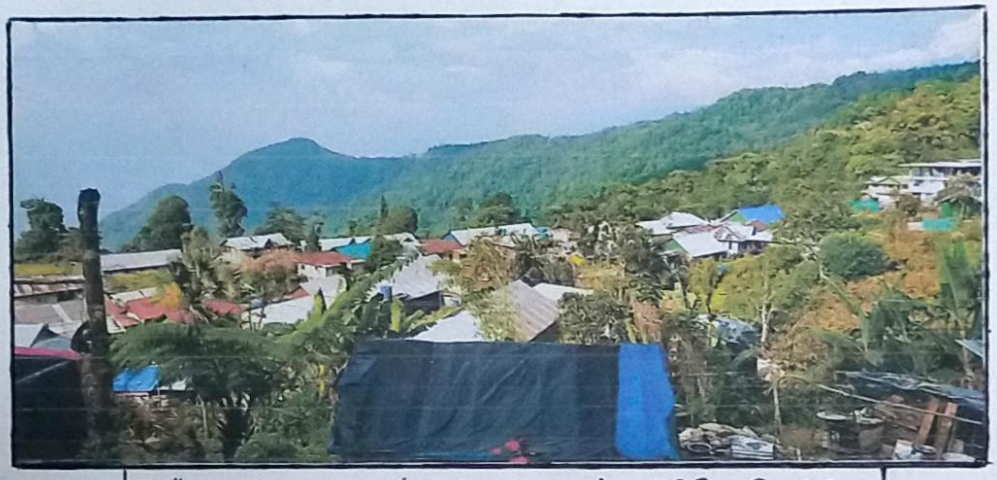
PHYSIO CULTURAL STUDY OF SILLERY GAON (KALIMPONG CD BLOCK) WB, INDIA



Sillery gaon (kalimpong) WB, INDIA

REGN. NO - 077531 YEAR - 4th SEM

ROLL NO - 2114247 - 2077937

SESSION - 2020 - 21

NAME - DEBMITRA PAL

UNIVERSITY OF KALYANI

NAME :-

DEBMITRA PAL

ROLL NO :-

21142 47 - 2077937

REGN. NO:-

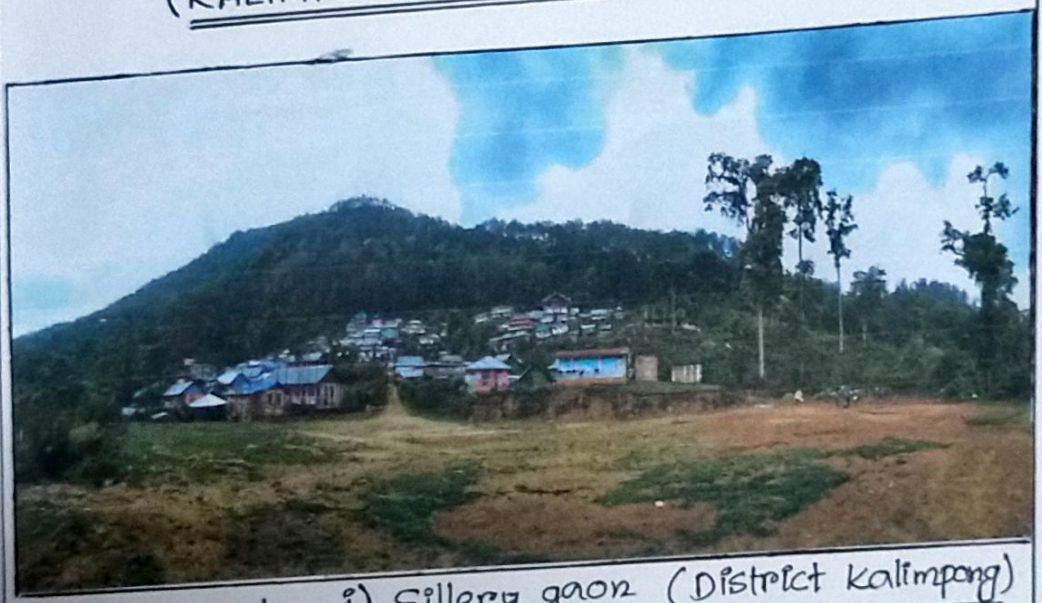
077531

OUR SERVEY TEAM ...

Our Survey Team ...

THE STUDY AREA...

GENERAL INFORMATION – SILLERYGAON (KALIMPONG CD BLOCK) WB, INDIA



Photoplate i) Sillery gaon (District kalimpong) West Bengal

Sillery Gaon is a village in the Kalimpong II CD block in the Kalimpong Sadar Sub-division of the Kalimpong district in the state of West Bengal, India. (Wiki 2022). It is located at 27.14°N 88.58°E situated at an altitude of 6000 ft. The area offers views of the Mt. Kanchenjunga and its allied peaks and the Teesta River. This area also abounds in cinchona plantation, introduced in the region by the British

as a source of quinine used for the treatment of malaria. (Wiki 2022)

Physiographically, this area forms the Kalimpong Range, with the average elevation varying from 300 to 3,000 metres (980 to 9,840 ft). This region is characterized by abruptly rising hills and numerous small streams. It is a predominantly rural area with nearest health centres at Pedong and Kalimpong.

PHYSIOGRAPHIC CHARACTERISTICS:-

A. GEOLOGY :-

The geologic composition of Sillerygaon in the Kalimpong district consists of schists, gneiss, and phyllite. Geological joints and cracks make the rocks disintegrate and decompose and form delicate matter. Joints are observed in parallel, perpendicular, and oblique directions to foliations. In terms of lithology, quartz-mica schist of Daling series of a golden to a silver color contributes the bedrock throughout the region. It is also evident that, the rock is metamorphosed in the eastern margin.

The rise of the Himalayan Mountain Belt at the end of early Eocene about 55 million years agodue to Indo-Asian continental collision has resulted in EW trend folding. The Darjeeling Sikkim Himalaya comprises of two major litho-tectonic components :

1) the Proterozoic low-grade rocks (Stratigraphically defined as the Daling Group) and

2) the Late Palaeozoic Gondwana rocks.

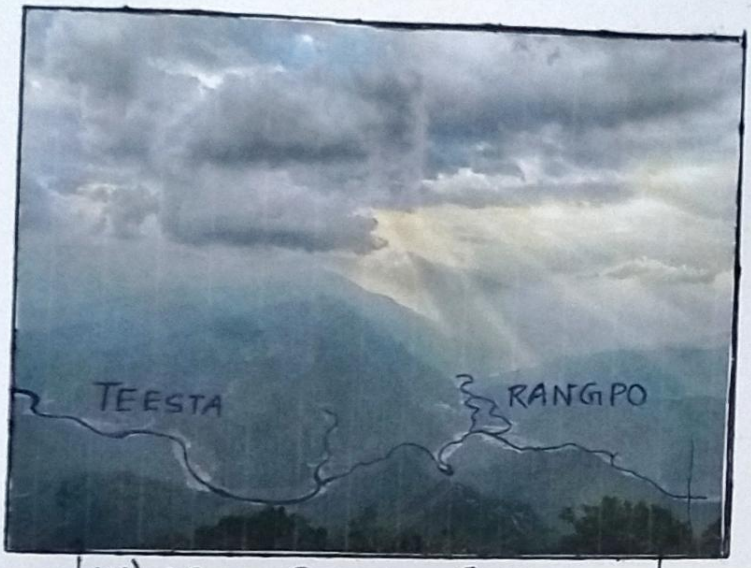
The study area shows "distinct rock types. grades of metamorphism and the intensity of deformation " according to Heim and Gnasser 1939.

Rich micaceous minerals and foliation of schist controls the landslides to a great extent. The leaching of bases, intensive weathering, addition of leaf mulch and sloping landforms were major factors for formation of soil in the study area.

B. PEDOLOGICAL CHARACTERISTICS :-

ii) Soil of Sillery gaon

Morpho- physical properties of soils of Sillerygaon hills in the Kalimpong district do not reflect much morpho-physical variation of soil. The variation in soil depth is due to nature of terrace, rocky phase, sloppy land developed on hill side and soil erosion and mass wasting. The light texture is due to sand-stone, quartzite and other light textured secondary rocks which are the parent material for the formation of this soil. A light soil texture gives rise to poor soil with low organic content. The increased clay content in the lower horizons of the soil profile than the upper part is due to migration / illuviation pedogenic processes like movement of water particles within soil space. It was noticed that because of severe erosion due to heavy rainfall,



iii) River Teesta & Rangpo

Urban area expansion in the semi rural hamlets of Pedong and Sillery gaon have increased the use of concrete and asphalt in the region. These materials do not allow the water to percolate through. As the area is in the process of rapid expansion, a huge amount of runoff also enhances the the monsoon water flow. Being free flowing and not flowing through guided channels, the jharas creat threat to farm Lands and weak slopes. The absence of a planned drained system in the area that is getting urbanized allows the water to be fed into natural tributaries that slowly flows

into the major jhoras. This causes intense headward and lateral erosion, which results in slope failures near the jhoras mostly in the form of a large landslide which affect the region.

D. GEOMORPHIC RISKS / HAZARDS / DISASTERS :-

iv) Landslide

The server landslides have adverse effects on the stability of the hill slopes of Kalimpong district especially on the western side and the town gets isolated from the rest of the State. Due to this Sillery gaon is also cutoff and it is difficult for the local people to get access to emergency services from Pedong or Kalimpong. Erosion of river Teesta and its tributaries during heavy rainfalls add to the poor lithdogical quality of the area and contributes to the initiation of landslides. Debris/rockslides have become a common incident in region during monsoon.

As per GSI reports, the history of landslides in kalimpong traces back to 1899. A total of 61 landslides were triggered by rainfall. The Landslides are characterizedby high saturation, carrying debris flows and long run-out distances. Continuousflow of runoff water along the banks of rivers and streams (jhoras) weaken the rocks and they start weathering. In a long span of time, these weak lithological units disintegrate along lines of weakness, leading to landslides. For soils which absorb water, the unitarea and total weight increase. The water gets percolated in joints and cracks. and triggers landslids. Addition of wakes the soil or rock heavy. It moves through the rock, which induces weathering of rock. Over a long time, the rock weakened and finally fails, leading to a rockfalls.

(v) (vi) (vii)

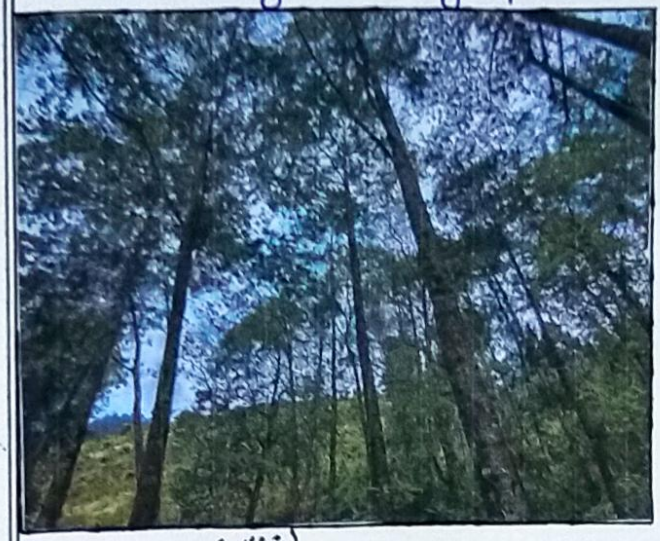
Photo plate i & v EW trend of fold of bedding planes interspersed with marble vi. Exfoliation of rock mass due to alternate contraction. (Near Sillery gaon-Kalimpong District).

E. NATURAL VEGETATION :-

1. Tropical evergreen lower montane forest (1000- 2000 mts.)
2. Tropical evergreen upper montane forest (2000- 3000 mts.)
3. Temperate forest (3000-3500 mts)

About 300 species of orchids have been reported in this region. The temperate ranges cover the forests of Algarah, Charkhola- Lolaygaon, Damsang, Thosum, Todey Tangta and continue above to the Rachela peak, the tri-junction of Sikkim, Bhutan and Kalimpong. Floristically, this climatic border is marked by the pre-sence of certain species like Leucocephrum canum (Ghumpis), Edgeworthia gardneri (Argeli), Rapidophora (Kan chirno),

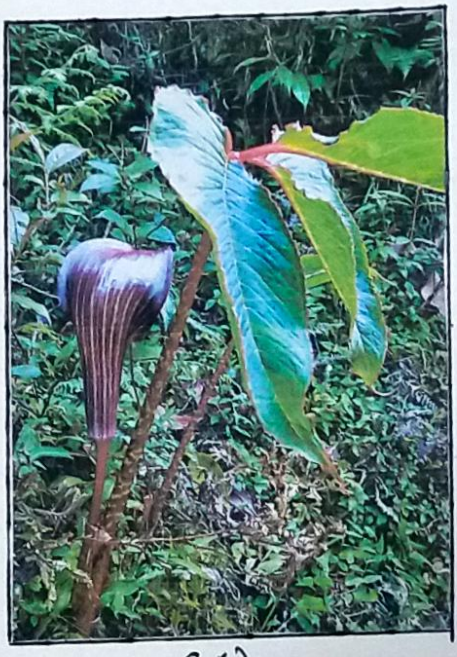
Thunbergia, Agapetes, etc.



(viii)

(ix)

(x)



(xi)

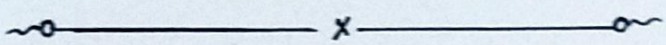
Photoplate (viii) evergreen trees, (ix) Fern & (x) forst floor at Sillerygaon ridge: The typical Himalayan flora is exhibited by the evergreen temperate forests around Sillery Gaon & Algarah.

The tropical mixed forests in this zone show the presence of Tetrameles (Maina). Beilschmiedia (Tarsing). Macaranga (Malata) along with the undergrowths. The subtropical forests, mostly deciduous, extending to an altitude of 1800m, are home to species like Gynocardia odrata (Gante), Callicarpa (Guenlo), Duabanga (Lampate), Terminalia (Saj), Phyllanthus (Amala), Cinnamomum (Tejpat), Engelhardia (Mauwa) and Ficus (Khanjun). The beauty of these forests has been enhanced by the magnificent and lofty climbers like Entada (Pangra). Tinospora (Gurjo, Combretum (Thakauli), Mucuna (Kaoso & Baldengra), Cissus (Charchare).

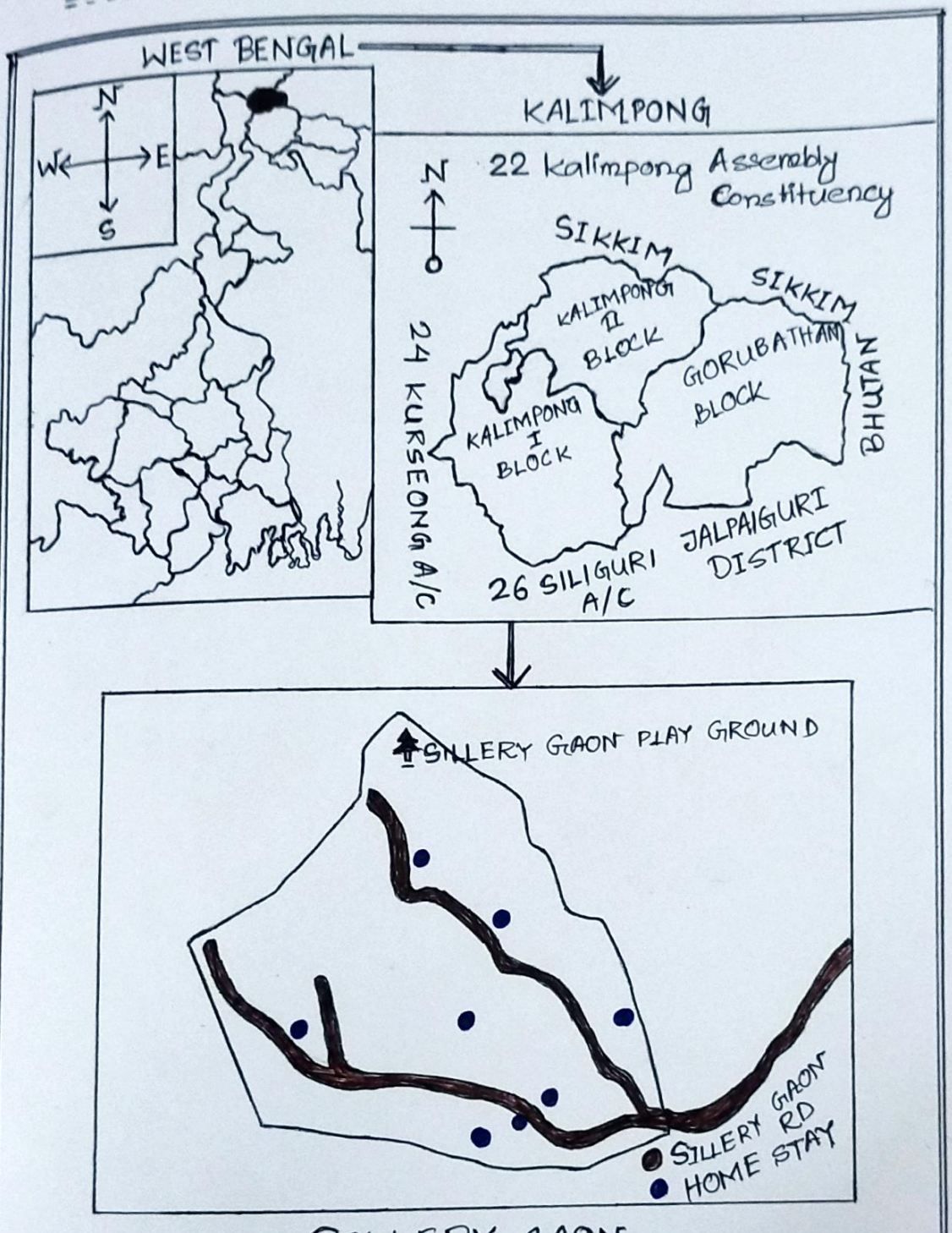
* FAUNA :-

Butterflies like Pieris, Poulia, Apollo, Papilio are noticed. Birds are sparrow hawks, Indian besra, griffon vulture, kaleej pheas-ant, a variety of hornbills, woodpeckers, owls, Indian black-crested baza, end-angered species like the red panda and munal pheasant. Himalayan black bear, clouded leopard tiger, Himalayan tahr, goral, gour and pangolin at

widely different altitudes. The forest belts host the Siberian weasel, today cat, Asiatic black bear, common India Leopard, barking bear, Indian bison, moupan hare and Himalayan Squirrels.



LOCATION OF THE STUDY AREA :-



SILLERY GAON

FIELD BOOK

OPEN TRAVERSE SURVEY BY PRISMATIC COMPASS ALONG THE MAIN ROAD

Place : Sillery Gaon, Kalimpong Date: 09/05/2022

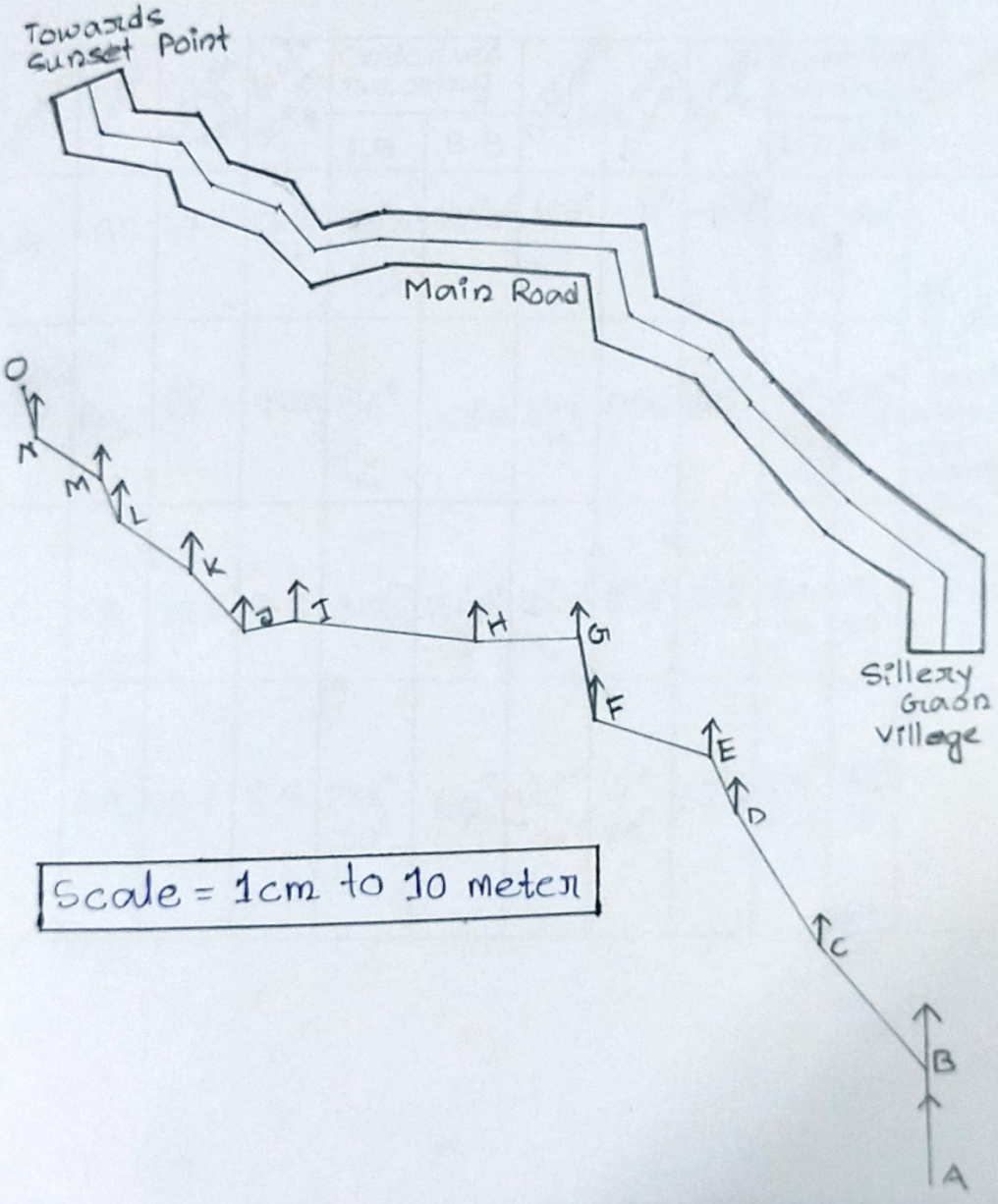
Inst. NO: SSC/PC/01 Location : 27°30'N, 88°58'E

Line	Length (m)	Length in Scale (1 cm = 10 mt)	Observed Bearing
			Forward Bearing
AB	18.6	1.86	0°45'
BC	26.30	2.63	320°
CD	26.10	2.61	327°30'
DE	10.8	1.08	337°
EF	20.50	2.05	289°
FG	14.0	1.40	349°30'
GH	17.70	1.77	269°30'
HI	29.30	2.93	278°
IJ	9.9	0.99	257°30'
JK	14.5	1.45	319°
KL	15.30	1.53	304°30'
LM	8.15	0.82	340°
MN	14.0	1.40	303°30'
NO	8.18	0.82	345°30'

OPEN TRAVERSE SURVEY BY PRISMATIC COMPASS ALONG THE MAIN ROAD OF SILLERY GAON, KALIMPONG, WEST BENGAL

Place : Sillery Gaon, Kalimpong
Location : 27°30'N, 88°58'E
Inst. NO : SSC /PC/01

Date : 09/05/2022
Time : 9 AM



Scale = 1cm to 10 meter

FIELD BOOK

CLOSED TRAVERSE SURVEY BY PRISMATIC COMPASS

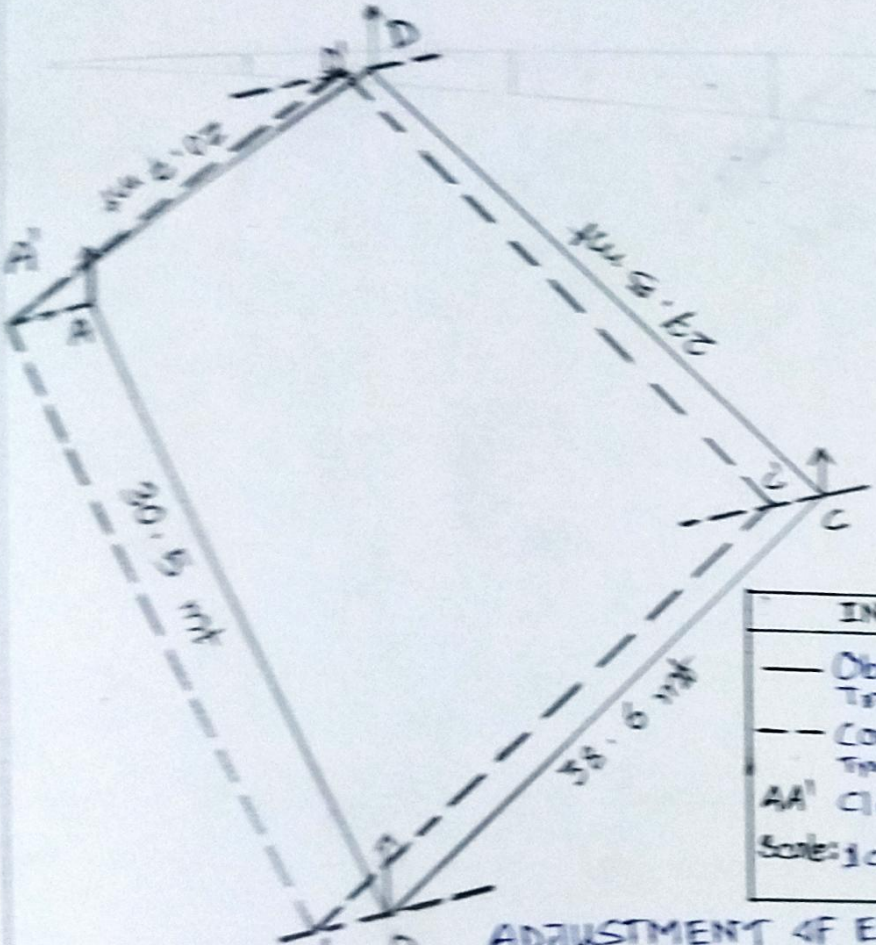
Place : Sillery Gaon, kalimpong Play Ground Date : 09/05/2022

Inst. NO : SSC/PC/01 Location : 27°30'N, 88°58'E

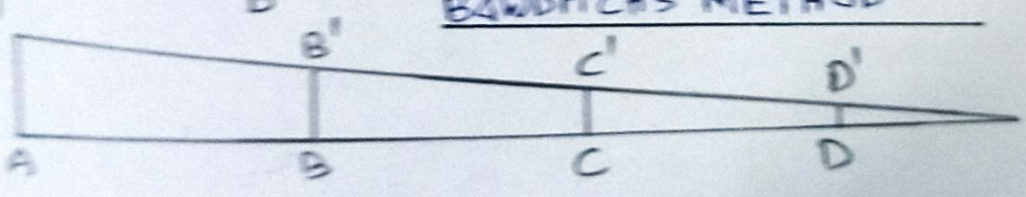
station	Line	Length (m)	Scale 1cm to 3m	Observed Bearing		Difference (d)	Error e=d-180°	Error/2	Corrected Bearing		Remarks
				F.B	B.B				F.B	B.B	
A	AB	30.5	10.16	155°30'	324°30'	169°	-11°	-5°30'	150°	330°	All station are locally attracted and survey was done clock wise
B	BC	28.6	9.53	46°	325°15'	279°15'	99°15'	49°37'	95°37'	275°38'	
C	CD	29.5	9.16	312°	131°30'	180°30'	0°30'	0°15'	311°45'	131°45'	
D	DA	20.7	6.9	232°30'	60°	172°30'	-7°30'	-3°45'	236°15'	56°15'	

CLOSED TRAVERSE SURVEY OF PRISMATIC COMPASS ALONG THE GROUND OF SILLERY GAON, KALIMPONG.

Place :- Sillery gaon, kalimpong
Date :- 09/05/2022
Group NO :- BSC/PC/05
Location :- Lat - 27°13'N
Long - 88°6'E



ADJUSTMENT OF ERROR BY BOWDITCH'S METHOD



Scale : 1 cm = 7 mt

FIELD BOOK

DETERMINATION OF REDUCED LEVEL AND BEARING BY A RADIATION LINE

Place:- Bhotey Gaon, Kalimpong Date:- 09/05/2022

Exp. No:- BSC/RC/01 Location:- 27°30'N, 88°58'E

Station	Distance from 'O' in m	Length in Scale (1cm = 10cm)	Staff Reading (cm) BS	IS	FS	Height of Collimation (CL)	Reduced Level (cm) (RL)	Remarks
O	0	0	1.550				1829	BM of O = 1829 m
A	8.5	5.4		1.290			1829.26	
B	18.6	9.44		0.100			1850.45	
C	30.6	12.29		0.225			1830.325	
D	13.1	5.24		1.980			1828.59	
E	21.5	8.6		3.790		1830.55	1826.76	
F	28	11.2		2.450			1828.1	
G	14.4	5.76		1.550			1829.0	
H	20.2	8.08		2.110			1828.44	
I	26.1	10.44		2.325			1828.225	
J	30.7	12.28			2.520		1828.05	
			Σ=1.55		Σ=2.520			

Prismatic Compass Reading

Lines	Length (cm)	Corrected forward Bearing
OC	30.6	149°
OF	28	112°45'
OJ	30.7	331°30'

Arithmatic check

ΣBS ~ ΣFS = Last RL ~ First RL

= 1.550 ~ 2.520

= 1828.05 ~ 1829

= 0.97 = 0.97

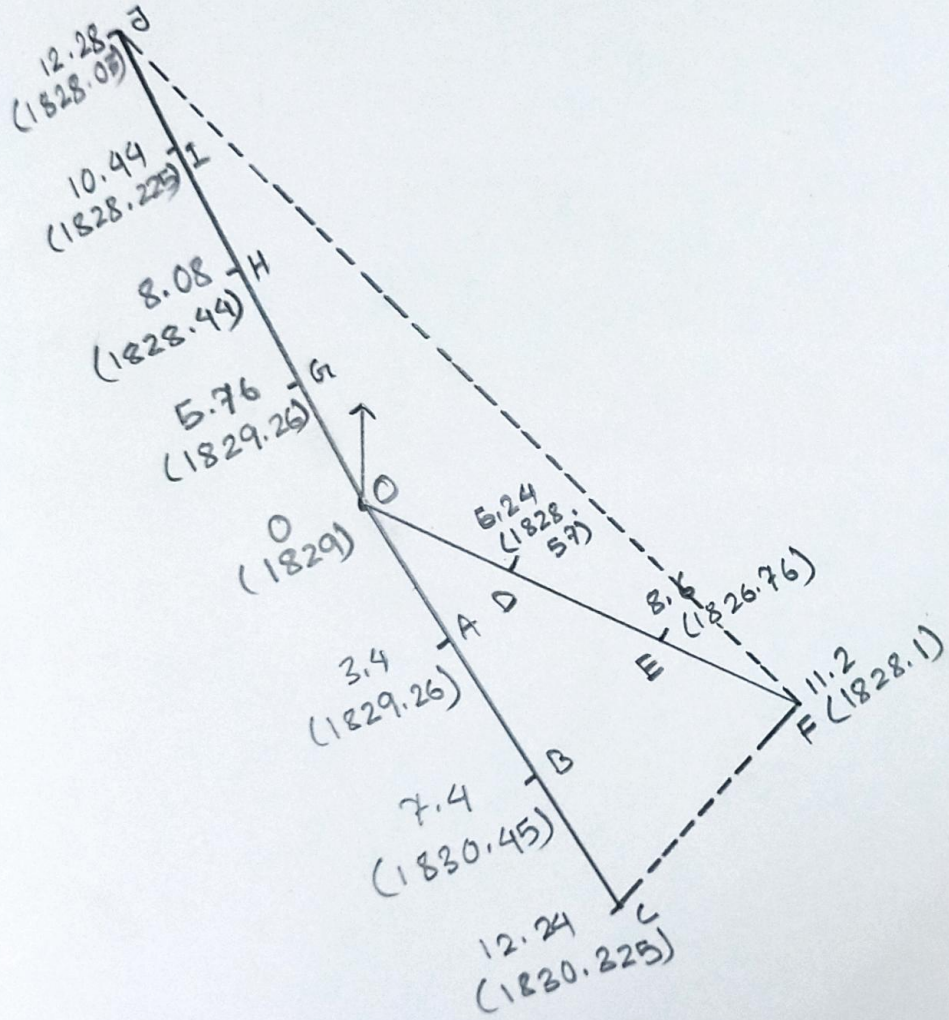
CL = BM + BS/IS/FS

RL = CL - BS/IS/FS

DETERMINATION OF REDUCED LEVEL BY DUMPY LEVEL ALONG THE RADIATING LINE ON THE ROAD OF SILLERY GAON, KALIMPONG

Place :- Sillery Gaon, Kalimpong Date :- 09/05/2002

Inst. NO :- SSC/PC/01. location :- 27°30'N, 88°58'E



FIELD BOOK

DETERMINATION OF REDUCED LEVEL BY DUMPY LEVEL

Place:- Sillery Gaon, Kalimpong Date:-09/05/2022

Inst. NO:- SSC/PC/01 Location:-27°30'N, 88°58'E

Station	Distance in M	Scale 1cm to 2.5m	Staff Reading (meter)			Height of Collimation (CL)	Reduced Level (m) (RL)	Remarks
			BS	IS	FS			
A	0	0	0.390				1829	
B	5.2	2.08		1.950			1829.44	
C	11.9	4.60		1.515			1829.88	
D	18.3	7.32		1.690			1827.7	
E	21.9	8.76		2.335			1827.055	BM
F	26.8	10.72		2.570			1826.82	OF
G	30.6	12.24		2.330		1829.39	1827.06	O=
H	36.1	14.44		2.505			1826.885	1829
I	45.3	18.12		3.310			1826.08	mt
J	46.0	18.4		2.380			1827.01	
K	47.6	19.04		1.910			1827.48	
L	52.5	21.0			1.870		1827.521	

Arithmatic check

$\Sigma BS \sim \Sigma FS$ = Last RL ~ First RL

= 0.390 ~ 1.870 = 1827.52 ~ 1829

= 1.48 = 1.48

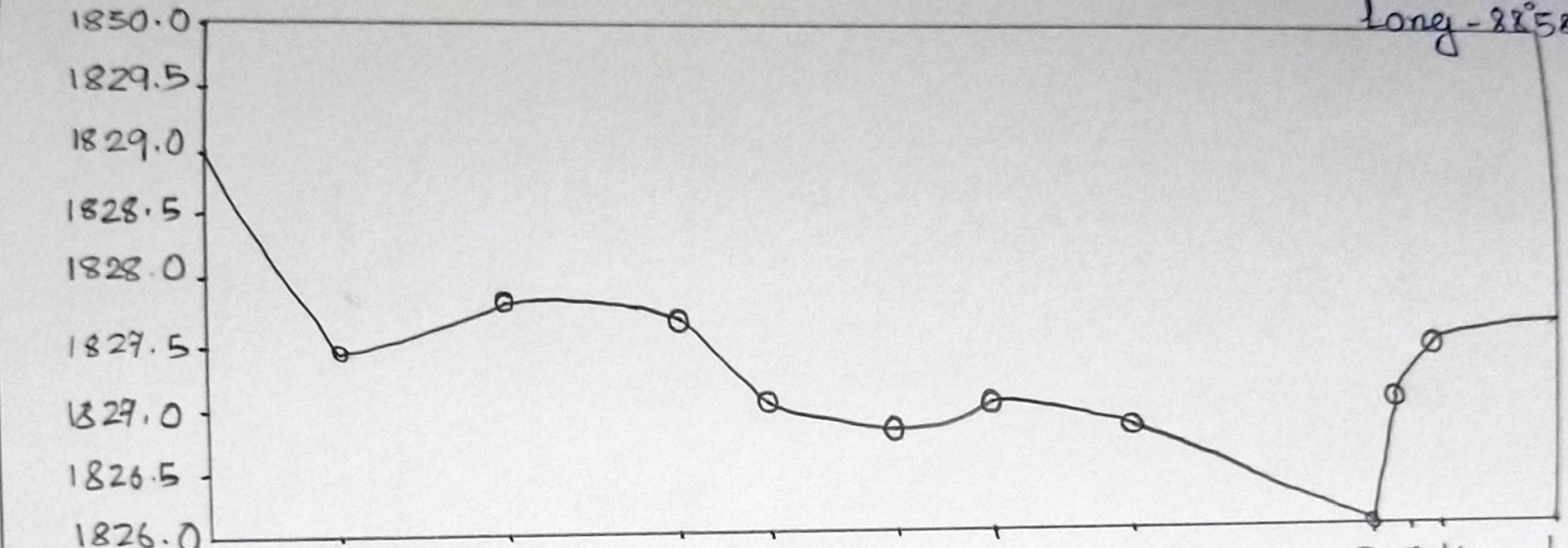
CL = BM + BS/IS/FS

RL = CL - BS/IS/FS

LEVELLING ALONG THE LINE AL BY DUMPI LEVEL

Place :- Sillerygaon, kalimpong
Inst. NO :- SSC/DL/04

Date :- 09/05/2022
Location :- lat - 27°13'N
long - 88°58'E

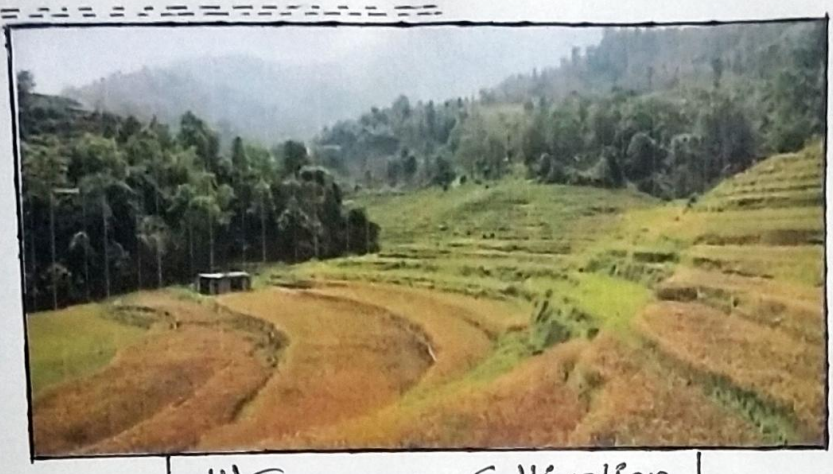


Vertical scale :- 1 cm = 0.5 mt
Horizontal scale :- 1 cm = 2.5 mt

Socio Economic Characteristics :-

A. Economic Activity :-

Terrace Cultivation :-



xii) Terrace Cultivation

The terraces in the nearby hills are bench terrace type by a series of nearly level to very gently sloping strips constructed on or near the contour. These terrace are supported by a barrier of stones or rocks by cutting and filling. The size and shape of these terraces are not of similar type. Their width and length are varied according to slope and rocky surface. They differ according to their shape, size, slope and position slopes also affected the nutrients availability. Agriculture is the primary source of income for the people of Sillery gaon. As large areas of paddy cultivation increase the chance of the landslide,

farmers moved towards other crops like black cardamom which fetch higher prices.

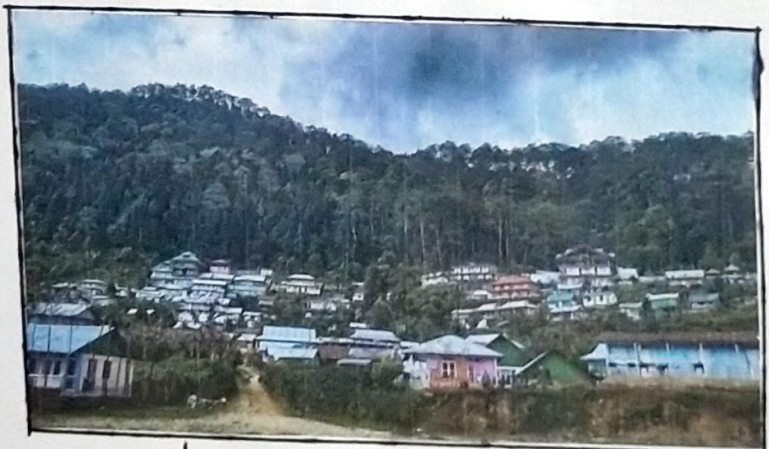
B. TOURISM :-

(xiii) Home Stay

A major attraction of tourist visiting sillery Gaon is Sangchen Dorjee Monastery near Pedong. This 300-year-old monastery was built during the reign of Bhutanese in Pedong. The old section of the monastery is admired with some exquisite wall paintings depicting Tantrik Buddhism.

C. House Type :-

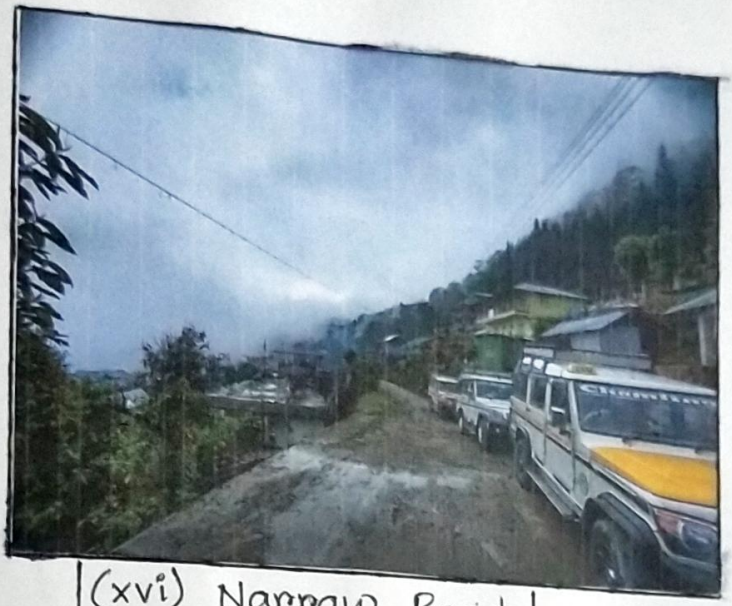
xiv) Wooden house



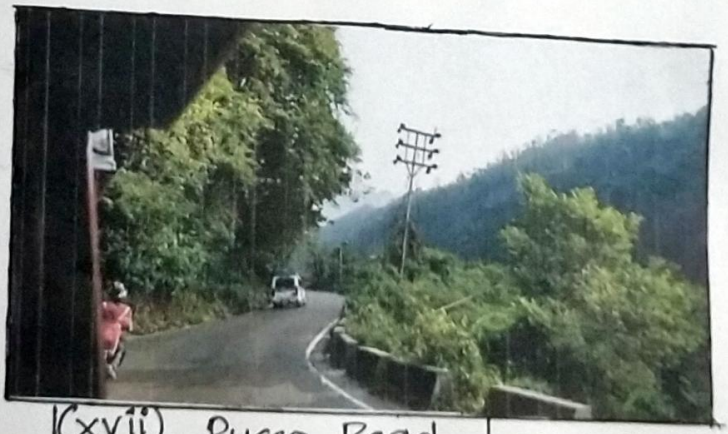
xv) Half-baked houses & Pucca houses

Sillery Gaon is a small village near Pedong in Kalimpong district. The village has close to 40 houses and it has became hugely popular in recent due to great mountain views from here.

D. ROAD Type :-



(xvi) Narrow Road

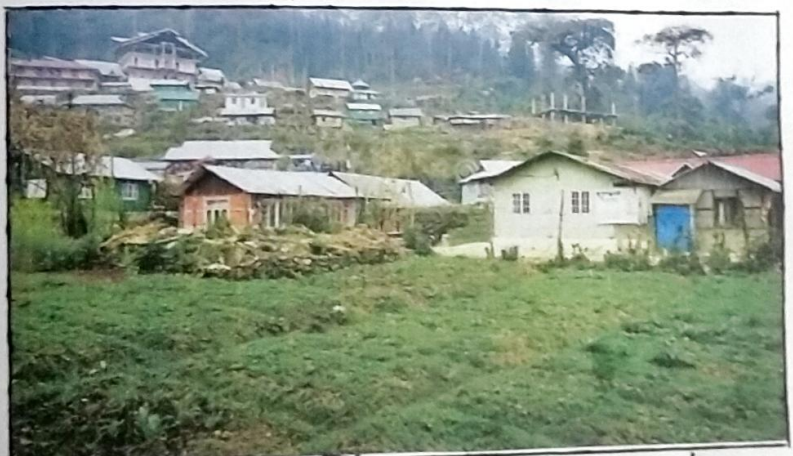


(xvii) Pucca Road

From kalimpong the distance to Sillery Gaon is 23 kms and will take over an hour by car. From kalimpong you will reach Algarah in about 40 minutes (15 kms) along Rishi Road.

E. VEGETABLE GARDEN :-

(xviii)



(xviii) & (xvix) Vegetable Garden in Sillery Gaon.

The sweet name Sillery was taken from a local plant that grows here in abundance. This area is also replete with Cinchona

Plantation which was introduced in this region by the Britishers as a source of Quinine used for the treatment of Malaria. Sillery Gaon has only a few families and they depend mostly on agriculture and nao they are concentrating equally in growing the tourism of this place.