessore Sadar	Ichhali	Jagannath pur	Jagannath pur	170	105	Hand Tube	UNICEF, NI / 93
56	EW-JJIc1-R (186)	Jessore	Jessore Sadar	Ichhali	Ramkrisnopur	Ramkrisnopur	186	213	Hand Tube	A No-6
57	EW-JJHb1-R (122)	Jessore	Jessore Sadar	Haibatpur	Samaspur	Samaspur	122	80	Hand Tube	UNICEF No-6
58	EW-JJHb1-R (128)	Jessore	Jessore Sadar	Haibatpur	Bhagalpur	Bhagalpur	128	100	Hand Tube	UNICEF No-6
59	EW-JJFt1-R (205)	Jessore	Jessore Sadar	Fatepur	Baolia	Baolia	205	No	Hand Tube	STC No-6
60	EW-JMKp1-R (157)	Jessore	Manirampur	Khanpur	Khanpur	Khanpur	157	1532	Hand Tube	UNICEF EPL 90 No-6
61	EW-JMJp1-R (174)	Jessore	Manirampur	Jhanpa	Jhanpa	Jhanpa	174	525	Hand Tube	Supper6
62	EW-JMHh1-R (25)	Jessore	Manirampur	Hariharanagar	Moktar pur	Moktar pur	25	549	Hand Tube	ME COL No-6
63	EW-JMHh1-R (35)	Jessore	Manirampur	Harihar nagar	Tentulia	Tentulia	35	30/5	Hand Tube	UNICEF, UE 90
64	EW-JMSm1-R (160)	Jessore	Manirampur	Shyamkur	Sundalpur	Sundalpur	160	52	Hand Tube	UNICEF, 75 No- 90
65	EW-JMSm1-R (210)	Jessore	Manirampur	Shyamkur	Aminpur	Aminpur	210	326	Hand Tube	UNICEF, (EPL) No-6
66	EW-JMCl 1-R (198)	Jessore	Manirampur	Chaluahati	Ghiba	Ghiba	198	90 A	Hand Tube	UNICEF, 75, No-6
67	EW-JMCl1-R (201)	Jessore	Manirampur	Chaluahati	Ralneswarpur	Ralneswarpur	201	222	Hand Tube	Pump is changed and form is illigible
68	EW-JMKl1-R (141)	Jessore	Manirampur	Kultia	Bajekultia	Bajekultia	141	15	Hand Tube	UNICEF (C) No-6
69	EW-JMKl1-R (148)	Jessore	Manirampur	Kultia	Padmangthpur	Padmangthpur	148	4	Hand Tube	UNICEF (EPL 95) No-6
70	EW-JMDb1-R (227)	Jessore	Manirampur	Durbadanga	Kuarikona	Kuarikona	227	11	Hand Tube	UNICEF (EPL 84) No-6
71	EW-JMMh1-R (239)	Jessore	Manirampur	Momoharpur	Momoharpur	Momoharpur	239	1029	Hand Tube	UNICEF (M) 92 No-6
72	EW-JMMs1-R (186)	Jessore	Manirampur	Maswim nagar	Hazrakati	Hazrakati	186	393	Hand Tube	UNICEF, NI / 79 No-6
73	EW-JMHd1-R (108)	Jessore	Manirampur	Haridaskati	Kajirgaon	Kajirgaon	108	54	Hand Tube	UNICEF No-6
74	EW-JMHd1-R (138)	Jessore	Manirampur	Haridaskati	Diganga	Diganga	138	22	Hand Tube	UNICEF 72 No-6
75	EW-JMMr1-R (91)	Jessore	Manirampur	Manirampur	Faytabad	Faytabad	91	186	Hand Tube	NI / 97 No-6
76	EW-JMMr1-R (101)	Jessore	Manirampur	Manirampur	Mahadebpur	Mahadebpur	101	285	Hand Tube	UNICEF (NI 72) No-6
77	EW-JMPh1-R (13)	Jessore	Manirampur	Rohita	Bagdob	Bagdob	13	109/A	Hand Tube	UNICEF 75 No-6
78	EW-JMNh1-R (244)	Jessore	Manirampur	Nehalpur	Bahdaba	Bahdaba	244	688	Hand Tube	UNICEF (NI 79) No-6
79	EW-JMKd1-R (51)	Jessore	Manirampur	Khedapar	Jalal pur	Jalal pur	51	NA	Hand Tube	UNICEF EPL 90 No-6
80	EW-JMDk1-R (124)	Jessore	Manirampur	Dhakuria	Brahmapur	Brahmapur	124	47	Hand Tube	(EPL) No-6
81	EW-JMKs1-R (71)	Jessore	Manirampur	Kasim nagar	Nadra	Nadra	71	No	Hand Tube	UNICEF NI/80 No-6
82	EW-JMBj1-R (81)	Jessore	Manirampur	Bhojgati	Dohar	Dohar	81	52	Hand Tube	UNICEF NI/79
83	EW-JCDl1-R (181)	Jessore	Chougachha	Dhuliani	Dhuliani	Dhuliani	181	124	Hand Tube	90 EPL No-6
84	EW-JCPs1-R (210)	Jessore	Chougachha	Pashapole	Hauli	Hauli	210	169	Hand Tube	UNICEFUE 90 No-6
85	EW-JCPs1-R (215)	Jessore	Chougachha	Pashapole	Durali	Durali	215	31	Hand Tube	UNICEF Nove 83, No-6
86	EW-JCSr1-R (198)	Jessore	Chougachha	Swarupdaha	Madhabpur	Madhabpur	198	134	Hand Tube	UNICEF GE 93, No-6
87	EW-JCHk1-R (54)	Jessore	Chougachha	Hakimpur	Hakimpur	Hakimpur	54	N.A	Hand Tube	UNICEF EPL 83
88	EW-JCPt1-R (207)	Jessore	Chougachha	Patibila	Muktadaha	Muktadaha	207	Illigible	Hand Tube	UNICEF ICI 89
89	EW-JCCg1-R (170)	Jessore	Chougachha	Chugachha	Manmathapur	Manmathapur	170	160	Hand Tube	UNICEF EPL 93 No-6
90	EW-JCNr1-R (174)	Jessore	Chougachha	Narayanpur	Bundalitala	Bundalitala	174	157	Hand Tube	Illegible
91	EW-JCJr1-R (218)	Jessore	Chougachha	Jaradishpur	Marua	Marua	218	241	Hand Tube	UNICEF, SEPT /92 No-6
92	EW-JCSk1-R (124)	Jessore	Chougachha	Sukpukhuria	Andulia	Andulia	124	NA	Hand Tube	UNICEF No-6
93	EW-JCSk1-R (133)	Jessore	Chougachha	Sukpukhuria	Purapara	Purapara	133	104	Hand Tube	UNICEF EPL No-6
94	EW-JCSk1-R (198)	Jessore	Chougachha	Paulsara	Kotalipar	Kotalipar	198	48	Hand Tube	UNICEF No-6
95	EW-JCPl1-R (205)	Jessore	Chougachha	Paulsara	Aradaha	Aradaha	205	93	Hand Tube	UNICEF No-6
96	EW-JCSg1-R (187)	Jessore	Chougachha	Singhajhuli	Garibpur	Garibpur	187	380	Hand Tube	UNICEF EPL 90, No-6
97	EW-JBNr1-R (72)	Jessore	Bagherpara	Narikelbaria	Dyarampur	Dyarampur	72	NA	Hand Tube	UNICEF No-6
98	EW-JBJd1-R (149)	Jessore	Bagherpara	Jamdia	Jamdia	Jamdia	149	433	Hand Tube	(Talim) Dec. No-6
99	EW-JBRp1-R (54)	Jessore	Bagherpara	Raipur	Bangagram	Bangagram	54	No	Hand Tube	UNICEF, EF MW 76 No-6
100	EW-JBRp1-R (65)	Jessore	Bagherpara	Raipur	Salbarat	Salbarat	65	2月24日	Hand Tube	UNICEF, RFL Aug 92

Table 4.1.2 List of 300 Existing Wells Surveyed by the Study (3/6)

No.	Well No.	District	Thana	Union	Mouza	Village	JL-No	House#	Well Type	Pump Type
101	EW-JBJh1-R (3)	Jessore	Bagherpara	Jaharpur	Halda	Halda	65	63	Hand Tube	UNICEF, EPL 93
102	EW-JBJh1-R (30)	Jessore	Bagherpara	Jaharpur	Khalia	Khalia	30	234	Hand Tube	UNICEF, No-6
103	EW-JBBd1-R (15)	Jessore	Bagherpara	Bandabilla	Gahid ghat	Gahid ghat	15	12	Hand Tube	UNICEF, No-6
104	EW-JBBd1-R (36)	Jessore	Bagherpara	Bandabilla	Mirzapur	Mirzapur	36	131	Hand Tube	BRDB 86 No-6
105	EW-JBDr1-R (91)	Jessore	Bagherpara	Darajhat	Pukhuria	Pukhuria	91	198	Hand Tube	No-6
106	EW-JBBs1-R (117)	Jessore	Bagherpara	Basuari	Ramnagara	Ramnagara	117	3	Hand Tube	UNICEF 75 No-6
107	EW-JBBs1-R (132)	Jessore	Bagherpara	Basuari	Ramchandrapur	Ramchandrapur	132	41	Hand Tube	No-6
108	EW-JBDh1-R (108)	Jessore	Bagherpara	Dohakula	Mamudanipur	Mamudanipur	108	1	Hand Tube	UNICEF 85, No-6
109	EW-JBDl1-R (102)	Jessore	Bagherpara	Dhalgram	Dhalgram	Dhalgram	102	66	Hand Tube	UNICEF No-6
110	EW-JASd1-R (4)	Jessore	Abhaynagar	Sridharpur	Purakhali	Purakhali	4	11	Hand Tube	No-6
111	EW-JABg1-R (12)	Jessore	Abhaynagar	Baghutia	Bhatpara Abhaynagar	Bhatpara Abhaynagar	12	425	Hand Tube	UNICEF (C) 85 No-6
112	EW-JAMh1-R (49)	Jessore	Abhaynagar	Mahakal	Pombhag	Pombhag	49	224	Hand Tube	UNICEF (C) 84 No-6
113	EW-JAMh1-R (58)	Jessore	Abhaynagar	Mahakal	Ramsara	Ramsara	58	162	Hand Tube	No-6
114	EW-JANa1-R (72)	Jessore	Abhaynagar	Noapara	Dhopadi	Dhopadi	72	911	Hand Tube	UNICEF 84 No-6
115	EW-JARj1-R (85)	Jessore	Abhaynagar	Rajghat	Bagdaha	Bagdaha	85	No	Hand Tube	Illigible
116	EW-JAPr1-R (92)	Jessore	Abhaynagar	Payra	Payra	Payra	92	No	Hand Tube	TAMIN No -06
117	EW-JASh1-R (37)	Jessore	Abhaynagar	Subharara	Hida	Hida	37	150 A	Hand Tube	RFL No -06
118	EW-JASd1-R (42)	Jessore	Abhaynagar	Siddhipasa	Nauli	Nauli	42	578	Hand Tube	UNICEF NI / 81 No-6
119	EW-HJNl1-R (136)	Jhenaidah	Jhenaidah Sadar	Naldanga	Jatrapur	Jatrapur	136	No	Hand Tube	UNICEF No-6 NI /79
120	EW-HJNl1-R (147)	Jhenaidah	Jhenaidah Sadar	Naldanga	Banghutia	Banghutia	147	No	Hand Tube	BRDB KML No-6
121	EW-HJSr1-R (133)	Jhenaidah	Jhenaidah Sadar	Surat	Chutlia	Chutlia	N.A	No	Hand Tube	UNICEF DHPE No-6
122	EW-HJHl1-R (42)	Jhenaidah	Jhenaidah Sadar	Haldhani	Kola	Kola	42	448	Hand Tube	UNICEF- 82 DHPE-6
123	EW-HJGn1-R (55)	Jhenaidah	Jhenaidah Sadar	Ganna	Chandipur	Chandipur	55	No	Hand Tube	UNICEF DHPE-6 EPL- 83
124	EW-HJGn1-R (86)	Jhenaidah	Jhenaidah Sadar	Ganna	Madhabpur	Madhabpur	N.A	No	Hand Tube	UNICEF DHPE-6 NI/ 76
125	EW-HJHr1-R (231)	Jhenaidah	Jhenaidah Sadar	Horisangkerpur	Nara Haridra	Nara Haridra	N.A	30	Hand Tube	UNICEF NI / 79 No-6
126	EW-HJHr1-R (240)	Jhenaidah	Jhenaidah Sadar	Horisangkerpur	Horisangkerpur	Horisangkerpur	N.A	No	Hand Tube	UNICEF NI / 79 No-6
127	EW-HJGr1-R (200)	Jhenaidah	Jhenaidah Sadar	Ghorasal	Pakka	Pakka	N.A	No	Hand Tube	UNICEF No-6
128	EW-HJFr1-R (261)	Jhenaidah	Jhenaidah Sadar	Fursandi	Moktarampur	Moktarampur	261	50	Hand Tube	UNICEF No-6 IC 89
129	EW-HJMd1-R (19)	Jhenaidah	Jhenaidah Sadar	Madhuhati	Barobari	Barobari	N.A	N.A	Hand Tube	UNICEF UMI 77
130	EW-HJMd1-R (26)	Jhenaidah	Jhenaidah Sadar	Madhuhati	Shyamnagar	Shyamnagar	N.A	81	Hand Tube	UNICEF -6 CEC- 90
131	EW-HJJn1-R (122)	Jhenaidah	Jhenaidah Sadar	Jhenaidah Pourashava	Muraridaha	Muraridaha	N.A	82	Hand Tube	UNICEF No-6 SMI- 91
132	EW-HJJn1-R (125)	Jhenaidah	Jhenaidah Sadar	Jhenaidah Pourashava	Jhenaidah	Chaklapara Hatkhola	N.A	No	Hand Tube	RFL No-6
133	EW-HJKi1-R (176)	Jhenaidah	Jhenaidah Sadar	Kalicharanpur	Kalicharanpur	Kalicharanpur	N.A	No	Hand Tube	PAIL-6Khaza
134	EW-HJSg1-R (34)	Jhenaidah	Jhenaidah Sadar	Sagenna	Baliadanga	Baliadanga	N.A	97	Hand Tube	No-6NI / 79
135	EW-HJPd1-R (225)	Jhenaidah	Jhenaidah Sadar	Padmakar	Achintya nagar	Achintya nagar	N.A	50	Hand Tube	UNICEF No-6
136	EW-HJPg1-R (114)	Jhenaidah	Jhenaidah Sadar	Paglakanai	baribathan	baribathan	N.A	707	Hand Tube	UNICEF -6 NI/84
137	EW-HJSd1-R (3)	Jhenaidah	Jhenaidah Sadar	Sadhuhati	Bankira	Bankira	N.A	N.A	Hand Tube	UNICEF-6 NI/83
138	EW-HJMh1-R (88)	Jhenaidah	Jhenaidah Sadar	Maharajpur	Dhakin Ramnagar	Dhakin Ramnagar	N.A	N.A	Hand Tube	UNICEF-6
139	EW-HJMh1-R (98)	Jhenaidah	Jhenaidah Sadar	Maharajpur	Maharajpur	Maharajpur	N.A	197	Hand Tube	No-6 TANIM CEC
140	EW-HJPr1-R (190)	Jhenaidah	Jhenaidah Sadar	Purahati	Baliadanga	Baliadanga	N.A	99	Hand Tube	No-6 NI / 79
141	EW-HJPr1-R (251)	Jhenaidah	Jhenaidah Sadar	Porahati	Ghoramara	Ghoramara	N.A	78	Hand Tube	UNICEF NI / 79
142	EW-HJKm1-R (62)	Jhenaidah	Jhenaidah Sadar	Kumarbaria	Nagar Bathan	Nagar Bathan	N.A	No	Hand Tube	No-6 UNICEF 90
143	EW-HJDg1-R (196)	Jhenaidah	Jhenaidah Sadar	Dogachi	Dogachi	Dogachi	N.A	No	Hand Tube	UNICEF No-6
144	EW-HKRg1-R (74)	Jhenaidah	Kaliganj	Raigram	Buzruk Mundia	Buzruk Mundia	74	No	Hand Tube	UNICEF No-6 NI /80
145	EW-HKRk1-R (135)	Jhenaidah	Kaliganj	Rakhalgachhi	Subidpur	Subidpur	N.A	26	Hand Tube	UNICEF No-6
146	EW-HKJm1-R (89)	Jhenaidah	Kaliganj	Jamal	Gutiani	Gutiani	N.A	52	Hand Tube	UNICEF-6 NI/82
147	EW-HKJm1-R (101)	Jhenaidah	Kaliganj	Jamal	Talian	Borotalian	101	261	Hand Tube	No-6 JMT
148	EW-HKKl1-R (115)	Jhenaidah	Kaliganj	Kola	Kola	Kola	0	No	Hand Tube	UNICEF No-6
149	EW-HKKl1-R (173)	Jhenaidah	Kaliganj	Kola	Tenghari Huda	Tenghari Huda	N.A	No	Hand Tube	UNICEF No-6
150	EW-HKTl1-R (45)	Jhenaidah	Kaliganj	Trilochanpur	Shahapur	Shahapur	N.A	27/4	Hand Tube	UNICEF NI / 79

Table 4.1.2 List of 300 Existing Wells Surveyed by the Study (4/6)

No.	Well No.	District	Thana	Union	Mouza	Village	JL-No	House#	Well Type	Pump Type
151	EW-HKKl1-R (28)	Jhenaidah	Kaliganj	Kaliganj Pourashava	Arpara	Arpara	N.A	No	Hand Tube	UNICEF NI / 79
152	EW-HKKs1-R (152)	Jhenaidah	Kaliganj	Kashtabhanga	Kumarhati	Kumarhati	N.A	41	Hand Tube	No-6 TRAD MAID MAR
153	EW-HKSm1-R (40)	Jhenaidah	Kaliganj	Simla Rokanpur	Barasimla	Barasimla	N.A	165	Hand Tube	No-6
154	EW-HKMi1-R (180)	Jhenaidah	Kaliganj	Maliat	Maliat	Maliat	180	161	Hand Tube	UNICEF No-6EPL 76
155	EW-HKSd1-R (9)	Jhenaidah	Kaliganj	Sundarpur Durgapur	Bejpara	Bejpara	N.A	114	Hand Tube	No-6 EPL- 86
156	EW-HKBr1-R (164)	Jhenaidah	Kaliganj	Bara bazar	Pirojpur	Pirojpur	N.A	259	Hand Tube	UNICEF ICI No-6
157	EW-HKBr1-R (195)	Jhenaidah	Kaliganj	Bara bazar	Gram Majdia	Gram Majdia	195	198	Hand Tube	UNICEF No-6
158	EW-HKNm1-R (32)	Jhenaidah	Kaliganj	Niamatpur	Mahishadera	Mahishadera	N.A	No	Hand Tube	UNICEF No-6 NI/79
159	EW-HKNm1-R (123)	Jhenaidah	Kaliganj	Niamatpur	Nagar chaprail	Nagar chaprail	N.A	81	Hand Tube	UNICEF No-6 RMS
160	EW-HTEl1-R (75)	Jhenaidah	Kotchandpur	Elengi	Gurpara	Gurpara	75	64	Hand Tube	TANIM No-6
161	EW-HTKs1-R (32)	Jhenaidah	Kotchandpur	Kushna	Horindi	Horindi	32	21	Hand Tube	UNICEF NI / 77 No-6
162	EW-HTKt1-R (50)	Jhenaidah	Kotchandpur	Kushna	Kushna	Kushna	50	No	Hand Tube	UNICEF No-6
163	EW-HTKt1-R (46)	Jhenaidah	Kotchandpur	Kotchandpur Paurashava	Kot Chandpur	Gabtolapara	46	No	Hand Tube	UNICEF No-7
164	EW-HTDr1-R (13)	Jhenaidah	Kotchandpur	Dora	Dora	Dora	N.A	171	Hand Tube	DPHE TANIM CEC
165	EW-HTDr1-R (18)	Jhenaidah	Kotchandpur	Dora	Suadi	Suadi	N.A	25	Hand Tube	No-6 MEW
166	EW-HTSb1-R (24)	Jhenaidah	Kotchandpur	Sabdalpur	Baliadanga	Baliadanga	N.A	No	Hand Tube	UNICEF No-6
167	EW-HLBl1-R (40)	Jhenaidah	Kotchandpur	Baluhar	Singia	Singia	N.A	No	Hand Tube	UNICEF,-6 SMI- 94
168	EW-HMNp1-R (26)	Jhenaidah	Moheshpur	Nepa	Baksputa	Baksputa	26	No	Hand Tube	UNICEF, No-6
169	EW-HMKz1-R (13)	Jhenaidah	Moheshpur	Kajirber	Kajirber	Kajirber	13	357	Hand Tube	UNICEF No-6
170	EW-HMFt1-R (104)	Jhenaidah	Moheshpur	Fatehpur	Chandpur	Chandpur	No	720	Hand Tube	UNICEF, No-6, 84 Janata
171	EW-HMMd1-R (139)	Jhenaidah	Moheshpur	Manderbari	Hudauhankar	Hudauhankar	No	131	Hand Tube	UNICEF, No-6
172	EW-HMMd1-R (159)	Jhenaidah	Moheshpur	Manderbari	Syamnagar	Syamnagar	No	345	Hand Tube	UNICEF, No-6
173	EW-HMSk1-R (29)	Jhenaidah	Moheshpur	Syamkur	Anantapur	Anantapur	29	167	Hand Tube	UNICEF, No-6
174	EW-HMBb1-R (48)	Jhenaidah	Moheshpur	Bansbaria	Bhairaba	Bhairaba	48	219	Hand Tube	UNICEF, No-6
175	EW-HMMh1-R (109)	Jhenaidah	Moheshpur	Moheshpur Paurashava	Moheshpur	Baruipara	109	No	Hand Tube	UNICEF, No-6
176	EW-HMPt1-R (74)	Jhenaidah	Moheshpur	Pantapara	Manikdihi	Mani	74	30	Hand Tube	UNICEF, No-6 EE-82
177	EW-HMAz1-R (152)	Jhenaidah	Moheshpur	Azampur	Azampur	Azampur	No	No	Hand Tube	UNICEF, No-6
178	EW-HMSd1-R (147)	Jhenaidah	Moheshpur	Sundarpur	Beleghata	Beleghata	No	95	Hand Tube	LPL 1963
179	EW-HMSw1-R (34)	Jhenaidah	Moheshpur	Swarup pur	Hudakashadanga	Hudakashadanga	34	430	Hand Tube	UNICEF RFL No-6
180	EW-HMNt1-R (95)	Jhenaidah	Moheshpur	Natima	Shibanandapur	Shibanandapur	No	397	Hand Tube	UNICEF NI/ 82
181	EW-HMJd1-R (56)	Jhenaidah	Moheshpur	Jadabpur	Pathra	Pathra	No	No	Hand Tube	No-6 New Maya
182	EW-HMJd1-R (90)	Jhenaidah	Moheshpur	Jadabpur	Dhanharia	Dhanharia	No	40	Hand Tube	EPL-6
183	EW-HHTh1-R (9)	Jhenaidah	Harinakunda	Taherhuda	Bhabani pur	Bhabani pur	No	No	Hand Tube	BRDB -6
184	EW-HHRg1-R (48)	Jhenaidah	Harinakunda	Raghunathpur	Narayanpur	Narayanpur	No	No	Hand Tube	No-6
185	EW-HHHr1-R (26)	Jhenaidah	Harinakunda	Harinakunda	Balthapara	Balthapara	26	366	Hand Tube	UNICEF No-6 NI /82
186	EW-HHBy1-R (4)	Jhenaidah	Harinakunda	Bhayna	Kalisankapur	Kalisankapur	No	No	Hand Tube	UNICEF NI /76
187	EW-HHJr1-R (8)	Jhenaidah	Harinakunda	Joradaha	Joradaha	Joradaha Kalitola	No	No	Hand Tube	UNICEF
188	EW-HHCd1-R (72)	Jhenaidah	Harinakunda	Chandpur	Bashudebpur	Bashudebpur	No	No	Hand Tube	BRDB UNICEF NI/84
189	EW-HHDl1-R (33)	Jhenaidah	Harinakunda	Daulatpur	Parbatipur	Parbatipur	33	No	Hand Tube	UNICEF No-6NI/78
190	EW-HHKp1-R (56)	Jhenaidah	Harinakunda	Kapashati	Ghoragachha	Ghoragachha	56	No	Hand Tube	UNICEF No-6NI/79
191	EW-HSSr1-R (54)	Jhenaidah	Sailkupa	Sarutia	Nabagram	Nabagram	54	No	Hand Tube	UNICEF EPL 93 No-6
192	EW-HSFz1-R (69)	Jhenaidah	Sailkupa	Fazilpur	Bijlia	Bijlia	69	142	Hand Tube	UNICEF GP 81 No-6
193	EW-HSDl1-R (96)	Jhenaidah	Sailkupa	Dhalhara	Dautia Chakirgati	Dautia Chakirgati	96	374	Hand Tube	No-6 Tanim GEG
194	EW-HSDg1-R (40)	Jhenaidah	Sailkupa	Dignagar	Dignagar	Dignagar	No	178	Hand Tube	1963 Trad Mark
195	EW-HSUm1-R (122)	Jhenaidah	Sailkupa	Umedpur	Traf Imedpur	Umedpur	No	319	Hand Tube	BRDB FMS / 94
196	EW-HSFl1-R (133)	Jhenaidah	Sailkupa	Fulhari	Chandpur	Chandpur	No	No	Hand Tube	UNICE EPL- 93
197	EW-HSNt1-R (155)	Jhenaidah	Sailkupa	Nityanandapur	Shakhra	Shakhra	155	No	Hand Tube	UNICE No-6
198	EW-HSNt1-R (166)	Jhenaidah	Sailkupa	Nityanandapur	Bagutia	Bagutia	166	547	Hand Tube	UNICE UMI- 82 No-6
199	EW-HSHk1-R (88)	Jhenaidah	Sailkupa	Hakimpur	Kowpara	Shaduhati	88	88	Hand Tube	CPL No-6
200	EW-HSSl1-R (51)	Jhenaidah	Sailkupa	Sailkupa Pourashava	Sailkupa Bazar	Sailkupa Bazar	51	No	Hand Tube	UNICEF No-6

Table 4.1.2 List of 300 Existing Wells Surveyed by the Study (5/6)

No.	Well No.	District	Thana	Union	Mouza	Village	JL-No	House#	Well Type	Pump Type
201	EW-HSAb1-R (177)	Jhenaidah	Sailkupa	Abaipur	Kumiradaha	Kumiradaha	177	No	Hand Tube	UNICEF No-6 GE- 18
202	EW-HSBg1-R (101)	Jhenaidah	Sailkupa	Bagura	Ratnat	Ratnat	101	85 A	Hand Tube	UNICEF No-6GEC- 98
203	EW-HSBg1-R (115)	Jhenaidah	Sailkupa	Bagura	Sitali	Sitali	115	No	Hand Tube	BRDB No-6
204	EW-HSKc1-R (27)	Jhenaidah	Sailkupa	Kancherkol	Kancherkol	Kancherkol	N.A	No	Hand Tube	No-6, UNICEF
205	EW-HSTb1-R (16)	Jhenaidah	Sailkupa	Tribeni	Padamdi	Padamdi Mia Para	N.A	No	Hand Tube	UNICEF ,No-6 ICI 89
206	EW-HSMr1-R (9)	Jhenaidah	Sailkupa	Mirjapur	Alamdanga	Alamdanga	N.A	121	Hand Tube	UNICEF , F.M.S / 89, No-6
207	EW-HSDd1-R (145)	Jhenaidah	Sailkupa	Dudshar	Mainali	Mainali	N.A	N.A	Hand Tube	NEW MAYA
208	EW-CAAl 1-R (79)	Chuadanga	Alamdanga	Alamdanga	Belgachhi	Belgachhi	N.A	1077	Hand Tube	No-6
209	EW-CAAl 1-R (72)	Chuadanga	Alamdanga	Alamdanga	Gobindapur	Gobindapur	N.A	No	Hand Tube	UNICEF NI/84 No-6
210	EW-CABr 1-R (56)	Chuadanga	Alamdanga	Baradi	Fatepur	Fatepur	No	No	Hand Tube	UNICEF FMS / 93 No-6
211	EW-CABg 1-R (6)	Chuadanga	Alamdanga	Bahnga baria	Gaurihard	Gaurihard	No	413	Hand Tube	UNICEF UE 48 No-6
212	EW-CADu 1-R (78)	Chuadanga	Alamdanga	Dauki	Dauki	Dauki	No	224	Hand Tube	UNICEF NI /84 No-6
213	EW-CAGg 1-R (09)	Chuadanga	Alamdanga	Gangni	Sahebpur	Sahebpur	No	No	Hand Tube	UNICEF Sept./92 No-6
214	EW-CAGg 1-R (18)	Chuadanga	Alamdanga	Gangni	Chhotagangni	Chhotagangni	No	48	Hand Tube	UNICEF IC No-6
215	EW-CAHr 1-R (68)	Chuadanga	Alamdanga	Hardi	Hardi	Hardi	No	25	Hand Tube	TFL 98 No-6
216	EW-CAKl 1-R (95)	Chuadanga	Alamdanga	Kalidaspur	Parkula	Parkula	No	No	Hand Tube	UNICEF FMS / 93 No-6
217	EW-CAJm 1-R (103)	Chuadanga	Alamdanga	Jamjami	Jamjami	Nutan Jamjami	No	302	Hand Tube	93-94 No-6
218	EW-CAJh 1-R (30)	Chuadanga	Alamdanga	Jehala	Jehala	East Kamalapur	No	85/D	Hand Tube	UNICEF UE-81 No-6
219	EW-CAJh 1-R (81)	Chuadanga	Alamdanga	Jehala	Ruakuli	Ruakuli	No	No	Hand Tube	UNICEF 98 No-6
220	EW-CAKd 1-R (22)	Chuadanga	Alamdanga	Khadimpur	Chithla	Chithla	No	753	Hand Tube	UNICEF No-6
221	EW-CAKd 1-R (35)	Chuadanga	Alamdanga	Khadimpur	Rangpur	Rangpur	No	262	Hand Tube	UNICEF NI / 82 No-6
222	EW-CAKs 1-R (116)	Chuadanga	Alamdanga	Khas Kara	Khas Kara	Khas Kara	No	No	Hand Tube	UNICEF 89 No-6
223	EW-CAKs 1-R (120)	Chuadanga	Alamdanga	Khas Kara	Dakshin Lakshmipur	Dakshin Lakshmipur	No	No	Hand Tube	UNICEF SEPT/92 No-6
224	EW-CAKm 1-R (48)	Chuadanga	Alamdanga	Kumari	Sympur	Sympur	No	189	Hand Tube	UNICEF SEPT/92 No-6
225	EW-CANg 1-R (90)	Chuadanga	Alamdanga	Nagdaha	Chhagharia	Chhagharia	No	15	Hand Tube	UNICEF NI/76 No-6
226	EW-CANg 1-R (119)	Chuadanga	Alamdanga	Nagdaha	Ailhas	Ailhas	No	No	Hand Tube	UNICEF NIP / 74 No-6
227	EW-CDDm 1-R (34)	Chuadanga	Damurhuda	Damurhuda	Uttar Chandpur	Uttar Chandpur	No	No	Hand Tube	UNICEF SMI 94 No-6
228	EW-CDDm 1-R (59)	Chuadanga	Damurhuda	Damurhuda	Deuli	Deuli	No	82	Hand Tube	UNICEF ICI 92 No-6
229	EW-CDDr 1-R (20)	Chuadanga	Damurhuda	Darshana	Kamarpara	Nartipur	No	438	Hand Tube	UNICEF 984 No-6
230	EW-CDDr 1-R (75)	Chuadanga	Damurhuda	Darshana	Shyampur	Shyampur	No	No	Hand Tube	CEC 95 No-6
231	EW-CDHw 1-R (73)	Chuadanga	Damurhuda	Hawli	Dudhpatila	Bara Dudhpatila	No	885	Hand Tube	UNICEF ICI 78 No-6
232	EW-CDHw 1-R (68)	Chuadanga	Damurhuda	Hawli	Joyrampur	Joyrampur	68	2143	Hand Tube	UNICEF UMI 80 No-6
233	EW-CDJr 1-R (51)	Chuadanga	Damurhuda	Juranpur	Ram Nagar	Ram Nagar	No	89	Hand Tube	UNICEF 79 EPL No-6
234	EW-CDKp 1-R (7)	Chuadanga	Damurhuda	Karpasdanga	Pirpurkulla	Pirpurkulla	No	No	Hand Tube	UNICEF ICI 92 No-6
235	EW-CDKr 1-R (26)	Chuadanga	Damurhuda	Kuralgachhi	Madna	Madna	No	514	Hand Tube	UNICEF TLUKDER 92 No-6
236	EW-CDKr 1-R (29)	Chuadanga	Damurhuda	Kuralgachhi	Kuralgachhi	Kuralgachhi	No	1333	Hand Tube	UNICEF, 83 No-6
237	EW-CDNt 1-R (41)	Chuadanga	Damurhuda	Natipota	Natopia	Natopia	No	152	Hand Tube	UNICEF NI/80 No-6
238	EW-CDNt 1-R (43)	Chuadanga	Damurhuda	Natipata	Hemayetpur	Hemayetpur	No	125	Hand Tube	UNICEF NI/81 No-6
239	EW-CCAl 1-R (1)	Chuadanga	Chuadanga Sadar	Alokdia	Alokdia	Alokdia	No	363	Hand Tube	W MAYA No-6
240	EW-CCBg 1-R (18)	Chuadanga	Chuadanga Sadar	Begampur	Hijalgari	Hijalgari	No	No	Hand Tube	UNICEF NI / 80 No-6
241	EW-CCBg 1-R (66)	Chuadanga	Chuadanga Sadar	Begampur	Jhajri	Jhajri	No	186	Hand Tube	CEC No-6
242	EW-CCKt 1-R (78)	Chuadanga	Chuadanga Sadar	Kutubpur	Boalia	Zoly villa	No	No	Hand Tube	MEW No-6
243	EW-CCkt 1-R (91)	Chuadanga	Chuadanga Sadar	Kutubpur	Kutubpur	Aliar pur	No	390	Hand Tube	UNICEF IC 84 No-6
244	EW-CCMm 1-R (47)	Chuadanga	Chuadanga Sadar	Mominpur	Kathuli	Macher Dair	No	78	Hand Tube	90 EPL No-6
245	EW-CCPd 1-R (53)	Chuadanga	Chuadanga Sadar	Padda billa	Padda Billa	Khejura	No	133	Hand Tube	UNICEF UE / 93 No-6
246	EW-CCPd 1-R (81)	Chuadanga	Chuadanga Sadar	Padda Billa	Bura para	Bura para	No	None	Hand Tube	UNICEF DEC / 82 No-6
247	EW-CCCd 1-R (5)	Chuadanga	Chuadanga Sadar	Chuadanga Sadar	Bhingulla	Bhingulla	No	None	Hand Tube	UNICEF UE 93 No-6
248	EW-CCCd 1-R (41)	Chuadanga	Chuadanga Sadar	Nur Nagar	Nur Nagar	Nur Nagar	No	None	Hand Tube	UNICEF FMS / 98 No-6
249	EW-CCSk 1-R (33)	Chuadanga	Chuadanga Sadar	Shankar Chandra	Shankar chandra	Srikol	No	94	Hand Tube	TANIM CEC No-6
250	EW-CCSk 1-R (35)	Chuadanga	Chuadanga Sadar	Shankar Chandra	Shankar chandra	Shankar chandra	No	8月25日	Hand Tube	EPL No-6

Table 4.1.2 List of 300 Existing Wells Surveyed by the Study (6/6)

No.	Well No.	District	Thana	Union	Mouza	Village	JL-No	House#	Well Type	Pump Type
251	EW-CCTt 1-R (72)	Chuadanga	Chuadanga Sadar	Titudaha	Titudaha	Titudaha	No	266	Hand Tube	UNICEF BL 86 No-6
252	EW-CCTt 1-R (98)	Chuadanga	Chuadanga Sadar	Titudaha	Sujatpur	Sujatpur	No	RC 63/120	Hand Tube	UNICEF UE 88 No-6
253	EW-CJUt 1-R (31)	Chuadanga	Jibannagar	Uthali	Monoharpur	Monoharpur	No	No	Hand Tube	UNICEF UE 80 No-6
254	EW-CJUt 1-R (36)	Chuadanga	Jibannagar	Uthali	Dehati	Dehati	No	26 (A	Hand Tube	UNICEF NI /76 No-6
255	EW-CJJb 1-R (10)	Chuadanga	Jibannagar	Jibannagar	Umapur	Goespur	No	No	Hand Tube	UNICEF NI /76 No-6
256	EW-CJJb 1-R (20)	Chuadanga	Jibannagar	Jibannagar	Gangadaspur	Gangadaspur	No	No	Hand Tube	TANIM CEC No-6
257	EW-CJBk 1-R (47)	Chuadanga	Jibannagar	Jibannagar	Baidyanathpur	Baidyanathpur	No	No	Hand Tube	UNICEF EPL 08/92 No-6
258	EW-CJBk 1-R (69)	Chuadanga	Jibannagar	Banka	Raypur	Raypur	No	1055 A	Hand Tube	UNICEF UE 88 No-6
259	EW-CJAd 1-R (54)	Chuadanga	Jibannagar	Andulabaria	Kultala	Kultala	No	256	Hand Tube	UNICEF AFL SEPT /92 No-6
260	EW-CJAd 1-R (55)	Chuadanga	Jibannagar	Andulabaria	Andula Baria	Andula Baria	No	799	Hand Tube	UNICEF BL 83 No-6
261	EW-JJJs1-R (PTW-10),T-1)	Jessore	Jessore Sadar	Jessore Pourashava	N.A	Ghospara	N.A	No	Production	Turbine
262	EW-JJJs1-R (T.PTW-02),T-2)	Jessore	Jessore Sadar	Jessore Pourashava	No	Pal bari	No	No	Production	Turbine (KSB)
263	EW-JJJs1-R (PTW-02),T-3)	Jessore	Jessore Sadar	Jessore Pourashava	No	Airport road	No	No	Production	Turbine
264	EW-JJJs1-R (T.PTW-04),T-4	Jessore	Jessore Sadar	Jessore Pourashava	Smith Road	Smith Road	No	No	Production	Turbine
265	EW-JJJs1-R (PTW-11),T-5	Jessore	Jessore Sadar	Jessore Pourashava	No	Stadium Road	No	No	Production	Turbine
266	EW-JJJs 1-R(T.PTW-6),T-6	Jessore	Jessore Sadar	Jessore Pourashava	M.M Ali Road	M.M Ali Road	No	No	Production	Submersible
267	EW-JJJs 1-R(PTW-7),T-7	Jessore	Jessore Sadar	Jessore Pourashava	Barandipara	Barandipara	No	No	Production	KSB, Turbine
268	EW-JJJs 1-R (T.PTW-9),T-9	Jessore	Jessore Sadar	Jessore Pourashava	Molla para	City College para	No	No	Production	KIRLOSKAR, Turbine
269	EW-JJJs 1-R (PTW-15),T-10	Jessore	Jessore Sadar	Jessore Pourashava	No	Barandi para	No	No	Production	Turbine
270	EW-JJJs 1-R (PTW-8),T-11	Jessore	Jessore Sadar	Jessore Pourashava	No	Peary Mohan Road, Bejpara Taltola	No	No	Production	Turbine
271	EW-JJJs 1-R(PTW-13),T-12	Jessore	Jessore Sadar	Jessore Pourashava	No	Shankarpur Chapdharpara	No	No	Production	Turbine
272	EW-JJJs 1-R(PTW-14),T-14	Jessore	Jessore Sadar	Jessore Pourashava	Chanchra	Chanchra, Tetul tala	No	No	Production	Submersible
273	EW-JJJs1-R(PTW-12),T-15	Jessore	Jessore Sadar	Jessore Pourashava	No	Benapol Road	No	No	Production	Turbine
274	EW-JJJs1-R(PTW-17),T-17	Jessore	Jessore Sadar	Jessore Pourashava	N.A	Ghop Jail Road	N.A	No	Production	KSB, Turbine
275	EW-HJJn 1-R (PTW-01)	Jhenaidah	Jhenaidah Sadar	Jhenaidah Pourashava	NA	Parkpara (Pourashava)	NA	NA	Production	Turbine
276	EW-HJJn 1-R (PTW-03)	Jhenaidah	Jhenaidah Sadar	Jhenaidah Pourashava	No	Track Terminal	No	No	Production	Turbine
277	EW-HJJn 1-R (PTW-04)	Jhenaidah	Jhenaidah Sadar	Jhenaidah Pourashava	NA	Hamdu para	NA	No	Production	GEC, Turbine
278	EW-HJJn 1-R (PTW-05)	Jhenaidah	Jhenaidah Sadar	Jhenaidah Pourashava	NA	Arap pur	NA	No	Production	Turbine
279	EW-HJJn 1-R (PTW-06)	Jhenaidah	Jhenaidah Sadar	Jhenaidah Pourashava	NA	Chakla para	NA	No	Production	KSB, Turbine
280	EW-HJJn 1-R (PTW-07)	Jhenaidah	Jhenaidah Sadar	Jhenaidah Pourashava	NA	Kanchanpur	NA	No	Production	GEC, Turbine
281	EW-HKKl 1-R (PTW-01)	Jhenaidah	Kaliganj	Kaliganj Pourashava	NA	Arpara	NA	No	Production	KSB, Turbine
282	EW-HKKl 1-R (PTW-02)	Jhenaidah	Kaliganj	Kaliganj Pourashava	NA	Nischintapur	NA	No	Production	WORTHINGTON, Turbine
283	EW-HKKl 1-R (PTW-03)	Jhenaidah	Kaliganj	Kaliganj Pourashava	NA	Bus/Track Terminal	NA	No	Production	KSB, Turbine
284	EW-HTKt 1-R (PTW-01)	Jhenaidah	Kotchandpur	Kotchanpur Pourashava	NA	Pourashava Compund	NA	No	Production	Turbine
285	EW-HTKt 1-R (PTW-02)	Jhenaidah	Kotchandpur	Kotchanpur Pourashava	NA	Near Model Primary school	NA	No	Production	Turbine
286	EW-HTKt 1-R (PTW-03)	Jhenaidah	Kotchandpur	Kotchanpur Pourashava	NA	Solemanpur	NA	No	Production	Turbine
287	EW-HMMh 1-R (PTW-01)	Jhenaidah	Mohespur	Mohespur Pourashava	NA	Zamindarpara	NA	No	Production	Turbine
288	EW-HMMh 1-R (PTW-02)	Jhenaidah	Mohespur	Mohespur Pourashava	NA	Baraipara	NA	203	Production	Turbine
289	EW-HSSl 1-R (PTW-01)	Jhenaidah	Sailkupa	Sailkupa Pourashava	NA	Shahi Mosque para	NA	NA	Production	Turbine
290	EW-HSSl 1-R (PTW-02)	Jhenaidah	Sailkupa	Sailkupa Pourashava	NA	Garowanpara	No	No	Production	Turbine
291	EW-HSSl 1-R (PTW-03)	Jhenaidah	Sailkupa	Sailkupa Pourashava	NA	Kabirpur	NA	No	Production	Turbine
292	EW-CCCd 1-R (PTW-01)	Chuadanga	Chuadanga Sadar	Chuadanga Pourashava	NA	Kedargonj	NA	No	Production	Turbine
293	EW-CCCd 1-R (PTW-2A)	Chuadanga	Chuadanga Sadar	Chuadanga Pourashava	NA	Mohalla Sheak para	NA	No	Production	Turbine
294	EW-CCCd 1-R (PTW-2B)	Chuadanga	Chuadanga Sadar	Chuadanga Pourashava	NA	Majer para	NA	No	Production	Turbine
295	EW-CCCd 1-R (PTW-03)	Chuadanga	Chuadanga Sadar	Chuadanga Pourashava	NA	Near Hospiptal	NA	No	Production	Turbine
296	EW-CCCd 1-R (PTW-04)	Chuadanga	Chuadanga Sadar	Chuadanga Pourashava	NA	Zila Parishad Compound Area	NA	No	Production	Turbine
297	EW-CCCd 1-R (PTW-05)	Chuadanga	Chuadanga Sadar	Chuadanga Pourashava	NA	Bus Terminal	NA	No	Production	Turbine
298	EW-JJJs 1-R (T.PTW-8) (T-8)	Jessore	Jessore Sadar	Jessore Pourashava	NA	Khaldar Road, Near PHE staff quarter	NA	No	Production	Turbine
299	EW-JJJs1-R(T.PTW-13),(T-13)	Jessore	Jessore Sadar	Jessore Pourashava	NA	Ramkrisna Mssion Road	NA	No	Production	Turbine
300	EW-JJJs1-R(T.PTW-16), (T-16)	Jessore	Jessore Sadar	Jessore Pourashava	NA	Poet Golam Mostafa Road	NA	No	Production	Turbine

Table 4.1.3 Results of Well Structure Survey for Production Wells in Jessore Pourashava

No.	Well No. and Location	Existing Data														New Data Measured in June 2000				
		Well and Facilities								Production Test						Field Measurement by the Study				
		Construction Date	Well Depth (m)	Screen Depth (m)	Screen Length (m)	Well Diameter (mm)	Well Log	OHT	IRP	Collection Date	Discharge (Q) (m^3/h)	① S.W.L (GL-m)	② D.W.L. (GL-m)	③=②-① Drawdon (m)	Specific Capacity (m^2/day)	① S.W.L (GL-m)	② D.W.L. (GL-m)	③=②-① Drawdon (m)	Discharge (Q) (m^3/h)	Specific Capacity (m^2/day)
1	W-2 GHOSHPARA	20-9-89	115.41	98.96~112.36	13.4	150	◎			07-10-89	71.99	3.93	5.42	1.49	1159.57	6.600	26.710	20.110	66.00	78.77
2	W-1 PALBARI	19-11-89	125.15	108.7~122.1	13.4	150	◎	◎	◎	29-12-89	71.99	4.86	6.27	1.41	1225.36	6.665	19.350	12.685	174.00	329.21
3	OW-2 AIRPORT ROAD	1965-66	132.54	85.32~129.90	44.58	200	◎			1965-66	90.90	3.123	4.799	1.676	1301.67	6.190	6.960	0.770	26.00	810.39
4	OW-1 SMITH ROAD	1962-63	98.85	60.94~91.41	30.47	100	◎			1962-63	45.45	3.123	6.779	3.656	298.36	6.485	16.150	9.665	110.00	273.15
5	W-3 NEAR at STADIUM ROAD	03-4-89	117.53	67.75~72.93 95.93~98.6 106.93~112.48	13.42	150	◎	◎		19-10-89	71.99	2.67	4.2	1.53	1129.25	6.190	14.810	8.620	58.00	161.48
6	OW-7 M.M.ALI ROAD	1981-82	125.84	98.42~122.79	24.37	150	×			1981-82	68.18	5.078	7.617	2.539	644.43	9.800	23.900	14.100	—	—
7	W-17 West BARANDI PARA	26-11-99	114.77	79.16~111.13	31.97	150	◎			15-12-99	116.10	4.74	6.57	1.83	1522.62	6.710	8.590	1.880	144.00	1838.30
8	OW-3 Khal dhara Road near.PHE.staff Quartar	1965-66	131.94	81.96~129.50	47.54	200	◎			1965-66	90.90	2.742	4.25	1.508	1446.68	N.M.	N.M.	—	—	—
9	W-6 NEAR at CITY COLLEGE	08-3-89	118.46	102.01~115.41	13.4	150	◎	◎	◎	21-8-89	73.08	3.76	5.02	1.26	1392.00	5.930	9.630	3.700	91.00	590.27
10	W-7 HOLLAH PARA	06-9-89	124.1	111.06~124.46	13.4	150	◎			20-8-89	71.99	4.45	5.83	1.38	1252.00	6.520	8.400	1.880	100.00	1276.60
11	OW-8 PEARY MOHON ROAD	1982-83	89.31	61.88~86.26	24.38	150	×			1982-83	68.175	4.113	6.779	2.666	613.73	5.680	9.680	4.000	128.00	768.00
12	W-5 Bejpara, South Side of Answar Camp	02-5-89	120.16	103.36~116.76	13.4	150	◎	◎	◎	19-6-89	71.99	4.08	5.49	1.41	1225.36	5.170	20.320	15.150	107.00	169.50
13	OW-4 ASRAM ROAD (Ram Krishna Mission road)	1972-73	91.41	65.21~89.58	24.37	150	×			1972-73	68.18	2.59	10.207	7.617	214.81	N.M.	N.M.	—	—	—
14	WO-6 CHANGHARA	1978-79	103.6	70.08~100.55	30.47	150			◎	1978-79	68.18	2.361	7.236	4.875	335.63	5.295	10.410	5.115	98.00	459.82
15	W-4 Benapole Road	08-3-89	118.46	102.01~115.41	13.4	150	◎	◎	◎	09-8-89	71.99	2.61	3.83	1.22	1416.20	N.M.	N.M.	—	92.00	—
16	W-8 GHOPH	06-9-89	124.1	100.65~108.76 115.67~120.96	13.4	150	◎			16-9-89	71.99	5.03	5.84	0.81	2133.04	6.780	N.M.	—	—	—
17	OW-5 JAIL ROAD	1973-74	85.32	59.11~83.49	24.38	100	◎	◎		1973-74	45.45	3.352	5.941	2.589	421.32	6.580	9.970	3.390	120.00	849.56

S.W.L=Startic Water Level, D.W.L=Dynamic Water Level, G.W.L=Groundwater level, OHT=Over Head Tank, IRP: Iron Removal Plant, ◎=exist, ×=not exist, N.M.=not measured

Table 4.1.4 Results of Well Structure Survey for Production Wells in Jhenaidah District

No.	Pourashava Name, Well No. and Location	Existing Data														New Data Measured in June 2000				
		Well and Facilities								Production Test						Field Measurement by the Study				
		Construction Date	Well Depth (m)	Screen Depth (m)	Screen Length (m)	Well Diameter (mm)	Well Log	OHT	IRP	Collection Date	Discharge (Q) (m^3/h)	① S.W.L (GL-m)	② D.W.L (GL-m)	③=②-① Drawdon (m)	Specific Capacity (m^2/day)	① S.W.L (GL-m)	② D.W.L (GL-m)	③=②-① Drawdon (m)	Discharge (Q) (m^3/h)	Specific Capacity (m^2/day)
1	Jhenaidah W-1 Kanchanrapur	04-Jun-00	132.08	99.01~129.08	30.07	150	◎	◎		17-Jun-00	154.26	5.640	11.120	5.480	675.59	5.980	N.M.	—	—	—
2	Jhenaidah W-2 Hamdah		no data	~		150	no data	◎								5.910	N.M.	—	—	—
3	Jhenaidah W-3 P.H.E.Cowpus (SAE office)	04-Jun-00	no data	~		200	no data									3.975	7.295	3.320	68.18	492.87
4	Jhenaidah W-4 Ponro Park		no data	~		150	no data	◎								5.700	10.630	4.930	68.18	331.91
5	Jhenaidah W-5 Chaklapara	10-Jun-95	92.2	71.85~96.20	24.35	150	◎			10-Jun-95	145.98	6.730	9.050	2.320	1510.14	6.800	9.160	2.360	68.18	693.36
6	Jhenaidah W-6 Arappur Bus Stand	03-Jun-95	123.34	91.12~120.34	29.22	150	◎			10-Jun-95	173.62	5.290	7.920	2.630	1584.37	6.830	N.M.	—	—	—
7	Jhenaidah W-7 Track TerminalL	14-Jul-96	95.32	68.0~92.35	24.35	150	◎			14-Jul-96	168.17	2.620	6.250	3.630	1111.87	6.720	14.110	7.390	68.18	221.42
8	Kaliganj W-1 Ap Bara	18-Aug-95	123.65	96.30~120.65	24.3	150	◎			22-Sep-95	167	2.790	6.320	3.53	1135.41	5.500	N.M.	—	—	—
9	Kaliganj W-2 Nischintapur (Old Hospital)	14-Oct-95	129.25	96.31~120.6	24.29	150	◎			25-Oct-95	168	3.290	6.735	3.445	1170.39	3.545	5.640	2.095	90.90	1041.34
10	Kaliganj W-3 Bus Stand	28-Aug-96	128.07	100.72~125.07	24.35	150	◎			12-Sep-96	163.17	3.060	6.015	2.955	1325.20	3.855	8.135	4.280	113.62	637.12
11	Sailkupa W-1 Garowanpara	09-Jun-95	96.64	69.19~73.54	4.35	150	◎			16-Jun-95	175.89	5.630	8.455	2.825	1494.30	5.220	N.M.	—	—	—
12	Sailkupa W-2 Kabirpur	12-Jun-95	93.49	66.14~90.47	24.33	150	◎			18-Jun-95	175.89	6.640	9.265	2.625	1608.15	6.090	N.M.	—	—	—
13	Sailkupa W-3 Shahi mosque pra	11-Jun-96	97.76	55.56~70.17 85.07~94.81	24.35	150	◎									5.520	N.M.	—	—	—
14	Kotchandpur W-1 Purosova Compus	11-Jun-96	116.79	89.44~113.79	24.35	150	◎			01-Jun-95	168.48	4.590	9.230	4.640	871.45	3.170	4.440	1.270	102.26	1932.47
15	Kotchandpur W-2 Model School	23-Jun-95	111.16	78.94~108.16	29.22	150	◎			01-Jun-95	175.00	5.270	9.180	3.910	1074.17	4.040	7.170	3.130	102.26	784.10
16	Kotchandpur W-3 Solamanpur	22-Nov-96	118.93	91.62~115.97	24.35	150	◎									5.680	7.710	2.030	68.18	806.07
17	Moheshpur W-1 Zamider para	17-Jun-95	99.6	72.25~96.60	24.35	150	◎			01-Jun-95	172.73	5.450	8.260	2.810	1475.27	5.900	N.M.	—	—	—
18	Moheshpur W-2 Baraipara	16-Jul-96	113.47	88.79~110.14	21.35	150	◎			05-Sep-96	164.53	4.280	7.265	2.985	1322.85	6.570	N.M.	—	—	—

S.W.L=Startic Water Level, D.W.L=Dynamic Water Level, G.W.L=Groundwater level, OHT=Over Head Tank, IRP: Iron Removal Plant, ◎=exist, ×=not exist, N.M.=not measured

Table 4.1.5 Results of Well Structure Survey for Production Wells in Chuadanga Pourashava

No.	Pourashava Name, Well No. and Location	Existing Data															New Data Measured in June 2000				
		Well and Facilities								Production Test							Field Measurement by the Study				
		Construction Date	Well Depth (m)	Screen Depth (m)	Screen Length (m)	Well Diameter (mm)	Well Log	OHT	IRP	Collection Date	Discharge (Q) (m^3/h)	① S.W.L (GL-m)	② D.W.L (GL-m)	③=②-① Drawdon (m)	Specific Capacity (m^3/day)		① S.W.L (GL-m)	② D.W.L (GL-m)	③=②-① Drawdon (m)	Discharge (Q) (m^3/h)	Specific Capacity (m^3/day)
1	Chuadanga TW-1 Kedargonj	23-10-1988	106.50	80.6~105.0	24.4	150		O		23-10-1988	145.00	5.75	10.25	4.50	773.33		6.590	10.450	3.860	—	—
2	Chuadanga TW-2A Mohalla Sheak Para (Pourashav Compound)	10-11-1991	102.10	69.10~99.10	30	150				10-11-1991	290.49	3.45	9.30	5.85	1191.75		5.360	11.625	6.265	—	—
3	Chuadanga TW-2B Major para (Football Ground)	07-11-1991	133.00	100~124	24	200		O		07-11-1991	288.37	3.30	8.60	5.30	1305.83		5.280	9.380	4.100	—	—
4	Chuadanga TW-3 PHE Office Compound (near Hospital)	10-11-1991	133.00	86.0~110	24	200		O		10-11-1991	271.54	5.00	8.48	3.48	1872.69		5.820	7.350	1.530	—	—
5	Chuadanga TW-4 Zila Parishad Compound Area																6.650	9.530	2.880	—	—
6	Chuadanga TW-5 Bus Terminal																5.680	8.720	3.040	—	—

S.W.L=Startic Water Level, D.W.L=Dynamic Water Level, G.W.L=Groundwater level, OHT=Over Head Tank, IRP: Iron Removal Plant, O=exist, ×=not exist, N.M.=not measured

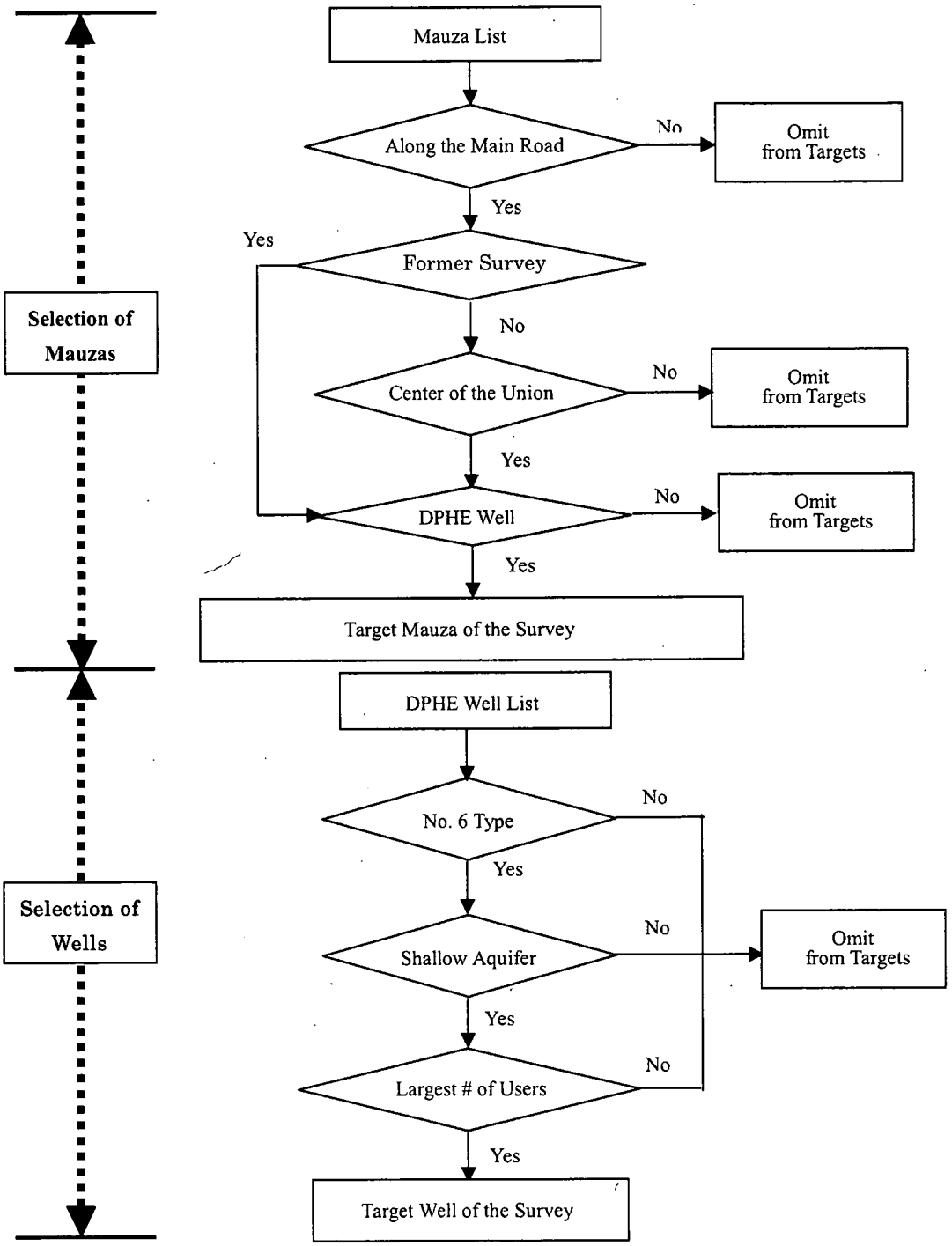


Figure 4.1.1 **Process of Target Well Selection**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

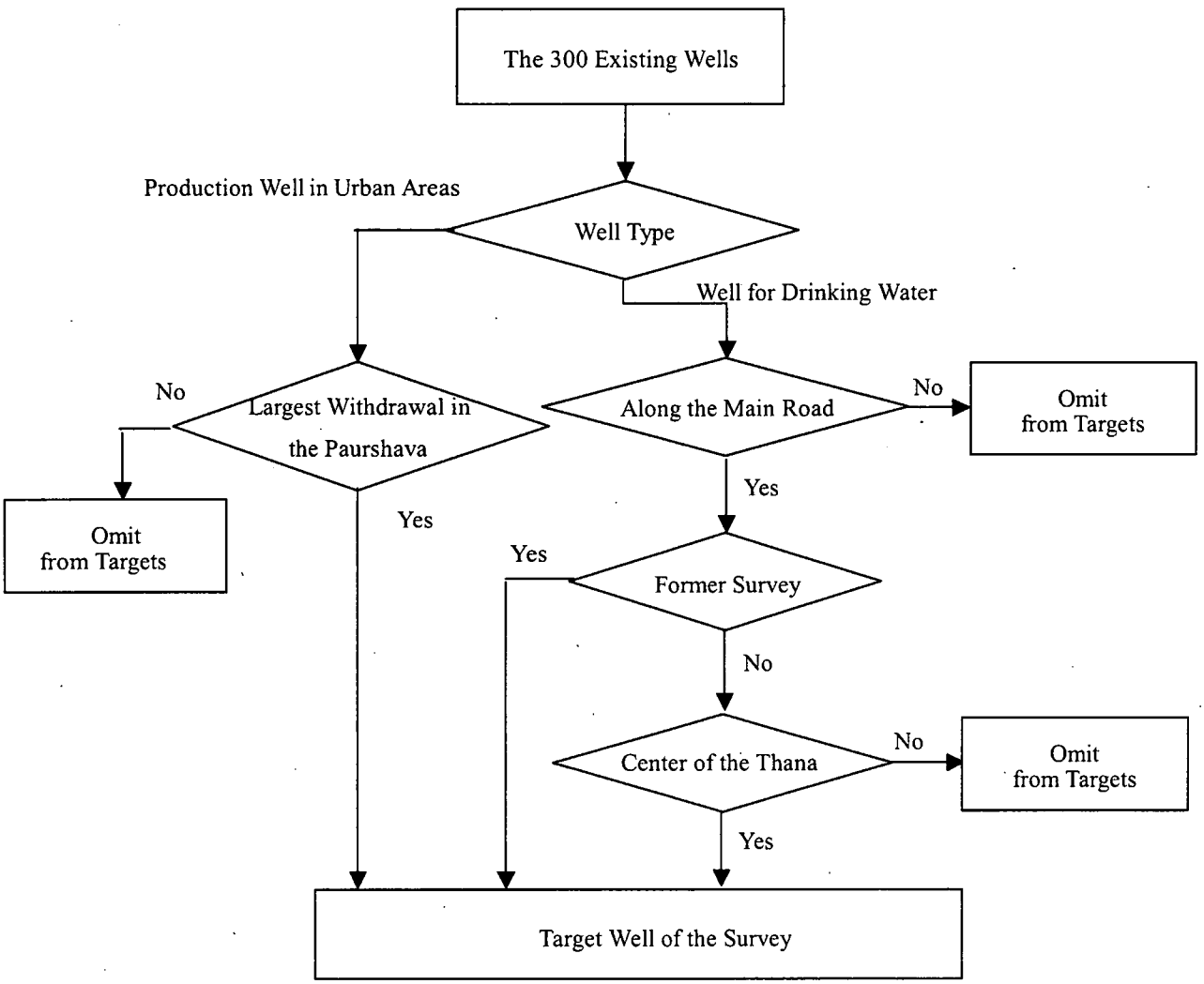
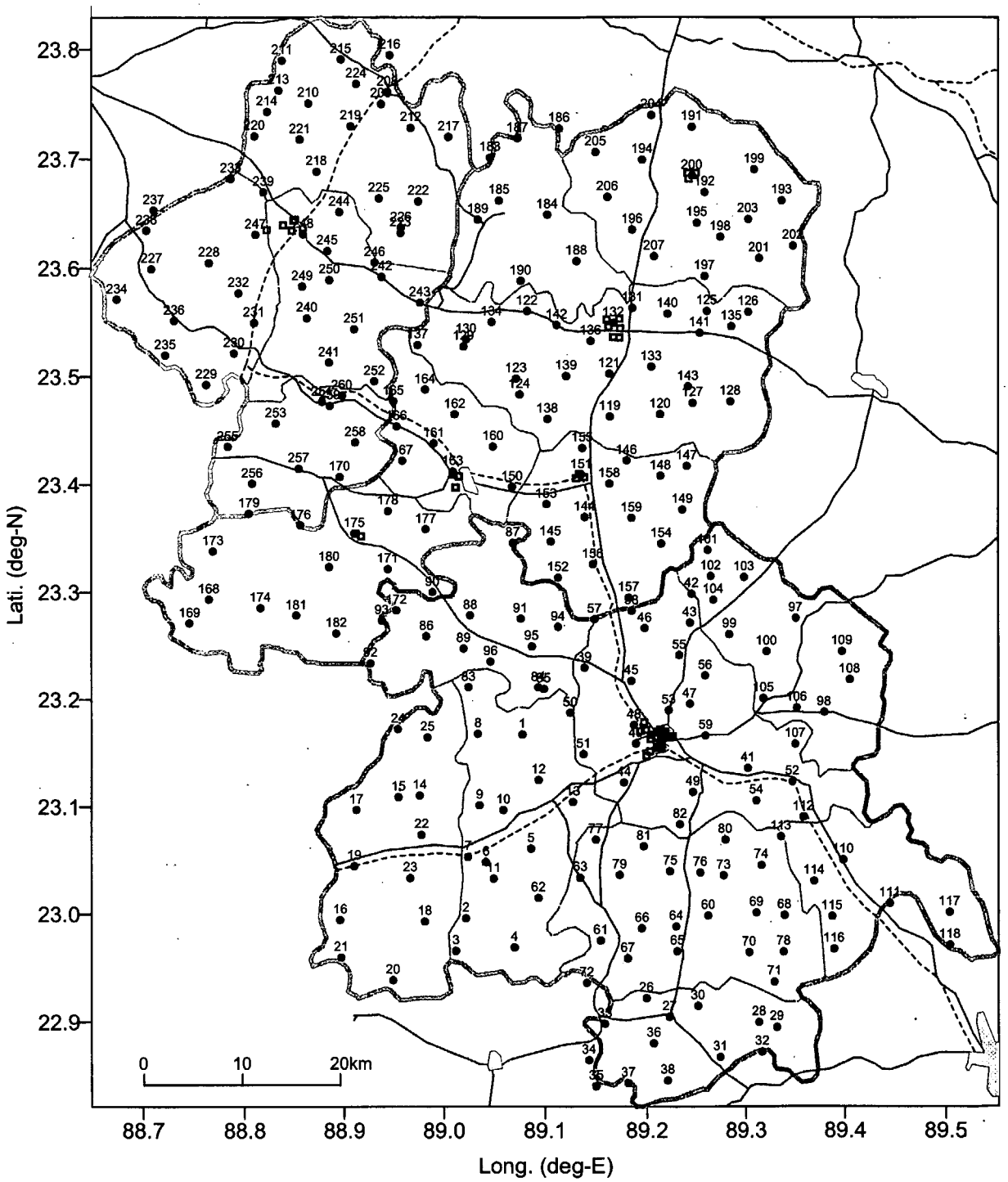


Figure 4.1.2 **Process of Target Well Selection for General Water Quality Analysis**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



28 • Existing Shallow Tubewell with Serial No.

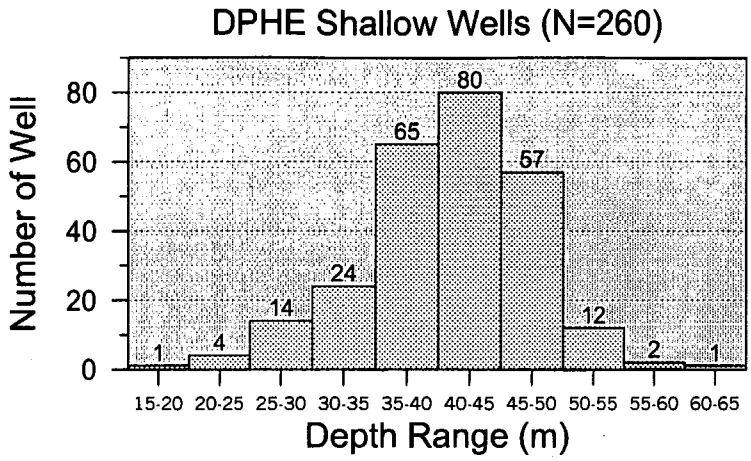
▫ Pourashava Production Wells

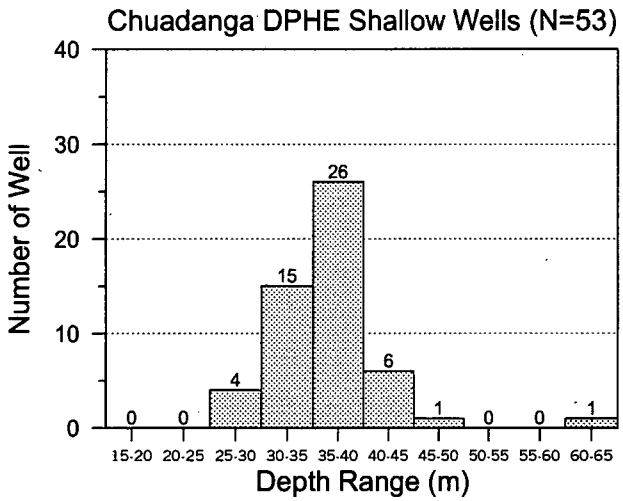
• Sample Taken for General Water Quality Analysis

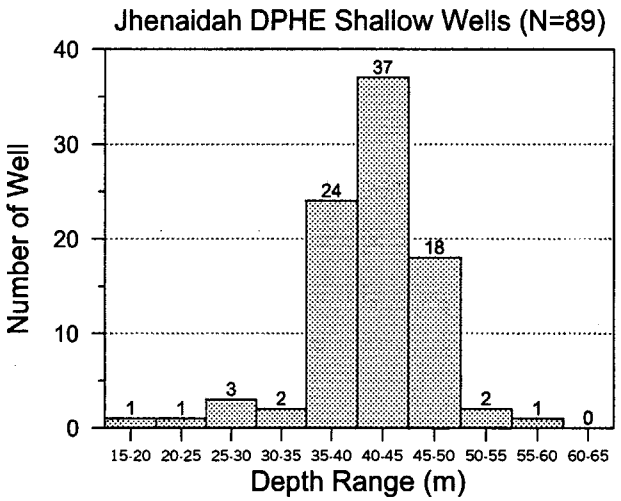
Figure 4.1.3	Location of 300 Existing Wells

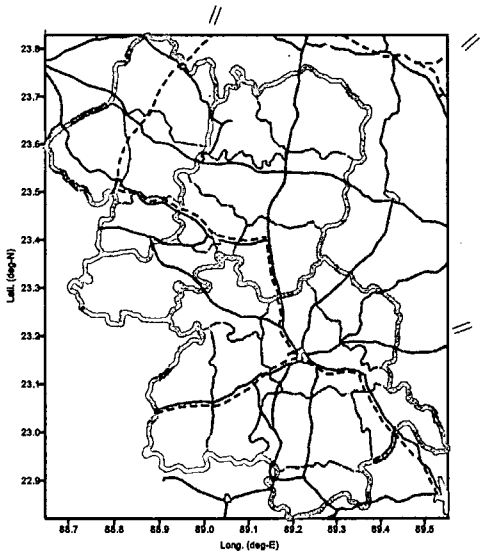
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)









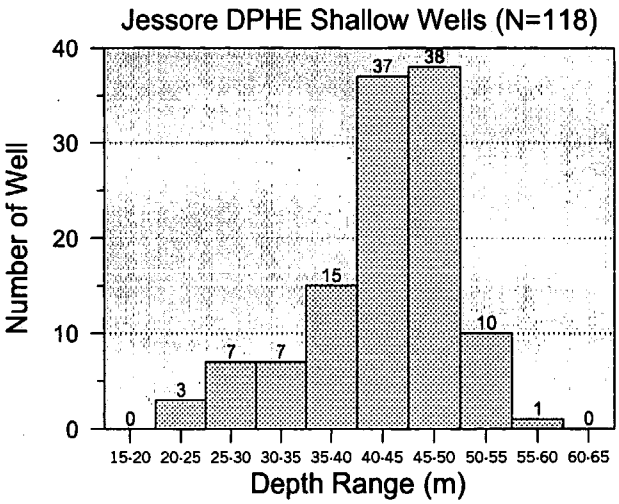
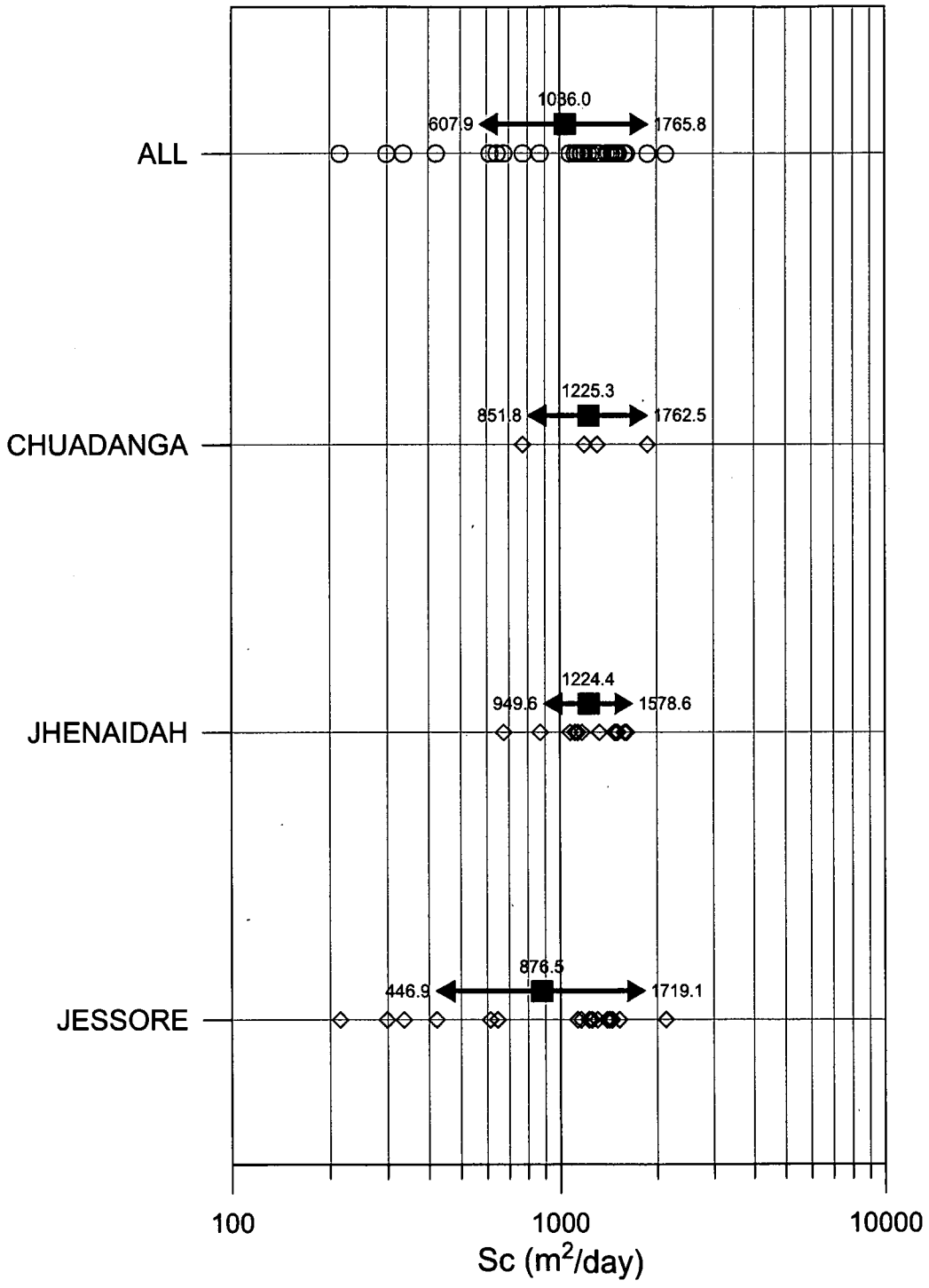


Figure 4.1.4	Well Depth of 260 Existing DPHE Shallow Wells by District
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	



AVG-STD AVG+STD

Logarithmic Average (AVG)

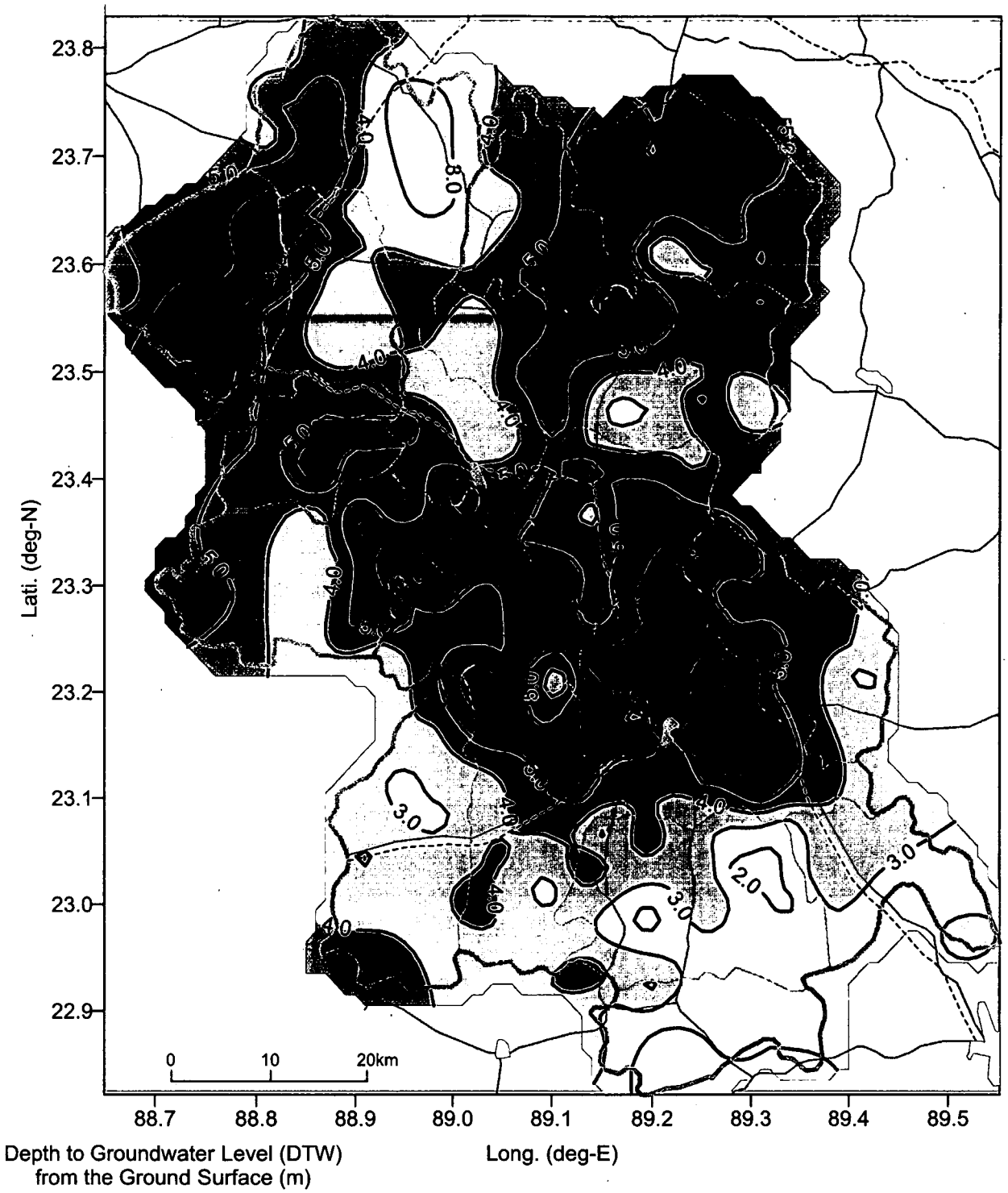
STD: Logarithmic Standard Deviation

[Data source: DPHE District Offices and DPHE Ground Water Division]

Figure 4.1.5 **Distribution of Specific Capacity (Sc) Obtained from Existing Production Wells**

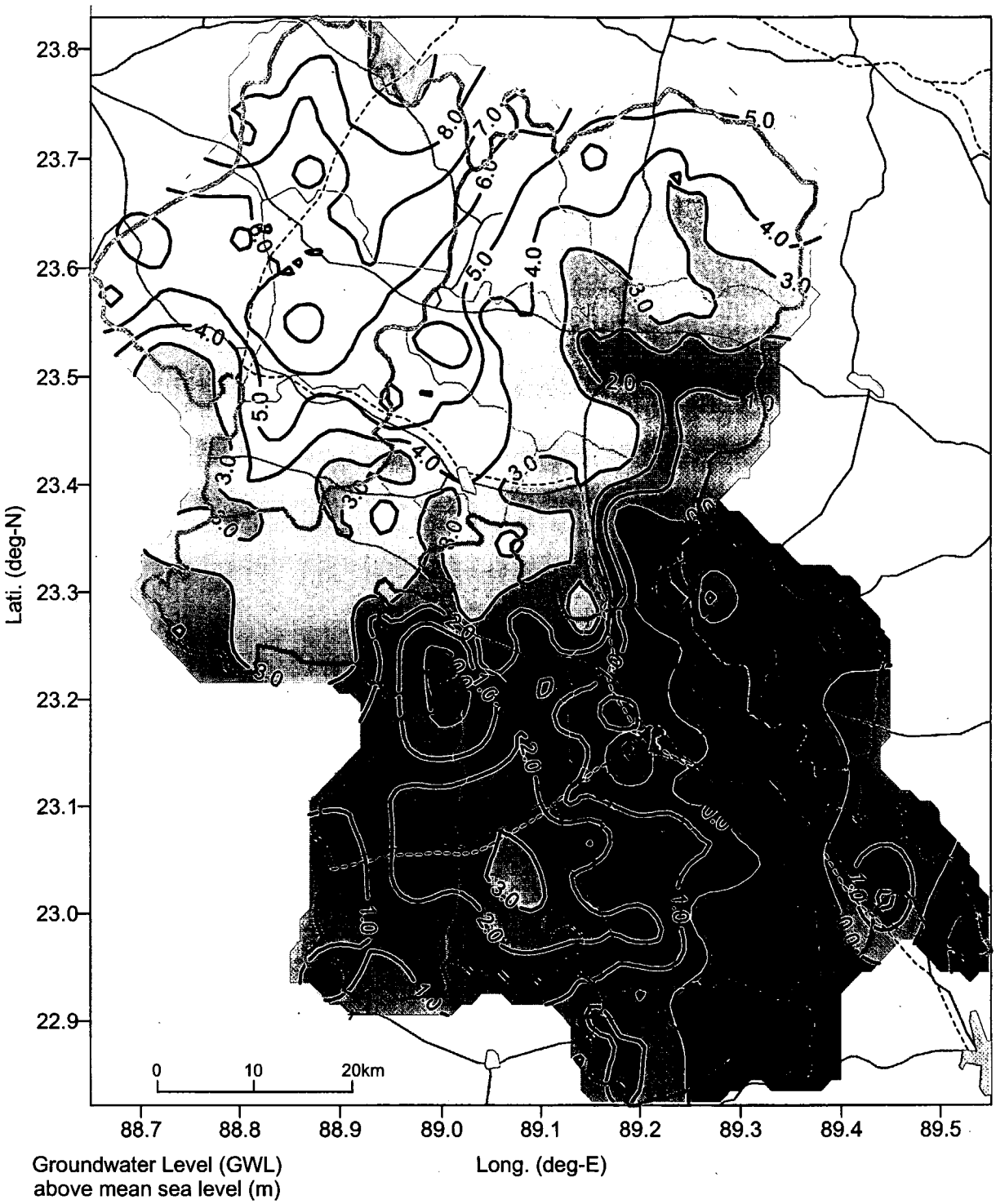
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



[DTW (Depth to Groundwater Level from the ground surface) values at 300 existing wells were measured by the JICA Study Team in June to July 2000 using potable water level meter.]

Figure 4.1.6	DTW Measured at 300 Existing Wells in Rainy Season
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

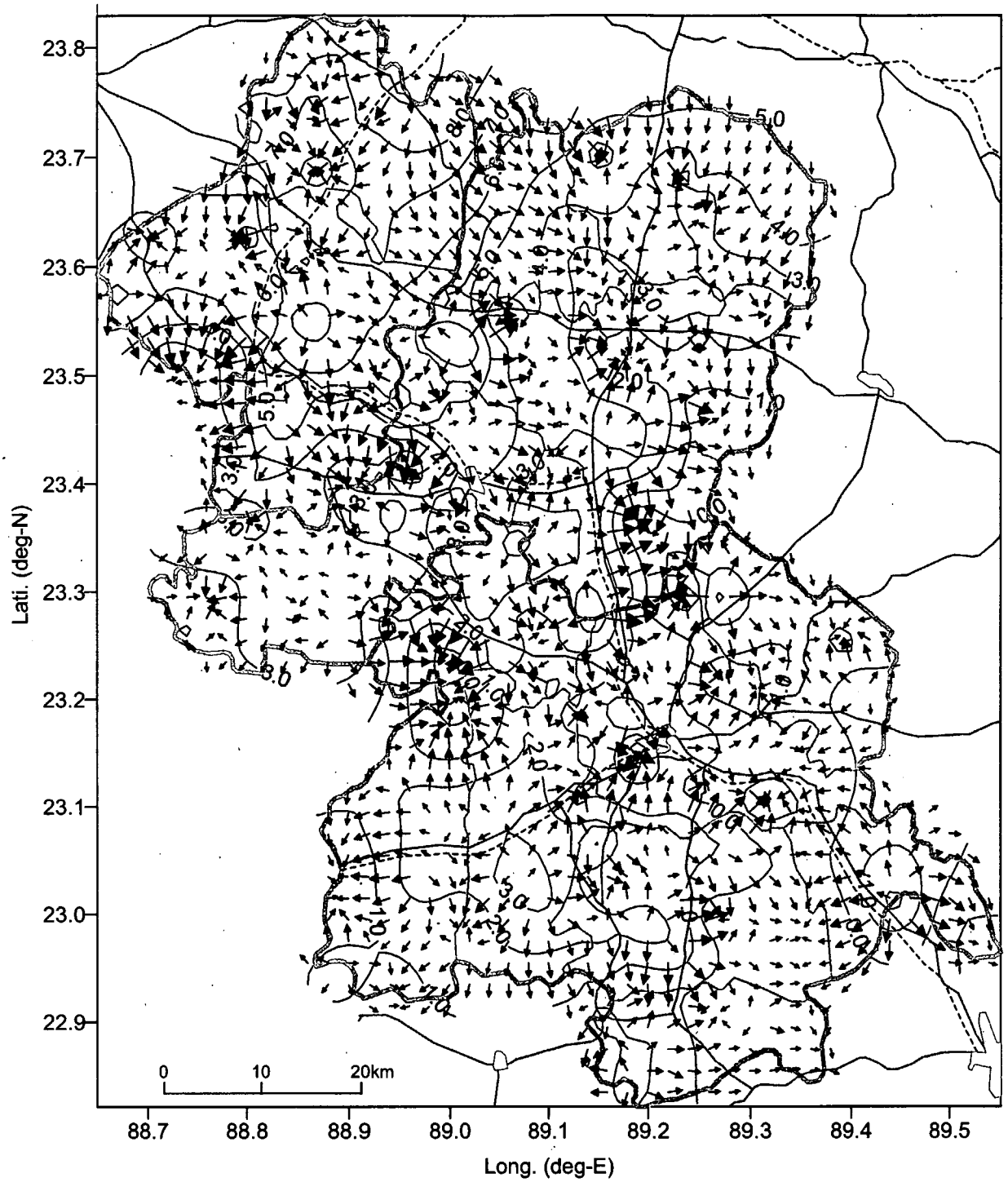


[GWL (Groundwater Level) values at 300 existing wells were obtained by (GL) - (DTW).
The Ground Elevation (GL) at each existing well was computed from SOB data and USGS GTOPO30 data.
The Depth to Groundwater Level (DTW) was measured by the JICA Study Team in June to July 2000.]

Figure 4.1.7	GWL Measured at 300 Existing Wells in Rainy Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



Groundwater Flow Vectors
(m/100km in gradient)

- 0.2
- 1
- 10
- 50
- 100
- 150

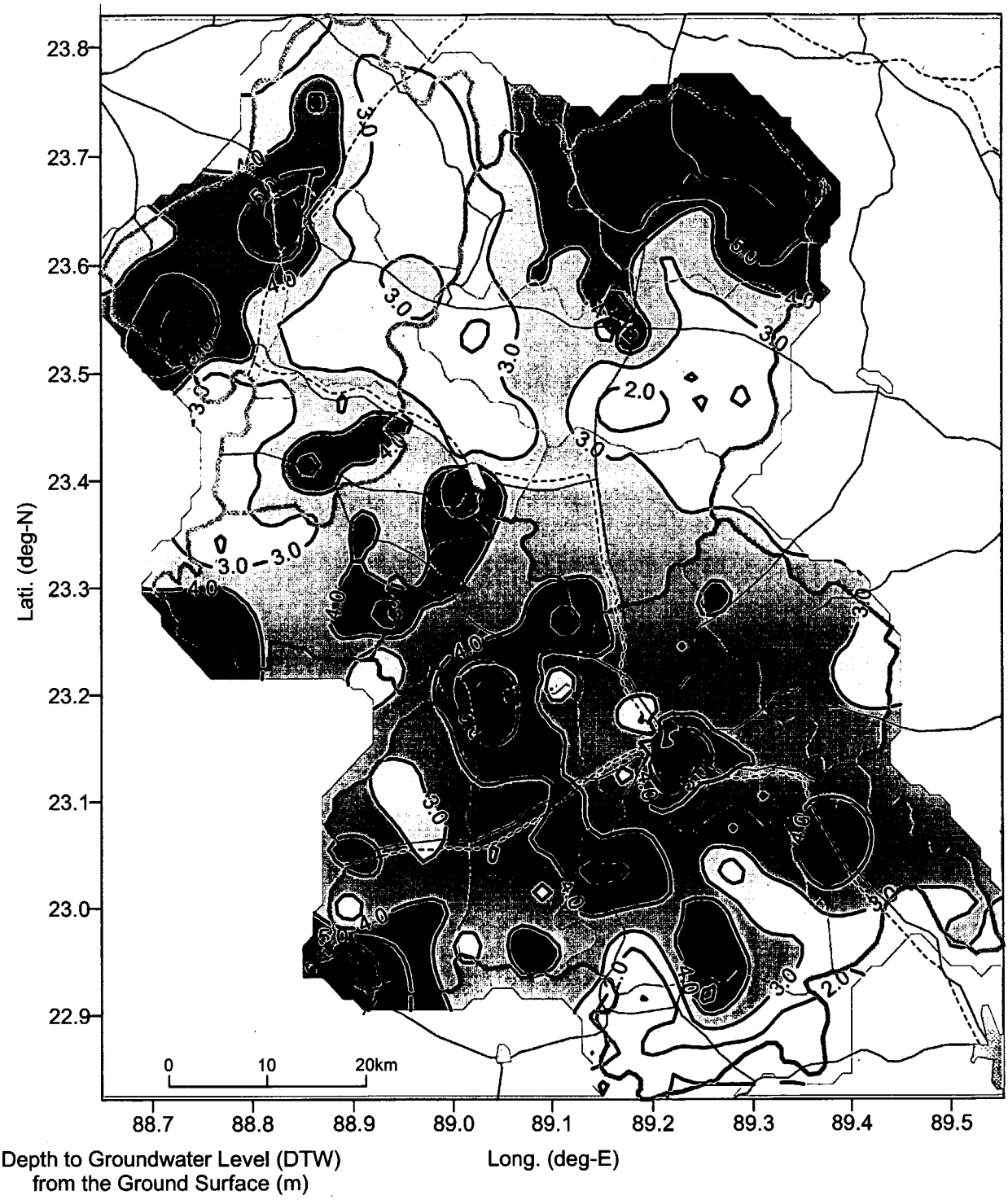
3.0 Equal Line of Groundwater Level (GWL) above mean sea level (m)

[The groundwater flow vectors are drawn based on the groundwater levels (GWL) measured at 300 existing wells in June to July 2000.]

Figure 4.1.8 **Groundwater Flow Vectors in Rainy Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

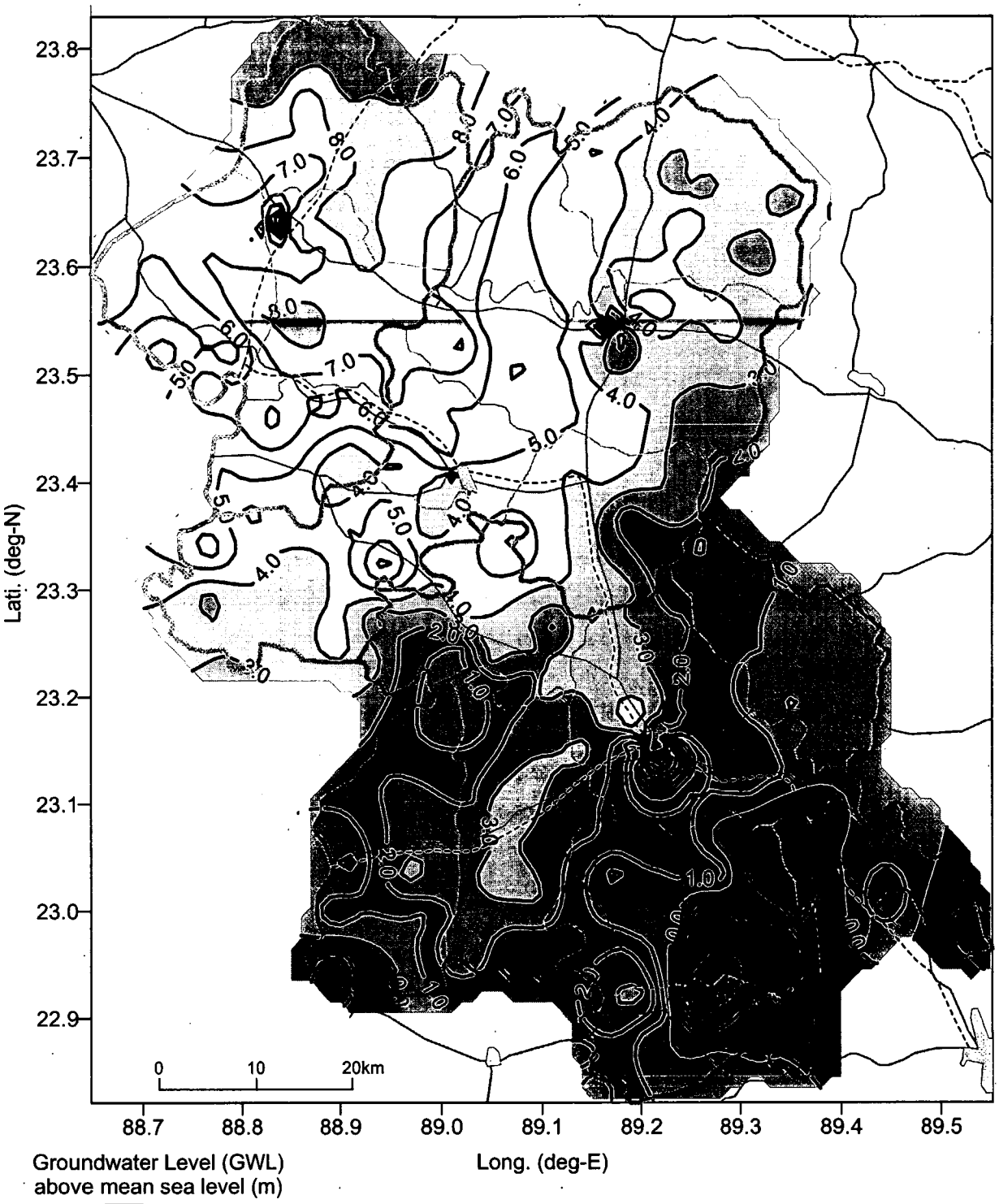


[DTW (Depth to Groundwater Level from the ground surface) values at 300 existing wells were measured by the JICA Study Team in December 2000 to January 2001 using potable water level meter.]

Figure 4.1.9	DTW Measured at 300 Existing Wells in Dry Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

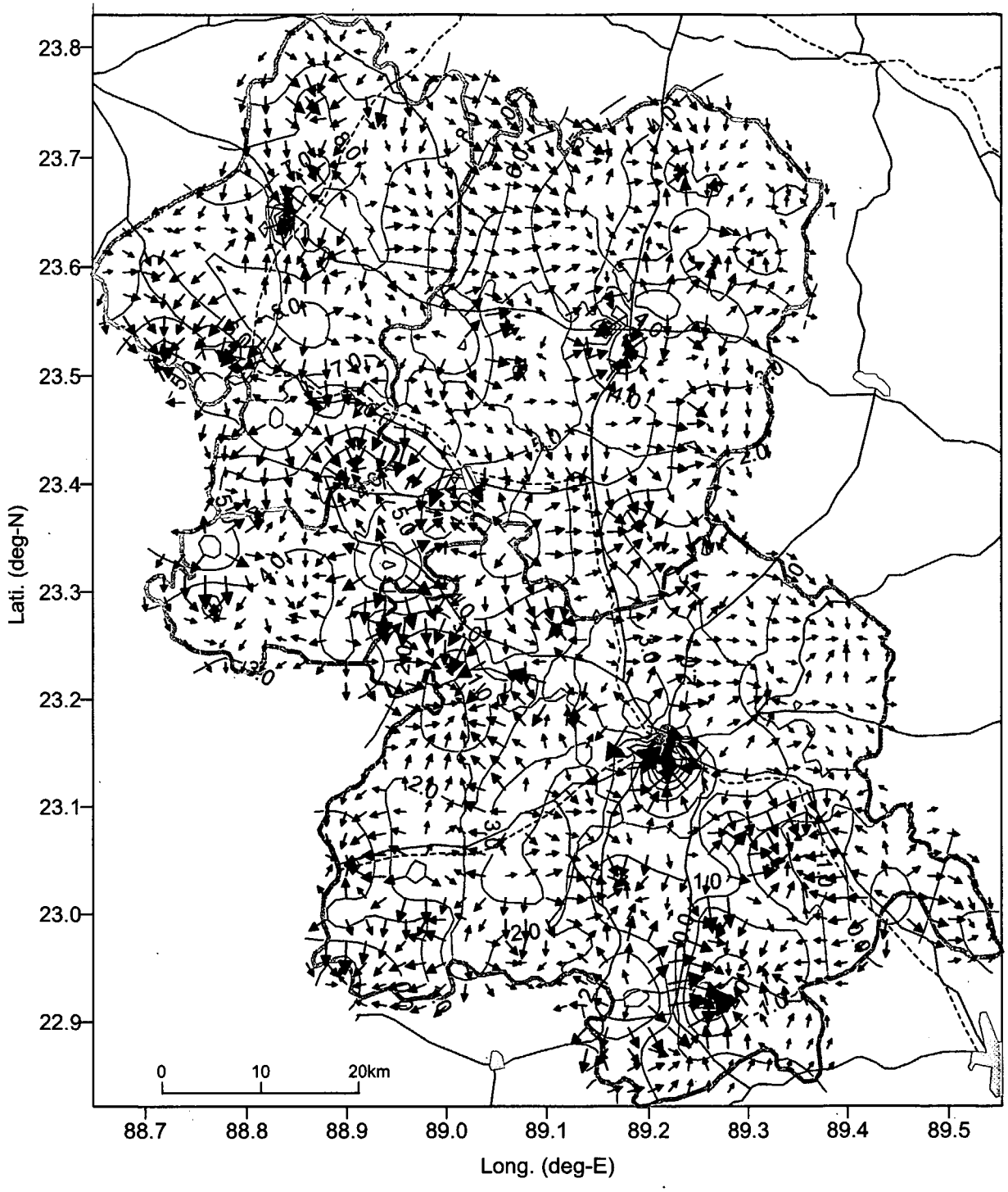


[GWL (Groundwater Level) values at 300 existing wells were obtained by (GL) - (DTW).
The Ground Elevation (GL) at each existing well was computed from SOB data and USGS GTOPO30 data.
The Depth to Groundwater Level (DTW) was measured by the JICA Study Team in December 2000 to January 2001.]

Figure 4.1.10	GWL Measured at 300 Existing Wells in Dry Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



Groundwater Flow Vectors (m/100km in gradient)

- 0.2
- 1
- 10
- 50
- 100
- 150

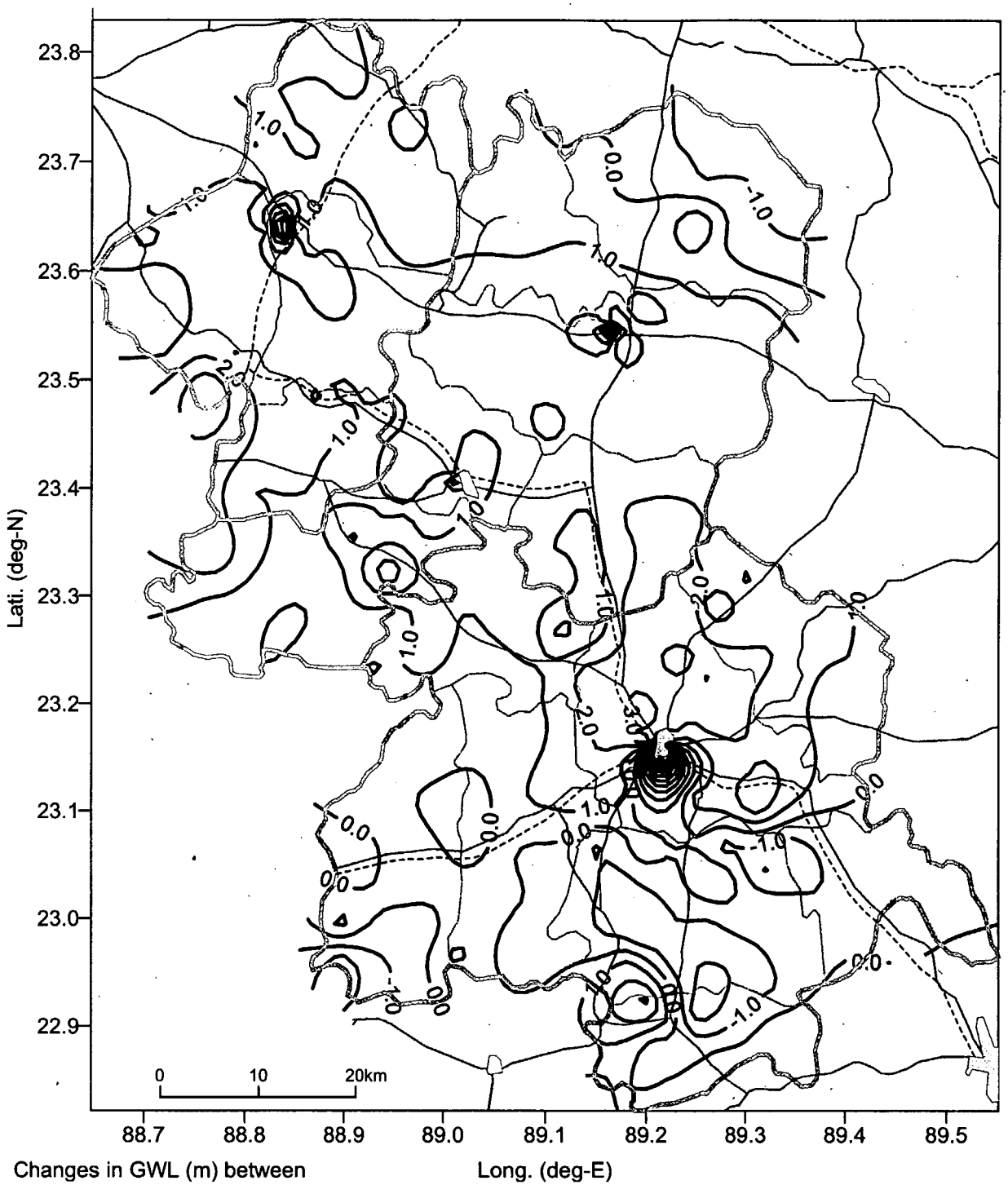
3.0 Equal Line of Groundwater Level (GWL) above mean sea level (m)

[The groundwater flow vectors are drawn based on the groundwater levels (GWL) measured at 300 existing wells in December 2000 to January 2001.]

Figure 4.1.11 **Groundwater Flow Vectors in Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



[GWL (Groundwater Level) values in Rainy Season were measured in June to July 2000. GWL values in Dry Season were measured in December 2000 to January 2001.]

Figure 4.1.12	Changes in GWL at 300 Existing Wells between Rainy Season and Dry Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

4.2 Arsenic Contamination in Rainy Season

Groundwater samples from the 300 existing wells were collected from June to July 2000 for the arsenic analysis in the rainy season. The samples were brought to Jhenaidah Laboratory established by the study team and analyzed by AAS.

At the time of the groundwater sampling, groundwater quality including arsenic was tested in the field. The tested parameters in the field and their methods are shown below:

(1) Arsenic (AAN Field Kit)
(2) Dissolved iron, Fe^{2+} (Fe^{2+} pack test kit)
(3) pH (potable pH meter)
(4) Oxidation-reduction potential, ORP (potable ORP meter)
(5) Electric conductivity, EC (potable EC meter)

The results of the arsenic analysis and other parameters' measurements at the 300 existing wells in the rainy season are shown in Table 4.2.1.

4.2.1 Arsenic Analysis by AAS

1) Arsenic Concentration by District

Figure 4.2.1 shows bar charts of arsenic concentrations of the existing wells by district in the rainy season. In the study area, 99 wells (33.3%) have arsenic concentrations less than 0.01mg/l. There are 94 wells (31.7%) having As concentrations between 0.01 to 0.05mg/l. Therefore, 65.0% of the wells in the study area show As concentrations below the Bangladeshi permissible limit for drinking water (= 0.05mg/l). Above the standard, there are 49 wells (16.5%) having As concentrations between 0.05 and 0.1mg/l and 51 wells (17.2%) having As concentrations between 0.1 and 0.5mg/l. The number of wells showing more than 1.0mg/l of As concentration is 2 (0.7%).

In Chuadanga District, there are 9 wells (15.3%) having As concentrations less than 0.01mg/l. The number of samples having As concentration from 0.01 to 0.05mg/l is 24 (40.7%). Therefore, the number of samples within the Bangladeshi limit is 33 (55.9%). There are 15 samples (25.4%) having As concentrations between 0.05 and 0.1mg/l and 10 samples (17.0%) showing As concentrations between 0.1 and 0.5mg/l. One sample shows arsenic concentration between 0.5 and 1.0mg/l. There is no well having more than 1.0mg/l of As among the surveyed wells in Chuadanga District.

In Jhenaidah District, the number of wells showing As concentrations from 0 to 0.01mg/l and 0.01 to 0.05mg/l are 40 (37.7%)and 41 (38.7%), respectively. Therefore, 76.4% of the surveyed wells show As concentrations below the Bangladeshi permissible limit. There are 16 wells (15.1%) having 0.05 to 0.1mg/l of As and 9 wells (8.5%) with 0.1 to 0.5mg/l of As. There is no well having more than 0.5mg/l of As among the surveyed wells in Jhenaidah District.

In Jessore District, 50 samples (37.9%) show As concentrations below 0.01mg/l. The number of wells having As concentrations between 0.01 and 0.05mg/l is 29 (22.0%) so that 59.9% of the surveyed wells show As concentrations below the Bangladeshi limit. There are 18 samples (13.6%) having As concentration between 0.05 and 0.1mg/l and 32 samples (24.2%) showing 0.1 to 0.5mg/l of As. One sample shows As concentration between 0.5 and 1.0mg/l. Highly contaminated samples having more than 1.0mg/l of As are found from 2 wells in Jessore District.

Among Pourashava water supply systems in the study area, those in Jessore Sadar, Kaliganj Thana, Kotchandpur Thana and Sailkupa Thana showed little As contamination although some exceeded WHO guideline 0.01 mg/l, however, those in Jhenaidah Sadar, Mohespur Thana and Chuadanga Sadar exceeded the Bangladesh As standard 0.05 mg/l.

The bar charts indicate that the existing wells in Jessore are characterized by a large number of samples having As concentration between 0.1 and 0.5mg/l. On the other hand, the percentage of arsenic safe wells (below the WHO guideline value of 0.01mg/l) is also high in Jessore District.

2) Arsenic Concentration Map

Figure 4.2.2 shows the distribution of As concentration in the study area in the rainy season measured by AAS. The figure clearly shows that the contaminated areas having more than 0.05mg/l of As are located mostly in the western part of the study area. On the other hand, less contaminated areas with less than 0.01mg/l of As are found in the eastern part of the study area, which is bounded from the contaminated area to the west by a line with NNW-SSE orientation.

It is, therefore, concluded from the survey results that the As contaminated areas are distributed irregularly but roughly located in the western half of the study area. The less contaminated areas are located in the eastern half. The reason of this distribution pattern will be revealed by the hydrogeological/geochemical investigations and analyses to be carried out in the study.

4.2.2 Arsenic Analysis by Field Kit

Although the accuracy of arsenic measurement by field kit is limited, the study team employed the AAN Field Kit to measure arsenic concentrations of groundwater in the field. The merit of using the field kit is to be able to know the rough As concentration at the site within a short time at low cost. The results of the field kit measurements also helped prepare the water samples for the AAS analysis in Jhenaidah laboratory.

1) Arsenic Concentration by District

Figure 4.2.3 shows bar charts of arsenic concentrations of the existing wells by district. In the study area, 103 wells (34.7%) have arsenic concentrations less than 0.01mg/l. There are 104 wells (35.0%) having As concentrations between 0.01 to 0.05mg/l. Therefore, 69.7% of the

wells in Jessore District show As concentrations below the Bangladeshi permissible limit for drinking water (= 0.05mg/l). Above the standard, there are 30 wells (10.1%) having As concentrations between 0.05 and 0.1mg/l and 46 wells (15.5%) having As concentrations between 0.1 and 0.5mg/l. The number of wells showing more than 1.0mg/l of As is 6 (2.0%).

In Chuadanga District, there are 26 wells (44.1%) having As concentrations ranging from 0.01 to 0.05mg/l. The number of samples within the Bangladeshi limit is 36 (61.0%). There are 10 samples (17.0%) having As concentrations between 0.05 and 0.1mg/l and 12 samples (20.3%) showing As concentrations between 0.1 and 0.5mg/l. There is no well having more than 1.0mg/l of As among the surveyed wells in Chuadanga District.

In Jhenaidah District, the numbers of wells showing As concentrations from 0 to 0.01mg/l and 0.01 to 0.05mg/l are 39 (36.8%) and 40 (37.7%), respectively. Therefore, 74.5% of the surveyed wells show As concentrations below the Bangladeshi permissible limit. There are 15 wells (14.2%) having 0.05 to 0.1mg/l of As and 9 wells (8.5%) with 0.5 to 1.0mg/l of As.

In Jessore District, 54 samples (40.9%) show As concentrations below 0.01mg/l. The number of wells having As concentrations between 0.01 and 0.05mg/l is 38 (28.8%) so that 69.7% of the surveyed wells show As concentrations below the Bangladeshi limit. There are 25 samples (18.9%) showing 0.1 to 0.5mg/l of As. Highly contaminated samples having more than 1.0mg/l of As are found from 5 wells in Jessore District.

Compared with the results of As measurement by AAS shown in Figure 4.2.1, it seems that it is difficult to detect As concentrations between 0.05 and 0.1mg/l with the AAN Field Kit. This is because the yellowish colors of the bromide papers between 0.05 and 0.1mg/l are difficult to identify. However, the general tendency of As detection by the AAN Field Kit is similar to the results of the AAS analysis.

2) Arsenic Concentration Map

Figure 4.2.4 shows the distribution of As concentration in the study area by the AAN Field Kit. Although the absolute value of each As concentration by field kit differs from that by AAS, the As concentration map shows a very similar As distribution pattern by AAS shown in Figure 4.2.2.

4.2.3 Groundwater Quality

1) Dissolved Iron (Fe^{2+})

It is known by previous studies such as the DFID-DPHE project that arsenic rich groundwater is generally rich in dissolved iron. Figure 4.2.5 shows the distribution of Fe^{2+} in groundwater measured by Iron Pack Test Kit. Although the accuracy of the Fe^{2+} measurement is limited, the distribution pattern of Fe^{2+} concentrations is quite similar to that of As concentrations.

2) pH

It is known that the pH and ORP values control the occurrence of iron hydroxides and arsenic in groundwater. Figure 4.2.6 shows the distribution of pH values measured at the existing wells. In the study area, acidic groundwater is distributed in the central part of Jhenaidah District and Jessore District. Particularly in the northwestern part of Jessore District, acidic groundwater is distributed in a relatively wider area. On the other hand, there is no acidic groundwater in Chuadanga District. It is noted that the alkaline groundwater occurs along a NW-SE line across the study area from southern Chuadanga to eastern Jessore District. However, there is no clear correlation between the pH distribution and As distribution.

3) Oxidation-Reduction Potential (Eh)

The oxidation-reduction potential is an important parameter to express the groundwater environment. The oxidation-reduction potential was measured by potable ORP meters in the field. The reading value of the ORP meter shows an apparent value of oxidation-reduction potential including the potential difference of the platinum electrode. Therefore, corrections of reading values are needed to obtain the true oxidation-reduction potential (Eh) values. Equation (4.2.1) is used for the correction:

$$Eh = ORP - 0.71978 \times Temp + 224.363 \qquad (4.2.1)$$

where, *Eh* is the corrected oxidation-reduction potential (mV), *ORP* is the reading value of the ORP meter using the platinum electrode (mV), *Temp* is the water temperature (°C).

Figure 4.2.7 shows the distribution of Eh values in the study area. The lower Eh values of less than 200mV are widely distributed in the western part of the Study area. Particularly the Eh values below 100mV are found in the central to southern part of Jessore District, western part of Jhenaidah District, and southern part of Chuadanga District where the As concentration is high. On the other hand, higher Eh values of more than 200mV are mainly found from the eastern part of the Study area. The boundary between the high Eh area and low Eh area separated by 200mV is located across the Study area with an orientation of NNW-SSE. The distribution pattern of the lower values of Eh is similar to that of the As concentration.

4) Electric Conductivity (EC)

Figure 4.2.8 shows the distribution of EC values measured at the existing wells. Higher EC values of more than 100mS/m are found from the southeastern part of Jessore District. The area is known to be affected by saline water from the Khulna area. The high EC area also corresponds to the low ground elevation area. There is no correlation between the EC distribution and As distribution.

5) Relationship between Eh and pH

Figure 4.2.9 shows the Eh-pH plots of the existing wells in the study area. It is known that the Eh-pH relationship generally shows a linear correlation; the Eh values increase with pH values. However, the Eh-pH plots in the study area do not show such a linear relationship. The plots are concentrated in a domain between 6.8 and 7.4 in pH and 50 and 150mV in Eh. Some plots are located in the domain of alkaline water with higher Eh values of more than 200mV. These water samples may have been influenced by rainwater and/or surface water.

Figure 4.2.10 shows the Eh-pH plots by district. It is clear that the shape of the plotted area is different by district. The plotted areas in Chuadanga and Jhenaidah Districts are similar, showing 6.9 to 7.4 in pH and 50 to 550mV in Eh. However, the plotted area of Jessore District is different from the others, showing 6.5 to 7.5 in pH. In the Second Phase of the Study, plots in the dry season shall be prepared and that will be compared with the plots in the rainy season.

6) Eh-pH-As Relationship

Figure 4.2.11 shows the relationship among Eh, pH, and As concentrations of the existing wells. The As concentrations were analyzed by AAS. Most of the contaminated samples having more than 0.05mg/l in As concentration are plotted in a zone with 6.8 to 7.2 in pH and 50 to 120mV in Eh.

7) Eh-pH-Fe^{2+} Relationship

Figure 4.2.12 shows the relationship among Eh, pH, and Fe^{2+} concentration of the existing wells. Although the Fe^{2+} concentration was tested by field pack test kit, the results show that most of the samples having Fe^{2+} concentration more than 1.0mg/l have pH values ranging from 6.6 to 7.4 and Eh values ranging from 50 to 150mV. The high concentration zone of Fe^{2+} and the high concentration zone of As are located in almost the same domain, but the area of the high Fe^{2+} zone is larger than that of the high As zone in the graph.

The relationships of Eh-pH-As and Eh-pH-Fe^{2+} suggest that the occurrence of arsenic in groundwater is strongly correlated with the occurrence of iron. And groundwater that is rich in arsenic and iron shows reducing conditions. This would be basic information to reveal the mechanism of groundwater contamination by arsenic as well as to design appropriate measures to remove arsenic from groundwater.

Table 4.2.1 Results of 300 Existing Wells Survey in Rainy Season [June to July 2000]

No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
1	EW-JHMg1-R (48)	Jessore	Jhikargachha	23.16722	89.07833	41.43	0.4	0.25	98.7	2	6.94	-118	27.0	86.9	5.08	7.20	2.12
2	EW-JHHz1-R (138)	Jessore	Jhikargachha	22.99611	89.02194	36.79	0.02	0.047	74.7	2	7.15	-90	27.5	114.6	4.52	5.71	1.19
3	EW-JHSk1-R (146)	Jessore	Jhikargachha	22.96583	89.01194	41.42	0.01	0.025	71.5	2	7.05	-127	27.0	77.9	3.59	5.46	1.87
4	EW-JHBk1-R (156)	Jessore	Jhikargachha	22.96889	89.07056	47.32	0.3	0.18	80.4	5	6.88	-94	28.3	110.0	3.79	5.86	2.07
5	EW-JHPn1-R (93)	Jessore	Jhikargachha	23.06083	89.08667	41.65	0.01	0.13	77.3	2	7.23	-99	27.3	105.7	3.85	6.85	3.00
6	EW-JHNh1-R (105)	Jessore	Jhikargachha	23.04833	89.04194	50.39	0.4	0.44	80.7	10	6.93	-116	27.2	88.8	4.30	7.10	2.80
7	EW-JHNh1-R (108)	Jessore	Jhikargachha	23.05333	89.02417	38.10	0	0.038	97.6	2	6.98	-95	27.1	109.9	3.62	5.92	2.30
8	EW-JHGg1-R (08)	Jessore	Jhikargachha	23.16806	89.03417	47.02	0.2	0.26	71.3	5	7.03	-126	26.9	79.0	5.87	6.23	0.36
9	EW-JHSm 1-R (28)	Jessore	Jhikargachha	23.10139	89.03583	37.33	0.2	0.28	74.2	5	6.95	-127	27.4	77.6	3.02	5.88	2.86
10	EW-JHGd1-R (30)	Jessore	Jhikargachha	23.09667	89.05944	36.05	0	0.024	62.2	2	7.11	-109	27.0	95.9	4.29	7.24	2.95
11	EW-JHNs 1-R (124)	Jessore	Jhikargachha	23.03306	89.04972	44.34	0.03	0.046	74.9	5	7.17	-96	26.8	109.5	3.95	7.17	3.22
12	EW-JHJk1-R (35)	Jessore	Jhikargachha	23.12472	89.09417	31.56	0.3	0.14	97.9	5	6.92	-134	27.4	70.6	5.22	7.28	2.06
13	EW-JHJk1-R (62)	Jessore	Jhikargachha	23.10417	89.12778	26.28	0.02	0.012	69.5	2	7.01	-116	27.3	88.7	5.45	6.22	0.77
14	EW-JSNz1-R (62)	Jessore	Sharsha	23.11056	88.97611	37.41	0.3	0.13	60.2	5	7.19	107	27.3	311.7	3.21	5.51	2.30
15	EW-JSLk1-R (33)	Jessore	Sharsha	23.10889	88.95500	40.09	0.03	0.025	65.2	2	6.72	-90	27.2	114.8	2.60	4.72	2.12
16	EW-JSPt1-R (92)	Jessore	Sharsha	22.99472	88.89611	40.67	0.4	0.13	76.1	5	7.07	-135	27.7	69.4	3.48	3.77	0.29
17	EW-JSBn1-R (37)	Jessore	Sharsha	23.09694	88.91250	30.25	0.01	0.022	49.1	0.5	6.99	-67	27.8	137.4	3.35	4.39	1.04
18	EW-JSBg1-R (126)	Jessore	Sharsha	22.99306	88.98111	37.99	0.5	0.15	62.9	10	6.99	-121	27.9	83.3	3.72	5.34	1.62
19	EW-JSBn1-R (88)	Jessore	Sharsha	23.04472	88.91056	39.84	0.01	0.014	65.9	2	7.13	-119	27.5	85.6	4.10	4.47	0.37
20	EW-JSKb1-R (132)	Jessore	Sharsha	22.93889	88.94917	27.46	0.3	0.1	92.7	10	7.77	-123	28.2	81.1	4.20	4.89	0.69
21	EW-JSGg1-R (114)	Jessore	Sharsha	22.95991	88.89694	41.87	0.5	0.34	78.6	5	7.04	-134	27.8	70.4	4.44	5.79	1.35
22	EW-JSSs1-R (75)	Jessore	Sharsha	23.07389	88.97778	33.95	0.01	0.071	85.2	5	6.90	-100	27.3	104.7	2.82	5.34	2.52
23	EW-JSUl 1-R (99)	Jessore	Sharsha	23.03361	88.96667	32.18	0.05	0.069	55.2	2	6.98	-117	27.0	87.9	3.80	6.47	2.67
24	EW-JSDh1-R (01)	Jessore	Sharsha	23.17222	88.95444	37.00	0.02	0.031	73.2	5	6.85	-81	27.4	123.6	3.90	5.22	1.32
25	EW-JSDh1-R (8)	Jessore	Sharsha	23.16472	88.98389	37.01	0.04	0.069	67.1	2	6.60	-89	27.4	115.6	3.95	4.09	0.14
26	EW-JKKs1-R (26)	Jessore	Keshabpur	22.92189	89.19978	42.31	0.01	0.13	88.2	5	6.75	-96	27.5	108.6	4.28	4.10	-0.18
27	EW-JKKs1-R (72)	Jessore	Keshabpur	22.90472	89.22278	43.76	0.4	0.2	105.9	2	7.10	-142	28.7	61.7	2.57	2.96	0.39
28	EW-JKSf1-R (121)	Jessore	Keshabpur	22.89963	89.31333	42.82	0.03	0.026	71.0	1	7.26	-114	27.6	90.5	2.49	2.28	-0.21
29	EW-JKSf1-R (128)	Jessore	Keshabpur	22.89519	89.33139	45.70	0	<0.0005	73.3	0.1	7.29	32	27.7	236.4	2.22	1.49	-0.73
30	EW-JKPj1-R (102)	Jessore	Keshabpur	22.91472	89.25111	46.52	1	0.52	199.9	0.1	7.15	-161	27.0	43.9	2.56	1.94	-0.62
31	EW-JKMg1-R (97)	Jessore	Keshabpur	22.86759	89.27389	36.12	0.6	0.19	88.2	2	6.93	-124	27.9	80.3	2.20	1.88	-0.32
32	EW-JKGr1-R (135)	Jessore	Keshabpur	22.87241	89.31639	45.01	0	<0.0005	99.2	0.1	7.35	3	27.6	207.5	2.03	1.39	-0.64
33	EW-JKTm1-R (11)	Jessore	Keshabpur	22.89833	89.15861	40.98	0.01	0.0077	69.3	5	7.06	-93	27.0	111.9	2.59	3.87	1.28
34	EW-JKSg1-R (17)	Jessore	Keshabpur	22.86472	89.14306	40.62	0.3	0.17	84.9	5	6.97	-113	26.8	92.1	3.39	3.26	-0.13
35	EW-JKSg1-R (41)	Jessore	Keshabpur	22.84056	89.15000	35.28	0.01	0.077	93.4	10	6.68	-108	26.8	97.1	2.97	3.40	0.43
36	EW-JKMj1-R (65)	Jessore	Keshabpur	22.88028	89.20694	46.36	0	0.058	87.7	5	7.00	-109	26.7	96.1	1.90	2.93	1.03
37	EW-JKBn1-R (51)	Jessore	Keshabpur	22.84333	89.18139	21.33	0.03	0.073	124.0	10	6.76	-120	27.0	84.9	1.91	3.52	1.61
38	EW-JKBn1-R (88)	Jessore	Keshabpur	22.84611	89.22056	43.31	0.02	0.079	76.8	2	7.01	-116	27.7	88.4	1.12	1.45	0.33
39	EW-JJCr1-R (13)	Jessore	Jessore Sadar	23.22954	89.13917	46.57	0.1	0.09	40.1	1	7.31	-102	26.2	103.5	6.22	7.61	1.39
40	EW-JJJs1-R (78)	Jessore	Jessore Sadar	23.15861	89.18944	48.40	1	0.25	81.3	10	6.99	-132	26.2	73.5	6.27	4.62	-1.65
41	EW-JJKc1-R (223)	Jessore	Jessore Sadar	23.13583	89.30222	46.80	0	<0.0005	85.4	0.1	7.01	81	25.7	286.9	5.98	5.90	-0.08
42	EW-JJLb1-R (156)	Jessore	Jessore Sadar	23.29833	89.24500	48.50	0.01	0.011	84.0	2	7.10	-73	26.5	132.3	6.53	4.61	-1.92
43	EW-JJLb1-R (162)	Jessore	Jessore Sadar	23.27139	89.24333	49.00	0.01	0.0058	83.0	2	7.11	-72	24.5	134.7	6.76	6.10	-0.66
44	EW-JJCc1-R (59)	Jessore	Jessore Sadar	23.12250	89.17778	42.20	0.9	0.13	92.3	5	6.98	-123	26.4	82.4	4.30	4.36	0.06
45	EW-JJKs1-R (113)	Jessore	Jessore Sadar	23.21722	89.18500	45.07	0	<0.0005	72.4	0.2	7.14	71	26.6	276.2	6.93	7.28	0.35
46	EW-JJKs1-R (136)	Jessore	Jessore Sadar	23.26639	89.19824	46.40	0	<0.0005	66.3	0.1	7.14	104	26.8	309.1	6.01	6.56	0.55
47	EW-JJNp1-R (195)	Jessore	Jessore Sadar	23.19583	89.24333	47.23	0	<0.0005	86.3	0.2	7.16	76	27.4	280.6	5.87	5.47	-0.40
48	EW-JJAr1-R (95)	Jessore	Jessore Sadar	23.17611	89.18778	40.37	0	0.0038	73.5	0.2	7.15	8	26.8	213.1	4.25	6.52	2.27
49	EW-JJRn1-R (214)	Jessore	Jessore Sadar	23.11361	89.24639	45.00	0	<0.0005	103.2	0.5	7.25	60	29.9	262.8	4.97	4.55	-0.42
50	EW-JJDa1-R (22)	Jessore	Jessore Sadar	23.18750	89.12528	44.28	0	<0.0005	114.2	0.1	7.10	119	27.0	323.9	5.53	5.77	0.24

Table 4.2.1 Results of 300 Existing Wells Survey in Rainy Season [June to July 2000] (2/6)

No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
51	EW-JJDa1-R (38)	Jessore	Jessore Sadar	23.14889	89.13806	47.04	0	0.0007	76.0	0.1	7.18	211	26.4	416.4	5.55	7.06	1.51
52	EW-JJBs1-R (247)	Jessore	Jessore Sadar	23.12333	89.34750	27.00	0.04	0.08	96.9	10	7.17	-83	28.1	121.1	5.04	4.34	-0.70
53	EW-JJNp1-R (104)	Jessore	Jessore Sadar	23.19000	89.22222	46.30	0	<0.0005	71.7	0.1	7.25	90	26.8	295.1	6.18	6.64	0.46
54	EW-JJNr1-R (240)	Jessore	Jessore Sadar	23.10583	89.31083	41.90	0	<0.0005	157.6	0.2	7.18	56	27.4	260.6	5.88	3.78	-2.10
55	EW-JJlc1-R (170)	Jessore	Jessore Sadar	23.24111	89.23278	46.56	0	0.001	91.1	0	7.23	84	28.4	287.9	5.32	6.17	0.85
56	EW-JJlc1-R (186)	Jessore	Jessore Sadar	23.22222	89.25880	49.00	0	<0.0005	83.2	0.2	7.09	42	26.5	247.3	6.41	4.88	-1.53
57	EW-JJHb1-R (122)	Jessore	Jessore Sadar	23.27463	89.14889	43.85	0	0.0009	77.6	1	7.20	31	27.0	235.9	4.28	8.27	3.99
58	EW-JJHb1-R (128)	Jessore	Jessore Sadar	23.28250	89.18528	25.37	0.2	0.1	80.9	2	7.08	-80	26.3	125.4	6.08	6.22	0.14
59	EW-JJFt1-R (205)	Jessore	Jessore Sadar	23.16639	89.25917	43.50	0	<0.0005	112.5	0.5	7.18	13	28.0	217.2	5.71	5.95	0.24
60	EW-JMKp1-R (157)	Jessore	Manirampur	22.99861	89.26167	42.76	0.07	0.032	79.6	2	6.96	-125	27.6	79.5	3.77	3.05	-0.72
61	EW-JMJp1-R (174)	Jessore	Manirampur	22.97556	89.15472	46.80	0.01	0.053	42.3	2	7.16	-107	28.5	96.8	2.61	4.71	2.10
62	EW-JMHh1-R (25)	Jessore	Manirampur	23.01500	89.09389	40.03	0.02	0.078	59.0	2	7.16	-112	27.5	92.6	2.52	5.88	3.36
63	EW-JMHh1-R (35)	Jessore	Manirampur	23.03389	89.13472	27.85	1	0.41	63.7	10	7.02	-127	26.7	78.1	4.90	6.70	1.80
64	EW-JMSm1-R (160)	Jessore	Manirampur	22.98833	89.22944	46.94	0.04	0.042	56.6	2	7.14	-136	26.9	69.0	2.85	4.68	1.83
65	EW-JMSm1-R (210)	Jessore	Manirampur	22.96528	89.23056	48.10	0.3	0.18	99.6	5	6.97	-129	26.8	76.1	2.63	4.42	1.79
66	EW-JMCl 1-R (198)	Jessore	Manirampur	22.98667	89.19528	40.75	0.02	0.02	111.2	5	6.91	-111	28.5	92.8	1.43	3.97	2.54
67	EW-JMCl1-R (201)	Jessore	Manirampur	22.95889	89.18111	47.42	0.01	0.048	75.4	5	7.07	-116	27.6	88.5	2.92	4.03	1.11
68	EW-JMKl1-R (141)	Jessore	Manirampur	22.99917	89.33917	41.60	0	0.0066	178.7	2	7.10	-126	28.8	77.6	1.81	1.04	-0.77
69	EW-JMKl1-R (148)	Jessore	Manirampur	23.00139	89.31083	50.24	0.1	0.08	199.9	10	6.89	-121	28.0	83.2	2.12	1.63	-0.49
70	EW-JMDb1-R (227)	Jessore	Manirampur	22.96444	89.30333	47.84	0	0.0065	168.7	0.1	7.09	41	28.8	244.6	1.92	1.73	-0.19
71	EW-JMMh1-R (239)	Jessore	Manirampur	22.93722	89.32889	56.79	0	<0.0005	145.5	0.5	7.14	108	28.0	312.2	2.22	1.45	-0.77
72	EW-JMMs1-R (186)	Jessore	Manirampur	22.93611	89.14083	43.43	0	0.0025	82.7	2	7.20	-97	27.6	107.5	4.54	5.49	0.95
73	EW-JMHd1-R (108)	Jessore	Manirampur	23.03583	89.27750	51.65	0	<0.0005	78.8	0.1	7.14	108	27.4	312.6	1.94	2.57	0.63
74	EW-JMHd1-R (138)	Jessore	Manirampur	23.04556	89.31583	51.46	0	<0.0005	151.2	0.1	7.24	52	27.6	256.5	1.77	1.90	0.13
75	EW-JMMr1-R (91)	Jessore	Manirampur	23.03972	89.22333	31.11	0.1	0.075	69.5	10	7.01	-104	26.7	101.1	3.44	4.92	1.48
76	EW-JMMr1-R (101)	Jessore	Manirampur	23.03861	89.25361	46.92	0.1	0.07	61.7	5	7.01	-138	27.1	66.9	3.56	4.33	0.77
77	EW-JMPh1-R (13)	Jessore	Manirampur	23.06917	89.15000	42.50	0.01	0.015	82.8	10	6.85	-119	26.3	86.4	2.68	5.94	3.26
78	EW-JMNh1-R (244)	Jessore	Manirampur	22.96500	89.33833	52.63	0	<0.0005	137.8	0.1	7.24	32	28.5	235.8	2.88	2.19	-0.69
79	EW-JMKd1-R (51)	Jessore	Manirampur	23.03639	89.17306	36.01	0	0.0104	40.6	0.5	7.43	-105	26.7	100.1	3.79	4.86	1.07
80	EW-JMDk1-R (124)	Jessore	Manirampur	23.06917	89.27917	36.98	0.2	0.11	96.7	2	7.07	-124	27.4	80.6	2.76	3.71	0.95
81	EW-JMKs1-R (71)	Jessore	Manirampur	23.06306	89.19722	52.11	0.04	0.065	70.4	2	7.11	-114	28.2	90.1	4.70	5.99	1.29
82	EW-JMBj1-R (81)	Jessore	Manirampur	23.08333	89.23333	45.05	0.01	0.031	64.8	5	7.25	-114	27.2	90.8	3.06	4.63	1.57
83	EW-JCDl1-R (181)	Jessore	Chougachha	23.21139	89.02472	41.20	0.02	0.046	118.3	2	6.52	-79	27.0	125.9	6.82	6.61	-0.21
84	EW-JCPs1-R (210)	Jessore	Chougachha	23.21111	89.09389	41.80	0	0.013	90.4	0.1	7.15	5	29.0	208.5	4.48	5.22	0.74
85	EW-JCPs1-R (215)	Jessore	Chougachha	23.20972	89.09917	26.33	0.04	0.13	67.5	5	6.98	-113	26.5	92.3	2.59	5.35	2.76
86	EW-JCSr1-R (198)	Jessore	Chougachha	23.25889	88.98278	43.32	0.1	0.194	59.1	2	7.03	-75	27.5	129.6	4.63	4.69	0.06
87	EW-JCHk1-R (54)	Jessore	Chougachha	23.34583	89.06917	46.62	0	0.011	71.2	0.2	7.30	90	27.5	294.6	4.94	9.40	4.46
88	EW-JCPt1-R (207)	Jessore	Chougachha	23.27833	89.02639	46.00	0.4	0.09	82.6	5	7.07	-90	28.5	113.8	4.15	7.62	3.47
89	EW-JCCg1-R (170)	Jessore	Chougachha	23.24750	89.01972	41.60	0.4	0.42	96.6	5	6.86	-51	28.0	153.2	4.78	4.95	0.17
90	EW-JCNr1-R (174)	Jessore	Chougachha	23.29990	88.98889	34.20	0.09	0.1	64.5	2	6.92	-89	27.1	115.9	5.90	8.27	2.37
91	EW-JCJr1-R (218)	Jessore	Chougachha	23.27509	89.07667	32.39	0.5	1	82.7	10	7.08	-161	27.0	43.9	5.79	7.39	1.60
92	EW-JCSk1-R (124)	Jessore	Chougachha	23.23389	88.92694	39.30	0.05	0.064	68.8	5	6.80	-82	27.7	122.4	3.15	5.96	2.81
93	EW-JCSk1-R (133)	Jessore	Chougachha	23.27361	88.93833	46.40	1	0.48	86.5	5	6.80	-75	28.1	129.1	6.22	7.62	1.40
94	EW-JCSk1-R (198)	Jessore	Chougachha	23.26750	89.11333	22.83	0.03	0.083	85.2	0.2	7.04	-106	26.6	99.2	5.35	7.40	2.05
95	EW-JCPl1-R (205)	Jessore	Chougachha	23.24944	89.08750	22.71	1	1.6	84.3	5	7.01	-122	26.5	83.3	5.47	7.34	1.87
96	EW-JCSg1-R (187)	Jessore	Chougachha	23.23528	89.04667	27.05	0.09	0.15	83.8	5	6.96	-115	26.8	90.1	4.95	7.85	2.90
97	EW-JBNr1-R (72)	Jessore	Bagherpara	23.27583	89.35083	49.50	0.01	0.036	88.3	0.2	7.18	79	26.5	283.8	4.51	3.76	-0.75
98	EW-JBJd1-R (149)	Jessore	Bagherpara	23.18833	89.37972	44.69	0.2	0.22	76.6	5	7.02	-133	28.2	71.1	3.84	3.81	-0.03
99	EW-JBRp1-R (54)	Jessore	Bagherpara	23.26065	89.28333	46.40	0	<0.0005	58.0	0.2	7.02	117	26.7	322.1	5.02	4.62	-0.40
100	EW-JBRp1-R (65)	Jessore	Bagherpara	23.24472	89.32111	45.70	0	<0.0005	83.0	0.2	6.76	75	27.0	279.9	5.34	4.19	-1.15

Table 4.2.1 Results of 300 Existing Wells Survey in Rainy Season [June to July 2000] (3/6)

No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
101	EW-JBJh1-R (3)	Jessore	Bagherpara	23.33907	89.26150	52.00	0	0.0011	115.6	0.2	7.16	79	28.5	282.3	5.67	4.66	-1.01
102	EW-JBJh1-R (30)	Jessore	Bagherpara	23.31472	89.26444	51.20	0.01	0.02	93.5	5	6.75	-95	28.0	109.2	5.57	5.91	0.34
103	EW-JBBd1-R (15)	Jessore	Bagherpara	23.31389	89.29833	47.63	0.04	0.033	85.7	10	6.62	-115	27.5	89.6	5.18	4.92	-0.26
104	EW-JBBd1-R (36)	Jessore	Bagherpara	23.29278	89.26722	47.63	0.04	0.041	72.4	5	6.81	-93	27.0	111.9	4.36	5.72	1.36
105	EW-JBDr1-R (91)	Jessore	Bagherpara	23.20111	89.31806	43.73	0	0.0019	91.0	0.1	7.18	-38	26.9	167.0	5.03	3.57	-1.46
106	EW-JBBs1-R (117)	Jessore	Bagherpara	23.19250	89.35194	52.09	0.2	0.12	56.0	5	7.14	-140	27.5	64.6	4.66	4.62	-0.04
107	EW-JBBs1-R (132)	Jessore	Bagherpara	23.15861	89.35056	43.25	0	0.0012	44.6	0.1	7.28	-44	26.9	161.0	4.91	3.99	-0.92
108	EW-JBDh1-R (108)	Jessore	Bagherpara	23.21889	89.40500	41.70	0.3	0.14	68.8	5	7.18	-142	27.7	62.4	2.84	3.30	0.46
109	EW-JBDl1-R (102)	Jessore	Bagherpara	23.24500	89.39722	40.03	0.01	0.018	122.5	5	7.14	-130	27.7	74.4	4.16	2.99	-1.17
110	EW-JASd1-R (4)	Jessore	Abhaynagar	23.05083	89.39824	47.67	0	0.0006	98.9	0.1	7.22	54	27.7	258.4	3.92	4.54	0.62
111	EW-JABg1-R (12)	Jessore	Abhaynagar	23.01028	89.44472	45.46	0	0.0006	90.1	0.1	7.15	208	27.6	412.5	2.34	4.78	2.44
112	EW-JAMh1-R (49)	Jessore	Abhaynagar	23.09056	89.35852	44.28	0	0.0007	76.0	0.1	7.22	188	26.7	393.1	3.92	2.95	-0.97
113	EW-JAMh1-R (58)	Jessore	Abhaynagar	23.07222	89.33556	51.26	0	0.0057	195.0	2	7.09	-95	27.1	109.9	2.32	2.04	-0.28
114	EW-JANa1-R (72)	Jessore	Abhaynagar	23.03111	89.36917	37.43	0.2	0.11	85.9	0.5	7.07	-60	26.8	145.1	3.45	2.96	-0.49
115	EW-JARj1-R (85)	Jessore	Abhaynagar	22.99833	89.38722	47.91	0	0.0011	179.4	0	6.88	63	26.1	268.6	3.18	2.62	-0.56
116	EW-JAPr1-R (92)	Jessore	Abhaynagar	22.96806	89.38917	42.53	0	<0.0005	390.0	0.2	6.72	30	27.1	234.9	2.01	1.48	-0.53
117	EW-JASh1-R (37)	Jessore	Abhaynagar	23.00222	89.50361	47.40	0	0.0008	158.8	0.2	7.09	54	29.6	257.1	2.81	1.96	-0.85
118	EW-JASd1-R (42)	Jessore	Abhaynagar	22.97167	89.50389	43.85	0	0.0061	182.5	5	6.88	-57	29.6	146.1	3.19	2.25	-0.94
119	EW-HJNl1-R (136)	Jhenaidah	Jhenaidah Sadar	23.46306	89.16389	46.55	0	0.0011	68.0	2	7.07	287	26.9	492.0	2.50	6.09	3.59
120	EW-HJNl1-R (147)	Jhenaidah	Jhenaidah Sadar	23.46500	89.21398	41.33	0	0.0008	57.0	0	7.02	240	27.0	444.9	3.07	5.77	2.70
121	EW-HJSr1-R (133)	Jhenaidah	Jhenaidah Sadar	23.50259	89.16361	39.06	0.01	0.0025	71.0	1	7.00	103	26.8	308.1	4.15	5.65	1.50
122	EW-HJHl1-R (42)	Jhenaidah	Jhenaidah Sadar	23.56028	89.08306	44.80	0.07	0.046	58.2	2	6.88	-128	26.6	77.2	4.67	8.82	4.15
123	EW-HJGn1-R (55)	Jhenaidah	Jhenaidah Sadar	23.49806	89.07222	40.40	0	0.0006	58.0	0	7.01	98	27.2	302.8	5.36	8.79	3.43
124	EW-HJGn1-R (86)	Jhenaidah	Jhenaidah Sadar	23.48352	89.07565	47.00	0.1	0.47	87.3	5	6.91	-119	29.4	84.2	5.06	8.93	3.87
125	EW-HJHr1-R (231)	Jhenaidah	Jhenaidah Sadar	23.56046	89.26046	37.82	0.03	0.017	73.3	0.5	7.11	-10	29.0	193.5	4.25	7.65	3.40
126	EW-HJHr1-R (240)	Jhenaidah	Jhenaidah Sadar	23.55972	89.30259	46.01	0.04	0.03	91.7	5	7.07	-104	30.0	98.8	5.09	7.18	2.09
127	EW-HJGr1-R (200)	Jhenaidah	Jhenaidah Sadar	23.47556	89.24639	41.44	0	0.0006	66.7	0	7.10	168	26.3	373.4	5.31	5.54	0.23
128	EW-HJFr1-R (261)	Jhenaidah	Jhenaidah Sadar	23.47704	89.28444	35.45	0.02	0.016	49.3	1	7.30	-103	26.5	102.3	3.71	4.65	0.94
129	EW-HJMd1-R (19)	Jhenaidah	Jhenaidah Sadar	23.52778	89.01972	38.22	0.04	0.047	83.1	10	6.87	-129	26.4	76.4	3.09	10.12	7.03
130	EW-HJMd1-R (26)	Jhenaidah	Jhenaidah Sadar	23.53417	89.02250	39.70	0.08	0.054	73.8	2	6.94	-107	26.4	98.4	3.25	9.62	6.37
131	EW-HJJn1-R (122)	Jhenaidah	Jhenaidah Sadar	23.56333	89.18639	41.90	0	0.004	65.7	0.2	7.07	6	26.5	211.3	6.49	8.59	2.10
132	EW-HJJn1-R (125)	Jhenaidah	Jhenaidah Sadar	23.54944	89.16750	19.83	0.01	0.0068	82.5	1	6.98	-53	27.1	151.9	6.39	8.74	2.35
133	EW-HJKi1-R (176)	Jhenaidah	Jhenaidah Sadar	23.50898	89.20500	37.90	0	<0.0005	71.5	0	7.12	180	26.2	385.5	4.40	6.06	1.66
134	EW-HJSg1-R (34)	Jhenaidah	Jhenaidah Sadar	23.55028	89.04778	39.90	0.05	0.034	49.6	0.5	7.09	-85	26.8	120.1	4.10	7.18	3.08
135	EW-HJPd1-R (225)	Jhenaidah	Jhenaidah Sadar	23.54630	89.28556	35.18	0	<0.0005	53.0	0	7.17	187	29.0	390.5	4.55	7.48	2.93
136	EW-HJPg1-R (114)	Jhenaidah	Jhenaidah Sadar	23.53278	89.14528	48.80	0.03	0.016	51.9	1	6.96	-71	26.4	134.4	5.57	6.99	1.42
137	EW-HJSd1-R (3)	Jhenaidah	Jhenaidah Sadar	23.52917	88.97417	41.59	0.5	0.28	69.8	5	6.95	-125	26.4	80.4	4.09	10.10	6.01
138	EW-HJMh1-R (88)	Jhenaidah	Jhenaidah Sadar	23.46065	89.10296	41.01	0.02	0.03	72.9	5	6.96	-113	26.2	92.5	5.52	8.60	3.08
139	EW-HJMh1-R (98)	Jhenaidah	Jhenaidah Sadar	23.50037	89.12139	46.60	0.1	0.11	68.3	2	6.89	-128	26.1	77.6	4.93	8.65	3.72
140	EW-HJPr1-R (190)	Jhenaidah	Jhenaidah Sadar	23.55787	89.22111	35.80	0	<0.0005	47.5	0	7.08	131	26.2	336.5	5.07	8.63	3.56
141	EW-HJPr1-R (251)	Jhenaidah	Jhenaidah Sadar	23.54028	89.25333	42.35	0.03	0.023	75.3	1	6.92	-96	26.3	109.4	4.34	6.11	1.77
142	EW-HJKm1-R (62)	Jhenaidah	Jhenaidah Sadar	23.54750	89.11222	39.60	0.09	0.041	58.4	2	6.97	-117	26.6	88.2	5.26	8.96	3.70
143	EW-HJDg1-R (196)	Jhenaidah	Jhenaidah Sadar	23.49074	89.24167	39.00	0.06	0.062	78.6	5	7.08	-106	26.7	99.1	3.72	5.47	1.75
144	EW-HKRg1-R (74)	Jhenaidah	Kaliganj	23.36981	89.13926	45.35	0.01	0.023	71.8	5	7.05	34	27.1	238.9	3.63	6.64	3.01
145	EW-HKRk1-R (135)	Jhenaidah	Kaliganj	23.34694	89.10611	38.75	0	0.0031	63.0	2	7.08	-96	26.6	109.2	4.65	8.16	3.51
146	EW-HKJm1-R (89)	Jhenaidah	Kaliganj	23.42222	89.18028	46.71	0	0.0018	77.0	0	7.14	68	27.3	272.7	4.16	7.71	3.55
147	EW-HKJm1-R (101)	Jhenaidah	Kaliganj	23.41713	89.24046	55.60	0.3	0.17	82.2	5	6.99	-122	26.5	83.3	3.79	4.57	0.78
148	EW-HKKl1-R (115)	Jhenaidah	Kaliganj	23.40806	89.21426	40.85	0.01	0.017	77.5	2	7.05	-60	27.1	144.9	4.58	6.25	1.67
149	EW-HKKl1-R (173)	Jhenaidah	Kaliganj	23.37676	89.23611	28.50	0	<0.0005	82.5	0	7.02	254	26.7	459.1	5.03	5.82	0.79
150	EW-HKTl1-R (45)	Jhenaidah	Kaliganj	23.39778	89.06861	46.30	0.03	0.027	53.4	1	7.06	-117	26.6	88.2	5.50	8.02	2.52

Table 4.2.1 Results of 300 Existing Wells Survey in Rainy Season [June to July 2000] (4/6)

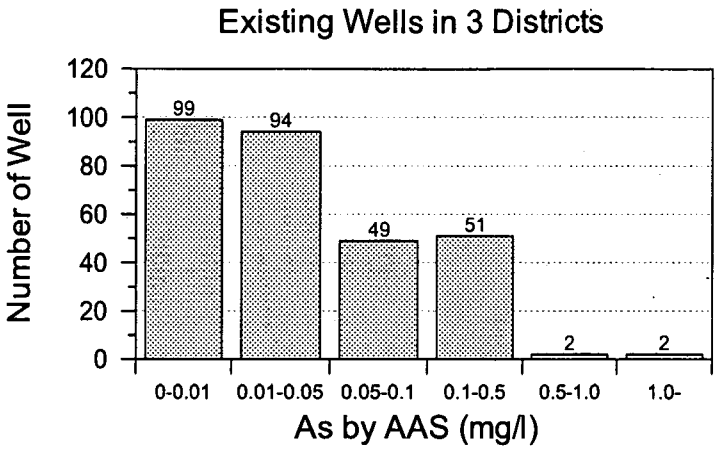
No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
151	EW-HKKl1-R (28)	Jhenaidah	Kaliganj	23.40889	89.13583	41.45	0	0.0011	72.3	0	7.07	36	26.8	241.1	5.30	8.12	2.82
152	EW-HKKs1-R (152)	Jhenaidah	Kaliganj	23.31343	89.11333	45.80	0	<0.0005	76.0	0	7.18	-15	27.0	189.9	5.54	8.18	2.64
153	EW-HKSm1-R (40)	Jhenaidah	Kaliganj	23.38167	89.10194	44.40	0.01	0.018	67.2	2	6.99	-110	26.3	95.4	4.73	7.49	2.76
154	EW-HKMi1-R (180)	Jhenaidah	Kaliganj	23.34509	89.21491	44.67	0.04	0.03	50.2	5	7.05	-110	26.7	95.1	5.89	4.92	-0.97
155	EW-HKSd1-R (9)	Jhenaidah	Kaliganj	23.43389	89.13694	44.80	0	<0.0005	74.4	0	7.00	38	26.8	243.1	3.89	7.65	3.76
156	EW-HKBr1-R (164)	Jhenaidah	Kaliganj	23.32574	89.14741	47.00	0.02	0.014	85.0	5	7.04	-94	26.6	111.2	4.46	7.32	2.86
157	EW-HKBr1-R (195)	Jhenaidah	Kaliganj	23.29463	89.18250	35.30	0.09	0.075	74.5	5	7.07	-127	26.6	78.2	5.96	7.35	1.39
158	EW-HKNm1-R (32)	Jhenaidah	Kaliganj	23.40074	89.16352	45.42	0	<0.0005	68.0	0	7.08	144	27.5	348.6	5.02	7.25	2.23
159	EW-HKNm1-R (123)	Jhenaidah	Kaliganj	23.36898	89.18537	44.31	0.02	0.0099	88.5	5	6.96	-92	28.0	112.2	5.89	5.04	-0.85
160	EW-HTEl1-R (75)	Jhenaidah	Kotchandpur	23.43528	89.04917	40.10	0.03	0.017	118.8	10	6.96	8	26.9	213.0	2.98	7.66	4.68
161	EW-HTKs1-R (32)	Jhenaidah	Kotchandpur	23.43833	88.99028	41.15	0.03	0.032	64.6	2	7.22	-20	27.0	184.9	4.43	9.29	4.86
162	EW-HTKt1-R (50)	Jhenaidah	Kotchandpur	23.46500	89.01111	50.65	0	<0.0005	74.7	0	7.22	282	26.3	487.4	3.68	8.53	4.85
163	EW-HTKt1-R (46)	Jhenaidah	Kotchandpur	23.41222	89.00917	30.20	0	<0.0005	67.5	1	7.16	220	27.0	424.9	4.50	9.08	4.58
164	EW-HTDr1-R (13)	Jhenaidah	Kotchandpur	23.48806	88.98167	43.85	1	0.24	78.6	5	7.16	-129	26.3	76.4	3.62	8.47	4.85
165	EW-HTDr1-R (18)	Jhenaidah	Kotchandpur	23.47722	88.95000	21.40	0.06	0.061	82.9	5	7.07	-139	26.7	66.1	3.92	10.58	6.66
166	EW-HTSb1-R (24)	Jhenaidah	Kotchandpur	23.45407	88.95315	25.80	0.06	0.051	61.7	5	7.13	-128	26.7	77.1	5.35	10.65	5.30
167	EW-HLBl1-R (40)	Jhenaidah	Kotchandpur	23.42222	88.95889	47.25	0.01	0.017	49.9	0.2	7.48	-113	27.0	91.9	4.82	6.90	2.08
168	EW-HMNp1-R (26)	Jhenaidah	Moheshpur	23.29324	88.76528	42.05	0.01	0.023	92.7	5	7.08	110	27.3	314.7	5.43	7.24	1.81
169	EW-HMKz1-R (13)	Jhenaidah	Moheshpur	23.27111	88.74611	48.22	0.02	0.04	73.3	5	7.15	190	27.0	394.9	5.21	8.26	3.05
170	EW-HMFt1-R (104)	Jhenaidah	Moheshpur	23.40722	88.89583	25.85	0.2	0.096	95.0	2	7.09	-133	26.6	72.2	4.27	6.65	2.38
171	EW-HMMd1-R (139)	Jhenaidah	Moheshpur	23.32167	88.94417	41.70	0.05	0.051	76.4	1	7.21	-139	26.8	66.1	6.76	10.46	3.70
172	EW-HMMd1-R (159)	Jhenaidah	Moheshpur	23.28306	88.95278	42.54	0.2	0.16	51.3	2	7.12	-141	26.2	64.5	4.83	7.87	3.04
173	EW-HMSk1-R (29)	Jhenaidah	Moheshpur	23.33806	88.76944	41.37	0.02	0.042	74.0	2	7.16	70	27.3	274.7	4.53	8.35	3.82
174	EW-HMBb1-R (48)	Jhenaidah	Moheshpur	23.28528	88.81639	51.75	0.01	0.057	68.0	1	7.13	187	26.9	392.0	3.84	7.58	3.74
175	EW-HMMh1-R (109)	Jhenaidah	Moheshpur	23.35472	88.91056	45.75	0.1	0.083	68.0	5	7.13	13	27.1	217.9	6.56	9.41	2.85
176	EW-HMPt1-R (74)	Jhenaidah	Moheshpur	23.36213	88.85657	40.55	0.2	0.092	77.0	5	7.09	30	26.5	235.3	3.33	6.92	3.59
177	EW-HMAz1-R (152)	Jhenaidah	Moheshpur	23.35861	88.98222	40.70	0.07	0.085	74.3	2	7.14	-139	26.1	66.6	5.32	8.09	2.77
178	EW-HMSd1-R (147)	Jhenaidah	Moheshpur	23.37556	88.94444	39.95	0.01	0.014	49.7	0.5	7.32	-118	26.7	87.1	3.82	8.51	4.69
179	EW-HMSw1-R (34)	Jhenaidah	Moheshpur	23.37315	88.80528	45.10	0.01	0.019	108.8	2	7.11	192	26.5	397.3	4.60	6.95	2.35
180	EW-HMNt1-R (95)	Jhenaidah	Moheshpur	23.32333	88.88528	42.30	0.2	0.13	79.3	5	7.07	-125	26.9	80.0	4.11	7.68	3.57
181	EW-HMJd1-R (56)	Jhenaidah	Moheshpur	23.27833	88.85222	39.35	0.01	0.026	46.7	1	7.26	-122	26.4	83.4	3.15	6.30	3.15
182	EW-HMJd1-R (90)	Jhenaidah	Moheshpur	23.26167	88.89250	40.45	0.01	0.021	68.9	2	7.12	-115	26.5	90.3	5.02	9.04	4.02
183	EW-HHTh1-R (9)	Jhenaidah	Harinakunda	23.70111	89.04611	41.28	0.04	0.03	67.6	1	7.10	-94	26.3	111.4	4.59	10.60	6.01
184	EW-HHRg1-R (48)	Jhenaidah	Harinakunda	23.64880	89.10287	41.21	0	0.0015	43.8	0.5	7.34	136	25.7	341.9	4.90	8.86	3.96
185	EW-HHHr1-R (26)	Jhenaidah	Harinakunda	23.66194	89.05528	37.45	0.09	0.11	81.4	2	7.15	96	27.1	300.9	3.62	9.26	5.64
186	EW-HHBy1-R (4)	Jhenaidah	Harinakunda	23.72778	89.11454	38.20	0.05	0.055	79.0	5	7.10	-127	26.4	78.4	4.77	11.12	6.35
187	EW-HHJr1-R (8)	Jhenaidah	Harinakunda	23.71889	89.07370	38.25	0.04	0.046	75.2	2	7.09	-112	26.3	93.4	4.53	10.28	5.75
188	EW-HHCd1-R (72)	Jhenaidah	Harinakunda	23.60611	89.13111	48.30	0	0.016	46.4	0	7.33	117	26.0	322.6	5.32	7.97	2.65
189	EW-HHDl1-R (33)	Jhenaidah	Harinakunda	23.64435	89.03417	38.28	0	<0.0005	61.4	0	7.22	320	26.5	525.3	3.45	9.26	5.81
190	EW-HHKp1-R (56)	Jhenaidah	Harinakunda	23.58806	89.07676	39.81	0.05	0.0325	59.4	2	7.15	92	27.4	296.6	5.29	9.65	4.36
191	EW-HSSr1-R (54)	Jhenaidah	Sailkupa	23.72917	89.24528	46.70	0	0.0018	79.5	0	7.06	326	26.7	531.1	5.22	9.90	4.68
192	EW-HSFz1-R (69)	Jhenaidah	Sailkupa	23.66944	89.25833	40.35	0.9	0.17	94.8	2	6.88	59	26.4	264.4	5.30	8.07	2.77
193	EW-HSDl1-R (96)	Jhenaidah	Sailkupa	23.66222	89.33667	40.78	0	0.0005	119.2	0	7.13	304	26.4	509.4	4.85	9.26	4.41
194	EW-HSDg1-R (40)	Jhenaidah	Sailkupa	23.69926	89.19593	35.10	0	0.0006	65.3	0	7.28	33	26.2	238.5	4.92	9.26	4.34
195	EW-HSUm1-R (122)	Jhenaidah	Sailkupa	23.64139	89.25056	34.80	0	<0.0005	84.7	0	7.19	187	26.1	392.6	5.25	8.04	2.79
196	EW-HSFl1-R (133)	Jhenaidah	Sailkupa	23.63528	89.18611	40.55	0	0.0005	65.6	0	7.12	210	26.0	415.6	5.57	8.93	3.36
197	EW-HSNt1-R (155)	Jhenaidah	Sailkupa	23.59250	89.25833	41.37	0	<0.0005	52.8	0	7.04	322	26.1	527.6	3.91	6.72	2.81
198	EW-HSNt1-R (166)	Jhenaidah	Sailkupa	23.62861	89.27435	39.75	0	<0.0005	86.6	0	7.11	325	26.8	530.1	5.21	8.34	3.13
199	EW-HSHk1-R (88)	Jhenaidah	Sailkupa	23.69056	89.30870	42.34	0.03	0.045	96.4	5	6.90	58	26.3	263.4	5.22	9.66	4.44
200	EW-HSSl1-R (51)	Jhenaidah	Sailkupa	23.68444	89.24556	40.85	0	0.009	87.3	0	7.02	283	26.3	488.4	5.14	9.23	4.09

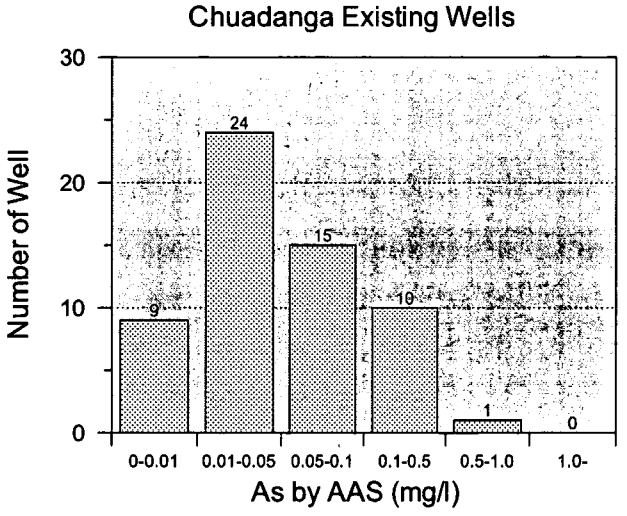
Table 4.2.1 Results of 300 Existing Wells Survey in Rainy Season [June to July 2000] (5/6)

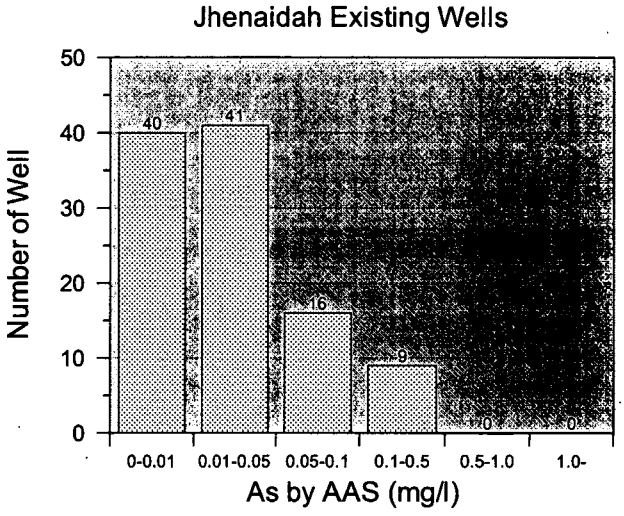
No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
201	EW-HSAb1-R (177)	Jhenaidah	Sailkupa	23.60917	89.31389	43.64	0	<0.0005	90.0	0	7.07	320	27.1	524.9	5.05	8.08	3.03
202	EW-HSBg1-R (101)	Jhenaidah	Sailkupa	23.62083	89.34806	40.92	0	0.0009	93.8	0	7.01	354	26.8	559.1	4.07	8.17	4.10
203	EW-HSBg1-R (115)	Jhenaidah	Sailkupa	23.64500	89.30250	39.40	0	<0.0005	92.1	0	7.03	356	25.9	561.7	4.77	8.65	3.88
204	EW-HSKc1-R (27)	Jhenaidah	Sailkupa	23.74000	89.20500	38.30	0.02	0.021	77.3	2	7.02	-95	26.0	110.6	4.97	10.07	5.10
205	EW-HSTb1-R (16)	Jhenaidah	Sailkupa	23.70611	89.15000	45.35	0.02	0.028	52.0	2	7.21	-135	26.8	70.1	5.68	9.22	3.54
206	EW-HSMr1-R (9)	Jhenaidah	Sailkupa	23.66509	89.16167	41.70	0	0.029	54.2	0	7.15	131	26.6	336.2	5.55	10.25	4.70
207	EW-HSDd1-R (145)	Jhenaidah	Sailkupa	23.61083	89.20778	44.54	0.02	0.019	61.5	2	7.20	-120	26.2	85.5	3.10	6.79	3.69
208	EW-CAAl 1-R (79)	Chuadanga	Alamdanga	23.76083	88.94361	35.20	0.03	0.046	85.6	10	7.08	-120	26.4	85.4	2.68	12.22	9.54
209	EW-CAAl 1-R (72)	Chuadanga	Alamdanga	23.75042	88.93722	32.49	0.02	0.021	94.9	5	7.15	-71	27.0	133.9	2.78	11.01	8.23
210	EW-CABr 1-R (56)	Chuadanga	Alamdanga	23.75083	88.86426	39.21	0.01	0.03	60.0	2	7.14	-88	26.7	117.1	6.08	12.75	6.67
211	EW-CABg 1-R (6)	Chuadanga	Alamdanga	23.78958	88.83792	29.72	0.06	0.04	93.6	10	7.09	-120	27.4	84.6	3.90	12.32	8.42
212	EW-CADu 1-R (78)	Chuadanga	Alamdanga	23.72843	88.96694	37.57	0.02	0.018	60.1	0.5	7.15	-45	26.7	160.1	1.99	10.68	8.69
213	EW-CAGg 1-R (09)	Chuadanga	Alamdanga	23.76259	88.83454	36.16	0.04	0.037	75.0	5	7.20	-90	27.5	114.6	4.33	12.91	8.58
214	EW-CAGg 1-R (18)	Chuadanga	Alamdanga	23.74306	88.82306	39.26	0.01	0.014	42.0	0.5	7.43	-90	27.3	114.7	5.12	12.20	7.08
215	EW-CAHr 1-R (68)	Chuadanga	Alamdanga	23.79083	88.89676	39.81	0	0.0006	63.4	0	7.19	180	26.3	385.4	4.44	12.41	7.97
216	EW-CAKl 1-R (95)	Chuadanga	Alamdanga	23.79472	88.94597	26.68	0.1	0.063	130.0	10	7.08	-103	26.3	102.4	3.94	13.33	9.39
217	EW-CAJm 1-R (103)	Chuadanga	Alamdanga	23.72000	89.00481	36.58	0	<0.0005	52.2	0	7.20	300	26.7	505.1	3.24	11.26	8.02
218	EW-CAJh 1-R (30)	Chuadanga	Alamdanga	23.68847	88.87250	36.64	0.01	0.036	67.5	2	7.24	-45	26.4	160.4	6.09	11.35	5.26
219	EW-CAJh 1-R (81)	Chuadanga	Alamdanga	23.73000	88.90667	36.76	0	<0.0005	48.0	0	7.30	330	27.5	534.6	3.93	11.96	8.03
220	EW-CAKd 1-R (22)	Chuadanga	Alamdanga	23.72083	88.81056	36.10	0.01	0.0076	106.5	5	7.20	-105	26.5	100.3	3.28	11.72	8.44
221	EW-CAKd 1-R (35)	Chuadanga	Alamdanga	23.71778	88.85583	31.00	0.01	0.051	79.9	5	7.17	-115	26.7	90.1	5.18	12.04	6.86
222	EW-CAKs 1-R (116)	Chuadanga	Alamdanga	23.66111	88.97472	36.72	0.02	0.032	70.0	10	7.20	-95	26.3	110.4	2.59	9.45	6.86
223	EW-CAKs 1-R (120)	Chuadanga	Alamdanga	23.63222	88.95694	35.32	0.2	0.1	82.0	10	7.12	-111	26.2	94.5	3.30	10.10	6.80
224	EW-CAKm 1-R (48)	Chuadanga	Alamdanga	23.76847	88.91208	35.30	0	0.016	53.0	2	7.31	-90	26.0	115.6	3.80	12.23	8.43
225	EW-CANg 1-R (90)	Chuadanga	Alamdanga	23.66389	88.93528	41.58	0.7	0.23	76.5	10	7.09	-121	26.2	84.5	3.32	10.67	7.35
226	EW-CANg 1-R (119)	Chuadanga	Alamdanga	23.63694	88.95722	63.71	0	0.0007	63.0	0	7.18	305	25.8	510.8	3.29	9.85	6.56
227	EW-CDDm 1-R (34)	Chuadanga	Damurhuda	23.59935	88.70861	37.28	0.01	0.0258	85.7	2	7.32	-90	27.8	114.4	5.37	10.41	5.04
228	EW-CDDm 1-R (59)	Chuadanga	Damurhuda	23.60472	88.76542	35.35	0.02	0.033	55.0	1	7.40	-90	27.1	114.9	5.49	11.30	5.81
229	EW-CDDr 1-R (20)	Chuadanga	Damurhuda	23.49250	88.76287	31.58	0.02	0.051	45.7	2	7.30	-50	28.0	154.2	6.39	9.14	2.75
230	EW-CDDr 1-R (75)	Chuadanga	Damurhuda	23.52167	88.79039	30.31	0.3	0.11	59.9	5	7.35	-118	27.3	86.7	5.67	8.96	3.29
231	EW-CDHw 1-R (73)	Chuadanga	Damurhuda	23.54972	88.81014	33.43	0.3	0.23	75.7	5	7.37	-135	26.6	70.2	4.64	10.93	6.29
232	EW-CDHw 1-R (68)	Chuadanga	Damurhuda	23.57694	88.79472	37.92	0.3	0.12	90.8	2	7.22	-98	27.0	106.9	6.29	11.73	5.44
233	EW-CDJr 1-R (51)	Chuadanga	Damurhuda	23.68194	88.78694	36.50	0	<0.0005	112.6	0.2	7.09	224	27.0	428.9	5.14	11.70	6.56
234	EW-CDKp 1-R (7)	Chuadanga	Damurhuda	23.57139	88.67431	34.86	0.01	0.014	74.6	2	7.36	-92	27.5	112.6	4.60	10.90	6.30
235	EW-CDKr 1-R (26)	Chuadanga	Damurhuda	23.51972	88.72222	31.65	0	0.0092	120.0	2	7.20	-80	28.0	124.2	7.20	9.41	2.21
236	EW-CDKr 1-R (29)	Chuadanga	Damurhuda	23.55167	88.73111	34.00	0	0.02	75.0	2	7.19	-65	27.5	139.6	7.11	11.42	4.31
237	EW-CDNt 1-R (41)	Chuadanga	Damurhuda	23.65306	88.71083	32.81	0.01	0.01	81.1	2	7.25	-90	26.8	115.1	5.29	10.76	5.47
238	EW-CDNt 1-R (43)	Chuadanga	Damurhuda	23.63472	88.70361	40.73	0.03	0.072	101.6	5	7.30	-102	27.5	102.6	5.63	9.60	3.97
239	EW-CCAl 1-R (1)	Chuadanga	Chuadanga Sadar	23.66963	88.81944	32.31	0.03	0.028	21.0	0.5	7.40	21	27.0	225.9	6.10	12.05	5.95
240	EW-CCBg 1-R (18)	Chuadanga	Chuadanga Sadar	23.55389	88.86306	37.22	0.03	0.024	62.5	2	7.27	-105	26.7	100.1	3.73	11.42	7.69
241	EW-CCBg 1-R (66)	Chuadanga	Chuadanga Sadar	23.51306	88.88528	35.67	0.04	0.046	72.0	5	7.28	-105	27.5	99.6	3.67	10.20	6.53
242	EW-CCKt 1-R (78)	Chuadanga	Chuadanga Sadar	23.59213	88.93806	25.48	0.3	0.16	64.3	10	7.11	-113	26.6	92.2	4.53	10.72	6.19
243	EW-CCkt 1-R (91)	Chuadanga	Chuadanga Sadar	23.56819	88.97653	44.22	0	<0.0005	68.9	0	7.18	150	26.9	355.0	4.63	10.35	5.72
244	EW-CCMm 1-R (47)	Chuadanga	Chuadanga Sadar	23.65139	88.89556	46.55	0.01	0.049	55.7	2	7.25	-32	26.3	173.4	3.56	10.83	7.27
245	EW-CCPd 1-R (53)	Chuadanga	Chuadanga Sadar	23.61583	88.88347	31.72	0.03	0.023	106.9	5	7.20	-104	26.6	101.2	4.82	10.74	5.92
246	EW-CCPd 1-R (81)	Chuadanga	Chuadanga Sadar	23.60519	88.93111	31.23	0.3	0.099	84.3	5	7.17	-113	28.1	91.1	4.23	11.40	7.17
247	EW-CCCd 1-R (5)	Chuadanga	Chuadanga Sadar	23.63056	88.81157	35.47	0.05	0.072	73.1	5	7.09	-57	27.5	147.2	7.09	11.52	4.43
248	EW-CCCd 1-R (41)	Chuadanga	Chuadanga Sadar	23.63111	88.85917	34.85	0.01	0.025	68.0	2	7.08	-32	27.1	172.9	5.48	11.64	6.16
249	EW-CCSk 1-R (33)	Chuadanga	Chuadanga Sadar	23.58306	88.85833	42.43	0	<0.0005	63.4	0	7.28	125	27.1	329.9	4.57	10.59	6.02
250	EW-CCSk 1-R (35)	Chuadanga	Chuadanga Sadar	23.58917	88.88556	30.95	0.03	0.079	61.9	2	7.20	-100	26.6	105.2	3.02	9.63	6.61

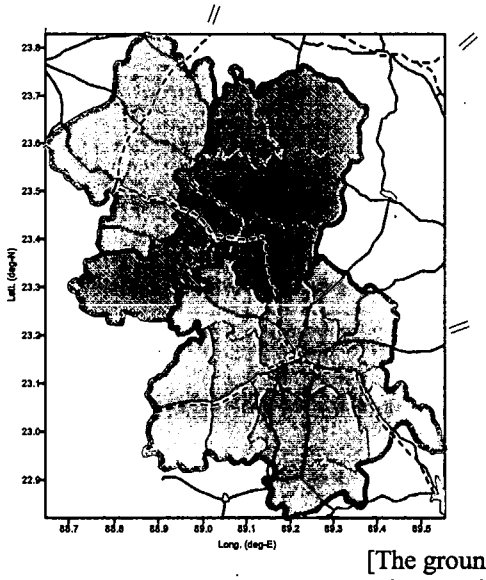
Table 4.2.1 Results of 300 Existing Wells Survey in Rainy Season [June to July 2000] (6/6)

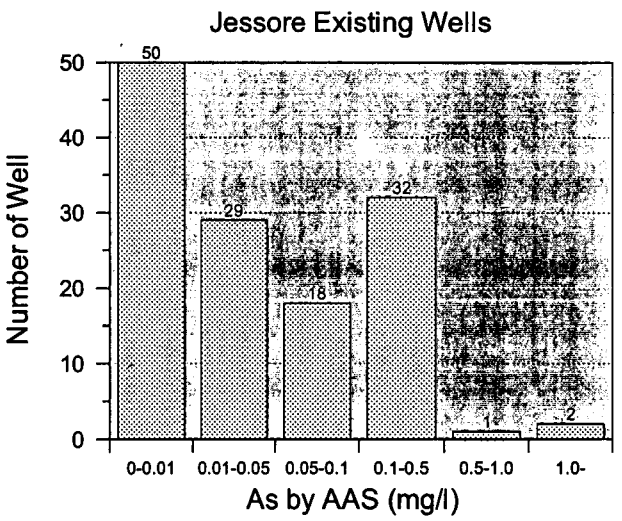
No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
251	EW-CCTt 1-R (72)	Chuadanga	Chuadanga Sadar	23.54472	88.90806	35.67	0.3	0.16	69.4	5	7.14	-98	27.0	106.9	3.25	9.36	6.11
252	EW-CCTt 1-R (98)	Chuadanga	Chuadanga Sadar	23.49639	88.92833	37.55	0.09	0.065	72.0	5	7.20	-115	26.9	90.0	4.41	9.62	5.21
253	EW-CJUt 1-R (31)	Chuadanga	Jibannagar	23.45667	88.83194	42.00	0.01	0.026	58.6	2	7.35	-65	26.5	140.3	3.96	9.79	5.83
254	EW-CJUt 1-R (36)	Chuadanga	Jibannagar	23.47667	88.87833	38.64	0.03	0.049	72.4	5	7.30	-85	27.3	119.7	4.97	9.57	4.60
255	EW-CJJb 1-R (10)	Chuadanga	Jibannagar	23.43509	88.78398	41.00	0.02	0.019	102.0	5	6.98	-92	26.6	113.2	5.37	7.87	2.50
256	EW-CJJb 1-R (20)	Chuadanga	Jibannagar	23.40083	88.80833	38.42	0.2	0.1	68.7	5	7.09	-115	26.6	90.2	3.85	7.92	4.07
257	EW-CJBk 1-R (47)	Chuadanga	Jibannagar	23.41486	88.85486	29.57	0.05	0.076	50.1	2	7.23	-113	27.3	91.7	6.95	10.76	3.81
258	EW-CJBk 1-R (69)	Chuadanga	Jibannagar	23.43917	88.91167	36.10	0.3	0.46	62.3	5	7.22	-110	27.3	94.7	5.27	8.86	3.59
259	EW-CJAd 1-R (54)	Chuadanga	Jibannagar	23.47311	88.88606	34.00	0.2	0.43	67.9	5	7.17	-105	27.7	99.4	4.49	9.06	4.57
260	EW-CJAd 1-R (55)	Chuadanga	Jibannagar	23.48253	88.89819	39.35	0.3	0.5	78.0	5	7.10	-105	26.8	100.1	4.64	9.68	5.04
261	EW-JJJs1-R (PTW-10),T-1)	Jessore	Jessore Sadar	23.17861	89.19796	115.41	0	0.0075	56.0	0	7.45	27	26.0	232.6	6.18	6.82	0.64
262	EW-JJJs1-R (T.PTW-02),T-2)	Jessore	Jessore Sadar	23.17056	89.19463	125.15	0.02	0.013	54.1	0.5	7.17	240	26.5	445.3	6.27	5.97	-0.29
263	EW-JJJs1-R (PTW-02),T-3)	Jessore	Jessore Sadar	23.17139	89.20000	132.54	0	0.0025	70.5	0	7.27	0	26.6	205.2	5.94	7.07	1.13
264	EW-JJJs1-R (T.PTW-04),T-4	Jessore	Jessore Sadar	23.16667	89.20556	98.85	0	<0.0005	79.2	0	7.31	374	26.5	579.3	6.19	7.18	0.99
265	EW-JJJs1-R (PTW-11),T-5	Jessore	Jessore Sadar	23.16306	89.20444	117.53	0	<0.0005	76.2	0	7.27	82	27.0	286.9	5.82	6.25	0.43
266	EW-JJJs 1-R(T.PTW-6),T-6	Jessore	Jessore Sadar	23.16426	89.21028	125.84	0	<0.0005	79.3	0.5	7.31	248	27.9	452.3	9.78	6.50	-3.28
267	EW-JJJs 1-R(PTW-7),T-7	Jessore	Jessore Sadar	23.16917	89.21843	114.77	0	<0.0005	82.5	0	7.51	270	34.1	469.8	6.49	6.62	0.13
268	EW-JJJs 1-R (T.PTW-9),T-9	Jessore	Jessore Sadar	23.16417	89.22306	118.46	0	<0.0005	98.2	0.2	7.30	270	27.3	474.7	5.54	6.49	0.95
269	EW-JJJs 1-R (PTW-15),T-10	Jessore	Jessore Sadar	23.16500	89.22667	124.10	0	0.0005	85.2	0.5	7.24	-60	28.0	144.2	6.10	6.63	0.53
270	EW-JJJs 1-R (PTW-8),T-11	Jessore	Jessore Sadar	23.15861	89.21528	89.31	0	<0.0005	86.4	0	7.33	47	28.0	251.2	5.46	6.03	0.57
271	EW-JJJs 1-R(PTW-13),T-12	Jessore	Jessore Sadar	23.15481	89.21463	120.16	0	0.0018	86.2	0	7.50	-52	26.9	153.0	4.77	5.72	0.95
272	EW-JJJs 1-R(PTW-14),T-14	Jessore	Jessore Sadar	23.15157	89.20389	103.60	0	0.0021	78.4	0.2	7.42	327	28.6	530.8	5.30	4.39	-0.90
273	EW-JJJs1-R(PTW-12),T-15	Jessore	Jessore Sadar	23.14722	89.20065	118.46	0.02	0.026	85.4	2	7.15	-107	27.0	97.9		4.62	
274	EW-JJJs1-R(PTW-17),T-17	Jessore	Jessore Sadar	23.17194	89.21380	85.32	0	<0.0005	85.8	0.2	7.18	340	28.1	544.1	6.38	6.34	-0.04
275	EW-HJJn 1-R (PTW-01)	Jhenaidah	Jhenaidah Sadar	23.54417	89.17431	99.20	0	0.0088	80.6	0.5	7.05	-55	26.6	150.2	5.40	7.75	2.35
276	EW-HJJn 1-R (PTW-03)	Jhenaidah	Jhenaidah Sadar	23.54583	89.16333	95.32	0.02	0.033	59.8	0.2	7.16	-54	26.2	151.5	5.94	8.35	2.41
277	EW-HJJn 1-R (PTW-04)	Jhenaidah	Jhenaidah Sadar	23.53602	89.17361		0.01	0.0027	62.1	0.5	7.07	-22	26.9	183.0	5.81	7.17	1.36
278	EW-HJJn 1-R (PTW-05)	Jhenaidah	Jhenaidah Sadar	23.55306	89.17361	123.24	0.06	0.06	76.7	0.5	7.35	-58	26.5	147.3	6.58	8.75	2.17
279	EW-HJJn 1-R (PTW-06)	Jhenaidah	Jhenaidah Sadar	23.55241	89.16139	99.20	0.04	0.06	57.6	1	7.05	45	27.6	249.5	6.54	8.78	2.24
280	EW-HJJn 1-R (PTW-07)	Jhenaidah	Jhenaidah Sadar	23.53639	89.16778	96.22	0	0.0012	64.3	0	7.04	64	26.5	269.3	5.70	8.01	2.31
281	EW-HKKl 1-R (PTW-01)	Jhenaidah	Kaliganj	23.40568	89.13135	124.56	0.02	0.019	75.0	2	6.97	-30	26.6	175.2	5.23	7.78	2.55
282	EW-HKKl 1-R (PTW-02)	Jhenaidah	Kaliganj	23.40667	89.13917	124.56	0.01	0.011	71.8	0.5	7.20	-35	26.4	170.4	5.29	8.66	3.37
283	EW-HKKl 1-R (PTW-03)	Jhenaidah	Kaliganj	23.40926	89.13444	128.97	0.01	0.025	75.0	0.5	7.01	17	27.0	221.9	5.52	8.02	2.50
284	EW-HTKt 1-R (PTW-01)	Jhenaidah	Kotchandpur	23.40750	89.01556	116.79	0	0.0077	69.0	0.5	7.13	-60	26.5	145.3	4.22	9.09	4.87
285	EW-HTKt 1-R (PTW-02)	Jhenaidah	Kotchandpur	23.40944	89.01028	110.50	0	0.0044	73.0	0.2	7.22	-31	27.0	173.9	5.03	9.27	4.24
286	EW-HTKt 1-R (PTW-03)	Jhenaidah	Kotchandpur	23.39722	89.01250	118.93	0.01	0.015	82.5	0.5	7.21	-70	26.9	135.0	6.71	9.59	2.88
287	EW-HMMh 1-R (PTW-01)	Jhenaidah	Mohespur	23.35194	88.91778	99.60	0.07	0.068	53.6	0.5	7.28	-104	27.0	100.9	5.65	9.17	3.52
288	EW-HMMh 1-R (PTW-02)	Jhenaidah	Mohespur	23.35444	88.91222	113.17	0.1	0.082	64.0	1	7.14	-99	27.0	105.9	6.39	9.64	3.25
289	EW-HSSI 1-R (PTW-01)	Jhenaidah	Sailkupa	23.68694	89.24167	96.54	0	0.0027	80.4	0.2	7.12	248	27.7	452.4	5.24	8.00	2.76
290	EW-HSSI 1-R (PTW-02)	Jhenaidah	Sailkupa	23.68694	89.24972	93.49	0	0.0032	90.2	0.5	7.11	288	26.8	493.1	5.02	9.55	4.53
291	EW-HSSI 1-R (PTW-03)	Jhenaidah	Sailkupa	23.68157	89.24278	97.76	0	0.01	86.8	0.5	7.12	215	27.1	419.9	5.91	9.17	3.26
292	EW-CCCd 1-R (PTW-01)	Chuadanga	Chuadanga Sadar	23.63917	88.83972	106.50	0.08	0.08	65.1	0.2	7.32	148	27.3	352.7	5.98	12.17	6.19
293	EW-CCCd 1-R (PTW-2A)	Chuadanga	Chuadanga Sadar	23.64361	88.85000	102.10	0.09	0.071	62.8	0.5	7.17	5	27.3	209.7	4.95	11.94	6.99
294	EW-CCCd 1-R (PTW-2B)	Chuadanga	Chuadanga Sadar	23.64417	88.85167	133.00	0.08	0.063	75.4	1	7.02	-40	27.0	164.9	4.78	11.90	7.12
295	EW-CCCd 1-R (PTW-03)	Chuadanga	Chuadanga Sadar	23.63454	88.84815	133.00	0.06	0.058	61.6	0.5	7.36	40	27.3	244.7	5.41	11.92	6.51
296	EW-CCCd 1-R (PTW-04)	Chuadanga	Chuadanga Sadar	23.63500	88.82306	109.72	0.05	0.081	70.2	0.2	7.35	160	27.3	364.7	5.79	13.65	7.86
297	EW-CCCd 1-R (PTW-05)	Chuadanga	Chuadanga Sadar	23.63667	88.85944		0.05	0.055	54.5	2	7.12	-50	27.1	154.9	4.99	11.74	6.75
298	EW-JJJs 1-R (T.PTW-8) (T-8)	Jessore	Jessore Sadar	23.16667	89.21861											6.78	
299	EW-JJJs1-R(T.PTW-13),(T-13)	Jessore	Jessore Sadar	23.15556	89.21083											4.88	
300	EW-JJJs1-R(T.PTW-16), (T-16)	Jessore	Jessore Sadar	23.16981	89.21083											7.32	









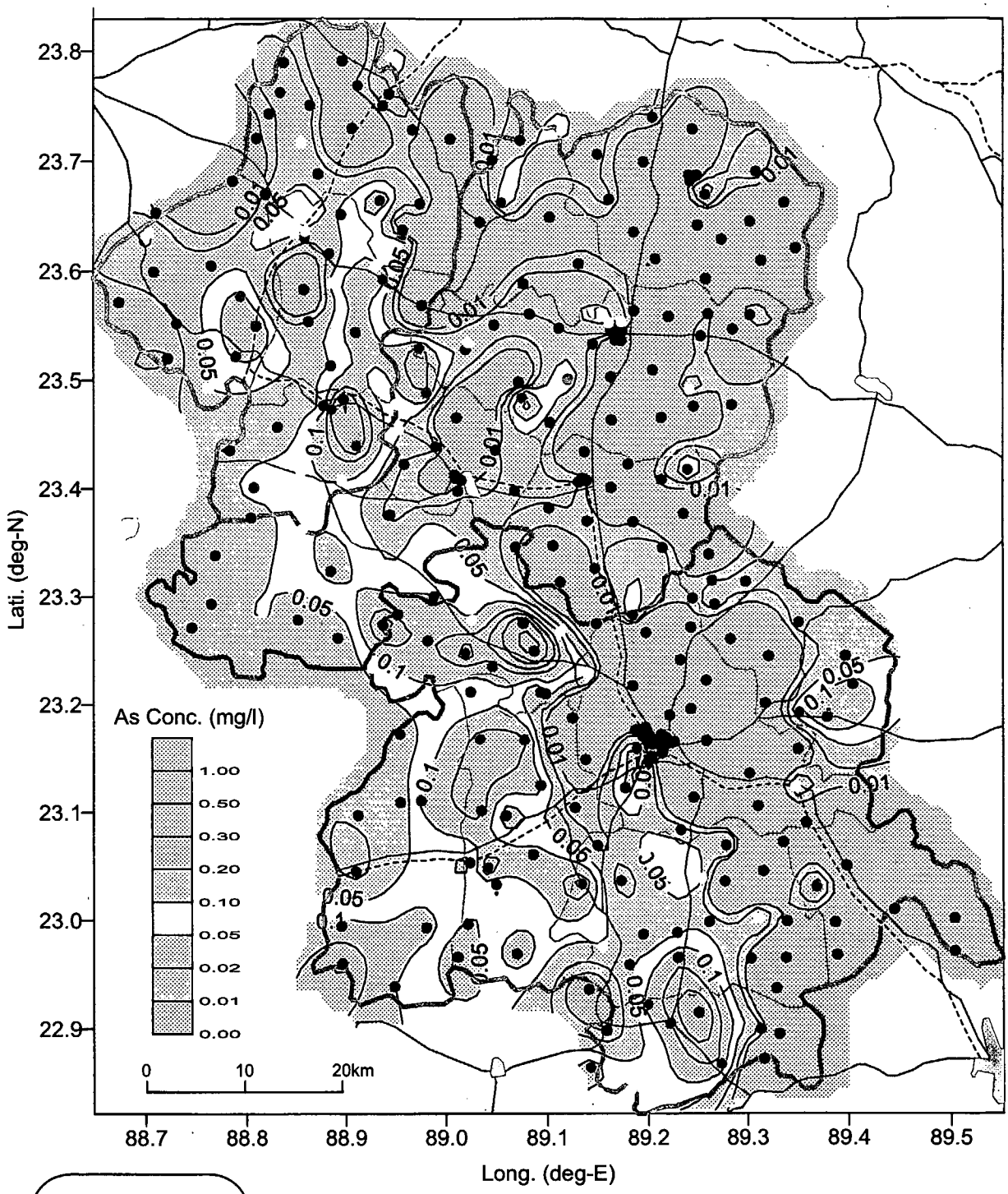


[The groundwater samples were collected in June to July 2000.
The arsenic concentrations were analyzed by the AAS in Jhenaidah Laboratory.]

Figure 4.2.1	As Concentrations by District in Rainy Season Analyzed by AAS

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



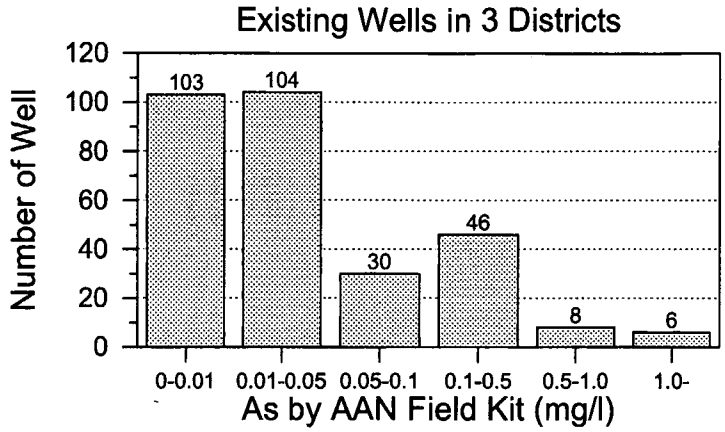
As (mg/l) analyzed by AAS
- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1
- 1 to 2

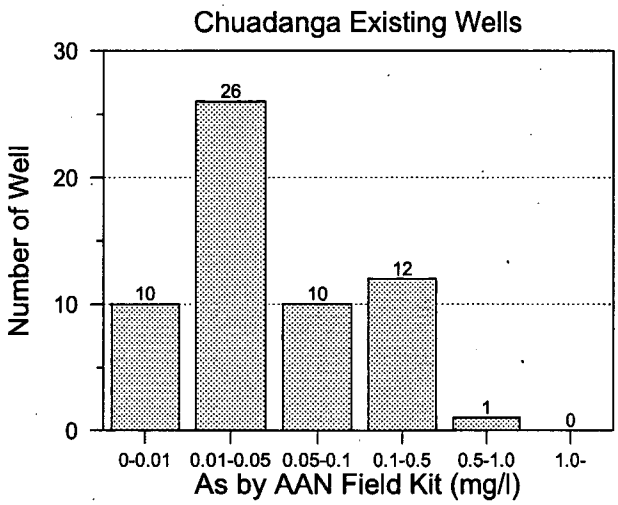
[The groundwater samples of 300 existing wells were collected in June to July 2000.]
[The arsenic concentrations were analyzed by AAS in Jhenaidah Laboratory established by the JICA Study Team.]

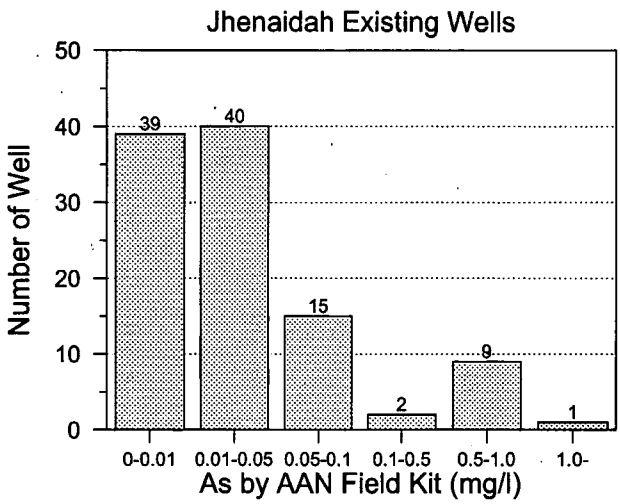
Figure 4.2.2 **As Concentration in Rainy Season Analyzed by AAS**

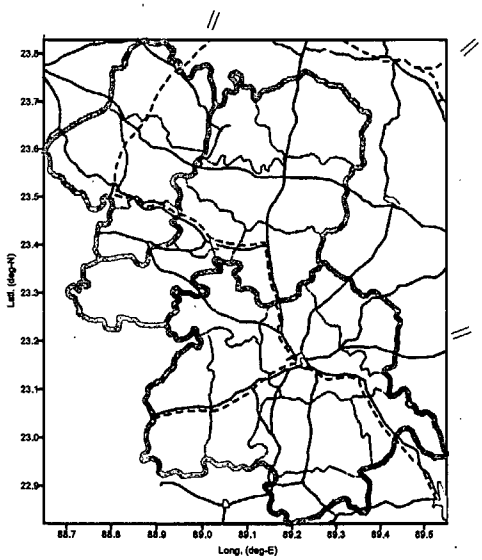
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

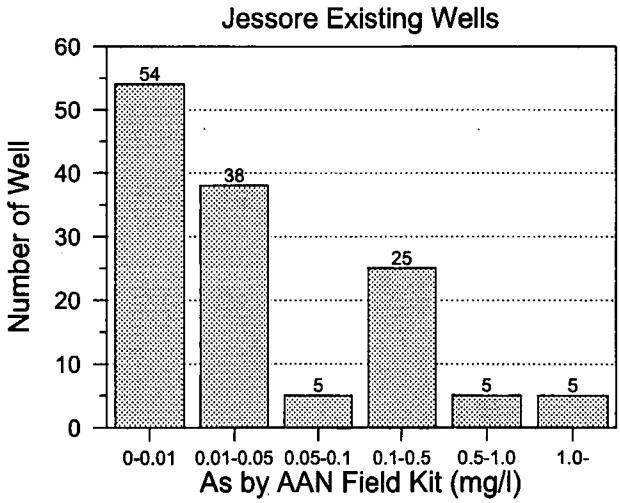
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)









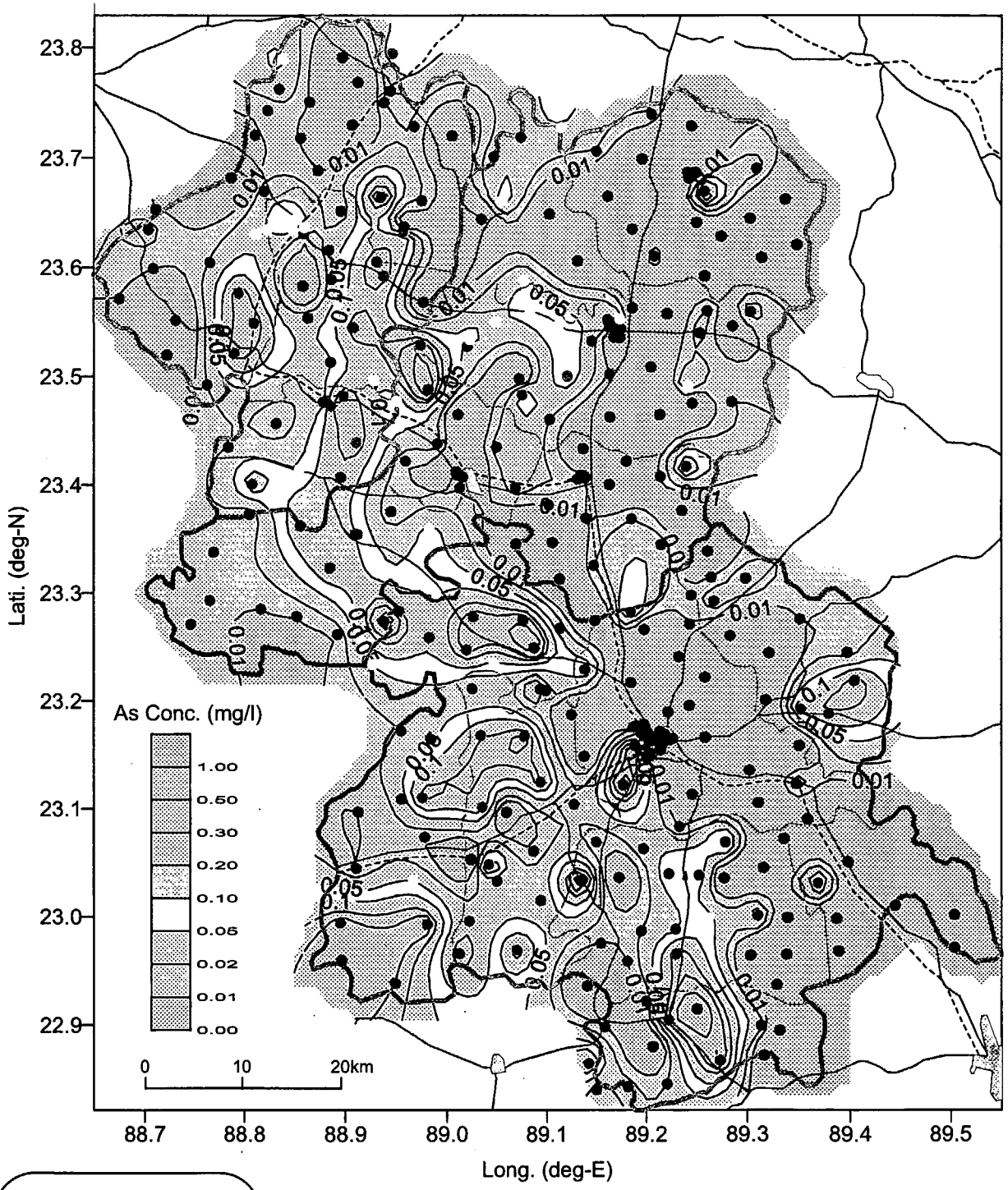


[The groundwater samples were collected in June to July 2000.
The arsenic concentrations were measured by the AAN Filed Kit.]

Figure 4.2.3	As Concentrations by District in Rainy Season by AAN Field Kit

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



As (mg/l) measured by AAN Field Kit

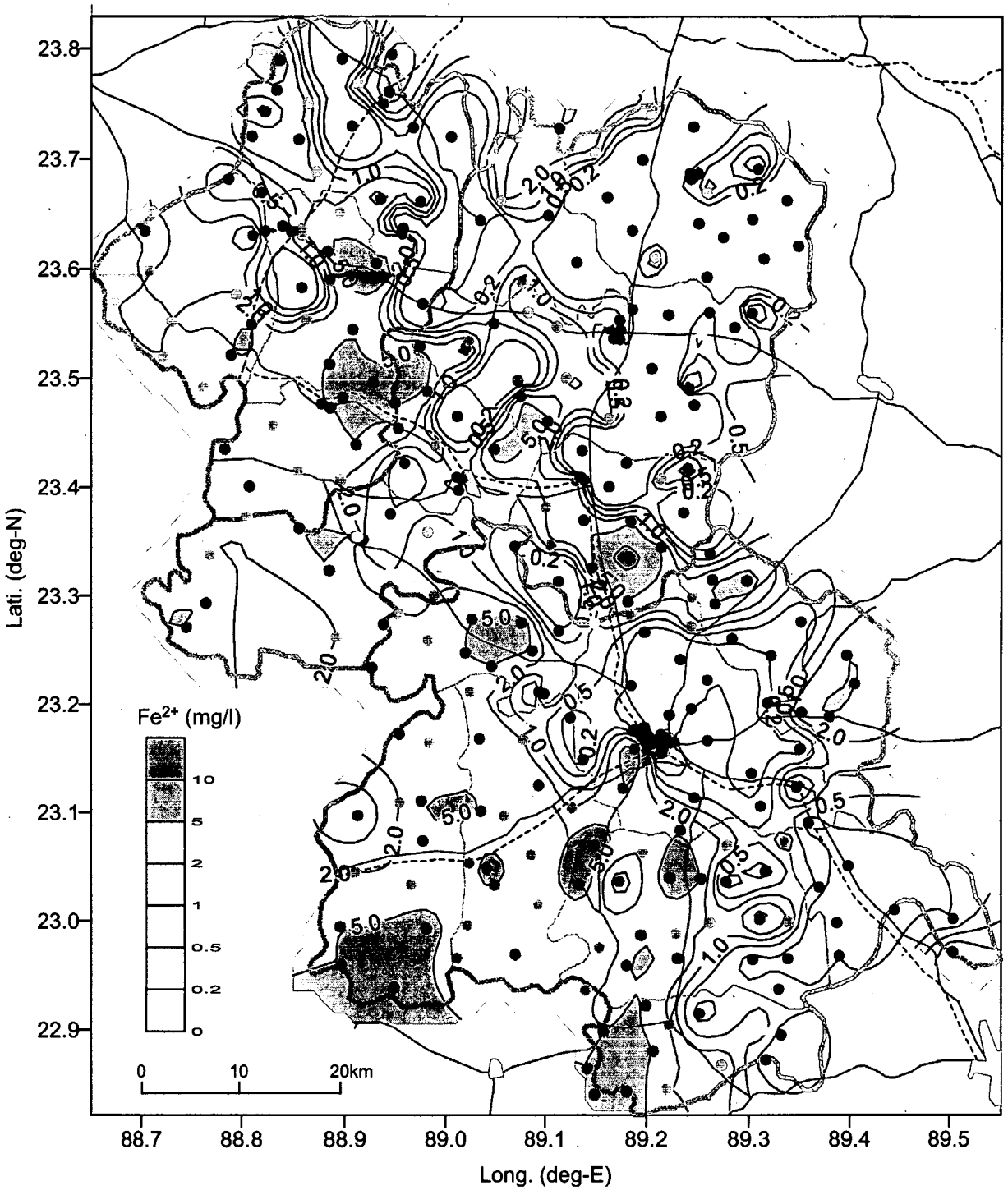
- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1
- 1 to 2

[The groundwater samples of 300 existing wells were collected in June to July 2000.]
The arsenic concentrations were measured by the AAN Field Kit.]

Figure 4.2.4 **As Concentration in Rainy Season Analyzed by AAN Field Kit**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



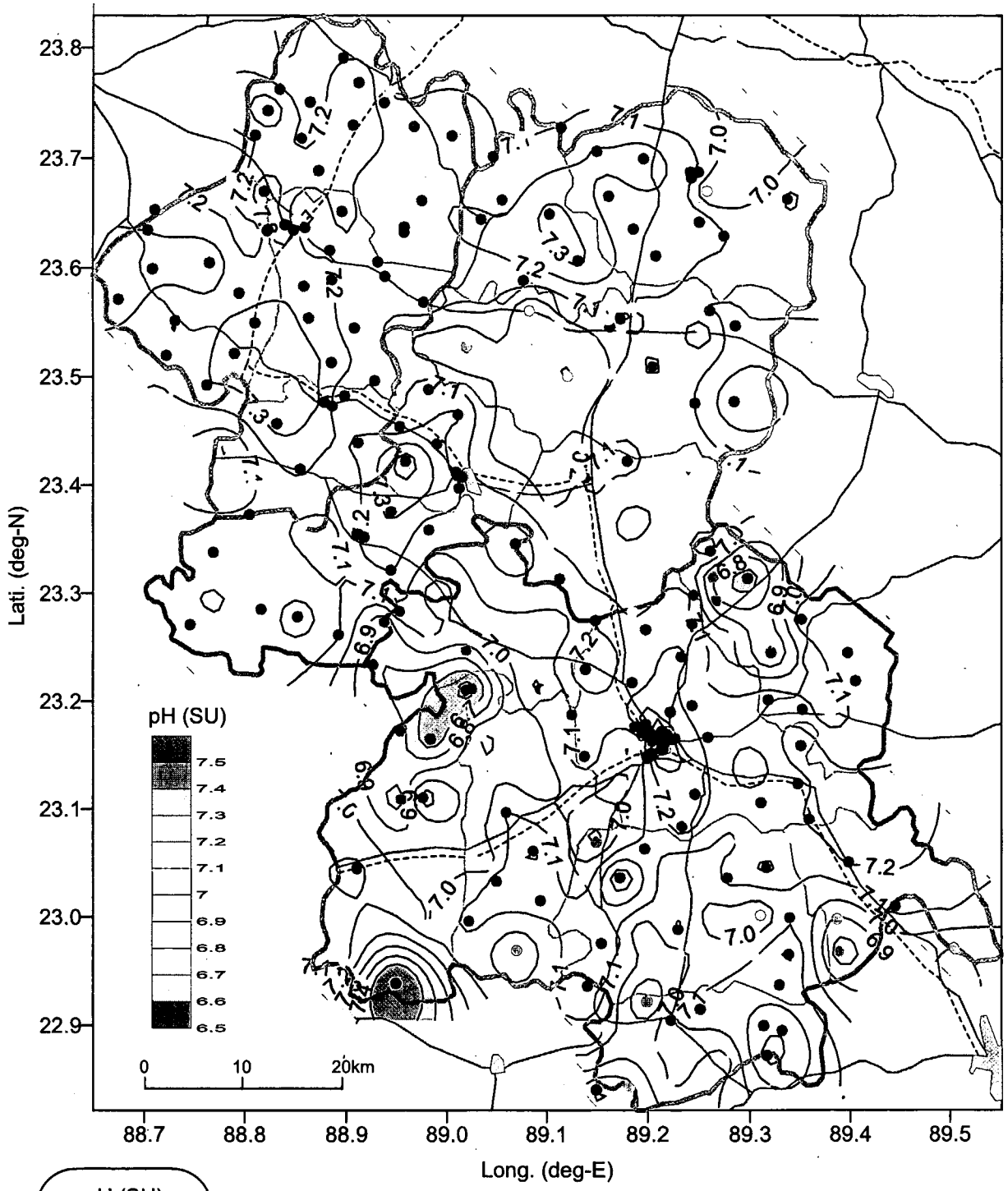
Fe^{2+}(mg/l)
- 0.0 to 0.2
- 0.2 to 1.0
- 1.0 to 2.0
- 2.0 to 5.0
- 5.0 to 10.0

[Iron (Fe^{2+}) concentrations in groundwater of 300 existing wells were measured in June to July 2000 using Iron Pack Test Kit.]

Figure 4.2.5	Iron (Fe^{2+}) Concentrations Measured at 300 Existing Wells in Rainy Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



pH (SU)
- 6.5 to 6.7
- 6.7 to 6.9
- 6.9 to 7.1
- 7.1 to 7.3
- 7.3 to 7.5
- 7.5 to 7.8

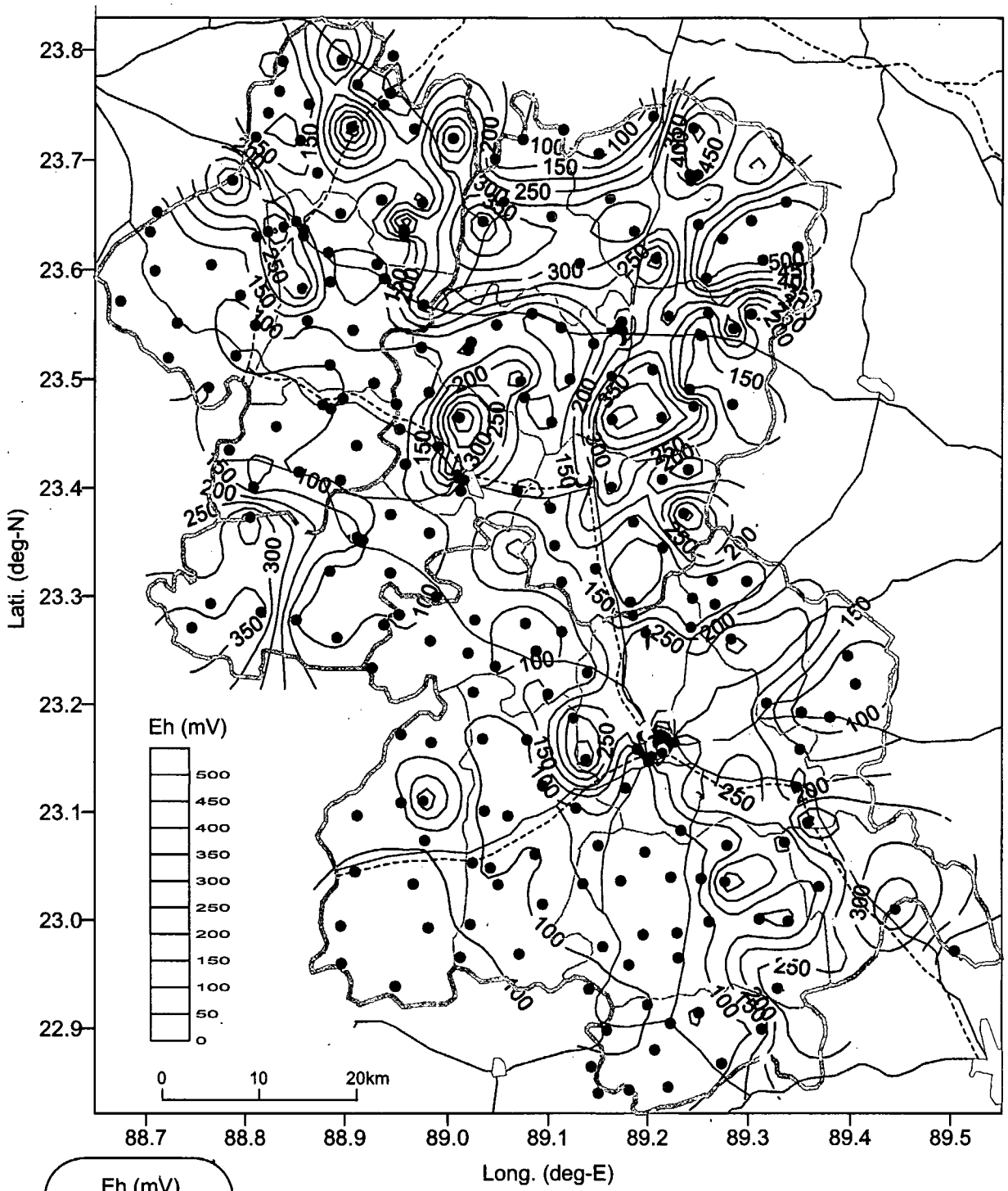
[SU: Standard Units]

[pH values in groundwater of 300 existing wells were measured in June to July 2000 by potable pH meter.]

Figure 4.2.6	pH Values Measured at 300 Existing Wells in Rainy Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



Eh (mV)

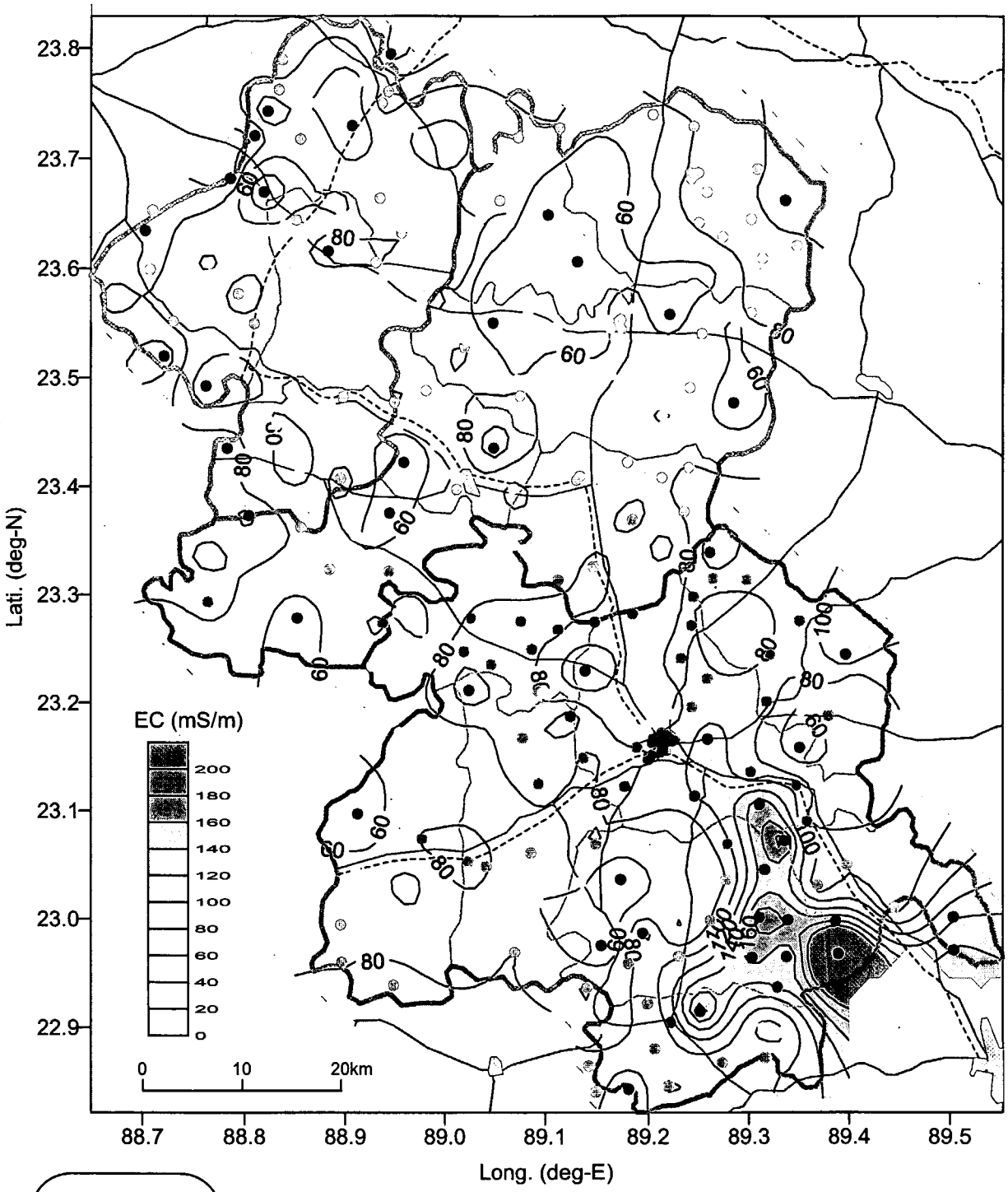
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 200
- 200 to 250
- 250 to 300
- 300 to 350
- 350 to 400
- 400 to 450
- 450 to 600

[ORP (Oxidation-Reduction Potential) values in groundwater of 300 existing wells were measured in June to July 2000 by potable ORP meter.
Then, the reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.2.7	Eh Values Measured at 300 Existing Wells in Rainy Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



EC (mS/m)

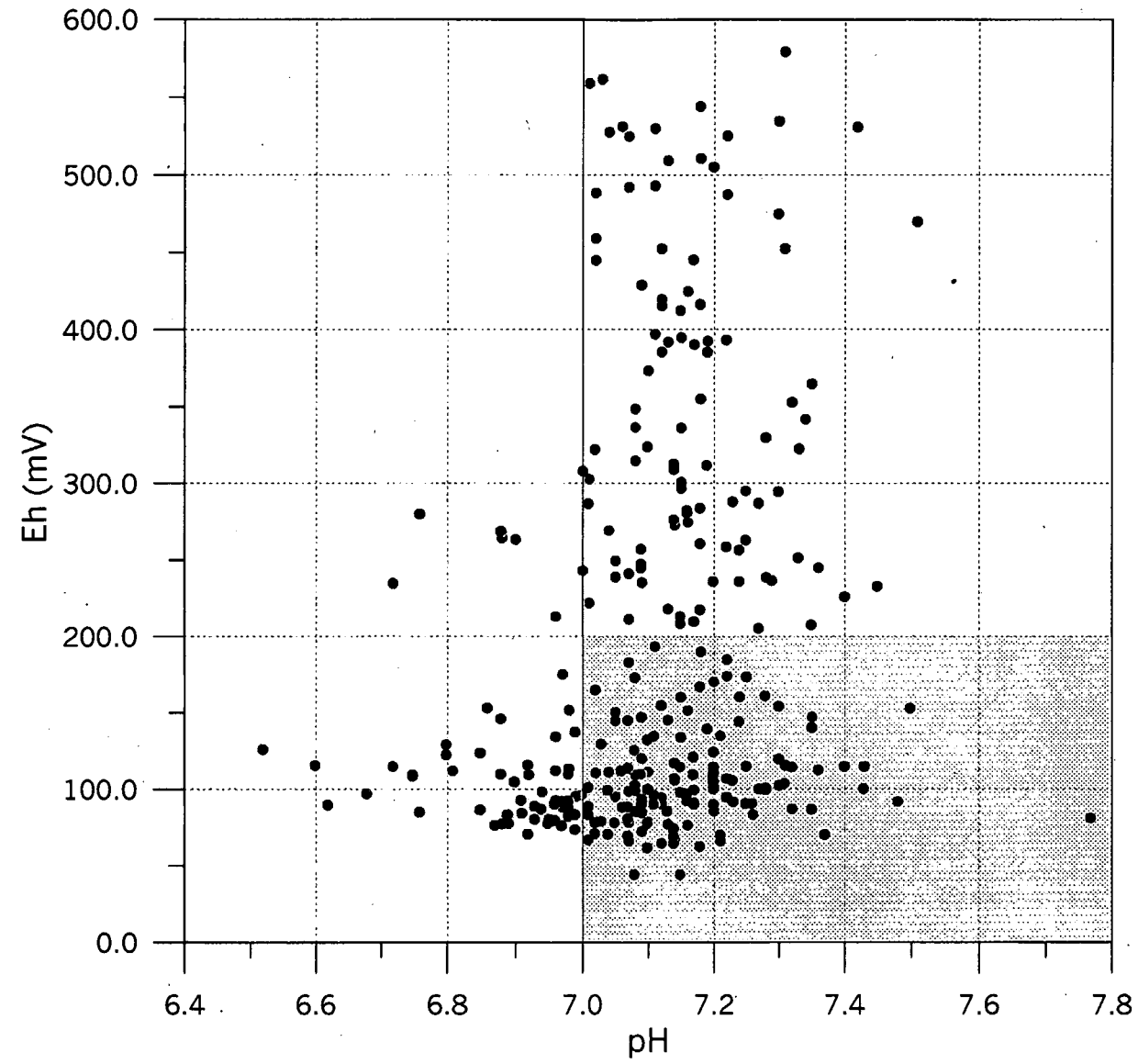
- 0 to 25
- 25 to 50
- 50 to 75
- 75 to 100
- 100 to 150
- 150 to 200
- 200 to 500

[Electric Conductivity (EC) in groundwater of 300 existing wells were measured in June to July 2000 by potable EC meter.]

Figure 4.2.8 **Electric Conductivity (EC) Measured at 300 Existing Wells in Rainy Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



LEGEND

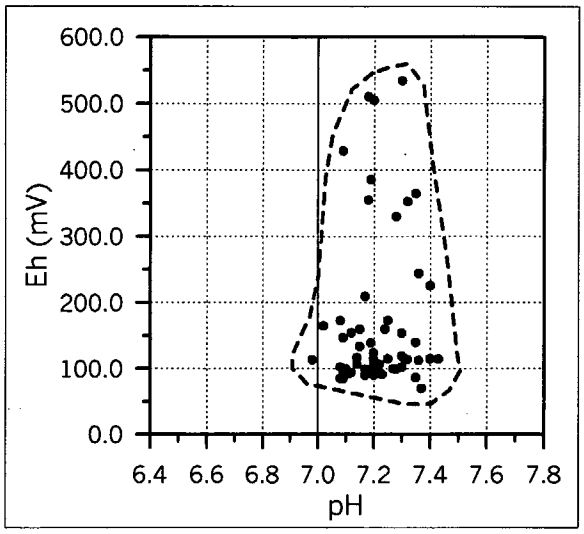
- JESSORE
- JHENAIDAH
- CHUADANGA

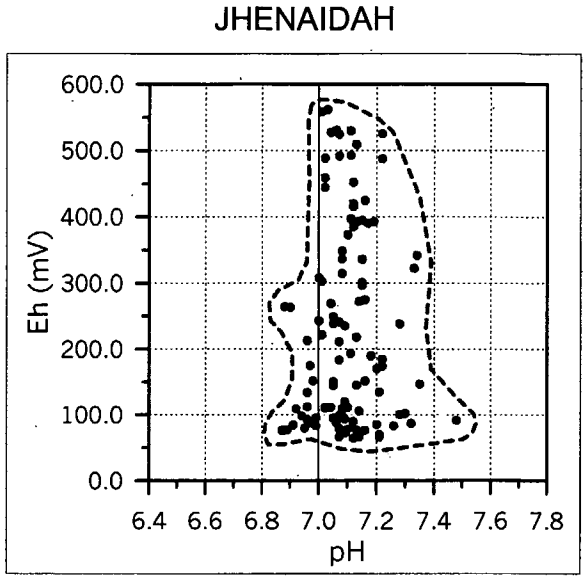
[ORP (Oxidation-Reduction Potential) values in groundwater of 300 existing wells were measured in June to July 2000 by potable ORP meter.
Then, the reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

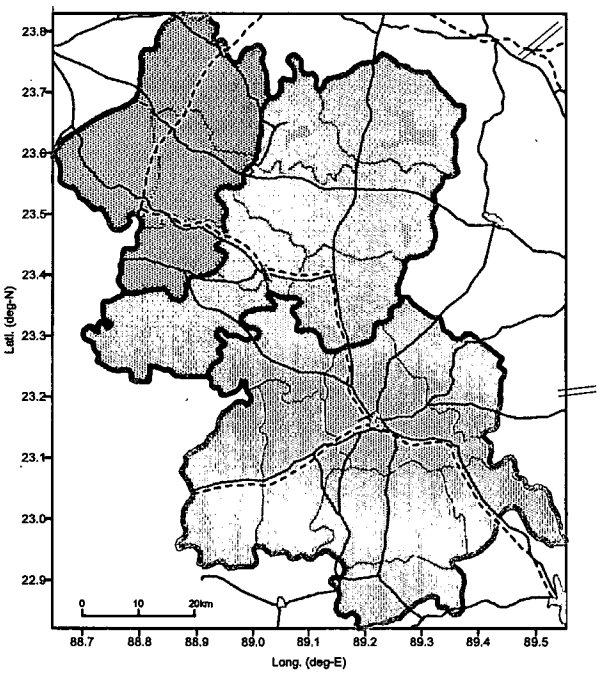
Figure 4.2.9 **Eh-pH Plots of 300 Existing Wells Measured in Rainy Season**

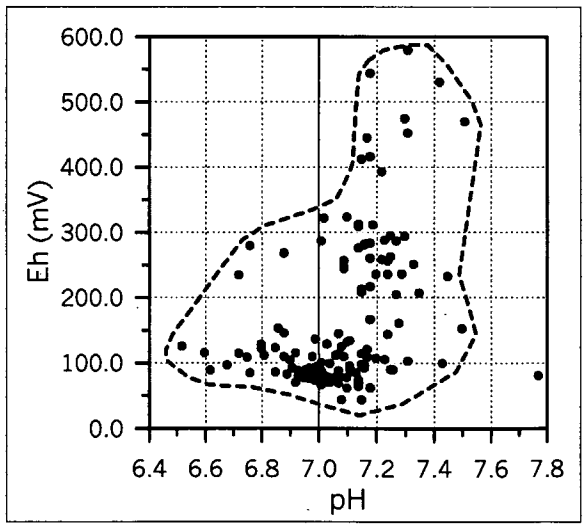
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)







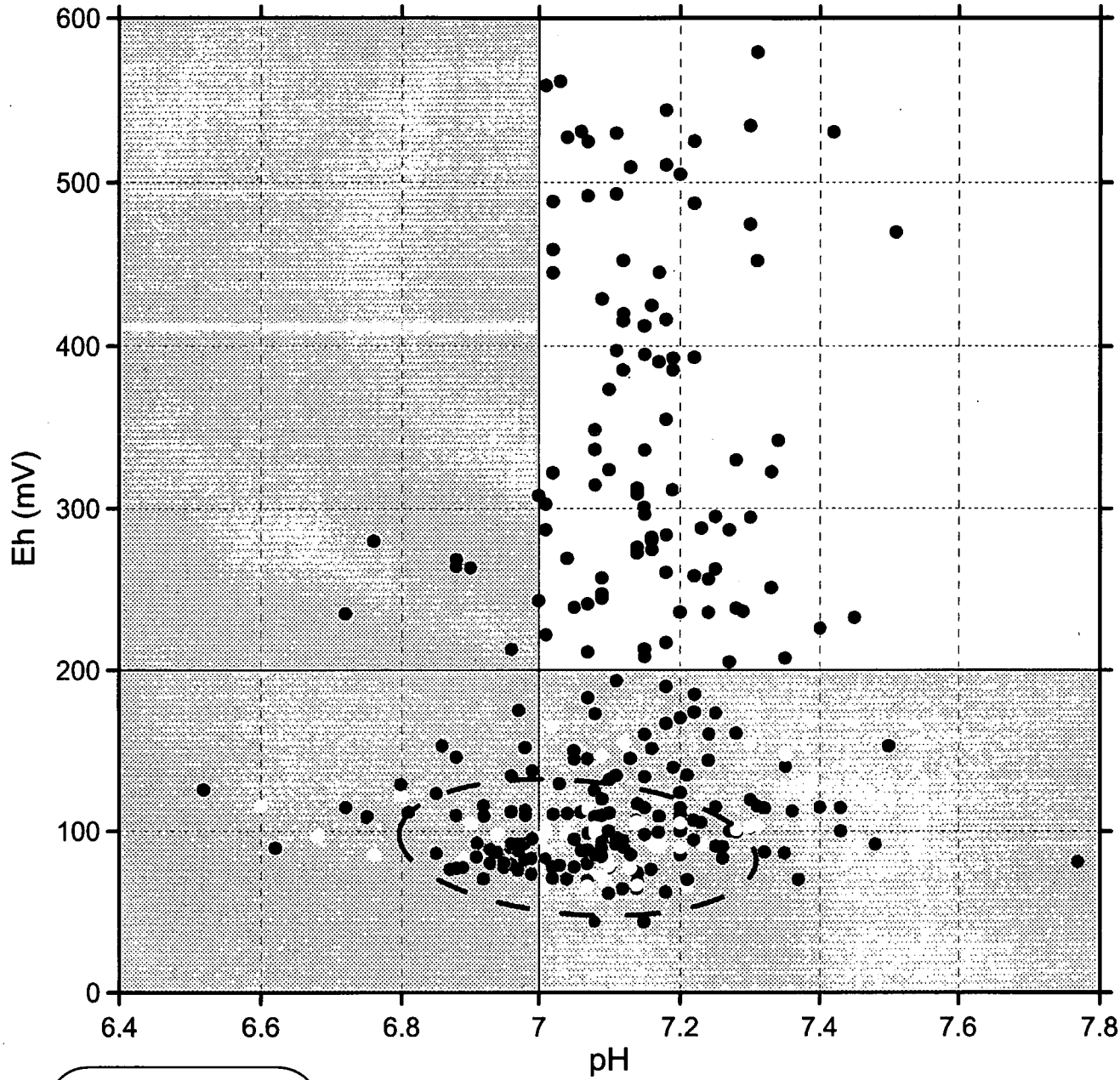


[The values of ORP and pH values in groundwater of 300 existing wells were measured in June to July 2000 by potable ORP meter and potable pH meter. Then, the reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.2.10	Relationship between Eh and pH by District in Rainy Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



As Concentration (mg/l)
Analyzed by AAS

- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1
- 1 to 2

High Arsenic Concentration Zone

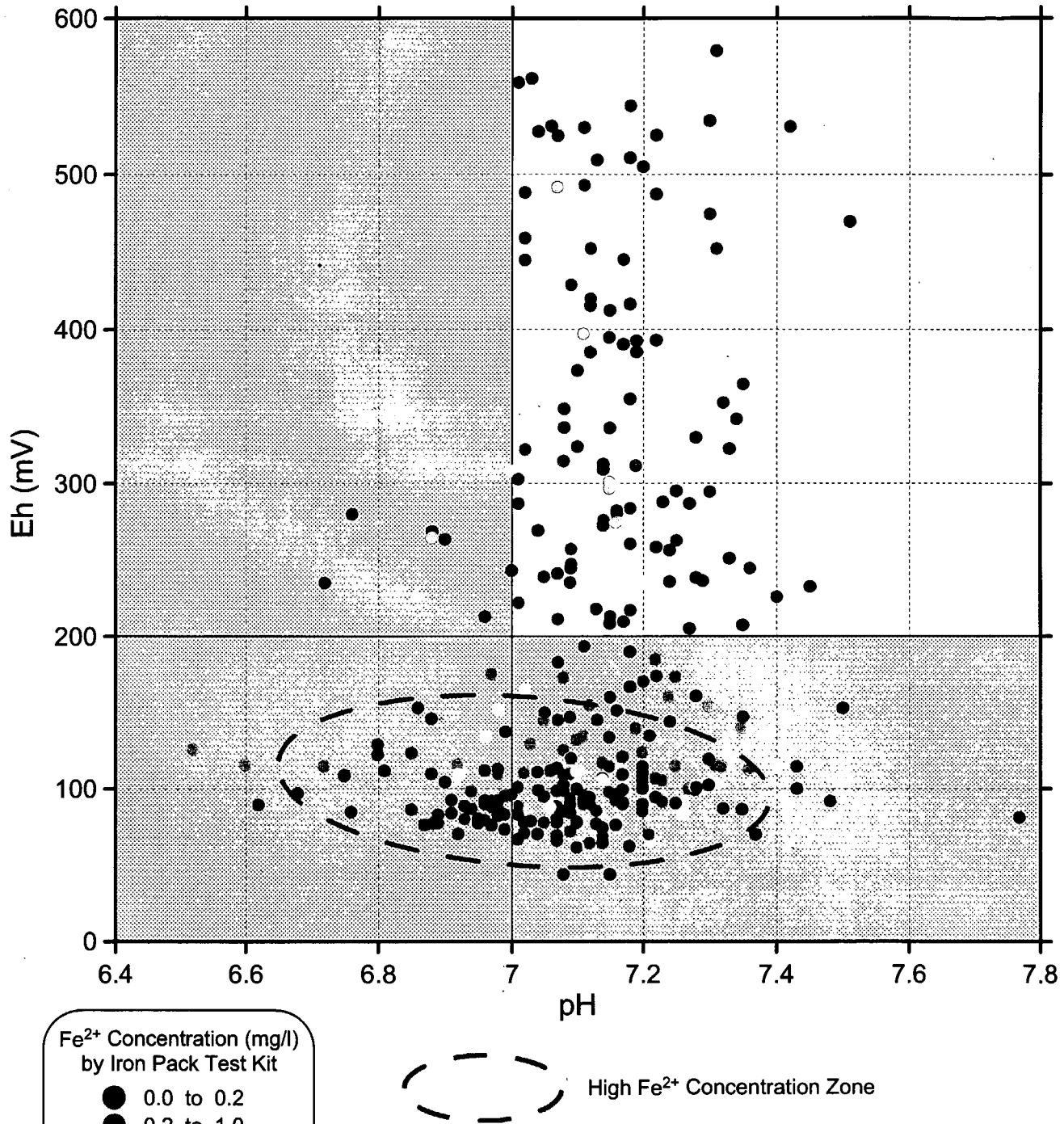
[The values of ORP and pH values were measured at 300 existing wells in June to July 2000 by potable ORP meter and potable pH meter. The arsenic concentrations were analyzed by the AAS in Jhenaidah Laboratory.

The reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.2.11 **Eh-pH-As Relations of 300 Existing Wells Measured in Rainy Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



[The values of ORP, pH, and Fe^{2+} concentrations were measured at 300 existing wells in June to July 2000 by potable ORP meter, potable pH meter, and Iron Pack Test Kit, respectively.
Then, the reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.2.12 **Eh-pH-Fe^{2+} Relations of 300 Existing Wells Measured in Rainy Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

4.3 Arsenic Contamination in Dry Season

Groundwater samples from the 300 existing wells were collected from December 2000 to January 2001 for the arsenic analysis in the dry season. The samples were brought to Jhenaidah Laboratory established by the study team and analyzed by AAS.

At the time of the groundwater sampling, groundwater quality including arsenic was tested in the field. The tested parameters in the field and their methods are shown below:

(1) Arsenic (AAN Field Kit)
(2) Dissolved iron, Fe^{2+} (Fe^{2+} pack test kit)
(3) pH (potable pH meter)
(4) Oxidation-reduction potential, ORP (potable ORP meter)
(5) Electric conductivity, EC (potable EC meter)

The results of arsenic analysis and other parameter measurements at the 300 existing wells in the dry season are shown in Table 4.3.1.

4.3.1 Arsenic Analysis by AAS

1) Arsenic Concentration by District

Figure 4.3.1 shows bar charts of arsenic concentrations of the existing wells by district in the dry season. In the study area, 105 wells (34.3%) have arsenic concentrations less than 0.01mg/l. There are 94 wells (30.7%) having As concentrations between 0.01 to 0.05mg/l. Therefore, 65.0% of the wells in the study area show As concentrations below the Bangladeshi permissible limit for drinking water (= 0.05mg/l). Above the standard, there are 54 wells (17.7%) having As concentrations between 0.05 and 0.1mg/l and 51 wells (16.7%) having As concentrations between 0.1 and 0.5mg/l. The number of wells showing more than 0.5mg/l of As is 2 (0.7%).

In Chuadanga district, there are 10 wells (17.2%) having As concentrations less than 0.01mg/l. The number of samples having As concentration from 0.01 to 0.05mg/l is 21 (36.2%). Therefore, the number of samples within the Bangladeshi limit is 31 (53.4%). There are 18 samples (31.0%) having As concentrations between 0.05 and 0.1mg/l and 9 samples (15.5%) showing As concentrations between 0.1 and 0.5mg/l. There is no sample showing arsenic concentrations more than 0.5mg/l.

In Jhenaidah district, the numbers of wells showing As concentrations from 0 to 0.01mg/l and 0.01 to 0.05mg/l are 41 (38.7%) and 40 (37.7%), respectively. Therefore, 76.4% of the surveyed wells show As concentrations below the Bangladeshi permissible limit. There are 18 wells (17.0%) having 0.05 to 0.1mg/l of As and 7 wells (6.6%) with 0.1 to 0.5mg/l of As. There is no well having more than 0.5mg/l of As among the surveyed wells in Jhenaidah district in the dry season.

In Jessore district, 54 samples (38.0%) show As concentrations below 0.01mg/l. The number of

wells having As concentrations between 0.01 and 0.05mg/l is 33 (23.2%) so that 61.2% of the surveyed wells show As concentrations below the Bangladeshi limit. There are 18 samples (12.7%) having As concentrations between 0.05 and 0.1mg/l and 35 samples (24.7%) showing 0.1 to 0.5 mg/l of As. Two samples show As concentrations between 0.5 and 1.0mg/l. There is no sample showing As concentrations more than 1.0mg/l in the dry season.

Among Pourashava water supply systems in the study area, those in Jessore Sadar, Kaliganj Thana, Kotchandpur Thana and Sailkupa Thana showed little As contamination although some exceeded WHO guideline 0.01 mg/l, however, those in Jhenaidah Sadar, Mohespur Thana and Chuadanga Sadar exceeded the Bangladesh As standard 0.05 mg/l.

The bar charts indicate that the Jessore existing wells are characterized by a large number of samples having As concentration between 0.1 and 0.5mg/l. On the other hand, the percentage of arsenic safe wells (below the WHO guideline value of 0.01mg/l) is also high in Jessore District.

Figure 4.3.2 shows the comparison of As concentrations by district between the rainy season (June to July 2000) and dry season (December 2000 to January 2001) analyzed by AAS. It is found from the graphs that there is no significant change of As contaminated wells between the rainy season and the dry season. In the three districts, the wells showing 0 to 0.01mg/l in As slightly increased from 33.3 % to 34.3%. However, the wells having 0.01 to 0.05mg/l decreased from 31.6% to 30.7%. The wells containing 0.05 to 0.1mg/l of As increased from 16.5% to 17.6%. But the wells containing 0.1 to 0.5mg/l decreased from 17.2 to 16.7%.

In Chuadanga District, the wells having 0 to 0.01mg/l and 0.05 to 0.1mg/l of As increased. But the wells having 0.01 to 0.05mg/l, 0.1 to 0.5mg/l and 0.5 to 1.0mg/l decreased. In the rainy season, there is no well showing As concentrations more than 0.5mg/l.

In Jhenaidah District, the percentage of the wells having 0 to 0.01mg/l and 0.05 to 0.1mg/l in As increased from the rainy season to dry season. But the wells having 0.01 to 0.05mg/l and 0.1 to 0.5mg/l decreased.

In Jessore District, the wells showing 0.01 to 0.05mg/l rose from 22.0 to 23.2%. However, the wells showing 0.05 to 0.1mg/l decreased from 13.6 to 12.7%.

2) Arsenic Concentration Map

Figure 4.3.3 shows the distribution of As concentration in the study area in the dry season measured by AAS. The distribution pattern of As concentrations is quite similar to that of the rainy season. From the map, it is clearly seen that the contaminated areas having more than 0.05mg/l of As are located mostly in the western part of the study area. On the other hand, less contaminated areas within 0.01mg/l of As are found in the eastern part of the study area, which is bounded from the contaminated area to the west by a line with NNW-SSE orientation.

It is, therefore, concluded from the survey result that the As contaminated areas are distributed irregularly but roughly located in the western half of the study area. The less contaminated areas

are located in the eastern half.

Figure 4.3.4 shows the changes in As concentration in the rainy season and dry season. The areas where the As concentration rose in the dry season are widely distributed in the northern half of Chuadanga District, the northwestern and southwestern part of Jhenaidah District, and the central part of Jessore District. On the other hand, the areas where the As concentration decreased occur from western Jhenaidah to western Jessore District.

To know the changes of As concentration in detail, the change ratios of As concentration from the rainy season to the dry season were computed. Figure 4.3.5 shows the distribution of change ratio of As concentration. As concentrations clearly decreased in the dry season from western Jessore District to central Jhenaidah District. The As change ratio of the eastern marginal parts of the study area from Jhenaidah to Jessore is also low, showing less than 1/1.5. On the other hand, south to central Jessore, northeastern Jhenaidah and most parts of Chuadanga District have As change ratios from 1.2 to more than 5 times.

4.3.2 Arsenic Analysis by Field Kit

During the groundwater sampling from the 300 existing wells in the dry season, the AAN Field Kit was used to know the approximate As concentration in the field.

1) Arsenic Concentration by District

Figure 4.3.6 shows bar charts of arsenic concentrations measured by the AAN Field Kit in the rainy season and dry season. The results show that the wells having 0 to 0.01mg/l of As increased from 34.7 to 45.1% in the dry season. Compared with the results of AAS analysis, the increase/decrease tendency of the bar charts is similar, but the field kit results show a more enhanced distribution of the bar charts. The percentage of the wells ranging from 0 to 0.01mg/l in As by the field kit in the dry season significantly increased from that in the rainy season in all three districts. These are 8 to 15 points higher than the results of AAS analysis. On the other hand, the field kit results show that the percentage of wells with 0.1 to 0.5mg/l of As in Jessore is only 4.7%, which is about 20 points lower than the results of AAS.

2) Arsenic Concentration Map

Figure 4.3.7 shows the distribution of As concentration in the study area by the AAN Field Kit in the dry season. Although the absolute value of each As concentration by field kit differs from that by AAS, the As concentration map shows a very similar As distribution pattern by AAS as shown in Figure 4.3.3.

4.3.3 Groundwater Quality

1) Dissolved Iron (Fe^{2+})

Figure 4.3.8 shows the distribution of Fe^{2+} in groundwater measured by Iron Pack Test Kit in the dry season. Although the accuracy of the Fe^{2+} measurement is limited, the distribution pattern of Fe^{2+} concentrations is similar to that of As concentrations.

Figure 4.3.9 shows the changes in Fe^{2+} concentration between the rainy season and dry season. The increase/decrease patterns of Fe^{2+} concentration are irregular. However, it seems that the Fe^{2+} concentration tends to increase in the western half of the study area. On the other hand, the concentration in the eastern part tends to decrease.

2) pH

Figure 4.3.10 shows the distribution of pH values measured at the existing wells in the dry season. In the study area, acidic groundwater is distributed in the western to southern part of Jessore District. On the other hand, alkaline groundwater more than 7.3 in pH occurs along a NW-SE line across the study area from southern Chuadanga to eastern Jessore District.

Figure 4.3.11 shows changes in pH values between the rainy season and the dry season. The pH values decreased in the western part of Chuadanga District and southwestern part of Jessore District. Increased pH values are seen in the eastern part of the study area.

3) Oxidation-Reduction Potential (Eh)

Figure 4.3.12 shows the distribution of Eh values in the study area. The lower Eh values less than 200mV are widely distributed in the central to northwestern part, western part and southern part of the study area. However, it is seen that the lower Eh values in the western part of Jessore district in the rainy season disappeared in the dry season.

Figure 4.3.13 shows the changes in Eh between the rainy season and the dry season. It is clearly shown that the Eh values in most parts of Jessore district increased 50 to 150mV. On the other hand, the Eh values in central Chuadanga District, northern to central and western Jhenaidah District, and the southeastern part of Jessore District decreased 100 to 200mV from the rainy season.

4) Electric Conductivity (EC)

Figure 4.3.14 shows the distribution of EC values measured at the existing wells in the dry season. Higher EC values more than 100mS/m are found from the southeastern part of Jessore District. Then the slightly higher EC zone stretches towards the northwest and north from the southeast of Jessore Sadar thana.

Figure 4.3.15 shows the changes in EC values between the rainy season and the dry season. The EC values increased in the higher EC zone from southern Jessore District to Jessore Sadar thana.

Increased EC values are also seen in the northern part of Jhenaidah District and western parts of Chuadanga District. On the other hand, EC values decreased 20 to 40mS/m in eastern Jessore District, central to western Jessore District, western Jhenaidah District, and central Chuadanga District.

5) Eh-pH-As Relationship

Figure 4.3.16 shows the relationship among Eh, pH, and As concentrations of the existing wells in the dry season. The As concentrations were analyzed by AAS. Most of the contaminated samples having more than 0.05mg/l in As concentration are plotted in a zone with 6.8 to 7.3 in pH and 80 to 270mV in Eh.

Figure 4.3.17 shows the Eh-pH-As relationship of Chuadanga in the rainy season and the dry season. In the rainy season, the samples are plotted in a large area with 6.95 to 7.45 in pH and 70 to 550mV in Eh. The samples highly contaminated with As are concentrated in the lower part of the plotted area having 7.05 to 7.4 in pH and 80 to 120mV in Eh. However, in the dry season, the total plotted area decreased and the highly contaminated samples are plotted in a wider zone. All the Chuadanga samples are plotted within an area of 6.85 to 7.4 in pH and 80 to 360mV in Eh. The contaminated samples are scattered in an area of 6.9 to 7.4 in pH and 80 to 250mV in Eh.

Figure 4.3.18 shows the Eh-pH-As relationship of Jhenaidah District in the rainy season and the dry season. In the rainy season, the plotted area of all the samples ranges from 6.85 to 7.5 in pH and 60 to 570mV in Eh. The samples contaminated with As are concentrated in a domain with 6.85 to 7.2 in pH and 50 to 100mV in Eh. In the dry season, most samples are plotted in an area with 6.9 to 7.5 in pH and 80 to 480mV in Eh. The contaminated samples are scattered in an area of 6.95 to 7.25 in pH and 90 to 180mV in Eh.

Figure 4.3.19 shows the Eh-pH-As relationship of Jessore district. In the rainy season, all the samples are plotted in a wide area with 6.5 to 7.5 in pH and 40 to 580mV in Eh. Most of the samples containing more than 0.1mg/l of As are concentrated in an area with 6.7 to 7.3 in pH and 50 to 150mV in Eh. In the dry season, all the samples are plotted in a smaller area with 6.7 to 7.5 in pH and 90 to 420mV in Eh. However, most of the samples containing more than 0.1mg/l of As are plotted in a wider area with 6.8 to 7.3 in pH and 90 to 260mV in Eh.

6) Eh-pH-Fe^{2+} Relationship

Figure 4.3.20 shows the relationship among Eh, pH, and Fe^{2+} concentrations of the existing wells. Although the Fe^{2+} concentration was tested by field pack test kit, the results show that most of the samples having Fe^{2+} concentrations more than 1.0mg/l have pH values ranging from 6.8 to 7.3 and Eh values ranging from 80 to 250mV. The high concentration zone of Fe^{2+} and the high concentration zone of As are located in almost the same domain, but the area of the high

Fe^{2+} zone is larger than the high As zone in the graph.

Compared with the plots in the rainy season, the high Fe^{2+} zone in the dry season takes a narrower range in pH and wider range in Eh.

4.3.4 Comparison of FK and AAS

In the study, arsenic concentrations were measured by the AAN Field Kit in the field and by the AAS in Jhenaidah laboratory. It will be very useful to know the correlation between the results of field kit and AAS for evaluating the results as well as for planning future screening and monitoring programs.

Figure 4.3.21 shows the comparison of As concentrations measured by the AAN Field Kit and AAS by log-log plot for the rainy season. The results show that the field kit results tend to be lower than AAS for As concentration by AAS below the 0.044mg/l and higher above the value. For example, the samples showing 0.01mg/l by FK range from 0.0025 to 0.13mg/l by AAS. The samples show 1.0mg/l by FK range from 0.13 to 1.6mg/l by AAS.

Figure 4.3.22 shows a similar graph prepared for the dry season. The correlation between the FK results and AAS results is similar. The match point of [Y = X] and the linear fit line is 0.051mg/l. Therefore, it can be said statistically that the FK results and AAS results show good agreement near the Bangladeshi permissible limit of As in water for drinking purposes, which is 0.05mg/l.

Table 4.3.1 Results of 300 Existing Wells Survey in Dry Season [December 2000 to January 2001]

No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
1	EW-JHMg1-D (48)	Jessore	Jhikargachha	23.16722	89.07833	41.43	0.3	0.17	91.8	5	6.93	13	25.0	219.4	4.66	7.20	2.54
2	EW-JHHz1-D (138)	Jessore	Jhikargachha	22.99611	89.02194	36.79	0.05	0.050	45.9	5	7.12	11	25.7	216.9	3.62	5.71	2.09
3	EW-JHSk1-D (146)	Jessore	Jhikargachha	22.96583	89.01194	41.42	0	0.014	72.2	2	7.01	24	26.1	229.6	2.34	5.46	3.12
4	EW-JHBk1-D (156)	Jessore	Jhikargachha	22.96889	89.07056	47.32	0.1	0.22	54.2	5	7.17	35	24.5	241.7	4.61	5.86	1.26
5	EW-JHPn1-D (93)	Jessore	Jhikargachha	23.06083	89.08667	41.65	0.07	0.17	46.1	2	7.20	35	23.3	242.6	4.14	6.85	2.71
6	EW-JHNh1-D (105)	Jessore	Jhikargachha	23.04833	89.04194	50.39	0.3	0.20	46.2	5	6.99	17	26.1	222.6	4.16	7.10	2.94
7	EW-JHNh1-D (108)	Jessore	Jhikargachha	23.05333	89.02417	38.10	0.01	0.028	97.1	5	7.00	17	26.0	222.6	3.77	5.92	2.15
8	EW-JHGg1-D (08)	Jessore	Jhikargachha	23.16806	89.03417	47.02	0.09	0.11	45.5	5	7.08	17	24.8	223.5	5.61	6.23	0.62
9	EW-JHSm 1-D (28)	Jessore	Jhikargachha	23.10139	89.03583	37.33	0.03	0.14	46.6	5	6.95	22	25.3	228.2	3.89	5.88	1.99
10	EW-JHGd1-D (30)	Jessore	Jhikargachha	23.09667	89.05944	36.05	0.01	0.010	40.6	2	7.10	17	25.9	222.7	3.31	7.24	3.93
11	EW-JHNs 1-D (124)	Jessore	Jhikargachha	23.03306	89.04972	44.34	0.03	0.026	46.5	2	7.05	23	25.8	228.8	3.53	7.17	3.64
12	EW-JHJk1-D (35)	Jessore	Jhikargachha	23.12472	89.09417	31.56	0.2	0.15	53.0	10	6.92	44	24.7	250.6	4.00	7.28	3.28
13	EW-JHJk1-D (62)	Jessore	Jhikargachha	23.10417	89.12778	26.28	0.02	0.020	45.2	5	7.06	105	24.5	311.7	4.17	6.22	2.05
14	EW-JSNz1-D (62)	Jessore	Sharsha	23.11056	88.97611	37.41	0.05	0.070	40.2	5	7.05	55	25.2	261.2	3.26	5.51	2.25
15	EW-JSLk1-D (33)	Jessore	Sharsha	23.10889	88.95500	40.09	0.05	0.043	40.6	5	6.92	-55	25.1	151.3	2.35	4.72	2.37
16	EW-JSPt1-D (92)	Jessore	Sharsha	22.99472	88.89611	40.67	0.06	0.21	52.2	5	6.93	-17	26.1	188.6	2.07	3.77	1.70
17	EW-JSBn1-D (37)	Jessore	Sharsha	23.09694	88.91250	30.25	0	0.0012	48.0	0.5	7.13	-5	24.1	202.0	3.21	4.39	1.19
18	EW-JSBg1-D (126)	Jessore	Sharsha	22.99306	88.98111	37.99	0.1	0.12	40.9	5	6.80	-31	26.0	174.6	4.56	5.34	0.78
19	EW-JSBn1-D (88)	Jessore	Sharsha	23.04472	88.91056	39.84	0.05	0.024	40.9	5	6.99	-51	25.7	154.9	4.77	4.47	-0.30
20	EW-JSKb1-D (132)	Jessore	Sharsha	22.93889	88.94917	27.46	0.2	0.13	55.5	5	6.86	-55	25.8	150.8	5.22	4.89	-0.33
21	EW-JSGg1-D (114)	Jessore	Sharsha	22.95991	88.89694	41.87	0.8	0.22	49.1	5	6.93	-39	26.0	166.6	7.13	5.79	-1.34
22	EW-JSSs1-D (75)	Jessore	Sharsha	23.07389	88.97778	33.95	0	0.026	88.2	5	6.96	-18	25.6	187.9	2.60	5.34	2.74
23	EW-JSUl 1-D (99)	Jessore	Sharsha	23.03361	88.96667	32.18	0.02	0.043	36.9	2	7.07	-44	24.0	163.1	3.05	6.47	3.42
24	EW-JSDh1-D (01)	Jessore	Sharsha	23.17222	88.95444	37.00	0	0.0040	70.0	5	7.00	-50	24.2	156.8	3.74	5.22	1.49
25	EW-JSDh1-D (8)	Jessore	Sharsha	23.16472	88.98389	37.01	0.05	0.057	65.7	2	6.70	-5	23.4	202.5	3.20	4.09	0.89
26	EW-JKKs1-D (26)	Jessore	Keshabpur	22.92189	89.19978	42.31	0.03	0.10	72.2	5	7.10	35	25.2	241.2	0.85	4.10	3.25
27	EW-JKKs1-D (72)	Jessore	Keshabpur	22.90472	89.22278	43.76	1	0.32	110.7	5	7.10	135	23.8	342.2	1.70	2.96	1.26
28	EW-JKSf1-D (121)	Jessore	Keshabpur	22.89963	89.31333	42.82	0	0.044	74.0	1	7.36	93	24.9	299.4	2.51	2.28	-0.23
29	EW-JKSf1-D (128)	Jessore	Keshabpur	22.89519	89.33139	45.70	0	0.0011	77.4	0	7.33	168	24.8	374.5	1.55	1.49	-0.06
30	EW-JKPj1-D (102)	Jessore	Keshabpur	22.91472	89.25111	46.52	1	0.43	272.0	5	7.13	-117	24.5	89.7	5.35	1.94	-3.41
31	EW-JKMg1-D (97)	Jessore	Keshabpur	22.86759	89.27389	36.12	1	0.29	89.5	5	6.97	-62	24.2	144.9	1.60	1.88	0.28
32	EW-JKGr1-D (135)	Jessore	Keshabpur	22.87241	89.31639	45.01	0	0.0059	107.2	0	7.40	113	24.3	319.9	1.55	1.39	-0.16
33	EW-JKTm1-D (11)	Jessore	Keshabpur	22.89833	89.15861	40.98	0.01	0.044	67.8	5	7.16	-57	25.2	149.2	0.97	3.87	2.90
34	EW-JKSg1-D (17)	Jessore	Keshabpur	22.86472	89.14306	40.62	0.4	0.19	83.4	10	7.01	-70	24.5	136.7	3.11	3.26	0.15
35	EW-JKSg1-D (41)	Jessore	Keshabpur	22.84056	89.15000	35.28	0.1	0.077	108.7	10	6.98	-62	24.8	144.5	0.80	3.40	2.60
36	EW-JKMj1-D (65)	Jessore	Keshabpur	22.88028	89.20694	46.36	0	0.055	86.3	5	6.93	-24	24.2	230.9	2.58	2.93	0.35
37	EW-JKBn1-D (51)	Jessore	Keshabpur	22.84333	89.18139	21.33	0.03	0.064	121.8	10	6.83	-36	24.1	171.0	1.94	3.52	1.58
38	EW-JKBn1-D (88)	Jessore	Keshabpur	22.84611	89.22056	43.31	0.08	0.072	71.7	5	7.12	-47	25.0	159.4	0.99	1.45	0.46
39	EW-JJCr1-D (13)	Jessore	Jessore Sadar	23.22954	89.13917	46.57	0.1	0.080	30.5	2	7.35	-18	24.1	189.0	3.87	7.61	3.74
40	EW-JJJs1-D (78)	Jessore	Jessore Sadar	23.15861	89.18944	48.40	1	0.27	44.9	5	7.02	8	23.3	215.6	4.57	4.62	0.06
41	EW-JJKc1-D (223)	Jessore	Jessore Sadar	23.13583	89.30222	46.80	0	0.0006	84.6	0	7.33	175	24.0	382.1	4.07	5.90	1.83
42	EW-JJLb1-D (156)	Jessore	Jessore Sadar	23.29833	89.24500	48.50	0.01	0.014	81.6	2	7.10	122	24.2	328.9	3.86	4.61	0.75
43	EW-JJLb1-D (162)	Jessore	Jessore Sadar	23.27139	89.24333	49.00	0	0.0091	81.0	2	7.18	118	26.1	323.6	3.95	6.10	2.15
44	EW-JJCc1-D (59)	Jessore	Jessore Sadar	23.12250	89.17778	42.20	0.01	0.22	93.7	5	7.11	145	24.2	351.9	2.75	4.36	1.61
45	EW-JJKs1-D (113)	Jessore	Jessore Sadar	23.21722	89.18500	45.07	0	0.0008	50.1	0.2	7.21	17	24.1	224.0	4.00	7.28	3.28
46	EW-JJKs1-D (136)	Jessore	Jessore Sadar	23.26639	89.19824	46.40	0	0.0003	44.8	0	7.20	96	24.5	302.7	3.55	6.56	3.01
47	EW-JJNp1-D (195)	Jessore	Jessore Sadar	23.19583	89.24333	47.23	0	0.0005	84.6	0.5	7.27	184	24.2	390.9	3.79	5.47	1.69
48	EW-JJAr1-D (95)	Jessore	Jessore Sadar	23.17611	89.18778	40.37	0	0.0011	69.7	0.2	7.11	39	23.1	246.7	1.96	6.52	4.56
49	EW-JJRn1-D (214)	Jessore	Jessore Sadar	23.11361	89.24639	45.00	0	0.0010	101.3	0.5	7.25	209	24.8	415.5	3.57	4.55	0.98
50	EW-JJDa1-D (22)	Jessore	Jessore Sadar	23.18750	89.12528	44.28	0	0.0009	113.2	0	7.12	25	25.8	230.8	4.08	5.77	1.69

Table 4.3.1 Results of 300 Existing Wells Survey in Dry Season [December 2000 to January 2001] (2/7)

No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
51	EW-JJDa1-D (38)	Jessore	Jessore Sadar	23.14889	89.13806	47.04	0	0.0013	53.4	0	7.22	34	25.7	239.9	3.71	7.06	3.35
52	EW-JJBs1-D (247)	Jessore	Jessore Sadar	23.12333	89.34750	27.00	0.08	0.11	48.7	5	7.06	-53	25.3	153.2	3.38	4.34	0.96
53	EW-JJNp1-D (104)	Jessore	Jessore Sadar	23.19000	89.22222	46.30	0	0.0016	51.7	0	7.17	197	24.5	403.7	3.64	6.64	3.00
54	EW-JJNr1-D (240)	Jessore	Jessore Sadar	23.10583	89.31083	41.90	0	<0.0005	195.0	0	7.27	134	25.2	340.2	2.89	3.78	0.89
55	EW-JJlc1-D (170)	Jessore	Jessore Sadar	23.24111	89.23278	46.56	0	<0.0005	88.4	0	7.20	155	26.2	360.5	4.06	6.17	2.11
56	EW-JJlc1-D (186)	Jessore	Jessore Sadar	23.22222	89.25880	49.00	0	<0.0005	81.2	0	7.28	184	26.1	389.6	3.24	4.88	1.64
57	EW-JJHb1-D (122)	Jessore	Jessore Sadar	23.27463	89.14889	43.85	0	0.0024	54.0	0	7.31	178	25.0	384.4	4.09	8.27	4.18
58	EW-JJHb1-D (128)	Jessore	Jessore Sadar	23.28250	89.18528	25.37	0.06	0.10	49.6	5	7.13	169	23.8	376.2	3.58	6.22	2.64
59	EW-JJFt1-D (205)	Jessore	Jessore Sadar	23.16639	89.25917	43.50	0	0.0006	110.6	0	7.30	197	25.1	403.3	3.99	5.95	1.96
60	EW-JMKp1-D (157)	Jessore	Manirampur	22.99861	89.26167	42.76	0.05	0.042	52.9	5	6.99	11	21.7	219.7	4.85	3.05	-1.80
61	EW-JMJp1-D (174)	Jessore	Manirampur	22.97556	89.15472	46.80	0.06	0.072	31.6	1	7.20	17	23.2	224.7	3.40	4.71	1.31
62	EW-JMHh1-D (25)	Jessore	Manirampur	23.01500	89.09389	40.03	0.09	0.088	36.3	5	7.03	-23	25.3	183.2	2.63	5.88	3.25
63	EW-JMHh1-D (35)	Jessore	Manirampur	23.03389	89.13472	27.85	0.05	0.38	40.0	5	7.05	-69	24.7	137.6	5.30	6.70	1.40
64	EW-JMSm1-D (160)	Jessore	Manirampur	22.98833	89.22944	46.94	0	0.047	39.1	5	7.07	-22	25.5	184.0	3.93	4.68	0.75
65	EW-JMSm1-D (210)	Jessore	Manirampur	22.96528	89.23056	48.10	0.5	0.22	56.2	10	6.98	-20	24.7	186.6	4.56	4.42	-0.14
66	EW-JMCl 1-D (198)	Jessore	Manirampur	22.98667	89.19528	40.75	0.01	0.036	54.2	5	6.96	-51	23.8	156.2	3.51	3.97	0.47
67	EW-JMCl1-D (201)	Jessore	Manirampur	22.95889	89.18111	47.42	0.06	0.073	43.0	0.5	7.32	-66	23.3	141.6	1.63	4.03	2.40
68	EW-JMKl1-D (141)	Jessore	Manirampur	22.99917	89.33917	41.60	0	0.0012	183.6	5	7.08	-47	23.4	160.5	1.92	1.04	-0.87
69	EW-JMKl1-D (148)	Jessore	Manirampur	23.00139	89.31083	50.24	0.06	0.086	279.0	10	7.04	24	22.8	232.0	2.07	1.63	-0.44
70	EW-JMDb1-D (227)	Jessore	Manirampur	22.96444	89.30333	47.84	0	0.0034	179.9	0	7.21	-69	22.3	139.3	3.60	1.73	-1.87
71	EW-JMMh1-D (239)	Jessore	Manirampur	22.93722	89.32889	56.79	0	<0.0005	148.4	0	7.34	-88	24.5	118.7	3.29	1.45	-1.84
72	EW-JMMs1-D (186)	Jessore	Manirampur	22.93611	89.14083	43.43	0	0.011	80.1	2	7.22	87	23.4	294.5	3.63	5.49	1.86
73	EW-JMHd1-D (108)	Jessore	Manirampur	23.03583	89.27750	51.65	0	0.0025	75.0	0.2	7.11	140	24.1	347.0	0.95	2.57	1.62
74	EW-JMHd1-D (138)	Jessore	Manirampur	23.04556	89.31583	51.46	0	<0.0005	139.6	0.2	7.21	89	23.5	296.4	3.95	1.90	-2.05
75	EW-JMMr1-D (91)	Jessore	Manirampur	23.03972	89.22333	31.11	0.2	0.10	40.1	5	7.08	-58	24.5	148.7	3.84	4.92	1.08
76	EW-JMMr1-D (101)	Jessore	Manirampur	23.03861	89.25361	46.92	0.08	0.055	47.6	10	6.96	-70	23.0	137.8	2.81	4.33	1.52
77	EW-JMPh1-D (13)	Jessore	Manirampur	23.06917	89.15000	42.50	0.03	0.029	44.5	5	6.94	-49	24.2	157.9	3.82	5.94	2.12
78	EW-JMNh1-D (244)	Jessore	Manirampur	22.96500	89.33833	52.63	0	<0.0005	143.3	0	7.26	-92	25.1	114.3	3.43	2.19	-1.24
79	EW-JMKd1-D (51)	Jessore	Manirampur	23.03639	89.17306	36.01	0	0.015	27.8	0.5	7.31	-98	22.4	110.2	5.18	4.86	-0.32
80	EW-JMDk1-D (124)	Jessore	Manirampur	23.06917	89.27917	36.98	0.06	0.15	99.5	2	7.33	-35	25.6	170.9	4.21	3.71	-0.50
81	EW-JMKs1-D (71)	Jessore	Manirampur	23.06306	89.19722	52.11	0.09	0.037	43.1	2	7.18	-74	24.5	132.7	4.08	5.99	1.91
82	EW-JMBj1-D (81)	Jessore	Manirampur	23.08333	89.23333	45.05	0	0.011	39.7	1	7.33	-24	24.1	183.0	3.29	4.63	1.34
83	EW-JCDl1-D (181)	Jessore	Chougachha	23.21139	89.02472	41.20	0.01	0.022	110.3	2	6.97	36	24.5	242.7	6.27	6.61	0.34
84	EW-JCPs1-D (210)	Jessore	Chougachha	23.21111	89.09389	41.80	0	0.0050	92.0	0	7.10	-3	25.7	202.9	4.10	5.22	1.12
85	EW-JCPs1-D (215)	Jessore	Chougachha	23.20972	89.09917	26.33	0.03	0.22	63.9	5	6.99	39	24.8	245.5	1.20	5.35	4.15
86	EW-JCSr1-D (198)	Jessore	Chougachha	23.25889	88.98278	43.32	0.06	0.11	38.5	2	7.01	-59	25.7	146.9	3.06	4.69	1.63
87	EW-JCHk1-D (54)	Jessore	Chougachha	23.34583	89.06917	46.62	0	0.0031	44.2	0	7.21	-99	24.8	107.5	3.12	9.40	6.28
88	EW-JCPt1-D (207)	Jessore	Chougachha	23.27833	89.02639	46.00	0.4	0.12	49.9	2	7.12	9	25.4	215.1	3.27	7.62	4.35
89	EW-JCCg1-D (170)	Jessore	Chougachha	23.24750	89.01972	41.60	0.09	0.22	42.7	5	7.00	-55	24.8	151.5	4.00	4.95	0.95
90	EW-JCNr1-D (174)	Jessore	Chougachha	23.29990	88.98889	34.20	0.05	0.062	40.2	2	6.96	-32	26.2	173.5	4.57	8.27	3.70
91	EW-JCJr1-D (218)	Jessore	Chougachha	23.27509	89.07667	32.39	0.6	0.60	56.0	10	7.06	-63	24.8	143.5	4.06	7.39	3.33
92	EW-JCSk1-D (124)	Jessore	Chougachha	23.23389	88.92694	39.30	0.03	0.040	42.7	5	7.07	-18	25.9	187.7	2.05	5.96	3.91
93	EW-JCSk1-D (133)	Jessore	Chougachha	23.27361	88.93833	46.40	0.8	0.40	43.7	5	7.10	-53	25.8	152.8	5.96	7.62	1.66
94	EW-JCSk1-D (198)	Jessore	Chougachha	23.26750	89.11333	22.83	0.6	0.040	46.3	5	7.11	-55	25.7	150.9	5.73	7.40	1.67
95	EW-JCPl1-D (205)	Jessore	Chougachha	23.24944	89.08750	22.71	0.1	0.77	86.1	5	7.06	-65	24.1	142.0	4.07	7.34	3.27
96	EW-JCSg1-D (187)	Jessore	Chougachha	23.23528	89.04667	27.05	0.06	0.044	51.0	5	6.94	-51	24.4	155.8	4.63	7.85	3.22
97	EW-JBNr1-D (72)	Jessore	Bagherpara	23.27583	89.35083	49.50	0	0.016	43.7	5	7.11	24	24.5	230.7	3.29	3.76	0.47
98	EW-JBJd1-D (149)	Jessore	Bagherpara	23.18833	89.37972	44.69	0.01	0.12	49.1	5	7.08	55	25.3	261.2	3.19	3.81	0.62
99	EW-JBRp1-D (54)	Jessore	Bagherpara	23.26065	89.28333	46.40	0	0.0007	38.6	0	7.28	-12	23.9	195.2	3.27	4.62	1.35
100	EW-JBRp1-D (65)	Jessore	Bagherpara	23.24472	89.32111	45.70	0	<0.0005	52.7	0	7.22	2	24.1	209.0	3.18	4.19	1.01

Table 4.3.1 Results of 300 Existing Wells Survey in Dry Season [December 2000 to January 2001] (3/7)

No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
101	EW-JBJh1-D (3)	Jessore	Bagherpara	23.33907	89.26150	52.00	0	<0.0005	47.6	0	7.23	166	24.1	373.0	3.96	4.66	0.70
102	EW-JBJh1-D (30)	Jessore	Bagherpara	23.31472	89.26444	51.20	0.01	0.026	52.8	5	7.04	190	23.5	397.4	3.75	5.91	2.16
103	EW-JBBd1-D (15)	Jessore	Bagherpara	23.31389	89.29833	47.63	0.05	0.049	51.8	10	6.97	105	23.6	312.4	3.11	4.92	1.81
104	EW-JBBd1-D (36)	Jessore	Bagherpara	23.29278	89.26722	47.63	0	0.013	37.8	0	7.32	146	25.1	352.3	4.55	5.72	1.17
105	EW-JBDr1-D (91)	Jessore	Bagherpara	23.20111	89.31806	43.73	0	0.0016	91.8	0	7.11	1	24.3	207.9	3.36	3.57	0.21
106	EW-JBBs1-D (117)	Jessore	Bagherpara	23.19250	89.35194	52.09	0.06	0.074	38.2	5	7.05	17	25.9	222.7	3.48	4.62	1.14
107	EW-JBBs1-D (132)	Jessore	Bagherpara	23.15861	89.35056	43.25	0	0.0007	41.8	0.5	7.21	47	25.1	253.3	3.47	3.99	0.52
108	EW-JBDh1-D (108)	Jessore	Bagherpara	23.21889	89.40500	41.70	0.04	0.12	46.1	5	7.12	-4	23.5	203.4	2.65	3.30	0.65
109	EW-JBDl1-D (102)	Jessore	Bagherpara	23.24500	89.39722	40.03	0	0.016	126.0	5	7.05	16	25.5	222.0	3.01	2.99	-0.02
110	EW-JASd1-D (4)	Jessore	Abhaynagar	23.05083	89.39824	47.67	0	0.0006	101.8	0	7.24	13	24.4	219.8	4.43	4.54	0.11
111	EW-JABg1-D (12)	Jessore	Abhaynagar	23.01028	89.44472	45.46	0	<0.0005	52.0	0	7.21	16	24.5	222.7	2.85	4.78	1.93
112	EW-JAMh1-D (49)	Jessore	Abhaynagar	23.09056	89.35852	44.28	0	0.0006	49.5	0	7.15	-56	24.4	150.8	4.25	2.95	-1.29
113	EW-JAMh1-D (58)	Jessore	Abhaynagar	23.07222	89.33556	51.26	0	0.0049	198.6	2	7.10	-54	25.5	152.0	3.63	2.04	-1.59
114	EW-JANa1-D (72)	Jessore	Abhaynagar	23.03111	89.36917	37.43	0.1	0.12	88.1	1	7.20	-63	25.2	143.2	4.65	2.96	-1.69
115	EW-JARj1-D (85)	Jessore	Abhaynagar	22.99833	89.38722	47.91	0	<0.0005	173.3	0	7.53	-74	24.7	132.6	3.27	2.62	-0.65
116	EW-JAPr1-D (92)	Jessore	Abhaynagar	22.96806	89.38917	42.53	0	<0.0005	35.4	0	7.11	-43	24.9	163.4	2.06	1.48	-0.58
117	EW-JASh1-D (37)	Jessore	Abhaynagar	23.00222	89.50361	47.40	0	<0.0005	148.3	0	7.26	16	25.1	222.3	2.93	1.96	-0.96
118	EW-JASd1-D (42)	Jessore	Abhaynagar	22.97167	89.50389	43.85	0	0.0034	159.7	2	7.33	15	25.3	221.2	3.13	2.25	-0.88
119	EW-HJNl1-D (136)	Jhenaidah	Jhenaidah Sadar	23.46306	89.16389	46.55	0	0.0006	55.0	0	7.10	-26	25.6	179.9	1.13	6.09	4.96
120	EW-HJNl1-D (147)	Jhenaidah	Jhenaidah Sadar	23.46500	89.21398	41.33	0	0.0005	46.2	0	7.28	-60	25.1	146.3	1.84	5.77	3.93
121	EW-HJSr1-D (133)	Jhenaidah	Jhenaidah Sadar	23.50259	89.16361	39.06	0	0.0013	53.8	0	7.16	-19	25.8	186.8	2.63	5.65	3.02
122	EW-HJHl1-D (42)	Jhenaidah	Jhenaidah Sadar	23.56028	89.08306	44.80	0.03	0.029	51.3	5	7.12	-108	26.2	97.5	3.73	8.82	5.09
123	EW-HJGn1-D (55)	Jhenaidah	Jhenaidah Sadar	23.49806	89.07222	40.40	0	<0.0005	59.8	0	7.06	95	24.2	301.9	4.06	8.79	4.73
124	EW-HJGn1-D (86)	Jhenaidah	Jhenaidah Sadar	23.48352	89.07565	47.00	0.01	0.14	86.0	10	7.05	-70	25.6	135.9	3.17	8.93	5.76
125	EW-HJHr1-D (231)	Jhenaidah	Jhenaidah Sadar	23.56046	89.26046	37.82	0	0.029	53.4	0	7.30	38	24.5	244.7	2.65	7.65	5.00
126	EW-HJHr1-D (240)	Jhenaidah	Jhenaidah Sadar	23.55972	89.30259	46.01	0.01	0.033	90.9	5	7.16	-1	24.6	205.7	3.43	7.18	3.75
127	EW-HJGr1-D (200)	Jhenaidah	Jhenaidah Sadar	23.47556	89.24639	41.44	0	0.0007	51.6	0	7.32	-77	25.1	129.3	3.42	5.54	2.12
128	EW-HJFr1-D (261)	Jhenaidah	Jhenaidah Sadar	23.47704	89.28444	35.45	0	0.015	49.2	2	7.36	-93	25.6	112.9	1.83	4.65	2.82
129	EW-HJMd1-D (19)	Jhenaidah	Jhenaidah Sadar	23.52778	89.01972	38.22	0.03	0.047	83.0	5	7.08	-58	25.3	148.2	1.85	10.12	8.27
130	EW-HJMd1-D (26)	Jhenaidah	Jhenaidah Sadar	23.53417	89.02250	39.70	0.09	0.042	73.2	5	7.15	-82	25.6	123.9	1.66	9.62	7.96
131	EW-HJJn1-D (122)	Jhenaidah	Jhenaidah Sadar	23.56333	89.18639	41.90	0	0.0023	46.2	0	7.31	-13	24.2	193.9	3.33	8.59	5.26
132	EW-HJJn1-D (125)	Jhenaidah	Jhenaidah Sadar	23.54944	89.16750	19.83	0	0.0051	5.12	2	7.43	111	25.2	317.2	4.46	8.74	4.28
133	EW-HJKi1-D (176)	Jhenaidah	Jhenaidah Sadar	23.50898	89.20500	37.90	0	<0.0005	56.7	0	7.12	38	24.9	244.4	2.70	6.06	3.37
134	EW-HJSg1-D (34)	Jhenaidah	Jhenaidah Sadar	23.55028	89.04778	39.90	0.06	0.031	45.0	2	7.22	-89	25.4	117.1	2.13	7.18	5.05
135	EW-HJPd1-D (225)	Jhenaidah	Jhenaidah Sadar	23.54630	89.28556	35.18	0	<0.0005	41.8	0	7.38	-10	24.4	196.8	2.80	7.48	4.68
136	EW-HJPg1-D (114)	Jhenaidah	Jhenaidah Sadar	23.53278	89.14528	48.80	0	0.047	43.9	2	7.20	-52	25.2	154.2	3.35	6.99	3.64
137	EW-HJSd1-D (3)	Jhenaidah	Jhenaidah Sadar	23.52917	88.97417	41.59	0.6	0.22	71.5	5	6.98	-88	25.8	117.8	2.79	10.10	7.31
138	EW-HJMh1-D (88)	Jhenaidah	Jhenaidah Sadar	23.46065	89.10296	41.01	0.01	0.034	55.4	5	7.12	-81	26.8	124.1	3.23	8.60	5.37
139	EW-HJMh1-D (98)	Jhenaidah	Jhenaidah Sadar	23.50037	89.12139	46.60	0.03	0.081	51.7	5	7.12	-61	25.2	145.2	3.33	8.65	5.32
140	EW-HJPr1-D (190)	Jhenaidah	Jhenaidah Sadar	23.55787	89.22111	35.80	0	<0.0005	40.2	0	7.21	-23	25.3	183.2	3.06	8.63	5.57
141	EW-HJPr1-D (251)	Jhenaidah	Jhenaidah Sadar	23.54028	89.25333	42.35	0.02	0.024	55.4	5	7.01	-10	25.2	196.2	2.97	6.11	3.14
142	EW-HJKm1-D (62)	Jhenaidah	Jhenaidah Sadar	23.54750	89.11222	39.60	0.4	0.053	51.8	5	7.14	-68	23.8	139.2	3.34	8.96	5.62
143	EW-HJDg1-D (196)	Jhenaidah	Jhenaidah Sadar	23.49074	89.24167	39.00	0.05	0.087	79.1	5	7.18	3	25.2	209.2	1.82	5.47	3.65
144	EW-HKRg1-D (74)	Jhenaidah	Kaliganj	23.36981	89.13926	45.35	0	0.021	54.2	5	7.02	-75	25.9	130.7	2.92	6.64	3.72
145	EW-HKRk1-D (135)	Jhenaidah	Kaliganj	23.34694	89.10611	38.75	0	0.0018	47.5	5	7.10	-8	25.5	198.0	3.69	8.16	4.47
146	EW-HKJm1-D (89)	Jhenaidah	Kaliganj	23.42222	89.18028	46.71	0	0.0009	76.4	0	7.10	13	27.0	217.9	3.13	7.71	4.58
147	EW-HKJm1-D (101)	Jhenaidah	Kaliganj	23.41713	89.24046	55.60	0.2	0.085	83.4	5	7.17	-34	25.8	171.8	2.41	4.57	2.16
148	EW-HKKl1-D (115)	Jhenaidah	Kaliganj	23.40806	89.21426	40.85	0	0.013	77.3	2	7.35	-3	25.6	202.9	2.82	6.25	3.43
149	EW-HKKl1-D (173)	Jhenaidah	Kaliganj	23.37676	89.23611	28.50	0	<0.0005	81.3	0	7.15	-68	26.9	137.0	2.77	5.82	3.05
150	EW-HKTl1-D (45)	Jhenaidah	Kaliganj	23.39778	89.06861	46.30	0	0.022	51.9	2	7.18	-93	25.2	113.2	3.63	8.02	4.39

Table 4.3.1 Results of 300 Existing Wells Survey in Dry Season [December 2000 to January 2001] (4/7)

No.	Well No.	District.	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
151	EW-HKKl1-D (28)	Jhenaidah	Kaliganj	23.40889	89.13583	41.45	0	0.0006	54.1	0	7.17	-11	26.1	194.6		8.12	
152	EW-HKKs1-D (152)	Jhenaidah	Kaliganj	23.31343	89.11333	45.80	0	<0.0005	75.3	0.5	7.21	-72	25.2	134.2	3.81	8.18	4.37
153	EW-HKSm1-D (40)	Jhenaidah	Kaliganj	23.38167	89.10194	44.40	0	0.015	49.4	5	7.10	-66	25.5	140.0	3.08	7.49	4.41
154	EW-HKMi1-D (180)	Jhenaidah	Kaliganj	23.34509	89.21491	44.67	0.01	0.030	40.7	5	7.15	-65	25.0	141.4	3.61	4.92	1.31
155	EW-HKSd1-D (9)	Jhenaidah	Kaliganj	23.43389	89.13694	44.80	0	<0.0005	54.4	0	7.74	-95	23.5	112.4		7.65	
156	EW-HKBr1-D (164)	Jhenaidah	Kaliganj	23.32574	89.14741	47.00	0	0.023	54.4	5	7.15	-61	25.6	144.9	3.85	7.32	3.47
157	EW-HKBr1-D (195)	Jhenaidah	Kaliganj	23.29463	89.18250	35.30	0.05	0.096	51.0	5	7.24	-68	25.3	138.2	3.63	7.35	3.72
158	EW-HKNm1-D (32)	Jhenaidah	Kaliganj	23.40074	89.16352	45.42	0	0.0008	54.2	0	7.13	-39	24.3	167.9	3.07	7.25	4.18
159	EW-HKNm1-D (123)	Jhenaidah	Kaliganj	23.36898	89.18537	44.31	0.01	0.0052	89.4	5	6.96	11	24.7	217.6	3.68	5.04	1.36
160	EW-HTEl1-D (75)	Jhenaidah	Kotchandpur	23.43528	89.04917	40.10	0	0.013	110.2	10	7.08	-92	24.8	114.5	2.16	7.66	5.50
161	EW-HTKs1-D (32)	Jhenaidah	Kotchandpur	23.43833	88.99028	41.15	0.01	0.037	45.9	5	7.26	-35	26.3	170.4	3.11	9.29	6.18
162	EW-HTKt1-D (50)	Jhenaidah	Kotchandpur	23.46500	89.01111	50.65	0	<0.0005	51.5	0	7.22	-34	25.5	172.0	2.63	8.53	5.90
163	EW-HTKt1-D (46)	Jhenaidah	Kotchandpur	23.41222	89.00917	30.20	0	0.014	68.2	2	7.30	-83	24.8	123.5	3.18	9.08	5.90
164	EW-HTDr1-D (13)	Jhenaidah	Kotchandpur	23.48806	88.98167	43.85	0.8	0.248	78.3	5	7.15	-115	25.2	91.2	2.10	8.47	6.37
165	EW-HTDr1-D (18)	Jhenaidah	Kotchandpur	23.47722	88.95000	21.40	0	0.069	81.3	10	7.08	-127	24.9	79.4	3.15	10.58	7.43
166	EW-HTSb1-D (24)	Jhenaidah	Kotchandpur	23.45407	88.95315	25.80	0.01	0.076	45.2	5	7.13	-76	25.5	130.0	4.43	10.65	6.22
167	EW-HLBl1-D (40)	Jhenaidah	Kotchandpur	23.42222	88.95889	47.25	0	0.017	49.2	1	7.36	-103	24.5	103.7	3.03	6.90	3.87
168	EW-HMNp1-D (26)	Jhenaidah	Moheshpur	23.29324	88.76528	42.05	0	0.032	96.4	5	7.05	-52	25.7	153.9	4.65	7.24	2.59
169	EW-HMKz1-D (13)	Jhenaidah	Moheshpur	23.27111	88.74611	48.22	0.01	0.046	50.0	5	7.07	-80	26.2	125.5	4.69	8.26	3.57
170	EW-HMFt1-D (104)	Jhenaidah	Moheshpur	23.40722	88.89583	25.85	0.03	0.092	96.6	10	7.10	-98	25.0	108.4	3.74	6.65	2.91
171	EW-HMMd1-D (139)	Jhenaidah	Moheshpur	23.32167	88.94417	41.70	0.06	0.066	71.3	5	7.21	-62	24.9	144.4	2.81	10.46	7.65
172	EW-HMMd1-D (159)	Jhenaidah	Moheshpur	23.28306	88.95278	42.54	0.3	0.16	39.0	5	6.95	-55	25.5	151.0	4.44	7.87	3.43
173	EW-HMSk1-D (29)	Jhenaidah	Moheshpur	23.33806	88.76944	41.37	0.01	0.048	82.9	5	7.18	-64	26.3	141.4	1.74	8.35	6.61
174	EW-HMBb1-D (48)	Jhenaidah	Moheshpur	23.28528	88.81639	51.75	0.03	0.079	48.1	2	7.12	-48	26.3	157.4	3.72	7.58	3.86
175	EW-HMMh1-D (109)	Jhenaidah	Moheshpur	23.35472	88.91056	45.75	0.05	0.072	42.8	5	7.13	-18	24.7	188.6	4.34	9.41	5.07
176	EW-HMPt1-D (74)	Jhenaidah	Moheshpur	23.36213	88.85657	40.55	0.05	0.084	51.1	5	7.09	-75	24.9	131.4	2.62	6.92	4.30
177	EW-HMAz1-D (152)	Jhenaidah	Moheshpur	23.35861	88.98222	40.70	0.08	0.089	74.8	2	7.18	-48	25.1	158.3	4.50	8.09	3.59
178	EW-HMSd1-D (147)	Jhenaidah	Moheshpur	23.37556	88.94444	39.95	0.01	0.016	51.2	0.5	7.32	-118	25.8	87.8	2.93	8.51	5.58
179	EW-HMSw1-D (34)	Jhenaidah	Moheshpur	23.37315	88.80528	45.10	0.02	0.019	99.6	5	7.15	-69	25.2	137.2	3.25	6.95	3.70
180	EW-HMNt1-D (95)	Jhenaidah	Moheshpur	23.32333	88.88528	42.30	0.2	0.13	52.9	5	7.21	-33	26.1	172.6	3.84	7.68	3.84
181	EW-HMJd1-D (56)	Jhenaidah	Moheshpur	23.27833	88.85222	39.35	0.01	0.024	48.6	1	7.28	-38	25.8	167.8	3.30	6.30	3.00
182	EW-HMJd1-D (90)	Jhenaidah	Moheshpur	23.26167	88.89250	40.45	0.01	0.020	47.3	5	7.01	44	25.4	250.1	4.39	9.04	4.65
183	EW-HHTh1-D (9)	Jhenaidah	Harinakunda	23.70111	89.04611	41.28	0.03	0.028	51.7	2	7.21	-67	25.2	139.2	3.95	10.60	6.65
184	EW-HHRg1-D (48)	Jhenaidah	Harinakunda	23.64880	89.10287	41.21	0	0.0017	38.6	0	7.37	-54	25.1	152.3	4.44	8.86	4.42
185	EW-HHHr1-D (26)	Jhenaidah	Harinakunda	23.66194	89.05528	37.45	0.04	0.083	55.1	2	7.24	-29	25.2	177.2	2.99	9.26	6.27
186	EW-HHBy1-D (4)	Jhenaidah	Harinakunda	23.72778	89.11454	38.20	0.03	0.057	56.6	5	7.16	-80	25.3	126.2	5.04	11.12	6.08
187	EW-HHJr1-D (8)	Jhenaidah	Harinakunda	23.71889	89.07370	38.25	0.05	0.047	55.7	5	7.16	-76	25.0	130.4	4.11	10.28	6.17
188	EW-HHCd1-D (72)	Jhenaidah	Harinakunda	23.60611	89.13111	48.30	0	0.016	38.6	0	7.52	111	24.3	317.9	3.76	7.97	4.21
189	EW-HHDl1-D (33)	Jhenaidah	Harinakunda	23.64435	89.03417	38.28	0	0.0005	47.3	0	7.36	-39	25.3	167.2	2.71	9.26	6.55
190	EW-HHKp1-D (56)	Jhenaidah	Harinakunda	23.58806	89.07676	39.81	0.01	0.030	44.9	2	7.19	117	24.6	323.7	4.12	9.65	5.53
191	EW-HSSr1-D (54)	Jhenaidah	Sailkupa	23.72917	89.24528	46.70	0	0.0015	88.3	0	7.25	103	25.3	309.2	6.66	9.90	3.24
192	EW-HSFz1-D (69)	Jhenaidah	Sailkupa	23.66944	89.25833	40.35	0.2	0.13	98.8	2	7.08	264	25.7	469.9	5.55	8.07	2.52
193	EW-HSDl1-D (96)	Jhenaidah	Sailkupa	23.66222	89.33667	40.78	0	0.0006	116.2	0	7.31	71	25.8	276.8	6.39	9.26	2.87
194	EW-HSDg1-D (40)	Jhenaidah	Sailkupa	23.69926	89.19593	35.10	0	0.0010	76.9	0	7.37	101	26.1	306.6	5.51	9.26	3.75
195	EW-HSUm1-D (122)	Jhenaidah	Sailkupa	23.64139	89.25056	34.80	0	0.0006	85.8	0	7.04	141	25.3	347.2	2.98	8.04	5.06
196	EW-HSFl1-D (133)	Jhenaidah	Sailkupa	23.63528	89.18611	40.55	0	<0.0005	69.7	0	7.27	186	25.8	391.8	5.23	8.93	3.70
197	EW-HSNt1-D (155)	Jhenaidah	Sailkupa	23.59250	89.25833	41.37	0	0.0006	48.8	0	7.34	184	25.5	390.0	3.64	6.72	3.08
198	EW-HSNt1-D (166)	Jhenaidah	Sailkupa	23.62861	89.27435	39.75	0	<0.0005	87.7	0	7.25	176	26.0	381.6	5.17	8.34	3.17
199	EW-HSHk1-D (88)	Jhenaidah	Sailkupa	23.69056	89.30870	42.34	0.02	0.045	94.4	5	7.12	25	26.1	230.6	6.29	9.66	3.37
200	EW-HSSl1-D (51)	Jhenaidah	Sailkupa	23.68444	89.24556	40.85	0	0.0090	88.2	0	7.13	183	26.1	388.6	5.01	9.23	4.22

Table 4.3.1 Results of 300 Existing Wells Survey in Dry Season [December 2000 to January 2001] (5/7)

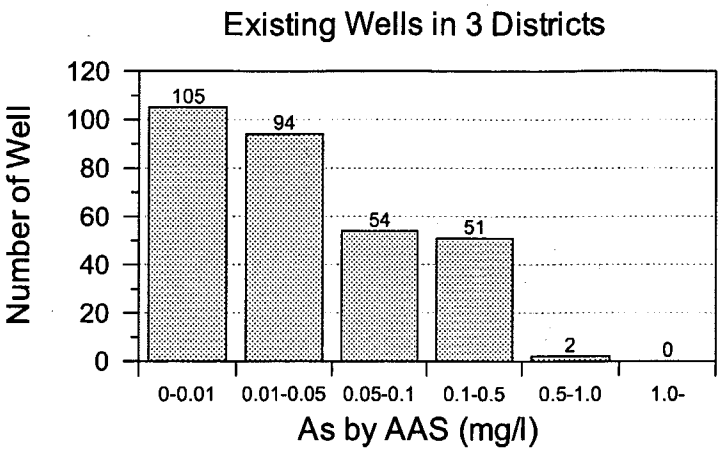
No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
201	EW-HSAb1-D (177)	Jhenaidah	Sailkupa	23.60917	89.31389	43.64	0	<0.0005	94.6	0	7.49	100	26.2	305.5	5.42	8.08	2.66
202	EW-HSBg1-D (101)	Jhenaidah	Sailkupa	23.62083	89.34806	40.92	0	0.0008	94.9	0	7.26	85	26.2	290.5	4.90	8.17	3.27
203	EW-HSBg1-D (115)	Jhenaidah	Sailkupa	23.64500	89.30250	39.40	0	0.0014	98.7	0	7.21	79	26.3	284.4	5.38	8.65	3.27
204	EW-HSKc1-D (27)	Jhenaidah	Sailkupa	23.74000	89.20500	38.30	0.01	0.020	80.0	2	7.29	54	26.3	259.4	5.50	10.07	4.57
205	EW-HSTb1-D (16)	Jhenaidah	Sailkupa	23.70611	89.15000	45.35	0.01	0.044	48.4	2	7.31	158	25.6	363.9	5.31	9.22	3.91
206	EW-HSMr1-D (9)	Jhenaidah	Sailkupa	23.66509	89.16167	41.70	0	0.039	52.7	0	7.23	-52	26.1	153.6	5.50	10.25	4.75
207	EW-HSDd1-D (145)	Jhenaidah	Sailkupa	23.61083	89.20778	44.54	0.02	0.024	52.3	2	7.29	103	24.8	309.5	3.00	6.79	3.79
208	EW-CAAl 1-D (79)	Chuadanga	Alamdanga	23.76083	88.94361	35.20	0.03	0.043	83.8	10	7.08	-56	26.3	149.4	2.25	12.22	9.97
209	EW-CAAl 1-D (72)	Chuadanga	Alamdanga	23.75042	88.93722	32.49	0.03	0.025	93.2	5	7.11	-45	26.2	160.5	2.66	11.01	8.35
210	EW-CABr 1-D (56)	Chuadanga	Alamdanga	23.75083	88.86426	39.21	0.04	0.043	57.3	2	7.15	40	24.4	246.8	5.63	12.75	7.12
211	EW-CABg 1-D (6)	Chuadanga	Alamdanga	23.78958	88.83792	29.72	0.04	0.065	91.3	10	6.90	-18	25.8	187.8	2.47	12.32	9.85
212	EW-CADu 1-D (78)	Chuadanga	Alamdanga	23.72843	88.96694	37.57	0.01	0.025	60.0	1	7.07	-30	26.0	175.6	2.35	10.68	8.33
213	EW-CAGg 1-D (09)	Chuadanga	Alamdanga	23.76259	88.83454	36.16	0.02	0.053	73.1	5	6.89	-107	25.1	99.3	3.44	12.91	9.47
214	EW-CAGg 1-D (18)	Chuadanga	Alamdanga	23.74306	88.82306	39.26	0	0.022	61.4	1	7.40	-80	25.9	125.7	3.33	12.20	8.87
215	EW-CAHr 1-D (68)	Chuadanga	Alamdanga	23.79083	88.89676	39.81	0	0.0010	62.8	0	7.05	-32	25.3	174.2	3.15	12.41	9.26
216	EW-CAKl 1-D (95)	Chuadanga	Alamdanga	23.79472	88.94597	26.68	0.05	0.046	125.0	5	7.05	-39	25.6	166.9	3.48	13.33	9.85
217	EW-CAJm 1-D (103)	Chuadanga	Alamdanga	23.72000	89.00481	36.58	0	0.0005	52.2	0	7.24	-60	26.1	145.6	2.65	11.26	8.61
218	EW-CAJh 1-D (30)	Chuadanga	Alamdanga	23.68847	88.87250	36.64	0.02	0.052	68.0	5	7.11	-41	25.5	165.0	5.17	11.35	6.18
219	EW-CAJh 1-D (81)	Chuadanga	Alamdanga	23.73000	88.90667	36.76	0	0.0012	48.8	0	7.36	97	25.9	302.7	3.24	11.96	8.72
220	EW-CAKd 1-D (22)	Chuadanga	Alamdanga	23.72083	88.81056	36.10	0	0.0090	109.0	5	6.94	151	24.5	357.7	3.52	11.72	8.20
221	EW-CAKd 1-D (35)	Chuadanga	Alamdanga	23.71778	88.85583	31.00	0.06	0.066	68.2	5	7.07	7	24.8	213.5	3.96	12.04	8.08
222	EW-CAKs 1-D (116)	Chuadanga	Alamdanga	23.66111	88.97472	36.72	0.03	0.041	71.0	10	7.15	-48	26.2	157.5	2.15	9.45	7.30
223	EW-CAKs 1-D (120)	Chuadanga	Alamdanga	23.63222	88.95694	35.32	0.1	0.066	81.3	10	7.14	-68	26.3	137.4	2.77	10.10	7.33
224	EW-CAKm 1-D (48)	Chuadanga	Alamdanga	23.76847	88.91208	35.30	0.02	0.017	52.0	2	7.10	-40	25.8	165.8	2.53	12.23	9.70
225	EW-CANg 1-D (90)	Chuadanga	Alamdanga	23.66389	88.93528	41.58	0.3	0.243	72.2	10	6.96	-60	26.2	145.5	2.52	10.67	8.15
226	EW-CANg 1-D (119)	Chuadanga	Alamdanga	23.63694	88.95722	63.71	0	0.0011	62.8	0	7.14	8	26.3	213.4	2.63	9.85	7.22
227	EW-CDDm 1-D (34)	Chuadanga	Damurhuda	23.59935	88.70861	37.28	0.01	0.029	34.2	2	7.17	-18	26.3	187.4	4.79	10.41	5.62
228	EW-CDDm 1-D (59)	Chuadanga	Damurhuda	23.60472	88.76542	35.35	0.01	0.042	39.5	1	7.15	-19	25.6	186.9	4.15	11.30	7.15
229	EW-CDDr 1-D (20)	Chuadanga	Damurhuda	23.49250	88.76287	31.58	0.02	0.036	42.4	2	7.32	-52	25.9	153.7	2.21	9.14	6.93
230	EW-CDDr 1-D (75)	Chuadanga	Damurhuda	23.52167	88.79039	30.31	0.06	0.10	45.3	0.5	7.20	-99	25.8	106.8	4.78	8.96	4.18
231	EW-CDHw 1-D (73)	Chuadanga	Damurhuda	23.54972	88.81014	33.43	0.4	0.18	74.4	2	7.02	-123	24.2	83.9	3.00	10.93	7.93
232	EW-CDHw 1-D (68)	Chuadanga	Damurhuda	23.57694	88.79472	37.92	0.3	0.068	88.2	2	7.25	-94	26.1	111.6	4.24	11.73	7.49
233	EW-CDJr 1-D (51)	Chuadanga	Damurhuda	23.68194	88.78694	36.50	0	<0.0005	116.0	0	7.07	-64	25.8	141.8	4.07	11.70	7.63
234	EW-CDKp 1-D (7)	Chuadanga	Damurhuda	23.57139	88.67431	34.86	0.01	0.0095	50.4	5	7.08	-28	26.4	177.4	4.15	10.90	6.75
235	EW-CDKr 1-D (26)	Chuadanga	Damurhuda	23.51972	88.72222	31.65	0	0.0054	126.2	2	6.91	-90	26.1	115.6	6.15	9.41	3.26
236	EW-CDKr 1-D (29)	Chuadanga	Damurhuda	23.55167	88.73111	34.00	0.01	0.014	74.2	0.5	7.04	-39	26.2	166.5	6.39	11.42	5.03
237	EW-CDNt 1-D (41)	Chuadanga	Damurhuda	23.65306	88.71083	32.81	0	0.010	86.2	5	6.99	-44	26.2	161.5	4.62	10.76	6.14
238	EW-CDNt 1-D (43)	Chuadanga	Damurhuda	23.63472	88.70361	40.73	0.04	0.055	101.2	5	6.93	-30	26.1	175.6	2.93	9.60	6.67
239	EW-CCAl 1-D (1)	Chuadanga	Chuadanga Sadar	23.66963	88.81944	32.31	0.01	0.024	33.8	1	7.34	-28	25.7	177.9	4.99	12.05	7.06
240	EW-CCBg 1-D (18)	Chuadanga	Chuadanga Sadar	23.55389	88.86306	37.22	0	0.028	47.8	5	7.32	-79	25.9	126.7	2.59	11.42	8.83
241	EW-CCBg 1-D (66)	Chuadanga	Chuadanga Sadar	23.51306	88.88528	35.67	0.01	0.051	50.0	5	7.14	-78	26.0	127.6	2.46	10.20	7.74
242	EW-CCKt 1-D (78)	Chuadanga	Chuadanga Sadar	23.59213	88.93806	25.48	0.6	0.18	55.2	10	7.09	-99	25.4	107.1	3.34	10.72	7.38
243	EW-CCkt 1-D (91)	Chuadanga	Chuadanga Sadar	23.56819	88.97653	44.22	0	<0.0005	77.4	0	7.20	-78	24.8	128.5	3.30	10.35	7.05
244	EW-CCMm 1-D (47)	Chuadanga	Chuadanga Sadar	23.65139	88.89556	46.55	0.05	0.055	54.2	2	7.08	115	24.3	321.9	2.16	10.83	8.67
245	EW-CCPd 1-D (53)	Chuadanga	Chuadanga Sadar	23.61583	88.88347	31.72	0.01	0.039	99.5	10	7.07	-76	26.1	129.6	3.93	10.74	6.81
246	EW-CCPd 1-D (81)	Chuadanga	Chuadanga Sadar	23.60519	88.93111	31.23	0.3	0.088	86.9	5	7.15	-123	26.4	82.4	2.69	11.40	8.71
247	EW-CCCd 1-D (5)	Chuadanga	Chuadanga Sadar	23.63056	88.81157	35.47	0.05	0.076	50.6	10	7.01	-102	26.2	103.5	5.94	11.52	5.58
248	EW-CCCd 1-D (41)	Chuadanga	Chuadanga Sadar	23.63111	88.85917	34.85	0	0.026	45.7	2	7.11	-97	26.0	108.6	4.14	11.64	7.51
249	EW-CCSk 1-D (33)	Chuadanga	Chuadanga Sadar	23.58306	88.85833	42.43	0	<0.0005	44.4	0	7.18	-71	25.9	134.7	3.58	10.59	7.01
250	EW-CCSk 1-D (35)	Chuadanga	Chuadanga Sadar	23.58917	88.88556	30.95	0	0.077	45.5	2	7.10	-60	26.1	145.6	2.45	9.63	7.18

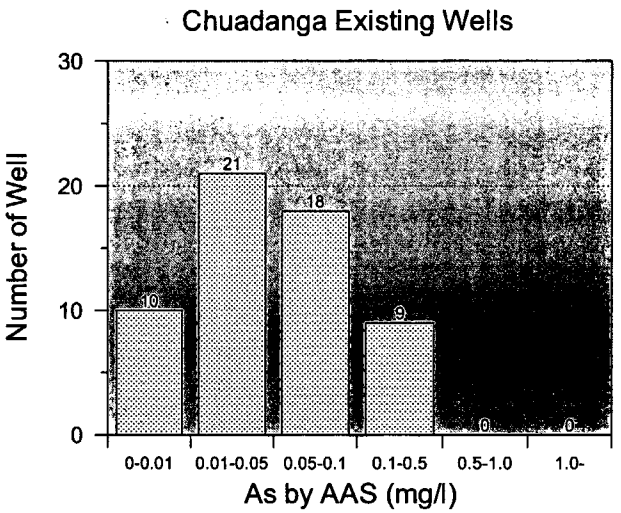
Table 4.3.1 Results of 300 Existing Wells Survey in Dry Season [December 2000 to January 2001] (6/7)

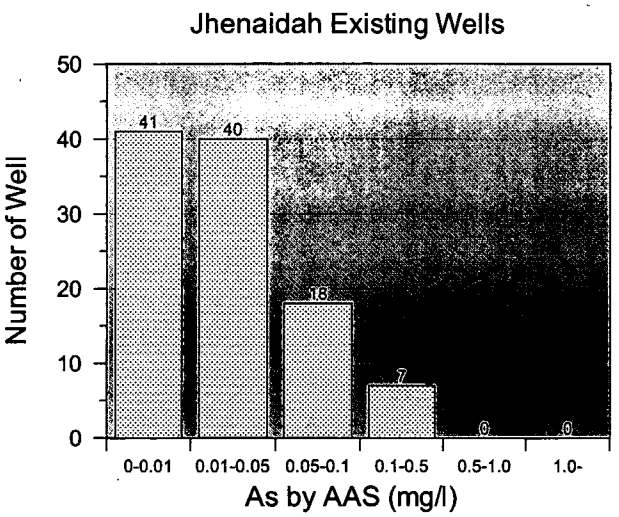
No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
251	EW-CCTt 1-D (72)	Chuadanga	Chuadanga Sadar	23.54472	88.90806	35.67	0.4	0.16	48.6	5	7.12	38	25.1	244.3	2.17	9.36	7.19
252	EW-CCTt 1-D (98)	Chuadanga	Chuadanga Sadar	23.49639	88.92833	37.55	0	0.087	50.4	5	7.03	-66	26.1	139.6	2.99	9.62	6.63
253	EW-CJUt 1-D (31)	Chuadanga	Jibannagar	23.45667	88.83194	42.00	0.02	0.025	58.0	2	7.31	-59	26.6	146.2	2.47	9.79	7.32
254	EW-CJUt 1-D (36)	Chuadanga	Jibannagar	23.47667	88.87833	38.64	0.01	0.047	53.1	5	7.16	-66	26.0	139.6	4.08	9.57	5.49
255	EW-CJJb 1-D (10)	Chuadanga	Jibannagar	23.43509	88.78398	41.00	0.01	0.048	96.1	5	7.01	-86	25.2	120.2	2.89	7.87	4.98
256	EW-CJJb 1-D (20)	Chuadanga	Jibannagar	23.40083	88.80833	38.42	0.2	0.071	47.2	5	7.07	-48	26.2	157.5	2.91	7.92	5.01
257	EW-CJBk 1-D (47)	Chuadanga	Jibannagar	23.41486	88.85486	29.57	0.05	0.073	39.4	5	7.26	-96	25.7	109.9	5.66	10.76	5.10
258	EW-CJBk 1-D (69)	Chuadanga	Jibannagar	23.43917	88.91167	36.10	0.04	0.14	46.2	5	7.18	-78	25.5	128.0	4.80	8.86	4.06
259	EW-CJAd 1-D (54)	Chuadanga	Jibannagar	23.47311	88.88606	34.00	0.05	0.12	48.2	5	7.14	-74	25.5	132.0	2.01	9.06	7.05
260	EW-CJAd 1-D (55)	Chuadanga	Jibannagar	23.48253	88.89819	39.35	0.1	0.17	53.5	5	7.12	-55	25.9	150.7	3.93	9.68	5.75
261	EW-JJJs1-D (PTW-10),T-1)	Jessore	Jessore Sadar	23.17861	89.19796	115.41	0	0.013	40.6	0.2	7.51	60	24.7	266.6	2.04	6.82	4.78
262	EW-JJJs1-D (T.PTW-02),T-2)	Jessore	Jessore Sadar	23.17056	89.19463	125.15	0	0.024	37.9	0.5	7.34	8	24.2	214.9	1.65	5.97	4.33
263	EW-JJJs1-D (PTW-02),T-3)	Jessore,	Jessore Sadar	23.17139	89.20000	132.54	0	0.0042	45.2	0.5	7.25	102	25.2	308.2	4.63	7.07	2.44
264	EW-JJJs1-D (T.PTW-04),T-4	Jessore	Jessore Sadar	23.16667	89.20556	98.85	0	0.0006	51.7	0	7.25	111	26.1	316.6		7.18	
265	EW-JJJs1-D (PTW-11),T-5	Jessore	Jessore Sadar	23.16306	89.20444	117.53	0	0.0007	49.8	0.2	7.27	160	25.9	365.7	1.42	6.25	4.83
266	EW-JJJs 1-D(T.PTW-6),T-6	Jessore	Jessore Sadar	23.16426	89.21028	125.84										6.50	
267	EW-JJJs 1-D(PTW-7),T-7	Jessore	Jessore Sadar	23.16917	89.21843	114.77	0	0.0012	52.4	0	7.39	21	25.9	226.7	5.18	6.62	1.44
268	EW-JJJs 1-D (T.PTW-9),T-9	Jessore	Jessore Sadar	23.16417	89.22306	118.46	0	0.0008	59.5	0.2	7.42	12	21.2	221.1	4.42	6.49	2.07
269	EW-JJJs 1-D (PTW-15),T-10	Jessore	Jessore Sadar	23.16500	89.22667	124.10	0	0.0018	107.4	1	7.51	11	27.1	215.9	4.89	6.63	1.74
270	EW-JJJs 1-D (PTW-8),T-11	Jessore	Jessore Sadar	23.15861	89.21528	89.31	0	0.0026	53.2	0	7.02	119	20.4	328.7	8.35	6.03	-2.32
271	EW-JJJs 1-D(PTW-13),T-12	Jessore	Jessore Sadar	23.15481	89.21463	120.16	0	0.0025	52.4	0.2	7.34	2	26.2	207.5	19.46	5.72	-13.74
272	EW-JJJs 1-D(PTW-14),T-14	Jessore	Jessore Sadar	23.15157	89.20389	103.60										4.39	
273	EW-JJJs1-D(PTW-12),T-15	Jessore	Jessore Sadar	23.14722	89.20065	118.46	0.01	0.030	47.6	2	7.15	16	25.8	221.3	3.71	4.62	0.92
274	EW-JJJs1-D(PTW-17),T-17	Jessore	Jessore Sadar	23.17194	89.21380	85.32	0	<0.0005	56.1	0	7.38	39	25.4	245.1	5.04	6.34	1.30
275	EW-HJJn 1-D (PTW-01)	Jhenaidah	Jhenaidah Sadar	23.54417	89.17431	99.20	0	0.0078	48.6	0.5	7.10	155	23.9	362.2	3.57	7.75	4.18
276	EW-HJJn 1-D (PTW-03)	Jhenaidah	Jhenaidah Sadar	23.54583	89.16333	95.32	0.03	0.035	40.6	1	7.19	77	25.8	282.8	-0.77	8.35	9.12
277	EW-HJJn 1-D (PTW-04)	Jhenaidah	Jhenaidah Sadar	23.53602	89.17361		0	0.0026	41.7	0.5	7.48	12	25.1	218.3	6.16	7.17	1.01
278	EW-HJJn 1-D (PTW-05)	Jhenaidah	Jhenaidah Sadar	23.55306	89.17361	123.24	0.04	0.044	48.1	0.2	7.45	40	25.2	246.2	7.27	8.75	1.48
279	EW-HJJn 1-D (PTW-06)	Jhenaidah	Jhenaidah Sadar	23.55241	89.16139	99.20	0.05	0.064	55.5	0.5	7.03	42	25.7	247.9	5.00	8.78	3.78
280	EW-HJJn 1-D (PTW-07)	Jhenaidah	Jhenaidah Sadar	23.53639	89.16778	96.22	0	0.0011	39.3	0	7.21	138	24.0	345.1	3.86	8.01	4.15
281	EW-HKKl 1-D (PTW-01)	Jhenaidah	Kaliganj	23.40568	89.13135	124.56	0	0.0024	74.0	2	6.95	-2	24.0	205.1	3.99	7.78	3.79
282	EW-HKKl 1-D (PTW-02)	Jhenaidah	Kaliganj	23.40667	89.13917	124.56	0.01	0.021	48.5	2	6.98	109	24.5	315.7		8.66	
283	EW-HKKl 1-D (PTW-03)	Jhenaidah	Kaliganj	23.40926	89.13444	128.97										8.02	
284	EW-HTKt 1-D (PTW-01)	Jhenaidah	Kotchandpur	23.40750	89.01556	116.79	0	0.0054	45.5	0.5	7.12	112	24.0	319.1	5.51	9.09	3.58
285	EW-HTKt 1-D (PTW-02)	Jhenaidah	Kotchandpur	23.40944	89.01028	110.50	0	0.0031	49.2	0	7.17	40	24.2	246.9	7.45	9.27	1.82
286	EW-HTKt 1-D (PTW-03)	Jhenaidah	Kotchandpur	23.39722	89.01250	118.93	0.01	0.015	51.3	1	7.18	115	24.4	321.8	6.14	9.59	3.45
287	EW-HMMh 1-D (PTW-01)	Jhenaidah	Mohespur	23.35194	88.91778	99.60	0.01	0.063	40.8	1	7.23	-5	25.8	200.8	4.40	9.17	4.77
288	EW-HMMh 1-D (PTW-02)	Jhenaidah	Mohespur	23.35444	88.91222	113.17	0.02	0.072	43.6	1	7.12	-32	24.8	174.5	5.19	9.64	4.45
289	EW-HSSl 1-D (PTW-01)	Jhenaidah	Sailkupa	23.68694	89.24167	96.54	0	0.0024	76.4	0.2	7.12	183	25.2	389.2	5.51	8.00	2.49
290	EW-HSSl 1-D (PTW-02)	Jhenaidah	Sailkupa	23.68694	89.24972	93.49	0	0.0080	87.6	0.2	7.18	204	26.0	409.6	6.21	9.55	3.34
291	EW-HSSl 1-D (PTW-03)	Jhenaidah	Sailkupa	23.68157	89.24278	97.76	0	0.0014	84.4	0.5	7.12	163	24.2	369.9	6.81	9.17	2.36
292	EW-CCCd 1-D (PTW-01)	Chuadanga	Chuadanga Sadar	23.63917	88.83972	106.50	0.06	0.066	43.1	0.2	7.39	-60	25.9	145.7	14.09	12.17	-1.92
293	EW-CCCd 1-D (PTW-2A)	Chuadanga	Chuadanga Sadar	23.64361	88.85000	102.10	0.06		62.4	0.5	7.06	-15	26.1	190.6	4.22	11.94	7.72
294	EW-CCCd 1-D (PTW-2B)	Chuadanga	Chuadanga Sadar	23.64417	88.85167	133.00	0.06	0.059	53.5	0.5	7.11	72	24.9	278.4	4.13	11.90	7.77
295	EW-CCCd 1-D (PTW-03)	Chuadanga	Chuadanga Sadar	23.63454	88.84815	133.00									4.34	11.92	7.58
296	EW-CCCd 1-D (PTW-04)	Chuadanga	Chuadanga Sadar	23.63500	88.82306	109.72	0.2	0.12	47.5	0	7.40	-86	25.2	120.2	4.84	13.65	8.81
297	EW-CCCd 1-D (PTW-05)	Chuadanga	Chuadanga Sadar	23.63667	88.85944		0.02	0.051	41.1	2	7.20	117	25.1	323.3	3.97	11.74	7.77
298	EW-JJJs 1-D (T.PTW-8) (T-8)	Jessore	Jessore Sadar	23.16667	89.21861	131.94	0	0.0018	97.5	0.2	7.33	34	24.9	240.4		6.78	
299	EW-JJJs1-D(T.PTW-13),(T-13)	Jessore	Jessore Sadar	23.15556	89.21083	91.41										4.88	
300	EW-JJJs1-D(T.PTW-16), (T-16)	Jessore	Jessore Sadar	23.16981	89.21083	124.10										7.32	

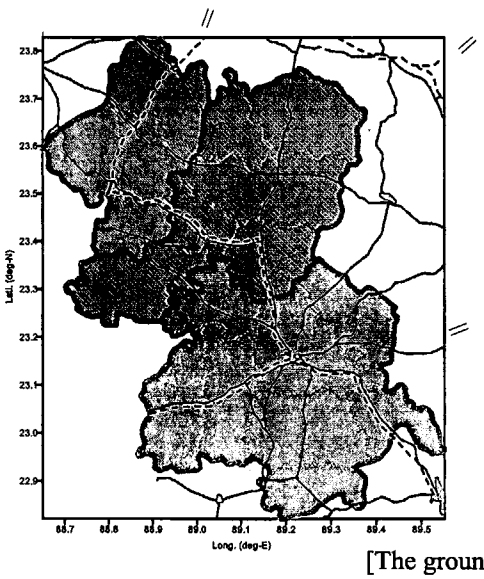
Table 4.3.1 Results of 300 Existing Wells Survey in Dry Season [December 2000 to January 2001] (7/7)

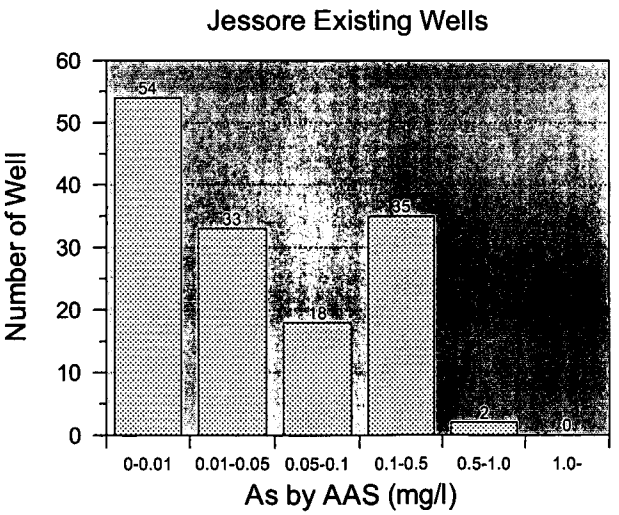
No.	Well No.	District	Thana	Lati. (deg-N)	Long. (deg-E)	Well depth (m)	As by FK (mg/l)	As by AAS (mg/l)	EC (mS/m)	Fe^{2+} (mg/l)	pH (SU)	ORP (mV)	W-Temp (deg-C)	Eh (mV)	DTW (GL-m)	GL (masl)	GWL (masl)
301	EW-JKPj1-D (102)(Near)	Jessore	Keshabpur	22.91472	89.25111	41.15	0.8	0.44	268.0	5	6.98	-93	24.2	113.9	2.35	1.94	-0.41
302	EW-JMJp1-D (174)(Near)	Jessore	Manirampur	22.97556	89.15472		0.05	0.070	39.7	1	6.98	31	20.2	240.8	2.95	4.71	1.76
303	EW-JMDb1-D (227)(Near)	Jessore	Manirampur	22.96444	89.30333	24.00	0	0.0009	185.3	0	7.16	-66	23.1	141.7	3.95	1.73	-2.22
304	EW-JMHd1-D (138)(Near)	Jessore	Manirampur	23.04556	89.31583	45.00	0	0.0031	154.7	0	7.07	-88	23.1	119.7	3.95	1.90	-2.05
305	EW-JMMr1-D (101)(Near)	Jessore	Manirampur	23.03861	89.25361	40.00	0.08	0.056	47.6	10	6.96	-70	23.0	137.8	2.81	4.33	1.52
306	EW-JMKs1-D (71)(Near)	Jessore	Manirampur	23.06306	89.19722	47.00	0.05	0.033	41.3	1	7.32	-80	23.2	127.7	4.16	5.99	1.83
307	EW-JCJr1-D (218)(Near)	Jessore	Chougachha	23.27509	89.07667	17.10	0.1	0.35	54.3	10	7.07	-81	25.9	124.7	4.13	7.39	3.26
308	EW-JCSk1-D (133)(Near)	Jessore	Chougachha	23.27361	88.93833	41.77	0.6	0.14	46.3	5	7.11	-55	25.7	150.9	5.73	7.62	1.89
309	EW-JCPl1-D (205)(Near)	Jessore	Chougachha	23.24944	89.08750	17.87	0.1	0.49	94.1	10	7.01	-13	24.8	193.5	3.92	7.34	3.42
310	EW-JARj1-D (85)(Near)	Jessore	Abhaynagar	22.99833	89.38722	49.75	0	<0.0005	171.2	0	7.27	-34	24.3	172.9	3.98	2.62	-1.35
311	EW-JAPr1-D (92)(Near)	Jessore	Abhaynagar	22.96806	89.38917	42.35	0	<0.0005	35.9	0	7.06	-57	24.8	149.5	2.13	1.48	-0.65
312	EW-HJGn1-D (86)(Near)	Jhenaidah	Jhenaidah Sadar	23.48352	89.07565	38.36	0.04	0.18	73.7	10	7.05	-114	25.4	92.1	3.07	8.93	5.86
313	EW-HTEl1-D (75) (Near)	Jhenaidah	Kotchandpur	23.43528	89.04917	15.19	0		115.4	0	7.10	-68	25.6	137.9	5.38	7.66	2.28
314	EW-JBBd1-D (36) (Near)	Jessore	Bagherpara	23.29278	89.26722	23.26	0		37.8	0	7.32	146	25.1	352.3		5.72	
315	EW-CJAd 1-D (55)(Near)	Chuadanga	Jibannagar	23.48253	88.89819			0.019								9.69	











[The groundwater samples were collected in December 2000 to January 2001.
The arsenic concentrations were analyzed by the AAS in Jhenaidah Laboratory.]

Figure 4.3.1	As Concentrations by District in Dry Season Analyzed by AAS

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

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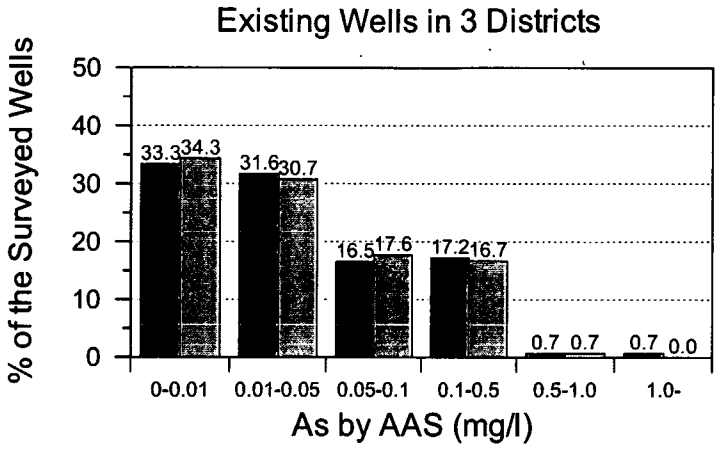

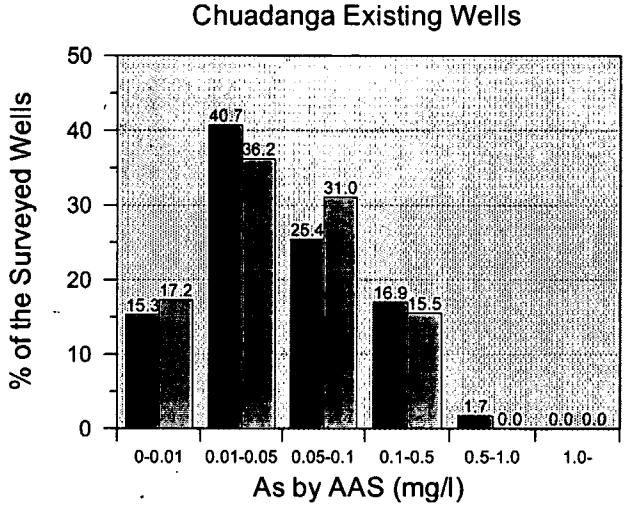

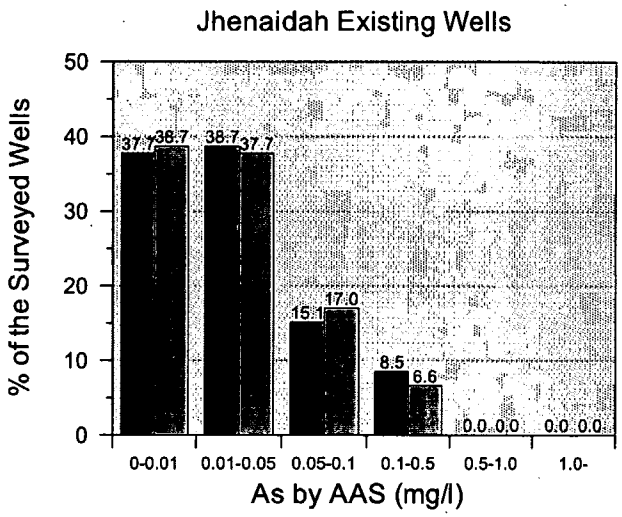

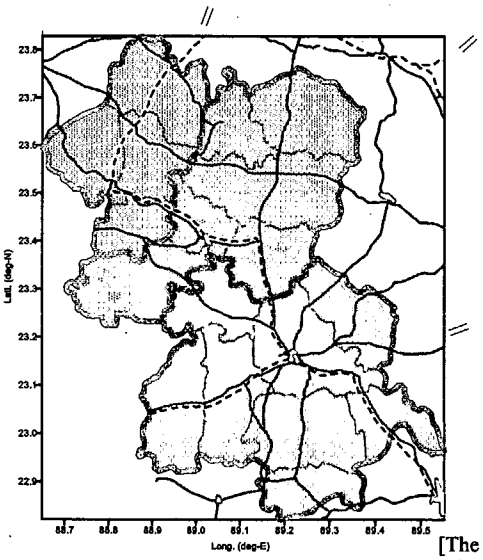

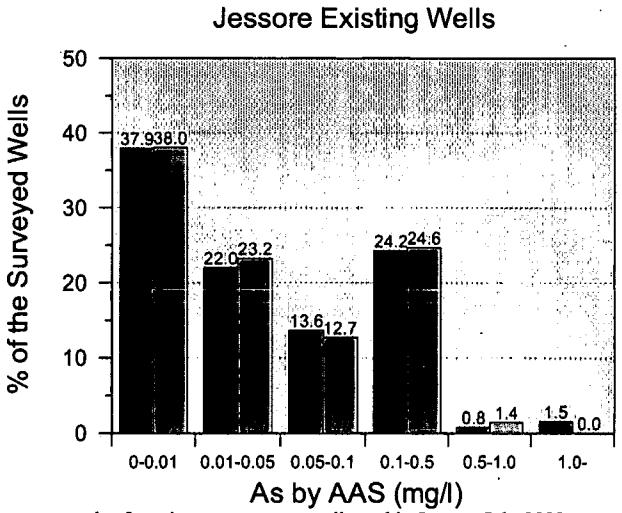

[The groundwater samples for rainy season were collected in June to July 2000.
The groundwater samples for dry season were collected in December 2000 to January 2001.
The arsenic concentrations were analyzed by the AAS in Jhenaidah Laboratory.]

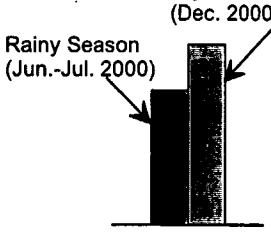

Figure 4.3.2 **Comparison of As Concentrations by District Analyzed by AAS**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

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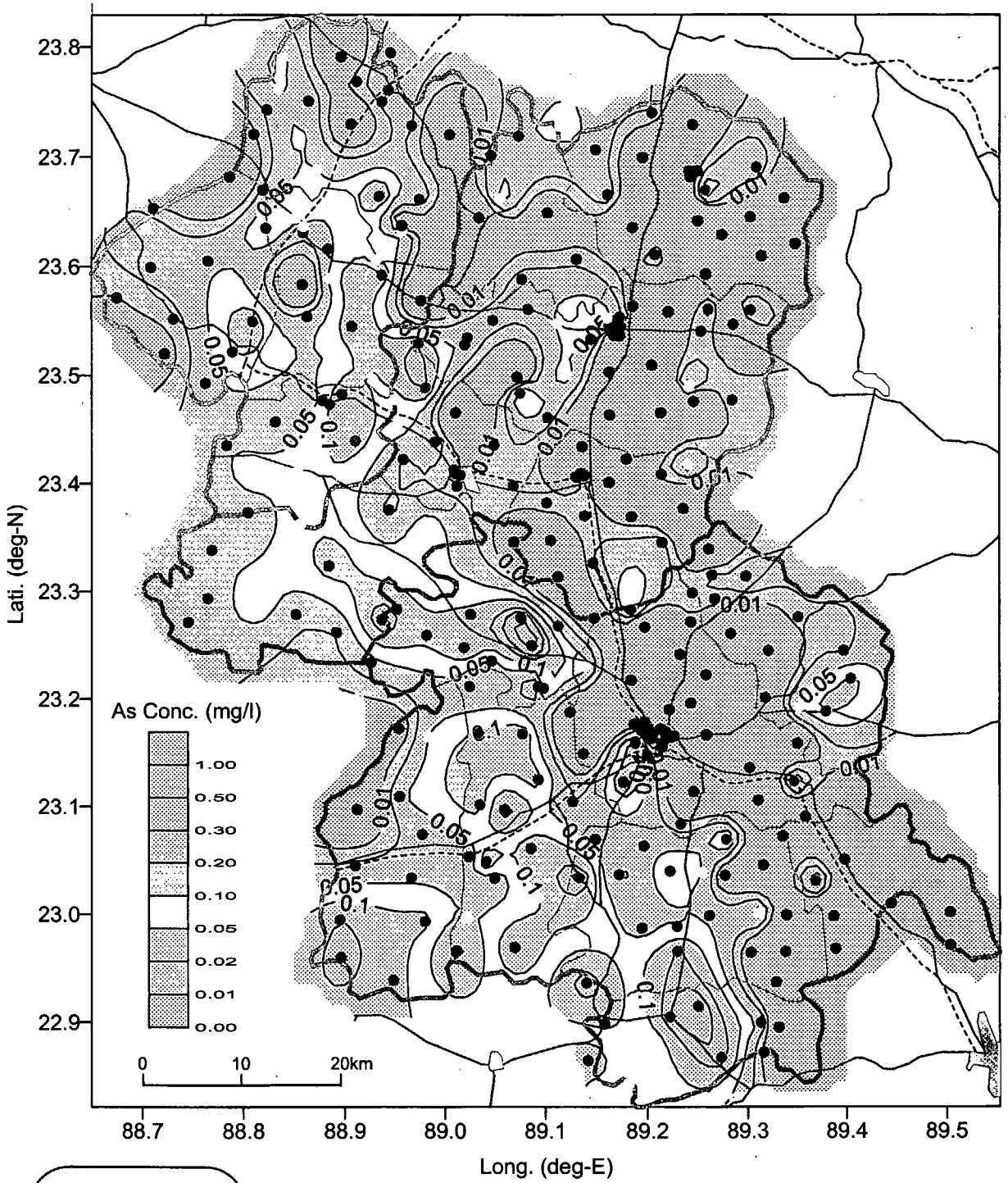


As (mg/l) analyzed by AAS

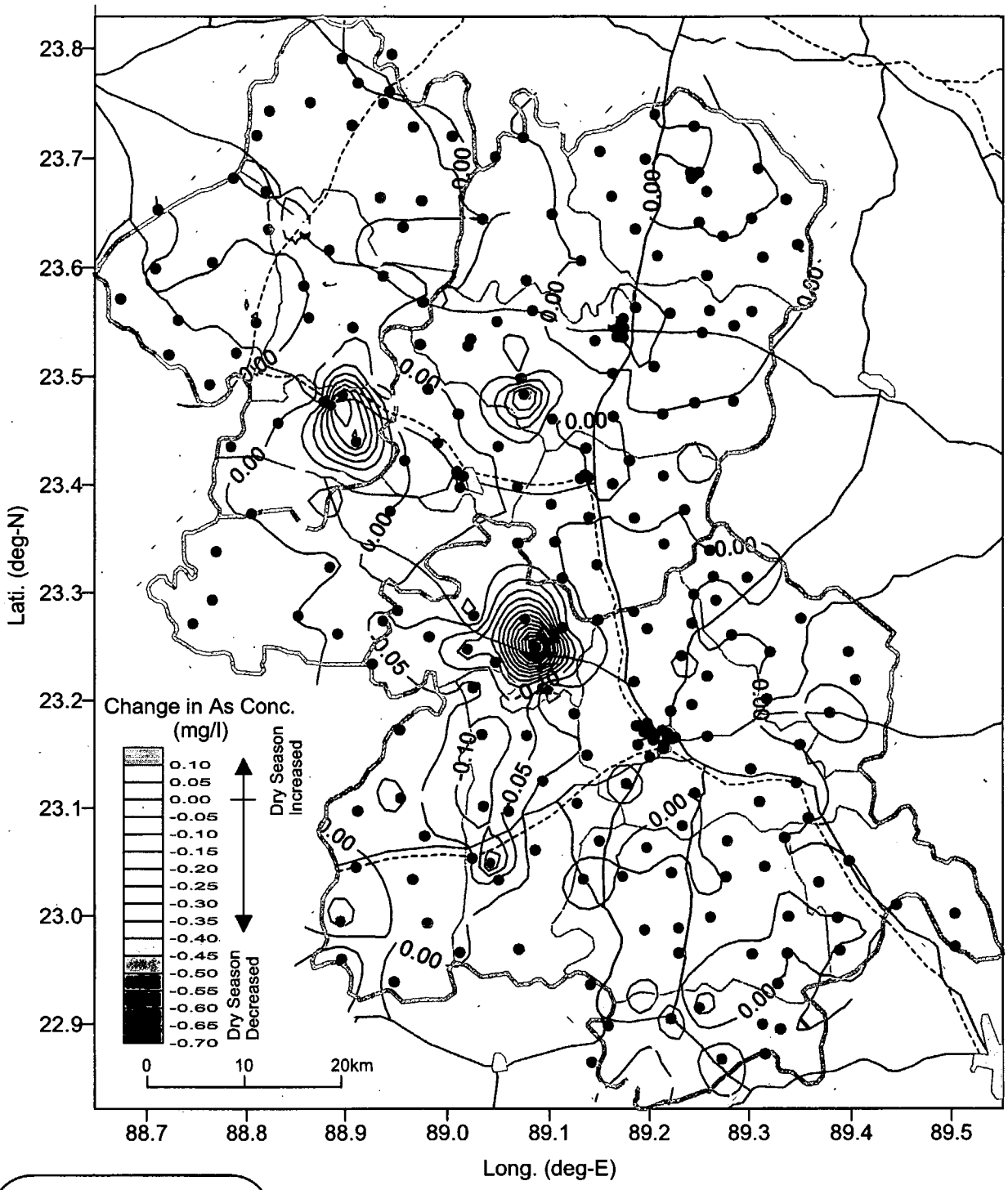
- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1
- 1 to 2

[The groundwater samples of 300 existing wells were collected in December 2000 to January 2001. The arsenic concentrations were analyzed by AAS in Jhenaidah Laboratory established by the JICA Study Team.]

Figure 4.3.3 **As Concentration in Dry Season Analyzed by AAS**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



As (mg/l) in Dry Season analyzed by AAS

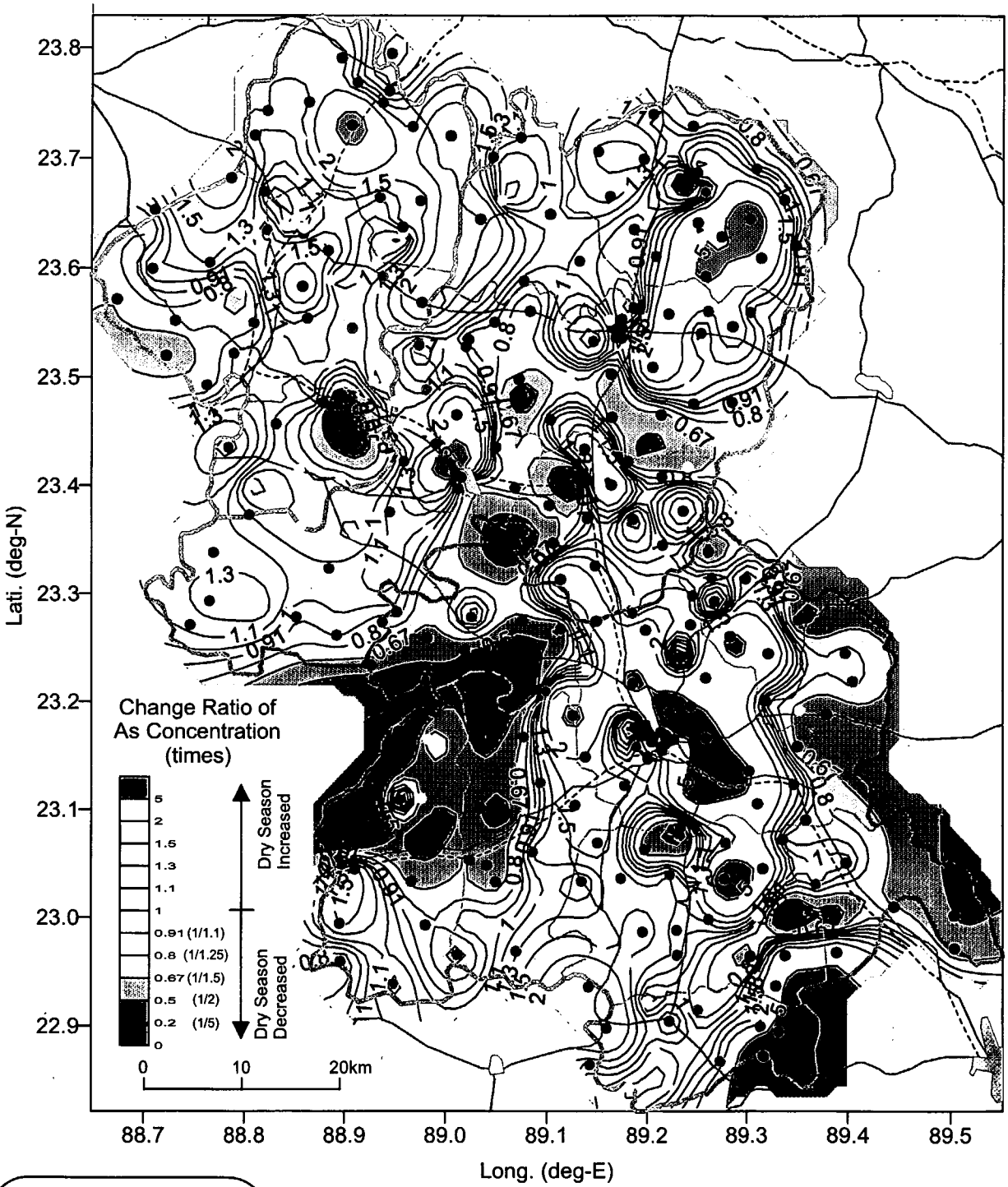
- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1
- 1 to 2

[The groundwater samples of 300 existing wells for rainy season and dry season were collected in June to July 2000 and December 2000 to January 2001, respectively. The arsenic concentrations were analyzed by AAS in Jhenaidah Laboratory established by the JICA Study Team.]

Figure 4.3.4 **Changes in As Concentration between Rainy Season and Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



As (mg/l) in Dry Season analyzed by AAS

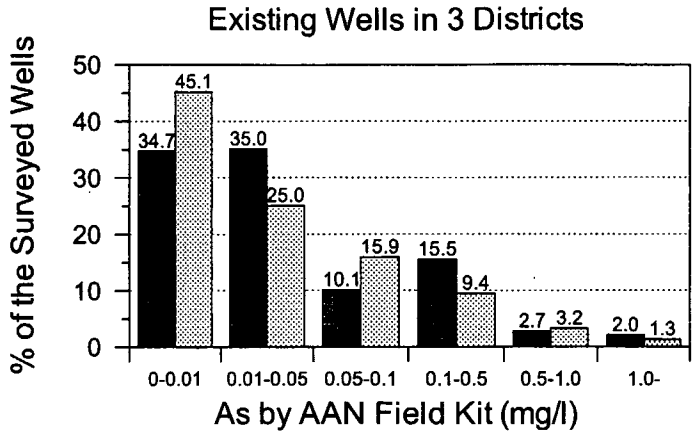
- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1
- 1 to 2

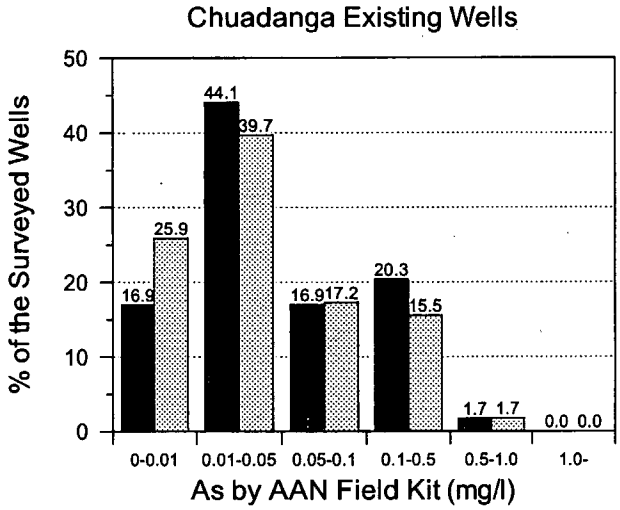
[The groundwater samples of 300 existing wells for rainy season and dry season were collected in June to July 2000 and December 2000 to January 2001, respectively. The arsenic concentrations were analyzed by AAS in Jhenaidah Laboratory established by the JICA Study Team.]

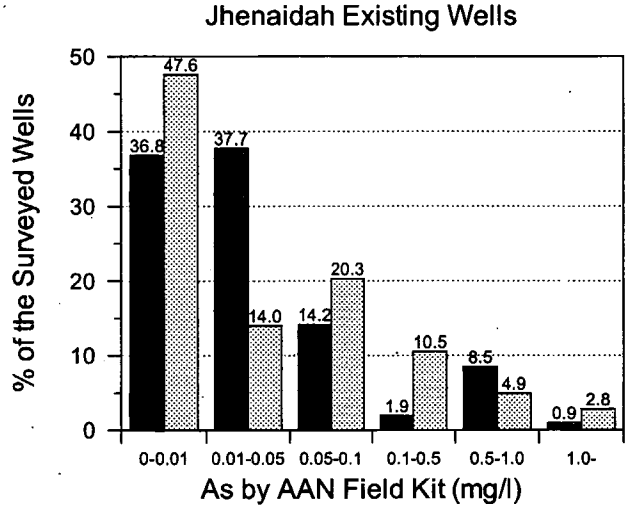
Figure 4.3.5 **Changes Ratio of As Concentration from Rainy Season and Dry Season**

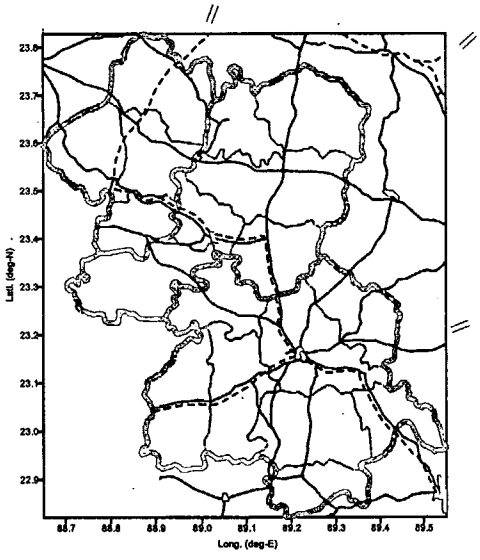
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

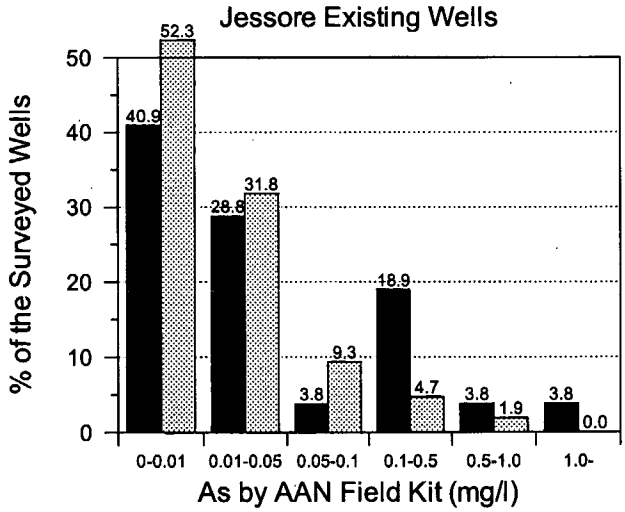
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)











[The samples for rainy season were measured in June to July 2000.
The samples for dry season were measured in December 2000 to January 2001.
The arsenic concentrations were measured by the AAN Filed Kit.]

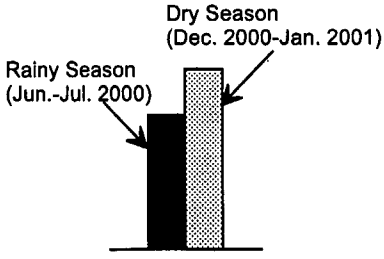
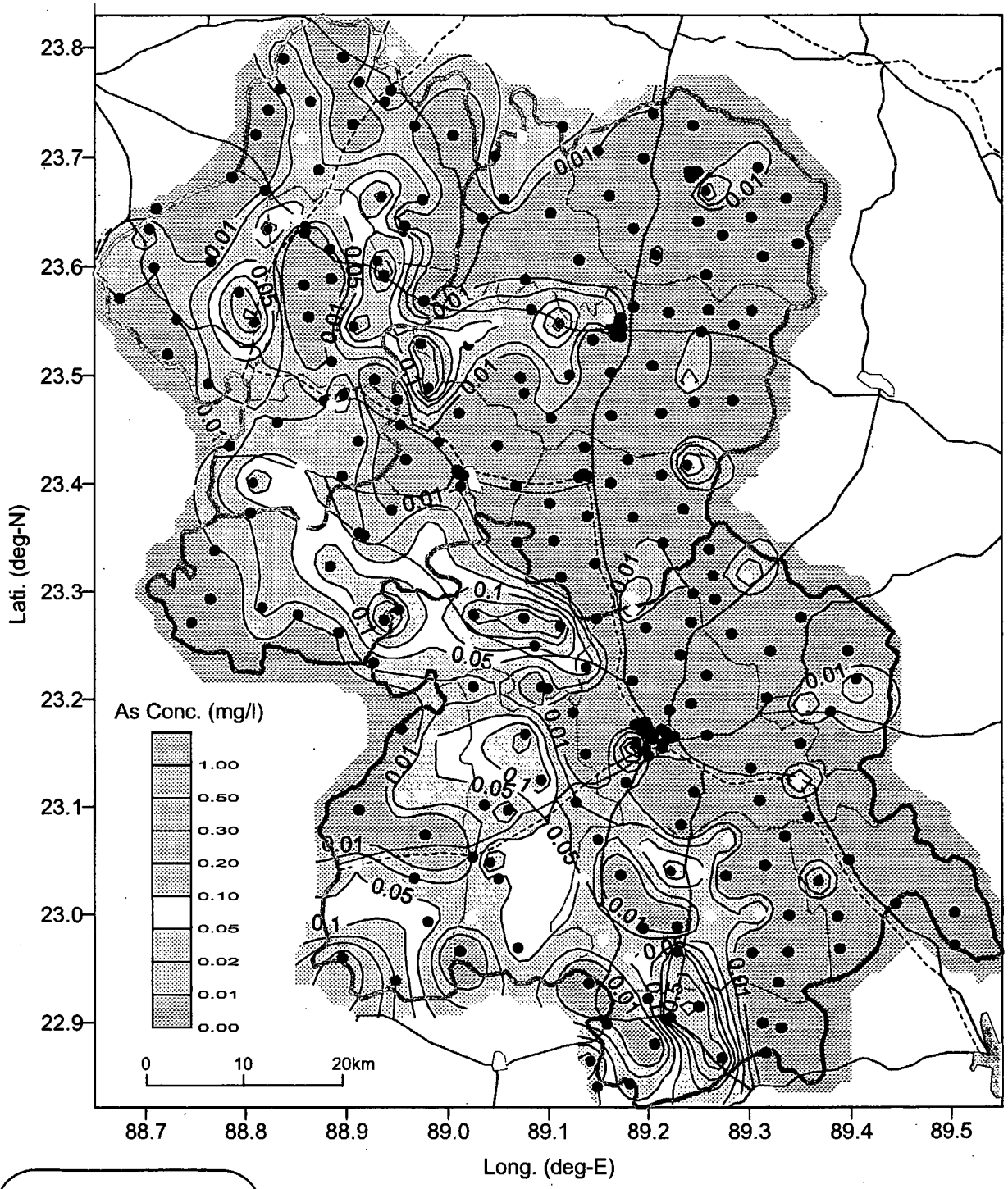


Figure 4.3.6 **Comparison of As Concentrations by District Measured by AAN Field Kit**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



As (mg/l) measured by AAN Field Kit

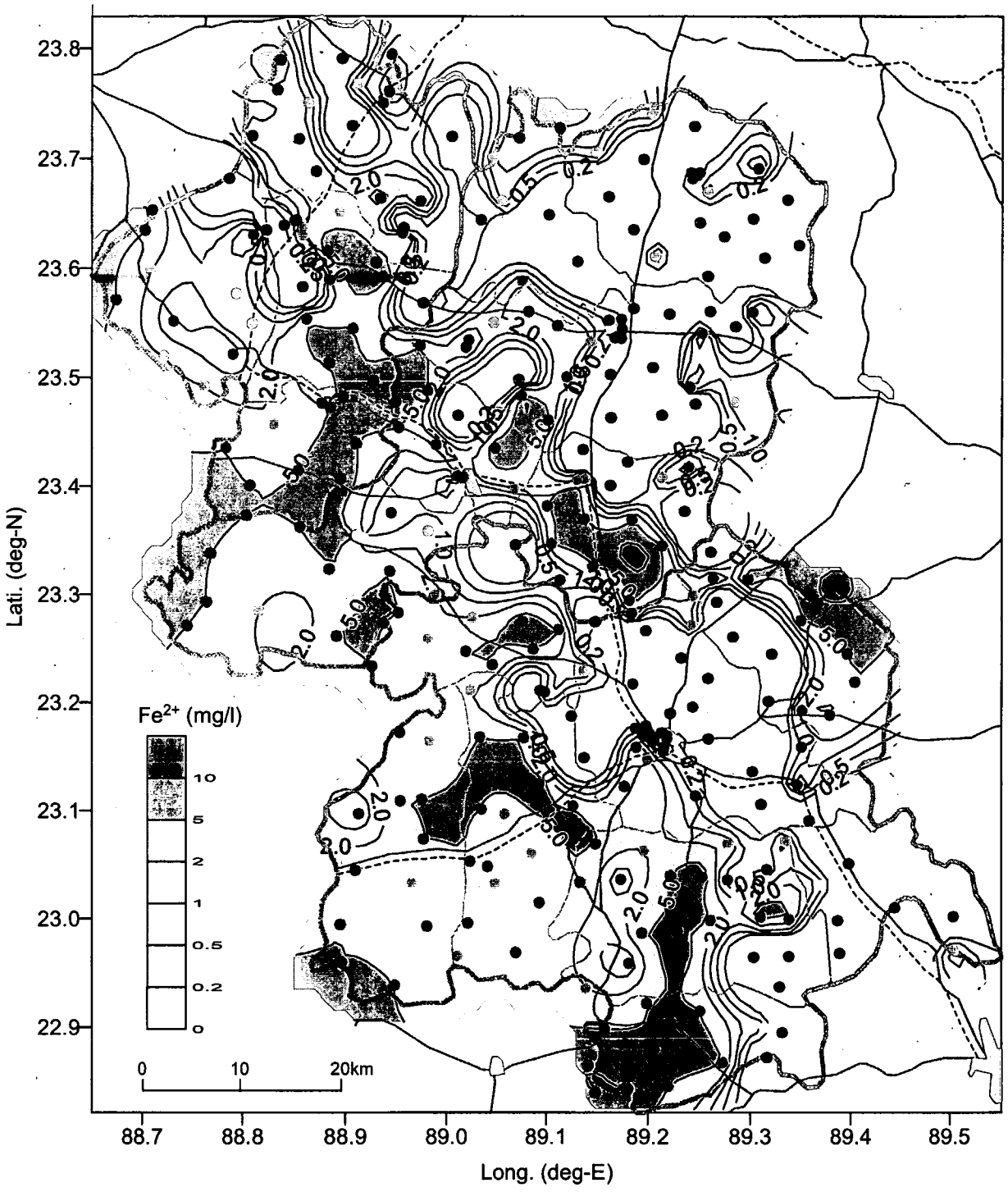
- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1
- 1 to 2

[The groundwater samples of 300 existing wells were collected in December 2000 to January 2001.
The arsenic concentrations were measured by the AAN Field Kit.]

Figure 4.3.7 **As Concentration in Dry Season Analyzed by AAN Field Kit**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



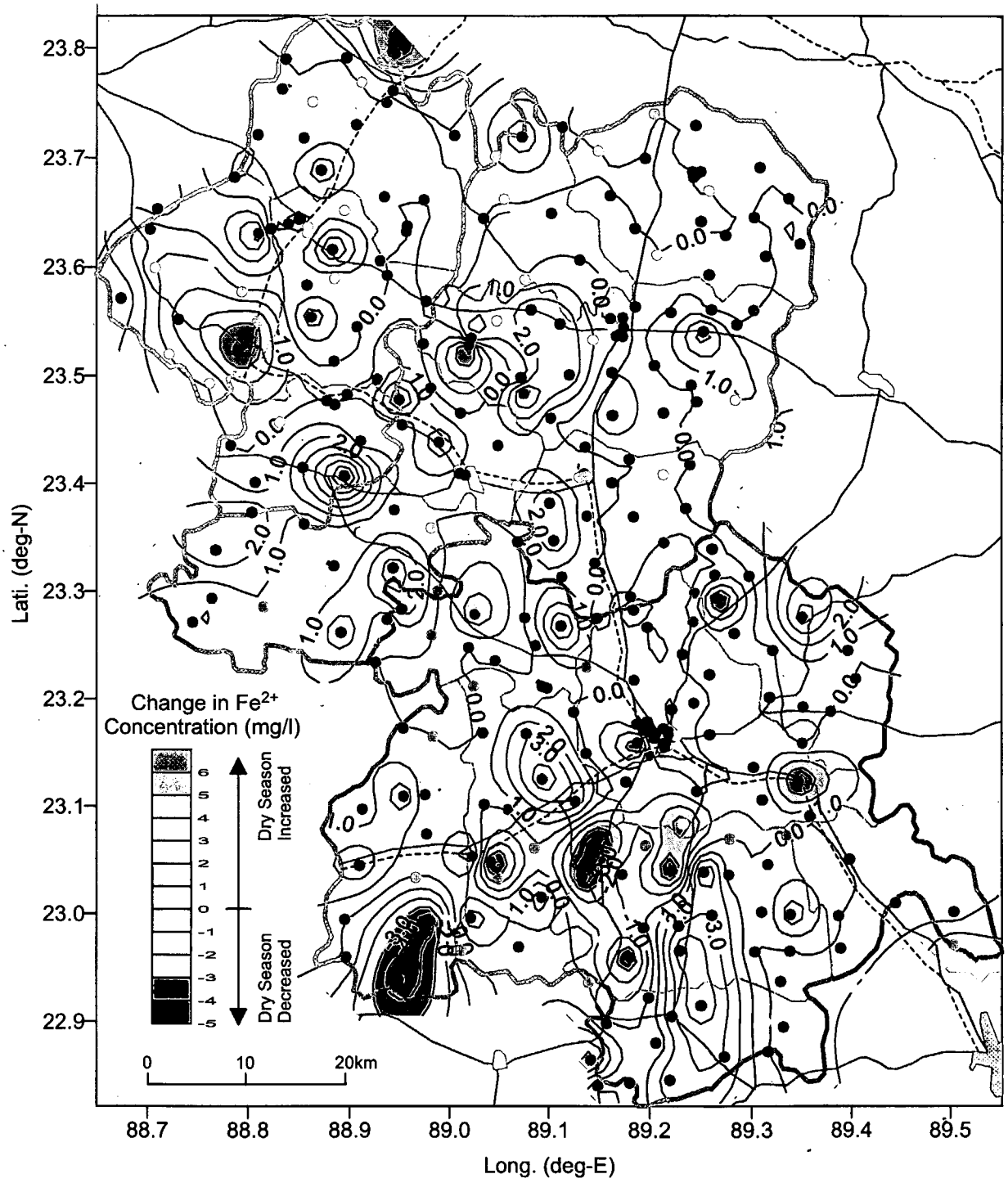
Fe2+(mg/l)
- 0.0 to 0.2
- 0.2 to 1.0
- 1.0 to 2.0
- 2.0 to 5.0
- 5.0 to 10.0

[Iron (Fe^{2+}) concentrations in groundwater of 300 existing wells were measured in December 2000 to January 2001 using Iron Pack Test Kit.]

Figure 4.3.8 **Iron (Fe^{2+}) Concentrations Measured at 300 Existing Wells in Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



Fe^{2+}(mg/l) in Dry Season

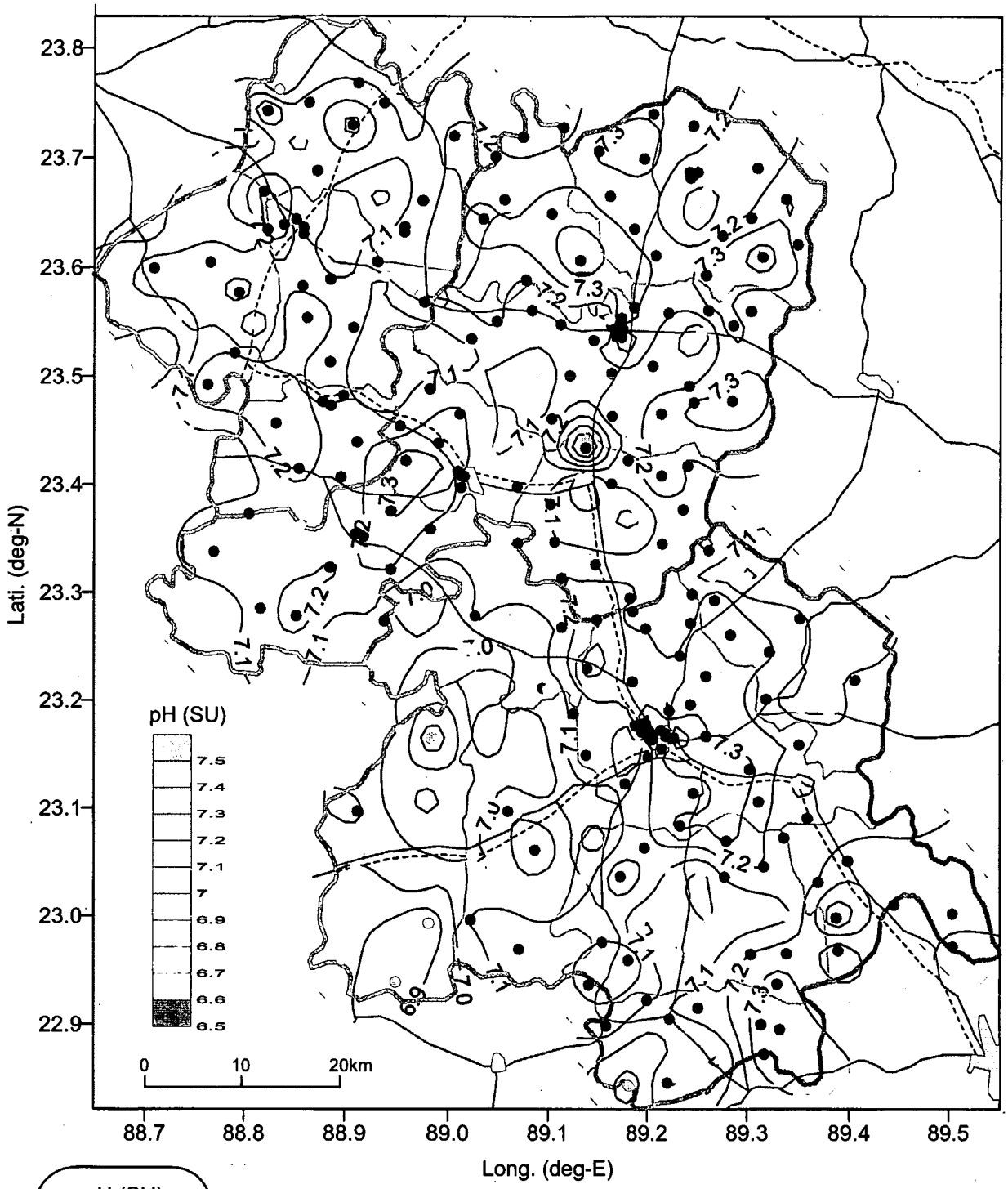
- 0.0 to 0.2
- 0.2 to 1.0
- 1.0 to 2.0
- 2.0 to 5.0
- 5.0 to 10.0

[Iron (Fe^{2+}) concentrations in groundwater of 300 existing wells were measured in June to July 2000 for rainy season and in December 2000 to January 2001 for dry season. The Iron Pack Test Kit was used for the measurement.]

Figure 4.3.9 **Changes in Iron (Fe^{2+}) Concentration between Rainy Season and Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



pH (SU)

- 6.5 to 6.7
- 6.7 to 6.9
- 6.9 to 7.1
- 7.1 to 7.3
- 7.3 to 7.5
- 7.5 to 7.8

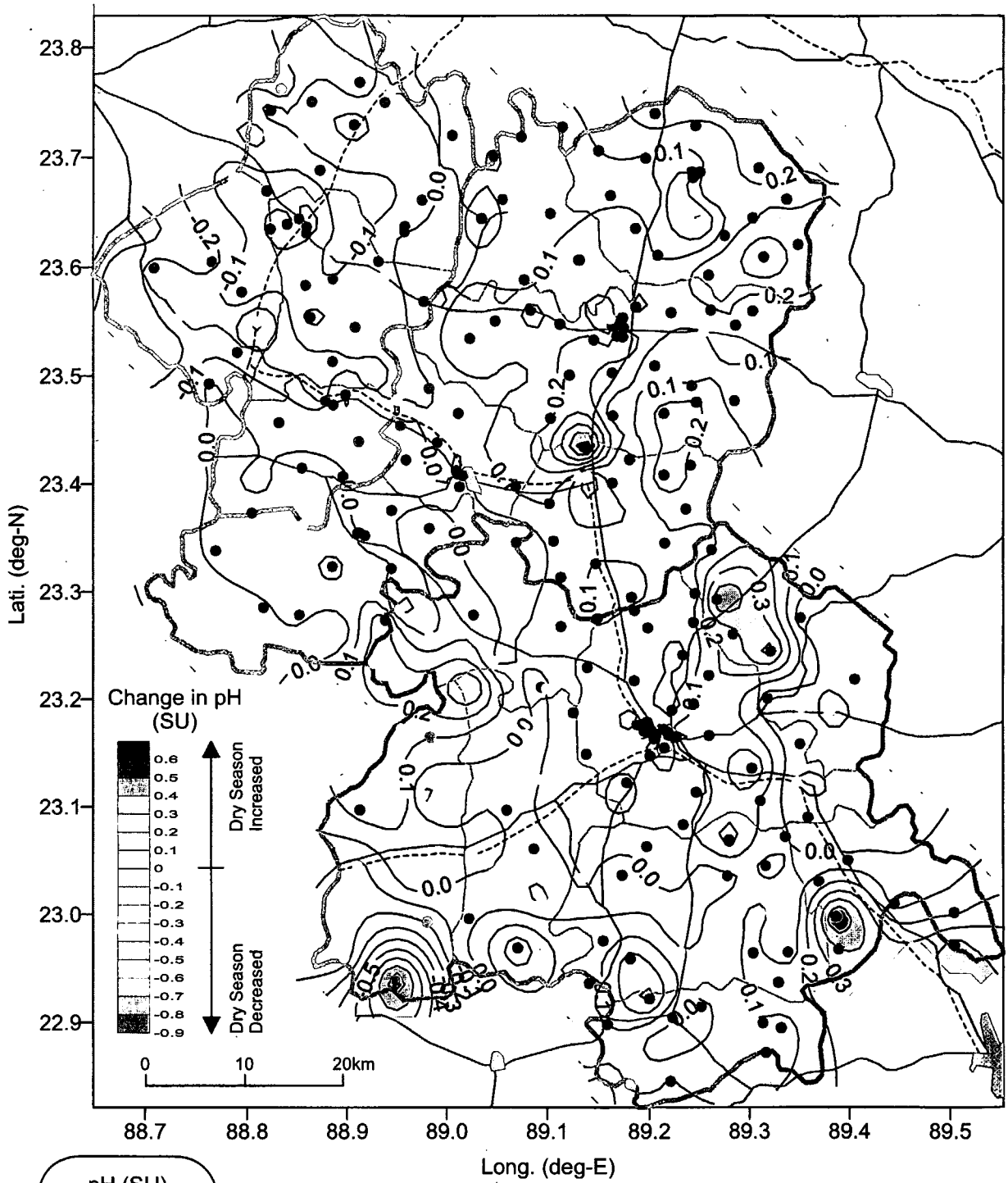
[SU: Standard Units]

[pH values in groundwater of 300 existing wells were measured in December 2000 to January 2001 by potable pH meter.]

Figure 4.3.10 **pH Values Measured at 300 Existing Wells in Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



pH (SU) in Dry Season

- 6.5 to 6.7
- 6.7 to 6.9
- 6.9 to 7.1
- 7.1 to 7.3
- 7.3 to 7.5
- 7.5 to 7.8

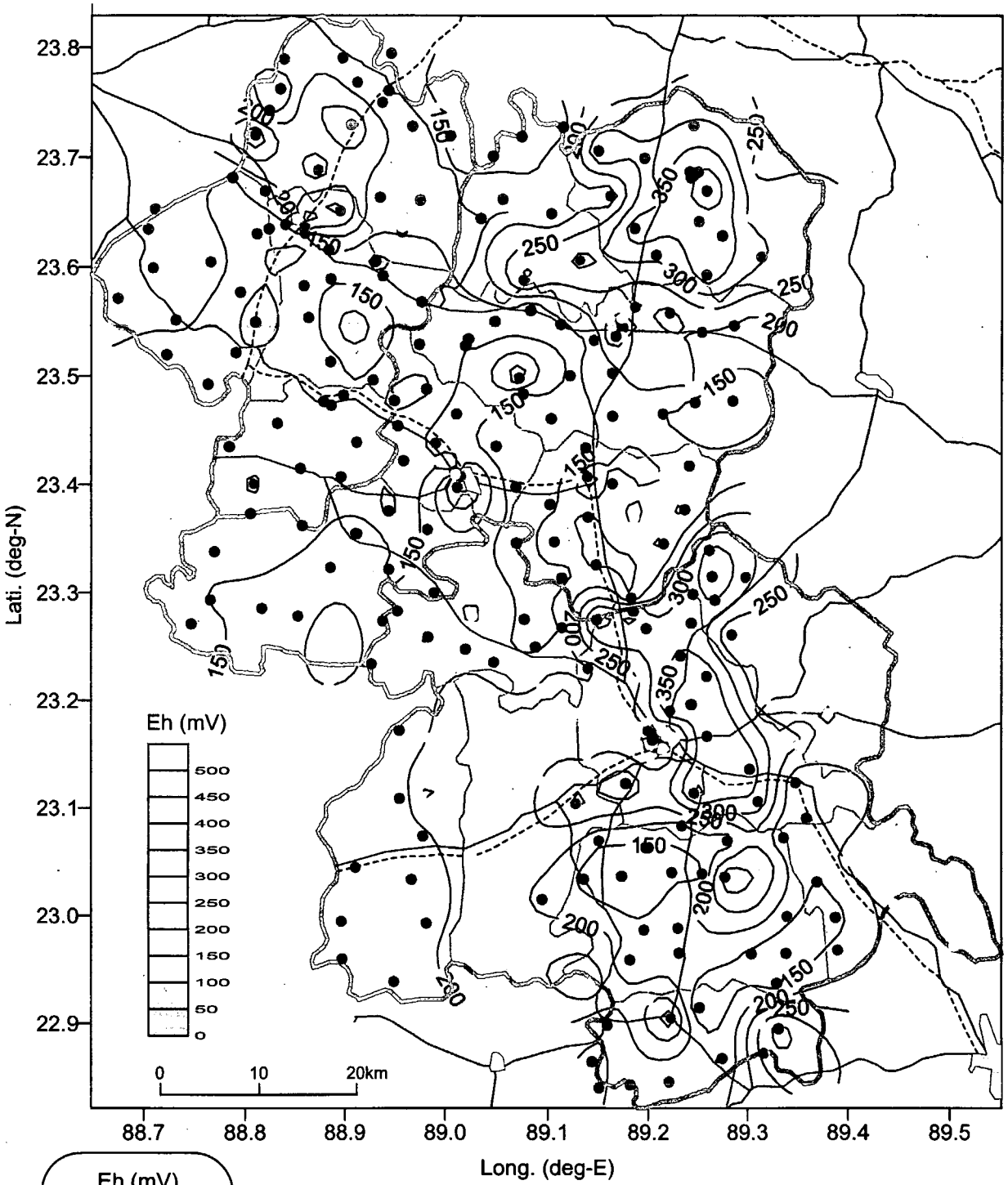
[SU: Standard Units]

[pH values in groundwater of 300 existing wells were measured in June to July 2000 for dry season and in December 2000 to January 2001 for dry season. The potable pH meter was used for the measurement.]

Figure 4.3.11 **Changes in pH Value between Rainy Season and Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



Eh (mV)

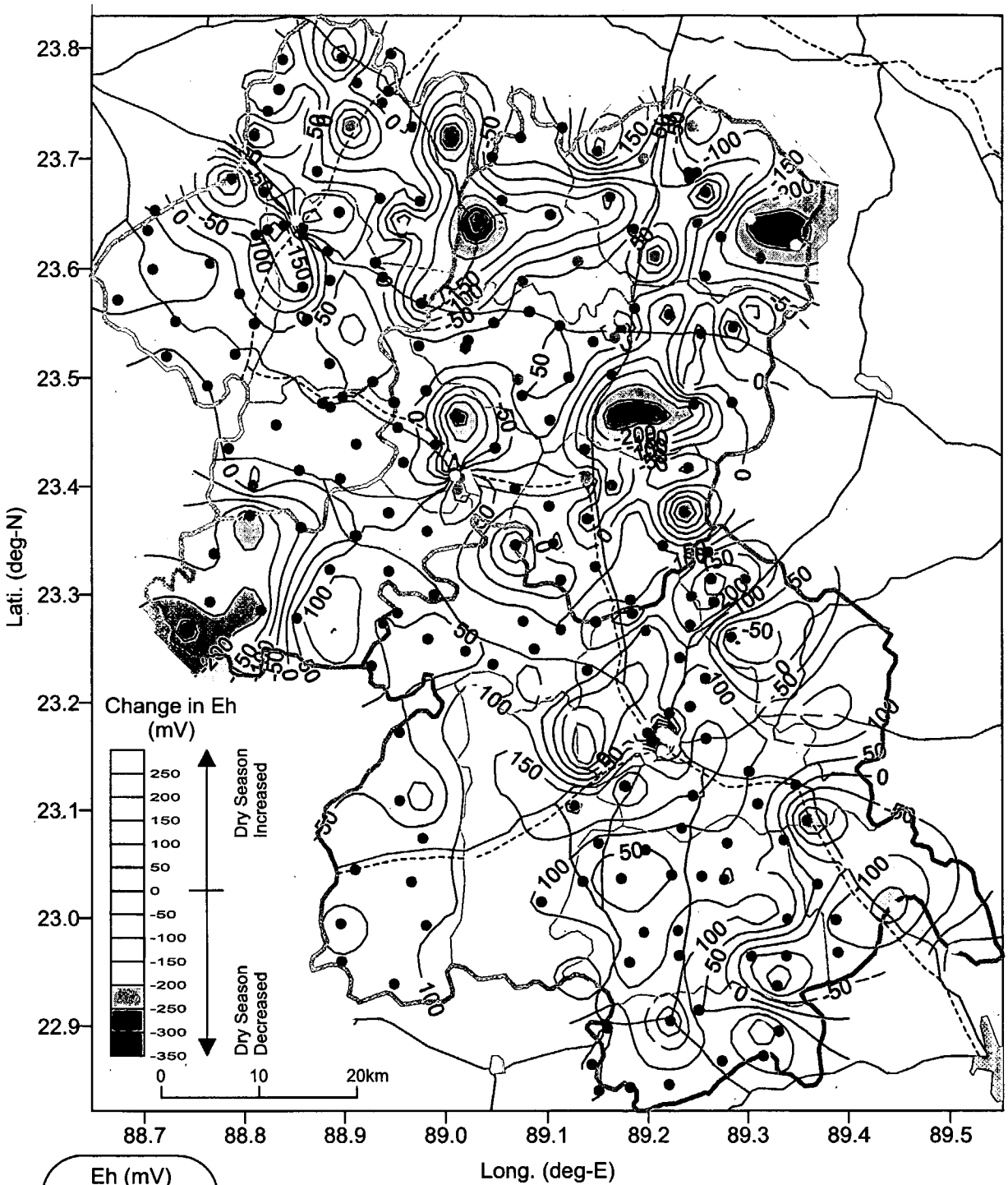
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 200
- 200 to 250
- 250 to 300
- 300 to 350
- 350 to 400
- 400 to 450
- 450 to 600

[ORP (Oxidation-Reduction Potential) values in groundwater of 300 existing wells were measured in December 2000 to January 2001 by potable ORP meter.
Then, the reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.3.12	Eh Values Measured at 300 Existing Wells in Dry Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



Eh (mV) in Dry Season

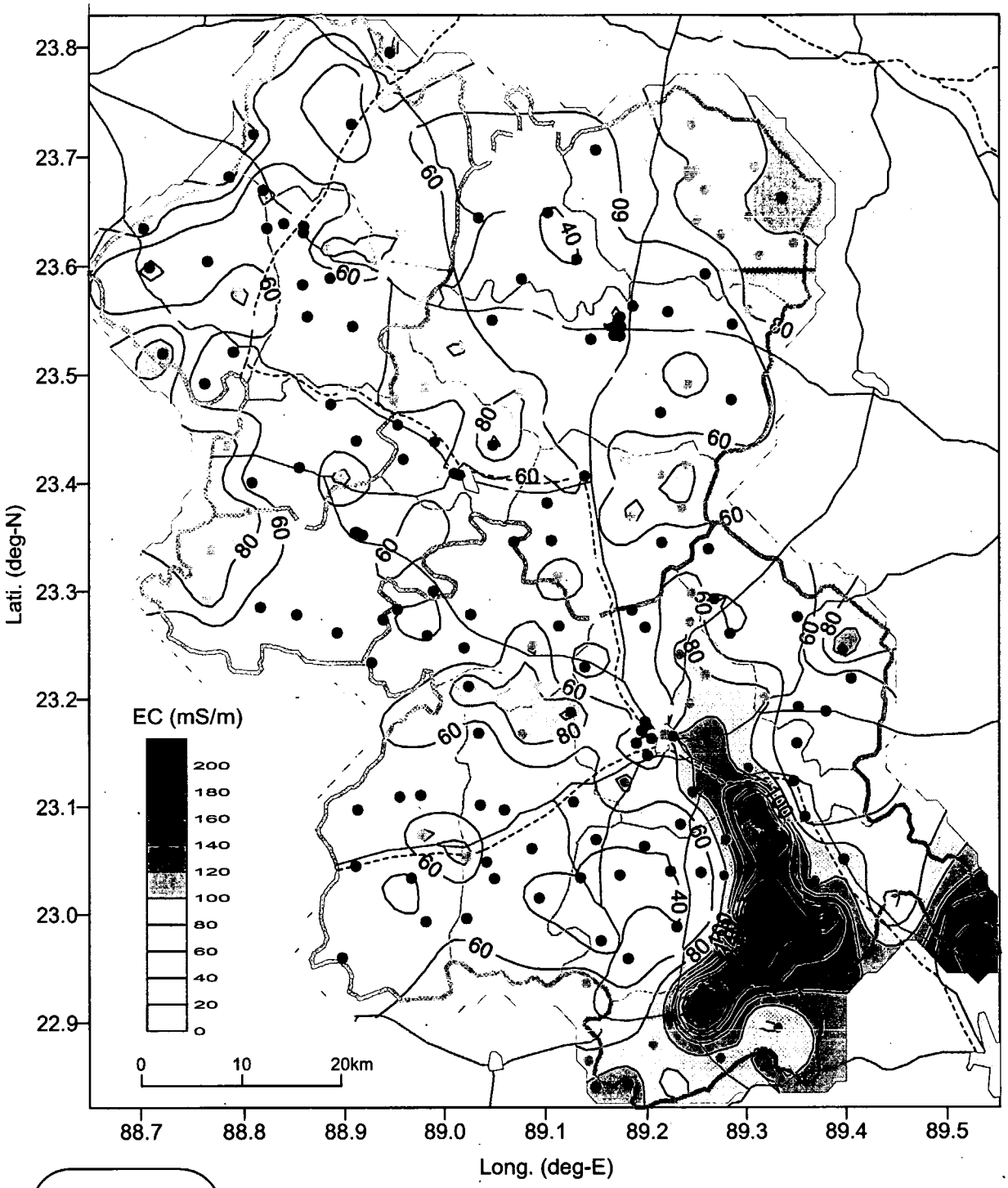
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 200
- 200 to 250
- 250 to 300
- 300 to 350
- 350 to 400
- 400 to 450
- 450 to 600

[ORP (Oxidation-Reduction Potential) values in groundwater of 300 existing wells were measured in June to July 2000 for rainy season and in December 2000 to January 2001 for dry season by potable ORP meter.
Then, the reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.3.13 **Changes in Eh Value between Rainy Season and Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



EC (mS/m)

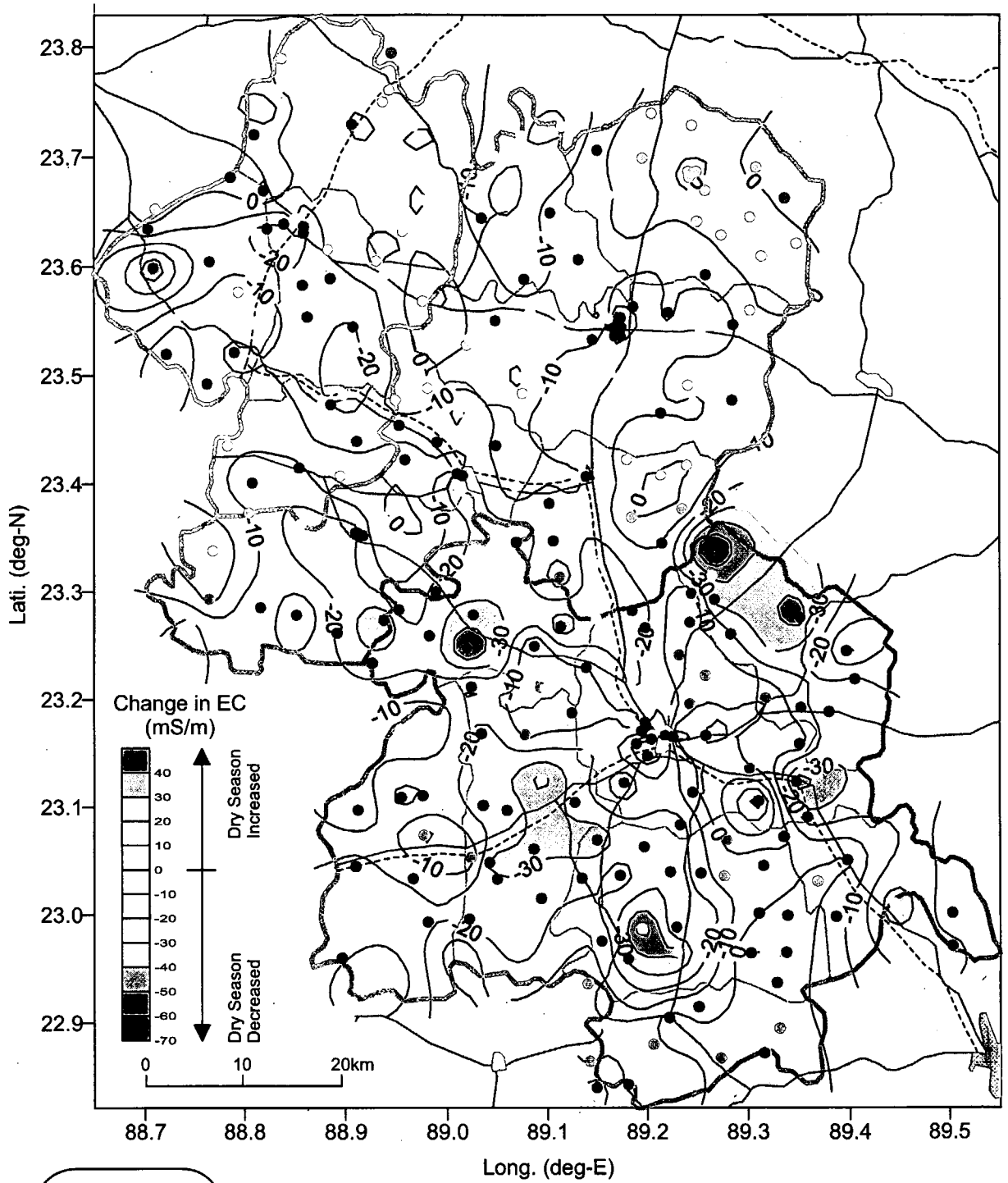
- 0 to 25
- 25 to 50
- 50 to 75
- 75 to 100
- 100 to 150
- 150 to 200
- 200 to 500

[Electric Conductivity (EC) in groundwater of 300 existing wells were measured in December 2000 to January 2001 by potable EC meter.]

Figure 4.3.14 **Electric Conductivity (EC) Measured at 300 Existing Wells in Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



EC (mS/m)
in Dry Season

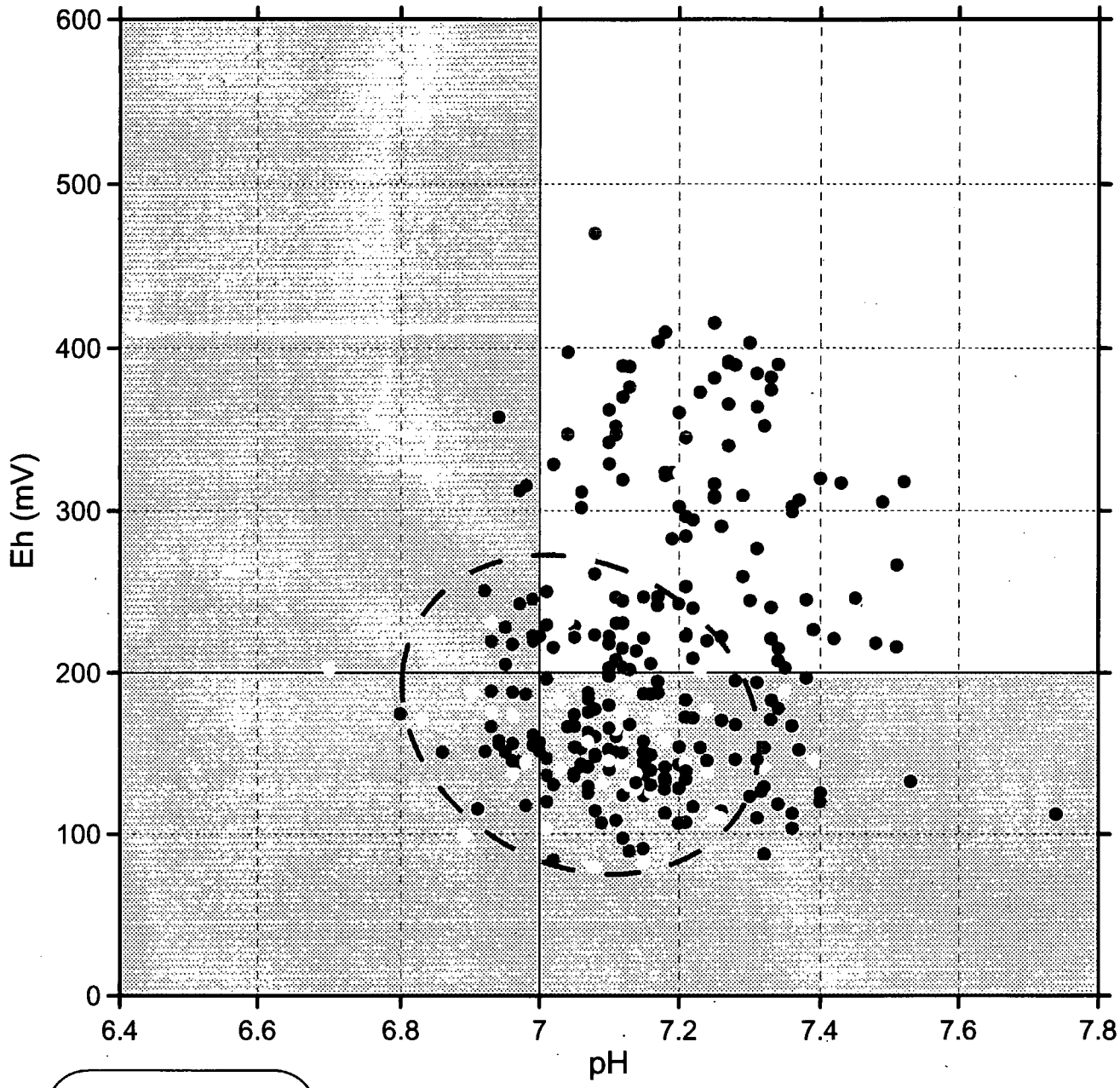
- 0 to 25
- 25 to 50
- 50 to 75
- 75 to 100
- 100 to 150
- 150 to 200
- 200 to 500

[Electric Conductivity (EC) in groundwater of 300 existing wells were measured in June to July 2000 for rainy season and in December 2000 to January 2001 for dry season. The potable EC meter was used for the measurement.]

Figure 4.3.15 **Changes in EC Value between Rainy Season and Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



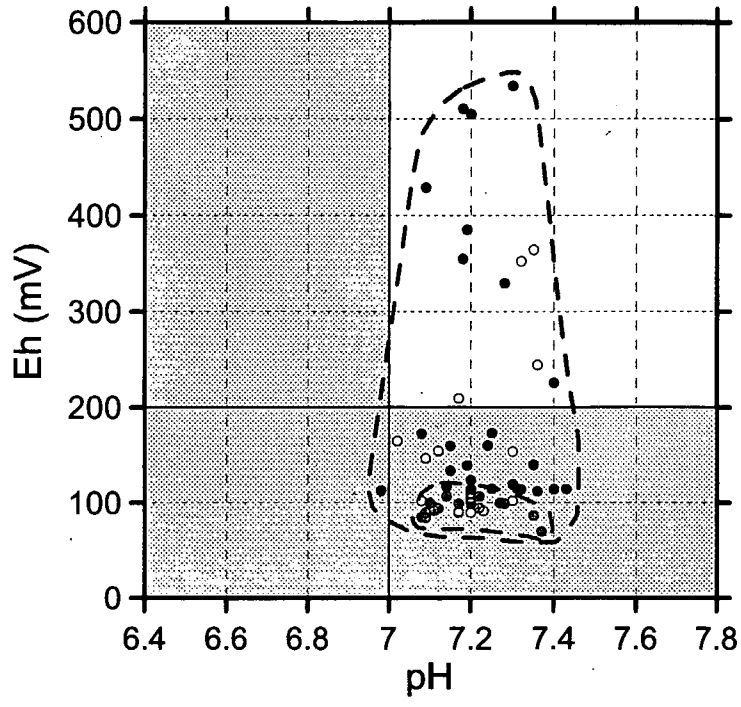
[The values of ORP and pH values were measured at 300 existing wells in December 2000 to January 2001 by potable ORP meter and potable pH meter. The arsenic concentrations were analyzed by the AAS in Jhenaidah Laboratory.

The reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

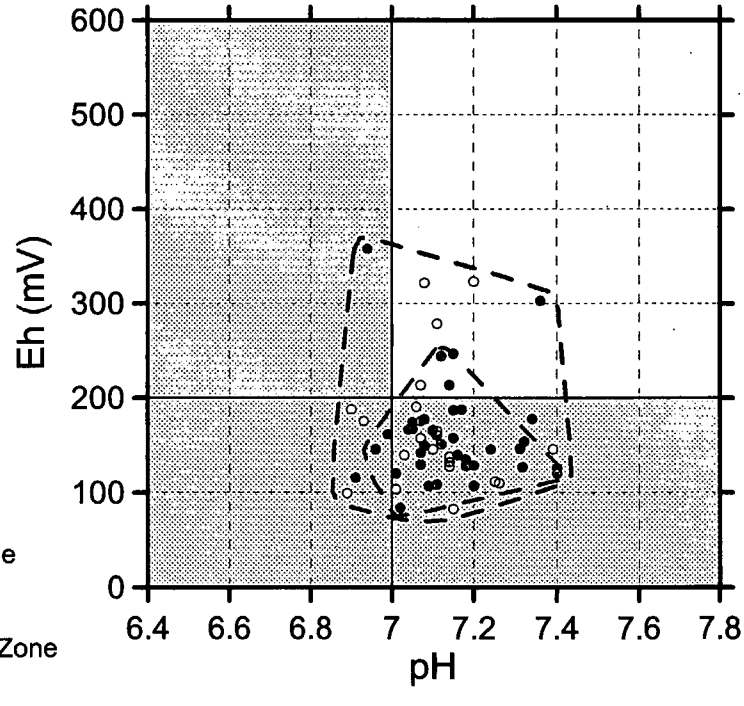
Figure 4.3.16	Eh-pH-As Relations of 300 Existing Wells Measured in Dry Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



CHUADANGA
Rainy Season
(June to July 2000)



CHUADANGA
Dry Season
(December 2000 to
January 2001)

Eh-pH Plot Zone

High As Conc. Zone

As Concentration (mg/l)
Analyzed by AAS

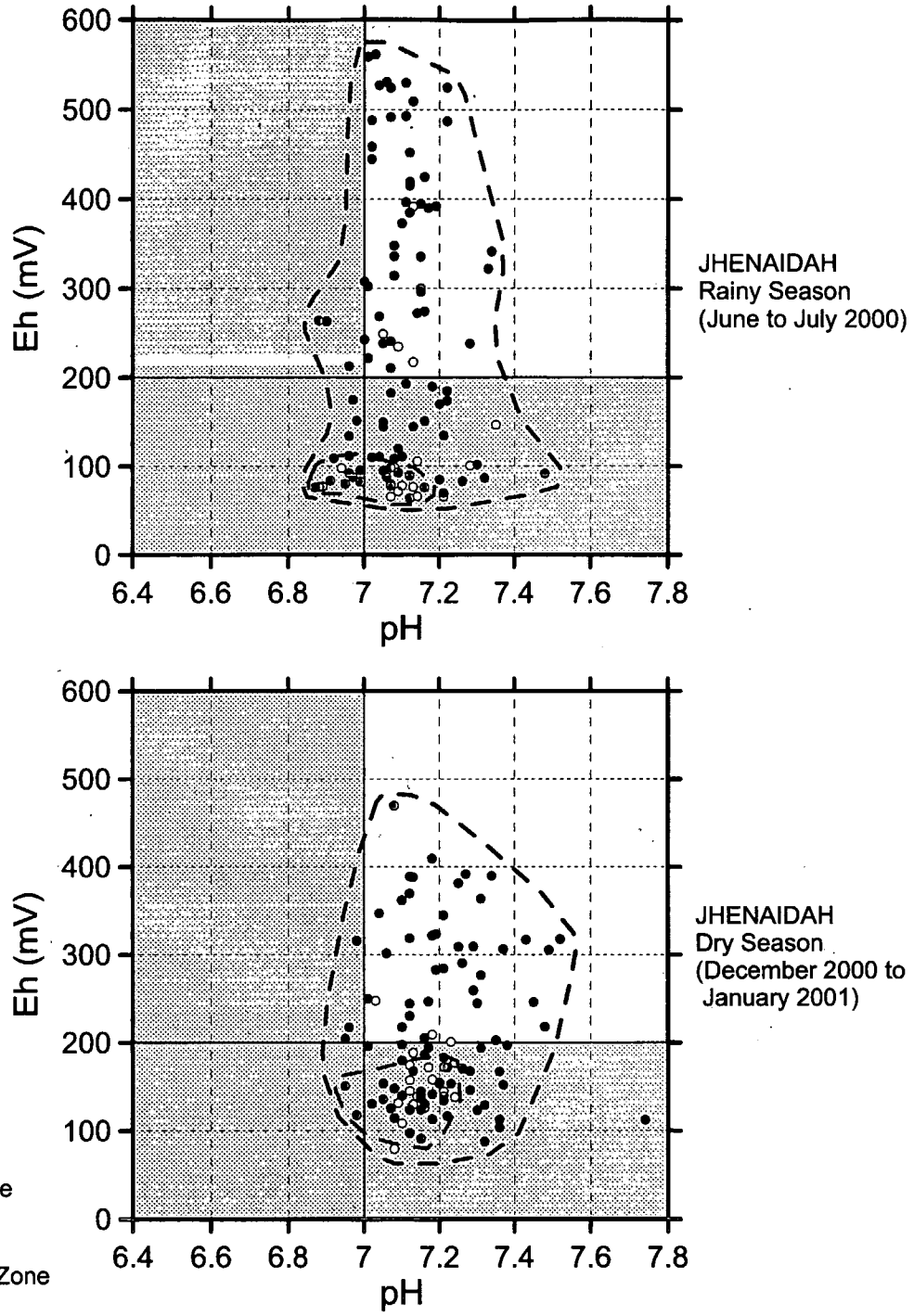
- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1
- 1 to 2

[The values of ORP and pH values were measured at Chuadanga existing wells in June to July 2000 for rainy season and in December 2000 to January 2001 for dry season.
The potable ORP meter and potable pH meter were used for the measurement.
The arsenic concentrations were analyzed by the AAS in Jhenaidah Laboratory.
The reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.3.17 **Eh-pH-As Relations of Chuadanga in Rainy Season and Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

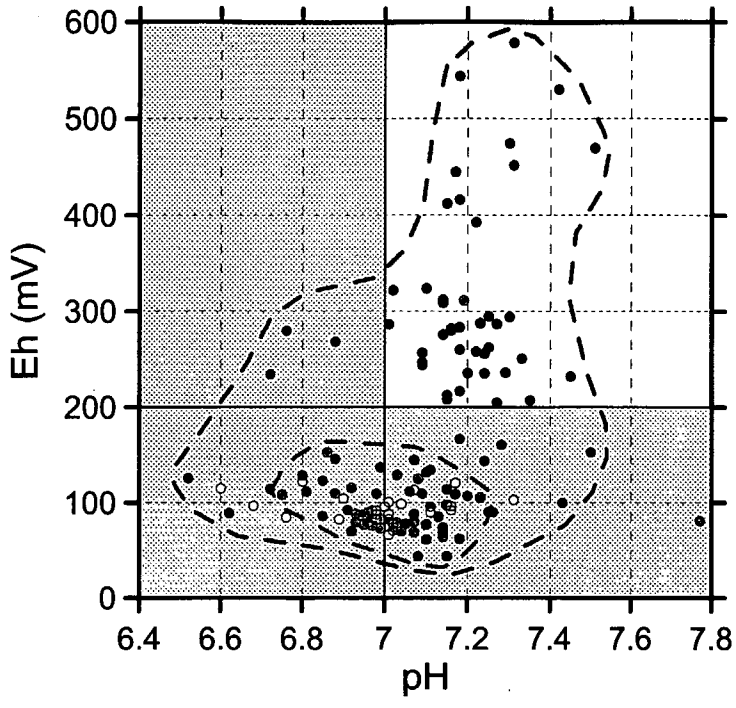


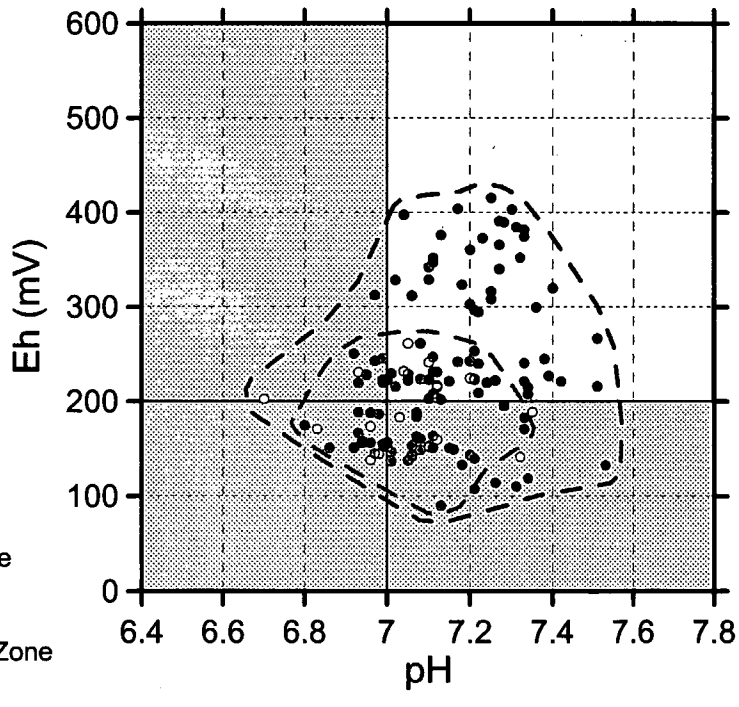
[The values of ORP and pH values were measured at Jhenaidah existing wells in June to July 2000 for rainy season and in December 2000 to January 2001 for dry season.
The potable ORP meter and potable pH meter were used for the measurement.
The arsenic concentrations were analyzed by the AAS in Jhenaidah Laboratory.
The reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.3.18 **Eh-pH-As Relations of Jhenaidah in Rainy Season and Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)





Eh-pH Plot Zone

High As Conc. Zone

As Concentration (mg/l)
Analyzed by AAS

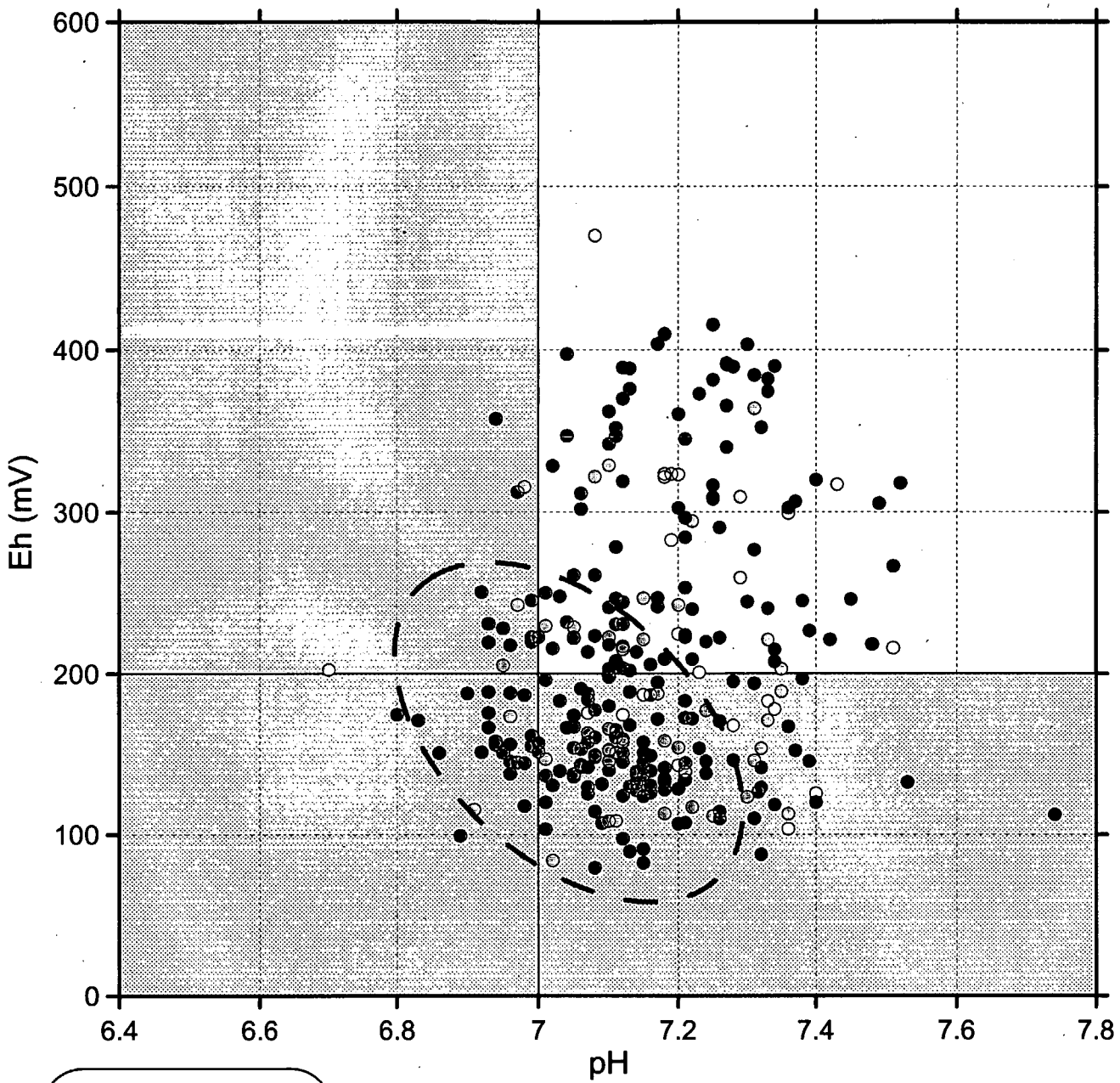
- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1
- 1 to 2

[The values of ORP and pH values were measured at Jessore existing wells in June to July 2000 for rainy season and in December 2000 to January 2001 for dry season.
The potable ORP meter and potable pH meter were used for the measurement.
The arsenic concentrations were analyzed by the AAS in Jhenaidah Laboratory.
The reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.3.19 **Eh-pH-As Relations of Jessore in Rainy Season and Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

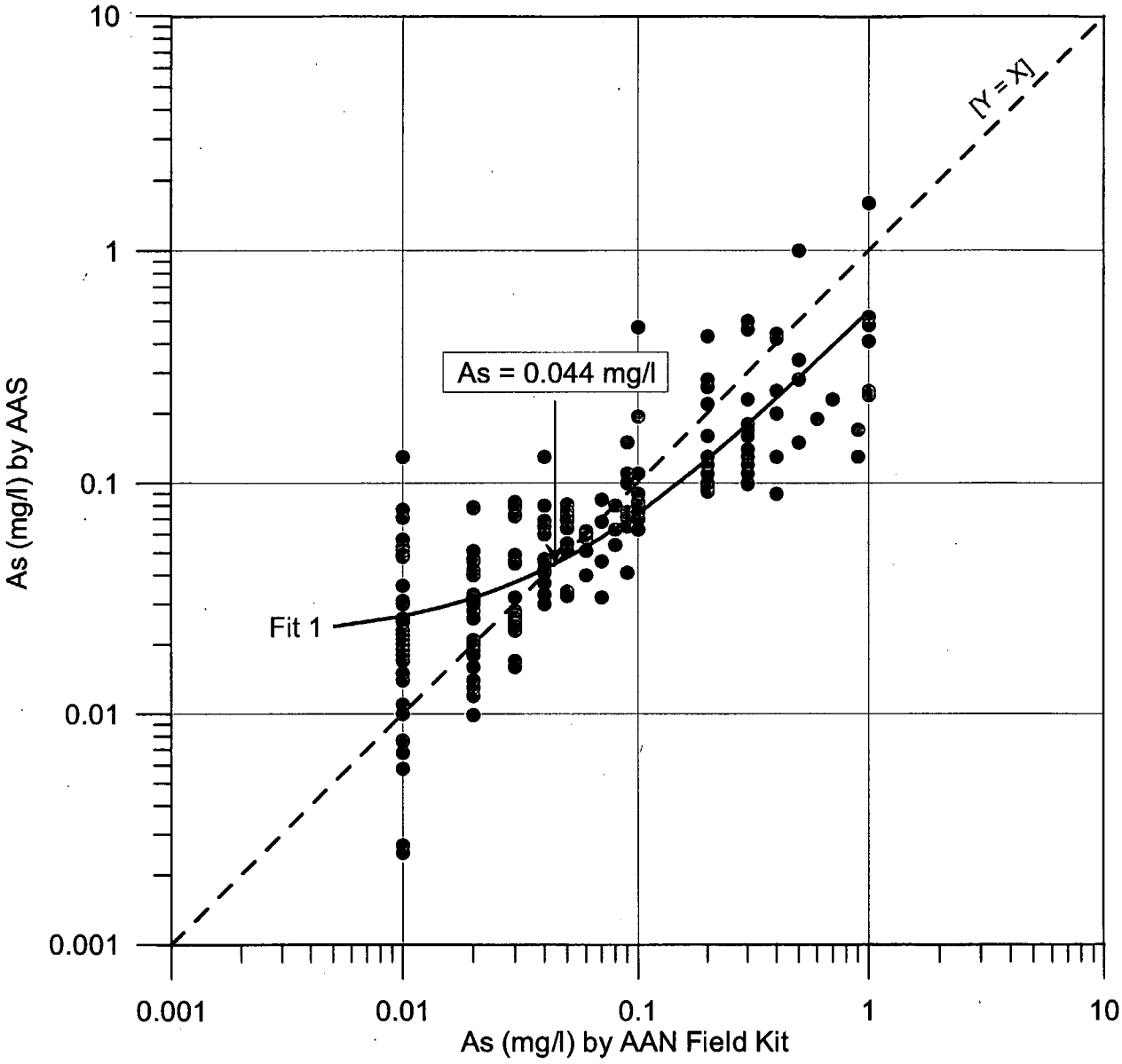


[The values of ORP, pH, and Fe^{2+} concentrations were measured at 300 existing wells in December 2000 to January 2001 by potable ORP meter, potable pH meter, and Iron Pack Test Kit, respectively.
Then, the reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 4.3.20	Eh-pH-Fe^{2+} Relations of 300 Existing Wells Measured in Dry Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

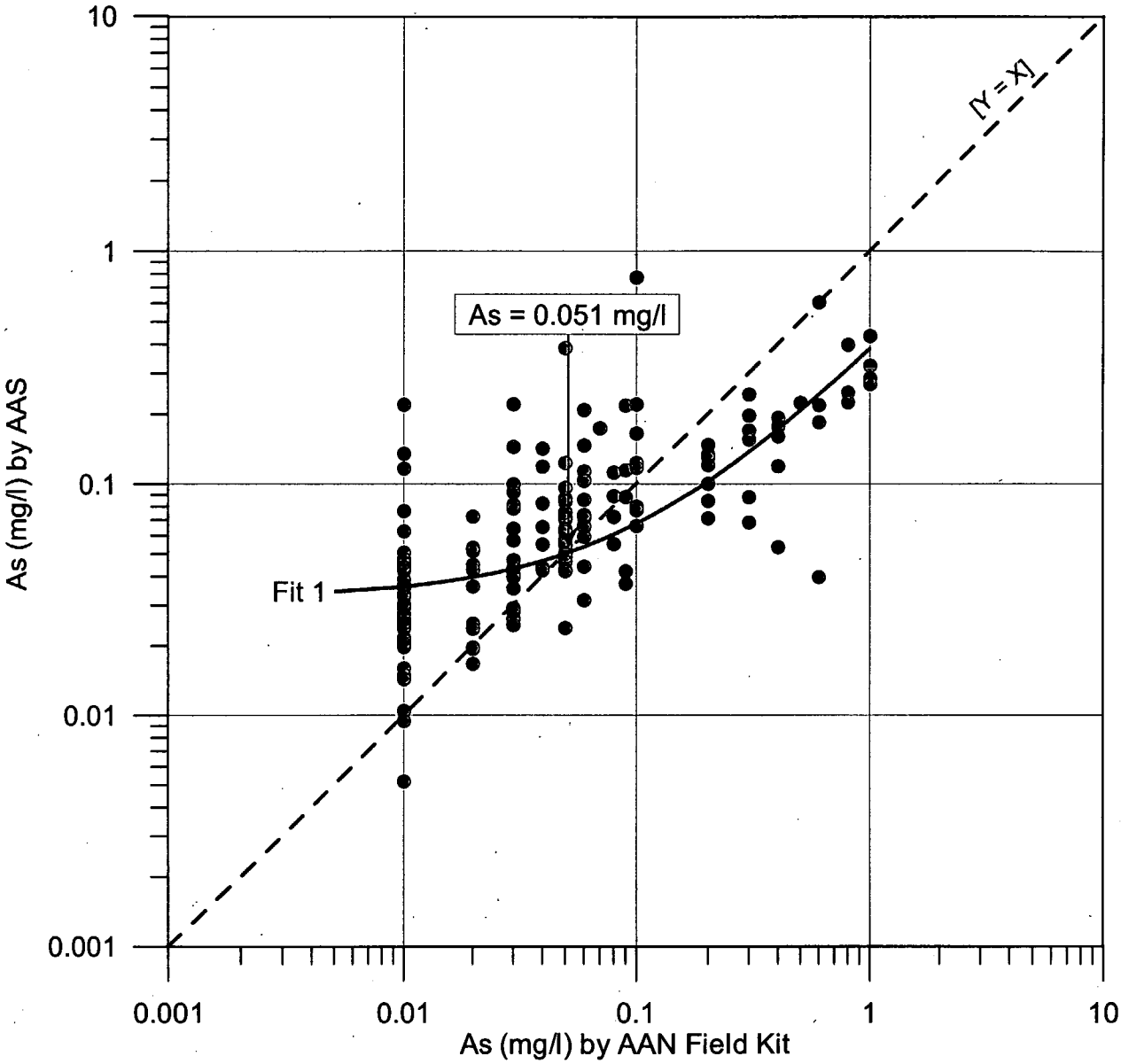


Fit Results

Fit 1: Linear
Equation Y = 0.5272264224 * X + 0.0212958878
Number of data points used = 297
Coef of determination, R-squared = 0.499782

(The arsenic concentrations were measured at 300 existing wells in June to July 2000.)

Figure 4.3.21	Comparison of As Concentrations Measured by FK and AAS by Log-Log Plot in Rainy Season
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	



Fit Results

Fit 1: Linear
Equation Y = 0.3488907739 * X + 0.03260257979
Number of data points used = 293
Coef of determination, R-squared = 0.442739

(The arsenic concentrations were measured at 300 existing wells in December 2000 to January 2001.)

Figure 4.3.22	Comparison of As Concentrations Measured by FK and AAS by Log-Log Plot in Dry Season
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

4.4 General Water Quality

A total of 30 groundwater samples for general water quality analysis were colleted from the existing wells. Shallow groundwater samples were collected from the selected 23 existing tube wells as mentioned in Section 4.1. In October 2000, 7 groundwater samples were collected from the Pourashava production wells. One sample was collected from each Pourashava in the study area. These samples are treated as the samples for the rainy season.

In addition 30 groundwater samples for the dry season were collected in a period from December 2000 to January 2001. These samples were collected from the same wells in the rainy season.

4.4.1 Trilinear Diagram Analysis

1) Groundwater from Shallow Tube wells

Figure 4.4.1 shows the trilinear diagram of shallow groundwater taken from 23 shallow tube wells in the rainy season. The well depths range from about 30 to 60m. The results show that the most samples of Chuadanga District and Jhenaidah District are plotted near the left corner of the diamond-shape diagram. The chemical compositions of these samples are characterized by Ca in cations and HCO_3 in anions. It should also be mentioned that the SO_4 content is very small in all the samples.

Six samples out of 10 Jessore samples have a similar chemical composition to the Chuadanga and Jhenaidah samples. However, the rest of the samples, which were colleted from the southern part of Jessore District, are plotted in the central to lower parts of the diamond-shape diagram. These samples are characterized by higher contents of Na+K and Cl.

Figure 4.4.2 shows the trilinear diagram of shallow groundwater taken from 23 shallow tube wells in the dry season. Compared with the plots in the rainy season, most samples are concentrated near the left corner on the diamond-shape diagram, showing a Ca-HCO_3 type of groundwater composition. However, two (2) samples in Jessore district are plotted more to the left-hand side, indicating that the groundwater compositions show a stronger influence of saline water.

2) Groundwater from Production Wells

Figure 4.4.3 shows the trilinear diagram of groundwater from Pourashava production wells in the end of the rainy season. There are seven (7) Pourashavas in the study area so that 7 groundwater samples were analyzed. The depths of the production wells range from 100 to 130m.

The trilinear diagram shows that the Chuadanga and Jhenaidah production wells show almost the same chemical compositions. In cations, Ca occupies 50 to 70%, and Mg occupies 20 to 35%. In anions, HCO_3 is dominant and the SO_4 content is very small.

The production well in Jessore is plotted in slightly different positions from the Chuadanga and Jhenaidah wells. In cations, the Na+K element occupies about 30%. In anions, Cl occupies about 30%.

Figure 4.4.4 shows the trilinear diagram of groundwater from Pourashava production wells in the dry season. The samples are plotted in almost the same place in the diagram. The groundwater from the production wells in Jhenaidah District tends to concentrate near the corner of the diamond-shape diagram. The Chuadanga sample is also plotted near the Jhenaidah samples.

4.4.2 Stiff Diagram Analysis

1) Groundwater from Shallow Tube wells

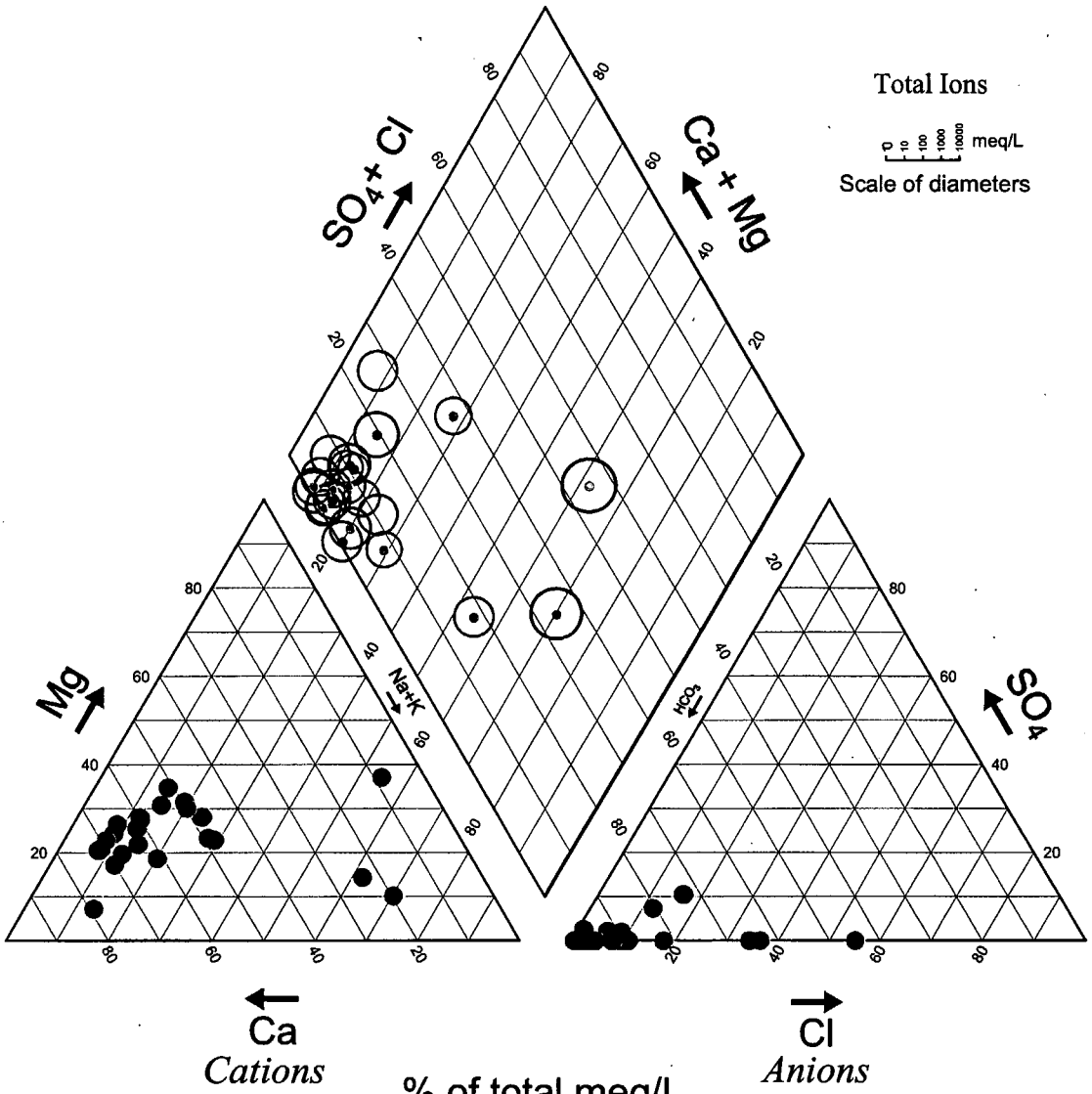
Figure 4.4.5 shows the Stiff diagram of groundwater taken from shallow tube wells in the rainy season. The samples from Chuadanga and Jhenaidah Districts and northern half of Jessore District show Ca–HCO_3 type groundwater. In southern Jessore District, the groundwater shows to be (Na+K)-Cl type or (Na+K)-HCO_3 type. The results show good agreement with the distribution of EC values in the study area, indicating that the shallow groundwater in southern Jessore district is influenced by saline water.

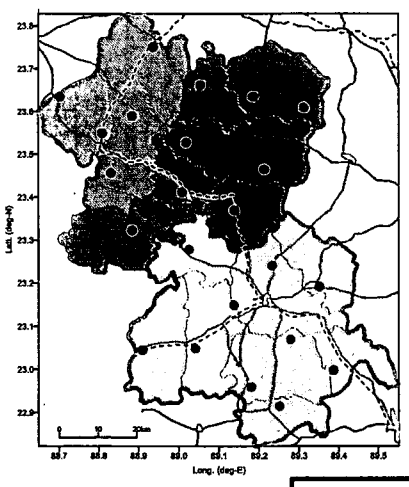
Figure 4.4.6 shows the Stiff diagram of groundwater taken from shallow tube wells in the dry season. The shapes of most samples are similar to those in the rainy season. The sample in Keshabpur thana in Jessore District show a clearer shape of (Na+K)-Cl type.

2) Groundwater from Production Wells

Figure 4.4.7 shows the Stiff diagram of groundwater taken from the Pourashava production wells. Basically the chemical composition shows Ca-Mg-HCO_3 type groundwater. The production well water in Jessore Pourashava shows slightly higher contents of (Na+K) and Cl.

Figure 4.4.8 shows the Stiff diagram in the dry season. The shapes of the diagrams are almost the same as those in October 2000.





Shallow Tubewell Groundwater Samples

- Chuadanga District
- Jhenaidah District
- Jessore District

[A total of 23 groundwater samples were collected from shallow existing tubewells in June to July 2000 for the general water quality analysis.]

Figure 4.4.1 **Trilinear Diagram of Shallow Groundwater by District in Rainy Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

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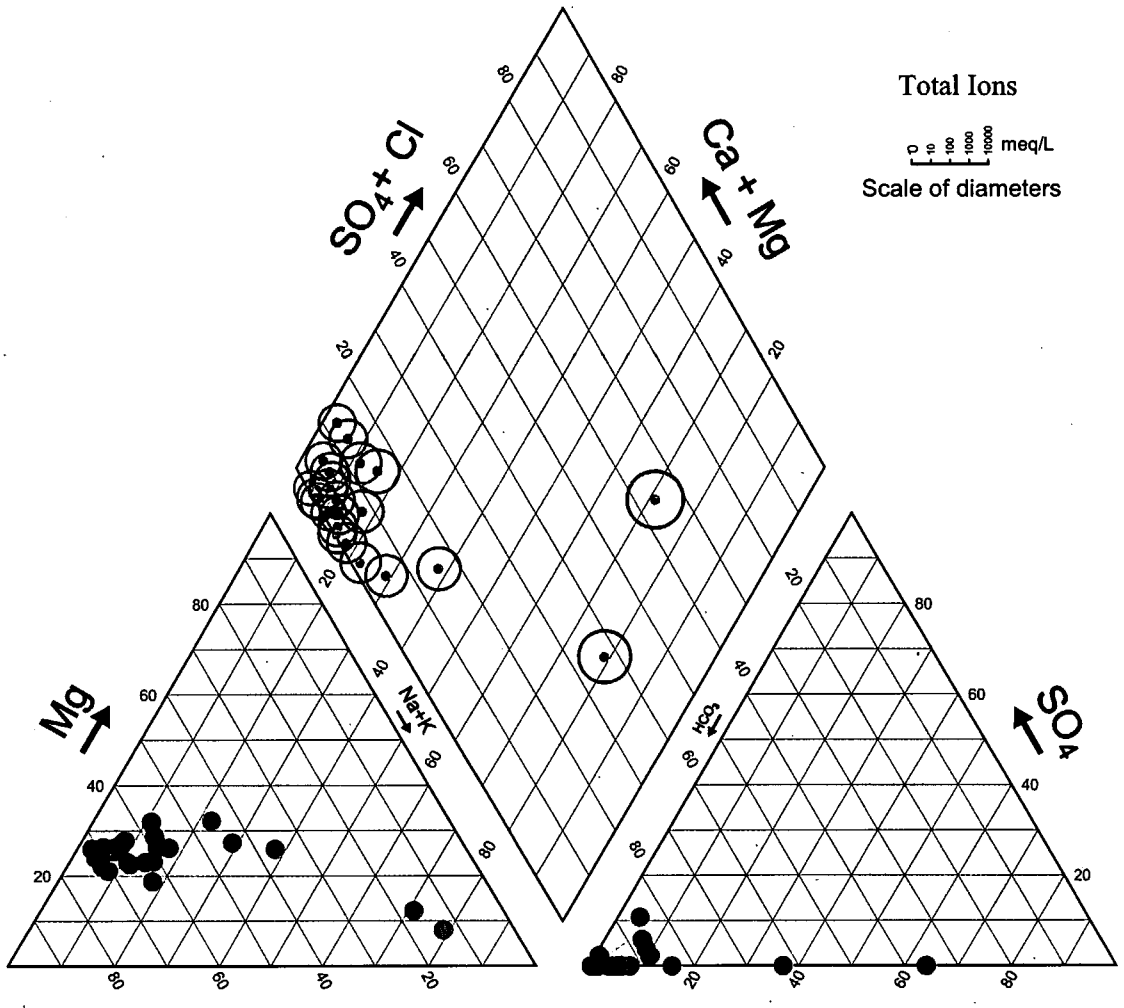
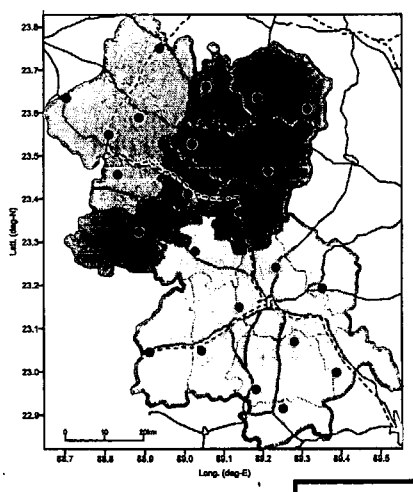




Shallow Tubewell Groundwater Samples

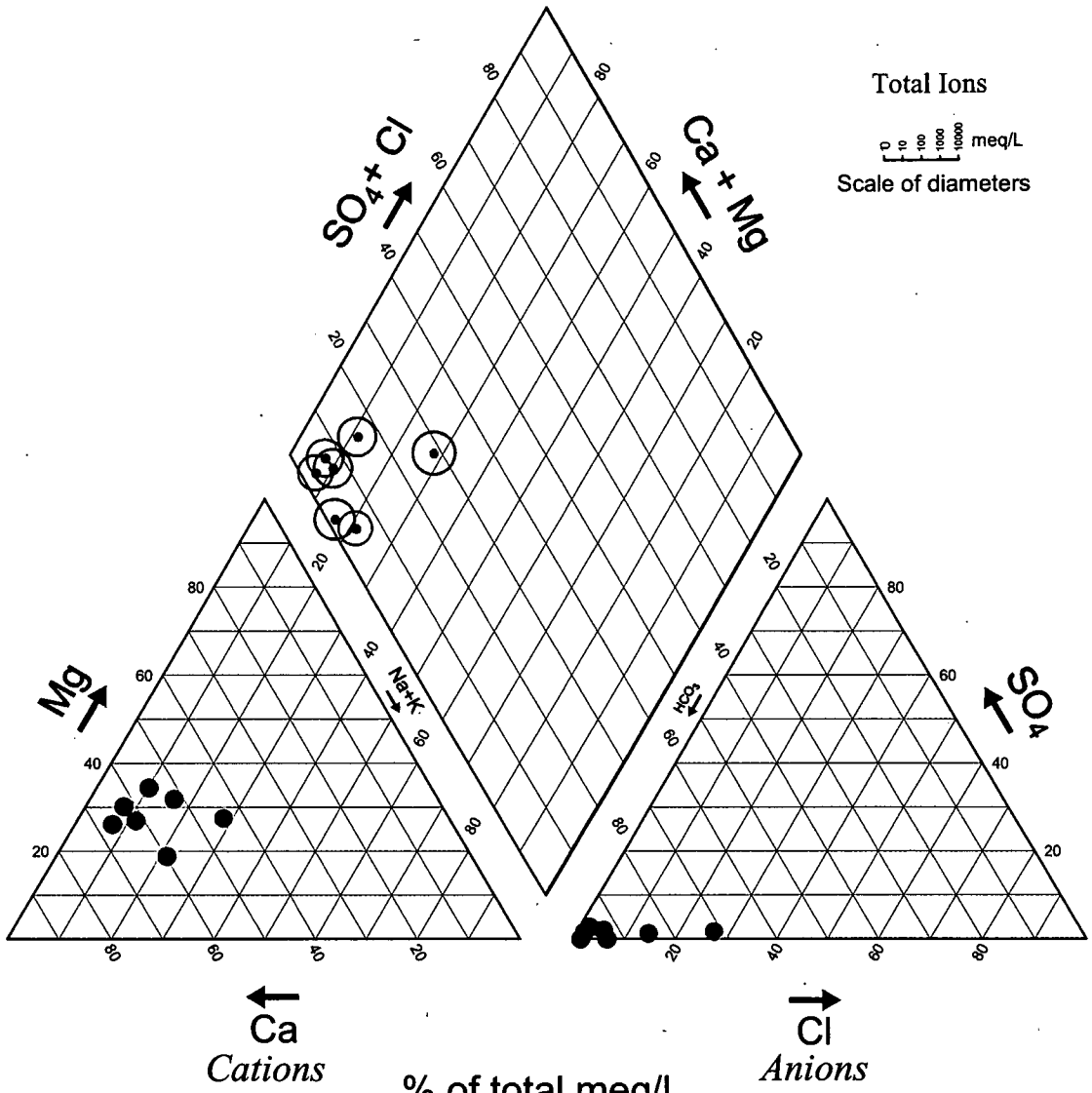
- Chuadanga District
- Jhenaidah District
- Jessore District

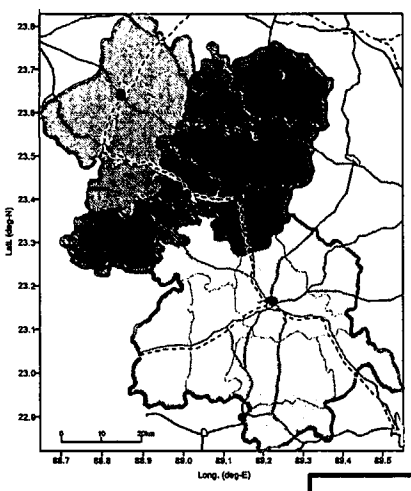
[A total of 23 groundwater samples were collected from shallow existing tubewells in December 2000 to January 2001 for the general water quality analysis.]

Figure 4.4.2	Trilinear Diagram of Shallow Groundwater by District in Dry Season

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)





Production Well Groundwater Samples

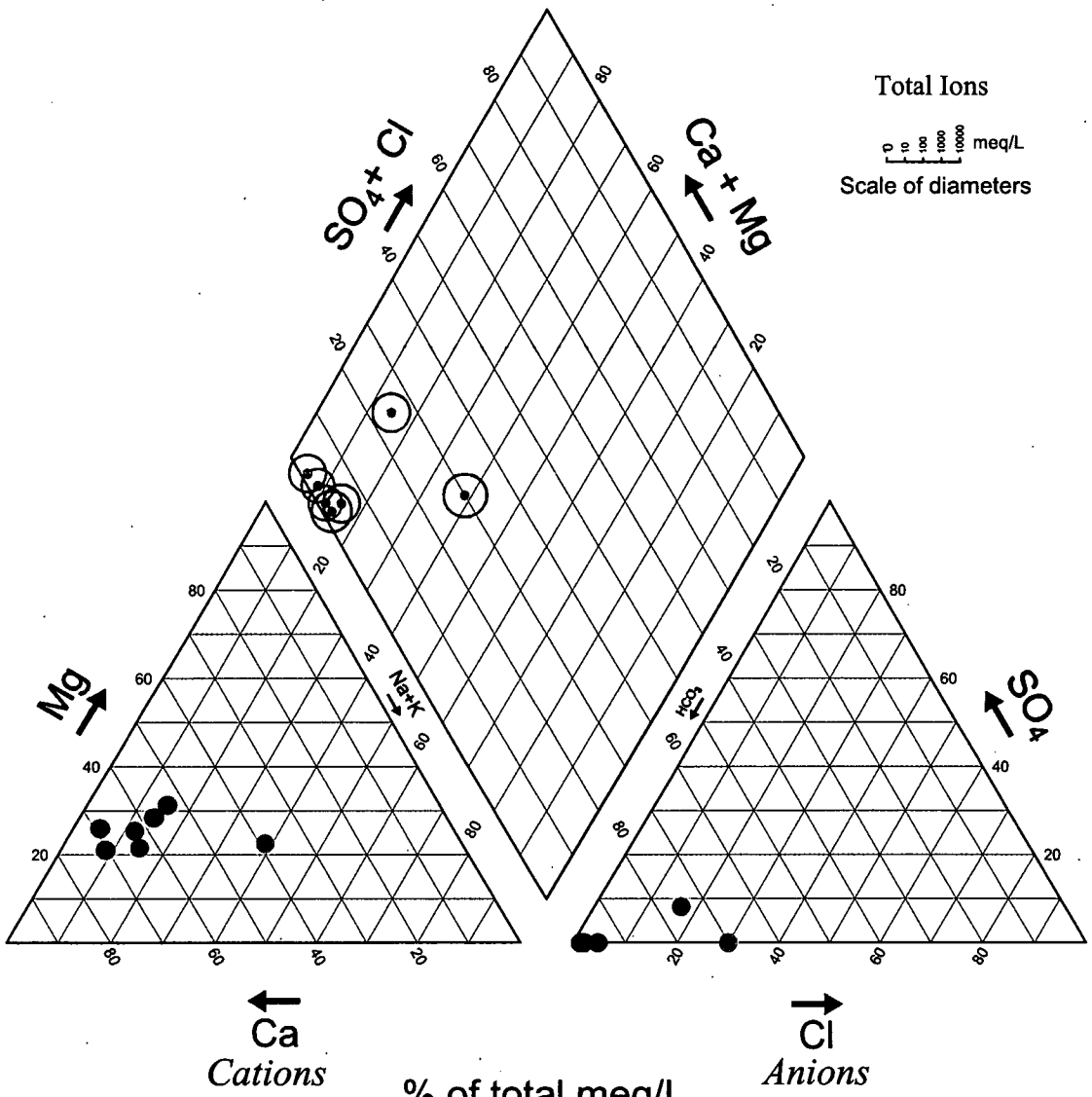
- Chuadanga District
- Jhenaidah District
- Jessore District

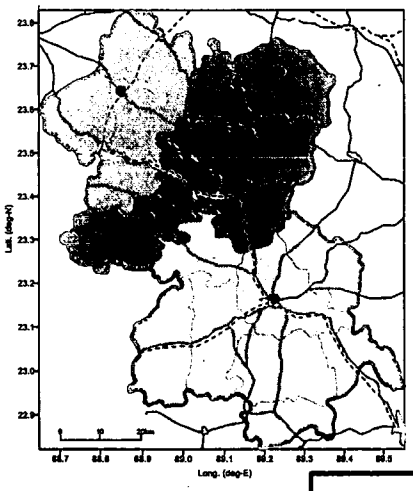
[A total of 7 groundwater samples were collected from production wells in October 2000 for the general water quality analysis.]

Figure 4.4.3 **Trilinear Diagram of Groundwater from Production Wells in Rainy Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)





Production Well Groundwater Samples

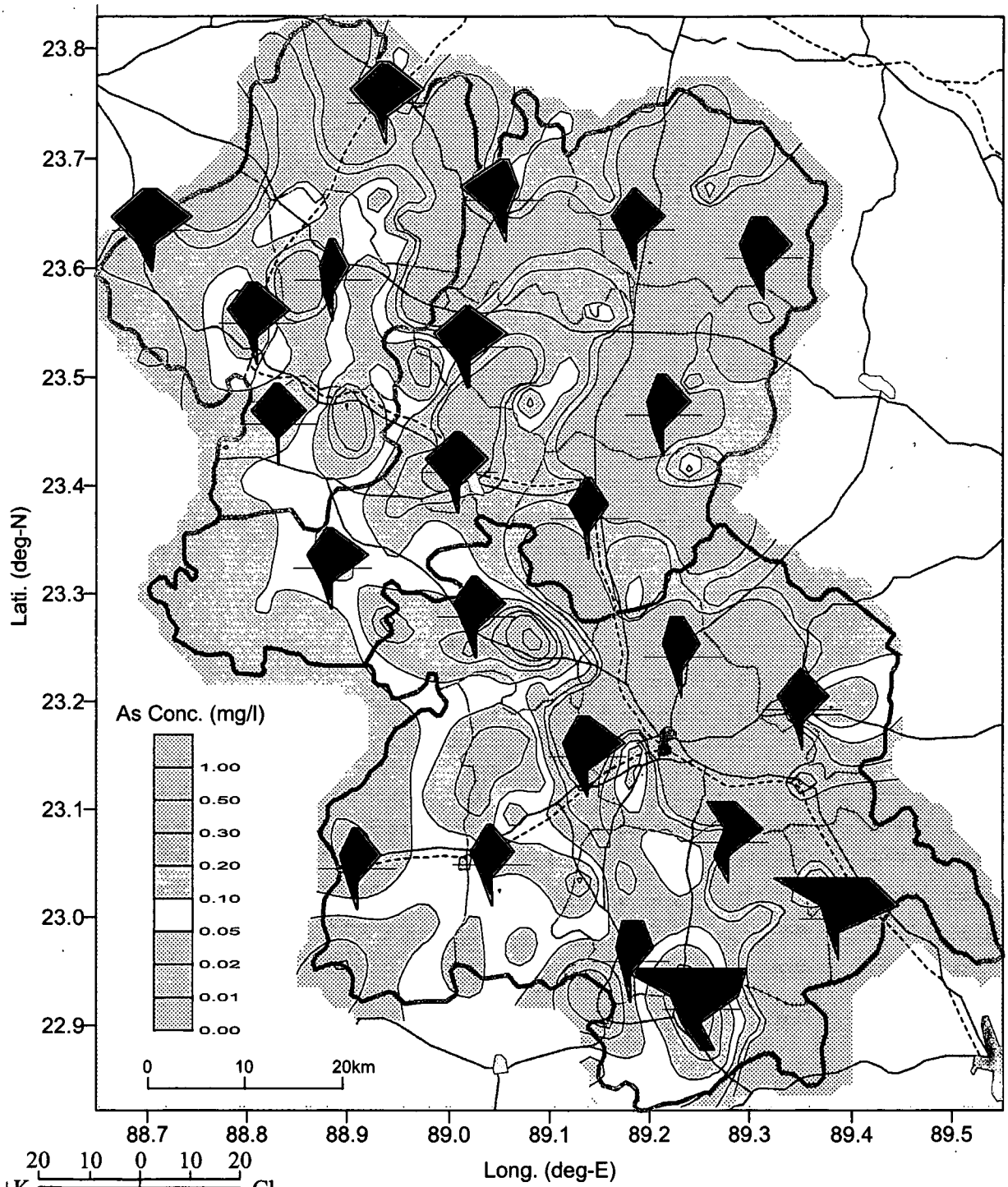
- Chuadanga District
- Jhenaidah District
- Jessore District

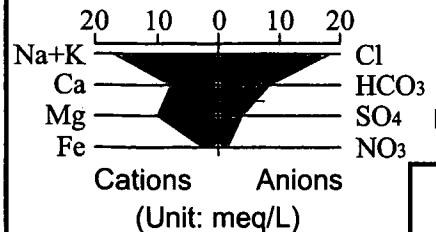
[A total of 7 groundwater samples were collected from production wells in December 2000 to January 2001 for the general water quality analysis.]

Figure 4.4.4 **Trilinear Diagram of Groundwater from Production Wells in Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



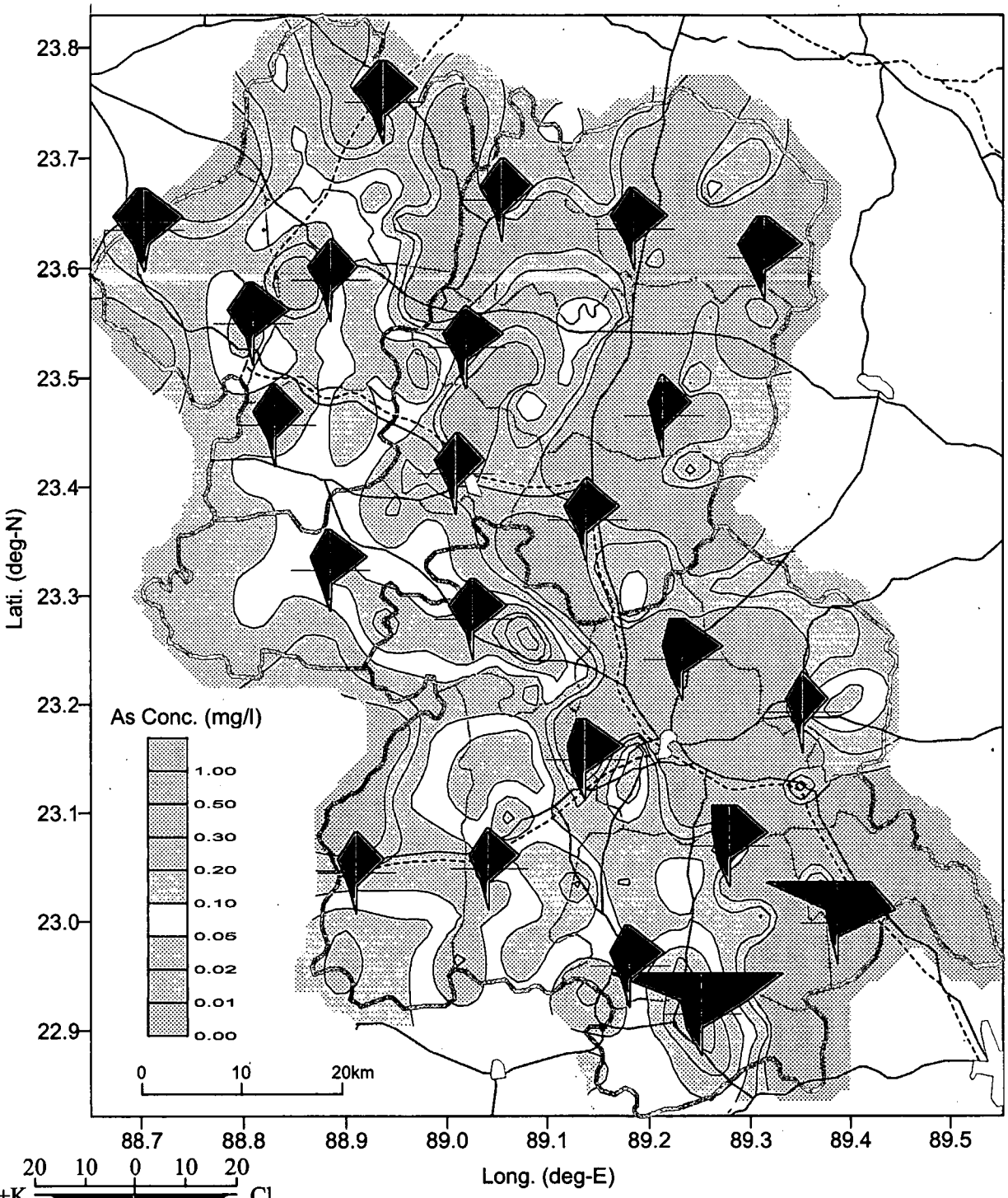


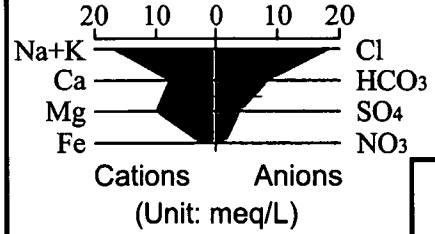
[The groundwater samples of 23 existing shallow tubewells were collected in June to July 2000. The contours of arsenic concentration were drawn based on the analysis by AAS in Jhenaidah Laboratory.]

Figure 4.4.5 **Stiff Diagram of Groundwater Taken from Existing Shallow Tubewells in Rainy Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



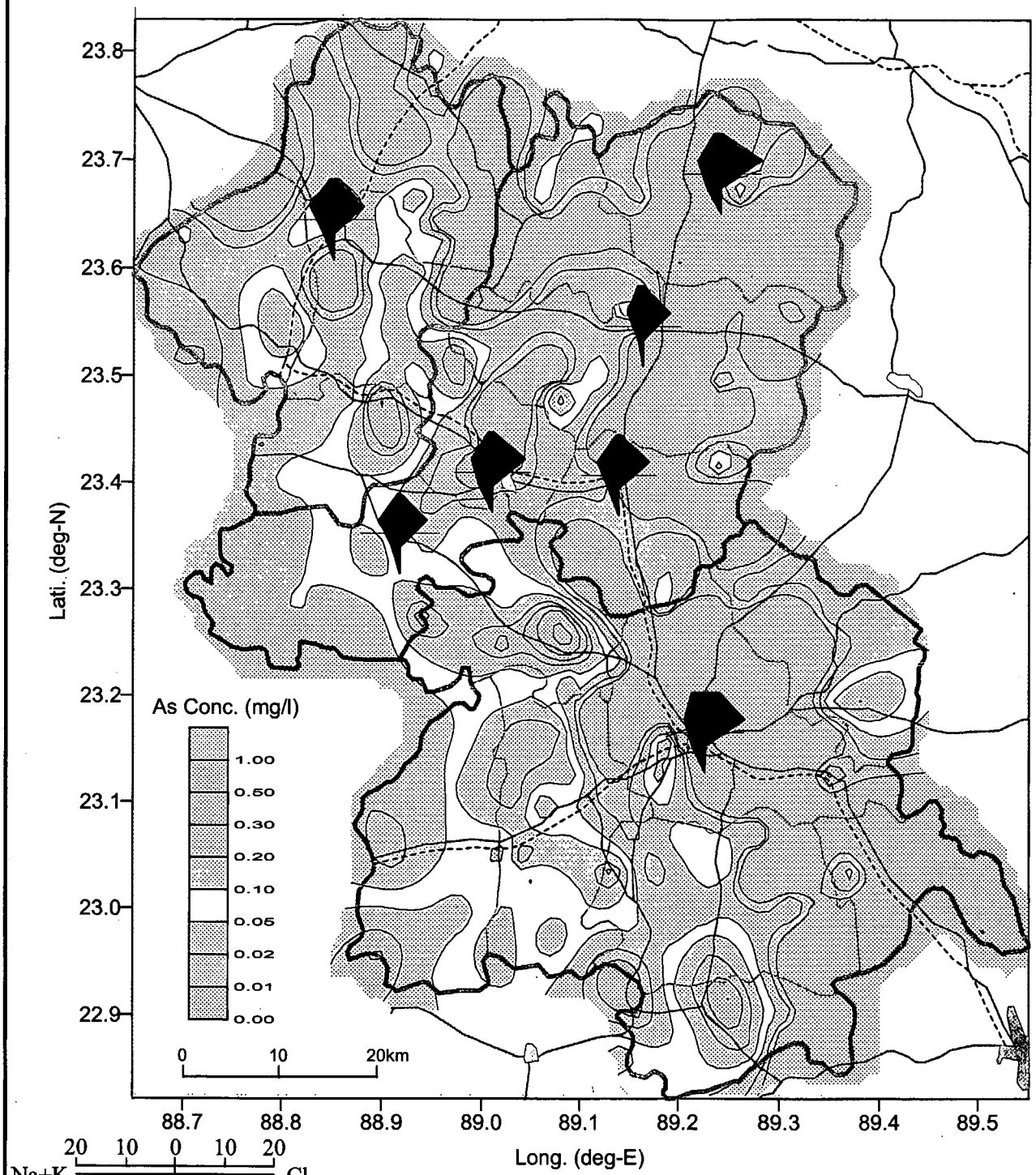


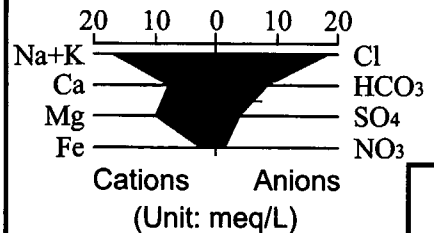
[The groundwater samples of 23 existing shallow tubewells were collected in December 2000 to January 2001. The contours of arsenic concentration in the dry season were drawn based on the analysis by AAS in Jhenaidah Laboratory.]

Figure 4.4.6 **Stiff Diagram of Groundwater Taken from Existing Shallow Tubewells in Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



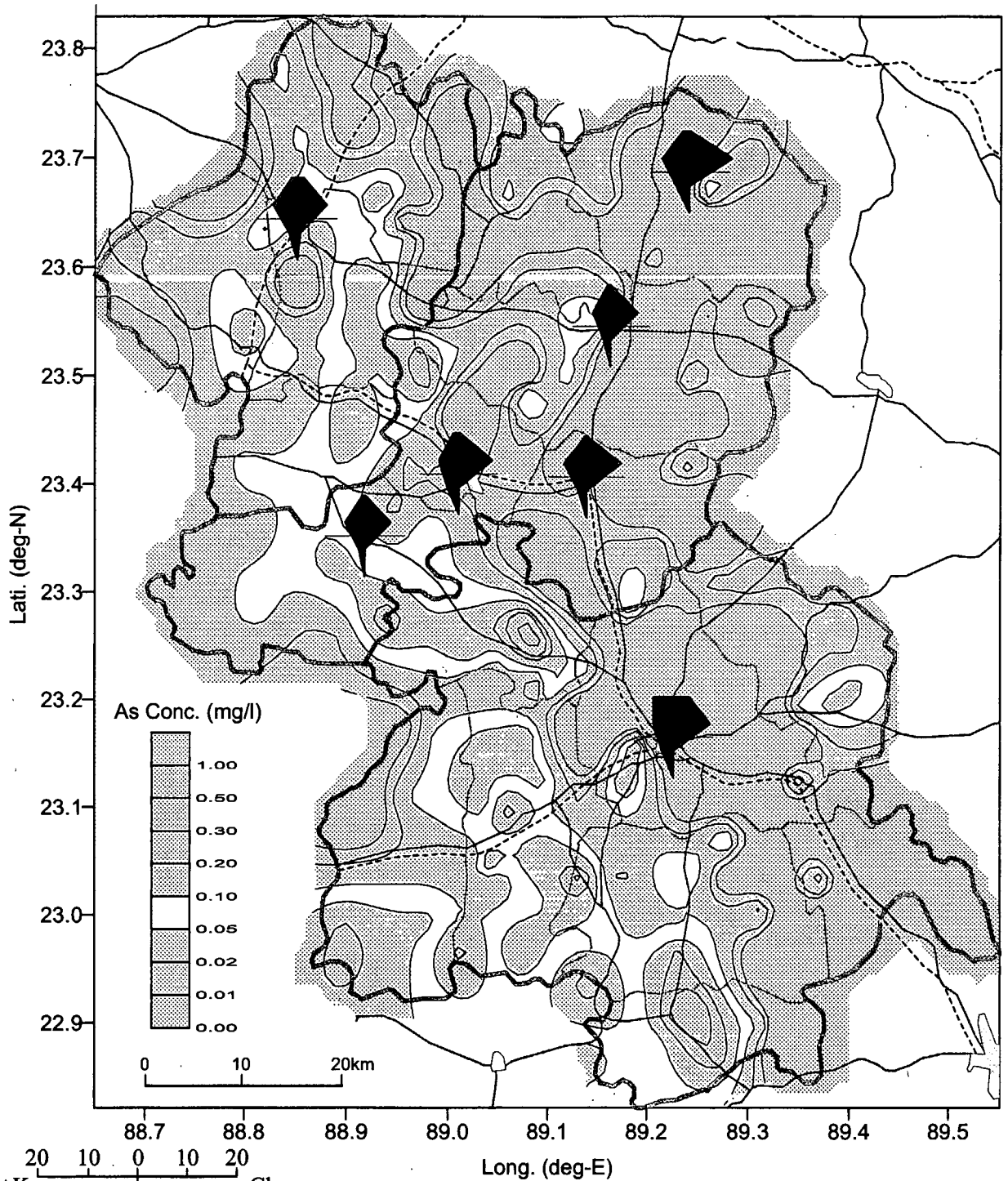


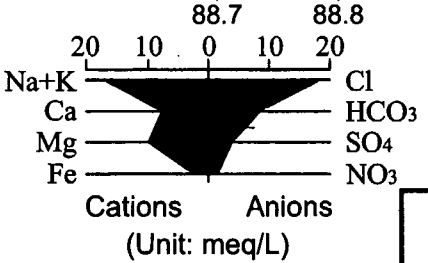
[The groundwater samples of 7 Pourashava production wells were collected in October 2000. The contours of arsenic concentration in rainy season were drawn based on the analysis by AAS in Jhenaidah Laboratory.]

Figure 4.4.7 **Stiff Diagram of Groundwater Taken from Pourashava Production Wells in October 2000**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)





[The groundwater samples of 7 Pourashava production wells were collected in December 2000 to January 2001. The contours of arsenic concentration in dry season were drawn based on the analysis by AAS in Jhenaidah Laboratory.]

Figure 4.4.8 **Stiff Diagram of Groundwater Taken from Pourashava Production Wells in Dry Season**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

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