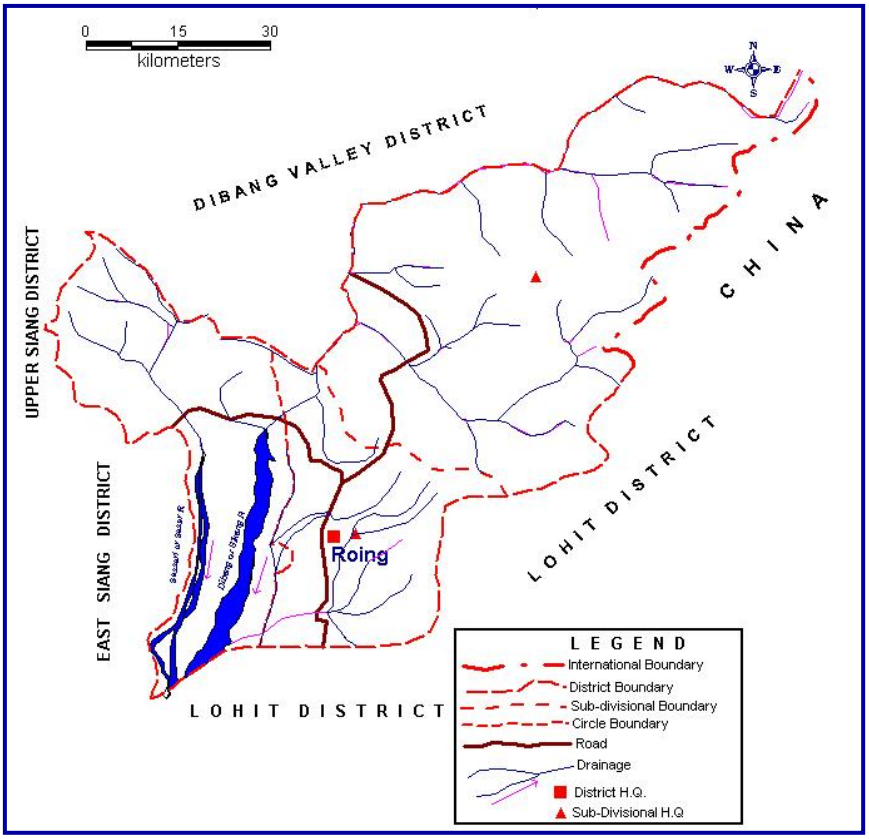
Technical Report Series: D **No: 22/2009-10**

Ground Water Information Booklet
Lower Dibang Valley District, Arunachal Pradesh



Central Ground Water Board
North Eastern Region
Ministry of Water Resources
Guwahati
September 2013

LOWER DIBANG VALLEY DISTRICT AT A GLANCE

Sl.No	ITEMS	Statistics
1.	**GENERAL INFORMATION**	
	i) Geographical area (sq. km)	3990
	ii) Administrative Divisions (As on 31st March 2011) Number of Tehsils/Block Number of Panchayat/Villages	3 3
	iii) Population (As on 2011 Census)	53,986
	iv) Average Annual Rainfall (mm)	3889
2.	**GEOMORPHOLOGY**	
	Major physiographic units	Denudational hills comprised of phyliite, schist, quartzite, granodiorite, gneiss and Alluvial Plains
	Major Drainages	Dibang River and Sesseri River
3.	LAND USE (sq. km)	
	a) Forest area (Reserved Forest):	
	b) Net area sown	155.02sq.km
	c) Cultivable area	222.50sq.km
4.	**MAJOR SOIL TYPES**	Alluvial and residual soils
5.	AREA UNDER PRINCIPAL CROPS (As on 2005-2006) (in sq. km)	113.57
6.	**IRRIGATION BY DIFFERENT SOURCES** (Areas and numbers of Structures)	
	Net irrigated area	74.02sq.km
7.	NUMBER OF GROUND WATER MONITORING WELLS OF CGWB (As on 31-3-2007) No. of Dug Wells No. of Piezometers	No NHS as the district have no groundwater abstraction structures Nil Nil
8.	PREDOMINENT GEOLOGICAL FORMATIONS	Schistose and gneissic rocks with phyllites and quartzites
9.	HYDROGEOLOGY	
	Major water bearing formation	Alluvium
10.	**GROUND WATER EXPLORATION BY CGWB (As on 31-03-2011)**	No exploration activity by CGWB due to inapproachability problem
	No of wells drilled (EW, OW, PZ, SH,	Nil

	Total)	
11.	**GROUND WATER QUALITY**	
	Presence of Chemical constituents more than permissible limit	
	Type of water	Soft and potable
12.	DYNAMIC GROUND WATER RESOURCES (2009) in mcm	
	Annual Replanishable Ground Water Resources	950.40
	Net annual Ground Water Draft	0.34
	Projected Demand for Domestic and Industrial Uses up to 2025	0.62
	Stage of Ground Water Development	0.03%
13	AWARNESS AND TRAINNING ACTIVITY	
	Mass Awareness Programme organized	Nil
14.	EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING	Nil
	Projects completed by CGWB (No & Amount spent)	Nil
	Projects under technical guidance of CGWB	Nil
15.	**GROUND WATER CONTROL AND REGULATION**	
	Number of OE Blocks	Nil
	No of Critical Blocks	Nil
	No of blocks notified	Nil

GROUND WATER INFORMATION BOOKLET

LOWER DIBANG VALLEY DISTRICT, ARUNACHAL PRADESH

1.0 Introduction

Lower Dibang Valley district lies between latitudes$27^0$45'N and 28^0 4' N and longitude between $95^0$10'E and $96^0$40' E. The district is bounded by Dibang Valley district in the Nortjh, Lohit district and Assam state in the south, Myanmar in the east and East Siang district in the west.

The district is divided into three sub-divisions, three blocks and eight Nos. of circles. The district Head Quarter is situated at Roing. The district is a predominantly mountainous terrain, with vast plains of Assam on the south. The river system of the district is a part of the Brahmaputra river basin. The main river system of the district is the Dibang river.The confluence of Matum river in the west, Dri river on east, both originating in the Tibetan Plateau takes the name of Dibang river. There are numerous southerly flowing small rivers and streams tributaries to the Dibang river, except the Iphi Pani river which flows from west to east at the base of hill north of Roing. Another small river, the Difu river flows from north to south in the eastern part of the district. The overall drainage pattern of the district is dendritic to sub-parallel. On the northern mountainous part it is mostly of dendritic nature. In the valleys of the foothill area, it is sub-parallel flowing from north to south. The streams and nallas are of losing nature in the piedmont zone and reappearance of these are observed towards southern part of the district.

Agriculture is the mainstay of the people. The agriculture of the district mainly depends on monsoon rainfall. However, the Government of Arunachal Pradesh is actively engaged in developing permanent cultivation in the low lying areas along the valleys patches of hill slopes and intermontane valleys. The main field of cultivation of paddy lies on the foothills from Roing to Shanitpur in the southern part It is observed that agriculture is basically monocropped and the farmers depend upon rainfall. However, minor and medium irrigation projects have been implemented in the district in certain areas.

Irrigation potential has been created for changing 'shifting' cultivation into permanent cultivation in the available land of foothills and valleys. Nos. of minor irrigation projects have been implemented in the district

2.0 Rainfall and Climate

Annual rainfall in the district varies from 3500 mm to 5000 mm. The normal annual rainfall in Roing area is 3990 mm. Most of the rainfall is received during the monsoon period (June to September). Heavy rainfall is received during summer and occasional rainfall during winter and Premonsoon period.. January and February are the driest months. The rainfall received during summer is under the spell of South-

West monsoon. The onset of South-West monsoon occurs by the end of May or the first week of June and withdraws by late September or early October.

The climate of the district is mainly influenced by orography. It is sub tropical, wet and highly humid in the foothills and cold in higher elevations. The temperature falls below freezing point during extremely cold period.

3.0 Geomorphology and Soil Type

3.1. Geomorphology

About 70% of the district constitutes hilly mountainous comprising parts of Lesser and Higher Himalaya. The topography is rather abrupt at the base of the foothills on south at the junction of the Assam Plains. Indicating some geotectonic movements. The plain area is found in the southern part of the District.The Mountains gradually increases in height towards north.

Geomorphologically the district may be divided into units, namely, educational hill and alluvial plain

a) Denudational Hills :

These hills comprise quartzites, phyllites, slates etc. of Precambrian age. The hills are highly eroded, fractured and with a weathered zone of 5 to 50m thickness. The regional trend of the hills is NW-SE and the hills alternate with deep gorges.

b) Alluvial Plains

The plain area occupies an area of 1200 sq. km. It is bounded on south from Roing to Santipur, to Dibang River bank on west and up to Korona on east. The gradient of the plain is towards south, and it merges with alluvial plains of Brahmaputra River.

3.2 Soil Types

The nature and properties of soil vary according to topography and elevation of the area. The soils of the foothills are generally loamy or sandy loam mixed with pebbles and gravels. In the valleys, it is clayey in nature and rich in organic matter. Soils of the hills and mountains contain high humus and nitrogen. The naure of the soil is mainly acidic.

In major part of the district, the soil is sandy but sometimes clayey in nature. The soils in the district can broadly divided into 1) Plain alluvial soil and 2) hilly soil. The plain alluvial soil may be further divided into

Older alluvium type: It is the soil of higher level terrace of foothill areas, which consist mainly of coarse sand and organic matter

Silt type: The silt type soil contain high silt content It composes the flood plains characterized by shallow surface layer of silt with sub-soil of coarse sand, sometimes mixed with pebbles and boulders The soil of the valleys are favorable for cultivation

of khariff and Rabi crops. The soils of the hills are suitable for shifting cultivation and dry paddy, maize etc.

4.0 Ground Water Scenario

4.1 Hydrogeology

The water table of the foot hill belt is related to the topography and type of aquifer materials. The slope of the ground surface is towards south and the aquifer materials gradually become finer towards south. The depth to water level is in north in the piedmont zone and shallower in the south. Due to highly bouldery nature of the piedmont zone streams and nallas disappear at the base of the hills and reaper further in the south, marked by a spring line. This spring line separates the Younger and Older alluvial sediments.

4.2 Ground Water Resources

The entire district is occupied by hill ranges with very steep slopes that are more than 20%. Moreover, no details about the recharge potential in these hills are available. As per GEC, 97 these hilly areas are not taken into account for resource computation. Due to lack of data especially on population, number of ground water structures, Draft and other important parameters on watershed basis, the smallest administrative unit, i.e. the R.D. Block has been taken as the unit of computation. Water level trend is also not available due to lack of ground water abstraction structures, hence the annual ground water recharges of all the assessment unit have been computed by the Rainfall Infiltration Factor method.

The annual replanishable ground water resource of the district is estimated as 950.40 MCM. Net ground water availability of the district is 855.36 MCM while net ground water draft for all uses is 0.34mcm. Projected demand for domestic and industrial uses up to 2025 is 0.62 MCM. Ground water availability for future irrigation use is 854.41 MCM. Stage of ground water development is thus negligible (0.03%) and the district can be categorized as safe.

Lower Dibang Valley district is under the SAFE category.

4.3 Ground Water Quality

As per earlier field investigation reports, the results of the analysis of the water samples collected from springs and dug wells are as follows-

Table –1. Ranges of chemical constituents

(All constituents expressed in mg/l, except pH and EC)

Sl No.	Constituent	Source – Dug wells	Source – Springs
		Range of parameters	
1	pH	6.27-6.97	6.94-7.48
2	E.C. (micromhos/cm)	70-195	20-59
3	TDS	50-140	10-40
4	Total Hardness	25-115	20
5	Calcium	6-24	6
6	Magnesium	2-13	8
7	Sodium	1-4	1-5
8	Bicarbonate	24-55	18-24
9	Chloride	5-18	7-11

(All constituents expressed in mg/l, except pH and EC)

It is seen that quality of water both from springs and dug wells are fresh and suitable for all uses. In general, the chemical quality of ground water in the district is fresh and potable and can safely be used for domestic and industrial purposes.

4.9 Status of Ground Water Development

The water requirement for drinking and domestic purposes in the district is mainly met with from the surface water sources like streams and nallas. Most of the population is being benefited from water supply schemes. In the Plain area, in Roing sub-division dug wells and hand pumps are available and lift water supply schemes are also prevalent.

5.0 Ground Water Management Strategy

5.1 Ground Water Development.

Major part of the district is covered by hills of consolidated rocks. In the absence of any ground water structure at present in the mountainous areas, springs constitutes an important source of water supply. However, mostly the springs are choked due to dirt, or are covered with vegetation. It is worthwhile to develop these springs. The foothill zone is suitable for the development of ground water through structures like dug wells, hand pumps and shallow tube wells The piedmont zone is suitable for dug wells, generally 15m deep.

The younger alluvium is suitable for all the shallow ground water structures. Dug wells down with depth of 10 to 20m having diameter 2 to 3 m are expected to yield 12 to 15 m3day. Shallow tube wells with depth of 25 m are likely to yield 30 tom 35m3/hr.Towards the southern part of the district, bordering Assam state, the depth of alluvium increases and deep tube wells down to 150m may be constructed in this area. Expected yield is 40 to 60 m3/hr.

5.1 Rainwater harvesting structures constructed under centrally sponsored scheme.

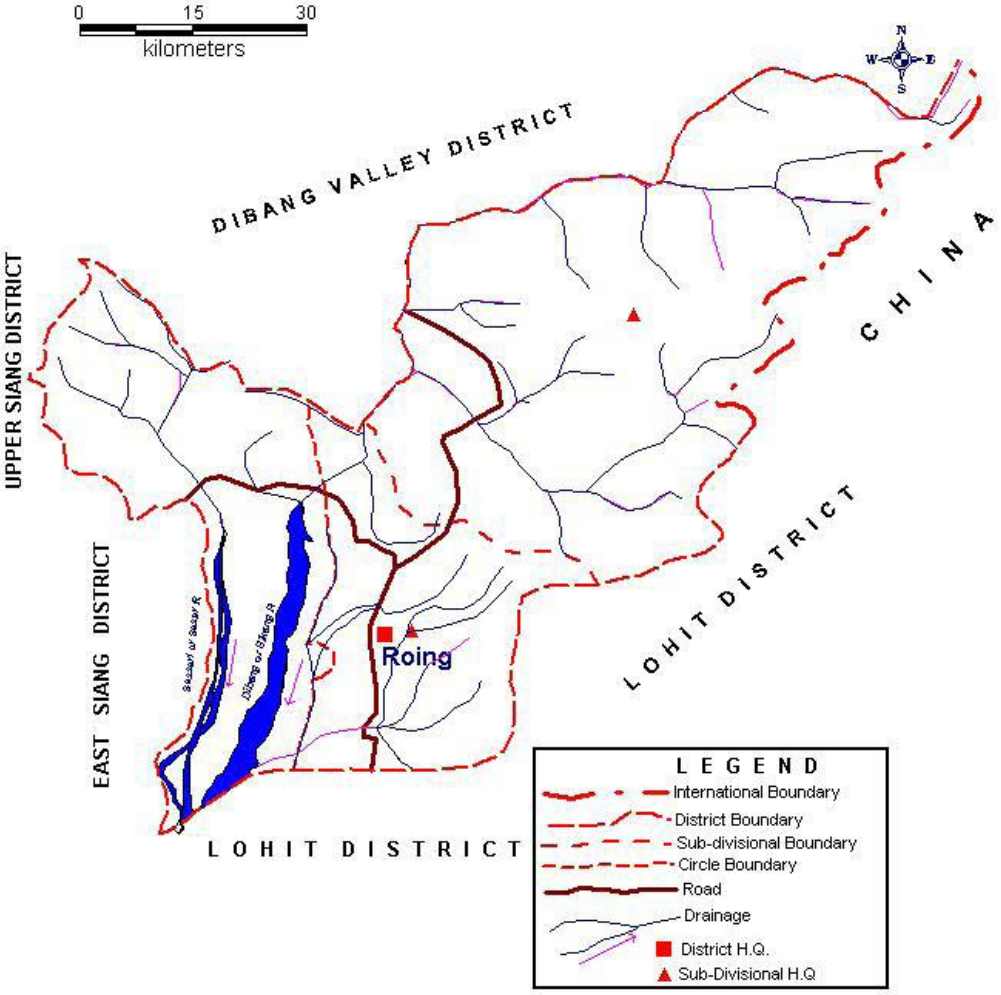
Nil.

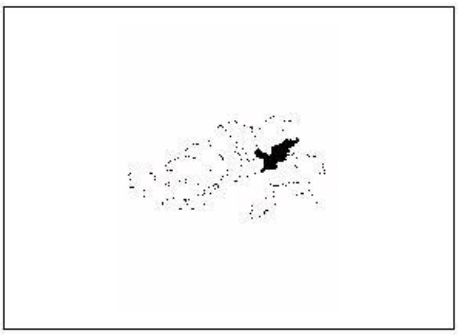
6.0 Awareness and Training Activity

6.1 Mass Awareness Training Programme

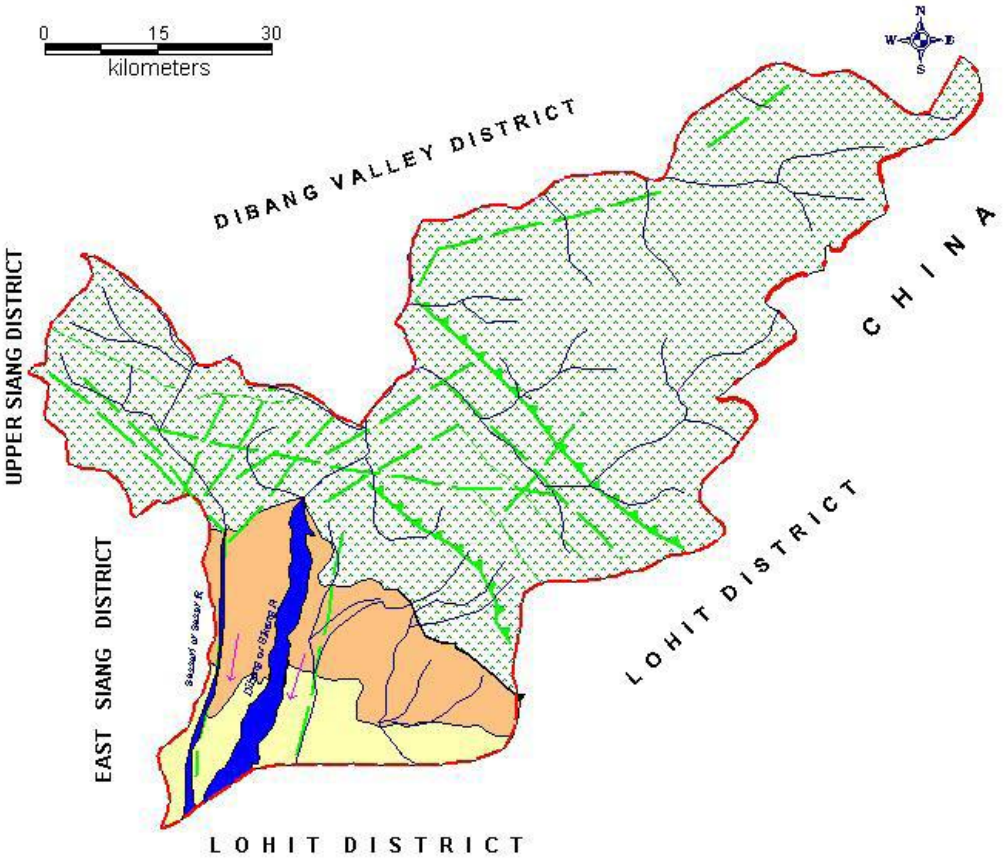
Nil.

ADMINISTRATIVE MAP OF LOWER DIBANG VALLEY DISTRICT, ARUNACHAL PRADESH





HYDROGEOLOGY OF LOWER DIBANG VALLEY DISTRICT, ARUNACHAL PRADESH



L E G E N D

Annotation	Formation/Group	Age	Lithology	Ground Water Potential
	Newer Alluvium	RECENT	Unconsolidated deposits of boulders, pebbles, sand and silt covering the river bed and foothills	Moderate Yield, 30-50m^3/hr Drawdown within 10 to 15 m
	Older Alluvium/ Piedmont Zone	SUB-RECENT	Boulders, pebbles and sand with clay pockets often forming terraces	Moderate Yield, 30-50m^3/hr Drawdown within 10 to 15 m
	Miri Formation, Tenga Formation, Buxa Group, Tidding Group	LOWER TO MIDDLE PALAEOZOIC	Quartzites, Schists, Phyllite with bands of Granodiorite and gneiss, granulites and amphibolites	Low Yield, 5 to 15m^3/hr
	Thrust			
	Lineament			