Chapter 2

Physical and Socio-Cultural Background of the Rammam Basin

2.1. Introduction

The physical background of the Rammam Basin is characterised by rugged terrain, harsh and cool climate and exquisite flora and fauna. The people living on this tract are also unique with their ethnic identity, economy and living style. In this chapter, the Physical and Socio-Cultural background of the people living in the Rammam Basin have been discussed in detail as these may help to understand all characteristic features of the settlements grown over the tract.

2.2. Terrain Characteristics: Ridges, Spurs & Terraces

The Rammam Basin is bounded by Southern Singalila Range in the west from Melido or Singalila-proper peak (3685m) in the north to Tonglu (3063m) in the south. The highly elevated Range acts as a boundary wall between the Rammam Basin (India) in the east and the Tamur Basin (Nepal) lying in the west. The south-eastern boundary of the basin, however, starts at Tonglu (elevation 3063m) of the said Range and ends near Goke, just above the confluence point of the Rammam with Bari (Great) Rangit, via Deoralli danra and Samalbong danra. Starting from this south-eastern boundary, several ridges are projected inside the southern part of the Rammam basin which are as follows:

Deorali danra

Deorali danra is a projected ridge running from Tonglu to Kankibong forming the water divide between the river Rammam and Chhota Rangit (Little Rangit) with heights varying from 3050m to 800m. Several streams have been originated from Deorali danra such as Dilpa khola, Palmajhuwa khola on the west and Jhepi khola in the north-east. The orientation of Deorali danra is from south-west to north-east. Total length of that ridge is 10 km and it is well inhabited all along its slopes except the first 4km (from Tonglu to Dhotrey).

Samalbong danra

This part is nothing but the extended part of Deorali danra which has been separated from the main ridge by the valley of Jhepi khola. This part starts from Kaijalia and

swings ESE to merge into Goke spur. The elevation of this tract ranges from 320m near Kerabari (Goke) to 1730m near Samalbong. The length of the ridge is 7.5 km.

Rimbick danra

Another projected ridge from Southern Singalila Range runs parallel to the Deorali danra. It lies about 5km north of the latter. In between these two projected ridges flows the river Lodhama khola which originates near Gahribas (2600m). The length of Rimbick danra is 11 km. The elevation of Rimbick danra near Bikhebhanjyang over the Southern Singalila Range is 3288m and near the River Rammam is 960m. Several streams originated from both flanks of the Rimbick danra such as Gurdum khola on the northern flank and Rithu khola (one of the sources of Lodhama khola), Mongong khola, etc. on the southern flank. Most part of Rimbick danra is covered with dense forests lying under the territory of Singalila National Park. The northern flank of this ridge is almost uninhabited and is covered with dense jungles. Gurdum khola, one of the tributaries of river Siri khola, has separated the ridge from Sandakphu danra.

Sandakphu danra

This danra starts from Sandakphu at an elevation of 3631m and terminates near the settlement Gudum at an elevation of 2200m. The length of Sandakphu danra is 6km. It is the most desolated ridge as this is settled by a single habitation named Gurdum which is located at the terminal point of the ridge. A trek path runs over the ridge connecting Gurdum to Sandakphu. The orientation of Sandakphu danra is from SSW to NNE. As per S. K. Samanta (2018), "At the nose of this ridge, above the hamlet Gurdum (27° 07′ N, 88° 04′ E, altitude 2350m), there is a large, steep (more than 65°) fault-line scarp which is receding rapidly".

Sabarkum danra

On the north of Sandakphu danra is another ridge named Sabarkum danra which starts at Sabarkum peak at an elevation of 3643m and runs north-west to south-east direction up to the settlement Sirikhola dropping at an elevation of 1900m. Length of the Sabarkum danra is 7 km. The danra (ridge) has several smaller branches (spurs) spreading out from it on various directions. Most part of the ridge is covered with dense jungles which are confined by Singalila National Park.

Kingsa danra

This danra starts from Phalut (3596m) and runs almost west to east direction up to the valley of river Rammam, traversing the length of 6 km. This ridge is also covered with dense forest and is under the domain of Singalila National Park. The only settlement located on this ridge at its nose is Gorkhey **(**2200m). The village is located at the confluence point of river Rammam and its right side tributary Ratho khola. On the north of Kingsa danra, flows the Rangbong – the main source of the river Rammam. North of this is another unnamed ridge starting at Singalila peak (3685m) and extends up to the river Rammam for a length of 4 km. The ridge is completely devoid of any habitation. To the north of this ridge is the river Kali khola which is one of the main headstreams of river Rammam.

On the northern part of Rammam Basin, no continuous ridge pattern can be found. The water parting in this part extends from west to east direction and is covered with several forests such as Hill Top Reserved Forest in the west, Sungri Reserved Forest in the middle, Phunsebung Reserved Forest in the east-southeast and Samdong Reserved Forest in the east-northeastern part. Immediately at the eastern part of Kali khola is the Hill Top Reserved Forest; the highest elevation of this water divide is 3218m. Several spurs are extending from this water divide in north to south directions which are as follows:

Bhareng spur

It is the northernmost inhabited spur of the North Rammam Basin extending from 3218m elevation in the north up to river Rammam in the south where it terminates at an elevation of 2050m. The length of this spur is 4.5km. On the western side of this spur is river Rammam flowing from north to south direction and on the east of this spur is a non-perennial stream Bhareng khola.

Ribdi spur

It also starts from the same knot of the ridge at 3218m elevation and extends southward parallel to the Bhareng spur and ends at the Rammam valley at an elevation of 2000m. The length of the spur is 5km, the chine section is much broken than that of the former.

Okhery spur

In the east of Ribdi spur is another extended spur i.e. Okhery Spur at the end of which the settlement Okhery (1600m -2400m) is located. This spur has also been extended from the same knot (Barsey danra) from where Bhareng and Ribdi spur extend towards south. Altitude of the spur, however, drops below 800m near the Rammam valley. Length of this spur is 10km. The spur is extended from almost NNW to SSW. The spur is separated from the Karthok spur on the east by Riyong khola.

Karthok spur

This spur is located on the east of Okhery spur. It extends from Phunsebung Reserved Forest, almost north to south direction and the elevation varies from 2850m near the water-devide to 600m at the Rammam valley. The length of the spur is 7km. The upper portion of this spur belongs to Phunsebung Reserved Forest and is covered with dense jungles. The middle and lower parts of the spur are densely settled as both the flanks (east and west) of this spur are dotted by various settlements. This spur is separated from Soreng Spur by Rani khola.

Soreng Spur

Soreng spur is located on the east of Rani khola. The length of the spur is 4km and elevation varies from 1600m to 450m.

Malbassey-Chumbong-Nayabazar spur

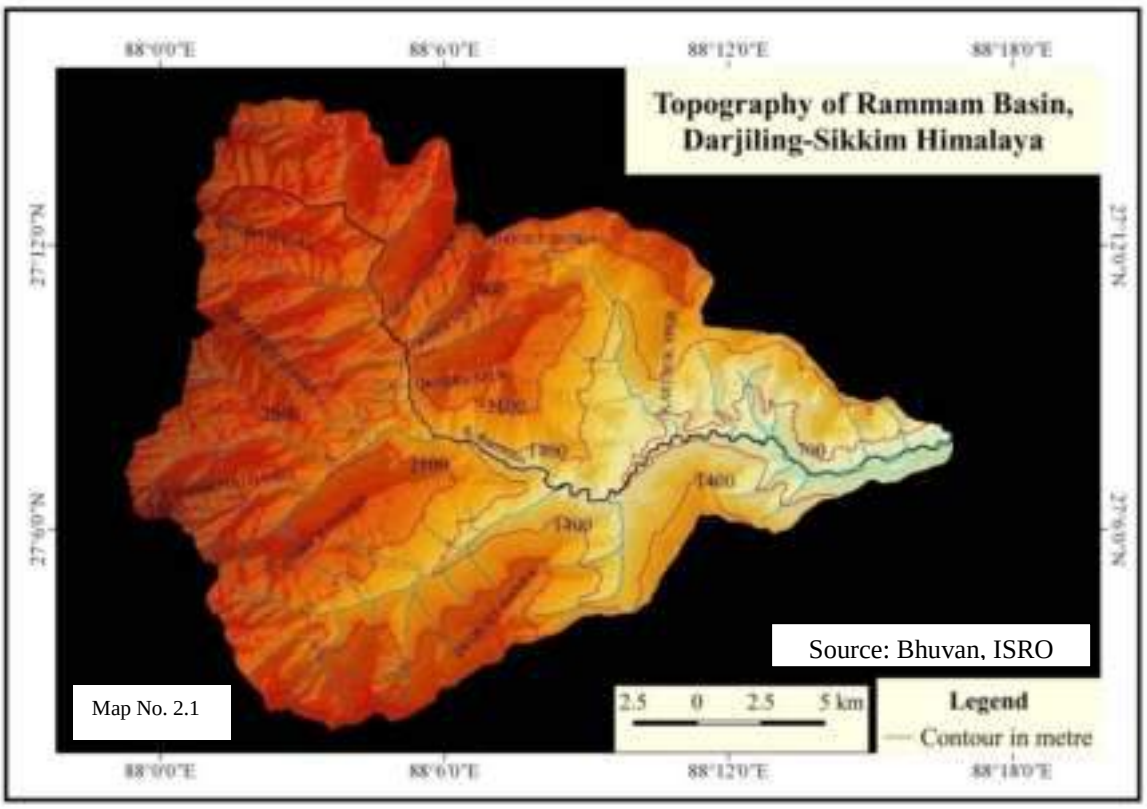
The tract lying east of the Soreng spur and north of the river Rammam is highly dissected by numerous non- perennial rivulets. In this tract the settlements Malbassey, Chumbong, Nayabazar Forest Block and Nayabazar Notified Bazar Area are located.

Terraces of Kamjer and Karmatar

These two terraces are located on the right side of river Rammam at an altitude of 350 m to 450m. Both these terraces are elongated in shape with little gradient towards the river Rammam. Both these terraces are under Goke village where two hamlets named Kamjer Busty and Lower Karmatar are located.

Terraces of Rammam & Samanden

The terraces of Rammam and Samanden have formed at an altitude of 2300m. These terraces are located in the middle part of Rammam River - on the right side of the river Rammam. Two settlements Rammam and Samanden are located on these terraces.



Map No. 2.1

Map No. 2.2

Terrace of Daramden

This terrace is located on the south-eastern part of Okhery spur at altitude of less than 1000m. The terrace of Daramden is one of the most important terraces of the Basin. The length of the terrace is 5km. and width is 3km. The altitude of the terrace varies from 700m towards the south-east to 1100m towards the west. This terrace has been formed at the confluence point of river Rammam and Riyong khola. The village Dhalam is located on this terrace.

2.3. Lithostratigraphical Characteristics

The surface rocks of the Rammam Basin are mostly of metamorphic type predominated mainly by Darjiling gneisses. These rocks once formed the seabed of the Tethys Ocean. With the orogenic movement these rocks are now located high above the sea level. Due to prolonged tectonic activities the rock strata have been crumpled, ruptured, thrusted, and at many places, been altered into granites and granitoids by rock cycle process. Some granitic intrusions with pure igneous characters are, however, found near the deep rooted thrusts. Mylonite and migmatite are also found along the ruptures and faults. All these rocks are of Archaean era (Risley, 2010).

The rocks of later ages are found below the gneissic strata in an inverted manner. Thus phyllite, slate and mica-schist (Daling series) of Late Proterozoic era are found below the gneissic coverage. The plane of unconformity is clearly marked along the valley walls of the Rammam, Siri khola, Ribdi khola, Lodhama khola at varying altitudes: from 1600m to 1800m. Quartzite and partly metamorphosed shale of Carboniferous-Permian period are found further below with ambiguous unconformity. Greywacke, mudstone and shale of Tertiary formation are found below the Palaeozoic rock strata. These rocks are found below 600m – at the lower valley section of the Rammam and near the mouth of Lodhama khola. These are purely sedimentary rocks with undulating plane of unconformity. The rocks along the river terraces and valley bottoms are characterised by alluvia (with fine to coarse grains), pebbles and cobbles which are of Quaternary origin.

The mineralogical composition of the rocks in the Rammam Basin varies widely on account of different ages of the rock strata and varied orogenic stresses acting upon them. In general they are highly micaceous and rich in quartz, feldspar, hornblende,

garnet and Kyanite. The rocks of Tertiary and Late Palaeozoic origin contain carbonaceous composition and quartose veins. Coal seam and fossils are completely absent in the region under study **(**Samanta, 2018, p.25).

Table No. 2.1: The rock sequences along with their Geological Ages

Rock Sequence	Era/Period (Epoch)
i) Alluvia at river beds and loose debris on the hill slopes	i) Quaternary (Holocene)
ii) Pebbles and cobbles rich in quartz, feldspar, feldspathoids and garnet, especially along the fault planes	ii) Quaternary (Pleistocene)
iii) Greywacke, shale and mudstone	iii) Tertiary
iv) Partly metamorphosed shale and quartzite	iv) Carboniferous-Permian (Gondwana)
v) Phyllite, slate and mica-scist of Daling series	vi) Late Proterozoic
vi) Gneiss, mylonite and migmatite	vii) Archaean

Source: Field study and 'Geomorphology of The Southern Singalila Range' (S.K.Samanta, 2018), p. 25.

As said earlier, the rock strata are highly crumpled and undulating due to differential stresses caused by tectonic movements in different geological ages. The axis of the Singalila Range runs more or less north to south – shifted towards south-east between Phalut-Sabarkum peaks and from Sandakphu to Tonglu peak. While the ridges projected from the main Range show slightly divergent characters due to the shifting nature of the main range. The deep rooted Main Central Thrust runs below the river Rammam which divides the region into two distinct geological units; Northern Singalila Range lying to the north of the Rammam valley; and the Southern Singalila Range lying to the south of the said valley. The thrust occurred in Oligocene Epoch of Lower Tertiary period (Samanta, 2018, p.21).

The tectonic movements of Upper Tertiary along with Quaternary periods caused many other faults and ruptures in the region. All the tributaries of the river Rammam follow these faults. There are many fault scarps as well as fault-line scarps in the region.

Among them the Gurdum fault-line scarp is prominent which is located just above the Gurdum forest village (Samanta, 2018, p.13). A series of fault scarps are also found along the Kali khola, Siri khola, Rithu khola and the Lodhama khola. These scarp areas are very much susceptible to landslide and the human constructions such as buildings, roads etc are damaged frequently especially during the monsoon rains.

Due to the thrusting effect, the structure of the Singalila Range is leaned towards the south and represents one of the largest (more than 80km) nappes in the entire Himalayan mountain system (Samanta, 2018, p.19). Prolonged sub-aerial erosion has removed the upper portion of the nappe leaving only the lower parts of the main axis of nappe. Thus the main Range of the Singalila reveals a complex composition of synclinorium, the peaks of which are nothing but the projected ends of each synform. Since the wave of the thrust came from north (pushed by the huge Kangchendzonga massif) the southern slope of any peak as well as any ridge are much steeper than that of the northern part.

2.4. Drainage of Rammam Basin

The trunk river Rammam and its tributaries are mainly fed by rainfall because there are no permanent glaciers at any part of the basin. Winter snows, however, provide a huge amount of water after their melting in spring time. Since the tract lies in high altitudinal region the velocity as well as erosional activities of the rivers and streams is very high. The ratio between the processes of valley deepening and valley widening found in the region is also very high. Hence narrow V-shaped gorges are conspicuous feature all along their courses.

The longitudinal profiles of most of the streams in the Rammam Basin show a series of concave segments abutting by knick points composed of harder rocks (especially metamorphic types) which reveal the multicyclic nature of the streams. Most of the knick points are the convergence of river terraces which are impaired in nature and slope towards the lower reaches of the valleys. The river terraces of the trunk river Rammam are, of course, paired in nature. The width of the terraces, however, varies widely – exceeding 200m near Daramden and Lower Goke. The lineations of these terraces are almost horizontal. These exceptional characteristics for the downcutting of the river Rammam can only be explained by its origin relating to the effect of Main Central Trust stretching all along its course. Most of the tributaries have been

originated during the warmer phases of the Pleistocene glacial age. Neo tectonic movements occurring in the said epoch and its latter age, i.e. in Holocene time, have affected their longitudinal profiles by the extension of fault-scarps and springs all along their valley walls.

The main headstream of the river Rammam is the Rangbong which originates from a small lake named Mong doe (3400m) lying about 1.5km south-east of Singalila peak. The narrow gorge of the stream runs for 6km towards east, thence 1.5km towards south-east, and about 5km towards south for reaching its open valley section (near Lower Daragaon). The river gets its name Rammam when it passes by the old settlement Rammam – about 1.5km NNE of Lower Daragaon. Total fall of the stream from its source to the point of reaching open valley section (1800m) is 1600m. Thus the gradient of the upper most section of the Rammam is 1:8 (approx). The later part of the Rammam runs through an open valley, though the valley walls are formidably steep at most places, especially along its northern bank. The valley floor is wide enough for setting up braided channel of the river along with several types of depositional features such as sand bars and immature river bed terraces. Maximum width is found from Salyangdang to Budang where it exceeds 40m. The serpentine course of this strath section traverses about 16km almost in eastern direction. Total fall of the river from Lower Daragaon to the confluence point with Bari (Great) Rangit (320m) is 1480m. Thus the gradient of the river valley of this section is 1: 40. It should be mentioned here the depth of the valley increases rapidly in the upper course – from the source (less than 10m) to the Lower Daragaon (about 500m). The depth reaches its maximum near Rajavir (more than 700m) and then decreases slowly towards the confluence point (about 80m). The velocity of the river thus shows maximum value near Lower Daragaon – more than 10km per hour during the monsoon period. Using the potential energy of the river Rammam a dam has been constructed 1km east of Rajavir for generation of Hydel power with the capacity of 35 megawatt.

The stream Rato khola is the first right hand tributary of the trunk river Rammam. It follows a depression created by thrusting which had developed by its north lying ridge – the Kingsa danra. The source of the stream lies on a swampy lowland (3350m), 1km south east of Phalut peak (3596m); while the confluence point lies at Gorkhey (2260m). The length of the stream is 6.4km. – thus the gradient of the stream being 1:6.

There are two small streams draining in between Gorkhey and Rammam: the first one Pathey khola (4.5km) and the second one the Mechi khola (4km). Both the streams flow through very narrow gorge and shows steep gradient – more than 1:4 and 1:5 respectively.

All gullies and rivulets coming down from the arcuate slope of the Singalila Range (from Sabarkum to Bikhebhanjyang) makes the fourth right-hand tributary ofthe river Rammam which is well known as Siri khola. As per area it is the largest sub-basin in the entire region. Two main headstreams of this tributary are Siri khola and Sandakphu khola which meets together near Gurdum (2200m). The first headstream rises from the south lying scarp of Sabarkum peak; while the second one rises from the northern slope of Sandakphu. The gradient of both of them is very high – 1:4 and their valleys are almost ravenous. From Gurdum to the confluence point with the river Rammam, near Sepi (1750m), the stream follows a wider gorge with many cascades along its course. The gradient of this section is 1:10. Total length of the stream, from the scarp of Sandakphu to Sepi, is 16.3kms. The velocity of the stream increases rapidly during the monsoon period and reaches up to 8kms per hour after a heavy shower in its catchment area.

The headstreams coming down from the north eastern slopes of the Singalila Range lying in between Bikhebhanjyang and Tonglu are the feeders of the fifth right-hand tributary - the Lodhama khola. The upper part of its catchment area, i,e, from the watershed running across the Singalila Range to Phedigaon shows very narrow ravine like valleys with enumerable large cascades. After Phedigaon the drainage system of the Lodhama khola follows an open valley bounded by impaired terraces lying at different altitudes. All terraces are inclined prominently towards the confluence point with the trunk river Rammam below 2kms of Lodhama Bazar. The stream merges the Rammam after forming a small alluvial fan (about 20 hectare).

The rivulets originating from the eastern escarpment lying at the end of the Deorali danra form the sixth right-hand tributary – the Jhepi khola. The first 3.5 km stretch of this tributary flows along very narrow serpentine valley towards east; while the latter part, i.e. 3.3 km flows along a wider valley towards north. Average gradient of this stream is 1: 4.2.

The first left hand tributary of the river Rongbong or Rammam is the Kali khola**,** the source of which lies near the Singalila Peak (NE) at an altitude of 3650m. It flows first

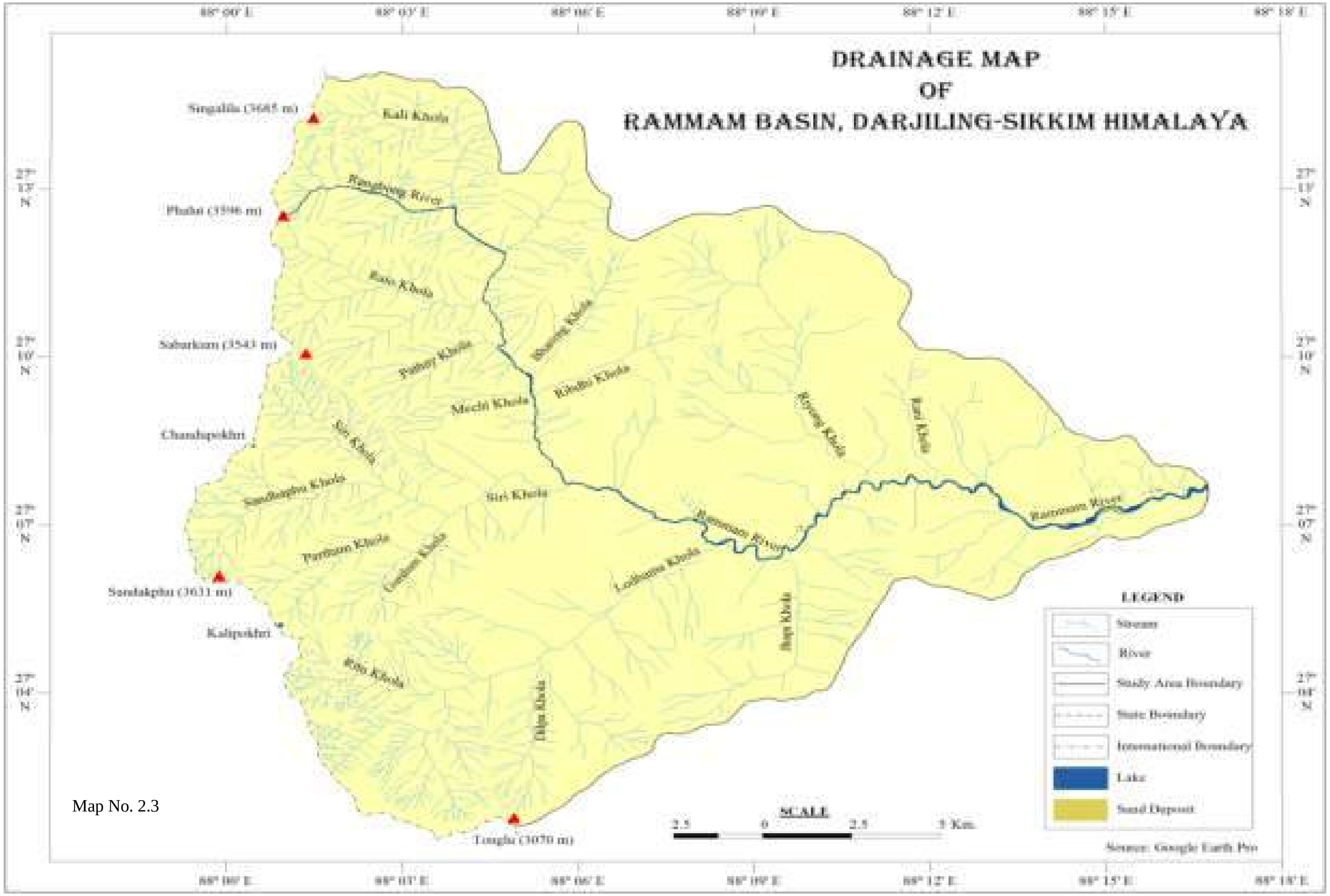
2.5 km towards north-east, thereafter about 3km towards south to join the Rongbong about 1.5kms north of hamlet Gorkhey. The gradient of the stream is very high - 1: 4.6. The valley is narrow but stable due to its development along the depression created behind the great Main Central Thrust (lying over a depressed portion of a gigantic synclinorium).

Bhareng khola is the second left hand tributary of the trunk river Rammam which has set a definite gorge like valley with narrow terraces near its confluence point below Bhareng (2030m) with the trunk river. The stream rises near the northern watershed (3200m) without any habitation at its upper part (above 2500m). Total length of the river is 3.5km while the mean gradient is 1:3.

The third important left hand tributary of the river Rammam is Ribdi khola which also rises near the northern watershed at 3000m. The confluence point of the stream with the trunk river lies below Ribdi at an altitude of 1980m. The tributary is characterised by wider gorge than that of the former with impaired terraces on its both sides which stretch from the confluence point towards upstream for about 2.5km. The length of the stream is also 3.5km and the mean gradient of this river is 1:3.5.

The fourth important left hand tributary of the river Rammam is the Riyong khola which rises on Sungri ridge at an altitude of 2800m. The confluence point of the stream lies below 620m, little south east of Daramden village. The stream has a prominent headstream flowing through a transverse fault lying to the north of Sombare. The wide strath of the stream along with a gently sloping terrace like landform extended across the eastern part of Daramden village seems to be a result of paleoglacial valley which existed at the very last stage of Pleistocene ice age. In consequence of deep glacio-fluvial deposition the lower section of the Riyong khola is well cultivated. The village Daramden is indeed the basket of foodgrains lying to the north of the river Rammam. The length of the Riyong khola is 5.5km and the mean gradient is 1:2.

The fifth important left-hand tributary of the river Rammam is Rani khola. The stream rises at the scarp lying below Soreng at an altitude of 1700m while its confluence point with the trunk river lies below 500m just south east of Tharpu. The tributary shows little wide gorge all along its course and a short impaired terraces at its lower section (less than 1km). Total length of the river is 3km and the mean gradient is 1:2.5.


DRAINAGE MAP
OF
RAMMAM BASIN, DARJILING-SIKKIM HIMALAYA
Singalila (3685 m)
Kali Khola
Phalut (3596 m)
Rangbang River
Rato Khola
Sabarkum (3543 m)
Siri Khola
Mechi Khola
Sirikhola
Chandipokhri
Siri Khola
Sandakphu (3631 m)
Kalipokhri
Rammam River
Lodhama Khola
Tonglu (3070 m)
LEGEND
Stream
River
Study Area Boundary
State Boundary
International Boundary
Lake
Sand Deposit
SCALE
2.5
0
2.5
5 Km.
Source: Google Earth Pro

Map No. 2.3

2.5. Weather and Climate

The high elevation of the Rammam Basin shows a typical 'Highland climate' as suggested by G.T.Trewartha in 1965. Thus the climatic elements of the region are temperate in nature though the latitudinal location of the tract belongs to sub-tropical belt. Since the altitude varies enormously from valley bottom to top of the ridges the weather conditions vary from place to place. Due to low air pressure local adiabatic lapse rate remains very high – from 8°C to 10° C per thousand metre. The maximum and minimum temperatures always go down far below the calculated figures of isanomalous values – deviation often goes down as low as -15°C, especially over the summit section. On this section daily cyclic pattern of weather phenomenon is prominent – dewy but sunny morning, drier noontime, cloudy afternoon, and chilled but clear night hours. The pattern is, however, disturbed during the monsoon season.

Seasons

Like other parts of the Himalayan Mountain System the Rammam Basin also experiences four well marked seasons:

Table 2.2: Seasons found in Rammam Basin

Season	Nepali Term	Tibetan Term	Months
1. Winter	Hiunda- Cold season	Gun - ka	November –early April
2. Spring	Garam – Warm	Chidh - ka	Early April to Mid May
3. Monsoon	Barkha – Rainy season	Ion - pa	Mid May to early October
4. Autumn	Sharad	Ton-ka	Second half of October

Source: Researcher

Spring (Early April to Mid May)

Since the region under study is mostly located on high altitudes true summer is absent here. In early May the lower sections of river valleys experience a little bit of warmer condition. Daytime temperature in this month often exceeds 30°C in the places located below 1500m. Maximum part of a day shows clear weather except at afternoon when the places located in high altitudes are covered with stratocumulus clouds. In spring

season gales often break out the velocities of which exceeds 120km per hour. These gales occasionally associated with heavy thunders (*druk-ke* in Tibetan) which sometimes cause forest fire in the coniferous forest. Sleet occurs towards evening which lowers the temperature of surface air abruptly. In general the weather conditions in spring time remain calm with warm temperature and low relative humidity.

Monsoon (Mid May to Early October)

In May dry environment of the mountainous tract is replaced suddenly by the accumulation of dark cumulonimbus cloud which is pushed by the pre-monsoon winds. It is occurred due to the shift of jet stream beyond the Great Himalayan Axis along with solinoidal field in the troposphere set up over the hot Tibetan landmass lying north of the Himalaya (P. Koteswaram, 1965). Monsoon period or the rainy season last over the tract under study for more than 140 days. With the advent of pure monsoon clouds and associated rains the temperature decreases whereas relative humidity increases enormously and often touches the saturation mark – 100%. Mean daily temperature during this season ranges from 15°C to 20°C in the lower valley sections and from 7°C to 15°C over the ridge tops. The velocity of wind, however, remains moderate throughout the season – 15 to 30 km per hour.

More than 75% of annual precipitation occurs by the spells of monsoon rains. Since the tract is completely devoid any permanent glacier all the rivulets and streams are rejuvenated by the monsoon rains, the solum over the mountain slope is supersaturated, and the arable lands are tilled and sown seeds by the farmers. Due to high altitudinal location most parts of the terrain are cultivated only in this season.

Autumn (Second Half of October)

A very short transitional period between the rainy season and winter, i.e. autumn (*Ton-ka* in Tibetan) is found in the second half of October. It is marked with calm and clear weather with low relative humidity (55% - 65%). Mean daily temperature ranges from 5°C to 12°C in valley sections and much lower above the ridge tops. Precipitation occurs during this time merely in the form of dews in early morning; frost is common along the crest line of the Singalila Range.

The characteristics of the season autumn is somewhat found at the end of monsoon rains (mid October). It is a transitional period when northerly wind replaces the monsoon by driving away the nimbus clouds. Thus a clear and pleasant weather prevails during those days. Though temperature touches the freezing point along the summit line, the mountain slopes and valleys remain much warmer; while relative humidity becomes the most favourable – 55 to 60 percent. Wind speed decreases below 5km per hour.

Winter (November to Early April)

During winter months cultivation is ceased as the temperature drops below 5°C in the valleys, and further below 0°C over the ridge slopes. The summit line stretching from Sandakphu to Singalila Peak often experiences minimum temperature below -15°C. Heavy snowfall (*Gang mang – po* in Tibetan) occurs along this section. Sporadic snows are also found in lower parts – up to 2000m. On account of chill northerly wind blizzards (*Ola* in Nepali and *Oshino* in Tibetan) often break out on the high altitudinal zones. The velocity of a blizzard occasionally exceeds 100 km per hour, causing civic loss frequently and cease to agricultural work even in middle valley section. The effects of large scale snowfall can be found in the following sunny days – through rapid weathering of the surface rock, solifluction on the steep mountain slopes and absolute lowering of temperatures below -20°C on Phalut and Singalila Peaks. Record snowfall occurred in the area under study in 2003 - 2004, 2011-12, 2015-16 and 2018-19. Loss of lives is common around the peak areas during this time, especially among the Yak herders.

Altitude, Vegetation and Climate

As natural vegetations are direct indicators of climate of any place, alpine grasses with sporadic growth of junipers over the Sabarkum and Singalila peaks reveals the Tundra type of climate prevailing over them, while the southern section of the summit line of the Southern Singalila Range along with the uppermost zones of the projected ridges is covered with Firs and stunted Rhododendrons. These types of vegetations may reveal the Cool Temperate Snowy climate existing over the belt. The altitudinal belt lying in between 2600m and 3200m is covered with various types of coniferous forest as well as

large Rhododendrons, Magnolia, Camellia and thickets of Maling Bamboo. This belt experiences Cool Temperate climate (slightly warmer) because relative humidity remains high throughout the year (due to the presence of advection fog as well as katabatic wind having low temperatures).

The slopes of the ridges lying in between 1500m and 2600m are covered with mixed deciduous forest mostly dominated by Oaks, Mapple, Walnut (*Okhre* - Nepali Word) Alder, Laurel, Mountain Figs including Ficus hookeri etc. with thick growth of *Pareng* bamboos. Though winter temperature remain very low, summer day temperature occasionally rise above 22°C. Thus the belt reveals Sub-Tropical climate (cooler than normal) – relative humidity varying widely both by seasonal time and locational factors.

The ridge slopes lying below 1500m as well as the valley floors of the lower Rammam Basin shows a typical Sub-Tropical climate where winter temperature never goes down below 3°C but summer day temperatures often go as high as 30°C. The belt is covered with mixed deciduous forest dominated by Sal, Toon, low altitudinal Bamboos, etc.

Micro-climatic Types after W. Köppen (1918)

W. Köppen first introduced his scheme of climatic classification in the year 1900. He divided the world's climate into five major climatic types following the distribution of flora. The classification scheme uses certain critical values of temperature of the warmest and the coldest month and precipitation of wettest and driest months. His classification was simple, scientific and easy to understand.

From time to time he revised his scheme of climatic classification and in the present paper the scheme proposed by him in the year 1918 has been adopted to classify the climatic types of the study area.

Table 2.3: Climatic Types after W. Köppen

Micro-climate	Characteristic Vegetation	Settlements
Cwam	Sub-Tropical forests dominated by deciduous trees	Goke, Kolbong, Kaijalia, Jhepi, Hatta, Nayabazar, Chumbong, Daramden, etc.
Cwbm	Sub-Tropical forests dominated by conifers	Dhotrey, Rimbick, Rammam, Sirikhola, Bhareng, Ribdi, Okhery, Soreng, etc.
Dwbm	Temperate forests dominated by Rhododendrons	Tonglu
Dwcm	Temperate forests dominated by Firs	Sandakphu
ETm	Tundra	Phalut and Chiabhanjyang

Source: Field Observation, 2017-2021; G.T.Trewartha: An Introduction to Climate (1980). pp. 400-403.

C= Sub-Tropical climate,

D= Cool temperate snowy climate, mean monthly temperature of coldest month >-3°C;

ET= Tundra climate, mean daily temperature of summer months remains between 0°C and 10°C;

w= Dry winter;

a= Mean monthly temperature of the warmest month >22°C;

b=Mean monthly temperature of the warmest month <22°C;

c= Mean monthly temperature of summer months >10°C; and

m= Influenced by monsoon winds.

Climatic factors and Habitation

Due to high relief and ruggedness of the region under study, role of local winds and amount of insolation received by the ground surface are two key factors for the growth of human habitation. The local winds are controlled by the lineation of the mountain ridges and their topography. Since the bare rocks including the grass and bush cover mountain peaks are heated directly during the sunny day time, the adjacent airmass experiences rapid expansion and updraft. In consequence of this the airmass from the down valley section is forced to climb up. It is a typical anabatic wind which becomes prominent in the late hours of a day. Due to higher temperature the wind brings much

comfort for humans as well as other organisms. On the other hand the summit section becomes cool abruptly at night due to direct radiation. The temperature of the adjacent airmass lowers down in the late hours of night, becomes heavy, and begins to flow towards the valleys. It is a typical katabatic wind which causes much discomfort to the organisms. As per S.K. Samanta (2018, p.32) "the upper parts of the range (The Singalila), lying above 2600m, thus shows relatively extreme weather conditions than that of the valley bottoms where the diurnal variation in temperature is moderate. The velocities of anabatic and katabatic winds attain obviously their maximum marks by twilights which may turn into light gales (the velocity varies seasonally) for many times".

The places lying at deep gorge surrounded by steep mountain slopes are affected much more by the katabatic wind which results in inversion of temperature – the condition prevails until the direct sunshine reaches the valley sides. This is one of the main factors which cause the deep valley portions to be remained out of any anthropogenic activities. The upper Rammam valley beyond Gorkhey is the spectacular example of such an uninhabited area.

The amount of insolation fluctuates on the nature of mountain slopes as well as their location. As steep as the slope is the less amount of insolation is received. It is therefore evident that the places having moderate to low gradients are well inhabited. The villages Rammam, Samanden, Daramden and Kolbong are good examples of such places having gradients less than 30°. Even the tiny hamlets over the summit section are grown on such favourable sites. Manedanra is the best example of such hamlet.

The location of mountain slope greatly influences the amount of insolation received by any place. Since the region under study is located little north of the tropic of cancer (3°30′), the slopes extended towards south receive maximum amount of insolation. Most of the villages lying in the region under study have grown on the sunny side of the mountain slopes. Daragaon, Okhery, Namla, Yakreybong (paddy cultivation is practiced at an elevation of 1280m as the place receives maximum insolation due to its sunny side location), Daramden, etc. are examples of such settlemenets. All agricultural lands are also located on these 'adret slopes'. Even paddy fields are found on such location at Yakreybong (Hamlet of Rimbick) and Daramden. On the contrary the ubac sides of the mountain and ridge slopes remain sparsely populated and covered with dense forests.

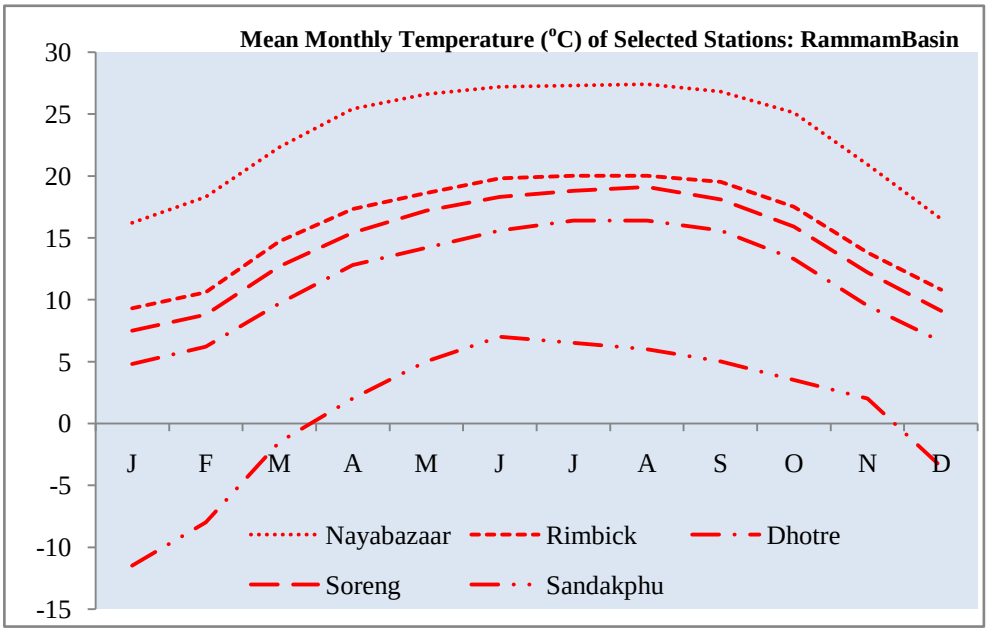


Figure 2.1

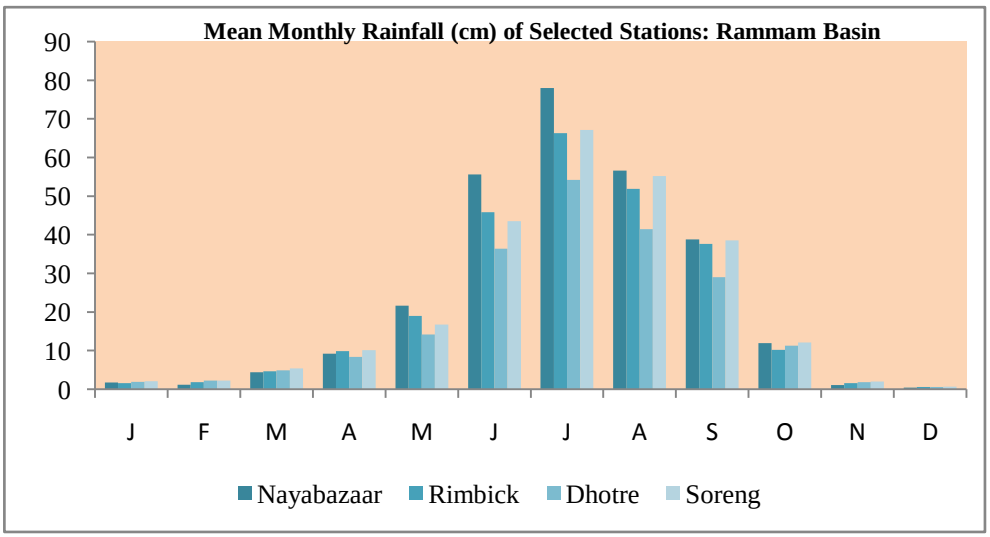
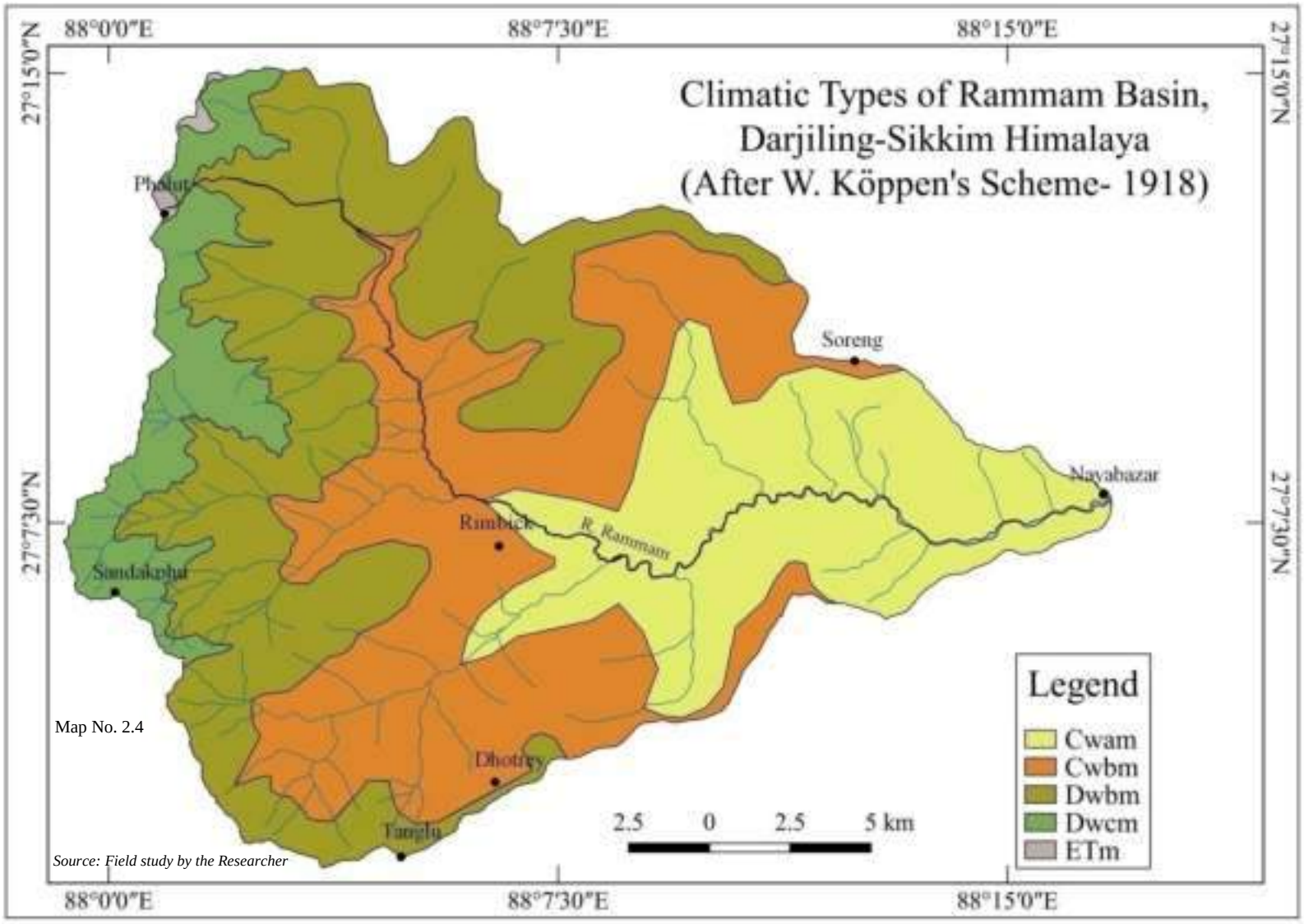


Figure 2.2

Source: https://en.climate-data.org>india& personal observation



Map No. 2.4

Source: Field study by the Researcher

Table 2.4: Mean monthly temperature (^{o}C) of some selected stations in Rammam Basin

Month	J	F	M	A	M	J	J	A	S	O	N	D
Nayabazar	14.2	18.3	22.3	25.4	26.6	27.2	27.3	27.4	26.2	25.1	20.9	16.5
Soreng	7.5	8.8	12.7	15.4	17.2	18.3	18.8	19.1	18.1	15.9	12.2	9.1
Rimbick	9.3	10.6	14.7	17.3	18.6	19.8	20.0	20.2	19.5	17.5	13.8	10.8
Dhotre	4.8	6.2	9.7	12.8	14.2	15.6	16.4	16.4	15.6	13.3	9.5	6.6
Sandakphu	-10.5	-6.0	0.5	2.5	5.5	7.5	6.5	6.0	5.5	4.0	2.5	-3.0
Phalut	-11.5	-8.0	-1.5	2.0	5.0	7.0	6.5	6.0	5.0	3.5	2.0	-3.5

Data source: https://en.climate-data.org>india& personal observation

Table 2.5: Mean monthly rainfall (cm) of some selected stations in Rammam Basin

Month	J	F	M	A	M	J	J	A	S	O	N	D
Nayabazar	1.7	1.2	4.4	9.2	21.6	55.6	78.0	56.6	38.8	11.9	1.1	0.4
Soreng	2.1	2.2	5.4	10.1	16.7	43.5	67.1	55.2	38.5	12.1	2.0	0.7
Rimbick	1.6	1.8	4.6	9.9	19.0	45.8	66.3	51.9	37.6	10.2	1.6	0.6
Dhotre	1.9	2.2	4.9	8.4	14.2	36.4	54.2	41.4	29.0	11.3	1.8	0.6
Sandakphu	Exact data not found											
Phalut	Exact data not found											

Data source: https://en.climate-data.org>india& personal observation

2.6. Soil Types

The cover of solum is an important factor which controls the surface configuration of topography of any region along with its land use system. Though the basin under study is mountainous, almost all parts of the ridges and spurs are covered with soil layers – either with thick or thin horizons. The formation of these soils depends mainly on parent rock as well as local climates. Since the region under study is mostly composed of Archaen gneiss and other metamorphic rocks with granite intrusions the texture of soil varies widely – from fine to very coarse. Due to high percentage of silica and mica, structure of these soils is loose and friable. Along the belts of Permian quartzites and hard sandstones medium grained sandy soils are found. Clay soils are, however, formed where shale and mudstone of Tertiary formation have been exposed (generally between 800m – 1000m altitude). High rate of erosive capacity of the river Rammam and its tributaries causes little amount of soil to be deposited on the valley floors. The constituent materials of the valley floors are coarse grained sand and gravels with mixture of large pebbles and boulders.

Maximum thickness of the soils is found along the river terraces where it often exceeds 80cm. Besides parent rock and local climate, natural vegetation grown over the region is another factor which influences the physico-chemical properties of the soils. The terrain of the Rammam Basin is mostly covered with coniferous forests (to be discussed later). Dead leaves and stems of plants of these forests help 'Podsolization' of soil layers. Thus a special type of soil is developed here which is known as 'Grey Brown Mountain Forest' soil. The deep grey to blakish brown colour of 'A' (zone of eluviation) horizon of this type is due to the presence of mull elements derived from decomposed coniferous vegetation. Low temperature and acidic parent rocks (gneiss, pegmatite and granite) associated with humic acid cause acid leaching below. As a result sesquioxides accumulates in the 'B' horizon, i.e. the zone of illuviation. High percentage of sesquioxides makes the zone lighter in colour – light gray to ash. Calcium, magnesia, potas and nitrogenous compounds are also illuviated in this zone. The colour becomes much lighter in 'C' horizon – the true colour of parent rock.

The pH value of Grey Brown Mountain Forest soil varies from 5.0 to 5.5. The lowest value is found along the belt of firs and pine forests. Thus lowest pH value is found in between 1800m – 2400m altitudes and again in between 3200m – 3600m altitudes. The cover of alpine grasses along the summit line (from Sabarkum to Phalut) reduces the acidity of the solum where pH value is found around 6.0.

2.7. Natural Vegetation

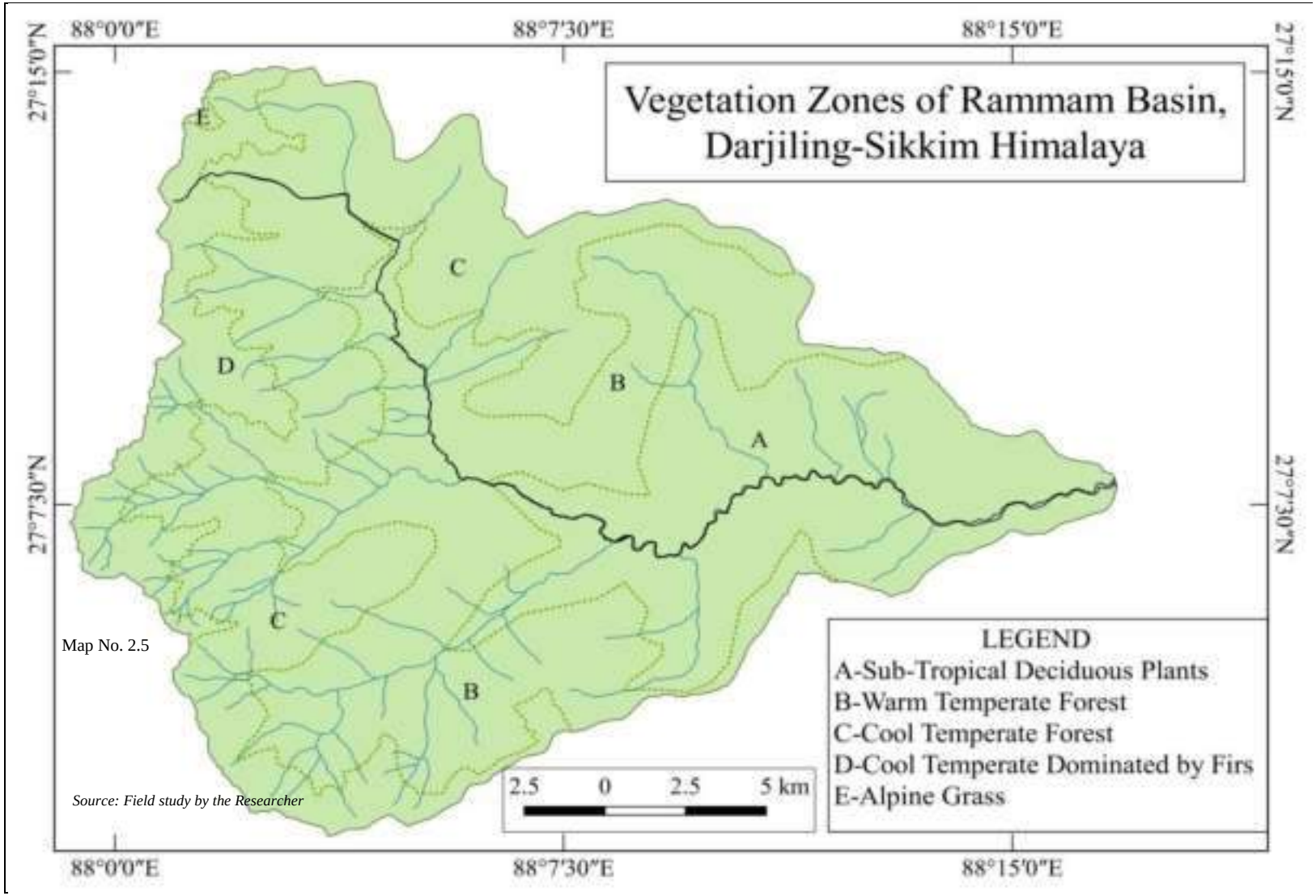
Altitudinal variation is the main factor for growing varied types of natural vegetation all over the hill slopes of the Rammam Basin. The maximum area of the region especially the high altitudinal zones, is covered with dense forests. The highly dissected lower valley sections are also covered with impenetrable jungle and bushes. Since 1986, the western part of the Southern Singalila Range was declared as Singalila National Park. The area joining Tonglu, Sandakphu, Phalut, Gorkhey, Upper Rimbick and Dhotrey belong to this national park area; southern part of which lies outside the Rammam Basin. On the other hand the north-western part of the Northern Rammam Basin, beyond Bhareng, also belongs to reserved forest area – Hilley Reserved Forest. Within and outside the national park and reserved forest areas, micro climatic characteristics play the most important role for the growth of a 'niche' with a particular set of natural vegetation.

According to altitudinal variation the forests and jungles of the Rammam Basin can be divided into the following belts:

A. **Belt of Sub-tropical deciduous plants:** The first belt of forest lies below 1500m. This belt is dominated by sub-tropical deciduous plants which grow as mixed jungles and bushes. Among the large trees growing here are important pine (grnus Pinus), lampati (Duabangasonneratioides), mandani (Acrocarpusfraxinifolius), kadam (Anthocephaluscadamba) and figs (genus Ficus). Tall bamboos cover the steep hill slopes, while scrubs and grasses grow abundantly along the valley sides. Since most parts of this belt are located at the close proximity of settlements, large trees and bamboos are frequently cut down for the construction of houses. Thus patches of bare hill slopes are conspicuous feature just above the river valleys. Extension of arable land also decreases the forest zone along this low lying belt.

B. **Warm temperate forest**: The second belt of forest extends from 1500m to 2400m. This belt is characterized by warm temperate forest which is composed of Oaks (genus Quercus, *banjhi* in Nepali), buk oak (Quercus lamellose, *katus* in Nepali), mountain figs (genus Ficus, khaniun in Nepali), alder (Alnus nepalensis, *uttis* in Nepali), laurel (Machilusgammieana), yew (Taxus baccata, *dhengresalla* in Nepali), walnut (Juglans regia, *okhar* in Nepali), etc. A special type of bamboo with slender but hard stem grows all over the mountain slopes which are known as Pareng in Nepali. Many types of orchids and ferns, including tree fern (Cyathea brunoniana, *uniu* in Nepali) are found abundantly in this belt. The surfaces of the forests are covered with thick layers of lichens, mosses along with lycopodium (Lycopodium clavatum, *nagbeli* in Nepali). This belt is the most affected zone by indiscriminate forest clearing due to the extension of arable lands as well as settlements.

C. **Cool Temperate Forest**: The third belt of forests is little affected by anthropogenic factors due to its extension from 2400m to 3200m. This belt is thus continuous in nature and is dominated by rhododendrons (genus Rhododendron, *gurans* in Nepali). At this altitude these trees attain their maximum height (more than 25m) and are intermingled with other types of large trees such as birch (Betula utilis, *saur* in Nepali), champ (Micheliadoltsopa, *swet champ* in Nepali), maple (Acer caesium, *kapasay* in Nepali), and magnolias (genus Magnolia).



Map No. 2.5

Source: Field study by the Researcher

NATURAL VEGETATION IN RAMMAM BASIN

1. Chhatim tree and tree firn at Rammam Forest; 2. Coniferous Forest at Gorkhey; 3. Dense jungle at Bhareng; 4. Wild Strawberry at Rammam Forest ; 5. Dense Forest at Rammam; 5. Coniferous Forest

Photo Plate 2.1

Source: Researcher

Thick bushes of brambles (family Rosaceae), various types of berries including gooseberries (genus Ribes) are also found in this belt. True coniferous trees like pines (genus Pinus, *dhupi* in Nepali, neet *kung* in Lecha), hemlock (Tsuga dumosa, *semedung* in Lepcha), and larch (Larix griffithiana, *saar* in Lepcha) are also found along this belt but their growth are confined at some ridge slopes depending on local micro climatic factors. Thick growth of mountain bamboos (genus Arundinaria, *maling* in Nepali/Limbu) is also found in this belt whose stems are very thin and soft, generally eaten by red panda. A variety of large fungus (genus Ganoderma) is grown on the stem of large trees and flourishes with their hard, fanshapedmaushrooms. Selected mushrooms are consumed by local people.

D. **Cool Temperate dominated by Firs**: The highest belt of natural vegetation in the Rammam basin lies above 3200m. This belt is dominated by firs (Abies densa, *gobresalla* in Nepali) which is the tallest tree (more than 40m) grown over the tract. The forest of this zone experience Tundra type climate which cause slow growth rate of all plants. The crest line from Sandakphu to Sabarkum shows another growth of plant – stunted rhododendrons (4m to 5m in height). The forests are open type with sparse undergrowths of hydrangea, cyperacea, seidge and aconite. From Sabarkum to Singalila peak the crest line is almost bare; the surface is covered with alpine grasses (genus Poa); junipers (genus Juniperus, *sukpadhup* in Nepali, *chukboo* in Lepcha) grow sporadically over the range and ridges. They generally form patches on the periglacial swamps of the upper parts of the headstreams of the river Rammam.

E. Alpine Grass: Discontinuous patches of Alpine Grass found along the western summit line of the basin. However, the crest of Sabarkum, Phalut and Singalila Peaks are fully covered by this type of vegetation. Due to prolonged cool period on these parts, the grass shows hard blades with lower percent of chlorophylls. Yaks and half wild horses can only consume this type of vegetation.

2.8. Population Distribution and Density

Distribution

The basin under study is divided into two unequal parts namely North Rammam Basin and South Rammam Basin. The area of the North Rammam Basin is 153.1565sq. km., out of which only 76.97 sq. km. of the tract is inhabited; the rest part is covered with

forests. On the other hand the area of the South Rammam Basin is 250.0035 sq. km. out of which 88.31 sq. km. area is inhabited. As said earlier, the basin is at present inhabited by 38 village units of which 19 villages, four Forest Blocks and one Notified Bazar Area, located in the North Rammam Basin and 14 village units in the South Rammam basin. The total population of the basin is 67469 persons; out of which the population of North Rammam basin is 32170 persons and South Rammam basin is 35299 persons. Settlement-wise distributions of population in the North and South Rammam Basin have been tabulated in the table no. 2.7.

The population sizes in the revenue villages vary from 390 at Bhareng to 6968 at Rimbick as per 2011 census. Whereas population of forest blocks in the northern part varies from four persons at Sombaria Forest Block to 36 persons at Hilley Forest Block. The distribution of population in the villages is not uniform. The average size of population for the villages in the South Rammam Basin is 2521 persons whereas the average size is 1340 persons in the North Rammam Basin. The median centre of population in the basin under study is located at Lower Fambong (27° 7′ 25″ N and 88° 10′ 01″ E).

The settlements in the North and South Rammam Basin have been categorized in to six categories on the basis of population size which are as follows:

I. Tiny Settlements (Population upto 100)

Nayabazar Forest Block, Sombaria Forest Block, Soreng Forest Block and Hilley Forest Block belong to this group. All are located in the northern part of the basin and all are forest blocks with very low population below 100 persons.

II. Very Small Settlements (101 - 1000 persons)

Bhareng, Karthok, Siktam, Salyangdang, Lower Fambong in the northern part; and Kolbong and Samalbong in the southern part, are included in this group.

III. Small Settlements (1001 – 2000 persons)

Ribdi, Okhery, Tikpur, Longchok, Dhalam, Rumbuk, Burikhop Rumbuk, Tharpu and Nayabazar (NBA) in northern part; and Singalila Forest, Namla, Jhepi, Lamagaon and Karmi in southern part belong to this group.

IV. Medium Settlements (2001 – 4000 persons)

In the northern part villages under this group, are Upper Fambong, Burikhop Dodok, Timberbong, Malbasey, Chumbong and Soreng whereas in the southern part the villages are Lodhama, Hatta, Kankibong, Kaijalia and Murmidong.

V. Large Settlements (4001 – 6000 persons)

Only one village named Goke, in southern part of the basin, belongs to this group.

VI. Very large Settlements (above 6000 persons)

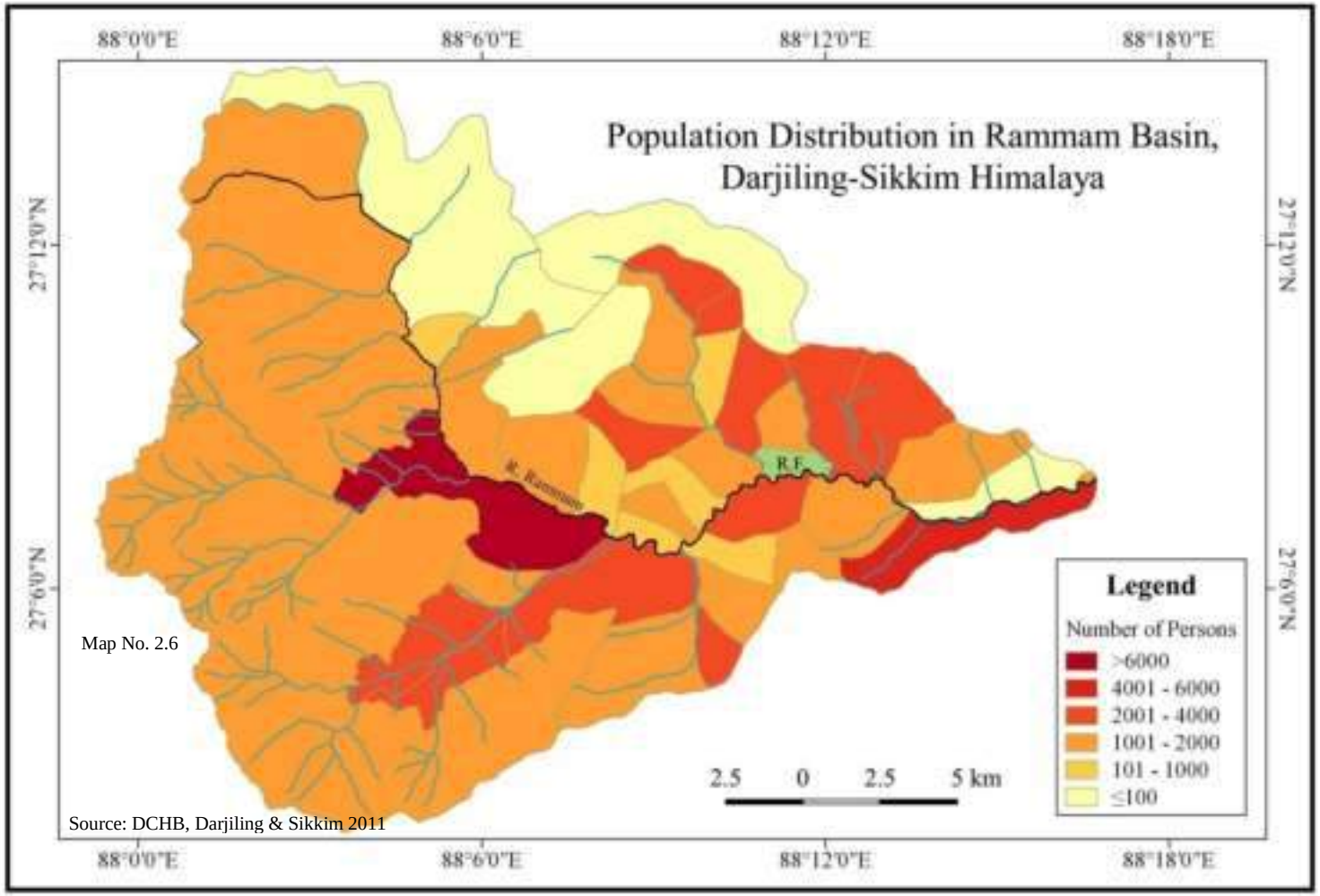
Rimbick village, located in southern part of the basin, belongs to this group.

Table 2.6: Population Size of Settlements in the Rammam Basin

Class	Category	North Rammam		South Rammam	
		No. of Village	%	No. of Village	%
0-100	Tiny	04	10.53	0	0
101-1000	Very Small	05	13.16	02	5.26
1001-2000	Small	09	23.68	05	13.16
2001-4000	Medium	06	15.79	05	13.16
4001-6000	Large	0	0	01	2.63
Above 6000	Very Large	0	0	01	2.63
Total		24	63.16	14	36.84

(Source: Computed by the Researcher on the basis of data of District Census Handbook of Darjiling and Sikkim, 2011)

From the above table it is clear that in terms of population size the villages located in the North Rammam basin are comparatively of smaller sizes than the villages located in the South Rammam basin.



Map No. 2.6

Source: DCHB, Darjiling & Sikkim 2011

Population Density

Population density is the ratio between population size and area of the region. This gives an idea about pressure of population on land. Density of population can be obtained by dividing total population of a place by its area. Population density of the region under study is 167 persons per sq.km which is far less than the population density value of 586 persons per sq. km. for the district of Darjiling, but it is very close to the density value of 117 persons per sq. km. for the district of West Sikkim. It is also low than the density values for India (324 persons/sq.km.), West Bengal (1094 persons/sq.km.) but it is higher than the value for Sikkim (86 persons/sq.km.). Population density in the northern part of the basin is 210 persons per sq. km. whereas the value is 141 persons per sq. km. for the south Rammam basin. The low density of population in the South Rammam basin is the result of existence of Singalila forest covering 167.6907 sq. km area (68.05% area) of the South Rammam basin.

In the North Rammam Basin highest density of population can be found at Nayabazar Notified Bazar Area; the density is 10,739 persons per sq.km. (as per census of India, 2011, when calculated with area of 0.115 sq.km.) whereas lowest density of population can be found at Sombaria Forest Block (1 person in every 3 sq. km.). In the southern part highest density of population can be found at Kaijalia (1177 persons per sq. km.) and lowest density can be found at Singalila forest (10 persons per sq. km.). The table no. 2.7 shows the density of population in the North and South Rammam Basin.

On the basis of density values, the Settlements of Rammam Basin can be categorised into the following six categories:

A. Areas of highly dense population (Population density above 1250 persons per sq. km.)

Nayabazar (NBA) in the northern part with density of 10291 persons per sq.km belong to this group. Nayabazar is a Notified Bazar Area with more than 53 shops, school, police station, petrol pumps, etc. which made it the most densely populated settlement in the North Rammam Basin.

Table No. 2.7: Area, Total Population and Population Density in the Settlements of Rammam Basin

Sl. No.	Part of the Basin	Settlements	Area (sq. km.)	Population	Population Per sq.km.	% of area	% of Population
1	North	Bhareng	1.9439	390	201	0.482	0.578
2		Ribdi	3.5591	1034	291	0.883	1.533
3		Okhery	6.4176	1683	262	1.592	2.494
4		Tikpur	7.2126	1911	265	1.789	2.832
5		Siktam	2.0125	510	253	0.499	0.756
6		Salyangdang	2.1913	963	439	0.544	1.427
7		Longchok	1.7196	1023	595	0.427	1.516
8		Lower Fambong	1.0497	723	689	0.260	1.072
9		Dhalam	2.1726	1886	868	0.539	2.795
10		Upper Fambong	4.1795	2995	717	1.037	4.439
11		Rumbuk	4.2046	1838	437	1.043	2.724
12		BurikhopRumbuk	5.0767	1337	263	1.259	1.982
13		BurikhopDodaak	7.7962	2167	278	1.934	3.212
14		Karthok	2.558	619	242	0.634	0.917
15		Timberbong	4.5658	2156	472	1.133	3.196
16		Tharpu	1.7986	1117	621	0.446	1.656
17		Soreng	5.9041	3818	647	1.464	5.659
18		Malbasey	6.5624	2888	440	1.628	4.280
19		Chumbong	6.0017	1796	299	1.489	2.662
20		Nayabazar	0.12	1235	10291	0.029	1.830
21		Nayabazar Forest Block	10.51	13	1	2.607	0.019
22		Soreng Forest Block	22.11	28	1	5.484	0.042
23		Sombaria Forest Block	12.17	4	0	3.019	0.006
24		Hilley Forest Block	31.32	36	1	7.769	0.053
25	South	Singalila Forest	167.6907	1632	10	41.594	2.419
26		Rimbick	14.78	6980	472	3.666	10.345
27		Namla**	2.3067	1093	474	0.572	1.620
28		Lodhama**	5.5968	2600	465	1.388	3.854
29		Hatta	4.7591	3436	722	1.180	5.093
30		Kankibong	10.623	3765	354	2.635	5.580
31		Jhepi	4.7753	1576	330	1.184	2.336
32		Lamagaon*	5.33	1660	311	1.322	2.460
33		Kaijalia*	2.59	3049	1177	0.642	4.519
34		Samalbong*	7.0937	660	93	1.760	0.978
35		Kolbong	2.9178	885	303	0.724	1.312
36		Murmidong	4.2572	2181	512	1.056	3.233
37		Karmi	8.5632	1012	118	2.124	1.500
38		Goke*	8.72	4770	547	2.163	7.070
Rammam Basin			**403.16**	**67469**	**168**	**100**	**100**
North Rammam Basin			**153.1565**	**32170**	**210**	**37.99**	**47.68**
South Rammam Basin			**250.0035**	**35299**	**141**	**62.01**	**52.32**

Source: District Census Hndbook, Darjiling and Sikkim, 2011

(*Settlements partly under the basin; ** Data of these two Settlements differ from the census data, 2011)

B. Areas of dense population (Population density from 1001 to 1250 persons per sq. km.)

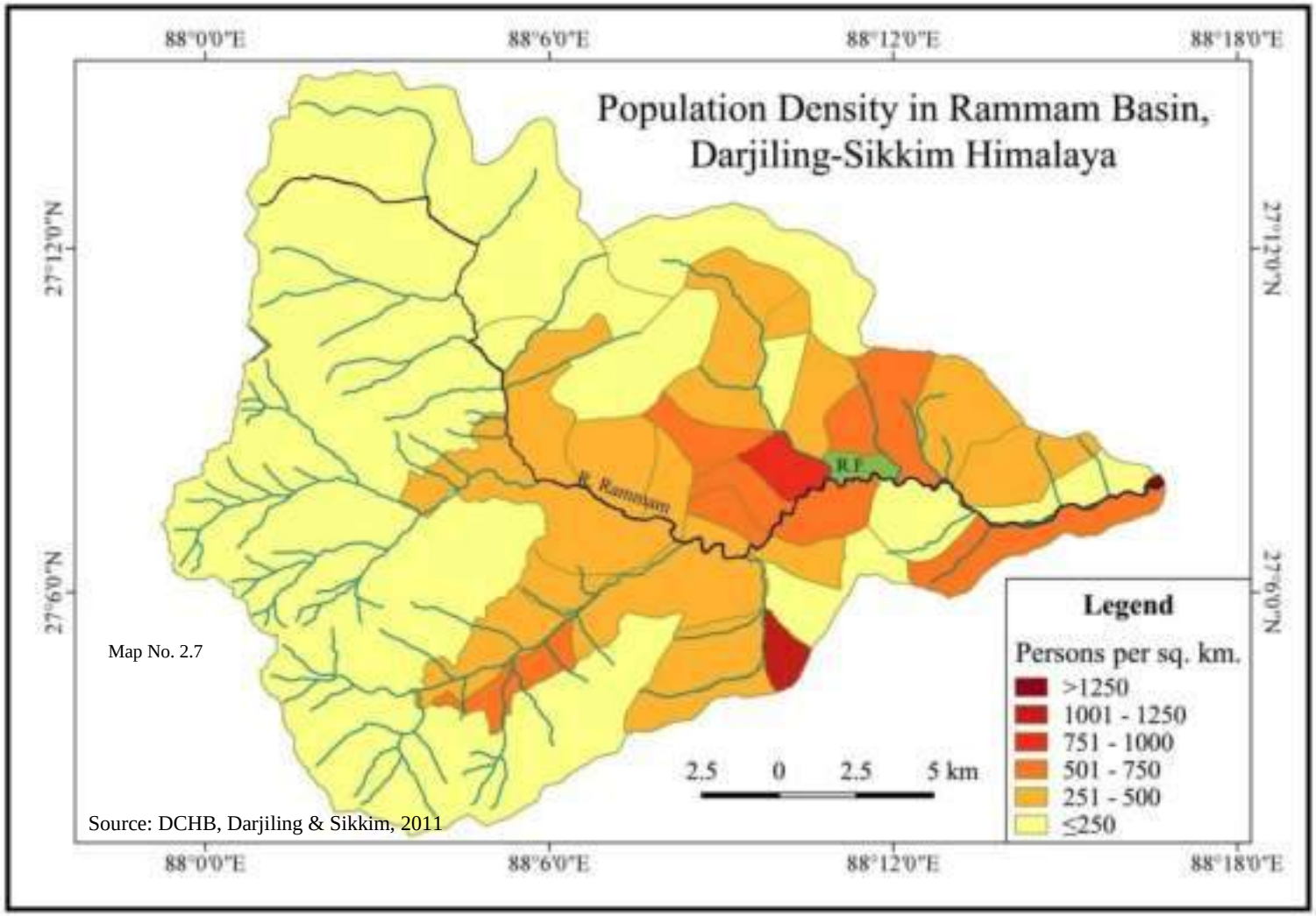
Kaijalia, in the southern part, with density of 1177 persons per sq.km, falls in this group. In the South Rammam Basin, Kaijalia is located at the favourable mountain gap (*Bhanjyang*) between Deorali danra and the Samalbong danra which connects Little Rangit Basin with the South Rammam Basin. The settlement has permanent market, school, post office and other civic amenities. It is well connected to the whole part of the South Rammam Basin.

C. Areas of fairly dense population (Population density from 751 to 1000 persons per sq. km.)

Dhalam in the northern part of the basin is the only settlement falling under this group. The population density of this settlement is 868 persons per sq. km. This is the only settlement in the basin characterised by less rugged topography, presence of broad and wide extensive flat terraces for the development of agriculture and homesteads, improved road condition, better connectivity and the location at the central part of the basin. All these favourable conditions have led to the dense population in the village.

D. Areas of moderate density (Population density from 501 to 750 persons per sq. km.)

Longchok, Lower Fambong, Upper Fambong, Tharpu, and Soreng in the northern part; and Goke, Murmidong and Hatta in the southern part belong to this group. In the northern part, this belt is lying at the middle of the basin and the moderate density of population is the reflection of the presence of various favourable physical, social and economic conditions in this belt. This part of the tract is characterised by less rugged topography, better road network and connectivity to the rest part of the basin due to location at the middle of the basin. Thus, these settlements are more suitable for establishments of various government offices, markets and other civic amenities. The famous Sombaria hamlet (Hamlet of Upper Fambong) is located in this zone. Agriculture is also developed in this belt. Besides, the basin is also connected to the South Rammam Basin through Salyangdang which has made this part of the basin more accessible. All the above mentioned favourable conditions have been reflected in the density pattern of population in this belt. In the southern part, Goke, Murmidong and Hatta are located sporadically in the tract. Moderate density in these villages is solely the result of agricultural development in these villages.



Map No. 2.7

Source: DCHB, Darjiling & Sikkim, 2011

E. Areas of low density (Population density from 251 to 500 persons per sq. km.)

Ribdi, Okhery, Siktam, Tikpur, Salyangdang, Rumbuk, Burikhop Rumbuk, Burikhop Dodok, Timberbong, Malbasey and Chumbong in the northern part; and Rimbick, Namla, Lodhama, Kankibong, Jhepi, Lamagaon and Kolbong in the southern part, belong to this group. In the northern part, the settlements in this group are located on the forest margins girdling the zone of settlements with moderate density of population. Thus these settlements are located in between the belt of moderately dense population (between 500 persons to 750 persons per sq. km**)** and the settlements with very low density (density upto 250 persons per sq. km.). Relatively high altitude, less favourable topography, location at the forest margins, less developed road network and less connectivity have resulted in low population density in these villages. In the southern part, all the settlements except Hatta and Singalila Forest on the western part of Jhepi khola and only Kolbong in the eastern part of Jhepi khola belong to this group. These settlements are characterised by rugged topography, less accessibility and other unfavourable conditions leading to low density of population.

F. Areas of very low density (Population density upto 250 persons per sq. km.)

All the forest villages such as Hilley F.B, Sombaria F.B., Soreng F.B. and Nayabazar F.B. in the northern part; and Singalila forest in the southern part belong to this group. These settlements are located at periphery of the North and South Rammam basin and all are forest villages; as a result the density of population is very low (less than 10 persons per sq. km) in these villages.

Karthok in the northern part; and Samalbong and Karmi in the southern part are the only revenue villages belonging to this group. Though these villages are in the same group with the forest villages but the population density is ten times higher in these revenue villages. Very low density in these revenue villages may be attributed to ruggedness of the topography, unfavourable physical condition, less developed road network, etc.

2.9. Population Composition

2.9.1. Rural and Urban Composition

The Rammam basin is completely rural in its personality. Out of 38 settlement units in the basin 37 units are rural in nature and only one unit is urban i.e. Nayabazar in the

North Rammam basin. Nayabazar is a Notified Bazar Area with total population of 1235 persons as per 2011 census. The percentage of rural population is 98.17 per cent whereas the percentage for urban population is only 1.83 per cent as per 2011 census. The percentage of rural population in the Basin is far higher in comparision to the percentage of rural population in India (68.84%) and the percentage of rural population living in Darjiling district (60.58%) but it is quite close to the values of the state of Sikkim (74.85%) and to West District of Sikkim (96.15%) as per 2011 census. If the northern and southern parts of the Basin are considered then the South Rammam Basin is 100 per cent rural whereas the North Rammam Basin is 96.16 per cent rural and 3.84 per cent urban in terms of population.

Rural Population

Total rural population is 66,234 (98.17%) inhabited in 403.04 sq. km. (99.97%) area. The rural population is dispersed in 37 villages of the Basin. The density of rural population is 164 persons per sq. km. which is similar to the density of West District of Sikkim (117 persons per sq. km.).

As the basin under study is completely rural in nature, so the distribution pattern of rural population is similar to the general distribution pattern of population of the basin.

Urban Population

Total urban population is 1235 persons, confined to only one Notified Bazar Area of Nayabazar located in North Rammam Basin. The per cent of urban population is 1.83 per cent confined to only 0.03 per cent area (0.12 sq. km area) with population density of 10291 (or 10739 persons per sq. km. as per census) persons per sq. km. This percentage of urban population is similar to the percentage of urban population in the West District (3.85 per cent) of Sikkim but is far less than the national average of 31.16 per cent of urban population for India.

2.9.2. Sex Ratio

Sex Ratio is defined as the number of females per 1000 males in the population. The Sex ratio of Rammam Basin is 958 females per 1000 males which is higher than the value of 940 females per 1000 males for India, but is less than the figure of 970 females per 1000 males for Darjiling in 2011. The figure for West District (District-wise highest

sex ratio in Sikkim) of Sikkim is 942 per 1000 male as per 2011 census. The sex ratio of Soreng Sub-division is highest in the state of Sikkim which is 959 females per 1000 males. In the North Rammam Basin, sex ratio is 967 females per 1000 males whereas in South Rammam Basin the ratio is 950 females per 1000 males.

Sex ratio of a region is determined by various socio-economic and demographic characteristics of the region. Over the region there is disparity in sex ratio as the ratio varies from '0' at Sombaria Forest Block to 1120 females per 1000 males at Bhareng village (both located in North Rammam Basin). On the basis of variations in sex ratio the villages can be divided into the following categories:

1. Very High Sex Ratio (above 1050 females per 1000 males)

Bhareng is the only settlement in this group.

2. High Sex Ratio (1001- 1050 females per 1000 males)

Okhery, Longchok and Dhalam of North Rammam Basin; and Kaijalia of South Rammam Basin fall in this category where numbers of females exceed number of males.

3. Moderately High Sex Ratio (951-1000 females per thousand males)

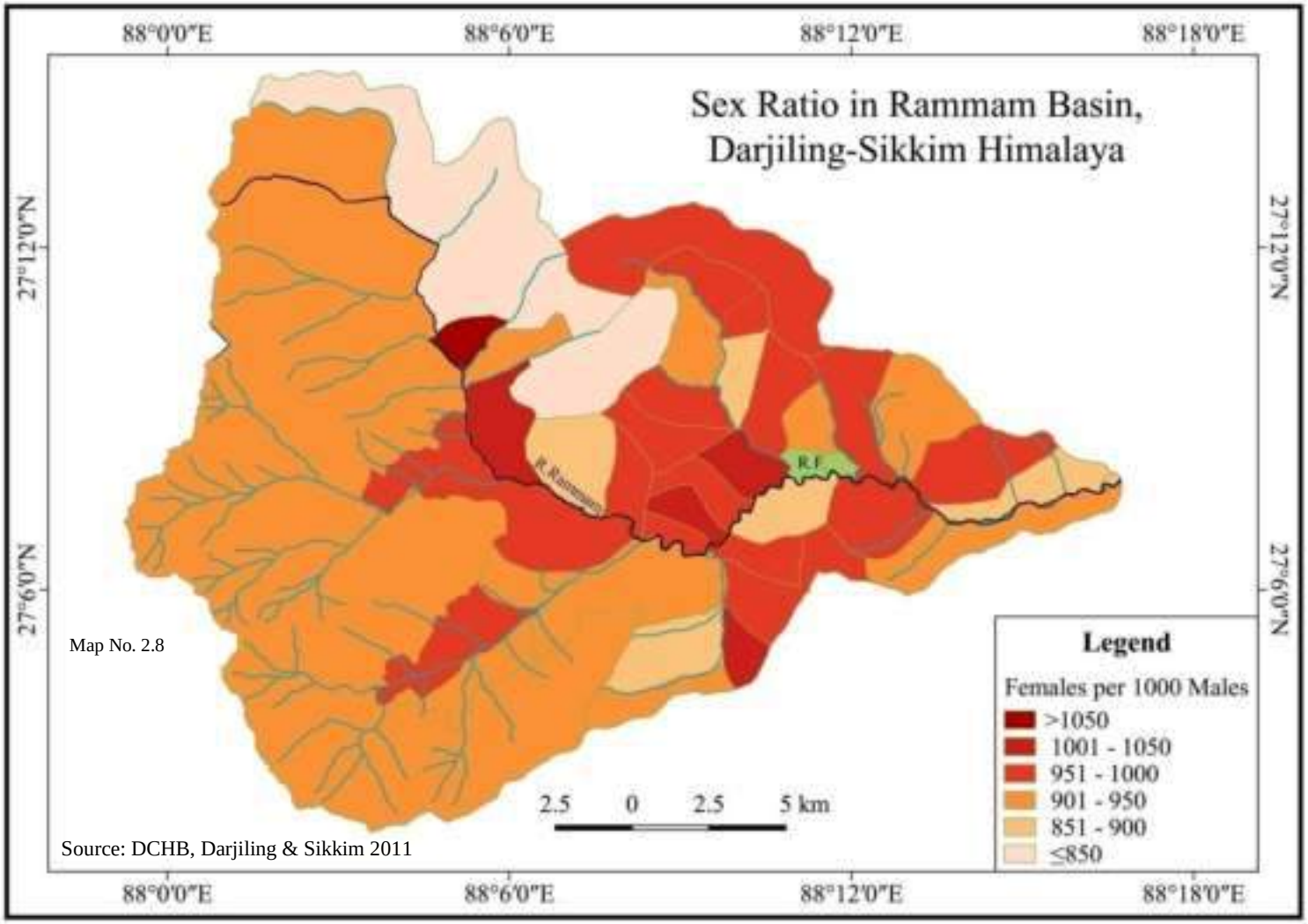
Siktam, Salyabgdang, Upper Fambong, Lower Fambong, Rumbuk, Burikhop Dodok, Timberbong, Soreng, Chumbong and Soreng Forest Block in the North Rammam Basin; and Rimbick, Lodhama, Samalbong, Kolbong and Karmi in the South Rammam Basin are settlements under this category.

4. Moderate Sex Ratio (901-950 females per 1000 males)

Ribdi, Burikhop Rumbuk, Tharpu and Malbasey in the North Rammam Basin; and Singalila Forest, Namla, Hatta, Kankibong, Lamagaon and Goke fall in this group.

5. Low Sex Ratio (851-900 females per 1000 males)

Tikpur, Karthok, Nayabazar (NBA) and Nayabazar Forest Block in the northern part; and Jhepi and Murmidong in the southern part belong to this group.



Map No. 2.8

Source: DCHB, Darjiling & Sikkim 2011

Table No. 2.8: Male, Female Population and Sex Ratio in the Rammam Basin

Sl.No.	Part of the Basin	Settlement	Total Population	Male	%	Female	%	Sex Ratio
1	North Rammam Basin	Bhareng	390	184	47.18	206	52.82	1120
2		Ribdi	1034	535	51.74	499	48.26	933
3		Okhery	1683	821	48.78	862	51.22	1050
4		Tikpur	1911	1019	53.32	892	46.68	875
5		Siktam	510	260	50.98	250	49.02	962
6		Salyangdang	963	488	50.67	475	49.33	973
7		Longchok	1023	509	49.76	514	50.24	1010
8		Dhalam	1886	921	48.83	965	51.17	1048
9		Timberbong	2156	1078	50.00	1078	50.00	1000
10		Upper Fambong	2995	1506	50.28	1489	49.72	989
11		Lower Fambong	723	365	50.48	358	49.52	981
12		BurikhopRumbuk	1337	690	51.61	647	48.39	938
13		BurikhopDodaak	2167	1084	50.02	1083	49.98	999
14		Tharpu	1117	584	52.28	533	47.72	913
15		Soreng	3818	1937	50.73	1881	49.27	971
16		Malbasey	2888	1481	51.28	1407	48.72	950
17		Chumbong	1796	909	50.61	887	49.39	976
18		Rumbuk	1838	936	50.92	902	49.08	964
19		Karthok	619	333	53.80	286	46.20	859
20		Nayabazar (NA)	1235	656	53.12	579	46.88	883
21		Nayabazar Forest Block	13	7	53.85	6	46.15	857
22		Soreng Forest Block	28	14	50.00	14	50.00	1000
23		Sombaria Forest Block	4	4	100.00	0	0.00	0
24		Hilley-Varsey Forest Block	36	31	86.11	5	13.89	161
25	South Rammam Basin	Singalila Forest	1632	842	51.59	790	48.41	938
26		Rimbick	6980	3544	50.77	3436	49.23	970
27		Namla**	1093	570	52.15	523	47.85	918
28		Lodhama**	2600	1309	50.35	1291	49.65	986
29		Hatta	3436	1799	52.36	1637	47.64	910
30		Kankibong	3765	1949	51.77	1816	48.23	932
31		Jhepi	1576	832	52.79	744	47.21	894
32		Lamagaon*	1660	852	51.33	808	48.67	948
33		Kaijalia*	3049	1497	49.10	1552	50.90	1037
34		Samalbong*	660	333	50.45	327	49.55	982
35		Kolbong	885	445	50.28	440	49.72	989
36		Murmidong	2181	1174	53.83	1007	46.17	858
37		Karmi	1012	509	50.30	503	49.70	988
38		Goke*	4770	2455	51.47	2315	48.53	943
Rammam Basin			**67469**	**34462**	**51.08**	**33007**	**48.92**	**958**
North Rammam Basin			**32170**	**16352**	**50.83**	**15818**	**49.17**	**967**
South Rammam Basin			**35299**	**18110**	**51.30**	**17189**	**48.70**	**949**

Source: District Census Handbook, Darjiling and Sikkim, 2011

(*Settlements partly under the basin; ** Data of these two settlements differ from the census data, 2011)

6. Very low Sex Ratio (upto 850 females per 1000 males)

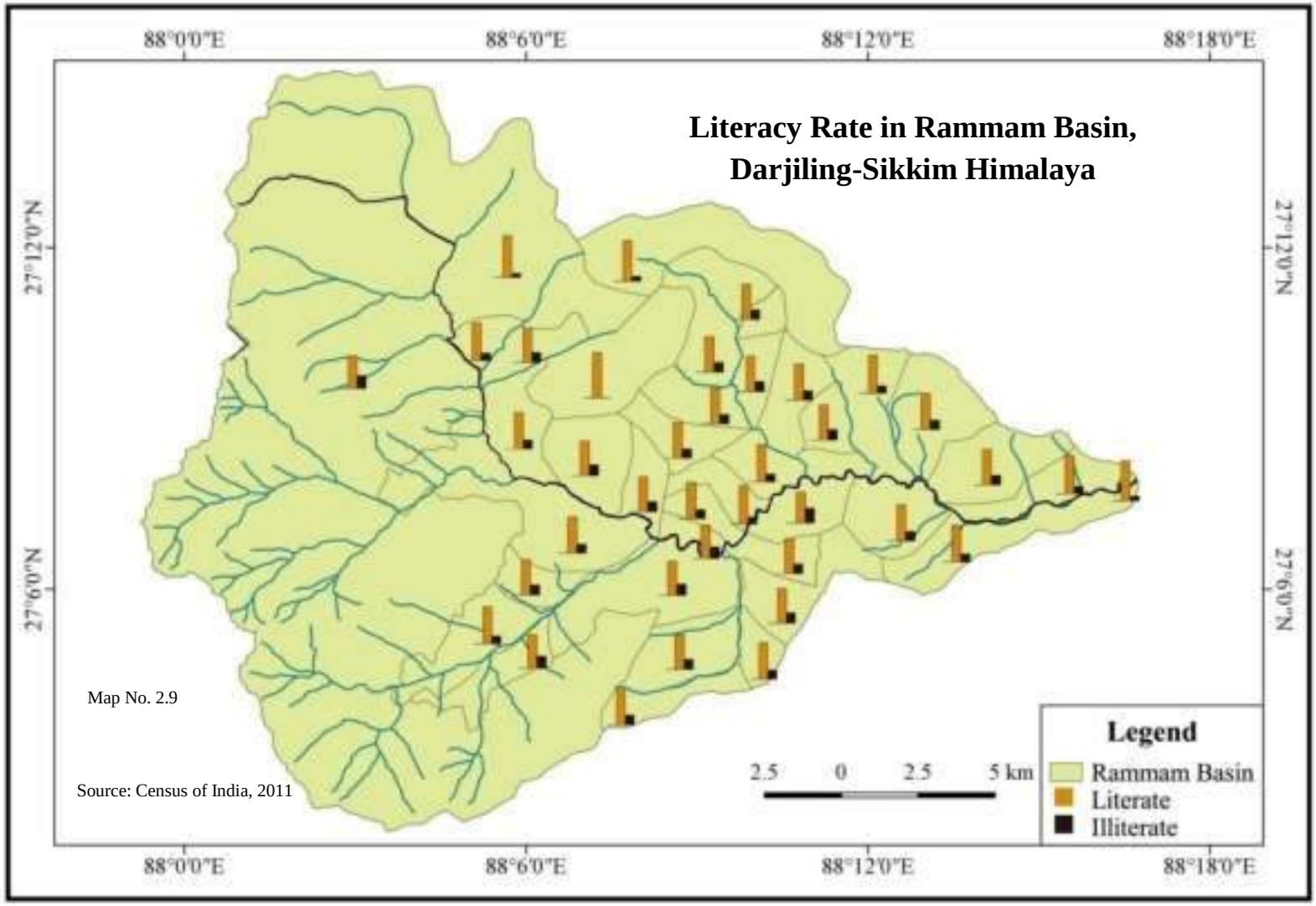
Only Sombaria Forest Block and Hilley Forest Block of North Rammam Basin belong to this group. Both these are forest blocks with no female at Sombaria F.B. and only 161 female per 1000 males at Hilley F.B.

2.9.3. Literacy Rate of Population

As per Census of India, 2011 "A person aged 7 years and above who can both read and write with understanding in any language is taken as literate". The basin under study as a whole has Crude Literacy Rate of 70.85 per cent which is higher than the national average of 64.32 per cent. The Crude Literacy Rate for the Northern part of the basin is 71.95 per cent whereas for southern part of the basin the figure is 69.86 per cent. The Crude Literacy Rate for the rural part is 70.70 per cent whereas for urban part the rate is 79.19 per cent. The Crude Literacy Rates have been calculated with respect to total population. If the population under '0-6' age group is excluded from total population then the Effective Literacy Rate for the Rammam Basin is 79.06% which is above the national average of 74.04%. For North Rammam Basin the figure is 80.24% and for South Rammam Basin, the figure is 77.99%. There are variations in the literacy rates of the villages of Rammam basin. The highest literacy rate in the basin can be found at Sombaria Forest Block (100%) and if the forest blocks are excluded then highest literacy rate is found at Bhareng (83.63%). Lowest literacy rate is found at Murmidong (67.66%).

2.9.4. Caste Composition of Population

As per census of India, 2011, the population of the Rammam Basin belongs to three caste categories as SC, ST and Other. The percentage share of SC, ST and Other caste population in the basin are 4.10%, 38.60% and 57.30% respectively. Thus the basin as a whole is dominated by population belonging to Other caste categories followed by population belonging to ST and SC category.The percentage share of SC population in the basin as a whole is very low and the settlement-wise distribution (Table No. 2.10) also shows that there are four settlements (three in northern part and one in the southern part) in the basin which are completely devoid of any SC population. Though, in case of ST and Other caste populations the lowest percentages found in the settlements of the basin are 9.14% (at Salyangdang) and 9.98% (at Okhery) respectively.


Literacy Rate in Rammam Basin,
Darjiling-Sikkim Himalaya
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88°12'0"E
88°18'0"E
27°12'0"N
27°6'0"N
Map No. 2.9
Source: Census of India, 2011
2.5 0 2.5 5 km
Legend
Rammam Basin
Literate
Illiterate

Table No. 2.9: Literacy Rate in the Rammam Basin

Sl. No.	Part of the Basin	Settlements	Total Population	Population (0-6 age group)	Total Population (excl. 0-6 age group)	Literate	Crude LiteracyRate in %	Effective Literacy Rate in %
1	North	Bhareng	390	54	336	281	72.05	83.63
2		Ribdi	1034	124	910	702	67.89	77.14
3		Okhery	1683	171	1512	1216	72.25	80.42
4		Tikpur	1911	199	1712	1303	68.18	76.11
5		Siktam	510	55	455	351	68.82	77.14
6		Salyangdang	963	98	865	638	66.25	73.76
7		Longchok	1023	109	914	730	71.36	79.87
8		Dhalam	1886	181	1705	1408	74.66	82.58
9		Timberbong	2156	234	1922	1520	70.5	79.08
10		Upper Fambong	2995	297	2698	2285	76.29	84.69
11		Lower Fambong	723	82	641	508	70.26	79.25
12		BurikhopRumbuk	1337	104	1233	971	72.63	78.75
13		BurikhopDodaak	2167	216	1951	1522	70.24	78.01
14		Tharpu	1117	119	998	767	68.67	76.85
15		Soreng	3818	368	3450	2877	75.35	83.39
16		Malbasey	2888	314	2574	2044	70.78	79.41
17		Chumbong	1796	202	1594	1249	69.54	78.36
18		Rumbuk	1838	188	1650	1302	70.84	78.91
19		Karthok	619	69	550	426	68.82	77.45
20		Nayabazar	1235	136	1099	978	79.19	88.98
21		Nayabazar FB	13	1	12	10	76.92	83.33
22		Soreng FB	28	0	28	25	89.29	89.29
23		Sombaria FB	4	0	4	4	100	100.00
24		Hilley-Varsey FB	36	3	33	30	83.33	90.91
25	South	Singalila Forest	1632	189	1443	1033	63.3	71.59
26		Rimbick	6980	659	6321	5137	73.60	79.69
27		Namla**	1093	112	981	761	69.62	77.57
28		Lodhama**	2600	232	2368	1995	76.73	84.25
29		Hatta	3436	384	3052	2245	65.34	73.56
30		Kankibong	3765	441	3324	2505	66.53	75.36
31		Jhepi	1576	168	1408	1088	69.04	77.27
32		Lamagaon*	1660	132	1528	1198	72.17	78.40
33		Kaijalia*	3049	288	2761	2213	72.58	80.15
34		Samalbong*	660	62	598	460	69.70	76.92
35		Kolbong	885	77	808	630	71.19	77.97
36		Murmidong	2181	298	1883	1274	58.41	67.66
37		Karmi	1012	124	888	703	69.47	79.17
38		Goke*	4770	573	4197	3419	71.68	81.46
Rammam Basin			**67469**	**7137**	**60466**	**47808**	**70.85**	**79.06**
North Rammam Basin			**32170**	**3324**	**28846**	**23147**	**71.95**	**80.24**
South Rammam Basin			**35299**	**3813**	**31620**	**24661**	**69.86**	**77.99**

Source: District Census Hndbook, Darjiling and Sikkim, 2011

(*Settlements partly under the basin; ** Data of these two settlements differ from the census data, 2011)

*Crude Literacy Rate – Number of Literate Population*100/Total population*

*Effective Literacy Rate - Number of Literate Population aged 7 and above*100/Population Aged 7 and above*

Table No. 2.10: Caste Composition in theRammam Basin

Sl. No.	Part	Settlements	SC	%	ST	%	Others	%	Total Population
1	NORTH RAMMAM BASIN	Bhareng	05	1.28	292	74.87	93	23.85	390
2		Ribdi	34	3.29	730	70.60	270	26.11	1034
3		Okhery	70	4.16	1445	85.86	168	9.98	1683
4		Tikpur	3	0.16	1135	59.39	773	40.45	1911
5		Siktam	96	18.82	194	38.04	220	43.14	510
6		Salyangdang	62	6.44	88	9.14	813	84.42	963
7		Longchok	47	4.59	360	35.19	616	60.22	1023
8		Dhalam	242	12.83	563	29.85	1081	57.32	1886
9		Timberbong	79	3.66	738	34.23	1339	62.11	2156
10		Upper Fambong	173	5.78	1737	58.00	1085	36.23	2995
11		Lower Fambong	0	0.00	611	84.51	112	15.49	723
12		BurikhopRumbuk	05	0.37	313	23.41	1019	76.22	1337
13		BurikhopDodaak	226	10.43	689	31.80	1253	57.82	2167
14		Tharpu	134	12.00	376	33.66	607	54.34	1117
15		Soreng	100	2.62	1490	39.03	2228	58.36	3818
16		Malbasey	86	2.98	680	23.55	2122	73.48	2888
17		Chumbong	38	2.12	428	23.83	1330	74.05	1796
18		Rumbuk	68	3.70	1151	62.62	619	33.68	1838
19		Karthok	9	1.45	234	37.80	376	60.74	619
20		Nayabazar	81	6.56	181	14.66	973	78.79	1235
21		Nayabazar FB	0	0.00	4	30.77	9	69.23	13
22		Soreng FB	5	17.86	15	53.57	8	28.57	28
23		Sombaria FB	0	0.00	2	50.00	2	50.00	4
24		Hilley-Varsey FB	4	11.11	19	52.78	13	36.11	36
25	S. RAMMAM BASIN	Singalila Forest	7	0.43	1039	63.66	586	35.91	1632
26		Rimbick	242	3.47	2150	30.80	4588	65.73	6980
27		Namla**	96	3.21	1603	53.63	1290	43.16	2989
28		Lodhama**	1	0.14	235	33.43	467	66.43	703
29		Hatta	85	2.47	1390	40.45	1961	57.07	3436
30		Kankibong	80	2.12	1538	40.85	2147	57.03	3765
31		Jhepi	106	6.73	543	34.45	927	58.82	1576
32		Lamagaon*	63	2.40	1530	58.17	1037	39.43	2630
33		Kaijalia*	88	2.12	1092	26.31	2970	71.57	4150
34		Samalbong*	48	2.31	876	42.18	1153	55.51	2077
35		Kolbong	16	1.81	352	39.77	517	58.42	885
36		Murmidong	38	1.74	819	37.55	1324	60.71	2181
37		Karmi	00	0.00	297	29.35	715	70.65	1012
38		Goke*	646	7.10	2125	23.35	6329	69.55	9100

Source: District Census Handbook, Darjiling and Sikkim, 2011

(*on the basis of data of whole settlement, though the settlements are partly under the basin; ** Calculated on the basis census data)

The highest percentage share of SC, ST and Other Caste population in the villages of the basin are 18.82% (at Siktam), 85.86% (at Okhery) and 84.42% (at Salyangdang) respectively.The table below represents the descriptive statistics of the Caste Composition of population of the Basin:

Table 2.11: Descriptive Statistics of the Settlement-wise Percentage Share of Various Caste Categories in the Rammam Basin

Descriptive statistics	SC Population (%)	ST Population (%)	Other Caste population (%)
Mean	4.43	42.39	53.17
Standard Deviation	4.76	18.21	18.17
Maximum Value	18.82	85.86	84.42
Minimum Value	0	9.14	9.98
Range	18.82	76.72	74.44

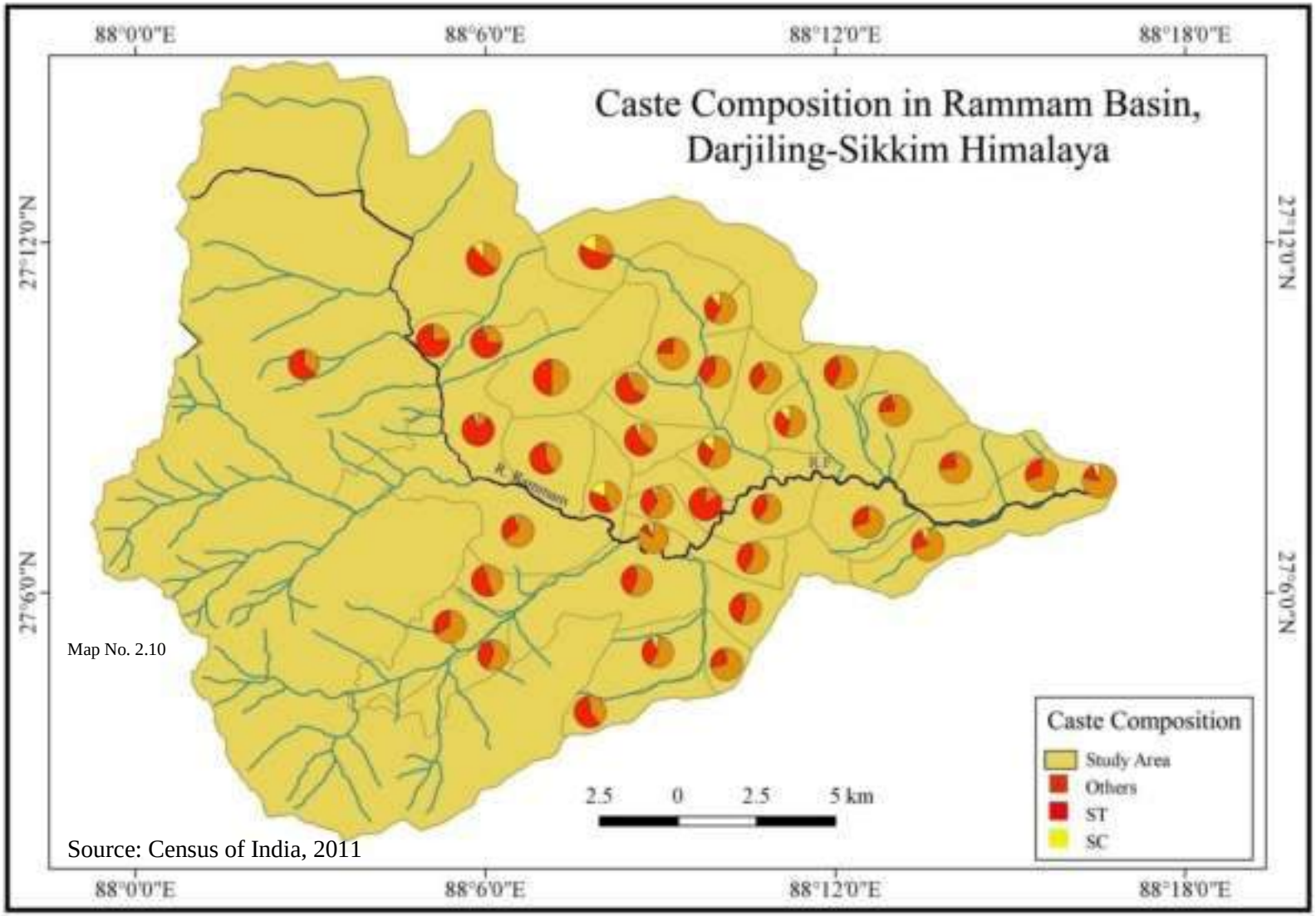
(Source: Computed by the Researcher on the basis of data of District Census Handbook of Darjiling and Sikkim, 2011)

Settlements dominated by ST population

Bhareng, Ribdi, Okhery, Tikpur, Upper Fambong, Rumbuk, Lower Fambong, Hilley F.B., Sombaria F.B. and Soreng F.B. in the northern part; and Singalila Forest, Namla and Lamagaon in the Southern part of the basin are dominated by ST population. Except Lower Fambong and Lamagaon, all ST dominated settlements are located above 1500m contour line. The mean percentage of ST population distributed in the settlements of the basin is 42.39%.

Settlements dominated by Others Population

Siktam, Salyangdang, Longchok, Daramden, Burikhop-Rumbuk, Burikhop-Dodok, Karthok, Timberbong, Tharpu, Soreng, Malbasey, Chumbong, Nayabazar F.B. and Nayabazar (NBA) in the North Rammam Bassin; and Rimbick, Lodhama, Hatta, Kankibong, Jhepi, Kaijalia, Samalbong, Kolbong, Murmidang, Karmi and Goke in the South Rammam Basin are dominated by population belonging to Other Castes. The percentage share of population belonging to Other castes increases with decreasing altitude. Thus, there is a negative correlation between distribution of population belonging to Other castes and altitude in the Rammam Basin. The mean percentage of Other castes population distributed in the settlements of the basin is 53.17%.



Map No. 2.10

Source: Census of India, 2011

Settlements with SC population

There are some settlements in the basin where a small proportion of SC population can be seen; these are Hilley Forest Block, Sombaria Forest Block, Ribdi, Okhery, Siktam, Salyangdang, Longchok, Daramden, Upper Fambong, Rumbuk, Burikhop Dodok, Timberbong, Tharpu, Soreng, Malbasey and Nayabazar NBA in the northern part; and Rimbick, Namla, Hatta, Kankibong, Jhepi, Kaijalia, Samalbong and Goke in the southern part of the Basin. Very small percentages of SC population inhabit these settlements; the per cent value ranging between 0.16% at Tikpur to 18.82% at Siktam. The mean percentage of SC population distributed in the basin is 4.43%.

Ethnic Groups and Cultural Traits of the people

The Basin under study is inhabited by people belonging to the following ethnic groups:

Sherpa (ST) - The Sherpa is one of the few communities who live in high altitudinal zones of the Himalayan mountain system. They are well adapted to the cold and harsh climate of their homelands. For hundreds of years they have been able to use the natural wealth of their local habitat in the best possible way. In the study area the Sherpas live above the elevation of 2200m encompassing the area located in the Southern Singalila Range. The settlements dominated by them are scattered in twelve hamlets of the Singalila forest, the largest forest-clad terrain of the Basin. Most of the Sherpa population residing in the region is still adhered to their conventional occupation i.e. rearing of yak and other bovine animals and making milk products from their domestic creatures. Besides these they also practise farming in their small landholdings mainly for subsistence purpose. Now-a-days they have also engaged themselves in tourism and other tertiary jobs.

Lepcha (ST) – The word Lepcha has originally been derived from the word 'Lapchey' the name used by the Nepali settlers **(**Tamlong, 2008). The Britishers couldn't utter the word 'Lapchay', and started to use the word 'Lepcha'. The Lepchas call themselves 'Mutanchi-Rongkup-Rumkup' meaning 'Children of Rong and God'. According to D. T. Tamlong (2008), "Prior to the advent of Tibetans in the 17th century or before, Lepchas were the masters of their own destiny in their own country, Mayel Lyang".

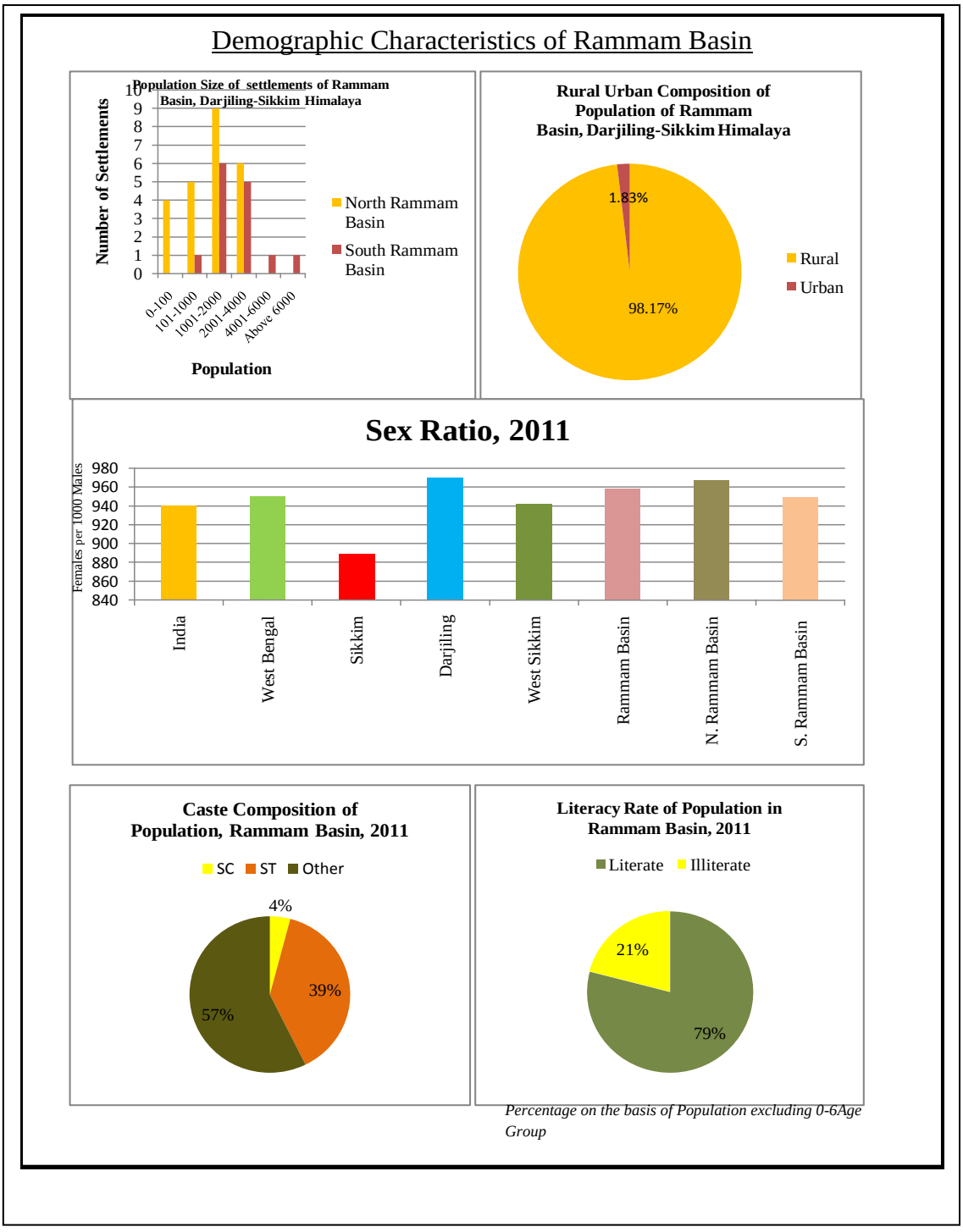


Figure 2.3 above left; Figure 2.4 (Above right); Figure 2.5 (Middle); Figure 2.6 (Below left); Figure 2.7 (Below right)

Source: District Census Handbook, Darjiling and Sikkim, 2011.

According to O'Malley (1907), "Formerly Lepchas possessed all hill countries of Darjeeling and Sikkim but about 250 years ago the Tibetans invaded their country and drove them into the lower valleys and gorges". O' Malley (1907) further describes that, "The Lepchas are timid people, peaceful, disliking fixed employment and never as happy as when they are in their native wood. They are born naturalists, and have separate names for nearly every bird, plant, orchid and butterfly. With the introduction of settled cultivation and the reservation of the forests, they have had to give up their old nomadic cultivation, and lost most of their jungle craft; but they have learnt in its place how to make terraced fields for rice and the methods of agriculture practiced by the Nepalese". Nowadays most of the Lepchas produce potato, maize, vegetables in their small fields. In the study area Lepchas are found in the hamlets named Tubun, Gumbadara, and Yakreybong in Rimbick and in Ranglyang hamlet of Upper Fambong village and at Lower Rumbuk. Besides agriculture, some of them are engaged in government jobs especially in military or border security forces. Most of them follow Bon religion till now.

Rai/ Khambu (OBC) – The Khambu people are commonly referred to as Rai (s). According to Jan Salter and Harka B. Gurung, "the term Rai is a collective eponym for the khambu people derived from the title given to their chieftains" (Roy, Gorkhas and Gorkhaland, 2012, p.65). The Rai people are indigenous ethno-linguistic group of the Indian subcontinent. The word Rai means King in old Khas kura (Nepali). When the king Prithvi Narayan Shah could not defeat the Khambu king he made them friends and imparted them the title 'Rai'. The Rai people are divided into many different sub-groups as Hangkhim, Bantawa, Sotang, Chamling, Sampang, Dumi, Jerung, Kulung, Khaling, Dilpali, Samsuhaang, Lohorung, Mewahung, Rakhali, Thulung, Tamla, Tilung, Wahaling, Wambule, Parali, Yamphu, Jero (Jerung), Puma, Syangbo and Dewas. This group of people makes the majority in the villages of Upper and Middle Rammam Basin. They follow Hinduism and are not caregorised as S.C. or S.T., but belong to OBC category. Subsistence agriculture of rice, wheat, millet, corn and cotton is the main occupation of themi. Sakela or Sakewa is their principal religious festival which is a prayer to Mother 'Nature' for healthy crops and protection from natural calamities. The festival is also known as Bhumi Puja and is celebrated on Baishakh Purnima (Full moon in the month of Baishakh) indicating the beginning of the farming year.

Limbu/Yakthung (ST) – According to Sanyal (2011), "A Mongolian tribe, called the Limbus, is a constituent of great Kirata race which inhabited in ancient times in the Lower Himalayas: from the Punjab to the eastern end of Assam, to Burma and Cacher, floated down from the High Himalayas as the great human stream to settle in the south eastern portion of modern Nepal, Sikkim, Bhotan and Darjiling district". According to B. Roy (2012), "They are also known as Yakthungba. The term 'Yakthungba' is most likely a combination of three 'Yakthung Pan' syllables: 'Yak' meaning hill, 'Thum' meaning place and 'Ba' or 'Pa' Meaning inhabitants**"**. Yakthung Pan is the language used by the Yakthungba or Limbu people. In 'Yakthung Pan' the word 'Limbu' means an archer.

H.H.Riseley in the Gazetteer of Sikkim 1894 (reprinted in 1973) says that the country between the Arun and Kankaya was originally populated by the Limbus. The Limbu's uses the title 'Subba' (O'Malley, 1907, p.42).

Mangar (OBC and MBC in Sikkim) – Mangars are one of the oldest known tribes of the Sub-Himalayan region. Most of the Magars are craftsman. They typically reside in large two storied stone houses with slatted or thatched roof. Majority of Magars follow Hinduism, though some of them follow Buddhism too. There are more than 700 clans of Magar people, some of the clans are: Ale, Thapa, Pun, Rana, Khapangi, Roka, Ghatri. Timberbong, Budang, Mangarjung, Mangsari and Ribdi are inhabited mostly by Mangars.

Bhujel (OBC) – the word has been originated from the name 'Bhujikot', a valley-side place of the river Bhuji in district of Nepal (Khawas, 2007). Bhujel language is referred to as Bhujeli, Ghhatri or Khawas. Bhujel are found in Bhujelgaon- a hamlet of the village Jhepi. Some of them also live in Lodhama, Kankibong and Kaijalia villages.

Chhetri (General Caste) – According to B. Roy **(**2012) "Chhetri is a Khas kura distortion of the Sanskrit word 'Kshatriya'. Chhetris represent the other most prominent class in the hierarchy of Khas hindu social stratification**"**. Majority of the Chhetris are farmers and live in small villages where loosely grouped homes are surrounded by farmlands. They produce various types of crop such as rice, wheat, maize and millet. The houses of the Chhetries are usually brick-walled with roofs made either of thatch or iron sheets. Most houses have two or more story. The kitchen and bedrooms are located upstairs to keep the residents free from dampness and stray animals **(**Roy, 2012, p.126).

Gurung (OBC) – Gurungs, also known as Tamu, (language Tamu Kuwei), are mostly farmers and they grow food crops along with soyabean and string beans. They follow Bon religion (known as Pyetan Lhutan). The houses of the Gurungs are pucca but are built on high ridges. Tamu society is divided into two groups- Char jat or Four clan and Sola Jat or Sixteen clan. The four clans of Tamu people are: Kle (or Ghaley), Gono (or Ghatani), Lam (or Lama), Khro (or Lamichane).

Tamang (S.T.) – Tamang is a Tibetan exonym meaning 'Ta- Horse' and 'Mag- Soldiers' or 'Tamang – Horse Soldiers'. They are also sometimes known as 'Murmi'. They are courageous, loyal and very good at climbing, Trekking and mountaineering (Roy, 2012, p.89). Tamangs of Rammam Basin are mainly farmers and are engaged in subsistence farming. According to Barun Roy, "Tamangs do not own large tracts of land. However, they own large number of animals, especially goats, sheep, pig and hen. They are mostly Buddhists and they practise Vajrayana Buddhism (the earliest form of Buddhism developed by Padmasambhava)". There are more than 100 Tamang clans and sub-clans. Some of the most known Tamang clans are: Damrong, Gomtsa, Mepa, Mamba, Moktan, Ghisingh, Yonzon and Waiba (Roy, 2012, p.91).

Newar (General)– Newars belong to Kirata and are considered as the first aryanisedkirata group Newers are skillful marchants and traders and most of them are engaged in business. Besides business, they practice farming also. Newers follow both Hinduism and Budhhism. They have social stratification which exhibits many castes such as Malla (Ruler), Pradhan (Administrators), Puun (Artist), Rajbhandari (Administrators and Royal Treasurers), Sagajyu (Marchant), Joshi (Astrologers), Jati (Music Player), etc. Pradhan is Administrator in Newer caste system and found in and around Rimbick. Socio-economic condition of this people is good and they hold the important places in the habitaitons of Rimbick and surrounding area.

Sunuwar (MBC) – the Sunuwars or Mukhia or Koinch are the aboriginal tribes inhabiting on both the banks of the Sun Kosi river. Like other hill tribes of the Himalaya they have been living with other tribes or migrated during the historical evolution in the geographical areas of present Nepal, Sikkim, Northern areas of West Bengal, Assam, and other Himalayan areas of India since ancient times **(**Subba, 2011, pp.339-345). The Sunuwars are settled in the Chumbong (under the study area), Mendo Gaon, Chyakhung of Soreng sub-division of West Sikkim. Traditionally Sunuwars were hunters and now they are agriculturist and a majority is mixed farmers. The

Sunuwars are animists and they believe to have been blessed by the Goddess Shandar for their protection and food.

Thapa (OBC) – Thapa is a surname commonly used by Nepali people belonging to the Chhetri caste of Khas group (an Indo-Aryan ethno linguistic group). Magar (Sino-Tibetan ethno linguistic group) people also use Thapa as their surname, though Kshatriya Thapas are addressed as Thapa Kaji while Thapa Magars are addressed as general Thapa. They reside in Rimbick area.

Kami – People belonging to this community are adept at metal works and produce tools and weapons of copper, iron and brass. They practice Hinduism and worship all the gods and goddesses of Hindu pantheon (Subba, 2011, pp.339-345). Houses of this community are attached to their small landholdings and often a foundry is built at one side of their houses where they prepare their tools. They are skilled at making the famous Gorkha weapon- Khukuri(Roy, 2012, p.134).They are found at Rimbick village though their percentage share is very low.

Thami – Thamis are originally nomadic tribe and also known as Thangmis **(**Roy, 2012, p.94). Their main occupation is farming. Their language is known as 'Thangmi Kham' orinated from the Tibeto-Burman family. Thami people have similarity with Tamangs. A major part of the Thami people is illiterate and work as labourers in the stone quarrying. Their economic condition is not good. In the study area they found at Rimbick village in small numbers.

Giri , Sarki and Damai (S.C.)– People belonging to these groups are found at the hamlet Dilpali located at Rimbick gram panchayat and adjacent areas.They follow Hinduism though some of them have been converted to Christianity and Budhhism. The economic condition of these people is very poor.

Maarwari (General Caste) and Other People from North Indian Plains (General Caste) – Marawaries have migrated from Rajasthan, mostly from its Marwar district; while the other Hindi speaking people have migerated from Northern states of India. The Marwaries of this region also speak Hindi. Both of these communities are businessmen and reside in the Bazar areas of Rimbick, Lodhama, Nayabazar, Soreng and Sombare.

2.9.5. Economic Composition

Economic composition of population gives an idea about the proportion of working and non-working population and also the dependency ratio of population in any region. On the basis of the census data of 2011, the Total population of Rammam Basin has been divided into two broad categories of worker and non-worker. The percentage of working population in the basin is 45.27% and the percentage of non-working population is 54.73%. Thus, the crude dependency ratio is 1209 persons per thousand populations. In the North Rammam Basin, the proportions of working and non-working population are 44.34% and 55.66% respectively. The crude dependency ratio is 1255 persons per thousand populations. While in the South Rammam Basin, the proportions of working and non-working populations are 44.96% and 55.04% respectively. The crude dependency ratio is 1176 persons per thousand populations.

There are variations in the village-wise distribution of the working population in the basin. Sombaria F.B. has the highest percentage (100%) of working population, whereas Lodhama has the lowest percentage (23.76%) of working population in the basin. The mean value of village-wise percentage distribution of workers in the North Rammam Basin is 49.62% whereas for the South Rammam Basin is 45.697%. This value for the whole basin is 48.18%.

The working population has again been categorized into main worker and marginal worker groups. In the census of India, main workers has been defined as the workers who are engaged in works more than 180 days in a year, whereas marginal workers are defined as workers engaged in works for less than 180 days period. The proportions of main and marginal workers in the basin as a whole are 55.95% and 44.05% respectively. The figures for the North Rammam Basin are 65.86% and 34.14% respectively; while the proportions of main and marginal workers in the South Rammam Basin are 48.81% and 51.19% respectively. Again Sombaria and Hilley F.B have highest percentage of main workers (100%) and Longchok has the lowest percentage (26.63%) of main workers in the North Rammam Basin, but in the South Rammam Basin the highest and lowest percentage of main worker can be found at Karmi (75.39%) and Jhepi (26.02%) respectively. The mean value of village-wise percentage distribution of main and marginal workers for the North and South Rammam Basins are 68.347% and 46.085% respectively. So it is clear that in the North Rammam Basin the proportion of main workers are higher than the South Rammam Basin.

Table 2.12: Distribution of Main, Marginal and Non-Workers in the Settlements of Rammam Basin

Sl. No.	Part	Settlement	Worker						Non-Worker	
			Main	%	Marginal	%	Total	%	Total	%
1	N. RAMMAM BASIN	Bhareng	228	99.56	1	0.44	229	58.72	161	41.28
2		Ribdhi	345	61.06	220	38.94	565	54.64	469	45.36
3		Okhrey	415	57.88	302	42.12	717	42.6	966	57.4
4		Tikpur	480	46.88	544	53.13	1024	53.58	887	46.42
5		Siktam	281	94.61	16	5.39	297	58.24	213	41.76
6		Salyangdang	143	36.86	245	63.14	388	40.29	575	59.71
7		Lungchok	131	26.63	361	73.37	492	48.09	531	51.91
8		Dhallam	522	67.35	253	32.65	775	41.09	1111	58.91
9		Timberbong	675	70.02	289	29.98	964	44.71	1192	55.29
10		Upper Fambong	938	78.36	259	21.64	1197	39.97	1798	60.03
11		Lower Fambong	86	32.09	182	67.91	268	37.07	455	62.93
12		BurikhopRumbuk	545	78.64	148	21.36	693	51.83	644	48.17
13		BurikhopDodaak	683	63.01	401	36.99	1084	50.02	1083	49.98
14		Tharpu	161	32.86	329	67.14	490	43.87	627	56.13
15		Soreng	1050	83.27	211	16.73	1261	33.03	2557	66.97
16		Malbasey	1071	69.55	469	30.45	1540	53.32	1348	46.68
17		Chongbong	405	56.8	308	43.2	713	39.7	1083	60.3
18		Rumbuk	558	73.23	204	26.77	762	41.46	1076	58.54
19		Karthok	224	68.5	103	31.5	327	52.83	292	47.17
20		Nayabazar	409	95.56	19	4.44	428	34.66	807	65.34
21		Nayabazar F.B.	5	83.33	1	16.67	6	46.15	7	53.85
22		Soreng F.B.	9	64.29	5	35.71	14	50	14	50
23		Sombaria F.B.	4	100	0	0	4	100	0	0
24		Hilley-Varsey F.B.	27	100	0	0	27	75	9	25
25	S. RAMMAM BASIN	Singalila Forest	234	29.32	564	70.68	798	48.9	834	51.1
26		Rimbick	1887	57.51	1394	42.49	3281	47.01	3699	52.99
27		Namla	645	60.96	413	39.04	1058	35.4	1931	64.6
28		Lodhama	93	55.69	74	44.31	167	23.76	536	76.24
29		Hatta	784	47.57	864	52.43	1648	47.96	1788	52.04
30		Kankibong	566	33.79	1109	66.21	1675	44.49	2090	55.51
31		Jhepi	230	26.02	654	73.98	884	56.09	692	43.91
32		Lamagaon*	544	48.31	582	51.69	1126	42.81	1504	57.19
33		Kainjalia*	786	39.09	1225	60.91	2011	48.46	2139	51.54
34		Samalbong*	456	55.47	366	44.53	822	39.58	1255	60.42
35		Kolbong	100	18.15	451	81.85	551	62.26	334	37.74
36		Murmidong	415	36.06	736	63.94	1151	52.77	1030	47.23
37		Karmi	337	75.39	110	24.61	447	44.17	565	55.83
38		Goke*	2595	61.84	1601	38.16	4196	46.11	4904	53.89

(*on the basis of data of whole settlement, though the settlements are partly under the basin)

 # Percentage of main and Merginal workers calculated on the basis of Workers.

Source: District Census Hndbook, Darjiling and Sikkim, 2011

Both main and marginal worker categories are further divided in to four categories such as **cultivators, agricultural labourers, household industry workers and other workers**. The following are the salient features of settlement-wise distribution of main workers grouped under various industrial categories:

1. The percentages of cultivator, agricultural lobourer, household industry worker and other worker in the basin are 55.7%, 12.6%, 3.50% and 28.2% respectively.

2. In the North Rammam Basin, the highest percentage of cultivator can be found at Bhareng (94.76%) whereas lowest percentage can be found at Nayabazar F.B., Sombaria and Soreng F.B. where no person is engaged in cultivation. In the South Rammam Basin, Jhepi (92.08%) has the highest percentage of Cultivators whereas lowest percentage can be found at Lodhama (14.97%).

3. Highest and lowest percentages of agricultural labourer in the North Rammam Basin can be found at Tharpu (69.80%) whereas there are several settlements such as Bhareng, Nayabazar, Nayabazar F.B. Sombaria and Hilley F.B. where no one has been categorized as agricultural labourer. In the South Rammam Basin, the highest and lowest percentages can be found at Kankibong (37.37%) and Jhepi (0.79%).

4. The percentage of workers engaged in household industry is highest at Malbasey (10.65%) in the northern part and at Singalila Forest (27.69%) in the southern part. In general the percentage of workers belonging to this category is very low compared to other categories and there are several settlements where no worker of this category can be found such as Bhareng, four forest blocks of Nayabazar, Soreng, Sombaria and Hilley in the northern part and Lodhama in the southern part.

5. Nayabazar (97.20%) and three forest blocks of Nayabazar, Sombaria and Hilley have large number of workers (more than 90%) engaged in other works in the northern part. In the southern part Lodhama (58.68%) has the highest percentage of workers in this group though Jhepi (6.45%) has the lowest percentage of workers in this category.

From the above discussion, it is clear that there are some settlements where agriculture is the mainstay of living such as Bhareng, Jhepi, Kolbong, Murmidong and Karmi where more than 80% workers are engaged in agriculture related activities. On the other hand there are some settlements where most of the people (more than 90%) are engaged in other works such as Nayabazar and four forest blocks of Nayabazar, Hilley,

Sombaria and Soreng in the northern part and Lodhama and Samalbong (more than 50%) in the southern part.

2.10. Language

The Government of Sikkim through the Sikkim Official Language Act, 1977 recognised the Nepali, the Bhutia, and the Lepcha language as the official languages of Sikkim on the 17th October 1977. The Limboo language was recognized as an official language on 31st March 1981 through the Sikkim Official Language Act 1977 amendment passing the Sikkim Official Language Bill, 1981. The Sikkim Official Language Act 1977, was further amended in 1997, and recognized Gurung, Khambu-Rai (Bantawa), Tamang, Newari, Sherpa, Mangar and Sunuwar as Official Languages of Sikkim. Thus, there are now 11 official languages in Sikkim. Besides these official languages, there are many other spoken dialects also namely, Thami, Bhujel, Yakhas, Kulungey, Khalingey, Sotangey, Thulungey, Waingey, Umbuley, etc. in the state. Except the Nepali language, the above languages and dialects are Trans-Himalayan stock and are closely affiliated **(**Subba, 2011, pp.151-178**)**. The northern part of Rammam Basin is the abode of various communities mentioned above where all the languages are practiced though Nepali is the lingua franca or the language of communication among the people of the region.

The Government of West Bengal through the West Bengal official language Act, 1961 recognised Bengali and Nepali languages as Official languages in the three hill subdivision of the district of Darjeeling namely Darjeeling, Kalimpong and Kurseong of West Bengal. Thus, Nepali and Bengali languages are the two Official languages in the South Rammam basin. Nepali is the language of communication among the various ethnic groups of people living in the villages of South Rammam Basin. Besides Nepali language, there are Lepcha, Sherpa, Limboo, Bhujel and other languages of the various ethnic groups inhabited in the basin.

2.11. Agriculture

Agriculture is the mainstay of living in the Ramam Basin (68.3% of working population engaged in agriculture). The agricultural system evolved here before 600 years by traditional communities like Lepchas and Limboos, and later on by Bhutias and other Nepalese **(**Subba, 2011, pp.102-104). It is generally restricted upto the altitude of 3000m. Between 2200m-3000m altitude, the agrarian communities are

mainly Bhutia and Sherpas. They are in the villages of Bhareng, Ribdi, Okhery in the northern part; and Singlalila forest in the southern part. Generally subsistence farming is practised here for raising a variety of crops such as wheat, maize, peas, beans, potato, cabbage, apple, medicinal plants, etc. Below 2000m altitude, a wide range of traditional crops are produced such as paddy, wheat, maize, potato, peas, beans and other vegetables. Some cash crops are also produced such as cardamom and ginger; fruits like orange are produced. Besides, fodders for livestocks are also produced in these areas. There are three main cropping seasons in the study area like the rest part of India; these are summer season, monsoon season and winter season. But in the high altitudes, only two croping seasons can be available as the cropping seasons are lengthy due to excessive cool temperature.

Major Crops

The crops of the study area can be classified into the following main groups:

(1) Cereal crops (Paddy, Maize, Wheat, Barley, Finger millet, Buckwheat),

(2) Pulse Crops (Black Gram, Horse Gram, Soybean)

(3) Oil seeds (Musterd),

(4) Tuber and Root crop (Potato),

(5) Cash Crops (Large Cardamom and Ginger),

(6) Fruit Crops (Orange, Appple) and

(7) Vegetables (Squash, Green Peas)

Some important cereal crops

Paddy is grown between altitudes of 300m – 1700m. It is practised in the settlements of Rimbick, Kolbong, Murmidong, Karmi and Goke in the South Rammam Basin; and at Daramden, Tharpu and Malbasey in North Rammam Basin.

Economic Composition of Population in Rammam Basin

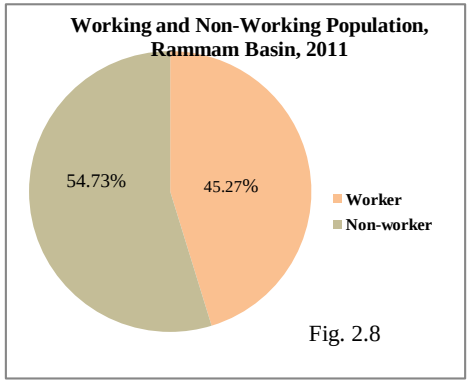


Fig. 2.8

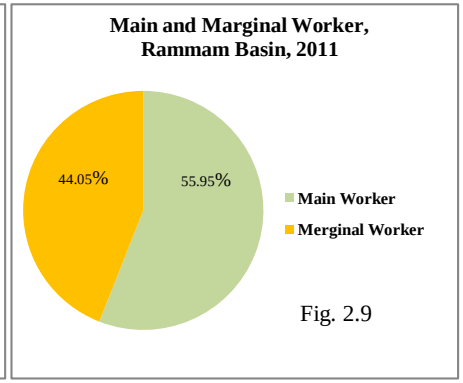
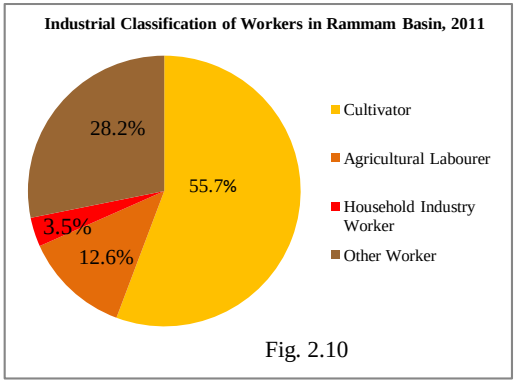


Fig. 2.9



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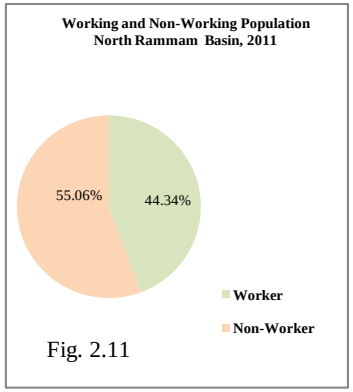

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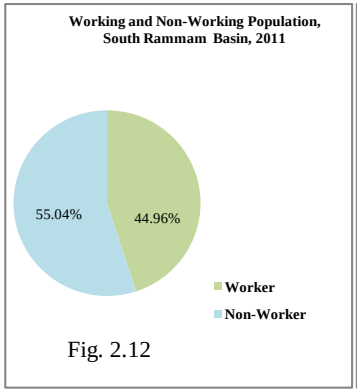

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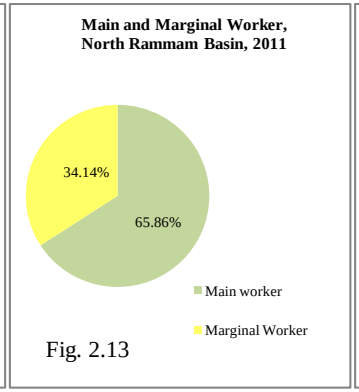


Fig. 2.13

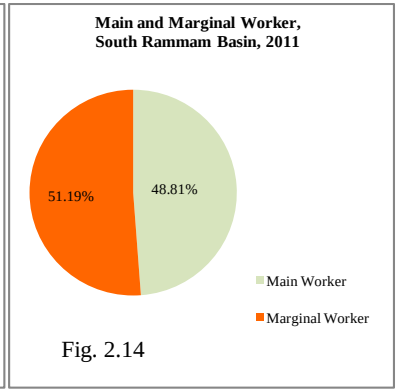


Fig. 2.14

Source: District Census Hndbook, Darjiling and Sikkim, 2011

Table 2.13: Industrial categories of Workers

Sl.No.	Part of the Basin	Settlements	Worker	Cultivators	%	Agricultural Labourers	%	House-hold Industry Workers	%	Other Workers	%
1	North Rammam Basin	Bhareng	229	217	94.76	0	0.00	0	0.00	12	5.24
2		Ribdi	565	439	77.70	1	0.18	11	1.95	114	20.18
3		Okhery	717	531	74.06	36	5.02	9	1.26	141	19.67
4		Tikpur	1024	719	70.21	51	4.98	27	2.64	227	22.17
5		Siktam	297	112	37.71	76	25.59	1	0.34	108	36.36
6		Salyangdang	388	90	23.20	25	6.44	8	2.06	265	68.30
7		Longchok	492	107	21.75	70	14.23	1	0.20	314	63.82
8		Dhalam	775	168	21.68	85	10.97	34	4.39	488	62.97
9		Timberbong	964	534	55.39	63	6.54	15	1.56	352	36.51
10		Upper Fambong	1197	252	21.05	104	8.69	53	4.43	788	65.83
11		Lower Fambong	268	109	40.67	12	4.48	11	4.10	136	50.75
12		BurikhopRumbuk	693	565	81.53	14	2.02	2	0.29	112	16.16
13		BurikhopDodaak	1084	689	63.56	39	3.60	12	1.11	344	31.73
14		Tharpu	490	13	2.65	342	69.80	6	1.22	129	26.33
15		Soreng	1261	301	23.87	158	12.53	34	2.70	768	60.90
16		Malbasey	1540	652	42.34	218	14.16	164	10.65	506	32.86
17		Chumbong	713	359	50.35	130	18.23	9	1.26	215	30.15
18		Rumbuk	762	530	69.55	40	5.25	9	1.18	183	24.02
19		Karthok	327	92	28.13	128	39.14	8	2.45	99	30.28
20		Nayabazar	428	01	0.23	0	0.00	11	2.57	416	97.20
21		Nayabazar F.B.	6	0	0.00	0	0.00	0	0.00	6	100.00
22		Soreng F.B.	14	0	0.00	3	21.43	0	0.00	11	78.57
23		Sombaria F.B.	4	0	0.00	0	0.00	0	0.00	4	100.00
24		Hilley F.B.	27	1	3.70	0	0.00	0	0.00	26	96.30
25	South Rammam Basin	Singalila Forest	798	484	60.65	24	3.00	221	27.70	69	8.65
26		Rimbick	3281	1900	57.91	362	11.03	314	9.57	705	21.49
27		Namla	1058	683	64.56	95	8.98	14	1.32	266	25.14
28		Lodhama	167	25	14.97	44	26.35	0	0.00	98	58.68
29		Hatta	1648	1225	74.33	120	7.28	9	0.55	294	17.84
30		Kankibong	1675	914	54.57	626	37.37	24	1.43	111	6.63
31		Jhepi	884	814	92.08	7	0.79	6	0.68	57	6.45
32		Lamagaon*	1126	746	66.25	191	16.96	29	2.58	160	14.21
33		Kaijalia*	2011	1390	69.12	121	6.02	24	1.19	476	23.67
34		Samalbong*	822	246	29.93	146	17.76	6	0.73	424	51.58
35		Kolbong	551	487	88.38	8	1.45	15	2.72	41	7.44
36		Murmidong	1151	923	80.19	45	3.91	62	5.39	121	10.51
37		Karmi	447	381	85.23	10	2.24	3	0.67	53	11.86
38		Goke*	4196	2285	54.46	911	21.71	35	0.83	965	23.00

(*on the basis of data of whole settlement, though the settlements are partly under the basin)

Source: District Census Hndbook, Darjiling and Sikkim, 2011

Table No. 2.14: Crops of Rammam Basin

Altitude in metre	Zaid or Summer Crop	Kharif Crop	Rabi Crop
300 – 1000m	Maize, Vegetables, Paddy, etc.	Paddy, Maize, Millet, Soyabean, Other Pulses, etc.	Wheat, Barley, Buckwheat, Rice-bean, Vegetables, etc
1000m – 1700m	-	Maize, Paddy, Soyabean, Other Pulse, Finger Millet etc.	Wheat, Barley, Buckwheat, Rice-bean, Rape and Mustard
Above 1700m	-	-	-

Source: Department of Food Security & Agriculture Development

The flat terraces of Daramden are famous for paddy cultivation. There is regional rice centre at Daramden where local and new varieties were tried for adoption.

Maize is highly adaptable and can be grown in all types of soil, slopes and even in adverse climatic condition. At Gyalsing Regional Farm, the best time recorded for sowing of Maize was after the first shower of pre-monsoon rain when there is sufficient moisture in the soil. In the lower altitudinal zone maize is rotated with paddy-potato/wheat/tori/buckwheat/millet, etc. In the higher altitudes maize is produced with other crops such as beans, peas, millet, soybean, ginger, etc.

Barley is a very hard crop which can be grown under dry condition as well as under extreme condition of frost. Barley is cultivated in the study area mainly for the raw material used in brewery of liquor. Though a substantial part of the crop is converted into barley powder which is very easy to digest and used as part of diets of olds and children. It is a Rabi crop and is sown during the last week of October or first week of November.

Buckwheat used to be grown in the study area widely two or three decades ago. The flour of buckwheat is used in preparing bread and also used in brewery of liquor. Buckwheat can be rotated with paddy or maize. Buckwheat is a Rabi crop.

The important root crops

Potato is the most extensively grown root crop in the study area. Now-a-days Potatoes are cultivated as commercial crops in the study area. Potato can be grown up to snow line; in the study area Potato is grown within the altitudinal zone of 350m to 2400m. It is a Rabi crop - planted during the months of December–March and is harvested in August/September. Large quantum of potatoes are grown also in the settlements of Singalila Forest, Rimbick, Namla, Lodhama, Hatta, Kankibong, Kaijalia, Lamagaon in the South Rammam Basin.

The important cash crops

Large cardamom is the most important traditional revenue earning cash crop of Rammam Basin. It is mostly grown between the elevations of 1500m – 2000m. In the study area large cardamom is planted as pure crops under shady trees on hilly slopes. The crop is grown on the well drained soil with good depth with plenty of humus.

Lamagaon, Hatta, Kankibong, and Rimbick in the southern part and Rumbuk, Upper Fambong, Okhery, Bhareng, and Ribdi in the northern part produce this crop. The crop is sold to the local market or most of the times the crop is collected from the field by the middlemen who later export the product abroad.

Ginger is another important cash crop of the study area. It is a harbaceous perennial crop which is grown in the study area from time immemorial. Ginger is produced upto the elevation of 1500m and the villages with low altitudes (elevation less than 1000m) such as Kolbong, Murmidong, Karmi and Goke in the southern part; and Tharpu in northern part produce this crop. The crops are sold to the local markets of Nayabazar or Zorethang and Darjiling from where it is exported to other parts of the state or country.

Orange is grown as commercial fruit crop at some settlements of the study area. The fruit produced in the study area belong to Darjiling variety. This is generally germinated from seed. The tree is generally medium to tall in height (4 to 7m), very densely foliaged, both thorny and thornless.

One tree produces 300 to 400 fruits on an average. The production is sold to the local markets of Jorethang and Darjiling or exported to other parts of West Bengal and outside it. The settlements of Kankibong, Samalbong, Kolbong and Goke in the southern part produce this fruit crop.

Table 2.15: Agricultural Commodities of South Rammam Basin

Village	Agricultural Commodities (First)	Agricultural Commodities (second)	Agricultural Commodities (third)
Singalila Forest	Potato	Na	Na
Rimbick	Potato	Pea	Maize
Namla	Potato	Na	Na
Lodhama	Potato	Na	Na
Hatta	Potato	Corn	Cardmum
Kankibong	Orange	Potato	Cardamum
Jhepi	Maize	Na	Na
Lamagaon	Cardamom	Potato	Squash
Kaijalia	Potato	Na	Na
Samalbong	Paddy	Orange	Ginger
Kolbong	Ginger	Orange	Na
Murmidong	Ginger	Na	Na
Karmi	Paddy	Na	Na
Goke	Orange	Ginger	Maize

Source: District Census Handbook, Darjiling, Part A, 2011.

Agricultural Characteristics of Rammam Basin

1. Paddy Field at terrace of Lodhama Khola; 2. Large cardamom at Dilpali, Rimbick; 3. Paddy Field at Yakreybong, Rimbick; 4. Green Peas at Dilpali, Rimbick; 5. Chuche Karela at Dilpali, Rimbick; 6. Mixed Crops at Samanden Forest Village

Source: Researcher

Photo Plate 2.2

Agricultural Characteristics of Rammam Basin

1. A farmer is tilling land at Dilpali, Rimbick; 2. Preparation of field for sowing crops at Maneydanra, Rimbick; 3. Farmers taking their bullocks to the field for tilling land at Maneydanra, Rimbick; 4. Agricultural Terraces at Dilpali, Rimbick; 5. Burning of roots of previous crops at Dilpali, Rimbick; 6. Haati Grass at the edge of terraces to check soil erosion and to protect crops from wild animals.

Source: Researcher

Photo Plate 2.3

Vegetables

The basin under study produces large amount of various types of vegetables like squash, green peas, chuche karela, cabbage, cauliflower and other vegetables. The climatic condition above 1500m altitude is favourable for the production of these vegetables.

2.12. Transport and Communication

Rammam Basin is mainly traversed by various types of roads, such metalled roads, boulder roads, cemented roads. There is no railway track in the basin as it is a highly rugged terrain. The settlements in the northern and southern part of the basin are connected to each other by permanent bridges at three places.The important roads connecting large settlements of each sides of the Basin are: (1) L.D.Kazi Marg (from Nayabazar to Bhareng),(2) Nayabazar – Chumbong (via Zoom) – Malbasey – Soreng-Timberbong-Tharpu Rd., (3) Karthok-Burikhop Dodok-Burikop Rumbuk-Rumbuk-Sombaria Rd., (4) Dhalam-lower Fambong-Longchok-Salyangdang-Siktam-Tikpur-Okhery-Ribdi-Bhareng Rd. (5) Sirikhola-Kaijalia Rd. via Lodhama,(6) Sirikhola-Dhotre Rd. via Hatta., and (7) Kaijalia-Goke Rd. via Kolbong. There are some important Kucha road (foot track) also: Bhareng-Gorkhey foot track, Sirikhola-Gorkhey foot track, Gorkhey-Phalut foot track, Rammam-Sabarkum foot track, Sirikhola-Sabarkum foot track, Gurdum-Sandakphu foot track, Rimbick-Kalipokhri foot track, Tonglu-Jhepi/Kaijalia foot track, etc. All the above mentioned foot tracks are traversing through the dense forested area of the Hilley forest and Singalila forest of the basin.

Apart from metalled road and foot tracks, there are boulder roads in the basin traversing mainly from Tonglu to Singalila Peak via Sandakphu and phalut. This boulder road mainly traverses through the crest line of the Singalila Range.

There are Post offices at various places in the Rammam Basin. In the northern part Head Post office is located at Soreng and in the southern part Sub-Heads are at Rimbick, Lodhama Bazar and Jhepi.

2.13. Electricity Network

Electricity has reached every hamlet in the northern part of the basin but in the southern part electricity network has been recently done in the hamlets of Singalila forest; though electrification in the rest part of the South Rammam Basin have been done earlier. The establishment of Rammam Hydroelectric Power Project in the 1995 has helped to distribution electricity in the settlements of Rammam basin.

Agricultural Characteristics of Rammam Basin

1. Terraces and mounds of organic fertilizer at Sirikhola Forest Village; 2. Kitchen Garden at Dilapli, Rimbick; 3. Green House at Samanden Forest Village; 4. Clearing of weeds for sowing cabbage at Gorkhey Forest village; 5. Sprinkling water on crops at Timburey; 6. Paddy Barn after harvesting at Daramden

Source: Researcher

Photo Plate 2.4

2.14. Market Centres

The region is completely rural in nature except the Nayabazar which is a Notified Bazar Area located in the North Rammam Basin. It is located just above the confluence point of river Rammam and Bari Rangit, and is used to serve most of the settlements of North Rammam Basin such as Chumbong, Malbasey, Timberbong, Tharpu, Dhalam, etc. Besides Nayabazar, there are other permanent market centres in the North Rammam Basin such as Soreng and Sombaria while Rimbick, Lodhama, Kaijalia in the South Rammam Basin are permanent market areas. Besides permanent markets, there are periodic markets or 'Haats' at various places such as Rimbick, Bansbotay, Lodhama, Hatta, Jhepi, Dhotre, Kaijalia, Goke, in the southern part and at Soreng, Sombaria, Dhalam in the northern part.

Nayabazar

Nayabazar is the only Notified Bazar Area under the Soreng Sub-division; thus it is also the only notified bazar area in the basin. The bazar has more than 50 shops of different categories though mostly are wholesale grocery shops owned by the Marwaries of North India. Before the development of Jorethang (on the eastern part of river Bari Rangit) during 1950's and 1960's this was the only Bazar in the area to serve. But after the development of Jorethang, this market place has lost its importance and now it only serves the villages located in the western part of river Bari Rangit.

The hamlets of Chumbong, Malbasey and Tharpu village are closer to this Bazar area. This is the only bazar area in the basin where two fueling stations are located.

Soreng

Soreng market is a large market with various types of shops. This market serves the nearby villages of Timberbong, Karthok, Burikhop Dodok, etc. Besides grocery, medicine and other important essential shops, this market has of building construction materials, hardware shops and hotels.

Bridges of Rammam Basin

1. Sirikhola Bridge; 2. Rato Khola Bridge; 3. Rammam Bridge at Gorkhey; 4. Colourful flags at Sirikhola Bridge; 5. Rammam Bridge near Nayabazaar connecting West Sikkim and Darjiling; 6. Old and New Bridges over Lodhama Khola near Lodhama Bazaar

Source: Researcher

Photo Plate 2.5

Sombaria

Sombaria market is located in the Upper Fambong and serves the settlements of Burikhop Rumbuk, Rumbuk, Upper Fambong, Dhalam, Longchok, Salyangdang, Siktam, Tikpur, Okhery, Ribdi, Bhareng, Sombaria and Hilley F.B. Restaurants, Grocery and shops of other necessary items are located here.

Rimbick

The Rimbick Bazar is located at Rimbick in South Rammam Basin and serves the hamlets of Rimbick and Singalila Forest. The hinterland of this market is extended up to Gorkhey which is 15 km away from this market. During the survey of this market on 28th April of 2017, the number of shops was 70 among which 23 was groceries, 16 stationaries, 6 food stalls, and 25 acts as other services.

On weekly haat of Tuesday 34 temporary shops have been surveyed during 28th April 2017. Woolen garments, clothes and shoes are dominant items in the weekly haat. Besides, spices, fertilizers, utensils, bags, various items, umbrella, etc. are also sold in the market. The shop owners are from nearby places mostly from Sukhiapokhri, Bijanbari, Relling, Gumbadara, etc.

Lodhama

Lodhama Bazar is a very old market (earlier called Budhware) of the South Rammam Basin. During earlier days people from Nepal used to visit the market on the days of weekly 'Haat' on Wednesday to buy huge amount of salt. They used to cross the Singalila Range to reach the market place. Now-a-days there are some permanent shops in the market among which is two garments shop, mobile recharge shop, two fair price shop, ration shop, one grill factory, tailor shop, etc. This market serves the neighbouring villages of Namla, Lodhama, Hatta, Kankibong, Jhepi etc.

Kaijalia

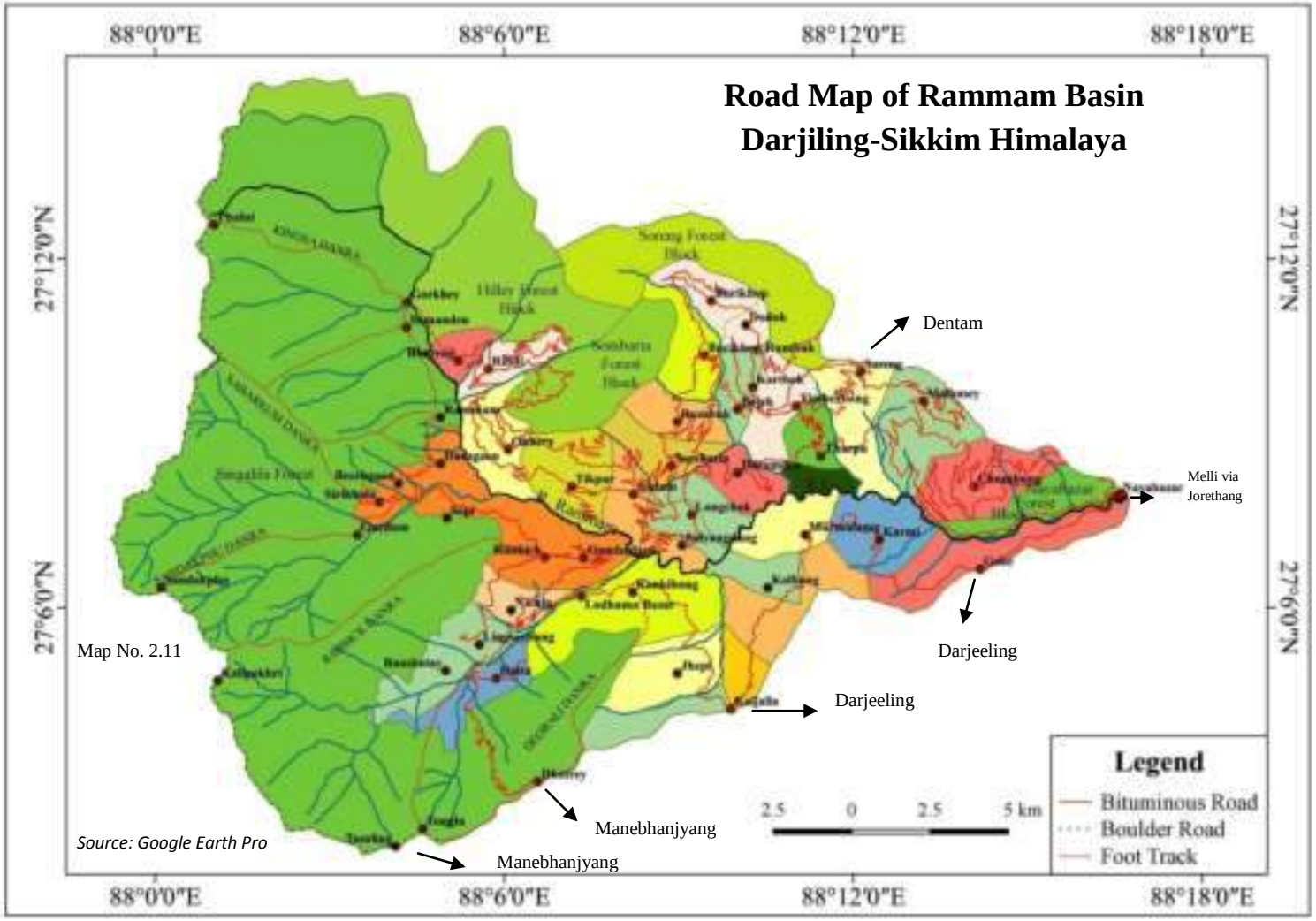
Kaijalia market is located at Kaijalia Bhanjyang. This market has various shops like grocery, medicine, stalls for mobile recharge, photocop, etc. This market serves the neighbouring hamlets of Kaijalia, Lamagaon, Samalbong and Kolbong.

Markets of Rammam Basin

1. Goke Bazaar; 2. Lodhama Bazaar;3. Kainjalia Bazaar; 4. Rimbick Bazaar; 5. Sold Items at Rimbick Bazaar; 6. Sombaria Haat

Source: Researcher

Photo Plate 2.6


Road Map of Rammam Basin
Darjiling-Sikkim Himalaya
88°0'0"E
88°6'0"E
88°12'0"E
88°18'0"E
27°12'0"N
27°6'0"N
Dentam
Melli via Jorethang
Darjeeling
Darjeeling
Manebhanjyang
Manebhanjyang
Map No. 2.11
Source: Google Earth Pro
2.5 0 2.5 5 km
Legend
Bituminous Road
Boulder Road
Foot Track

2.15. Conclusion

The discussion on the physical background of the basin gives clear idea about the topography, lithostratigraphy, drainage, soil types, weather and climate and natural vegetation of the basin under study. On the other hand, discussion on demgraphic, social, cultural characteristics of the basin, gives a clear view about the inhabitants and their characteristics in the basin under study.

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