

MINOR RESEARCH PROJECT
ON
LAND AND WATER MANAGEMENT
OF
SONITPUR DISTRICT FOR SUSTAINABLE DEVELOPMENT
AND THE ROLE OF DIFFERENT AGENCIES



ज्ञान-विज्ञान विमुक्तये

UNIVERSITY GRANTS COMMISSION
NORTH EASTERN REGION
GUWAHATI

INVESTIGATED BY
DR. BHUPEN SAikia
PRINCIPAL,
DR. BIRINCHI KUMAR BAROAH COLLEGE,
PURANIGUDAM, NAGAON, ASSAM
CO-INVESTIGATORS
SRI KAMAL CHANDRA UPADHAYA,
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Date : 26.12.07


(Dr. Bhupen Saikia)

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PART I: INTRODUCTION

CHAPTER I

INTRODUCTION

1.1 THE PROBLEM

Water and land are essential inputs for developmental activities, be it agriculture or industry. As for instance water is used in agriculture for production of cereals, fruits etc. In industry it is used in the production of steam and in refrigeration, in mixing with chemicals etc. Water is also responsible for navigation both inland and oceanic. Besides, water is the main supporting factor for all forms of life. Fresh water is used for drinking, cooking bathing and washing . It has vast household demand, but water is becoming an increasingly scare resource in the world.

Land is also an important and indispensable natural resource. It is used for both agricultural and non-agricultural purposes. The land is used by man for raising agricultural crops .It has productive power, but every plot of land is not equally suitable for cultivation. Agricultural production depends upon the extent and yields capacity of arable land. Non-agricultural use of land is varied. It is used for construction of houses, building, road etc. Demand for land is also increasing with the increasing population.

In terms of land and water resources Sonitpur district is rich. Situated in the central part of the north bank of the river Brahmaputra the district covers an area of 5324 sq.km . The region is covered with a network of drainage and channels which are coming out from the northern hills and flowing towards the Brahmaputra on the south. The tributaries with large catchment areas and heavy precipitation are bigger in size and have north-south courses. They have very steep slopes shallow braided channels and have coarse sandy beds with heavy silt charges.

The present study tries to assess the potentiality and availability of these two important natural resources and to suggest measures for proper management for future use. Effective and proper utilization of land and water resources of the district is a major concern in present day situation.

1.2 SIGNIFICANCE OF THE STUDY

Land and water are gift of nature . These are indispensable for man. The development of a region largely depends upon proper as well as effective utilization and management of these two most valuable natural resources. Due to lack of proper planning and management these two resources are not effectively used for the growth and development of the region. A detailed study of such a situation is urgently needed. So it should be the responsibility of the academicians and researchers to bring into light the different aspects associated with this problem.

Such a study is of significance not only for the researchers, but also for the planners, government and all those agencies who are interested in doing something for the benefit of the people at large.

1.3. SCOPE OF THE STUDY

The problem of land and water management has been studied sometimes by the government agencies and sometimes individually by researchers. The scientific, technological, economic and managerial aspects of the problem have been discussed in many books. But only peace meal attempts have been made so far to study the problem of the land and water management of the district. In these work, an attempt has been made to delineate and assess the potentiality and availability of these resources. The study also deals with the water and land utilization patterns in the district. It aims at to suggest measures for effective utilization of these resources in the region.

1.4 THE MAIN OBJECTIVES OF THE STUDY ARE :

- i. to delineate the water bodies and rivers;
- ii. to assess the water potentiality and availability;
- iii. to know the ground water potential;
- iv. to assess the nature of water utilization in agriculture;
- v. to discuss the land use pattern;
- vi. to discuss the land management system and
- vii. to suggest measures for effective utilization of water and land resources of the region.

1.5 METHODOLOGY

The study is made in the context of the Sonitpur district of Assam where 6.7 per cent of the total land area of the state is found. Field work trips were made to collect primary information about the area. Data and other relevant information about land and water resources of the area were collected from a variety of secondary sources, which include mostly published and unpublished records, maps and reports of the Government agencies.

Thus, the study has come out to the present stage after preparation of tables of data and analysis of the same which provide meaningful explanation. Drawing of maps and diagram have been made to provide with a better illustrative impression. All these together have helped to draw the conclusion regarding the land and water management of the district.

1.6 FORMAT OF THE STUDY

The study is divided into three parts with one chapter each in the first and third part and two in the second part. The first chapter includes the synopsis of the study. The second part is the analytical one with two chapters --- water and land. The part three consists of the summary and conclusion treated in one chapter.

Chapter one deals with the introduction of the problem, significance and scope of the study, objectives, methodology and format of the study.

Part two consisting of chapter second and third forms the core of thesis as the main analysis of the problem has been dealt in this part. The analysis of water and land situation is made in chapter second and third.

Part three consist of chapter four which attempts to synthesize the findings suggest some measures for the management of land and water in the district on the basis of the findings. of this study. Suggestions have also been made on what lines other reaserchers may take up some other aspects relating to the management of these resources for indepth study. At the end of the project, there are the bibliography and the appendices.

LOCATION OF SONITPUR DISTRICT

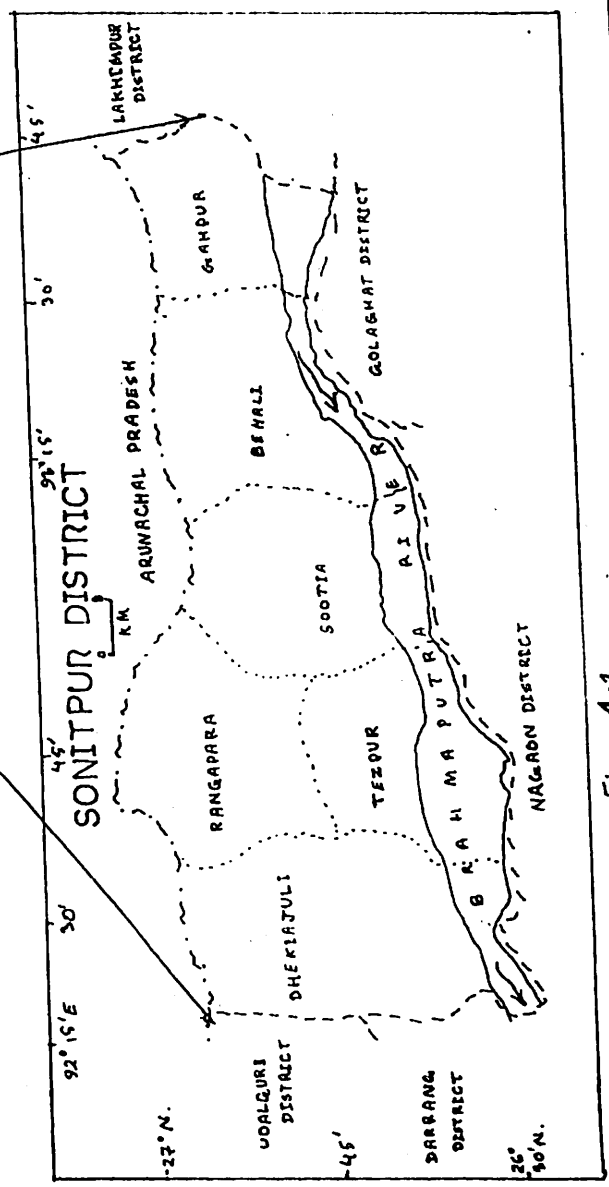
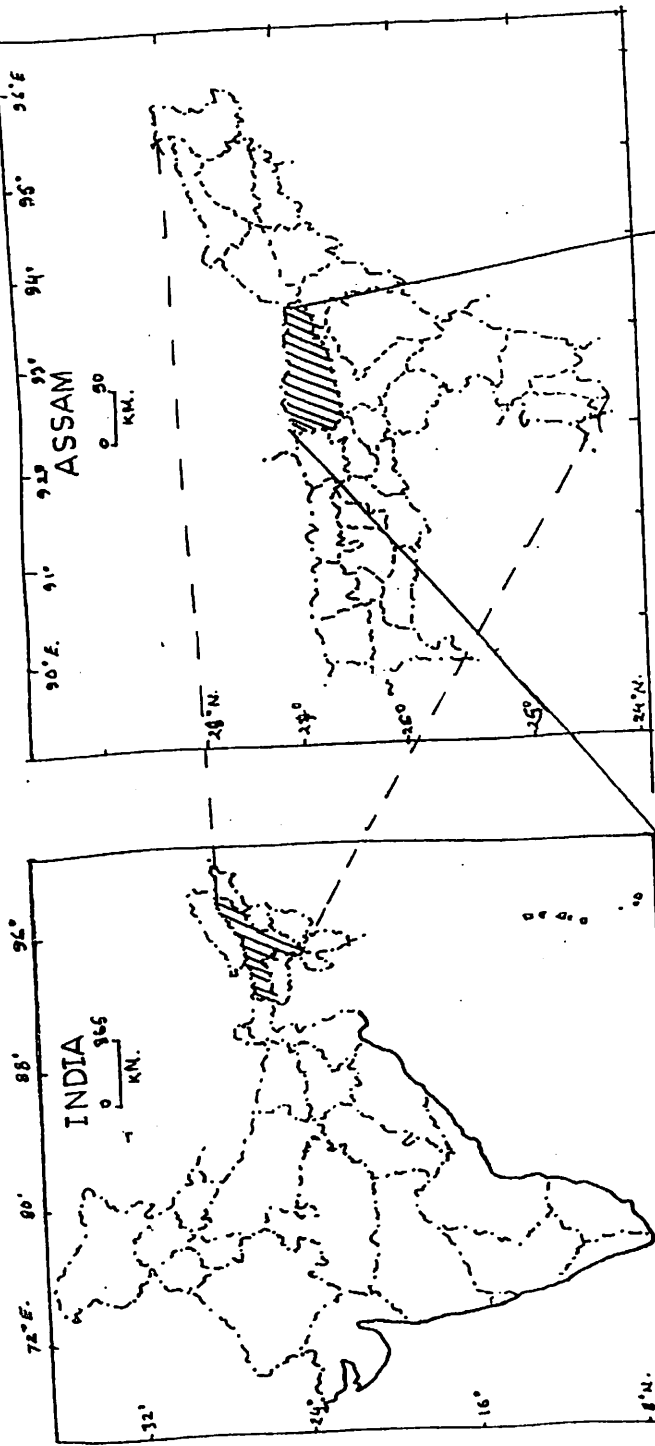


Fig- 4.1

PART II : ANALYSIS

CHAPTER II.

DELINEATION OF WATER BODIES AND RIVERS

2.1 WATER AVAILABILITY IN THE RIVERS AND STREAMS

Water bodies covered about 13.68 per cent of the total geographical area of Sonitpur District. It is covered with a network of drainage and channels which are coming out from the northern hills and flowing towards the Brahmaputra on the south. The tributaries with large catchment areas and heavy precipitation are bigger in size and have north and south courses. They have steep slopes, shallow braided channels and have coarse sandy/beds with heavy silt charges. Among the drainage, the river Bharali, Buroi, Borgang, Ghiladhari, Gabharu, Belsiri, Depota are important. Besides the above important drainages there are few other tributaries and numerous streams from east to west, they are Dubia, Balijan, Marnoi, Jia Pichala, Brahmajan, Rangajan, Sadharu, Dikorai, Mansiri and Sirajuli. The Panchnoi forms the boundary between the district of Sonitpur and Darrang. A brief description of some of these tributaries and streams are given below. (fig.2.1)

Table 21.

STATEMENT SHOWING THE MONTHLY AND ANNUAL MEAN DISCHARGE OF RIVER JIA-BHARALI

Name of river : Jia- Bharali

Name of Site : N. T. Road Crossing

Mean Discharge (Cumecs)							
Year	Jan	Feb	March	April	May	June	July
	1	2	3	4	5	6	
	Data is not available						2428.230
1969	196.945	167.606	175.79	203.253	291.545	999.35	1258.163
1970	166.473	204.336	242.00	397.58	485.823	2077.076	2303.20
1971	420.29	375.88	409.92	699.566	1374.843	2271.533	3052.156
1972	290.394	314.506	330.256	360.203	849.126	2807.966	2145.056
1973	161.905	237.623	297.153	477.666	711.526	1075.676	2330.346
1974	1670.238	1630.263	603.50	340.644	203.373	1146.708	Data is not available for the month of Jan. to June/69
1969							
	Aug	Sep	Oct	Nov	Dec	Total	
1970	1244.323	1573.543	1283.406	368.593	221.466	665.331	
1971	2141.83	2079.753	2080.963	386.063	515.913	1114.917	
1972	2073.826	2283.743	1181.763	446.333	354.873	1245.393	
1973	2364.97	1523.29	1013.253	565.37	335.639	1075.002	
1974	1730.55	1567.416	1105.416	516.386	508.70	893.363	
1975	346.316	330.718	302.509	401.776	662.923	1087.545	1248.194

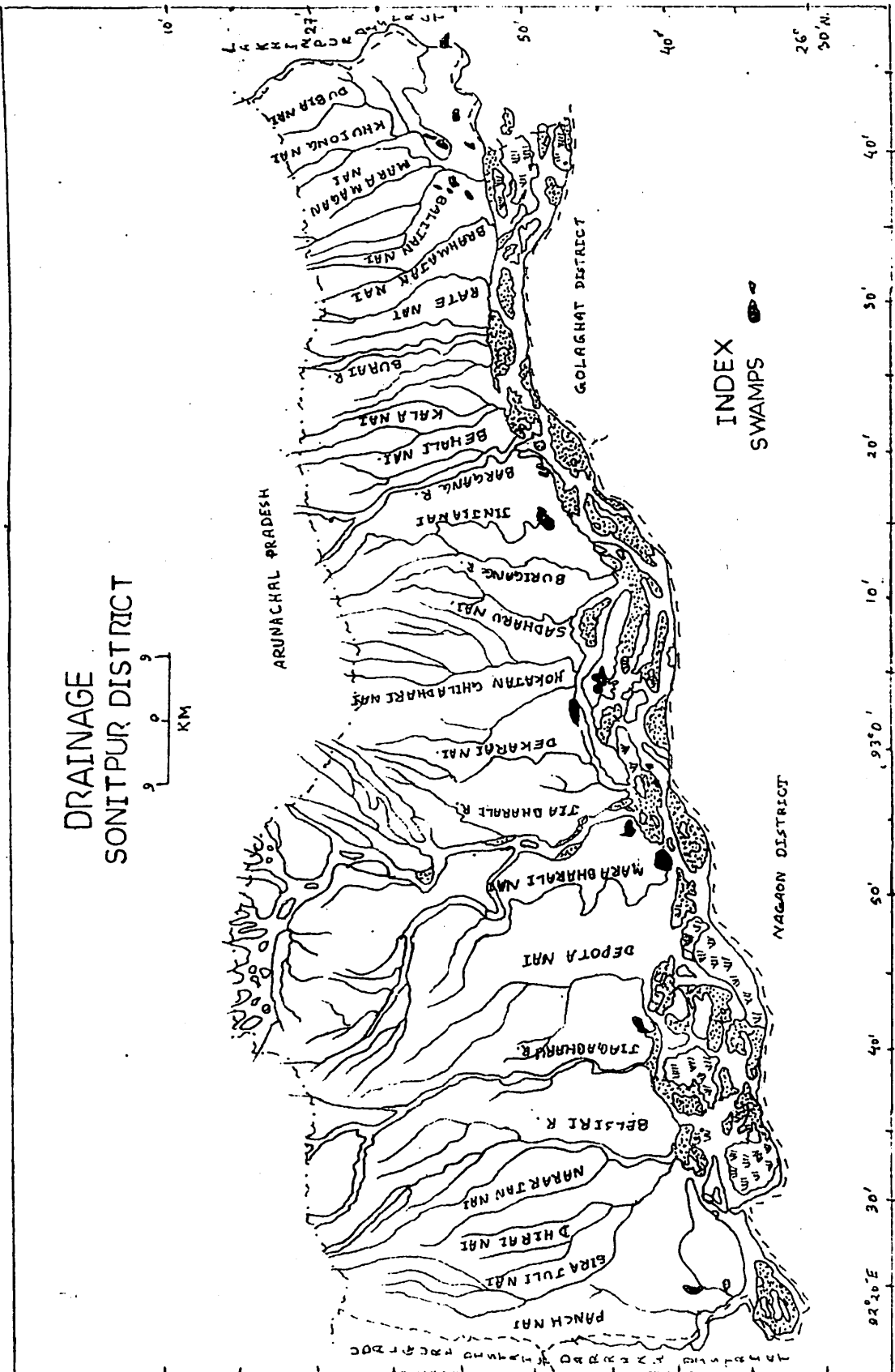


Fig - 2.1

JIA BHARALI : The largest tributary of the Brahmaputra in Sonitpur District is the Bharali flowing from the north to south almost along the middle part of the region with a long mountainous course. It originates in Arunachal Pradesh as Kameng which is fed by four major tributaries. These are-Tenga River from Bhutan hills and Bechan, Pakke and Papu from Arunachal Himalayas. The total length of the river is 267 km. In Sonitpur District, where it takes the name Bharali, its length is only 66 km. It has a catchment area of 10467.02 Sq km covered with thick forest. The river contributes about 4 per cent of water to the mighty Brahmaputra. Originally the confluence of the Bharali with the Brhmaputra was close to the Tezpur Town, but in the early part of the 19th century, it changed its course shifting about twelve kilometers further east. The dead course is known as Mora Bharali as distinguished from Jia Bharali the present active river. Presently Mora Bharali is also becoming reactive due to bank erosion of Singritali Jan (the western most channel of Jia Bharali) on one hand and the headward erosion of Panchmile Jan (a stream of Mora Bharali) on the other.

The Bharali river has developed a flat and wide valley floor after its debouchment into the plain. In its plain lower section, it also becomes braided due to low gradient and lateral erosion on one hand and joining of a number of tributaries from the both sides on the other. The principal tributaries in this lower courses are Bordikorai, Kharidikorai, Upardikorai etc. on its left bank and Sonai, Nam-Sonai, Mansiri etc. with numerous feeders from the Bhalukpung range of the right bank.

The average annual mean discharge of Jia Bharali river from 1969 to 1993 was 881.29 cymec. Table 2.1 shows the monthly and annual mean discharge of river Jia Bharali. Maximum monthly mean discharge occurred during the month of July 1972 which was 3052.156 cumec. The average monthly mean (maximum) for the same period was 1780.71 cumec which occurred in the month of July. The maximum and minimum discharges of a year of Jia Bharali at N.T. Road crossing G/D/S/ site are shown in table. 2.2.

Table 2.2

STATEMENT SHOWING MAXIMUM
AND
MINIMUM DISCHARGE OF RIVER JIA-BHARALI

Name of River : Jia-Bharali

Name of Site : N.T. Road Crossing

Year	Discharge in cumecs				Remarks
	Maximum discharge	Date	Minimum discharge	Date	
1	2	3	4	5	6
1969	5548.67	17.07.69	158.59	25.12.69	From January 1969 to June 1969 is not available
1970	3994.99	02.10.70	145.46	20.02.70	
1971	4886.55	12.07.71	137.60	17.01.71	
1972	5294.514	28.07.72	168.229	19.02.72	
1973	5755.05	30.06.73	216.686	09.01.73	
1974	3971.101	17.07.74	110.480	28.01.74	
1975	3850.262	05.09.75	211.397	23.03.75	
1976	4021.362	12.06.76	232.653	24.04.76	
1977	5493.250	17.08.77	147.875	07.03.77	
1978	4459.033	18.07.78		12.01.78	
1979	6004.873	12.07.79	266.286	15.01.79	
1980	2392.156	20.09.80	242.159	31.12.80	
1981	2335.396	15.07.81	223.777	08.02.81	
1982	2216.289	27.07.82	263.644	21.12.82	
1983	2991.051	31.08.83	266.456	03.03.83	
1984	2554.187	28.07.84	197.458	31.12.84	
1985	1592.667	29.06.85	177.706	20.02.85	
1986	2631.709	29.06.86	289.354	11.03.86	
1987	3369.038	21.07.87	358.615	31.12.87	
1988	2701.254	25.07.88	285.124	14.01.88	Data is not available from August/93 to Dec/93
1989	3207.423	16.06.89	211.380	03.02.89	
1990	2607.118	17.09.90	381.955	24.11.90	
1991	2178.049	02.08.91	319.325	09.01.91	
1992	2744.792	06.07.92	247.570	28.12.92	
1993	2658.580	20.06.93	246.696	03.01.93	

Gabharu : The Gabharu river originates at an altitude of about 1524 meters, a little to the east of the Belsiri river in the hills of the Kameng District. After moving for about 24 Km in the hilly area, the river enters the plain where its length is approximately 38 km up to its confluence with the Brahmaputra. Owing to its heavy silt deposits on its bed, it becomes shallow and wide, and it spills conspicuously in high flood on its left bank. It causes heavy erosion in the house-shoe bends.

The average annual yield of the river Gabharu has been estimated as 898.29 MCM at N.H. Road crossing (Missamari). The maximum and minimum discharges of this river are shown in table 2.3. Maximum discharge occurred during 1994 and minimum discharge recorded in 1992.

Table 2.3

MAXIMUM AND MINIMUM DISCHARGE OF RIVER GABHARU

Name of River :- Gabharu

Name of Site :- N.T. Road Crossing

Year	Maximum			
	Discharge	Date	Discharge	Date
1991	322.868	4.7.91	0.642	28.4.91
1992	317.506	6.7.92	0.391	19.4.92
1993	275.111	23.8.93	0.912	17.3.93
1994	352.309	21.6.94	1.123	31.3.94
1995	249.702	6.7.95	0.943	23.3.95
1996	275.111	27.6.96	1.286	22.12.96
1997	253.069	16.9.97	0.943	26.3.97
1998	275.01	10.6.98	1.032	10.1.98
1999	249.702	20.7.99	0.943	23.3.99
2000	339.550	12.10.00	1.032	25.1.00

Belsiri : To the West of Ghabaru is the Belsiri river which originates near Pankamala in the hills of Kameng District. It enters the plain near the foothills, and flows in a south eastern direction for about 32 km, then flows south for nearly 48 km and joins the Brahmaputra. In the lower reaches, the river banks gradually widen and the river remains shallow in the winter season.

The average annual discharge of Belsiri at N.T. Road crossing is 24.896 cumecs. The table 2.4 shows the monthly and annual discharges of river Belsiri during 1978-90. The maximum average annual discharge of 55.895 cumecs occurred in 1988 and the minimum average annual discharge of 5.183 cumec occurred in 1982. The mean average discharge 67.994 cumec during the month of July is the highest while the minimum discharge of 3.090 cumec occurred during the month of March.

The maximum and minimum discharges of Belsiri river for the period 1978 to 1990 are shown in table 2.5. The maximum discharge was recorded 397.741 cumec on 26-7-88 followed by 394.560 cumecs on 26-8-79 and 303.281 cumecs on 25-7-86. The minimum discharge was recorded 0.043 cumecs on 26-4-79 followed by 0.460 cumecs on 25-4-80 and 0.467 cumec on 5-3-87.

TABLE 2.4

STATEMENT SHOWING MONTHLY & ANNUAL DISCHARGE OF RIVER BELSIRI.

River :- Belsiri

Site :- N.T. Road Crossing

Mean Discharge (M3 Sec)						
Year	Jan	Feb	March	April	May	June
	1	2	3	4	5	6
1978	4.590	3.576	2.735	2.038	3.025	56.134
1979	4.340	3.560	2.749	0.338	2.576	15.398
1980	3.875	2.310	1.896	0.913	9.314	52.726
1981	1.673	1.125	1.036	1.013	3.397	3.611
1982	3.097	2.612	2.265	1.763	2.458	9.411
1983	1.424	1.276	1.233	0.928	2.019	10.937
1984	8.259	6.969	5.127	5.655	9.830	12.191
1985	9.686	6.303	4.341	5.548	7.430	13.772
1986	5.523	3.084	1.542	1.402	9.164	43.998
1987	1.593	0.740	0.745	0.745		27.165
1988	7.642	2.077	0.719	0.557	23.349	42.475
1989	11.991	9.503	7.586	6.502	8.953	30.040
1990	10.911	9.153	8.190	13.690	39.446	54.219
July	August	Sept.	Oct.	Nov.	Dec.	Annual Mean Discharge in (Cumec)
7	8	9	10	11	12	
60.549	39.833	42.395	19.009	7.963	2.981	20.385
86.547	57.634	69.787	24.969	6.098	2.953	23.279
74.195	24.482	34.353	13.254	8.797	4.815	19.161
14.140	12.553	13.943	7.474	5.733	3.995	5.808
13.204	7.498	10.109	5.345	2.697	1.734	5.183
24.902	25.757	43.856	20.811	13.322	8.908	12.948
39.505	47.557	56.552	32.386	18.407	13.274	21.309
41.009	39.917	54.727	36.433	-	8.594	20.705
159.256	31.953	42.991	17.021	3.450	2.794	25.814
89.494	87.275	136.555	117.262	44.075	17.394	47.548
168.041	215.282	-	-	42.916	-	55.895
56.161	69.746	68.012	61.455	46.147	37.347	34.454
56.921	58.776	37.229	32.897	10.303	-	30.158
67.994	55.251	50.875	32.360	17.493	8.756	24.896

TABLE 2.5

STATEMENT SHOWING MAXIMUM MINIMUM DISCHARGE OF RIVER BELSIRI.

River :- Belsiri

Site :- N.T. Road Crossing

Year	Discharge in cumecs			
	Maxm Discharge	Date	Minm Discharge	Date
1	2	3	4	5
1978	222.442	18.7.78	1.046	27.12.78
1979	394.550	26.8.79	0.043	26.4.79
1980	240.894	27.8.80	0.460	25.4.80
1981	30.010	16.7.81	0.692	30.30.81
1982	19.990	29.6.82	1.233	19.4.82
1983	83.625	5.7.83	0.843	28.4.83
1984	95.421	18.9.84	3.669	28.3.84
1985	112.690	28.9.85	1.100	10.4.85
1986	303.28	25.7.86	0.723	9.4.86
1987	236.352	17.9.87	0.467	5.3.87
1988	397.741	26.7.88	0.504	12.4.88
1989	137.855	29.7.89	5.605	27.4.89
1990	111.214	7.6.90	5.8 14	20.3.90
Total	2386.074		22.199	
Average	183.544		1.708	

Depota : The river Depota is a small river that flows through the western part of Tezpur. The Depota sub-basin has a catchment area of 295.70 sq.km. Of which 52.82 sq. km is hill catchment area and 242.88 sq. km. is sufficient to represent the sub-basin. The minor part of the Depota system traverse through a hilly region which is predominantly sand stone with thick soil cover. During the monsoon the river Depota and its tributaries carry heavy silt load. The change in slopes on entering the plain and consequent unloading of sediments has an important effect on the river channel, which are forced to cut through their own bed sediment. The sediments are also heavy due to much meandering of river course and landslide. The factors which are mainly responsible for the contribution of heavy silt load, are the high intensity of rainfall and the geographically younger formation of the rocks.

The surface water potential of Depota sub-basin has been assessed to be 143.7 MCM at N.T. Road crossing. It is assumed that 75 per cent annual dependable run-off of Depota sub-basin is 127.23 MCM. i.e. 12723 ha.m is utilisable water resources for irrigation, water supply, for human consumption, industry etc. if proper management is done.

The maximum and minimum discharges of Depota at N.T. Road crossing during the period 1980-2002 are shown on table 2.6 From the available data the maximum observed discharged is 45.086 cumec on 25th July,87 and minimum discharge is 0.084 cumec on 4th April,81. The yield at N.T. Road crossing is shown in table us 2.7. The average monsoon yield during the period is 95.56 MCM and non-monsoon yield is 47.5MCM. The average annual yield is 141.71 MCM. The monsoon yield is observed as 216.04 MCM during 1991. The minimum annual yield recorded is 75.45 MCM in the year 1984. A part from these rivers the district has 20 registered beel fisheries.

Buroi : The Buroi river is an important river that flows through the eastern part of Sonitpur. Emanating from the Dafla hills in the Kameng District of Arunachal, it flows towards south and falls into the Brahmaputra. The approximate length of the river in the plain is 32 km. It is not a perennial river. During the winter season, it becomes very shallow and the major portion of it dries up completely. But during the monsoon, the heavy rainfall in the catchment area supplies enough water resulting in rapid rise of water level in plain portion.

Borgang : To the west of Buroi is the Borgang river which again originates from the Dafla hills. After flowing for about 9 km through the hills and the forest, the river receives its first tributary Naomara and further down, another tributary Dikal joins it. Then the river flows through the plains of Sonitpur to the south and eventually meets the Brahmaputra. In the winter season, the river becomes very shallow and at places completely dries up, while again suddenly rises up during monsoon due to heavy rainfall in the catchment areas.

Ghiladhari : The Giladhari river coming out from the hilly ranges of the Kameng district flows in well-defined course for about 24 km in the plains of the region and joins the old out-flanking channel Ajalisuti/This channel forks out of the Brahmaputra at Biswanath and rejoins it at Panpur. The total length of the river from its origin to the mouth is about 33 km.

TABLE 2.6
MAXIMUM AND MINIMUM OF WATER LEVEL OF RIVER DEPOTA
AT N.T. ROAD CROSSING

Year	Maximum		Minimum		Remarks
	Discharge	Date	Discharge	Date	
1980	11.407	22.10.80	0.327	26.12.80	
1981	44.018	17.7.81	0.084	4.4.81	
1982	43.915	22.6.82	0.199	5.4.82	
1983	16.255	4.7.83	0.199	19.3.83	
1984	13.196	26.7.84	0.105	14.3.84	
1985	13.631	5.9.85	0.127	5.3.85	
1986	33.838	1.9.86	0.319	31.3.86	
1987	45.086	25.7.87	0.459	25.2.87	
1988	26.675	19.9.88	0.546	5.4.88	
1989	36.180	28.7.89	0.745	27.2.89	
1990	39.073	20.6.90	0.723	20.2.90	
1991	36.569	19.7.91	0.803	11.4.91	
1992	31.830	7.1.92	1.133	1.4.92	
1993					
1994	24.069	5.6.94	1.039	17.1.94	
1995	27.357	16.6.95	0.955	5.1.95	
1996	22.176	17.7.96	1.621	10.5.96	
1997	16.172	8.6.97	1.063	29.5.97	
1998	16.371	13.6.98	0.794	18.3.98	
1999	10.939	11.8.99	0.931	19.3.99	
2000	11.665	8.9.2000	0.930	24.2.00	
2001	19.007	22.7.01	1.384	29.12.01	
2002	19.124	23.7.02	0.886	19.2.02	

TABLE 2.7
STATEMENT SHOWING THE MONTHLY YIELD

River :- Depota
Site :- N.T. Road Crossing
Unit :- MCM

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Monsoon	Non Monsoon
1.24	0.82	0.43	1.31	4.43	5.33	49.84	27.89	34.66	8.27	2.3	1.71	138.23	117.72	20.51
1.69	1.5	0.73	1.42	1.14	29.98	54.91	8.51	34.37	8.59	0.81	0.8	144.45	127.77	16.68
24.2	0.9	0.69	1.89	4.81	13.9	22.71	21.08	22.4	17.93	4.12	1.17	135.80	80.09	55.71
0.73	0.59	1.2	1.72	5.2	8.31	22.18	9.23	15.48	6.14	2.76	1.91	75.45	55.20	20.25
1.08	0.53	0.43	1.19	70.15	14.84	15.03	11.87	25.43	10.8	3.06	1.96	156.37	67.17	89.20
1.13	0.9	0.97	1.22	76.25	5.15	15.73	11.76	49.25	21.01	3.95	2.33	189.65	81.89	107.79
1.76	1.22	1.47	1.75	1.87	15.06	59.16	49.9	42.86	23.04	7.24	3.54	208.87	166.98	41.89
2.8	2.49	2.63	1.75	2.87	3.26	9.35	26.14	20.93	11.23	6.29	4.99	94.73	59.68	35.05
3.81	2.54	3.49	8.47	6.08	24.57	48.46	22.38	31.23	6.27	4.34	2.93	164.57	126.64	37.93
2.35	2.07	2.28	6.4	10.18	48.86	47.18	11.85	19.85	23.6	5.03	2.72	182.37	127.74	54.63
2.39	2.17	2.28	2.38	18.08	34.07	48.32	27.85	40.11	31	7.6	4.69	216.04	145.54	70.59
2.76	2.2	2.25	2.38	7.56	30.92	24.5	32.45	15.38	10.93	4.58	3.64	139.55	103.25	36.30
2.44	1.82	1.53	1.24	1.47	23.15	34.63	27.58	14.79	10.1	4.82	4.07	127.64	100.15	27.49

2.2 GROUND WATER POTENTIAL

The underground water potential is extensive in Assam. It is about 16.52 cubic km/years. In Sonitpur District also the ground water potential is vast. The total replenishable ground water resources from normal natural recharge is 0.15676 m ha.m/year. The ground water resources and irrigation potential due to recharge in Sonitpur is shown in table 2.8.

Almost all the studies related to ground water resources are carried out by Central Ground Water Board (CGWB). A combined study of the hydrological conditions of the area stretching along the Indo-Bhutan territory downwards the plains nearer to the river Brahmaputra has been done by CGWB. The study reveals that a strip of about 8-10 km width along with Bhutan Border consists of moderately thick but discontinuous aquifer is of confined to semiconfined nature. The aquifer is under boundary conditions down to 25 km with a moderate yield prospects of 50-100 m³/hrs and draw-down within 20 m. It was observed that towards the further downward positions of the sub-basin, there exists a fairly thick and extensive confined to semi-confined aquifer with permeable boundary formation with a mix up of silt and occasional clay having a yield prospect up to 150 m³/hr and draw down within 6 km.

CGWB has worked out net seasonal fluctuation in water table (based on the analysis of hydrography of different key walls as well as data generated from the systematic hydrogeological surveys in different parts of the district). It has computed fluctuation in water table between the lowest stage in April and November, which is termed as net seasonal fluctuation.

It is observed that in the lower flood plains close to the river Brahmaputra the net seasonal fluctuations is about 1.0m where as it is 3 m and above near Bhutan border which is in the northern side and outside the sub-basin. The area in between has a net fluctuation of the order of 2.0m. The fluctuation gradually increases towards the North from the flood plain near Brahmaputra.

CGWB has estimated District wise annual recharge and annual draft for the year 1992 to arrive at a reasonable ground water balance available for further development.

Table 2.8

GROUND WATER RESOURCES AND IRRIGATION POTENTIAL DUE TO RECHARGE SONITPUR DISTRICT OF ASSAM

District	Total Replishable Ground Water Resources from Normal natural recharge (m ha m/ year)	Provision for Domestic Industrial & Other uses (m ha m/ year)	Available ground water resources for irrigation in net terms (m ha m/ year)	Utilisable ground water re-sources for irrigation in net terms (m ha m/ years)	Gross draft from natural recharge estimated on rate basis (1992)(m ha m/ years)	Net draft from natural recharge (1992)(in m ha m/ year)	Balanced ground water resources for future use (m ha m/year)	Level of ground water development (%)	Weighted Average delta
2	3	4	5	6	7	8	9	10	11
Somitpur	0.15676	0.02351	0.13325	0.11993	0.01530	0.01071	0.12254	8.04	1.283

Note : Delta is very high

Utilisation Irrigation Potential is limited to the area available.

Source : Ground Water Resources of India C.G. W.B. 1995.

The assessment of the recharge through precipitation which is the main source has done by CGWB. The estimated data of Annual recharge for Sonitpur District are shown in table 2.9.

TABLE 2.9

ESTIMATED DATA OF ANNUAL RECHARGE OF SONITPUR DISTRICT

District	Area Suitable for Ground Water development (Sq km)	Monsoon Re-charge (MCM)	Total annual Recharge (MCM)	Net utilisable re-charge for irrigation (MCM)
1	2	3	4	5
Sonitpur	5176	1455.94	1430.769	1216.154

The balance of ground water resources for future development is obtained from surplus of net utilised recharge after net draft which has been assessed by CGWB as shown in table 2.10.

The ground water potential is important from the view of irrigation and household need. The ground water can be tapped by excavation of tube wells and pumping out of the same manually. If the water table is very low and the land contains the rocks underneath, tapped by deep boring.

TABLE 2.10

SURPLUS OF NET UTILISED RECHARGE AFTER NET DRAFT

THE NET UTILISABLE RECHARGE IS 85 % OF THE TOTAL ANNUAL RECHARGE

District	Net Utilisable recharge (MCM)	Net annual Draft (MCM)	G.W.Balance Available (MCM)	Level of G.W. Development
1	2	3	4	5
Sonitpur	1216.154	110.331	1105.823	9.07%

2.3 UTILIZATION

Although Sonitpur District has immense potential for utilization of water resources yet there is no existing hydro electric project. Only one major irrigation scheme known as Bordikorai irrigation scheme is in progress. The estimated cost of the project was 32.50 crores and the time of completion was from 1975-76 to 1995-96. The Gross cultivatble Area and Net Irrigated Area of the project are 29150 and 16994 hecatre respectively.

The table 2.11 shows the estimated potential of Bordikorai Flow Irrigation scheme as on 1-4-2006.

Table 2.11

ESTIMATED POTENTIAL OF BORDIKORAI FIS (MAJOR)

NIA	Kharif (Hec)	Rabi (Hec)	Per Kharif (Hec)	Total (Hec)
16994	16994	8056	8950	34000

The Table 2.12 shows the potential created upto 31-3-06 for this scheme

Table 2.12

ESTIMATED POTENTIAL OF BORDIKORAI FIS (MAJOR)

NIA	Kharif (Hec)	Rabi (Hec)	Per Kharif (Hec)	Total (Hec)
16994	16111	7644	8900	32655

There exists no medium irrigation schemes either in existing or ongoing category in the Sub-basin of Jia-Bharali. The plain portion of the Sub-basin consists of a few minor irrigation schemes viz Kolong I/S, Extension of Colony I/S, Jorasar I/S and Dolabari I/S. The irrigation potential created up to 31-3-94 and potential utilized upto 1992-93 for district of Sonitpur is shown in table 2.13

Table 2.13

IRRIGATION POTENTIAL CREATED UPTO 31-3-94 AND UTILIZED UPTO 1992-93
FOR THE PLAIN PORTION OF SUB-BASIN IN SONITPUR DISTRICT.

Irrigation Potential created upto 31-3-94		Irrigation Potential utilized upto 1992-93	
Minor	Major/Medium	Kharif	Rabi & Pre-Kharif
24984	25452	28607	2219

The functioning of minor irrigation schemes with area under Tezpur Division(Irrigation) are shown blockwise in table 2.14. The information supplied by the District Agriculture Office regarding Shallow Tube Well (STW) blockwise under Sonitpur District as on 31-3-06 is tabulated in table 2.15.

With a reference to the assessment by CGWB it can be concluded that the balance of ground water resources for future development is obtained from the surplus of net utilisable recharge after net draft. CGWB analysed the parameter of different districts of Assam with a proportional area calculation. The position of Sonitpur district in respect of these aspects is shown in table 2.16

Table 2.14

**BLOCK WISE FUNCTIONING MINOR IRRIGATION SCHEME WITH AREA UNDER
TEZPUR DIVISION (IRRIGATION) TEZPUR**

Sl. No.	Name of Development Block	Schemes / Category	Nos. of Schemes (Nos)	Area Covered (N.I.A.) in hect.	REMARKS
1	2	3	4	5	6
1	Dhekiajuli	F.I.S., D.T.S. I/s	4 2	3504 80	Other Schemes NIL.
2	Rangapara	F.I.S.	1	1800	- Do -
3	Sootea	F.I.S.	1	1215	- Do -
4	Gabharu	L.I.S.	2	240	- Do -
5	Biswanath	F.I.S., D.T.S. I/s S.T.W. I/s.	7 2 1	8933 120 64	- Do -
6	Behali	S.T.W. I/s.	3	240	- Do -
7	Choiduar	S.T.W. I/s.	1	60	- Do -
8	Pub-Choiduar	S.T.W. I/s.	2	128	- Do -
9	Balipara	D.T.W. I/s.	2	120	- Do -
10	Borcholla	F.I.S.	2	1748	- Do -

- N.B.** F.I.S. - Flow Irrigation Schemes.
L.I.S. - Lift Irrigation Schemes.
D.T.W.I. / S - Deep Tube well Irrigation Schemes.
S.T.W.I. / S - Shallow Tube well Irrigation Schemes.

Table 2.15
INFORMATION REGARDING STW AS BLOCK WISE UNDER SONITPUR
DISTRICT AS ON 31-03-2006.

Sl.No.	Name of Block	No. of STW.	Area Irrigated (Ha)
1	Gabharu	413	826
2	Bihaguri	254	508
3	Dhekiajuli	1380	2760
4	Borcholla	1012	2024
5	Balipara	1000	2000
6	Rangapara	100	200
7	Naduar	350	700
8	Sootea	150	300
9	Biswanath	720	1440
10	Sakomatha	91	182
11	Baghmara	325	650
12	Behali	242	484
13	Choiduar	135	270
14	Pub-Choiduar	221	230
		6284	12074

Table 2.16

GROUND WATER BALANCE AVAILABLE AND LEVEL OF DEVELOPMENT IN
SONITPUR DISTRICT.

Geographical (area Sq. km)	Net Utilisable recharge (MCM)	Net Annual Draft (MCM)	Ground water balance avail- able (MCM)	Level of Ground Water Development (%)
5324	1216.54	110.331	1105.823	9.07 %

From the above table it is evident that the present utilization of ground water is 110.331 MCM annually which is only 9.07 per cent of the Net Utilizable Recharge i.e. Net Utilizable Ground Water Resource.

CHAPTER III

LAND USE

The nature of land use in an area reflect the levels of socio-cultural and economic development of the people under different physico-cultural milieu. Land is the basic resource to support the inhabitants of an area and it provides the base for production of food and raw materials for various industries. Land which is needed for one activity may be equally needed by other activities (Toyne, 1974,71) The uses to which man puts the land resosurces available to him reflect, in part differences in physical factors, such as soil fertility and climate in rural land use, and amenities such as high elevation with imposing views in urban land use. Historical and cultural factors too including the timing of settlement and cultural tradition of a population affect the land use.

The land use pattern of the region in influenced by the soil, climate and topography along with other socio-economic factors. Table 3.1 shows the land use and land cover of Sonitpur District in 1993. The total geographical area of the district is 532400 hectre. Out of this more than two-third area is covered by forest and agricultural land. Waterland and Water bodies cover 16.59 per cent of the area where as built up area accounts for 0.02 per cent of the total geographical area. Of the rest 12.14 per cent are occupied by grass land, grazing land and others. Fig. 3.1 shows the thanawise land use in Sonitpur District.

Table 3.1
LAND USE/LAND COVER OF
SONITPUR DISTRICT ASSAM

SI.No	Land use Category	Sonitpur District 1993	
		Area (Ha)	Percentage of Total geographical area
1	2	3	4
1	Geographical Area	532400	100.00
2	Built up land	125	0.02
3	Agricultural land	278274	52.27
4	Forest land	101013	18.97
5	Wasre land	15501	2.91
6	Water bodies	72857	13.68
7	Others	64630	12.14

SONITPUR DISTRICT LANDUSE PATTERN, 2001

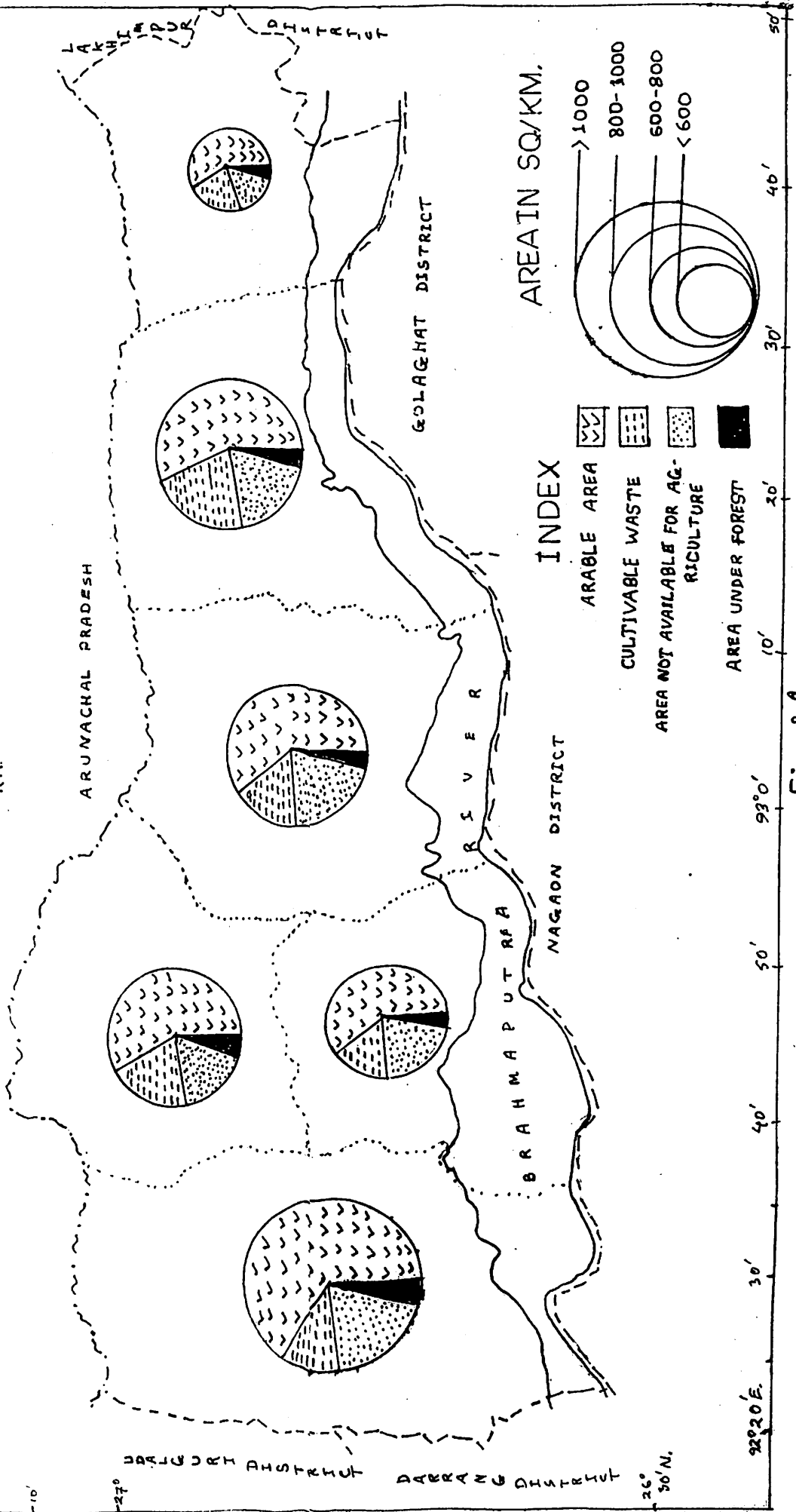
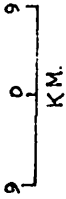


Fig-3.1

3.1 AGRICULTURAL USE

Agriculture occupies about 52.27 per cent of the total area in the district. The total area under cultivation is 278274 hectare in 1993. Agriculture is the chief occupation of more than 70 per cent of the villagers in the Sonitpur district.

Like other parts of Assam, Sonitpur District produces a variety of crops such as food crops fibre crops, oil seeds, pulses, sugarcane, fruits, vegetable, turmeric, ginger, onion etc. Among the food crops paddy, wheat and mazie are most important. Jute is the main fibre crop and tea is the most important plantation crop. Mustard, rape seeds and seasanum are the main oilseeds. Pulses and potatoes are also major crops. But mangoes, coconuts, betelnut and betel leaves, banana, pineapples etc. are subsidiary crops of the region. Rice is the staple food of the people. More than two-third of the total cropped area are covered with paddy, Table 3.2 shows the categorywise agricultural land use and percentage in Sonitpur District during 1987-88.

Agriculture of the district, like other District of Assam depends mainly on rain water. Monsoon season is the best season for cultivation. About 80 per cent of the annual rainfall of the area is received during the months from June to september. Minor irrigation projects have been taken up to augment the water supply in some areas where as the large areas of the region are yet to derive the benefit from such projects.

Table 3.2

LAND USE IN SONITPUR DISTRICT 1987-88

Category	Area in hectares	Percentage to the total geographical area
1. Built up land	125.00	0.03
2. Agricultural land	278274.00	56.54
3. Forest land	101013.00	20.25
4. Waste land	15501.00	3.15
5. Water bodies	72857.00	14.80
6. Others (Gross land)	24375.00	4.95
Total	492145.00	100.00

3.2 NON-AGRICULTURAL USE

Out of the total geographical area of the district about 47.73 of the area is under non-agricultural use in 1993 which includes forest land, grassland, waste land, built up land, waterbodies settlement, roads, government and non-government institutional, building, industries, recreational areas etc. Table 3.3 shows the category wise non-agricultural use in the district during 1987-88.

Table 3.3

CATEGORYWISE LAND USE/LAND COVER STATISTICS SONITPUR DISTRICT, 1987-88

Category	Area in hectares	Percentage to the total geographical area
1. Built up land	1.25	0.03
2. Agricultural area net area sown	222442.00	45.20
3. Forest		
3.1 Evergreen/Semi evergreen forest	76231.00	15.49
3.2 Deciduous forest	313.00	0.06
3.3 Degraded forest/scrub land	22156.00	4.50
3.4 Forest blank	2313.00	0.47
4. Wastelands -		
4.1 Marshy/Swamy land	7688.00	1.56
4.2 Land with or without scrub	7813.00	1.59
5. Waterbodies		
5.1 River/Stream	72044.00	14.64
5.2 Lake/Reservior/Tank/Canal	813.00	0.17
6. Others	24375.00	4.95
Total	492145.00	100.00

According to 1999-2000 (Provisional) statistics the land areas put to non-agricultural uses are about 16502 hectares and 21892 hectares are barren and un-cultivable land. The total area not available for cultivation is 186914 hectares which is 35.1 per cent. The other uncultivated land excluding fallow land in the district during 1999-2000 is shown in table 3.4

Table 3.4
OTHER UNCULTIVATED LAND EXCLUDING FALLOW LAND IN SONITPUR
DISTRICT (1999-2000)

Category	Area in Hectare
1. Permanent pastures and other grazing land	11902
2. Land under Miscellaneous tree groves not included in net area.	7820
3. Cultivable waste land	227
Total	19949
4. Fallow land other than current fallow	2062
5. Current fallow	6609
Total	8671

It is evident from the table 3.4 that area under cultivable waste, current fallow, land other than current fallow is less which is about 8898 hectare i.e. 4.7 per cent of the total geographical area. A portion of this cultivable waste and fallow land can be reclaimed and used for agricultural and non-agricultural purposes.

3.3 LAND MANAGEMENT AND CONSERVATION

Land is fixed in the sense of surface area but it is not fixed in the sense of its contributions. At present the use of land is a highly dynamic concept. The resource function or the contribution of land is always changing due to changing human attitudes and actions.

It is worthwhile to mention that irrigation facilities in the district is not sufficient. Only 16920 hectare area has been brought under irrigation out of which 16902 hectares for Kharif and only 18 hectares for Rabi and Pre-Kharif. The percentage of irrigated area to total cultivable area of the district is only 16 per cent. Therefore it is necessary to bring more and more area under irrigation for proper utilization of land resources for agricultural production. In this context it may be mentioned that due to severe drought in the year 2006 agricultural production reduced to less than 50 per cent. Because the cultivators could not produce Kharif crop due to lack of rain water as well as sufficient irrigation facilities. So the concept of land is important because of highly conditioning influence on human activities and attitudes relating to land use. Land is meaningful only in relation to man. (Mukhopadaya : 1992).

The surface land may be used for various purposes. The utilization of land depends upon the wants of man at a point of time. It is already mentioned earlier that the mainstay of the majority of the people is agriculture. So, it is necessary to develop agricultural practices and to bring more and more land under cultivation. It can be done by improving agricultural techniques for heavy production and by reclamation of waste land maintaining the physical quality of land, checking the erosion of topsoil etc. The horizontal expansion of agriculture is expensive which involves heavy capital investment. Only judicious utilization of land by adopting more remunerative cropping patterns may help in overcoming the problems of food and raw materials. The change in the cropping pattern and introduction of new crops enhancing the soil fertility are imperative to make agriculture more remunerative and sustainable. Only through proper management of land the demand for cultivable land can be met to a small extent. On the other hand the pressure on agricultural land may be lessened by shifting of occupation and function. As for instance cultivators may go for pisciculture where there is abundant low lying area suitable for fishery.

Conservation of soil is an important aspect of land management. Land area is mostly affected by erosion, deposition of sand and silt over cultivable land etc. Erosion of agricultural lands, forest land, through formation of gully, sheet and rill erosion, problems of water logged etc. are the major problems in the district of Sonitpur. In order to overcome these problems the various soil conservation activities usually implemented in brief as follows :-

A. LAND DEVELOPMENT ACTIVITIES

The objective of land development activities is to prevent loss of top soil due to rain drop and sheet erosion on agricultural land and thereby to improve the water regime of the soil for benefit of the crops. Earthen embankments are used to construct along the contours properly designed and sectioned to fulfill the purpose.

In land development, drainage line treatment activities are also used to carry out in order to draining out excess water by cutting nalas from water logged area to improve the quality of agricultural land and its productivity.

B. GULLY CONTROL WATER DISTRIBUTION WORKS

The objective of the project is to stop further advancement of the gully heads and siltation of the already formed gully alongwith improvement of in situ moisture content in the command areas. The scheme is implemented by construction of RCC drop spill way, guide bunds water distribution channel etc. The programmes are taken up on command area basis improving land groups of families, which are under gully erosion of different degrees, causing shrinkage in cultivable land.

Now-a-days this measure also helps in making available water to the crops during summer season alongwith controlling the gully. The stored rain water in the upstream are distributed to the agriculture land through the constructed field distribution channel to reduce the moisture stress to the field crops.

C. PROTECTION OF RIVERINE LANDS

The main objective of the scheme is to tackle one of the major problems of soil erosion i.e., river bank erosion. this is tackled by adopting both vegetative and engineering methods. Engineering methods consist of construction of boulder spurs and bamboo spurs of different types on eroded bank of rivers and streams so that erosion is checked gradually and siltation takes place, in the long run resulting in saving of agricultural land from being washed away. In vegetative measures, planting of suitable species are done in strips along the river bank, specially in the upstream portion on available land.

D. PROTECTIVE AFFORESTATION

The main objective of the scheme is to prevent the process of soil erosion along the river and stream bank. Protective afforestation is also taken in areas subjected to erosion because of lack of surface vegetation. Along with protection of catchment area and agricultural land, this measure also helps in restoration of ecological imbalance. Protective afforestation also helps in controlling soil erosion caused by shifting cultivation, although it is not visible in Sonitpur District.

E. FLOOD RIVER PROJECT

Govt. of India is presently insisted to improve the flood prone area through various soil conservation activities, just to control the catchment area of the connected rivers. This is a long term scheme and such a scheme has been approved by the Department of Agriculture and Co-operative. GOI, for treating the erosion prone area along Jia Bharali river catchment in collaboration with the Arunachal Pradesh, which is known as Kameng there. This year the Department proposed to treat some microwatershed of Jia Bharali watershed (3 x 3 x 1-6) as per the priority basis in the Sonitpur District.

F. WATERSHED DEVELOPMENT PROJECT

Apart from the above watershed management projects (Hariyali) are also proposed to implement in the district for control of soil erosion of affected rivers, proposal for 2 (two) such projects, one each at Sakomotha Development Block and Biswanath Development Block are send to GOI for sanctioning to control the erosion caused by Ghiladhari and Diring river in Biswanath sub-Division of Sonitpur District.

3.4 ROLE OF DIFFERENT AGENCIES

Various government and non-governmental agencies are working for the management of land and water resources in the district.

These agencies are -

- i. North-Eastern Regional Institute of Water and Land Management (NERIWALM)
- ii. Brahmaputra Board.
- iii. Irrigation Department.
- iv. Water Resources Department.
- v. Soil Conservation, Sonitpur Division.
- vi. District Agriculture Office.
- vii. NGO's

NERIWALM is a Central Government Institution located neat Tezpur Town on the North Bank of Morabharali. It deals with different activities related to the management of water and land. It has already studied and surveyed thoughly some of the major rivers with modern techniques. It has laboratories equiped with modern machines and equipments. NERIWALM is engaged in testing of soil and analysing water qualities also. The institution organises training, workshop, seminars etc. with a motive to arrive at desired goal.

Brahmaputra Board is also a central Government agency. The Borad has been concentrating its activities to prepare Master Plan by surveying the rivers and studying their potentials for harnessing the water resources for the well being of the inhabitants.

The Irrigation Department of the state has its division in the District. The Department is engaging itself for the utilization of water resources for the development of agriculture. The erstwhile Embankment and Drainage Department, Government of Assam has been renamed as Water Resources Department. It's main concern is to check the flood and erosion. It has mechanical division to carry out the survey work of the water resources of the district.

Soil Conservation is also a Department of the State Government. As the name implies, it is mainly involved with the conservation of soil. It has taken various steps to conserve the soil.

District Agriculture office is mainly concerned with the development of agriculture in the district. It provides irrigation facilities to the cultivators through shallow tube wells (STW).

A few NGO's are there in the district which are directly or indirectly involved with the management of land and water resources of the district through eco-restoration.

PART III : SUMMARY AND CONCLUSION

CHAPTER :IV

SUMMARY AND CONCLUSION

4.1 SUMMARY

The detailed analysis made in the foregoing chapters on the management of water and land in Sonitpur District for the sustainable development and role of different agencies has been summarized as follows.

Sonitpur District has vast water resources. Numerous tributaries, channels and streams have been flowing towards the Brahmaputra on the south through the district. Most of them are perennial with a good discharge. Besides these, a number of beels and swamps are also found in the district.

The district has vast potential of ground water potential. The can be tapped mainly for irrigation and household purposes without affecting the balance obtained from surplus of net utilised recharge after net draft.

In sub-chapter 2.3 the utilization of water resources of the district has been discussed. it is observed that there is no existing hydro-electric power project. A small portion of the water resources has been utilized for agriculture through minor and medium irrigation project. Bordikorai is the only major irrigation scheme in the district whose estimated cost is over 32 crores.

The District Agriculture Department has also been providing irrigation facilities in the agricultural fields through shallow tube wells (STW). The present utilization of ground water by these wells is slightly more than 100 MCM annually which is only 9.07 per cent of the Net utilizable recharge.

Chapter three deals with the land use pattern both agricultural and non-agricultural in the district. Out of the total geographical area more than two third is covered by forest and agriculture. About 52.27 per cent of the total area is occupied by agriculture alone on the contrary 35.1 per cent area is under non-agricultural use. The area under cultivable , current fallow, fallow land other than current fallow is about 4.7 per cent.

In sub-chapter 3.3 land management and conservation have been discussed. The management of land depends upon mainly the wants of man at a point of time and the level of economic deelopment. As the cultivable area covers more than half of the total area so it is necessary to give emphasis to improve agricultural production with an intention to reduce the pressure on land, side by side it is also essential to take soil conservation measures to maintain soil quality and to check erosion.

In sub-chapter 3.4 the role of various government and non- government has been discussed. It is seen that a number of agencies and departments have been actively engaging in different activities relating to management and water and land resources in the district.

4.2 CONCLUSION

The detailed study on the management of 'Water and Land in Sonitpur District for the Sustainable Development and Role of Different Agencies' made in the preceding chapters and summarized in the first part of this chapter is concluded with the following major finding and suggestions.

4.2.1 FINDINGS

1. The district has abundant water resource both surface and underground.
2. The study conclusively established that the water resource of the district is still underutilized.
3. As the cultivable area occupies more than half of the total area so it is important to give proper attention for improving agricultural production rather bringing more and more land under cultivation.
4. The cultivable waste and fallow land can be brought under economic use other than agriculture.
5. There is a great need to take urgent steps for efficient management of land and water resources for sustainable development.
6. The role of different agencies pertaining to land and water management is notable.

4.2. SUGGESTIONS

The present study has brought to light many aspects relating to water and land management. The findings suggest that concerted efforts are called for the management (both short term and long term) of land and water in the district. On the basis of the findings of the work, the following suggestions are put forward for the efficient management of water and land resources for the benefit of the inhabitants in particular and state in general.

1. Atleast one hydro-electric power project can be undertaken for generating electricity.
2. A few major and medium irrigation scheme should be undertaken so as to bring more and more area under irrigation.
3. Land reclamation is necessary for judicious and rational use.
4. Proper steps should be taken to conserve soil and to check erosion as land is a fixed resource.
5. Adequate funding is necessary to carry out different activities pertaining to land and water management.

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Appendix

DETAILS OF SOIL CONSERVATION SCHEMES TAKEN UP IN THE DISTRICT OF SONITPUR FROM THE FINANCIAL YEAR 01-02 TO 05-06 (5 YEARS)

SL. No	Year of creation	Scheme	Name of the project	Location (Block/G.P)	Amt.exp.	Acheiveme net Beniftted area.	Remarks
1	2001-2002	L.D.P. D.C.P.(G) B/Charali	Pabhoi L.D.P. 2001-02	B/Charali S.c. Range	45000	25 Hect	
2	2001-2002	D.C.P. (G) Gohpur	Gopalpur L.D.P. 2001-02	Gohpur S.C. Indt. A/Centre	30000	13 Hect	
3	2001-2002	D.C.P. (G) Gohpur	Dilapokhra L.D.P. 2001-02	Gohpur S.C. Indt. A/Centre	20000	8 Hect	
4	2001-2002	D.C.P. (G) Tezpur	Amtol Behergaon Sialmari Pothar L.D.P. 01-02	I/c Dhekiajuli A/Centre	30000	13 Hect	
5	2001-2002	D.C.P. (G) Tezpur	Delariguri L.D.P.	R.O. Mazgaon S.C. Range	40000	17 Hect	
6	2001-2002	DCP(Gen) Addl Scheme. Tezpur	Kalibari Namghar beautification	Sri N. Kakoti S.C.R.	22000	9 Hect	
7	2001-2002	D.C.P. (G) Tezpur	Dekorai R.T.P. 01-02	R.O Mazgaon S.C. Range	30000	7 Hect	
8	2001-2002	D.C.P. (G) Tezpur	Pachnoi R.T.P. Ph-II 01-02	Dhekiajuli S.C.I.A. Centre	20000	6 Hect	
9	2001-2003	Nil	Nil	---	Nil	--	
10	2002-03	Nil	Nil	---	Nil	--	
III.1	2003-04	T.S. Plan Tezpur	Borjhar Pathar G.C.P. (Cr)	Dhekiajuli S.C.I.A. Centre	150000	9 Hect	
12	2003-04	S.C.C. Plan Tezpur	Toubhanga (Nabeel)GCP (Cr)	Mazgaon S.C. Range Block :- Naduvar G.P.	150000	9 Hect	

13	2003-04	State Plan Tezpur.	No.2 Bhergaon L.D.P. 03-04	I/c Dhekiajuli SCAI A/Centre	100000	43 Hect	
14	2003-04	State Plan Tezpur.	Harigaon Nature Conservation works at harigaon.	R.O.Mazgaon S.C. Range	50000	1 No. Block area.	
15	2003-04	Tribal Sub-Plan Tezpur	Borjhar Pathar (GCP)(Cr)	Dhekiajuli S.C.I.A. Centre	150000	9 Hect	
16	2003-04	Schedule Caste Component Plan. Tezpur	Toubhanga (Nabeel)GCP (Cr)	Mazgaon S.C. Range	150000	9 Hect	
17	2003-04	D.C.P.(Gen) Udalguri.	Nisilamari G.C.P.	Orang S.C. Range	120000	7 Hect	
18	2003-04	D.C.P.(Gen) Mangaldoi.	Selepara G.C.P	Tangla S.C. Range	150000	9 Hect	
IV. 19	2004-05	State Plan	Borjhar Gully control Cum L.D. Project.	Dhekiajuli S.C.I.A. Centre Block :- Barchalla G.P. Niz- Borchalla	Part -I 300000	18 Hect	
20	2004-05	Border area near B.Ed college,	Gully protection works	By conteactor Sri Dekin Bayan President. Sri Sanjit Choudhary, Secy	Part -I 300000		
21	2004-05	State Plan	Borjhar gully control Cum L.Dev. Project.	Dhekiajuli S.C.I.A. Centre	300000	18 Hect	
22	2004-05	T.S.P. Darrang	Chengeliapara G.C.P.	Tangla S.C. Range	150000	9 Hect	
23	2004-05	T.S.P. Darrang	Batabari GCP (Cr)	Orang S.C. Range	150000	9 Hect	
24	2004-05	T.S.P. Sonitpur	Mazrowmari LDP 04-05	Dhekiajuli SCIA Centre	75000	32 Hect	
25	2004-05	T.S.P. Sonitpur	Uparkacharigaon LDP	Mazgaon S.C. Range	100000	43 Hect	

SCHEMATIC DETAILS FOR D.D.P. 2006-07

The following scheme are proposed covering the entering District on priority basis as per farmers demand for 2006-2007.

Sl. No.	Name of the Scheme	Sub-Division	Development Block/G.P.	Cost (Rs, in Lakhs)	Area benefitted (Ha)	Nature of work	Approx time of completion
1	Talakabari LDP (06-07)	Tezpur	Naduar/Barbhagia	0.80	30.00	Const. Of E/Bundh	20 Days
2	Pahijuli RTP (06-07)	Tezpur	Balipara Gamari	5.50	25.00	Boulder spurs with boulder Rivetment & pitching.	40 Days
3	kekoraajuli GCP Ph-I (06-07)	Tezpur	Balipara Chariduar	5.20	40.00	Const. Of RCC drop structure.	45 Days
4	Sirajuli RTP (06-07)	Tezpur	Borchalla/Natun Sirajuli	5.00	50.00	Const. Of Boulder spurs.	30 Days
5	No.1 Rongogora GCP cum W.D. Project.	Tezpur	Borchalla/Sirajuli	2.50	50.00	Const. Of RCC drop structure & E/Water dist. Channel.	30 Days
6	Deobarjan GCP (06-07)	Biswanath	Behali/Gangmouthan	7.50	80.00	Const. Of RCC drop structure & E/guide bundh.	45 Days
7	Bogijuli S.C. Afftn. (06-07)	Biswanath	Behali/Botiamari	3.00	10.00	Creation of protective Afftn.	60 Days
8	Moujuli Balichang GCP	Biswanath	Sakomatha/Balichang	7.50	50.00	Const. Of RCC drop structure.	45 Days
9	Ghiladhari RTP	Biswanath	Sakomatha/Balichang	7.50	100.00	Boulder spurs with boulder rivetment & pitching.	45 Days
10	Mornoi RTP (Ph-I)	Biswanath	Sootia/4 No. Sootia	4.80	60.00	Boulder spurs with boulder rivetment & pitching.	45 Days
11	Nature Conservation & beautification scheme, at	Borcholla	Borchalla Natun Pam	1.50	Invironmen t benefit	Creation of protective Afftn., for reducing environmental hazards.	45 Days
12	Diring RTP	Biswanath	Sakomatha/Balichang	8.50	60.00	Boulder spurs with boulder rivetment & pitching.	45 Days
13	Karbiblok LDP (06-07)	Biswanath	Sakomatha/Pabhoi	1.70	40.00	Const. Of E/ Embankment	30 Days
				Total =	61.00	595.00	

(Rupees Sixty One Lakhs) only