

Table No: II-V-I

Size of Individual Particles classified by the
Soil Survey staff of the U.S. Department of Agriculture
(U.S.D.A.) in 1951

SI No	Description of Products	Size of Particles
I	Clay	0-2 μ m
II	Silt	2-50 μ m
III	Very Fine sand	50-100 μ m
IV	Fine sand	0.1-0.25mm
V	Medium sand	0.25-0.5mm
VI	Coarse sand	0.5-1mm
VII	Very Coarse sand	1-2mm

Source: Texture of unconsolidated materials, page 16,
ground water hydrology by Herman bower.

Table No: III-III-I
Temperature of Palakkad

Year									
	Maximum			Minimum			Increasing		
	Month	Date	Temperature	Month	Date	Temperature	Month	Date	Temperature
1993	April	24 th	40.6 ⁰ C	June	7 th	25.4 ⁰ C	Oct	24 th	38.8 ⁰ C
1994	March	19 th	39.4 ⁰ C	July	14 th	25.2 ⁰ C	----	----	---
1995	April	2 nd	39.4 ⁰ C	July	16 th	24.8 ⁰ C	Oct	29 th	33.0 ⁰ C
1996	March	25 th	40.0 ⁰ C	June	18 th	23.8 ⁰ C	Oct	8 th	33.0 ⁰ C
1997	March	19 th	38.0 ⁰ C	July	13 th	23.8 ⁰ C	Oct	12 th	34.4 ⁰ C
1998	May	7 th	40.0 ⁰ C	June	29 th	23.2 ⁰ C	Sept	18 th	30.6 ⁰ C
1999	February	13 th	38.6 ⁰ C	July	16 th	24.0 ⁰ C	Sept	22 nd	32.8 ⁰ C
	Average		39.4 ⁰ C			24.31 ⁰ C			32.93 ⁰ C

Source: Temperature Register, Office of the Taluk Tahsildar, Palakkad, Kerala dated 24-1-2000

Table No: III-IV-I**Mean wind speed on Malampuzha and Pattambi**

Months	1990				1991				1992			
	Malampuzha		Pattambi		Malampuzha		Pattambi		Malampuzha		Pattambi	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
	Km/H		Km/H		Km/H		Km/H		Km/H		Km/H	
January	24.288	0.112	13.7	2.7	26.3	-	15.4	1.6	38.44	-	13.2	-
February	25.988	5.712	14.00	3.7	22.55	-	11.1	1.6	21.53	-	6.6	-
March	10.53	2.86	9.5	3.7	12.41	-	9.8	2.3	22.06	-	5.8	-
April	2.88	4.496	6.9	4.0	10.88	-	6.3	2.7	14.81	-	7.4	-
May	8.448	4.88	6.1	2.3	15.70	-	5.5	1.3	13.84	-	6.1	-
June	11.008	4.144	4.7	1.4	11.85	-	7.1	0.5	27.93	-	7.4	-
July	10.00	3.8	4.8	2.3	14.43	-	5.6	1.8	23.34	-	7.2	-
August	11.136	4.928	7.9	2.7	12.78	-	6.6	1.6	16.94	-	7.6	-
September	11.184	5.648	8.7	1.6	11.15	-	6.4	1.8	17.04	-	5.00	-
October	9.776	2.624	6.4	1.1	11.55	-	6.3	1.1	12.08	-	3.1	-
November	16.800	2.065	7.7	1.00	22.20	-	11.4	0.8	27.32	-	8.00	-
December	22.336	3.312	14.3	2.1	28.03	-	15.00	1.4	55.43	-	14.00	-
Mean	13.697	3.715	8.725	2.38	16.44	-	8.875	1.541	24.23	-	7.61	-

Source : Field Studies Circle, Irrigation Complex, Thrissur, Kerala Dated 29/03/2000

Table No: III-VIII-I

Annual Rainfall and Stream flow of selected twenty rivers in Kerala

SI No	Name of River	Basin Area	Average Annual Rainfall	Average Annual Stream Flow	SI No	Name of River	Basin Area	Average Annual Rainfall	Average Annual Stream Flow
		KM ²	mm	Mm ²			Km ²	mm	mm ²
I	Shiriyā	587	3700	1415.5	XI	Chalakkudy	1074	3600	1629.39
II	Chandragiri	1406	4000	3964	XII	Periyar	5398	3200	4867
III	Kariangod	1122	3600	1356	XIII	Muvattupuzha	1554	3100	356.6
IV	Kuppam	539	3800	1516	XIV	Meenachil	1272	3000	1059
V	Valapattanam	1867	3600	4779	XV	Manimala	1847	3300	1560.74
VI	Kuttiyadi	583	4500	1273.5	XVI	Pamba	2235	3600	3423.7
VII	Chaliyar	2923	3800	5902	XVII	Achancoil	1484	2600	1484
VIII	Kadalundi	1122	3400	1137.3	XVIII	Kallada Group	1699	2800	337486
IX	Bharathapuzha	6186	2300	5082.9	XIX	Vamanapuram	867	2200	1324
X	Karuvannur	1054	3200	1398.3	XX	Kabbini	1920	3600	2413

Source: Water Atlas of Kerala, Plate No: 34 to 58

Table No: III-VIII-II

Mean Annual Rainy Days at Ponnani, Mannarkad and Palakkad on Bharathapuzha Basin

Sl No	Place	South-west monsoon , June to Sep		North-east monsoon Oct-Dec		Other than monsoon Jan-May		Total rainy days	Percentage
		Days	Percentage %	Days	Percentage %	Days	Percentage %	Days	Percentage %
1	Ponnani	79	62.7	23	18.3	24	19	126	100%
2	Mannarkad	77	62.00	25	20.2	22	17.7	124	100%
3	Palakkad	69	65.7	20	19.5	16	15.3	105	100%
	Average	75	63.5	22	19.17	21	17.33	118	100%

Source : Plate No: 8, Mean Annual Rainy Days , Water Atlas of Kerala , 1995

Table No: III-VIII-III

Annual Rainfall on Bharathapuzha basin during the period of 1979-1992

SI No	Year	Rainfall mm	SI No	Year	Rainfall mm
1	1979	2478	8	1986	1823
2	1980	2561	9	1987	1693
3	1981	2679	10	1988	1929
4	1982	1837	11	1989	1822
5	1983	1972	12	1990	1990
6	1984	1931	13	1991	2278
7	1985	2066	14	1992	2560

Source: Kerala Engineering Research Institute, Peechi,
Thrissur (Dist), Kerala State

Table No: III-IX-I

Details of dams on Bharathapuzha Basin

SI No	Name of Dams	Location in State	Catchment area in km ²	Quantity of water storable in Million m ³
I	Upper Aliyar Dam	Tamil Nadu	140.52	26.55
II	Aliyar Dam	Tamil Nadu	196.89	109.35
III	Thirumurthy Dam	Tamil Nadu	80.31	46.05
IV	Attapady Project	Kerala	43.20	60.73
V	Kanhirapuzha Dam	Kerala	70.00	60.00
VI	Malampuzha Dam	Kerala	147.60	226.00
VII	Pothundi Dam	Kerala	31.00	50.91
VIII	Meenkara or Gayathri Dam	Kerala	90.65	12.75
IX	Chulliyar Dam	Kerala	29.78	13.70
X	Mangalam Dam	Kerala	48.85	25.50
XI	Walayar Dam	Kerala	106.37	20.08
XII	Moolathara Regulator	Kerala	-	9.769
XIII	Cheerakuzhi Regulator	Kerala	-	-

Sources : Offices concerned of the dams

Table No: III-IX-II

Annual Water Discharge through the Observatory

SI No	Year	Quantity	SI No	Year	Quantity
1	1981-82	78165.2 m ³ / sec	6	1986-87	40839.3 m ³ / sec
2	1982-83	40117.83 m ³ / sec	7	1987-88	26990.0 m ³ / sec
3	1983-84	40784.8 m ³ / sec	8	1988-89	43290.0 m ³ / sec
4	1984-85	40617 m ³ / sec	9	1989-90	40940.0 m ³ / sec
5	1985-86	45988.7 m ³ / sec			

Source : Central Water Commission, South-Western River Division, Cochin,
Kerala State, dated 29/12/1993

Table No: IV-II-I

Data about the auctioned amount of sand provided from the
Panchayaths and Municipalities

Sl No	Year of auction	Thrithala	Pattambi	Anakkara	Ottapalam
		Rs.	Rs.	Rs	Rs
I	1989-90	10,98,488	2,10,000	9,906	-
II	1990-91	2,13,259	6,21,000	31,800	23,100
III	1991-92	3,25,700	46,000	27,925	3,200
IV	1992-93	4,74,750	78,100	41,528	13,000
V	1993-94	9,23,000	1,30,300	12560	10,300

Average: Rs. 1,34,282.55 in a year from each centre

Sources: Concerned Panchayaths and Municipalities

Table No: IV-III-I

Data about the centres and permits of sand-drawal

SI No	Name of Centres	Panchayath or Municipality	District	Number of Permits
I	Thiruvillamala	Panchayath	Thrissur	70
II	Kondazhi	"	"	100
III	Cheerakuzhi	"	"	100
IV	Desamangalam	"	"	150
V	Shoranur	Municipality	Palakkad	150
VI	Pattambi	Panchayath	Palakkad	150
VII	Thrithala	"	"	150
VIII	Anakkara	"	"	150
IX	Edapal	"	Malapuram	150
X	Kuttipuram	"	"	150
	Average	-	-	132

Table No: IV-V-I

Data of sediments transported through the Kumbidi Observatory
in Bharathapuzha

SI No	Years	Coarse grain sand	Medium sand	Fine grain sand	Total in Metric ton
I	1981-82	51,457	71,131	7,21,181	8,43,859
II	1982-83	18,430	30,241	3,13,906	3,62,577
III	1983-84	17,857	30,939	2,67,927	31,67,231
IV	1984-85	37,298	.45,239	3,61,843	4,44,380
V	1985-86	40,738	63,293	3,39,753	4,43,784
VI	1986-87	26,463	47,960	2,81,491	3,55,914
VII	1987-88	1,135	2,431	1,51,250	1,54,816
VIII	1988-89	5,887	10,134	2,60,765	2,76,786
IX	1989-90	8,335	15,224	2,77,872	3,01,431
	Average	23,076.67	35,176.89	3,30,665.33	3,88,918.89

Sources: Central Water Commission, South Western River Division,
Cochin, Kerala state. Dated 29/12/1993

Table No: IV-IV-I

Paper reports about the illegal transaction of sand from Bharathapuzha

SI No	Date of Publication	Name of Paper	Location of sand-drawal
I	6/5/2001	Mathrubhumi Daily	Cheruthuruthi Panchayath area
II	9/5/2001	“	Kuzhalmannam Panchayath area
III	30/5/2001	“	Pattambi, Thrithala, Cheruthuruthi
IV	1/6/2001	“	Agali in Attapadi
V	8/6/2001	“	Ottapalam and Shoranur Municipalities
VI	9/6/2001	Malayala Manorama	Ottapalam Municipality Vaniyam Panchayath
VII	11/6/2001	Mathrubhumi	Malampuzha, Marutharoad

Table No:- V-II-I
Growth rate of S.S.I. units in Palakkad

Sl No	Year	Number of Units	Total number of units	Growth rate
I	Upto 1983-84	-----	1524	-----
II	1983-84	203	1724	13.30
III	1984-85	216	1943	12.50
IV	1985-86	336	2279	17.30
V	1986-87	400	2679	17.55
VI	1987-88	576	3255	21.50
VII	1988-89	750	4005	23.04
VIII	1989-90	402	4407	10.03
IX	1990-91	608	5015	13.80
X	1991-92	760	5775	15.15
XI	1992-93	750	6525	12.99

Source: Table No- 5-2 (6) Chapter No.V, Industrial Potential Survey in Palakkad

Table No:- V-III-I

Data of Institutional buildings, pertaining to the
Industrial growth in Palakkad

SI No	Category of Institutions	Numbers in districts
I	Animal Husbandry	123
II	Electrical Substations	31
III	K.S.R.T Units	4
IV	Telephone Exchanges	63
V	Post offices	442
VI	Bank buildings	372
VII	Educational Institutions	800
VIII	Medical Institutions	180
	Total	2,015

Source: Report on Industrial Potential Survey in Palakkad,
page 29 to 56

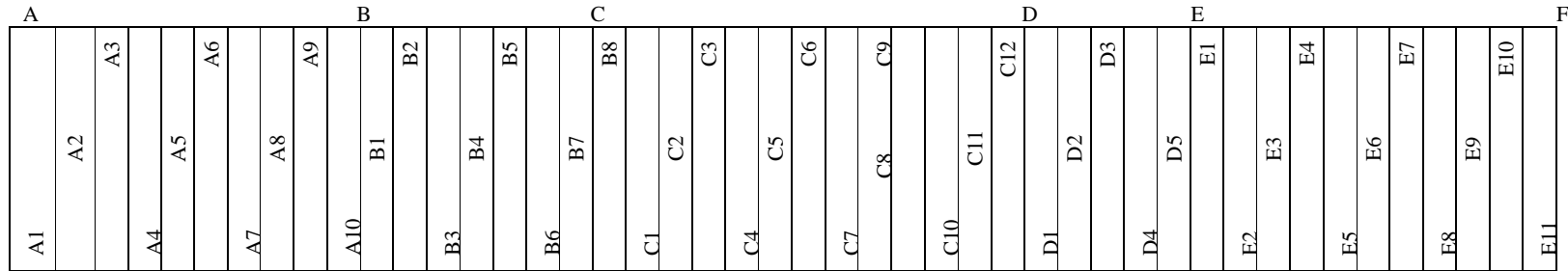
Table No:- V-IV-I

Density of buildings in seven Panchayaths in a cluster, as on 01/01/200

SI No	Name of Panchayath	Area of Panchayath in km ²	Number of buildings	Density of buildings in km ²
I	Lakkidi – Perur	30.379	7,014	231
II	Mankara	20.53	4,420	215
III	Kottay	19.865	3,658	184
IV	Vaniamkulam	35.52	8,032	226
V	Keralassery	23.95	3,768	157
VI	Kongad	35.55	7,164	202
VII	Mannur	18.51	4,702	254
	Total	184.306	38,758	-
		Average		210

Source : Panchayaths Concerned

Fig No: VI-III-I
Example of, Classification of area



A-F is the length of river-bed admissible to take the sand products.
A-B, B-C, C-D etc are the length of segments with the local name of that area A1, A2, A3, A4 are the sites or locations of products settled on the river-bed

Table No:- VI-III-A

Example of, Area-wise classification of products

SI No	Sites in midst of A-B	Quality of products			Dimensions of deposits			Volume in m ³	Total in m ³
		Coarse grained C	Medium M	Fine Grained F	Length in M	Width In M	Height in M		
I	A1	C	-	-	300	200	0.5	30,000	2,61,000
II	A2	-	M	-	400	200	0.6	48,000	
III	A3	C	-	-	100	250	0.3	7,500	
IV	A4	-	-	F	250	200	0.6	30,000	
V	A5	-	-	F	300	200	0.4	24,000	
VI	A6	C	-	-	300	200	0.2	12,000	
VII	A7	-	M	-	200	250	0.3	15,000	
VIII	A8	C	-	-	200	300	0.4	24,000	
IX	A9	C	-	-	200	300	0.5	30,000	
X	A10	-	M	-	300	300	0.45	40,500	

A-B. is the length of segment, A1, A2, A3 are the numbers of sites within the area of segment contained in A-B

Table No:- VI-IV-A

Example of, Identification of sites

SI No	Sites in midst of A-B	Sites of Products			Remarks
		Can be taken	Should be taken	Should not be taken	
I	A1	A1	-	-	Sufficient
II	A2	-	A2	-	Excess
III	A3	-	-	A3	Bridge on site
IV	A4	-	A4	-	Excess
V	A5	A5	-	-	Sufficient
VI	A6	-	-	A6	Insufficient
VII	A7	-	-	A7	Insufficient
VIII	A8	A8	-	-	Sufficient
IX	A9	-	A9	-	Excess
X	A10	A10	-	-	Sufficient

A-B is the length of segment, A1, A2, A3 are the numbers of sites within area of segment, contained in A-B

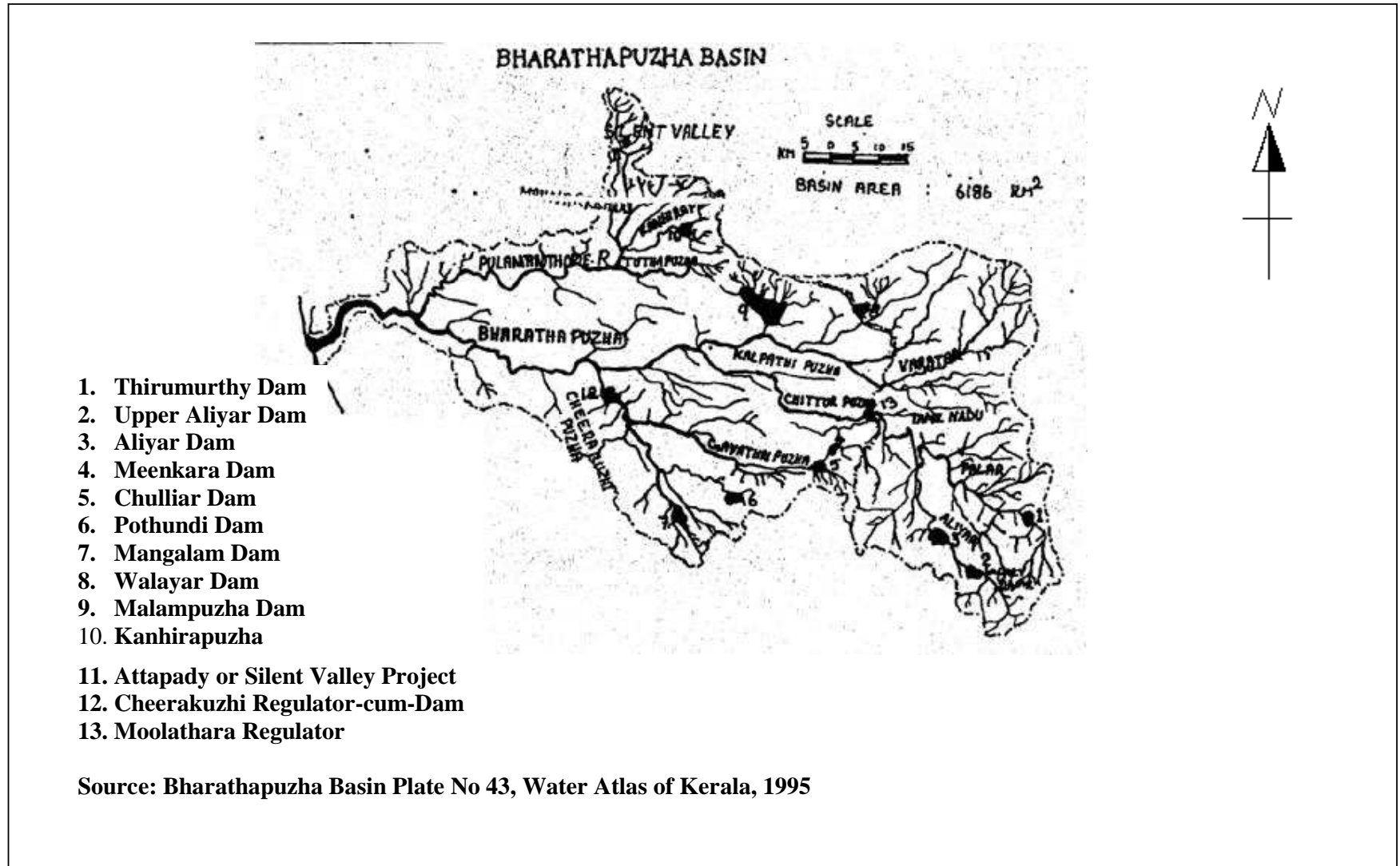
Table No:- VI-V-A

Example of, Determination of quantity

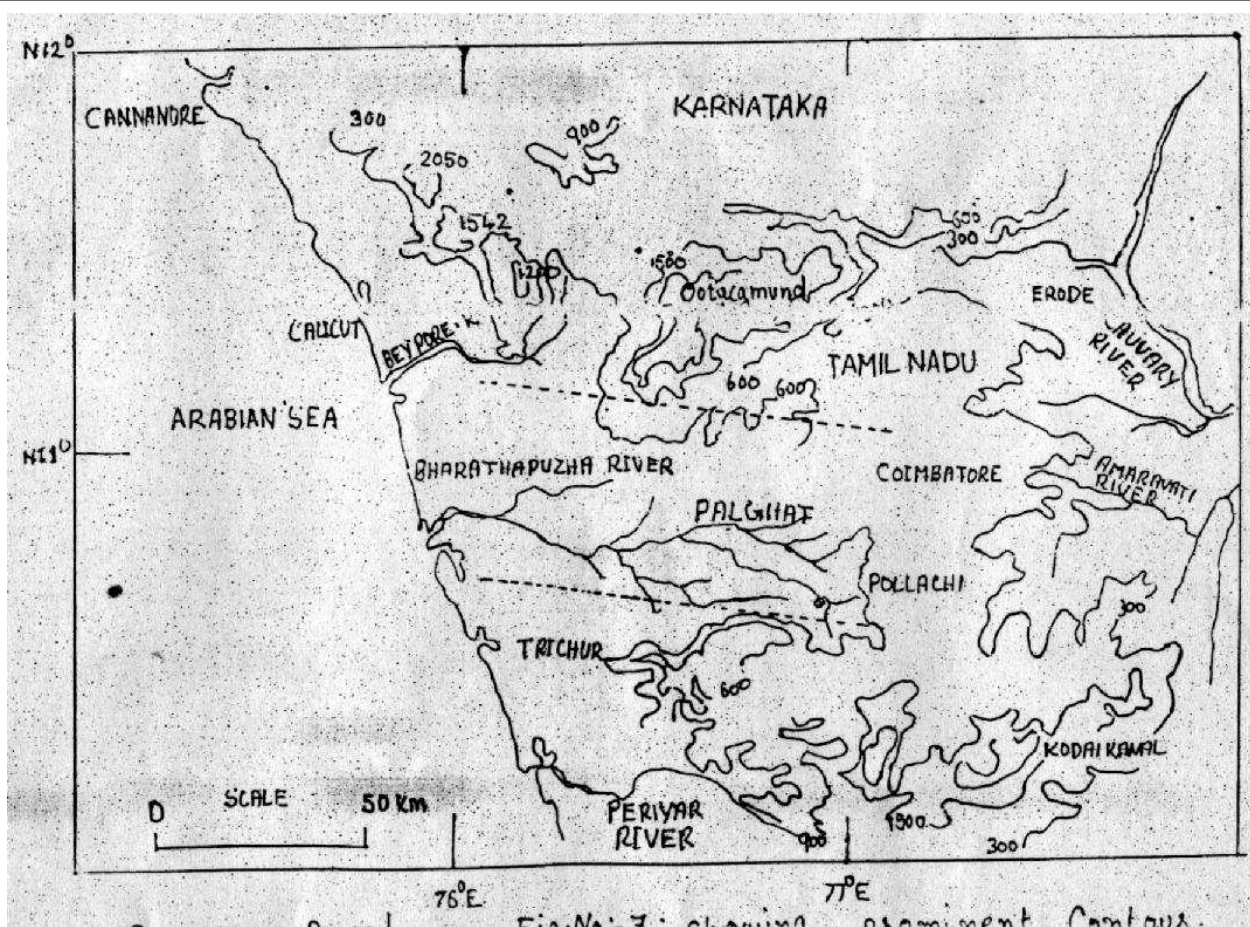
SI No	Sites in midst of A-B	Determination of depth in M								
		Can be taken			Should be taken			Should not be taken		
		Coarse C	Medium M	Fine F	Coarse C	Medium M	Fine F	Coarse C	Medium M	Fine F
I	A1	0.5	-	-	-	-	-	-	-	-
II	A2	-	-	-	-	0.6	-	-	-	-
III	A3	-	-	-	-	-	-	0.3	-	-
IV	A4	-	-	-	-	-	0.6	-	-	-
V	A5	-	-	0.4	-	-	-	-	-	-
VI	A6	-	-	-	-	-	-	-	-	0.2
VII	A7	-	-	-	-	-	-	-	0.3	-
VIII	A8	0.4	-	-	-	-	-	-	-	-
IX	A9	-	-	-	0.5	-	-	-	-	-
X	A10	-	0.45	-	-	-	-	-	-	-

A-B, is the length of segment, A1, A2, A3, are the sites within area of segments contained in A-B

Fig No: III-V-I



**Fig No: III-V-II,
Aproximate Length of Palakkad Gap**



Source : Based on upon Fig No:-7; showing prominent Contour 'A Report on the December 2, 1994, Wadakkanchery Earth Quake, Centre for Earth Science Studies, Thiruvanahtnapuram. Dashed lines mark the approximate extent of the Palakkad Gap by the tall mountains.

Fig No:- III-VI-I

