Classification Matrix for Groundwater Resources Evaluation

EC (μS/cm)		Allotment Points	Estimated Yield (liters/min) 100 <	50 - 100	< 50
			Good	Fair	Poor
			3	2	1
< 750	Good	2	**6**	**4**	**2**
750 - 3500	Fair	1	**3**	**2**	**1**
3500 <	Poor	0	**0**	**0**	**0**
			Weighting		

Evaluation of Groundwater Resources

6	*Very Good*
4	*Good*
3	*Good*
2	*Fair*
1	*Moderately Fair*
0	*Poor*

Explanation of Hydrogeological Symbols

- JICA Test Wells

Line Structures

- Thrust
- Shear Zone
- Fault, Fructure
- Lineaments by Landsat Image

Explanation of Topographical Symbols

- Tanks and Lagoons
- Streams
- Roads

- Pilot GND

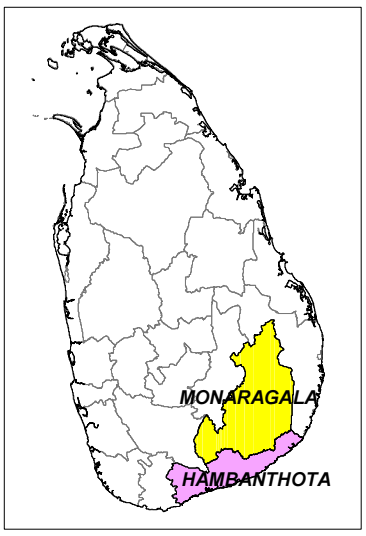

Figure 5.1(2) Groundwater Resources Evaluation Map

Lower/Deeper Farctured Aquifer (Deeper than 70)

5.2 GROUNDWATER POTENTIAL EVALUATION

5.2.1 YIELD

The *Table 5.1* shows the general guidelines of the evaluation of well potential by transmissivity and specific capacity. In the table, the transmissivity of 10 m^2/day means good potential for domestic water. The withdrawals, or productivity, are expected to be used for a water supply system of a small to moderate size local area, which may be nearly same scale of the pilot area of the Study.

The level of infeasible, or imperceptible, which is below the transmissivity of 0.1 m^2/day, means that groundwater cannot be practically extracted. Poor to fair, or very low to low, means that groundwater can possibly be pumped out by a hand pump. Good, or intermediate, means that groundwater may be withdrawn using a submersible pump for water supply.

Table 5.1 Comparison of Transmissivity, Specific Capacity and Well Potential

Transmissivity (m2/day)			Specific Capacity (liters/min/m)	Groundwater Supply Potential	
1000	Irrigation	Good	1000	Very high	Withdrawals of great regional importance
		Fair			
100		Poor	100	High	Withdrawals of lesser regional importance
	Domestic	Good	10	Intermediate	Withdrawals for local water supply
10					
		Fair	1	Low	Smaller withdrawals for local water supply
1					
		Poor	0.1	Very low	Withdrawals for local water supply with limited consumption
0.1					
		Infeasible	0.01	Imperceptible	Sources for local water supply are difficult (if possible) to ensure

after U.S. Bureau of Reclamation, Ground Water Manual, U.S. Department of Interior, Washington, 1977. (Kashef, A. Ismail, Groundwater Engineering, p.366)

after Krasny, Jiri. 1993. GROUND WATER. vol.31, no.2, pp.231

The result of the test well drilling for the Study was evaluated using the above table and also the yield from each well. Unfortunately the existing wells in the database have neither data of transmissivity nor data of specific capacity. Based on the results of pumping tests of both Test and Existing wells, the distributions of Transmissivity, Specific Capacity and Yield are examined as shown as *Figures 5.3.* The results of test well drilling generally indicate that the boundary between the poor and the fair is about a yield of 50 litres/min and the boundary between the fair and the good is about a yield of 100 litres/min. Then this classification of the yield was used to make the hydrogeological map and the evaluation map.

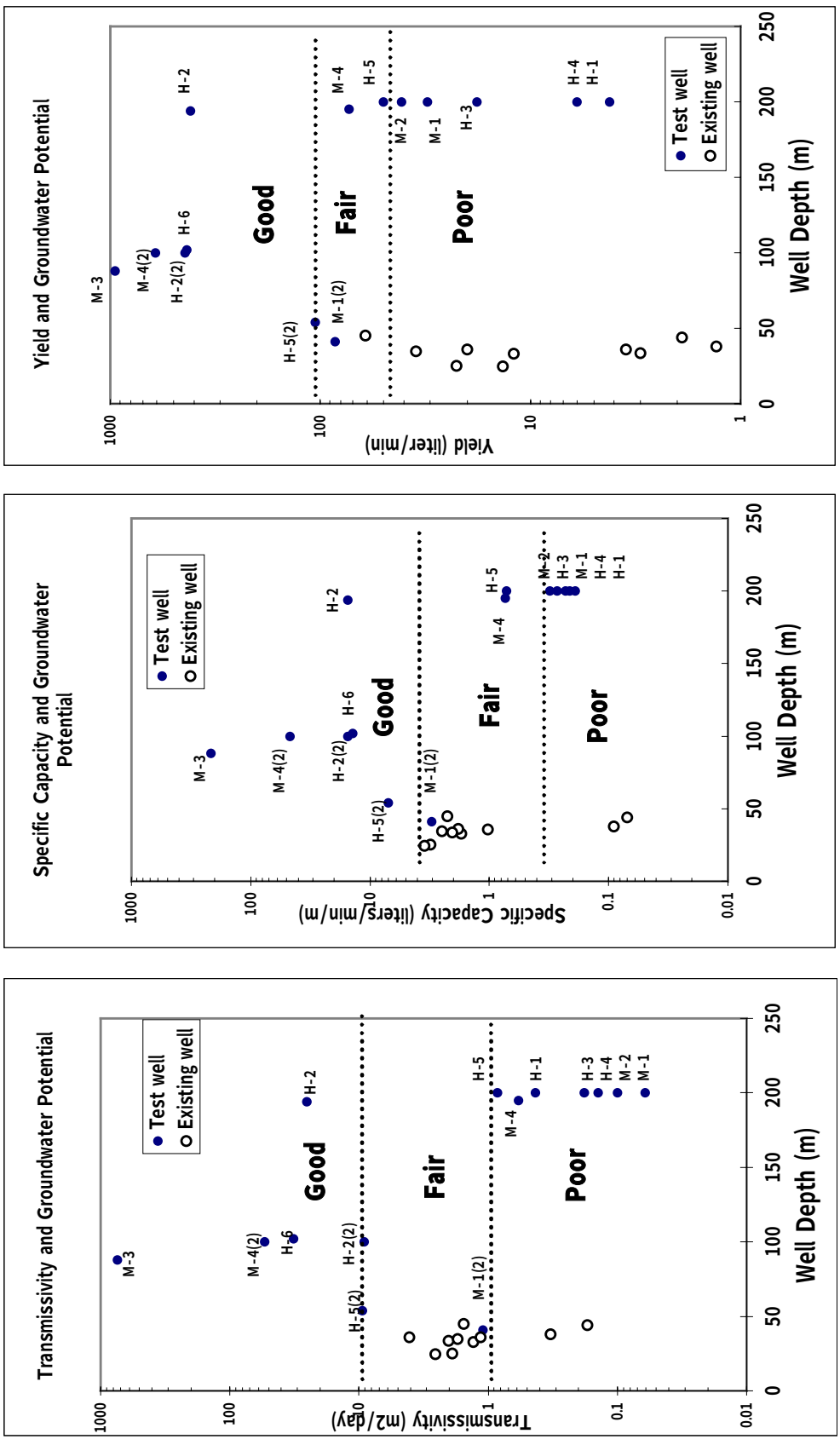

Figure 5.3 Evaluation of Transmissivity, Specific Capacity and Yield

5.2.2 QUALITY

Electric conductivity (EC) is an important representative factor of water quality. According to the water quality standards for drinking water in Sri Lanka, the value of EC is divided into three classes:

- EC under 750 μS/cm, which is the maximum desirable level, is good for drinking.
- EC between 750 and 3500 μS/cm, which is the maximum permissible level, is fair for drinking.
- EC of 3500 μS/cm and over is poor, or not satisfactory, for drinking.

The hydrogeological map shows these boundary lines for EC. The value of EC is useful as the practical indicator of water quality, therefore the above classification is used to make the evaluation map. As a matter of cause, there are other considerable elements such as fluoride and heavy metals; therefore a detailed chemical analysis is necessary on the implementation stage of development plan. The section of 7.5 in the supporting report described the details of water quality.

5.2.3 DEPTH TO GROUNDWATER

Depth to groundwater usually relates to pumping cost, or operation cost, of a production well. The isobaths of groundwater depth are shown in the hydrogeological map. As described in the chapter of hydrogeology, however, the depth to groundwater is mostly 25 mbgl and above. Practically, this means that the depth to groundwater is a less important factor for groundwater development. Therefore this factor was not used to make the evaluation map

5.2.4 GEOLOGICAL STRUCTURE

As described in the chapter of hydrogeology, some geological structures such as a thrust zone and a fault zone concern the productivity of groundwater. The classification of the area yielding groundwater was modified from the viewpoint of geological structure. And also the shaded area along a large geological structure in the hydro-geological map shows the possibility of productive groundwater occurrence even if there is no well data at present.

5.2.5 PROMISING AREA FOR GROUNDWATER DEVELOPMENT

(1) Area Evaluation

After the completion of the hydrogeological map, the groundwater resources evaluation map was prepared based on it. The evaluation map was drawn in accordance with the distribution of groundwater yield and quality (EC). The *Table 5.2* shows the combination of factors used in the evaluation map.

Table 5.2 Matrix of the Classification for Groundwater Evaluation

			Yield (litres/min)		
			100 <	50 – 100	< 50
EC		Allotment Points	Good	Fair	Poor
(μ S/cm)			3	2	1
750 <	Good	2	**6**	**4**	**2**
750 - 3500	Fair	1	**3**	**2**	**1**
3500 <	Poor	0	**0**	**0**	**0**
			Weighting		

The evaluation is described as follows.

Weighting: 6 Very Good

- EC is good for drinking, and besides the yield is expected 100 litres/min and more. This volume is exploitable using a submersible pump.

Weighting: 4 Good

- EC is good for drinking and the yield is expected from 50 to 100 litres/min. This volume is exploitable using a small submersible pump.

Weighting: 3 Good

- EC is fair for drinking and the yield is expected 100 litres/min and more.

Weighting: 2 Fair

- EC is fair for drinking and the yield is expected between 50 and 100 litres/min, or EC is good for drinking and the yield is expected 50 litres or less. This volume is exploitable by a hand pump.

Weighting: 1 Moderately Fair

- EC is fair for drinking and the yield is expected 50 litres/min or less.

Weighting: 0 Poor

- EC is poor for drinking. As shown in Table 5.1, an area classified to this class may have a groundwater potential yielding 100 litres/min or more. It may be possible to use as a source for small scale industrial water or livestock water.

(2) Promising Area for Groundwater Development

The area evaluated as Good or Very Good on the evaluation map is the promising area for groundwater development. It is the blue coloured area on the map.

In Monaragala, the promising area for groundwater development is fairly large. The upper aquifer of the northeast to central eastern part and the south central part of Monaragala is expected to be exploitable. And the lower aquifer of the central western area of Monaragala is also the promising aquifer, which was confirmed in Yalabowa and Badalkumbra by the Study. Besides the evaluation map indicates that the south central area including Kataragama is another promising

area of the lower aquifer. On the other hand, the southwest area seems to be less productive area except the north of Hambegamuwa.

In Hambantota, the coastal side of the central area was mostly evaluated as poor due to water quality. There is an area evaluated as good in the centre of the district, where the lower and deeper fractured aquifer is promising. The western end of the district was evaluated as good. This is the promising area of the upper aquifer. The lower and deeper aquifer of the part of this area is also promising. There is an area with possibilities of occurrence of productive deeper fractured aquifer around Talunna.

Please note the importance of geological investigation, especially geophysical survey, even in the promising area. The fractured aquifer in hard rock is unevenly distributed in the promising area.

5.3 EXTRACTABLE GROUNDWATER YIELD

5.3.1 GENERAL

A test well was drilled in each of 10 pilot areas that were selected by the hydrogeological study from 15 Pilot GNDs proposed by WRB. Based on the value of transmissivity (T) and specific capacity (Sc) obtained by the pumping test of the test well, the fractured aquifer in the pilot area was classified into three classes: namely, Poor, Fair and Good. And also the yield (Q) was classified into the three classes based on the relation between these obtained values and the yield from each test well as shown below.

	T (m2/day)	Sc (litres/min/m)	Q (litres/min)
Good	10 <	5 <	100 <
Fair	1-10	0.5 - 5	50 – 100
Poor	< 1	< 0.5	< 50

The aquifer of the pilot area was rated by the above classification. The aquifers with Good of every item (T, Sc, and Q) were rated as the top level (A) and the extractable yield is expected at an equivalent volume of discharge rate at the pumping test of the drilled well in the area. The aquifers with Poor of any one item (T, Sc, and Q) were rated as the bottom level (C) and the extractable yield is expected less than 50 litres/min or the equivalent volume at the pumping test. The other areas were rated as the intermediate level (B) and the extractable yield is expected between 50 to 100 litres/min or the equivalent volume at the pumping test. The evaluation map rated five other areas where a test well was not constructed. The area classified as Very Good was rated as the top level (A). The area classified as Good to Fair was rated as the intermediate level (B). The area classified as Moderately Fair to Poor was rated as the bottom level (C). *Table 5.3* shows the rating and the expected extractable yield of the pilot areas. The recharge potential estimated by viewpoints of hydrology is sufficient to cover the yield of each pilot area (See *Table 5.4* Estimated Minimum Recharge Volume) .

Table 5.3 Rating and Extractable Yield of the Pilot Areas

		Deeper (100-200m)					Lower (70-100m)					Upper (0-70m)					Exploitable Aquifer / Yield expected		
		T	Q/s	Q	Rated Level	litres/min	T	Q/s	Q	Rated Level	litres/min	T	Q/s	Q	Rated Level	litres/min	(Well Depth)	(litres/min)	**Q (m3/h)**
M1	Hambegamuwa	Moderately Fair								C	---	M. Fair - Fair			B	< 100	Upper(70m)	< 100	< 6
M2	Bodagama	P	---	---	C	---	**G**	**G**	**G**	**A**	440	F	---	---	C	---	Lower (100m)	440	**26.4**
M3	Hulandawa left	Fair								B	< 100	Fair			B	< 100	Upper-Lower(100m)	< 100	< 6
M4	Unawatuna	Fair - Good								B	< 100	M. Fair - Fair			B-C	< 100	Upper-Lower(100m)	< 100	< 6
M5	Yalabowa	**P**	F	F	C	73	**G**	**G**	**G**	**A**	610	F	G-	P	C	35	Lower (100m)	35	**36.6**
M6	Badalkumbura	*			*	*	**G**	**G**	**G**	**A**	950	F	---	---	C	---	Lower (100m)	950	**57**
M7	Sevanagala	P	---	---	C	---	---	---	---	C	---	**F**	G-	F	B	85	Upper (70m)	85	5.1
H1	Keliyapura	P	---	---	Imperceptible		---	---	---	Imperceptible		F	F	P	C	12	Upper	Poor	
H2	Vitarandeniya	Moderately Fair								C	< 50	G-	F	P	C	20	Lower (100m)	< 50	< 3
H3	Talunna	**G**	**G**	**G**	**A**	415	---	---	---	C	---	Poor - M.Fair			C	---	Deeper (200m)	415	**24.9**
H4	Wediwewa	P	---	---	C	---	---	---	---	C	---	P	P	P	C	1.9	Poor - Imperceptible		
H5	Tammennawewa	*			*	*	**G**	**G**	**G**	**A**	432	F	F	P	C	3.5	Lower (100m)	3.5	**25.92**
H6	Pahala Mattala	P	F	F	C	50	---	---	---	?	---	**G**	**G**	**G**	**A**	106	Upper (70m)	106	**6.36**
H7	Siyambalagaswila	P	---	---	C	---	---	---	---	C	---	F	F	P	C	3	Poor		
H8	Ranna	Good								B	< 100	Poor			C	---	Lower-Deeper (200m)	< 100	< 6

G: Good F: Fair P: Poor A blank column; Constant discharge test could not be continued for 720 min.

*: The well was not drilled up to the deeper aquifer.

Table 5.4 Estimated Minimum Recharge Volume

GND No.	Test well No.	GND name	Catchment area for test well site (km^2)	Minimum runoff (mm)	Minimum recharge volume		Extractable Yield, (12h operation)	Extractable Yield, Recharge Ratio
					(m^3/year)	(m^3/day)	(m^3/day)	(%)
H1	H-4	Keliyapura	15.59	100	1559000	4271	--	--
H2		Vitarandeniya	7.37	100	737000	2019	<36	1.78
H3	H-2	Talunna	6.14	100	614000	1682	298.8	17.76
H4	H-3	Wediwewa	44.37	100	4437000	12156	--	--
H5	H-6	Tammennnawewa	25.60	100	2560000	7014	645.4	9.20
H6	H-5	Pahala Mattala	61.83	100	6183000	16940	76.32	0.45
H7	H-1	Siyambalagaswila North	4.92	100	492000	1348	--	--
H8		Ranna West	2.78	100	278000	762	72.00	9.45
M1		Hambegamuwa	257.75	100	25775000	70616	72.00	0.10
M2	M-2	Bodagama	20.08	100	2008000	5501	316.80	5.76
M3		Hulandawa Left	18.82	200	3764000	10312	72.00	0.70
M4		Unawatuna	26.56	200	5312000	14553	72.00	0.49
M5	M-4	Yalabowa	14.18	200	2836000	7770	439.20	5.65
M6	M-3	Badalkumbura	5.80	200	1160000	3178	684.00	21.52
M7	M-1	Sevanagala	15.00	100	1500000	4110	61.20	1.49

5.3.2 EXTRACTABLE GROUNDWATER YIELD IN PILOT AREAS

(1) Monaragala District

1) Hambengamuwa

A test well was not drilled in the area. The evaluation map indicates that the lower/deeper aquifer is moderately fair for development and the upper aquifer is fair in some places. Some existing wells yielded 50 to 100 litres/min or more. The extractable yield from the aquifer above 70 mbgl is expected at 50 to 100 litres/min based on the evaluation.

2) Bodagama

The constant discharge test of the existing well was conducted for 600 minute with the pumping rate of 22.5 litres/min. Specific capacity was 3.09 litres/min/m and the transmissivity was estimated at 1.89 m^2/day. The potential level of the upper aquifer was evaluated to be fair. However, the constant discharge test of the additional test well with the depth of 100 m was conducted for 3 days with the pumping rate of 440 litres/min. The obtained values of transmissivity, specific capacity and yield are the level of Good. The potential level of the aquifer above 100 mbgl was rated as A. By the pumping test of the first test well drilled to 200 m, the transmissivity of the deeper aquifer was estimated at 0.12 m^2/day. The duration time of the pumping test was 240 minutes with the pumping rate of 41 litres/min. Specific capacity was 0.31 litres/min/m. The potential level of the deeper fractured aquifer is rated as C.

3) Hulandawa left

A test well was not drilled in the area. The evaluation map indicates that the lower/deeper aquifer is fair for development and the upper aquifer is also fair. An existing well located near the area yielded 50 litres/min or more. The extractable yield from the aquifer above 100 mbgl is expected at 50 to 100 litres/min based on the evaluation.

4) Unawatuna

A test well was not drilled in the area. The evaluation map indicates that the lower/deeper aquifer is fair to good for development and the upper aquifer is moderately fair. An existing well drilled near the area yielded more than 100 litres/min. The extractable yield is expected at 50 to 100 litres/min based on the evaluation.

5) Yalabowa

The constant discharge test of the existing well was conducted for 960 minute with the pumping rate of 35 litres/min. Specific capacity was 2.49 litres/min/m and the transmissivity was estimated at 1.73 m^2/day. The potential level of the upper aquifer was rated as C. However, the constant discharge test of the additional test well with the depth of 100 m was conducted for 3 days with the pumping rate of 610 litres/min. The obtained values of transmissivity, specific capacity and yield are the level of Good. The potential level of the aquifer above 100 mbgl was rated as A. By the pumping test of the first test well drilled to 200 m, the specific capacity was 0.73 litres/min/m with the pumping rate of 73 litres/min. The potential level of the deeper fractured aquifer is rated as C.

6) Badalkumbura

The constant discharge test of the existing well was conducted for only 110 minute with the pumping rate of 13.5 litres/min. The potential level of the upper aquifer was rated as C. However, the constant discharge test of the test well with the depth of 100 m was conducted for 3

days with the pumping rate of 950 litres/min. By the pumping test, the transmissivity of the lower aquifer was estimated at 741 m^2/day. Specific capacity was 216 litres/min/m. The potential level of the lower fractured aquifer is rated as A.

7) Sevanagala

The pumping test of the existing well was conducted for 720 minute with the pumping rate of 61 litres/min. By the test, the transmissivity of upper fractured aquifer was estimated at 1.55 m^2/day. Specific capacity was 2.24 litres/min/m. The additional test well was drilled to 40 m and the pumping test was conducted. The yield was 85 litres/min with the duration of 1440 minutes. Specific capacity was 3.05 litres/min/m and the estimated transmissivity was 1.1 m^2/day. The potential level of the upper aquifer was rated as B. The transmissivity of the deep fractured aquifer was estimated at 0.06 m^2/day by the constant discharge test of the first test well drilled to 200 m. The pumping test was conducted for only 360 minutes with the pumping rate of 31 litres/min. Specific capacity was 0.23 litres/min/m. The potential level of the deeper fractured aquifer was rated as C.

(2) Hambantota District

1) Keliyapura

The pumping test of existing well calculated the transmissivity of shallow fractured aquifer at 1.3 m^2/day with the specific capacity of 1.72 litres/min/m. The duration time of the constant discharge test was 2880 minutes with a pumping rate of 12 litres/min. The test well drilled in the area was almost dry. The potential level of the upper fractured aquifer is rated as C and the potential level of the deeper fractured aquifer is C or imperceptible.

2) Vitarandeniya

The transmissivity of upper fractured aquifer was estimated at 4.09 m^2/day by the result of the pumping test of existing well in the area. The pumping test was conducted for 2880 minute with the pumping rate of 20 litres/min. The potential level of the upper aquifer was rated as C. A test well was not drilled in the area. The evaluation map indicates that the upper aquifer is moderately fair for development and the lower/deeper aquifer is also moderately fair. However, there is an existing well yielding more than 100 litres/min in the area. The extractable yield may be expected at 50 to 100 litres/min from the fractured aquifer above 100 m.

3) Talunna

The pumping test of existing well was not conducted in the area. The evaluation map indicates that the upper aquifer is poor to fair for development. The potential level of the upper aquifer was rated as C. However, this is the area having possibilities of occurrence of productive deeper fractured aquifer according to the result of the test well drilling. The transmissivity of the deeper fractured aquifer was estimated at 25 m^2/day. The pumping test was conducted for 5760 minutes with the pumping rate of 415 litres/min. Specific capacity was 15.34 litres/min/m. The potential level of the deeper aquifer was rated as A.

4) Wediwewa

In the existing well, the constant discharge test was performed for 960 minute with the pumping rate of 1.9 litres/min. Specific capacity was 0.07 litres/min/m and the transmissivity was estimated at 0.17 m^2/day. The potential level of the upper fractured aquifer was rated as C. The pumping test of the test well drilled to 200 m yielded water of 30 litres/min for 45 minutes.

Specific capacity was 0.65 litres/min/m and the transmissivity was estimated at 0.18 m^2/day. The potential level of the deeper aquifer was also rated as C.

5) Tammennawewa

The transmissivity of upper fractured aquifer was estimated at 1.14 m^2/day. The pumping test of the existing well was conducted for 2880 minute with the pumping rate of 3.5 litres/min. The potential level of the upper aquifer was rated as C. This is another area having possibilities of occurrence of productive fractured aquifer below 50 m. The completed depth of the test well was 100 m and the screen pipes were installed at 52.5-60.5 and 72.5-84.5 m. The transmissivity of the lower fractured aquifer was estimated at 31 m^2/day. The pumping test was conducted for 4320 minutes with the pumping rate of 432 litres/min. Specific capacity was 13.98 litres/min/m. The potential level of the lower aquifer was rated as A.

6) Pahala Mattala

The constant discharge test of the existing well was performed for 2880 minute with the pumping rate of 1.3 litres/min. Specific capacity was 0.09 litres/min/m and the transmissivity was estimated at 0.03 m^2/day. The potential of the well was evaluated to be very poor level. However, the pumping test of the additional borehole drilled by WRB with the depth of 52 m shows the estimated transmissivity is 9.45 m^2/day and specific capacity is 6.98 litres/min/m. The test was conducted for 3000 minutes with the pumping rate of 106 litres/min. The result indicated that there is an area with the potential level for development of A. The pumping test of the test well drilled to 200 m was carried out for 4320 minute with the pumping rate of 50 litres/min. The transmissivity of the test well was estimated 0.85 m^2/day. Specific capacity was 0.72 litres/min/m. The potential level of the deeper aquifer was rated as C.

7) Siyambalagaswila North

The transmissivity of upper fractured aquifer was estimated at 2.02 m^2/day. The pumping test of the existing well was conducted for 2880 minute with the pumping rate of 3.0 litres/min. Specific capacity was 2.04 litres/min/m. The potential level of the upper aquifer was rated as C. The pumping from the test well was continued only 27 minutes with the pumping rate of 18 litres/min. Specific capacity was 0.75 litres/min/m and the transmissivity was estimated at 0.14 m^2/day. The potential level of the deeper aquifer was also rated as C.

8) Runna

A test well was not drilled in the area. The evaluation map indicates that the upper aquifer is poor for development. However the evaluation map of the lower aquifer indicated that the lower/deeper aquifer is good in the area for development. The area is expected to have possibilities of occurrence of productive deeper fractured aquifer as well as Talunna, although there is no existing well drilled to 70 m or more. Then the potential level of the lower/deeper aquifer was rated as B.

(3) Area of Influence of well

When more than one well is necessary to extract a volume of water to meet the demand in an area, it is advisable that the additional well(s) should be drilled out of the area of influence of the pumping well. It is known that the size of the area depends on four factors, the transmissivity and the storativity of the aquifer, the pumping rate and the duration of pumping. However, the most important factor is the distribution of the aquifer in reality. Although the distribution of a fractured aquifer in the metamorphic hard rock is actually very complicated, the influence of test wells was tentatively calculated based on the obtained factors as tabulated below.

Table 5.5 Influence of Pumping Well

	Well No.	Well Depth (m)	*T* (m2/day)	*Q* (m3/h)	*S*	s=0.01m $r_{0.01}$	0.1m $r_{0.1}$	1m r_1	10m r_{10}	r=0.075m s	Pumping Test Result 12 hours
Bodagama	M-2(2)	100	53.2	26	3.23E-04	1000	690	280	2.20	16.38	18.38
Yalabowa	M-4	195	0.58	4	1.87E-03	57	46	32	15.00	145.30	***92.48***
	M-4(2)	100	53.7	36		440	310	140	3.85	20.24	10.85
Badalkumbura	M-3	88	741	57	1.87E-03	1170	560	22	---	2.67	3.65
Sevanagala	M-1(2)	42	1.1	5	3.23E-04	180	140	97	38.00	116.50	***22.41***
Talunna	H-2	200	25.29	25	3.23E-04	750	540	270	20.00	31.27	24.84
Tammennawewa	H-6	102	31.93	26	1.23E-04	1350	960	470	21.00	27.53	31.30
Pahala Mattala	H-5	200	0.85	3	4.23E-04	130	100	70	24.00	86.90	64.50
	H-5(2)	52	9.45	6		380	270	120	3.10	19.59	11.06

Duration of pumping : 12 hours.
s: Drawdown in metres.
r_s: Radius of influence with the drawdown s (m) in metres.

5.3.3 EXTRACTABLE GROUNDWATER YIELD OF PROMISING AREA

As already described in the section of 5.2.5, the area evaluated as Good or Very Good on the evaluation map was regarded as the promising area for groundwater development. The evaluation was done based on the matrix of *Table 5.2*. The rank of Good is for the area with 3 or 4 points and the rank of Very Good is the area with 6 points. As indicated in the table, the aquifer of the area with 3 and 6 points is expected the yield of 100 litres/min or more. These areas are shown as the light and dark blue coloured areas, respectively, in the Evaluation map. The blue coloured area in the map is the area with 4 points, where the expected extractable yield is from 50 to 100 litres/min.

Figure 5.4 was drawn to show the area evaluated as Good or Very Good in the evaluation maps for the upper aquifer and for the lower/deeper aquifer. The classification of the area is summarised below.

Area	Point (Upper)	Points (Lower/Deeper)	Promising Aquifer	Well Depth	EC	Expected Yield
VGvg	6	6	Upper/Lower/Deepr	70 (or 100～200)	-750	100 <
VG	6	<6	Upper	70	-750	100 <
vg	<6	6	Lower/Deeper	100～200	-750	100 <
G1g1	4	4	Upper/Lower/Deepr	70 (or 100～200)	-750	50-100
G1	4	<4	Upper	70	-750	50-100
g1	<4	4	Lower/Deeper	100～200	-750	50-100
G2g2	3	3	Upper/Lower/Deepr	70 (or 100～200)	750-3500	100 <
G2	3	<3	Upper	70	750-3500	100 <
g2	<3	3	Lower/Deeper	100～200	750-3500	100 <

Capital letter means the evaluation of the upper aquifer, for example VG is Very Good of the upper aquifer and vg is Very Good of the lower/deeper aquifer.

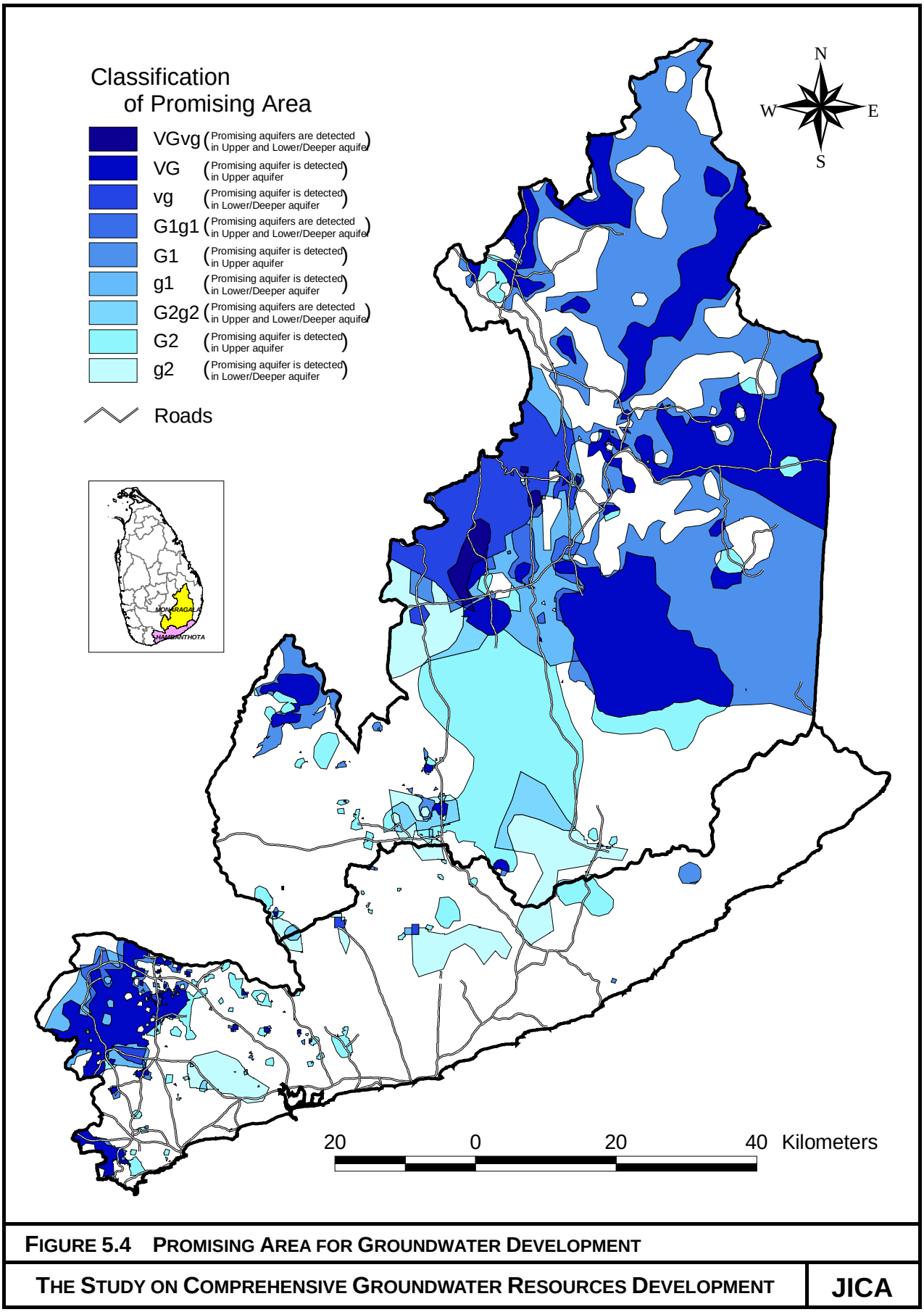

FIGURE 5.4 PROMISING AREA FOR GROUNDWATER DEVELOPMENT

THE STUDY ON COMPREHENSIVE GROUNDWATER RESOURCES DEVELOPMENT	JICA

5.3.4 STUDY FOR DEVELOPMENT OF PROMISING AREA

As already mentioned, the fractured aquifer is unevenly distributed in hard rock. Therefore geophysical survey is vital to get a success of groundwater development even in the promising area. The survey will be carried out by the following procedure.

Preliminary geological study will be conducted to decide effectively the number and location of survey stations and survey lines in a target area. It will pay attention especially to geological structure such as lineaments.

A main survey line is set to be orthogonal to geological structure extracted by the preliminary geological study. In addition the setting of some other survey lines, especially grid survey lines, is preferable to analyse more accurately. Besides, an interval between survey stations is 50 to 100 m.

A well location will be selected in the areas showing low resistivity anomalies by the result of geophysical survey. The areas with the resistivity of less than 400 ohm-m are recommended as a drilling point of a production well in Monaragala, while the areas with the resistivity between 100 to 400 ohm-m are recommendable in Hambantota.