Budge Budge College

AQAR for 2023-2024

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year &
1.3.3: Number of students undertaking project work/field work/internships

Serial No.	Content	Page No.
1.	Internships	2 – 99
2.	Department of Botany	100 – 193
3.	Department of Commerce	194 – 243
4.	Department of Food and Nutrition	244 – 298
5.	Department of Geography	299 – 361
6.	Department of Zoology	362 – 398

Budge Budge College

AQAR for 2023-2024

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year &
1.3.3: Number of students undertaking project work/field work/ internships

Program Name	Number of Students
Field work & Project work	
B.Sc. Botany Honours & Major	8*
B.Sc. Botany Major & MDC	20*
B. Com. Honours	87
B.Sc. Multidisciplinary	10*
B.Sc. Food and Nutrition Honours	29
B.A. & B.Sc. Geography Honours	39
B.Sc. Zoology 4-year Honours & Honours with Research	6*
B.A. Multidisciplinary	7
Internships	
B.Sc. Zoology 4-year Honours & Honours with Research	6*
B.Sc. Multidisciplinary	4*
Total	188
Percentage	7.21

* Includes common students;
Total excludes any common students and is the exclusive number of students undertaking field work/project work/internships during the academic year 2023-2024.

DR. DEBJANI DATTA
M.Sc. (Gold Medalist), Ph.D
Principal
Budge Budge College
7, D.B.C. Road, Kol-700137
West Bengal, India

Indian hotspots, 4.3. *In- situ* and *ex-situ* conservation, 4.4. Seed-banks, 4.5. Cryopreservation

…….16 lectures

EVOLUTION

1.1 Introduction, 1.2. Theories of evolution: Natural selection, Group selection, Neutral theory of molecular evolution, 1.3. Phyletic gradualism, Punctuated equilibrium and Stasis

…….6 lectures

2.1 Brief idea on: Stabilizing directional, disruptive and sexual selection; Speciation: Sympatric and allopatric speciation; Coevolution, Adaptive radiation, Reproductive isolation

…….4 lectures

3.1. Simplified phylogeny of bacteria, algae, fungi, bryophyte, pteridophyte and gymnosperm, 3.2. Phylogenetic tree.

…….6 lectures

PRACTICAL- PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION (BOT-A-CC-4-8-P)
(Credits 2)

1.Workout on ecological parameters

2.Classroom performance: (Lab records)

3. Field Records (Field note book of phytogeographical study and ecological study)

4. Viva

PLANT GEOGRAPHY

1. Field visit- at least one long excursion at different phytogeographical region of India.

2. Study of local flora and submission of a project report highlighting phytogeographical characteristics of the region.

ECOLOGY

1. Study of community structure by quadrat method and determination of (i) Minimal size of the quadrat, (ii) Frequency, density and abundance of components (to be done during excursion/ field visit).

2. Comparative anatomical studies of leaves form polluted and less polluted areas.

3. Measurement of dissolved O_2 by azide modification of Winkler's method.

4. Comparison of free CO_2 from different sources.

PLANT DIVERSITY (PRACTICAL)
BOT-MD-CC1-1-P
Total marks 25; Credit 1, Class 30 hours

1.	**Work out: Morphology**	**10 marks**
2.	**Identification with reasons (other groups except angiosperms)**	**5 marks**
3.	**Class room performance (Practical notebook)**	**3 marks**
4.	**Field notebook**	**2 marks**
5.	**Viva-voce**	**5 marks**

1. Flower- dissection, drawing and study
   a) Different parts, b) Adhesion and cohesion, c) Placentation, d) Aestivation
2. Study of ovules: types (Fresh specimens/ permanent slides/ photographs)
3. Fruits:different types- study from fresh/ preserved specimens
4. Inflorescence types: study from fresh/ preserved specimens
5. Identification on the basis of reproductive and structural features from preserved specimens/ permanent slides: Algae (*Nostoc*, *Oedogonium* and *Ectocarpus*), Fungi (*Rhizopus*, *Ascobolus* and *Agaricus*), Bryophytes (*Marchantia*, *Anthoceros* and *Funaria*), Pteridophytes (*Selaginella*, *Equisetum* and *Pteris*), Gymnosperms (male cone and female cone/ megasporophyll of *Cycas, Pinus* and *Gnetum*).
6. A field notebook supported with photographs taken during field study to be submitted giving comprehensive idea about different types of inflorescence, flowers and fruits.

Textbook Reference:

1. Ganguli,H.C., Das, K.S.K. & Dutta, C.T. College Botany, Vol. I, latest Ed., New Central Book Agency

2. Ganguli,H.C. and Kar, A.K. College Botany, Vol. II, latest Ed., New Central Book Agency

3. Mukherjee, S. College Botany, Vol. III, latest Ed., New Central Book Agency

4. Uno, Storey& Moore, Principles of Botany, 2001, McGraw Hill.

5. Kenrick,P. & Crane, P. The Origin & early diversification of land plants (1997), Smithsonian Institute Press.

6. Bell, P.R. & Hensley, A.R. Green plants; their Origin & Diversity (2nd ed.), 2000, Cambridge University Press

PLANT DIVERSITY (PRACTICAL)
BOT-H-CC1-1-P
Total marks 25; Credit 1, Class 30 hours

1.	**Work out: Morphology**	**10 marks**
2.	**Identification with reasons (other groups except angiosperms)**	**5 marks**
3.	**Class room performance (Practical notebook)**	**3 marks**
4.	**Field notebook**	**2 marks**
5.	**Viva-voce**	**5 marks**

1. Flower- dissection, drawing and study
   a) Different parts, b) Adhesion and cohesion, c) Placentation, d) Aestivation
2. Study of ovules: types (Fresh specimens/ permanent slides/ photographs)
3. Fruits:different types- study from fresh/ preserved specimens
4. Inflorescence types: study from fresh/ preserved specimens
5. Identification on the basis of reproductive and structural features from preserved specimens/ permanent slides: Algae (*Nostoc*, *Oedogonium* and *Ectocarpus*), Fungi (*Rhizopus*, *Ascobolus* and *Agaricus*), Bryophytes (*Marchantia*, *Anthoceros* and *Funaria*), Pteridophytes (*Selaginella*, *Equisetum* and *Pteris*), Gymnosperms (male cone and female cone/ megasporophyll of *Cycas, Pinus* and *Gnetum*).
6. A field notebook supported with photographs taken during field study to be submitted giving comprehensive idea about different types of inflorescence, flowers and fruits.

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PLANT SYSTEMATICS
PRACTICAL (BOT-H-CC2-2-P)
Total marks 25; Credit 1, Class 30 hours

1.	Work out on angiosperms	10 marks
2.	Spot Identification	3 marks
3.	Class room performance (Practical notebook)	2 marks
4.	Field records (field notebook, herbarium specimens)	5 marks
5. Viva-voce		5 marks

ANGIOSPERMS

1. Work out, description, preparation of floral formula and floral diagram, identification up to genus with the help of suitable literature of wild plants and systematic position according to Benthum and Hooker system of classification from the following families: Malvaceae, Leguminosae (Papilionaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Labiatae (Lamiaceae), Rubiaceae.

2. Spot identification (Binomial, Family) of common wild plants from families included in the theoretical syllabus .

FIELD WORK

At least three excursions including one excursion to Acharya Jagadish Chandra Bose Indian Botanic Garden (Shibpur, Howrah) and one to Central National Herbarium (CNH).

FIELD RECORDS

1. Field Note Book (authenticated) with field notes on the plants of the area of excursion and voucher specimen book.

2. Herbarium specimens: Preparation of 20 angiospermic specimens (identified with author citation, voucher number and arranged following Bentham and Hooker system of classification) to be submitted during examination.

PLANT SYSTEMATICS (PRACTICAL)
BOT-MD-CC2-2-P
Total marks 25; Credit 1, Class 30 hours

1.	Work out on angiosperms	10 marks
2.	Spot Identification	3 marks
3.	Class room performance (Practical notebook)	2 marks
4.	Field records (field notebook, herbarium specimens)	5 marks
5. Viva-voce		5 marks

ANGIOSPERMS

1. Work out, description, preparation of floral formula and floral diagram, identification up to genus with the help of suitable literature of wild plants and systematic position according to Benthum and Hooker system of classification from the following families: Malvaceae, Leguminosae (Papilionaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Labiatae (Lamiaceae), Rubiaceae.

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UNIVERSITY OF CALCUTTA

NISHAT ALAM
Secretary,
Councils for Undergraduate Studies,
University of Calcutta.

SENATE HOUSE
87/1, College Street, Kolkata-700 073.
Phone : 2257-3376, 2241-0071-74
e-mail: u.g.councilsc.u@gmail.com
Website: www.caluniv.ac.in

Ref. No. CUS/154/17

Dated the 26th May, 2017

To
The Principals
of all the Undergraduate Colleges
offering B.Com (Honours & General) courses
affiliated to the University of Calcutta.

Sir/Madam,

The undersigned is directed to forward you the University Notification No. CSR/26/17, dt. 26.05.2017 containing new course structure, syllabi and revised admission regulations for three-year B.Com. (*Honours & General*) Courses of Studies.

The above shall be effective for the students getting admission to the three-year six-semester B.Com. (Honours & General) Courses of Studies under CBCS, from the academic session 2017-18 and onwards.

The said notification along with detail course structure, syllabi and admission regulations are available in the Calcutta University website.

Thanking you,

Yours faithfully,

26/05/17

(NISHAT ALAM)
Secretary

26/5/17

Enclo.: C.U. Notification No. CSR/26/17, dt. 26.05.2017

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 26 /17

It is notified for information of all concerned that the Syndicate in its meeting dated 23.05.2017 (vide Item No.46) resolved to approve the **New Course Structure & Syllabi and revised Admission Regulations for the B.Com. (Honours and General)** courses of study under this University as laid down in the accompanying pamphlet.

The above shall be effective for the students getting admission to the 3-year 6-Semester B.Com. (Honours and General) courses of study under CBCS, from the academic session 2017-2018 and onwards.

SENATE HOUSE
KOLKATA-700073
The 26th May, 2017

(Prof. Dr. Rajagopal Dhar Chakraborti)

Registrar

Year 3: Semester VI

		Marks	Credit Hours	
AECC 6.1Chg	Environmental Studies	**100**	**2**	
SEC 6.1Chg	Computerised Accounting and e-Filing of Tax Returns	**100**	**4**	
CC 6.1 Ch	Project Work	**100**	**6**	
DSE 6.1 A**	Financial Reporting and Financial Statement Analysis	**100**	**6**	
DSE 6.2 A**	Financial Management	**100**	**6**	
			24	

Chg: Common for Honours and General; **Ch:** Core Course for Honours

Options:

**Or DSE 6.1 M (Retail Management and Marketing of Services (50+50)
& DSE 6.2 M (Rural Marketing and International Marketing (50+50)

**Or DSE 6.1 T (Indirect Tax: Laws and Practices)
& DSE 6.2 T (Tax Procedures and Planning)

**Or DSE 6.1 e-B (Internet & WWW and Functional e-Business System (50+50)
& DSE 6.2 e-B(Computer Applications and e-Business Applications – Practical (50+50)

Summary for B.Com. Hons.

		Marks	Credit Hours	
Ability Enhancement Compulsory Course (AECC)	Two Papers	**200**	**2 x 2 = 4**	
Skill Enhancement Elective Course (SEC)	Two Papers	**200**	**2x4 = 8**	
Generic Elective (GE)	Four Papers	**400**	**4 x 6 = 24**	
CORE COURSE (CC)	Fourteen Papers	**1400**	**14x 6 = 84**	
Discipline Specific Elective (DSE)	Four Papers	**400**	**4 x 6 = 24**	
		2600	**Total 144**	

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Spaul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

CBCS Syllabus
for
Undergraduate Courses in Geography

TO BE EFFECTIVE FROM THE ACADEMIC SESSION 2018-19

University of Calcutta
May, 2018

2.20 GEO-A-CC-4-10-P – Soil and Biogeography Lab 31
2.21 GEO-A-CC-5-11-TH – Research Methodology and Fieldwork 32
2.22 GEO-A-CC-5-11-P – Research Methodology and Fieldwork Lab 33
2.23 GEO-A-CC-5-12-TH – Remote Sensing, GIS and GNSS 35
2.24 GEO-A-CC-5-12-P – Remote Sensing, GIS and GNSS Lab 36
2.25 GEO-A-CC-6-13-TH – Evolution of Geographical Thought 38
2.26 GEO-A-CC-6-13-P – Evolution of Geographical Thought Lab 39
2.27 GEO-A-CC-6-14-TH – Hazard Management 40
2.28 GEO-A-CC-6-14-P – Hazard Management Lab 41

3. Honours Course: Discipline Specific Electives 42
3.1 GEO-A-DSE-A-5-01-TH – Fluvial Geomorphology 42
3.2 GEO-A-DSE-A-5-01-P – Fluvial Geomorphology Lab 43
3.3 GEO-A-DSE-A-5-02-TH – Climate Change: Vulnerability and Adaptations 44
3.4 GEO-A-DSE-A-5-02-P – Climate Change: Vulnerability and Adaptations Lab 45
3.5 GEO-A-DSE-A-6-03-TH – Environmental Issues in Geography 46
3.6 GEO-A-DSE-A-6-03-P – Environmental Issues in Geography Lab 47
3.7 GEO-A-DSE-A-6-04-TH – Resource Geography 48
3.8 GEO-A-DSE-A-6-04-P – Resource Geography Lab 49
3.9 GEO-A-DSE-B-5-05-TH – Cultural and Settlement Geography 50
3.10 GEO-A-DSE-B-5-05-P – Cultural and Settlement Geography Lab 51
3.11 GEO-A-DSE-B-5-06-TH– Social Geography 52
3.12 GEO-A-DSE-B-5-06-P – Social Geography Lab 53
3.13 GEO-A-DSE-B-6-07-TH – Urban Geography 54
3.14 GEO-A-DSE-B-6-07-P – Urban Geography Lab 55
3.15 GEO-A-DSE-B-6-08-TH – Geography of India 56
3.16 GEO-A-DSE-B-6-08-P –Geography of India Lab 57

4. Honours Course: Skill Enhancement Electives 58
4.1 GEO-A-SEC-A-3-01-TH – Coastal Management 58
4.2 GEO-A-SEC-A-3-02-TH – Tourism Management 59
4.3 GEO-A-SEC-B-4-03-TH – Rural Development 60
4.4 GEO-A-SEC-B-4-04-TH – Sustainable Development 61

5. General Course: Core Subjects 62
5.1 GEO-G-CC-1-01-TH – Physical Geography 62
5.2 GEO-G-CC-1-01-P – Physical Geography Lab 63
5.3 GEO-G-CC-2-02-TH – Environmental Geography 64
5.4 GEO-G-CC-2-02-P – Environmental Geography Lab 65
5.5 GEO-G-CC-3-03-TH – Human Geography 66
5.6 GEO-G-CC-3-03-P– Human Geography Lab 67
5.7 GEO-G-CC-4-04-TH – Cartography 68
5.8 GEO-G-CC-4-04-P – Cartography Lab 69

6. General Course: Discipline Specific Electives 70
6.1 GEO-G-DSE-A-5-01-TH – Regional Development 70
6.2 GEO-G-DSE-A-5-01-P – Regional Development Lab 71
6.3 GEO-G-DSE-A-5-02-TH – Geography of Tourism 72
6.4 GEO-G-DSE-A-5-02-P – Geography of Tourism Lab 73
6.5 GEO-G-DSE-B-6-03-TH – Agricultural Geography 74
6.6 GEO-G-DSE-B-6-03-P – Agricultural Geography Lab 75
6.7 GEO-G-DSE-B-6-04-TH – Population Geography 76
6.8 GEO-G-DSE-B-6-04-P – Population Geography Lab 77

7. General Course: Skill Enhancement Electives 78
7.1 GEO-G-SEC-A-3/4-01-TH – Coastal Management 78
7.2 GEO-G-SEC-A-3/4-02-TH – Forest and Wildlife Management 80
7.3 GEO-G-SEC-B-5/6-03-TH – Rural Development 80
7.4 GEO-G-SEC-B-5/6-04-TH – Sustainable Development 81

1.4 Honours Course: Core Subjects

GEO-A-CC-1-**01**-TH/P – Geotectonics and Geomorphology

GEO-A-CC-1-**02**-TH/P – Cartographic Techniques

GEO-A-CC-2-**03**-TH/P – Human Geography

GEO-A-CC-2-**04**-TH/P – Cartograms, Thematic Mapping and Surveying

GEO-A-CC-3-**05**-TH/P – Climatology

GEO-A-CC-3-**06**-TH/P – Hydrology and Oceanography

GEO-A-CC-3-**07**-TH/P – Statistical Methods in Geography

GEO-A-CC-4-**08**-TH/P – Economic Geography

GEO-A-CC-4-**09**-TH/P – Regional Planning and Development

GEO-A-CC-4-**10**-TH/P – Soil and Biogeography

GEO-A-CC-5-**11**-TH/P – Research Methodology and Fieldwork

GEO-A-CC-5-**12**-TH/P – Remote Sensing, GIS and GNSS

GEO-A-CC-6-**13**-TH/P – Evolution of Geographical Thought

GEO-A-CC-6-**14**-TH/P – Disaster Management

1.5 Honours Course: Choices for Four Discipline Specific Electives [1]

GEO-A-DSE-A-5-**01**-TH/P – Fluvial Geomorphology

GEO-A-DSE-A-5-**02**-TH/P – Climate Change: Vulnerability and Adaptations

GEO-A-DSE-B-5-**05**-TH/P – Cultural and Settlement Geography

GEO-A-DSE-B-5-**06**-TH/P – Social Geography

GEO-A-DSE-A-6-**03**-TH/P – Environmental Issues in Geography

GEO-A-DSE-A-6-**04**-TH/P – Resource Geography

GEO-A-DSE-B-6-**07**-TH/P – Urban Geography

GEO-B-DSE-B-6-**08**-TH/P – Geography of India

1.6 Honours Course: Choices for Two Skill Enhancement Courses

GEO-A-SEC-A-3-**01**-TH – Coastal Management

GEO-A-SEC-A-3-**02**-TH – Tourism Management

GEO-A-SEC-B-4-**03**-TH – Rural Development

GEO-A-SEC-B-4-**04**-TH – Sustainable Development

1.7 General Course: Core Subjects

GEO-G-CC-1-**01**-TH/P – Physical Geography

GEO-G-CC-2-**02**-TH/P – Environmental Geography

GEO-G-CC-3-**03**-TH/P – Human Geography

GEO-G-CC-4-**04**-TH/P – Cartography

[1] Any two electives, one each from DSE-A and DSE-B, are to be chosen in each of Semesters-V and VI

CURRICULUM SCHEME

Semester	Course Type	Paper ID and Name	Credits	Marks Distribution *						Marks per Qn Type	
				Full Marks	Attendance	Internal Assessment	Theoretical Exam	Practical Exam		MCQ	Long-Answer Type
								Written	Project/Viva		
IV Marks: 500 Credits: 26	Core Course - VIII	GEO-A-CC-4-**08**-TH – Economic Geography	4	70	10	10	50	—	—	20	30
		GEO-A-CC-4-**08**-P – Economic Geography Lab	2	30	—	—	—	25	5	—	25
	Core Course - IX	GEO-A-CC-4-**09**-TH – Regional Planning and Development	4	70	10	10	50	—	—	20	30
		GEO-A-CC-4-**09**-P – Regional Planning and Development Lab	2	30	—	—	—	25	5	—	25
	Core Course - X	GEO-A-CC-4-**10**-TH – Soil and Biogeography	4	70	10	10	50	—	—	20	30
		GEO-A-CC-4-**10**-P – Soil and Biogeography Lab	2	30	—	—	—	25	5	—	25
	Skill Enhancement Course - II	GEO-A-SEC-B-4-**03**-TH – Rural Development / GEO-A-SEC-B-4-**04**-TH – Sustainable Development	2	100	10	10	80	—	—		
	Generic Elective - IV	TBD-TH	4/5	70/85							
		TBD-P/TU	2/1	30/15							
V Marks: 400 Credits: 24	Core Course - XI	GEO-A-CC-5-**11**-TH – Research Methodology and Fieldwork	4	70	10	10	50	—	—	20	30
		GEO-A-CC-5-**11**-P – Research Methodology and Fieldwork Lab	2	30	—	—	—	—	20+10	—	—
	Core Course - XII	GEO-A-CC-5-**12**-TH – Remote Sensing, GIS and GNSS	4	70	10	10	50	—	—	20	30
		GEO-A-CC-5-**12**-P – Remote Sensing, GIS and GNSS Lab	2	30	—	—	—	25	5	—	25
	Discipline Specific Elective - I	GEO-A-DSE-A-5-**01/02**-TH	4	70	10	10	50	—	—	20	30
		GEO-A-DSE-A-5-**01/02**-P	2	30	—	—	—	25	5	—	25
	Discipline Specific Elective - II	GEO-A-DSE-B-5-**05/06**-TH	4	70	10	10	50	—	—	20	30
		GEO-A-DSE-B-5-**05/06**-P	2	30	—	—	—	25	5	—	25
VI Marks: 400 Credits: 24	Core Course - XIII	GEO-A-CC-6-**13**-TH – Evolution of Geographical Thought	4	70	10	10	50	—	—	20	30
		GEO-A-CC-6-**13**-P – Evolution of Geographical Thought Lab	2	30	—	—	—	—	20+10	—	15
	Core Course - XIV	GEO-A-CC-6-**14**-TH – Disaster Management	4	70	10	10	50	—	—	20	30
		GEO-A-CC-6-**14**-P – Disaster Management Lab	2	30	—	—	—	—	20+10	—	—
	Discipline Specific Elective - III	GEO-A-DSE-A-6-**03/04**-TH	4	70	10	10	50	—	—	20	30
		GEO-A-DSE-A-6-**03/04**-P	2	30	—	—	—	25	5	—	25
	Discipline Specific Elective - IV	GEO-A-DSE-B-6-**07/08**-TH	4	70	10	10	50	—	—	20	30
		GEO-A-DSE-B-6-**07/08**-P	2	30	—	—	—	25	5	—	25

*Tutorials of 1 Credit will be conducted in case there is no practical component

2.22 GEO-A-CC-5-11-P – Research Methodology and Fieldwork Lab ✧ 30 Marks / 2 Credits

Every student needs to participate in fieldwork and prepare a field report according to the following guideline, failing which he/she will not be evaluated for GEO-A-CC-5-11-P.

1. Each student will prepare a report based on primary data collected from field survey and secondary data collected from different sources.
2. Students will select either one rural area (*mouza*) or an urban area (municipal ward) for the study, with the primary objective of evaluating the relation between physical and cultural landscape.
3. A specific problem or a special feature should be identified based on which, the study area will be selected.
4. The report should be handwritten in English on A4 size paper in candidate's own words within 5,000 words (Introductory Chapter: 1000 words; Physical Aspects: 1500 words; Socio-economic Aspects: 1500 words; Concluding Chapter: 500 words, approximately) excluding tables, photographs, maps, diagrams, references and appendices.
5. Photographs, maps and diagrams should not exceed 15 pages.
6. A copy of the bound report, duly signed by the concerned teacher, will be submitted during examination.
7. The field work and post-field work will include:
   a. Collection of primary data on physical aspects (relief and soil) of the study area. Students should use survey instruments like prismatic compass, dumpy level, Abney level or clinometer wherever necessary.
   b. Collection of soil samples from different land cover land use regions of the study area for determining pH and NPK values with help of a soil kit.
   c. Collection of socio economic data, at the household level (with the help of a questionnaire) in the selected study area.
   d. Plot to plot land use survey for preparation of a land use map, covering whole or part of the selected area.
   e. Visit to different organisations and departments for collection of secondary data.
   f. Any other survey relevant to the objective of the study.
8. The Field Report should contain the following sections (a–e).
   a. Introduction: Study area extent and space relations, reasons for selection of the study area on the basis of a specific problem or special feature, objectives, methods of data collection, analyses and presentation, sources of information, etc.
   b. Physical aspects: Lithology and geological structure, relief, slope, drainage, climate, soil, vegetation, environmental issues, proneness to natural hazards, etc.
   c. Socio-economic aspects:
      i. Population attributes: Number, sex ratio, literacy, occupational structure, ethnic and religious composition, language, per capita income, etc.
      ii. Settlement characteristics: Number of houses, building materials, number and size of rooms, amenities, etc.
      iii. Agriculture: General land use, crop-combination, use of fertiliser and irrigational facilities, production and marketing etc.
      iv. Other economic activities: Fishing, horticulture, brick-making, household and other industries, etc.

d. Conclusions: Relation between physical and cultural landscape. Evaluation of problems and prospects. General recommendations.

e. Bibliography.

9. The students will prepare (i) a chorochromatic land use land cover map on the basis of plot to plot survey; (ii) a profile of suitable length, surveyed and plotted, with different land use land cover superimposed on it.

10. All sections of the report should contain relevant maps, diagrams and photographs using primary and secondary data, clearly citing sources.

11. All surveys should pertain to the objective of the study. Surveys not relevant for establishing the relation between physical and cultural landscape should be avoided.

12. Marks division: 20 on report + 10 on viva-voce = 30

2.26 GEO-A-CC-6-13-P – Evolution of Geographical Thought Lab ✧ 30 Marks / 2 Credits

A laboratory notebook, comprising class assignments of topics 1 and 2, is to be prepared and submitted. The exercises are to be drawn in pencil with photocopied representation of source materials where necessary. All texts are to be handwritten.

1. Changing perception of maps of the world (Ptolemy, Ibn Batuta, Mercator)
2. Mapping voyages; Columbus, Vasco da Gama, Magellan, Thomas Cook
3. Group Presentation of five to ten students on any selected school of geographical thought (20 marks)
4. Viva-voce based on laboratory notebook on topics 1 and 2 (10 Marks)

References

Black, J. 2003. Visions of the World: A History of Maps, Mitchell Beazley.

Couper, P. 2015. A Student's Introduction to Geographical Thought: Theories, Philosophies, Methodologies, Sage.

Holt-Jensen, A. 2011. Geography: History and Concepts: A Student's Guide, Sage.

Whitfield, P. 2017. Charting the Oceans, British Library.

2.28 GEO-A-CC-6-14-P – Hazard Management Lab ✧ 30 Marks / 2 Credits

A Group Project Report is to be prepared and submitted based on any one case study among the following hazards from West Bengal, incorporating a preparedness plan, preferably in the vicinity of the candidates' institution / district:

1. Earthquake
2. Landslide
3. Land subsidence
4. Thunderstorm
5. Flood
6. Riverbank / Coastal erosion
7. Fire
8. Industrial accident
9. Road / Railway accident
10. Structural collapse
11. Environmental pollution
12. Biohazard

One case study will be done by a group of five to ten students. Different groups may choose different case studies from any one or different types of disasters. The report should be prepared on secondary data and handwritten on A4 page in candidates' own words not exceeding 2,000 words excluding references. The report should contain a proper title. The report should incorporate relevant tables, maps, diagrams, and references, not exceeding ten pages. Photographs are optional and should not exceed three. A copy of the stapled / spiral-bound report in a transparent cover, duly signed by the concerned teacher, is to be submitted during examination. Without the report the candidates will not be evaluated for GEO-A-CC-6-14-P.

Marks division: 20 on report + 10 on viva-voce = 30

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

SPaul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

SCHEME AND SYLLABUS FOR CHOICE BASED CREDITSYSTEM FOR B.Sc. HONOURS FOOD AND NUTRITION

SEMESTER	CORE COURSE (14)	ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)	SKILL ENHANCEMENT COURSE (SEC)	DISPLINE SPECIFIC ELECTIVE COURSE (DSE)	ELECTIVE: GENERIC COURSE (GE)
I	FNT-A-CC-1-1-Th:BASIC FOOD SCIENCE-I FNT-A-CC-1-1-P:BASIC FOOD SCIENCE-I (PRACTICAL)	(2)	(2)	(4)	(4)
	FNT-A-CC-1-2-Th:HUMAN PHYSIOLOGY-I FNT-A-CC-1-2-P:HUMAN PHYSIOLOGY-I (PRACTICAL)				
II	FNT-A-CC-2-3-Th:BASIC FOOD SCIENCE-II FNT-A-CC-2-3-P: BASIC FOOD SCIENCE-II (PRACTICAL)				
	FNT-A-CC-2-4-Th:HUMAN PHYSIOLOGY-II FNT-A-CC-2-4-P:HUMAN PHYSIOLOGY-II (PRACTICAL)				
III	FNT-A-CC-3-5-Th: HUMAN NUTRITION-I FNT-A-CC-3-5-P: HUMAN NUTRITION-I (PRACTICAL)		SEC-A-(1/2)		
	FNT-A-CC-3-6-Th:COMMUNITY NUTRTION FNT-A-CC-3-6-P:COMMUNITY NUTRIION (PRACTICAL)				
	FNT-A-CC-3-7-Th: FOOD COMMODITIES FNT-A-CC-3-7-P: FOOD COMMODITIES (PRACTICAL)				

2. General concepts of weights and measures. Eye estimation of raw and cooked foods
3. Preparation of food from different food groups and their significance in relation to health.
4. Preparation of supplementary food for different age group and their nutritional significance.
5. Planning and preparation of low cost diet for Grade I and Grade II malnourished child

FNT-A-CC-3-6-Th: COMMUNITY NUTRITION 4 CREDITS

1. Concept of Community, types of Community, Factors affecting health of the Community.
2. Nutritional Assessment and Surveillance: Meaning, need, objectives and importance
3. Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods.
4. Diet survey: Need and importance, methods of dietary survey, Interpretation - concept of consumption unit, individual and total distribution of food in family, adequacy of diet in respect to RDA, concept of family food security.
5. Clinical Signs: Need & Importance's, identifying signs of PEM, vitamin A deficiency and iodine deficiency, Interpretation of descriptive list of clinical signs.
6. Nutritional anthropometry:Need and importance, standard for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements. Use of growth chart.
7. International, national, regional agencies and organisations. Nutritional intervention programmes to combat malnutrition.

FNT-A-CC-3-6-P:COMMUNITY NUTRITION (PRACTICAL) 4 CREDITS

1. Anthropometric Measurement of infant - Length, weight, circumference of chest, mid-upper arm circumference, precautions to be taken.
2. Comparison with norms and interpretation of the nutritional assessment data and its significance. Weight for age, height for age, weight for height, body Mass Index (BMI) Waist - Hip Ratio (WHR). Skin fold thickness.
3. Growth charts - plotting of growth charts, growth monitoring and promotion.
4. Clinical assessment and signs of nutrient deficiencies specially PEM (Kwashiorkor, marasmus) I vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies.

5. Estimation of food and nutrient intake: Household food consumption data, adult consumption unit, 24 hours dietary recall 24 hours record, Weighment method, food diaries, food frequency data, use of each of the above, information available through each individual, collection of data, estimation of intakes.

FNT-A-CC-3-7-Th: FOOD COMMODITIES 4 CREDITS

1. Cereals and Millets: Structure, processing, storage, use in various preparation, variety, selection and cost. Cereal products, breakfast cereals, fast food.

2. Pulses and Legumes: Structures, Selection and variety. Storage, Processing and use in different preparations, Nutritional aspects and cost.

3. Milk and Milk products : Composition, Classification, Selection Quality and Cost, Processing, Storage and uses in different preparations, Nutritional aspects, shelf life and spoilage.

4. Eggs: Production, grade, quality selection, storage and spoilage, cost nutritional aspects and use in different preparations.

5. Meat, Fish and Poultry: Types, Selection, Purchase, Storage, Uses, preparations Cost, Spoilage of fish Poultry and meat.

6. Vegetables and Fruits: Variety, Selection, purchase, storage, availability causes and nutritional aspects of raw and processed products and use in different preparations.

7. Sugar and sugar Products: Types of natural, sweeteners, manufacture, selection, storage and use as preserves, stages in sugar cookery.

8. Fats and Oils: Types and sources (animal and vegetable), Processing, uses in different preparations, storage, cost and nutritional aspects.

9. Raising and Leavening agents: Types, constituents, uses in cookery and bakery, storage.

10. Food Adjuncts: Spices, condiments, herbs, extracts; concentrates essences, food colours, origin, classification, description,uses, specifications, procurements and storage.
11. Convenience Foods: Role, types, advantages, uses, cost and contribution to diet.
12. Salt: Types and uses.
13. Beverages: Tea; Coffee. Chocolate and Cocoa Powder-Processing, cost and nutritional aspects, other beverages-Aerated beverages, juices.

FNT-A-CC-3-7-P: FOOD COMMODITIES (PRACTICAL) 2 CREDITS

1. Detection of starch, sucrose, sucrose, formalin, boric acid, and urea in milk.
2. Detection of urea in puffed rice.
3. Detection of Vanaspati in Ghee/Butter.
4. Detection of Khesari flour in besan.

FNT-A-DSE-A-5-1-P: PUBLIC HEALTH (PRACTICAL) 2 CREDITS

1. Preparation of 3 audio visual aids like charts, posters, models related to health and nutrition education.
2. Formulation and preparation of low cost and medium cost nutritious/ supplementary recipe.
3. Field visit(health centre, immunization centre, ICDS, MCH centre, NGOs etc.).

FNT-A-DSE-A-5-2-Th: MUSHROOM CULTURE 4 CREDITS

1 Definition and characteristics of mushroom.

2 Morphology and life cycle of Mushroom.

3 Identification and classification of mushroom

4 Nutritional and medicinal value of edible mushrooms; poisonous mushrooms

5 Types of edible mushrooms available in India- *Volvariella volvacea, Pleurotus citrinopileatus, Agaricus bisporus*.

6 Process of mushroom cultivation.

7 Storage and nutrition: short term storage (Refrigeration- upto 24 hours), long term storage (canning, pickles, papads), drying, storage in salt solutions.

FNT-A- DSE- A-5-2-P: MUSHROOM CULTURE(PRACTICAL) 2 CREDITS

1 Visit to Mushroom Culture Centers/ Farms for:

Process involved in mushroom cultivation
Types and varieties of mushroom
Visual Identification of edible and poisonous mushroom Marketing

2 Different Food preparation from mushroom

FNTA-DSE- A-6-3-Th : DIET COUNSELING AND PATIENT CARE 4 CREDITS

1. Introduction to term Dietician**:** Definition of Dietician , Difference between registered dietician & Nutrition
2. Role of dietician in hospital **:** work area of hospital dietician, role of dietician in hospital
3. Role of dietician in community :- work area of community dietician, role of community dietician

4. Introduction to Nutrition Care Process: Definition of Nutrition Care Process .Steps of Nutrition Care Process

5. Nutrition Assessment:-Definition , Nutrition assessment component, Critical thinking

6. Nutrition Diagnosis: nutrition diagnosis domain:- intake, clinical, behavioral – environmental

7. Nutrition diagnosis component• nutrition vs. medical diagnosis

8. Nutrition Interventions**:** Definition and objectives

9. Nutrition Monitoring & Evaluation **:** Definition, Nutrition monitoring & evaluation components, nutrition goals & objectives. Evaluation of nutrition care

FNT-A-DSE- A-6-3-P: DIET COUNSELING AND PATIENT CARE (PRACTICAL) 2CREDITS

Visit and training to hospitals/nursing homes for 7-15 days :

1 Taking Case history and study
2 Routine Hospital diet
3 Distribution of food from kitchen to individual patient with specific diet. 4 Dietary management of patient in different diseases and diet chart for the particular patient.
5 Role of dietitian /nutritionist in diet counselling

FNT-A-DSE- A-6-4-Th: GERIATRIC NUTRITION 4 CREDITS

1. Definition of ageing, senescence, old age or aged people, gerontology, geriatrics, and Geriatric nutrition. Classification of old population.
2 .Physiological and biochemical changes during old age.
3. Assessment of nutritional status of older adults.
4. Nutritional requirements and general dietary guidelines for elderly .
5. Major nutritional and health problems during old age.

FNT-A-DSE- A-6-4-P: GERIATRIC NUTRITION(PRACTICAL) 2 CREDITS

1. Visit to old- age homes.

2. Preparation of dishes suitable for older person- soft,semisolid and easily digestible balanced diet.

FNT-A-DSE-B-5-1-Th: THEORIES OF HUMAN DEVELOPMENT 4 CREDITS

PART I: SEMESTER 1
SEC-1: Applied Entomology
Major; SEC-1-TH

Full Marks 75	3 Credits	50 Hours
Unit 1 Basics of Entomology		12
Insect diversity and adaptation: Morphological adaptation of insects: Head and antenna; Mouthparts of honey bee and cockroach; Thorax and thoracic appendages- legs and wings [General concept]. **Physiological adaptation in cockroach:** Digestive system: Alimentary canal and digestive glands, digestion; Respiratory organs and mechanism of gaseous exchange; Sense organs compound eyes, chemoreceptors. **General Characteristics of Class Insecta and living orders with examples:**Orthoptera, Dictyoptera, Hemiptera, Coleoptera, Lepidoptera, Diptera, Hymenoptera, Anoplura, Siphonaptera(Imms, A.D., 1938); **Ticks and Mites:** General features; difference between ticks and mites; Soft ticks and Hard ticks.		
Unit 2 Medical Entomology		14
Concept of Vectors: Mechanical and biological vectors, modes of transmission; Biological vector and disease cycle. **Biology of *Anopheles*, *Culex* and *Aedes*:**Study of mosquito borne diseases- Malaria, Dengue, and Filariasis; control of mosquitoes. **Biology of *Musca domestica*:**Disease relationship; control of house fly. Biology and systematicsof Bed bug *Cimex lectularius*; disease relationship; Control of Bed Bug. Ticks as Causative agents and Vectors: Rickettsiosis, Tick-borne encephalitis. Forensic Entomology: General perceptions and status of Forensic entomology; Insects and other arthropods of forensic importance; Pattern of insect succession on carcass; Postmortem Interval (PMI) and its estimation process; Applications and limitations of Forensic Entomology		
Unit 3 Agricultural Entomology		14
Concept of insect pest; Economic Injury Level (EIL), Economic Threshold Level (ETL), Dynamics of EIL; Pests of major crops (Life cycle, Nature of damage and control measures): Pests of Paddy, *Scirpophagaincertulus*; Pests of Jute, *Anomissabulifera;* Pests of brinjal, *Leucinodesorbonalis*; Stored grain pest: *Sitophilusoryzae*; Invasive insect pests of India and their consequences. Insect Pest control: Chemical, Mechanical, Cultural and Biological control measures; Integrated Pest Management (IPM) Study of appliances used in pest control: Dusters; Sprayers- categories of sprayers, agricultural Aircrafts; Granule applicator; soil injectors.		
Unit 4 Sericulture		5
Types of Silk Moths with special reference to their scientific name, geographical distribution, and host plants. Life cycle of *Bombyx mori*; Structure of Silk Gland; Voltinism,Rearing of mulberry silkworm; Reeling and extraction of silk; Mulberry cocoon management; Mulberry plant types and cultivation; Common diseases and pests of mulberry silkworm and their control measures;Prospects of Sericulture in West Bengal; employment potential in sericulture.		
Unit 5 Apiculture		5
Various domesticated species of Honeybee; Social organization and life cycle of Honeybee; Modern method of Beekeeping: Newton Box and Langstroth Box; extraction of honey and composition of honey; Pests, Parasites and Diseases and their control measures; Bee-economy: Apiculture products and their uses.		

Applied Entomology Lab: SEC-1-P

Full Marks 25	1 Credit	20 Hours
List of Practical		

1. Dissection and temporary mounting of: - Antennae and mouth parts of Cockroach, House fly and Mosquito
2. Methods of collection, preservation, and identification of economically important insects.
3. Identification of following insect pests (Order, family and specimen characters only): *Scirpophagaincertulus; Sitophilusoryzae*; *Callosobruchuschinensis, Leucinodesorbonalis*; *Anomissabulifera; Pyrillaperpusilla.*
4. Morphological studies of various castes of *Apis* sp.
5. Identification of life stages of *Bombyx mori*; Identification of Bivoltine and multivoltine mulberry cocoon.
6. Identification and medical significance of following insects (adults) through permanent slides/photographs: *Aedes* sp., *Culex* sp., *Anopheles* sp. [for mosquito, larvae and both sexes of adults], *Musca* sp., *Phlebotomus* sp., *Cimex* sp., *Pediculushumanuscapitis*., *Xenopsylla* sp.
7. Visits to **any one place of applied entomological significance** (submission ofa field report):
    a. Agricultural field/ forest for on spot study of pests and damage caused.
    b. Any Sericulture farm for studying grainage and rearing activities
    c. Visit to an apiary to study various activities o Apiculture
    d. Any rural or urban health centre to study various aspects of vector surveillance

PART I: SEMESTER 2
SEC-2 Aquaculture
Major; SEC-2-TH

Full Marks 75	3 Credits	50 Hours
Unit 1 Basics of Idea of Fish Biology		**3**
Qualities of Cultivable fish, Indigenous and Exotic		
Unit 2Sustainable Aquaculture System		**17**
Sustainable Aquaculture Culture System: Extensive, Semi intensive, Extensive Water quality in culture ponds and factors controlling water quality. Preparation and Management of Fish Culture Ponds in Composite Fish Culture Cage Culture, Pen Culture, Raceways. Flow through system. Biofloc. Cold water fishery. Jeol Fishery. Sewage fed fishery. Mariculture with special emphasis on sea weed culture.(Basic concept) Induced Breeding of Carps. Synthetic Hormones in Hypophysation. Management of Fin Fish Hatcheries. Glass Jar Hatchery, Chinese Hatchery.		
Unit 3Recent Advancement of Aquaculture		**20**
Aquarium Fisheries. Preparation and Management of Fish Aquarium. Biology of Common Ornamental Fish: Guppy, Swordtail, Angel, Blue morph fish. Anemone fish, Butterfly fish, Molly. **Fish Nutritional Requirements:** Feed Formulations and Preparation of Compound Diets. **Capture Fishery:** Fishing Crafts and Gears, Post harvesting Technology. Fish Transport and Marketing. Fish Preservation and By-products. **Fish Biotechnology:** Transgenic Fish, Sex Reversal in Fish. Aquaponics,Application of GIS and Remote Sensing in Fisheries, Fishery Laws and Regulations.		
Unit 4 Fin Fish pathology		**5**
Name of Infective Disease. Causative Agents, Symptoms, Control.Bacteria- Dropsy, Fin and Tail rot. Protozoa- White Spot Disease; Fungal-Saprolegniasis; Ectoparasite-Gyrodactylosis, Dactylogyrosis. Virus- Rhabdovirus		
Unit 5Applied Aquaculture		**5**
Breeding Techniques in Shrimps and Prawns: Eyestalk Ablation in Shrimp and Salinity shock in Prawns.Techniques of Artificial Pearl Culture.		

Aquaculture Lab: SEC-2-P

Full Marks 25	1 Credit	20 Hours
List of Practical		

1. **Identification of different fish species using Meristic characters. (Systematic position, specimen characters)**
   Rohu, Catla, Cirhinus, Puntius, Amblyphyngodon, Channapunctatus, Lates, Mystus, Notopterus, Cyprinus, Hypopthalmichthys, Ctenopharyngodon, Oreochromisniloticus, Oreochromismossambicus
   Anabas, Clarias, Heteropneustis, Mugil, Macrobrachium, Paneus .
2. **Field visit to an Aquaculture farm/ Hatchery**

SEC G For MDC
Applied Zoology-Theory

Full Marks 75	3 Credits	50 Hours
Unit I: Agricultural Entomology		6
Pest- definition and types (major and minor pests with example); Lifecycle, nature of damage and control of Pests: *Scirpophagaincertulus*of paddy,*Anomissabuliferaof* Jute, *Bandicoota*–stored house pest; Insect Pest control: Chemical, Mechanical, Cultural and Biological control measures; Integrated Pest Management (IPM).		
Unit II: Sericulture		8
Types of Silkworms with special reference to their scientific name, geographical distribution and host plants; *Bombyx mori*: Silk gland, Composition of silk, Uses of silk; Lifecycle; Rearing, Extraction and Reeling of mulberry silk; Silkworm diseases, pests and their control.		
Unit III: Apiculture		7
Various domesticated species of Honeybee; Social organization of Honeybee; Bee keeping: Langstroth Box for rearing of honey bee, Extraction and processing of honey; Composition of honey, apiculture by products and their uses; Pests and Diseases of bees and their control measures		
Unit IV: Vermiculture		7
Scope of Vermiculture; Habit categories of earthworms; methodology of vermicomposting: containers for culturing, raw materials required, preparation of bed, environmental pre-requisites, feeding, harvesting and storage of vermicompost; Advantages of vermicomposting; Diseases and pests of earthworms.		
Unit V: Aquaculture		8
Principles, definition and scope; Prawn culture: Penaeid and Palaemonid features with examples; Semi-intensive method of prawn culture; Application of prawn culture; Difference between major and minor carps with examples; Composite fish farming: General concepts, advantages and disadvantages; Induced breeding: method and advantages; Integrated fish farming.		
Unit VI: Live Stock Management		8
Dairy: Introduction to common dairy animals: Types of Cattle breeds and their distribution in India; Exotic cattle breeds; Artificial insemination and MOET in breeding; Cattle feed: Roughage and Concentrate; dairy by products, preservation and uses. Dairy pathology and vaccination programme. Poultry: Types of breeds (fowl) with features and examples; Rearing method: Deep litter system; feed formulation for chicks; poultry by products with economic importance; Diseases of poultry and their control measures.		
Unit VII: Lac Culture		6
Life cycle, host plants and strains of Lac insect; Lac cultivation: Local practice, improved practice, propagation of Lac insect, inoculation period, harvesting of Lac; Lac composition, processing, products and uses; Natural enemies of lac insect and their management		

SEC G For MDC
Applied Zoology-Practical

Full Marks 25	1 Credit	20 Hours
List of Practical		

1. Identification of various castes of Honey bee, life stages of *Bombyx mori*, various life stages of *Kerrialacca*, various earthworm species used in vermiculture and ectoparasites of Poultry birds
2. Identification of the following fish and prawn specimens (Specimen characters only): *Labeorohita, Catlacatla, Cirrhinusmrigela, Cyprinuscarpio, L. bata, Penaeusmonodon, Macrobrachiumrosenbergi*
3. Collection of any two pests and submission of specimen it along with a small report on its identifying features, life cycle, nature of damage and control: *Sitophilusoryzae, Triboliumcastaneum, Nilaparvatalugens, Anomissabuliferaand*Leucinodesorbonalis
4. Visit to any one of the following and submission of report on the visit
   a) Apiary
   b) Freshwater fish farm
   c) Any agricultural field
   d) Poultry farm
   e) Sericulture farm
   f) Lac culture farm

UNIVERSITY OF CALCUTTA

NotificationNo.CSR/48/2023

It is notified for information of all concerned that the Syndicate in its meeting held on 12.12.2023 (Item No.20) approved the Modalities of Summer Internship to be undertaken at 2nd /4th /6th semesters of 4- year & 3-year B.A./B.Sc./B. Com Courses of Studies (under Curriculum & Credit Framework, 2022), Under this University, as laid down in the accompanying pamphlet.

The above shall be effective from the session 2023 -2024 and onwards.

29/12/2023

Prof.(Dr.) Debasis Das

Registrar

SENATE HOUSE

KOLKATA-700 073

29th December, 2023

MODALITIES OF SUMMER INTERNSHIP

Modalities of Summer Internship to be undertaken at 2nd /4th / 6th Semesters of 4 Year & 3 Year B.A./B.Sc./B.Com. courses of studies under CCF,2022 introduced from the academic session 2023-2024.

1. Scope:

The Summer Internship Programme shall include internships, community engagement programmes and field based learning/minor projects as prescribed in the guidelines laid down in C.C.F, 2022 issued by UGC bearing D.O. No.1-1/2021(QIP)(CBCS)dated 31.01.2023

A number of UGBOS are designing subject specific programmes. The colleges are free to adopt and offer such programmes or to offer programmes designed by themselves according to local needs and feasibility.

2. Period of programme:

The Summer Internship shall be of 15 days duration and will be undertaken during the Summer Recess ordinarily from 16th May to 30th May every year.

All the college teachers shall have to participate in planning of the programmes and in monitoring of the students during the programme.

3. Distribution of credits:

Every student undertaking summer internship shall maintain a project note - book which will carry 02(two) credits and the programme shall be followed by a viva of 01(one) credit.

4. Evaluation:

The evaluation on the basis of the project note-book and viva shall be made by an External Expert to be appointed by the university on the basis of recommendation made by the college.

The project note-book shall be duly signed by a teacher of the concerned college, authorised for the purpose, before the date of evaluation.

5. Internship and Exit:

Any student intending to exit the course must complete the summer internship (Including scoring at least 30% marks in the evaluation) before exit. A student intending to exit shall have to give option for that in the respective column of the application form for the respective even semester examination.

However, any such student desiring to withdraw the exit option may do that within 07(seven) days of the completion of theoretical examinations following the process to be determined by the Controller of Examinations.

A student who does not give option for exit in the application form may also undertake the summer internship. The marks scored by such students in summer internship shall be retained by the College and shall be sent to the University when such students opt for exit in the following even semesters.

The process of submission of marks of summer internship shall be formulated by the Controller of Examinations.

UNIVERSITY OF CALCUTTA

NotificationNo.CSR/05/2023

It is notified for information of all concerned that the Syndicate at its meeting held on 23.06.2023 approved the Admission Regulations for Semester wise Four-year B.A./B.Sc.(Honours & Honours with Research) Courses of Studies (under Curriculum & Credit Framework, 2022), under this University, as laid down in the accompanying pamphlet.

The above shall be effective from the academic session 2023 -2024 and onwards.

Prof.(Dr.) Debasis Das

Registrar

SENATE HOUSE

KOLKATA-700 073

The 23rd June,2023

UNIVERSITY OF CALCUTTA

ADMISSION REGULATIONS

FOR

SEMESTER WISE FOUR-YEAR

B.A./ B.Sc. (Honours with or without Research)

COURSES OF STUDIES

UNDER

[CURRICULUM AND CREDIT FRAMEWORK (CCF, 2022)]

2023

8. **Outline of CURRICULUM AND CREDIT FRAMEWORK (CCF):**

Category of subjects:

A) **Discipline Specific Core Course (DSCC):** A course, to be compulsorily studied by a student as a core requirement of the Major subject.

B) **Minor:** A subject of same broad discipline to be studied by the student with lesser number of courses other than the major subject.

C) **Ability Enhancement Course (AEC):** Ability Enhancement Course (AEC) courses are the courses based on the knowledge of languages. There shall be two AEC courses:

a) Compulsory English
b) MIL/ Alternative English
   - MIL includes: Bengali, Hindi & Urdu.

D) Skill Enhancement Courses (SEC): These courses are designed to provide skill-based knowledge and are aimed at providing competencies, skills etc. SEC courses are based upon skill enhancement. Student shall study 2 SECs based on Major subjects in 1st and 3rd semester. In the 2nd semester the student can study Artificial Intelligence (for Science discipline) or Digital Empowerment (for Humanities & Language discipline) or as specified in the syllabus of the concerned Major subject.

E) Practical/ Tutorial: All courses other than AEC & CVAC will have one Practical/ Tutorial. Wherever there is a practical, there will be no Tutorial and vice-versa. Inclusion of P/TU components in SECs will be decided by the concerned UGBOS.

F) Common Value Added Course (CVAC): These courses are based on Knowledge of Human & Social Values. There shall be 4 CVAC courses of 2 credits each. In the 1st semester there shall be 1 compulsory CVAC in ENVS & one compulsory CVAC in Constitutional Values. In the 2nd semester there shall be 1 compulsory CVAC in ENVS & the students shall select the other CVAC from a pool of courses.

G) Summer Internship: All the students are required to do one 3 credits Summer Internship at the end of the 2nd or 4th or 6th semester. Students completing Internship at the end of the 2nd semester will be allowed to take exit from the course and will be awarded Certificate of 45 credits. Students completing Internship at the end of the 4th semester will be allowed to take exit from the course and will be awarded Diploma of 88 credits. Students completing Internship at the end of the 6th semester will be allowed to take exit from the course and will be awarded three-year Single major Degree of 132 credits.

H) Inter Disciplinary Course (IDC): There shall be 3 IDCs of 3 credits each, to be studied in the first 3 semesters. The students shall take IDC from the different subjects other than the Major and Minor subjects.

UNIVERSITY OF CALCUTTA

NotificationNo.CSR/04/2023

It is notified for information of all concerned that the Syndicate at its meeting held on 23.06.2023 approved the Admission Regulations for Semester wise Three-year B.A./B.Sc.(Multidisciplinary Courses of Studies, under Curriculum & Credit Framework, 2022), under this University, as laid down in the accompanying pamphlet.

The above shall be effective from the academic session 2023 -2024 and onwards.

Prof.(Dr.) Debasis Das

Registrar

SENATE HOUSE

KOLKATA-700 073

The 23rd June, 2023

UNIVERSITY OF CALCUTTA

ADMISSION REGULATIONS

FOR

SEMESTER WISE THREE-YEAR

B.A./ B.Sc. (MULTIDISCIPLINARY)

COURSES OF STUDIES

UNDER

[CURRICULUM AND CREDIT FRAMEWORK (CCF, 2022)]

2023

D) Skill Enhancement Course (SEC): These courses are designed to provide skill-based knowledge and are aimed at providing competencies, skills etc. SEC courses are based upon skill enhancement. The students shall study 3 SECs 2 from each of 2 core subjects in 1st and 2nd semester respectively and in 3rd semester 1 SEC from the Minor subject.

E) Practical/ Tutorial: All courses other than AEC & CVAC will have one Practical/ Tutorial. Wherever there is a practical, there will be no Tutorial and vice-versa. P/TU components in SECs will be as mentioned in the syllabus of the respective subject.

F) Common Value Added Course (CVAC): These courses are based on Knowledge of Human & Social Values. There shall be 4 CVAC courses of 2 credits each. In the 1st semester there shall be 1 compulsory CVAC in ENVS & one compulsory CVAC in Constitutional Values. In the 2nd semester there shall be 1 compulsory CVAC in ENVS & the students shall select the other CVAC from a pool of courses.

G) Summer Internship: All the students are required to do one 3 credits Summer Internship at the end of the 2nd or 4th or 6th semester. Students completing Internship at the end of the 2nd semester will be allowed to take exit from the course and will be awarded Certificate of 45 (42+3) credits. Students completing Internship at the end of the 4th semester will be allowed to take exit from the course and will be awarded Diploma of 88 (85+3) credits. Students completing Internship at the end of the 6th semester and after successful completion of all the 6 semesters will be awarded B.A./ B.Sc. Degree of 128 (125+3) credits.

H) Inter Disciplinary Course (IDC): There shall be 3 IDCs of 3 credits each, to be studied in the first 3 semesters. The students shall select IDCs from the subjects other than the concerned core subjects & minor, not more than one from the each of the Multidisciplinary pool (clause no. 12)

UNIVERSITY OF CALCUTTA

Notification No. CSR/06/2023

It is notified for information of all concerned that the Syndicate at its meeting held on 23.06.2023 approved the Admission Regulations for Semester wise Four-year B.Com. (Honours or Honours with Research) & Three-year B.Com. Courses of Studies (under Curriculum & Credit Framework, 2022), under this University, as laid down in the accompanying pamphlet.

The above shall be effective from the academic session 2023 -2024 and onwards.

Prof.(Dr.) Debasis Das
Registrar

SENATE HOUSE
KOLKATA-700 073
The 23rd June, 2023

UNIVERSITY OF CALCUTTA

ADMISSION REGULATIONS

FOR

SEMESTER WISE FOUR-YEAR/THREE-YEAR

B.Com

COURSES OF STUDIES

UNDER

[CURRICULUM AND CREDIT FRAMEWORK (CCF, 2022)]

2023

6. Attendance

6.1 A student attending at least 75% of the total number of classes* held shall be allowed to sit for the concerned Semester Examinations subject to fulfillment of other conditions laid down in the regulations.

6.2 A student attending at least 60% but less than 75% of the total number of classes* held shall be allowed to sit for the concerned Semester Examinations subject to the payment of prescribed condonation fees and fulfillment of other conditions laid down in the regulations.

6.3 A student attending less than 60% of the total number of classes* held shall not be allowed to sit for the concerned Semester Examinations and he /she has to take admission to the same Semester in the very next year for attending the classes and appearing at the said Semester Examination.

*Such attendance will be calculated from the date of commencement of classes or date of admission, whichever is later.

Explanation: A candidate who has not been eligible to appear at any Semester-end Examination in terms of Clause 6.3 may take admission to the next higher Semester and appear at such higher Semester-end Examinations. However, such candidate has to take admission to the concerned Semester, for which he/she has been ineligible under clause 6.3, in the very next available chance without pursuing any other Semester Course simultaneously.

7. Outline of CURRICULUM AND CREDIT FRAMEWORK (CCF):

Category of subjects:

A) **Discipline Specific Core Course (DSCC)/ Major:** A course, to be compulsorily studied by a student.
B) **Minor:** A subject to be studied by the student with lesser number of courses than the major subject and to be chosen from a pool of subjects.

B) **AEC:** AEC courses are the courses based on the knowledge of languages. There shall be two AEC courses:

a) Compulsory English
b) MIL/ Alternative English
   - MIL includes: Bengali, Hindi & Urdu.

C) Skill Enhancement Courses (SEC): These courses are designed to provide skill-based knowledge and are aimed at providing competencies, skills etc. SEC courses are based upon skill enhancement.

D) Practical/ Tutorial: All courses other than AEC & CVAC will have one Practical/ Tutorial. Wherever there is a practical, there will be no Tutorial and vice-versa. Inclusion of P/TU components in SECs will be decided by the concerned UGBOS.

E) CVAC (Common Value Added Course): These courses are based on Knowledge of Human & Social Values. There shall be 4 CVAC courses of 2 credits each. In the 1st semester there shall be 1 compulsory CVAC in ENVS & one compulsory CVAC in Constitutional Values. In the 2nd semester there shall be 1 compulsory CVAC in ENVS & the students shall select the other CVAC from a pool of courses.

F) **Summer Internship:** All the students are required to do one3 credits Summer Internship at the end of the 2nd or 4th or 6th semester. Students completing Internship at the end of the 2nd semester will be allowed to take exit from the course and will be awarded Certificate of 45 credits. Students completing Internship at the end of the 4th semester will be allowed to take exit from the course and will be awarded Diploma of 88 credits. Students completing Internship at the end of the 6th semester will be allowed to take exit from the course and will be awarded three-year B.Com. Honours/ three-year B.Com.Degree of 128 credits.

Budge Budge College

AQAR for 2023-2024

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year &
1.3.3: Number of students undertaking project work/field work/internships

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Budge Budge College

AQAR for 2023-2024

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year &
1.3.3: Number of students undertaking project work/field work/ internships

Program Name	Number of Students
Field work & Project work	
B.Sc. Botany Honours & Major	8*
B.Sc. Botany Major & MDC	20*
B. Com. Honours	87
B.Sc. Multidisciplinary	10*
B.Sc. Food and Nutrition Honours	29
B.A. & B.Sc. Geography Honours	39
B.Sc. Zoology 4-year Honours & Honours with Research	6*
B.A. Multidisciplinary	7
Internships	
B.Sc. Zoology 4-year Honours & Honours with Research	6*
B.Sc. Multidisciplinary	4*
Total	188
Percentage	7.21

* Includes common students;
Total excludes any common students and is the exclusive number of students undertaking field work/project work/internships during the academic year 2023-2024.

SUMMER INTERNSHIP, 2023-2024

BUDGE BUDGE COLLEGE
Academic Year: 2023-2024

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year &
1.3.3: Number of students undertaking project work/field work/ internships

Credit and Curriculum Framework (CCF, 2022): Semester 2, 2024
Students Who Have Undertaken Internship

B.Sc. Three-year Multidisciplinary Program (B.Sc. MDC)

Institute	Serial No.	Name of the Students	University Registration No.	University Roll No.	Name of the Supervisor	Name of Mentor
Estaurine and Coastal Studies Foundation	1.	Sabana Khatun	561-1211-1112-23	233561-12-0009	Dr. Arunodaya Gautam	Dr. Debasis Upadhyay
	2.	Souvic Adak	561-1111-1091-23	233561-22-0001		
	3.	Muskaan Mallick	561-1215-1104-23	233561-12-0016		
	4.	Sania Farhana	561-1215-1094-23	233561-12-0015		

B.A. Three-year Multidisciplinary Program (B.A. MDC)

Institute	Sl. No.	Name of Students	University Registration No.	University Roll No.	Name of the Supervisor	Mentor Name
Rational Computer, Budge Budge	1.	Nasrun Raisa	561-1211-0420-23	232561-12-0323	Suvankar Das	Dr. Arpita Ray Maulik
	2.	Rina Parvin	561-1215-0558-23	232561-12-0262		
	3.	Rafia Khatun	561-1215-0997-23	232561-12-0441		
	4.	Sainaz Khatun	561-1211-0933-23	232561-12-0181		
	5.	Sathi Das	561-1211-0524-23	232561-12-0100		Dr. Poulomi Roy
	6.	Sharmila Khan	561-1211-0758-23	232561-12-0020		
	7.	Tuhina Parvin	561-1215-0914-23	232561-12-0269		

B.Sc. Four-year (Honours & Honours with Research) Program: Zoology Major (ZOOM)

Institute	Serial No.	Name of the Students	University Roll No.	Name of the Supervisor	Name of Mentor
Estuarine and Coastal Studies Foundation	1.	Dipannita Bhattacharjee	233561-11-0028	Dr. Arunodaya Gautam	Dr. Barnali Bera
	2.	Saswata Momdal	233561-21-0007		
	3.	Chandrika Das	233561-11-0030		
	4.	Sohini Adak	233561-11-0029		
	5.	Piona Sirin	233561-11-0031		
	6.	Sarmin Khatun	233561-11-0032		

SUMMER INTERNSHIP 2024

ESTUARINE AND COASTAL STUDIES FOUNDATION • ESTD 2021 •

EVALUATED

University of Calcutta

NAME : SABANA KHATUN

CU ROLL NO : 233561-12-0009

REG NO. : 561-1211-1112-23

STREAM : BSC. GENERAL

COURSE: 3 YEARS MULTIDISCIPLINARY COURSE

TOPIC : AN INTERGATIVE APPROACH TO ASSESS ENVIRONMENT FROM FIELD TO LABORATORY

Examined 19/9/24

Soman Pal 27/06/2024

(NAME OF THE SUPERVISOR)

Director
Estuarine and Coastal
Studies Foundation

ESTUARINE AND COASTAL STUDIES FOUNDATION

(registered with NITI Aayog DARPAN, Govt. of India)

Completion

Certificate

Summer Internship (2024)

This is to certify that **Sabana Khatun** of Semester II of Department of Zoology, Budge Budge College, University of Calcutta (Roll No 233561-12-0009; Registration No 561-1211-1112-23) has successfully completed the Summer Internship in 15 days / 60 hours on ***'An integrative approach to assess environment from field to laboratory'*** conducted offline from 10 June 2024 to 27 June 2024 at Estuarine and Coastal Studies Foundation, Howrah, West Bengal, India.

Dr. Arunodaya Gautam
Internship Supervisor, E.C.S.F

Mr. Sinchan Chatterjee
Director, E.C.S.F

ESTUARINE AND COASTAL STUDIES FOUNDATION • ESTD 2021 •

Certificate of completion

for

Summer Internship (2024) under Curriculum and credit Framework (CCF) of the University of culcutta

This is to certify that SABANA KHATUN , Student of zoology Minor, Semester II, University Roll no. : 233561-12-0009 , and Reg. No. : 561-1211-1112-23 ,of BUDGE BUDGE COLLEGE, Successfully completed the Summer internship in 15 days/ 60 hours on ' An integrative approach to assess environment from filed to laboratory' conducted offline from 10 June 2024 to 27 June at Estuarine and coastal studies Foundation , Howrah, west Bengal, India

Date :

Arunodaya Gautam
(Name of the Supervisor)

Scientist
Estuarine and Coastal Studies Foundation
Howrah, West Bengal - 711101

Director
Estuarine and Coastal Studies Foundation
(Name of the Director)

ESTUARINE AND COASTAL STUDIES FOUNDATION ESTD-2021

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Hot air Oven

ভূমিকা:- Hot air Oven হলো একটি lab testing instrument যেটি সাধারণত কাচ জাতীয় জিনিসের জন্য ব্যবহার করা হয়। এটি একটি বৈদ্যুতিক তাপমাত্রায় কাজ করে। এটি ব্যবহার করা হয় মূলত কোন কিছুর জীবাণু মুক্ত করার জন্য ১৭০-২০০ ডিগ্রি সেলসিয়াসের মধ্যে এটি হয়ে থাকে। এই Hot air Oven টি সাধারণত দুটি একটি বৈদ্যুতিক থাকে। এটিতে তাপমাত্রা নিয়ন্ত্রণ হয় থার্মোস্ট্যাটের দ্বারা। এক্ষেত্রে বৈদ্যুতিক থাকে থার্মোস্ট্যাটকে সাপোর্ট করে হয়।

চিত্র: Hot air Oven

মূলনীতি:- i. Hot air Oven মূলত Sterilization dry heat Process থাকে অনুসরণ করে জীবাণু মুক্ত করে থাকে।

ii. এটিতে অক্সিজেনের উপস্থিতির কারণে এই ধ্বংস হয়ে।

iii. থার্মোস্ট্যাট দ্বারা এই যন্ত্রের তাপমাত্রা নিয়ন্ত্রণ করা যায়।

ব্যবহার :- এটিতে সাধারণত বিকার, কাঁচের জিনিসপত্র, অন্যান্য চাপ অন্যান্য পরিবেশগত কারণ গুলির নির্দিষ্ট পরিস্থিতিতে একটি নির্দিষ্ট সময়ের মধ্যে জীবাণুমুক্ত করতে সাহায্য করে।

চিত্র :- Hot air oven structure

কাজ :- উচ্চ তাপমাত্রা ব্যবহার করে ব্যাকটেরিয়া ও স্পোর-ধ্বংস করা যায়।

চিত্র :- Hot air oven work

SUMMER INTERNSHIP 2024

ESTUARINE AND COASTAL STUDIES FOUNDATION • ESTD 2021 •

NAME : SOUVIC ADAK

CU ROLL NO : 233561-22-0001

REG NO. : 561-1111-1091-23

STREAM : BSC. GENERAL

COURSE: 3 YEARS MULTIDISCIPLINARY COURSE

TOPIC : AN INTERGATIVE APPROACH TO ASSESS ENVIRONMENT FROM FIELD TO LABORATORY

Examined, 19/9/24

Arunodaya Gautam

(NAME OF THE SUPERVISOR)

Scientist
Estuarine and Coastal Studies Foundation
Howrah, West Bengal - 711101

ESTUARINE AND COASTAL STUDIES FOUNDATION

(registered with NITI Aayog DARPAN, Govt. of India)

Completion

Certificate

Summer Internship (2024)

This is to certify that **Souvic Adak** of Semester II of Department of Zoology, Budge Budge College, University of Calcutta (Roll No 233561-22-0001; Registration No 561-1111-1091-23) has successfully completed the Summer Internship in 15 days / 60 hours on ***'An integrative approach to assess environment from field to laboratory'*** conducted offline from 10 June 2024 to 27 June 2024 at Estuarine and Coastal Studies Foundation, Howrah, West Bengal, India.

Dr. Arunodaya Gautam
Internship Supervisor, E.C.S.F

Mr. Sinchan Chatterjee
Director, E.C.S.F

ESTUARINE AND COASTAL STUDIES FOUNDATION • ESTD 2021 •

Certificate of completion

for

Summer Internship (2024) under Curriculum and credit Framework (CCF) of the

University of culcutta

This is to certify that SOUVIC ADAK , Student of zoology Minor, Semester II, University Roll no. : 233561-22-0001 , and Reg. No. : 561-1111-1091-23 ,of BUDGE BUDGE COLLEGE, Successfully completed the Summer internship in 15 days/ 60 hours on ' An integrative approach to assess environment from filed to laboratory' conducted offline from 10 June 2024 to 27 June at Estuarine and coastal studies Foundation , Howrah, west Bengal, India

Date :

Arunodaya Gautam

(Name of the Supervisor)

Scientist
Estuarine and Coastal Studies Foundation
Howrah, West Bengal - 711101

Bhattacharjee

Director
Estuarine and Coastal Studies Foundation

(Name of the Director)

ESTUARINE AND COASTAL STUDIES FOUNDATION • HOWRAH • ESTD-2021

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Hot Air Oven :-

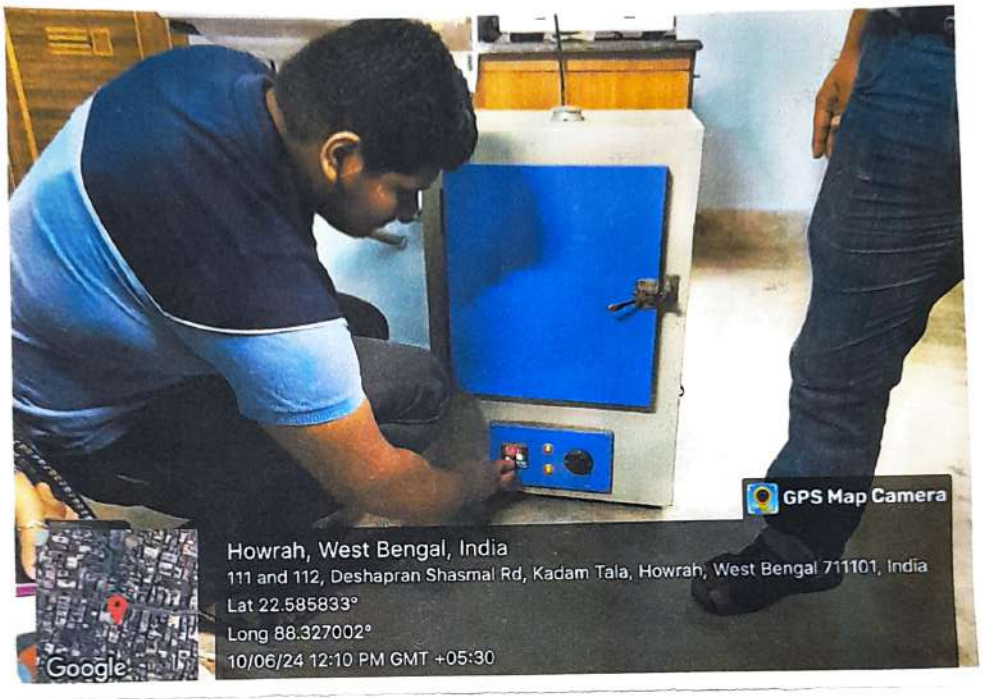
এটি হল একটি গরম বাতাসের Oven, যা সাধারণত একটি বৈদ্যুতিক যন্ত্র যা শুষ্ক তাপ ব্যবহার করে জীবাণুমুক্ত করা যায়। এই Oven দ্বারা সাধারণত তাপমাত্রার পরিসীমা 50 - 300°C এর মধ্যে হয়, তাপমাত্রা একটি থার্মোস্ট্যাট দ্বারা নিয়ন্ত্রিত হয়।

মূলনীতি :- ① এটি; কয়েলের মধ্যে দিয়ে বিদ্যুৎ চলাচল করে ও বৈদ্যুতিক শক্তি তাপশক্তিতে রূপান্তরিত হয়।

② এই যন্ত্রটি Laboratory তে ব্যাপক ভাবে ব্যবহৃত হয়।

③ অক্সিডেশনের কারণে এই ধ্বংস ঘটে।

কাজ : (1) উচ্চ তাপমাত্রায় ব্যবহার করে ব্যাকটেরিয়া ও স্পোর বিনাশ করা যায়।



SUMMER INTERNSHIP 2024

Name :- Muskaan Mallick

Class :- B.sc MDC

Final report

semester:- 2nd

college name:- Budge Budge college

CU roll no:- 233561-12-0016

Reg number:- 561-1215-1104-23

TOPIC NAME :- An integrative approach to assess environment from field to laboratory

Examined by 19/9/24

Estuarine and Coastal Studies Foundation

supervisor

Arunodaya Goutam

signature of internship

Scientist
Estuarine and Coastal Studies Foundation
Howrah, West Bengal - 711101

ESTUARINE AND COASTAL STUDIES FOUNDATION

(registered with NITI Aayog DARPAN, Govt. of India)

Completion

Certificate

Summer Internship (2024)

This is to certify that **Muskaan Mallick** of Semester II of Department of Zoology, Budge Budge College, University of Calcutta (Roll No 233561-12-0016; Registration No 561-1215-1104-23) has successfully completed the Summer Internship in 15 days / 60 hours on ***'An integrative approach to assess environment from field to laboratory'*** conducted offline from 10 June 2024 to 27 June 2024 at Estuarine and Coastal Studies Foundation, Howrah, West Bengal, India.

Dr. Arunodaya Gautam
Internship Supervisor, E.C.S.F

Mr. Sinchan Chatterjee
Director, E.C.S.F

CERTIFICATE OF COMPLETION

This is to certify that Ms. [illegible] of BSc Semester-II, MDC (CCF 2022), Roll No. 233561-12-0016 of Budge Budge College has successfully carried out the project titled –" An Integrative Approach To Assess Environment From Field To laboratory" for Summer Internship Programme 2024 under the guidence of Dr. Arunodaya Gautam of Estuarine and Coastal Studies Foundation (ECSF) in partial fulfillment of BSc. MDC Summer Internship Programme conducted by University of Calcutta, West Bengal, India.

Sign of the Director

Of ECSF

Director
Estuarine and Coastal
Studies Foundation

Sign of the Supervisor

Scientist
Estuarine and Coastal Studies Foundation
Howrah, West Bengal - 711101

Sign of the Mentor

ACKNOWLEDGEMENT

I would like to express my special thanks and gratitude to Dr. Debjani Dutta principal Budge Budge College. Dr. Swati Sachder, nodal officer, Budge Budge college Dr. Debasis Upadhyay mentor Teacher of Department of Botany, Budge Budge college for organizing such an informative educational internship for us. I would also like to express my special thanks to our teachers of Botany Department Dr. Saminar Pandey and Dr. Piyali Das and our laboratory attendant Mrs Mamta Mishra for helping us in all possible ways. I would like to express my gratitude to our internship supervisor Dr. Arunodaya Gautam and director of Estuaine and Coastal Studies. Dr. Sourav Paul. Who guided us all through the internship and also guided us to prepare the project report. Lastly, I would also like to thank all my Classmates who cooperated with me during the whole internship and helped me in preparing this report.

Environmental assessment (Local field survey):

Air analysis:

Instrument used:

To analyse the speed of the wind we generally use anemometer.

ANEMOMETER

(A) Introduction:

At the field survey we've used vane anemometer which is small hand held device comprising a turbine and a digital screen.

(B) Procedure:

At first the anemometer was held in hand then we're to move it 360 a way that the flow reaches the vane wheel by calculating the turns of the caps over a period of time, the maximum and the minimum speed of the wind is found.

(C) Collected Data:

Highest temperature 42.8°C
Highest speed of the wind - 3.0 km/hr
Lowest speed of the wind - 0.6 km/h

(c). Resolution :- The quality of the image on resolution depends on the lenses ability to focus light rays and the quality of the lenses themselves.

iii. Application :- A trinocular compound microscope is used across various disciplines for detailed microscopic examination and documentation. It's applications include biological research quality control in manufacturing forensic analysis material science environmental studies, and routine laboratory diagnostics. The trinocular set up allows for simultaneous viewing through eyepieces and image capture with a camera facilitating enhanced reserch, analysis, and documentation capabilities.

SUMMER INTERNSHIP 2024

ESTUARINE AND COASTAL STUDIES FOUNDATION • ESTD 2021 •

NAME : SANIA FARHANA

CU ROLL NO. : 233561-12-0015

REG. NO. : 561-1215-1094-23

STREAM : BSC. GENERAL

COURSE : 3 YEARS MULTIDISCIPLINARY COURSE

TOPIC : AN INTERGATIVE APPROACH TO ASSESS ENVIRONMENT FROM FIELD TO LABORATORY

Examined by 19/9/24

Arunodaya Gautam

(NAME OF THE SUPERVISOR)

Director
Estuarine and Coastal Studies Foundation

Scientist
Estuarine and Coastal Studies Foundation
Howrah, West Bengal - 711101

ESTUARINE AND COASTAL STUDIES FOUNDATION

(registered with NITI Aayog DARPAN, Govt. of India)

Completion

Certificate

Summer Internship (2024)

This is to certify that **Sania Farhana** of Semester II of Department of Zoology, Budge Budge College, University of Calcutta (Roll No 233561-12-0015; Registration No 561-1215-1094-23) has successfully completed the Summer Internship in 15 days / 60 hours on ***'An integrative approach to assess environment from field to laboratory'*** conducted offline from 10 June 2024 to 27 June 2024 at Estuarine and Coastal Studies Foundation, Howrah, West Bengal, India.

Dr. Arunodaya Gautam
Internship Supervisor, E.C.S.F

Mr. Sinchan Chatterjee
Director, E.C.S.F

ESTUARINE AND COASTAL STUDIES FOUNDATION • ESTD 2021 •

Certificate of completion

for

Summer Internship (2024) under Curriculum and credit Framework (CCF) of the

University of culcutta

This is to certify that **SANIA FARHANA** , Student of zoology Minor, Semester II, University Roll no. : 233561-12-0015 , and Reg. No. : 561-1215-1094-23 ,of BUDGE BUDGE COLLEGE, Successfully completed the Summer internship in 15 days/ 60 hours on ' An integrative approach to assess environment from filed to laboratory' conducted offline from 10 June 2024 to 27 June at Estuarine and coastal studies Foundation , Howrah, west Bengal, India

Date : 17-08-24

Arunodaya Gautam

(Name of the Supervisor)

Scientist
Estuarine and Coastal Studies Foundation
Howrah, West Bengal - 711101

(Name of the Director)

Director
Estuarine and Coastal
Studies Foundation

STEREO MICROSCOPE

Stereo microscope এক ধরনের অপটিক্যাল-মাইক্রোস্কোপ যা ব্যবহৃত ব্যবহারকারীকে একটি-নমুনার ত্রিমাত্রিক দৃশ্য দেখতে দেয়।

গঠন:- Stereo microscope এর প্রতিটি উপাদানের নিজস্ব কাজ রয়েছে। Stereo microscope এর সেসমস্ত উপাদান রয়েছে - অকুলিস, Top lighting, stage clips, focus knob, Lighting controls.

ব্যবহার:-

① অধিকাংশ বস্তুগুলিকে বিবর্ধিত করে।

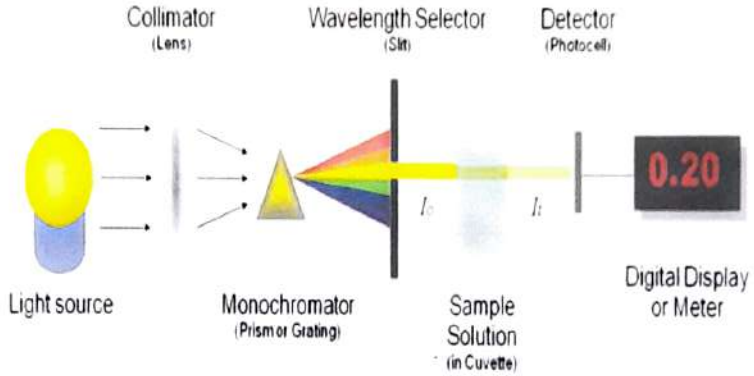
② জীবাশ্ম, পোকামাকড়, ফুল ইত্যাদির মতো অধিকাংশ বস্তুগুলি এই মাইক্রোস্কোপের বিবর্ধনের অধীনে দৃশ্যমান।

SPECTOPHOTO METER

Spectophoto Meter হল পরীক্ষাগারের সর্বক্ষুদ্র যা আলোর তীব্রতা পরিমাপ করতে পারে। আলোর তীব্রতা পরিমাপ করে solution এর ঘনত্বও পরিমাপ করতে পারে।

মূলনীতি:—

Spectophoto meter হল একটি বৈজ্ঞানিক পদ্ধতি।



গঠন:— একটি spectophoto meter চারটি সাধারণ অংশ নিয়ে গঠিত। সেগুলি —

1. Light source :— যেকোনো spectophoto meter এর বিভিন্ন তরঙ্গদৈর্ঘ্যের আলোর প্রয়োজন। সাধারণত টাংস্টেন ল্যাম্প একটি spectophoto meter এ আলোর প্রবেশদ্বারের একটি দৃশ্যমান বর্ণালী প্রদান করে।

2. optical system :— spectophoto meter এর

SALINITY TESTER

Salinity Tester হল এমন ডিভাইস যা একটি পদার্থে উপস্থিত লবণের পরিমাণ পরিমাপ করতে ব্যবহৃত হয়।

মূলতত্ত্ব:- ডিভাইসটি ওয়াটারপ্রুফ, জলের উপর ভেসমান এবং সহজে পরিবর্তনশীল সেন্সর রয়েছে।

ব্যবহার:-

① ড্রেজার্থেকে জলের লবণাক্ততা পরিমাপ করতে,

② ড্রেজার্থেকে জলের তাপমাত্রা পরিমাপ করতে।

কাজ:-

Salinity Tester এর সাহায্যে আমরা নদীর জলের লবণাক্ত ও তাপমাত্রা পরিমাপ করেছিলাম।

ঘাট 1 এ,

① Salinity - 0.1 PPT Temparature - 31.5°C

② Salinity - 0.1 PPT Temperature - 31.6°C

③ Salinity - 0.1 PPT, Temperature - 31.6°C

ঘাট 2 এ,

1) Salinity - 0.1 PPT, Temperature - 31.4°C

2) Salinity - 0.1 PPT, Temperature - 31.6°C

3) Salinity - 0.1 PPT, Temperature - 31.5°C

RATIONAL COMPUTER

43/1/B , D.P.J.M. Road(2nd Floor), Budge Budge , Kolkata -700137

Completion Certificate for Summer Internship (2023-2024)

This is to Certify that Sri/Smt.....RINA PARVIN.....

..... of Budge Budge College, Kolkata having University of Calcutta Registration no.....232561- 12-0262.....and University of Calcutta Roll Number .....561-1215-0558-23.....has successfully completed the Summer Internship of 15 days (60 hours) on 'Office Management' in offline mode conducted from 11-06-2024 to 28-06-2024 .

.....

Signature of Supervisor
RATIONAL COMPUTER

.....

Signature of Centre Co- ordinator.

Rina Parvin

THREE YEAR B.A MULTDISCIPLINARY EXAMINATION - 2024 (CCF, 2022)

UNIVERSITY Roll - 232561-12-0262

REGISTRATION No. — 561-1215-0558-23

SUMMER INTERNSHIP PROJECT NOTE BOOK

TOPIC — Office Management

DURATION - 28.06.2024

SUPERVISOR NAME- SUVAKAR DAS

Abhijit Barman 28/08/2024

PRINCIPAL

Multidisciplinary Academy

Budge Budge College Campus

University of Calcutta

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Introduction

office management involves the Plannig, desing implemantation of work in on organization and its offices. This includes Cneating a foused work. envinonment. and guiding and coordinationg the activities of office presonnel to achieve business gouls. These actives one evaluted and abjest to improve and maintion efficeney effectieness and prodetivity.

Objective

- Office management is important beacouse it can help us to use working house more efficiently.
- Increase employeed's productivity.
- Enhance the company's quality of work.
- Using strong office management strategies and techniques which can also help us to devetope poucrful administrative skills.
- Help to create a constructive working atmosphere and boost employee's moral values.

* List of office managment tips :—

1. Organize the Space

Creating an organized space can help improve your team efficiency and create a capable working environment. you can organize your office Space in several ways, including.

- Creating establised work zones for employees.
- updating Company filing Systems.
- labeling Shelves, drawers and cubbies.
- Sorting Completed project document into Storage boxes and files
- keeping a list of items that you need to replenish (printer ink, staplers, etc.)

Cleaning your office Space can also be very helpful when trying to create a benefical work atmoshere. Consider creating a schedule to remind you and your team to clen certain sections of the office during the workday.

For example on Mondays, you can clean and dust the break room, on Thursdays you can reorganize and sort the mail. Having a clean environment can help employes eliminate distractions and improve their work performace.

2. Keep updated records.

Maintaing updated company records can be a crucial step in managing your office keeping a list of customer contract information, updating payments ~~in~~ information and nothing when your team has already contacted clients can save your office time and help your team to perform their duties more effectively.

For example, if a sales associate reaches out to a new client's contact information it can be helful for them to record the client's contact information how the conversation went, ~~[illegible]~~ if your team needs to contact that client again in the future.

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If the Conversation went well, and the information so, cilent is already considering buying from your office, then the Sales acsocite can record the information so another associte doesn't waste time contacting that some client twice.

3. Schedule out your week

Schedule out your week can help you manage your time more efficiently and prioritize your work. At the beginning ~~and~~ of the ~~week~~ week, look over your deadlines meetings and other important duties you need to complete within that week and Sort them based on priority. when Sorting Consider using these categories.

*Slationary :- Activities are any meetings or employec revieaus that already have a set date. These duties are often already Scheduled for you, and you can'not move them very easity. Its helpful to fill inall of your stationary responsilibtities first and schedule your other taks around them.

* Top priority: Top priority tasks are often assignments that you need to complete on certain days within the coming week, or by the end of the week. It can be important to sort these assignments by their deadines So that you can finish them in order of importance.

Flexible: Flexible activites are often the last assignments you put into your Schedule. these are often tasks that you don't have to complete by the end of the week, but might contribute to another project or deadline in the near future. If you're not able to fit all your desired. flixible activities into your current work week, consider moving then to the next week when you might have more time to complete them.

By sorting your information and creating a weekly schedule, you can better understand what you can realisically accomplish within one week and if you need to adjust project goals, delegate work or request deadline extensions.

4. Delegate tasks :-

Delegating taks to employec and other individuals can help boost the performace and pro dutivity of your office while helping you meet important deadlins. For exampl, if you have a large project that you need to Complete in a short amout of time, consider assiging Small portions of that project to all different tem members. They Can Complete all of those Small assignments at the Some time and then allow you to complete the work and information into one cohesive document or report often they're done.

5) Establish routines :-

Creating established routin. in an office Space Can help mange workflow, creat. Systems for processing client information and responding to certain emergencies. when an individual or team member.

Completes their assigned duties or tasks, it can be helpful for them to have a routine person to contract if they need more work. By delegating that function to another team member, you can help create a self sufficient workflow that allows a team to work consistently throughout the day while freing up your own time to work on your own tasks and project.

During emergencies, like if the office building were closed or the company network was unresponsive, its also important to have routines in pluces to continue generating work and meeting important deadlines. whether you backup office hard-drives or have a system in place to work remotely if necessary having powerful established routines can help you salve any workpluce challanges or conflicts.

6) Eliminate distractions

Eliminate distractions in the workplace can also help you create a productive work atmosphere. Creating work free zones such as a lunch or break room, scheduling breaks and restricting certain ~~sub~~ websites during working hours can help increase work performance and eliminate unnecessary distractions from the office. Completing work in 30 to 45 minute segments while taking a quick break in between can boos your work rate and help you complete more tasks throughout the day.

Some other great ways to reduce distractions in the workplace include.

- Turning off notifications on your phone.
- Setting your phone to gray scale to reduce its appeal.

- wering naise- cancling headphones when appropriate.
- Schedule Specific times throught the day to check your email.

7. Define roles and responsibilities.

when employes and individuals understand their roles and responsibitles within a Company It Can help them know which assigments their daily work more efficiently. Before you hire a new team member, and during every employec evaluations, it can be important to go over each individuals priamary duties. This can remind them of their role within the Company and can also let them know if thier duties have expanded or changed Since their last Conversation with you.

For example, if one team member is in Charge of purchasing Company Supplies and Inventory.

Abhijit Basu 27/08/2024

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they know that questions about sales or marketing can be diected about to then individuals. This can also other employes in the office to inform this team member when certain supplies or inventory are running low so they can purchase more.

8. Give clear instructions

Making sure that employes clearly understand project or assignment goals is important because it can help save the company time and ensure that they achieve all the set project objectives. If you're unsure if an employee or team member understood your instructions, consider asking them to relay the information back to you. Having them verbally summarize the project goals can let you know if they heard and retained all the important information.

If some employes struggle with understanding certain aspects of the goals or objectives encourage them to ask. ~~g~~ questions. Asking questions can help them build their comprehension and complete the assignment more quickly.

9. Establish office goals.

Creating office goals with powerful incentives that every ~~the~~ team member can work towards is important because it can help encourage office ~~ta~~ teamwork and increase employee attentiveness towards their work, for three day weekend, you might see increased dedication to finding new clients and increasing sales with the combined effort of all office departments.

10. Focus on team building

A greate way to improve teamwork and manage your office more efficiently is to schedule times for team building whether you schedule times for team building.

whether you schedule team buiding. whether you events in the office during working hours, or host for social events outside of work, creating time for your employes to interact with one another and develop their professional relationship can improve office communication and create a helpful and encouraging work atmosphere.

Examples for helpful team-building a activities includ :-

* Trivia games
* Trust exercies
* Cook outs and dinner parties
* Scavenger hunts
* Group valuntering

11: Encourage further training and development

Encouraging your team member to continue developing and providing them with further training opportunities can help improve your office morale and increase employee performace. Allowing employees to improve their accupational skills and knowledge can help them conduct thir work more efficiently and enhance the quality of their deliverables.

If can also help position them for advancement within the company. For example, if you delegate an assignment to a marketing assistant that requies them to use a software they're not familiar with, consider giving them tutorials or asking a more advanced employee to train them on more advanced employed to train them on program.

Conclusion

we have learned many things in this Summer - Internship. we have gat many important Information about ofice management. So, we - achieved good experince about office management. For example - How to doing entry, how to check - files etc. And also we - achieved knowledge about excel, ms word etc.

Because of this learning, it will - helps us greatly and in future we can - done many works to using this experience about office management.

ACKNOWLEDGEMENT

I thankfully acknowledge my indebeledness to my nevend teacher
without whose active help and encouragment and guidance it would not have been possble for me to complete this project.

Thanks also find its way to my classmatem, parent and everyone Conssmates, parents and everyone Concerned, who have helped me in one way or other towards the Completion of this project.

Date- 28.06.24

Rina Parvin
Signature of the Student

28.06.24

Teacher's Singature

ESTUARINE AND COASTAL STUDIES FOUNDATION

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Completion

Certificate

Summer Internship (2024)

This is to certify that **Saswata Mondal** of Semester II of Department of Zoology, Budge Budge College, University of Calcutta (Roll No 233561-21-0007; Registration No 561-1112-0202-23) has successfully completed the Summer Internship in 15 days / 60 hours on ***'An integrative approach to assess environment from field to laboratory'*** conducted offline from 10 June 2024 to 27 June 2024 at Estuarine and Coastal Studies Foundation, Howrah, West Bengal, India.

Dr. Arunodaya Gautam
Internship Supervisor, E.C.S.F

Mr. Sinchan Chatterjee
Director, E.C.S.F

SUMMER INTERNSHIP 2024

NAME: CHANDRIKA DAS

CLASS:B.SC ZOOLOGY MAJOR SECOND SEMESTER

COLLEGE NAME: BUDGE BUDGE COLLEGE

CU ROLL NO.: 233561-11-0030

REGISTRATION NUMBER:561-1212-0203-23

TOPIC NAME: AN INTEGRATIVE APPROACH TO ASSESS ENVIRONMENT FROM FIELD TO LABORATORY

Director
Estuarine and Coastal
Studies Foundation

Arunodaya Gautam
SIGNATURE OF INTERNSHIP SUPERVISER

Scientist
Estuarine and Coastal Studies Foundation
Howrah, West Bengal - 711101

DEDICATION

This report is dedicated to my parents who have supported me throughout education. Thank you for encouraging and supporting me throughout my internship and make me challenge my limits and letting me grow both personally and professionally.

ESTUARINE AND COASTAL STUDIES FOUNDATION

(registered with NITI Aayog DARPAN, Govt. of India)

Completion

Certificate

Summer Internship (2024)

This is to certify that **Chandrika Das** of Semester II of Department of Zoolog Budge Budge College, University of Calcutta (Roll No 233561-11-003 Registration No 561-1212-0203-23) has successfully completed the Summe Internship in 15 days / 60 hours on ***'An integrative approach to asses environment from field to laboratory'*** conducted offline from 10 June 2024 to 2 June 2024 at Estuarine and Coastal Studies Foundation, Howrah, West Bengal, India.

Dr. Arunodaya Gautam
Internship Supervisor, E.C.S.F

Mr. Sinchan Chatterjee
Director, E.C.S.F

CERTIFICATE OF COMPLETION

This is to certify that Ms. Chandrika Das , of BSc Semester-II, Zoology Major, (CCF 2022), Roll No: 233561-11-0030, of Budge Budge College has successfully carried out the project titled -" An Integrative Approach To Assess Environment From Field To laboratory" for Summer Internship Programme 2024 under the guidence of Dr. Arunodaya Gautam of Estuarine and Coastal Studies Foundation (ECSF) in partial fulfillment of BSc. Major Summer Internship Programme conducted by University of Calcutta, West Bengal, India.

Sign of the Director

Of ECSF

Director
Estuarine and Coastal
Studies Foundation

Arunodaya Gautam

Sign of the Supervisor

Scientist
Estuarine and Coastal Studies Foundation
Howrah, West Bengal - 711101

Sign of the Mentor

DECLARATION

I hereby declare that the project entitled :AN INTEGRATIVE APROACH TO ASSESS ENVIRONMENT FROM FIELD TO LABORATORY submitted to the university of Calcutta, is a record of an original work done by me under the guidance of DR. ARUNODAYA GOUTAM, Internship supervisor, ECSF & DR. BARNALI BERA,SACT-1,Department of zoology, Budge Budge College and the result embodied in the project have not been submitted to any other university or institute for the award of any degree or diploma.

Chandrika Das

Chandrika das

Roll no. 233561-11-0030

ABSTRACT:

Field experiments in ecological and environmental research usually do not meet the criteria for modern experimental design. Subsampling is often mistakenly substituted for true replication, and sample sizes are too small for adequate power in tests of significance. In many cases, field-study objectives may be better served by various kinds of sampling procedures, even though the resulting inferences will be weaker than those obtainable through controlled experimentation.

The present paper provides a classification and description of methods for designing environmental studies, with emphasis on techniques as yet little used in ecology. Eight catagories of techniques for field studies are defined in terms of the nature of control exerted by the observer, by the presence or absence of a perturbation, and by the domain of study. Sampling for modelling provides efficient designs for estimating parameters in a specified model. Intervention analysis measures the effect of a known perturbation in a time series. Observational studies contrast selected groups from a population, while analytical sampling provides comparisons over the entire population. Descriptive survey sampling estimates means or totals over an entire population, while sampling for pattern deals with spatial patterns over a selected region.

INTRODUCTION

Internships are a great way for students to make the move from the classroom to the world of work. They help students improve their interpersonal, communication and problem-solving skills, increase their chances of getting a job (Sá and Holt, 2019) and teach them job-related skills (Holford, 2017a).

Internship is a temporary position offered by an organization to students or recent graduates, designed to provide practical experience in a specific industry or field. Internships can be full-time or part-time and are often short-term, lasting from a few weeks to several months. They can be paid or unpaid, depending on the organization and the nature of the internship. Our internship was conducted by our college under University regulation. It was an unpaid 15 days internship.

This report encapsulates our 15 day Research internship experience,where we delved into the realms of laboratory, environmental and field studies our research endeavor aimed to explore the intricate relationships between these three pivotal areas, seeking to understand the synergies and divergences that exist among them. Internships allow us to experience various work environments, from large corporations to small startups, helping us determine which setting best suits your work style and career goals. Overall, internships play a crucial role in birdging the gap between academic learning and professional work, making them an essential step in career development.

Through a combination of laboratory experiments,environmental observations and field investigations we sought to gain a comprehensive understanding of an integrative approach to assess environment from field to laboratory. Our research internship provided a unique opportunity to apply theoretical concepts to Real world scenarios fostering a deeper appreciation for the complexities of environment.

This report presents our findings in sights and reflections from the internship, highlighting the significance of integrating laboratory, environmental and field studies in advancing our knowledge and understanding of environment.

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"An Integrative approach to assess environment from field to Laboratory"

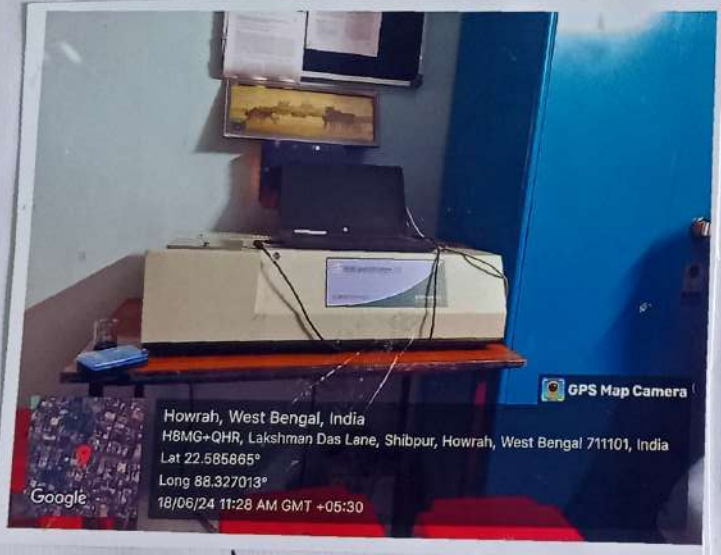


Fig.01: HOT AIR OVEN

Day 1:

DEMONSTRATION OF: HOT AIR OVEN

A. INTRODUCTION:

A hot air oven is an essential equipment used in laborato in which hot air is used to sterilize laboratory sampl

B. PRINCIPLE:

Hot air oven works on the principle of the dry air sterilization process through convection, conduction and radiation.

C. STRUCTURE OF THE INSTRUMENT:

1. COAT/CABINET:

The external shield is built of aluminum or stainles steel to resist mechanical shocks and oxidation.

2. FIBERGLASS:

The space between the outer cabinet and inner chamber is filled with thick glass wool insulation. There are two types of fiberglass: BROWN FIBERGLASS and YELLOW FIBERGLASS. As brown fiberglass causes inflammation in the respiratory system, while yellow fiberglass causes skin sensitivity. So, it is used with gloves.

3. CHAMBER:

The rectangular-shaped chamber is made of aluminum or stainless steel, which has space for ribs to keep shelves at the desired levels.

Fig. 02: Demonstration of the instrument At ECSF

4. SHELVES (MESH):

The ovens have detachable shelves made of stainl steel wire mesh cables. The height of these shelves can be changed to suit various materials or sample sizes. The size of the internal chamber affects how many shelves there are.

5. MOTORIZED FANS:

The fan, an essential part that is driven by a mot makes sure that the hot air is distributed evenl throughout the chamber.

6. DOOR:

The oven has a single door that is supported by sturdy hinges. During the sterilization procedure, this do is essential for maintaining a sealed environment and gaining entry to the chamber.

B. ELECTRICAL PARTS:

1. POWER SUPPLY:

The transformer and rectifier that supply the oven's power are 220V-50Hz. This ensures a steady and reliable energy supply for the oven's function.

2. HEATER:

With the passage of electric current through a conductor, heat is generated following the rise of temperature. The heating element has three main features: High resistance, electrical insulation and high conductivity. The

different types of heaters used in hot air ovens are One side circular type heater, One side U type heater, One side wave type heater, One side square type heater, Three side type heater and Four side type heater. The heater operates at temperature from 50 to 300 degree Celcius.

3. THERMOSTAT:

The thermostat is connected directly to the heater and functions as a heat sensor. It has a strong temperature coefficient and is made to tolerate extreme temperatures. With the use of this part, users can regulate the one's temperature to their preferred level while making sure it stays within the predetermined range.

4. TEMPERATURE INDICATOR:

The temperature indicator measures the temperature within the hot air oven. Then displays it on the controller screen.

5. TIMER:

There may be two types of timers: Electrical or Mechanical, which can operate for 5 - 60 minutes given the time period for sterilization.

6. FUSE:

Fuse functions to prevent electrical damage due to high current during short circuits or high loads.

7. CONTROL PANEL:

It is the region that allows the user to control different parameter settings such as temperature, time etc. as well as has an Indicator power lamp (usually green), indicator

heater lamp (usually red), and switch knob.

D. APPLICATION OF THE INSTRUMENT:

- In laboratories, glass ware, metal instruments, and reusable plastic containers are frequently sterilized with hot air.
- In microbiology laboratories. waste materials like used petri dishes, pepetts and disposable plastic ware can harbour potentially harmful microorganisms.
- It can be employed for testing food items, pharmaceutical products and other consumable materials in order to ensure their temperature stability during the shelf life.

E. PRECAUTIONS:

- The oven should only be used for items that are resistant to sterilizing by dry heat. Making sure the materials are resistant to heat damage is crucial.
- It is strictly prohibited to place combustible objects, especially volatile substances, inside the oven. Their presence may give rise to dangerous circumstances.
- Enough space should be left between the articles while placing them on the shelves. This guarantees unrestricted hot air circulation, which results in even heating.

Fig.03 : ROTARY FLASK SHAKER

DAY 2:

DEMONSTRATION OF ROTARY SHAKER

A. INTRODUCTION:

A rotary shaker is a sophisticated laboratory instrument designed to agitate and mix various samples and substar within vessels with the help of principle of rotation, combining controlled circular motion with adjustable s and timing.

B. PRINCIPLE:

Rotary flask shaker works on the principle of motoriz shaking which works on a brushless DC motor with variable speed function. The device typically has a mot driven mechanism that imparts rotary motion to the platform holding the flasks. This motion ensures that the liquid inside the flasks is evenly mixed or agitated, promo uniform conditions for biological growth, chemical reactions, o other process.

C. APPLICATION:

- In microbiology, rotary flask shakers are used for cultivati microorganisms such as bacteria, yeast and fungi. The rota motion helps in providing aeration and uniform mixing of nutrients, promoting the growth of cultures.
- In cell biology and tissue culture, these shakers are util for maintaining cells in suspension, ensuring even distribut of nutrients and oxygen. This is crucial for cell viability and optimal growth.

• Rotary flask shakers can be employed in chemical laboratories for mixing reagents in various reactions. This ensures homogenous mixing and enhances reaction kinetics by maintaining a consistent environment through out the reaction

D. PRECAUTION:

1. The exterior and interior of the machine should be clean with a mild detergent and disintifect.
2. The moving parts needs to be lubricated with a recommended lubricant.
3. Checking the power supply and electrical connections for any damage or wear and tear.
4. Any worn-out or damaged parts needs to replace promptly.

Fig.04: At princep ghat

fig.05 : pH and temperature meter

ENVIRONMENTAL ASSESSMENT (LOCAL FIELD SURVEY)

- OBJECTIVE : The physiochemical properties of water of the area.
- INSTRUMENTS USED: pH and temperature meter.
- DESCRIPTION:

These instruments use an electrode with a small electrical current to through the water sample. When immersed in water, the electrode developes an electrical potential that is related to the pH and temperature of the sample water.

- PROCEDURE:
  - First, the pH meter was turned on.
  - Then the pH meter electrode was dipped into a container of the first calibration buffer solution (e.g. pH 7) and the solution was gently stirred to prevent air bubbles from adhering to the electrode's surface.
  - The pH meter reading was then calibrated (adjusted) to match the known pH value of the calibration buffer solution. This was typically done with the calibration knob.
  - Then the electrode was rinsed with distilled water and gently bloated with a clean tissue.
  - Then the electrode was immersed in the selected water area of the river bank. It was ensured that the electrode is fully immersed but not touching the container's bottom.
  - The pH reading was allowed to stabilise.

- Once the reading stabilised, the reading was noted down.
- After measurement, the electrode was rinsed with distilled water and gently blotted with a clean tissue.
- DATA COLLECTED:

No.	pH	Temperature
1	7.56-61	34.1 °c
2	7.41	34.2 °c
3	7.36-40	34.3°c

- IMPORTANCE:

pH is an important parameter for assessing the health of a waterbody. pH changes can indicate external stresses such as acid rain or discharges. pH can predict what kinds of chemicals can be released from the sediment into the water column.

- CONCLUSION:

Under 34°c temperature the pH of the river water sample was around 7.56-61, which was normal to basic.

Fig. 06 : Measurement of soil pH

- OBJECTIVE : The physiochemical properties of soil and wind speed analysis.
- INSTRUMENTS USED:
- FOR SOIL : i) pH tester, ii) Temperature meter (Digital soil thermometer)
- FOR AIR : i) Vane anemometer
- DESCRIPTIONS OF THE INSTRUMENTS :

i) pH Tester:

The pocket sized instrument is made with polyvinylidene Fluoride (PVDF) that is resistant to abrasion and chemical solvent. The outer junction sleeve can be removed and cleaned after usage. Once cleaned, adding a small amount of supplied gel electrolyte refreshes the junction, improving measurement speed, and extending the life of the tester.

ii) Digital soil thermometer:

With the help of the thermoelectric effect, the soil temperature sensor measure and monitor soil temperature. By sensing temperature changes in the soil, converting the data into electrical signals, and transmit their to the user for analysis and application.

i) Vane anemometer:

A vane anemometer is a type of wind meter that measures wind velocity and volumetric flow. Generally, they are small handled device comprising a turbine and a digital screen. The 'turbine' (often referred to as a propeller, impeller or fan) can either be built into the device or supplied as a separate sensor plugin.

Fig. 07: Measurement of soil temperature

• PROCEDURE:

i) PH meter:

• First the pH meter was turned on.

• Then the area where the test will be run was made damp (but not saturated) with some distilled water.

• Then the instrument was inserted into the soil and it was allowed to stabilise the reading.

• The reading was recorded.

• IMPORTANCE:

PH is important, it influences the availability of essential nutrients and therefore the microclimate of the area.

ii) Digital soil thermometer:

• First the handy instrument was turned on.

• Then the instrument was inserted into the soil where the test will be done.

• As the record was shown on the screen, it was recorded.

• IMPORTANCE:

In order to study the microclimate of the area, learning the soil temperature is important.

i) Vane anemometer:

• The hand held instrument was turned on.

• The propeller was held above head and was rotated 360°.

• The instrument was allowed to stabilise.

• The displayed reading was recorded.

DATA COLLECTED:

i) pH tester:

No.	pH
1.	6.90

ii) Digital soil thermometer:

No.	Temperature (°c)
1	36.1
2	36.9
3	36.2

iii) Vane anemometer:

Highest : 3.5 km/h

Lowest : 0.7 km/h

fig.08 : Measurement of wind speed

fig.09 : Compound Microscope

DEMONSTRATION OF Compound Microscope

A. INTRODUCTION:

Compound microscopes are powerful scientific instrument that have set a milestone in observing small objects t can't be seen in naked eye.

B. COMPONENTS OF THE MICROSCOPE:

1. EYE PIECE OR OCULAR LENS:

The eye piece or the ocular lens is the closet to the viewer's eye. It typically provides a 10x magnification and allows the viewer to observe the specimen.

2. OBJECTIVE LENS:

Compound microscopes are equipped with multiple obje lenses with variable magnification power. (Typically from 4x to 100x).

3. STAGE:

The stage is a flat platform where the specimen is placed for observation. It includes specimen clips or slides to hold the specimen during observation.

4. CONDENSER:

The condenser is a lens system located beneath the sta It is used to focus and direct light onto the specimen, improving the quality and intensity of the illumination.

5. ILLUMINATION SOURCE:

Most compound microscopes are equipped with an integrated light source, such as an LED or halogen lamp. The illumination source is positioned beneath the stage and provides the necessary light to illuminate the specimen for clearer visibilit

6. COARSE AND FINE COARSE KNOB:

Coarse and fine coarse knobs are used to adjust the focus of the microscope. The coarse focus knob allows for rapid focusing by moving the objective lenses up-down, while the fine coarse knob provides precise adjustments for a clear and sharp image.

7. DIAPHRAGM:

The diaphragm is a disc-shaped component located beneath the stage. Adjusting the diaphragm helps optimize the contrast and illumination of the observed image.

8. BODY TUBE:

The body tube is a hollow cylindrical structure that connects the eye piece to the objective lenses. It ensures that the light travels accurately through the lenses to produce a magnified image.

9. ARM:

The arm is a curved structure that connects the body tube to the base of the microscope. It provides support and allows for easy handling and maneuvering of the instrument.

10. BASE:

The base of the instrument is a sturdy and stable platform that provides the foundation for the entire instrument.

11. STAGE CLIPS:

Stage clips are small, adjustable mechanisms on the stage. They hold the specimen slide securely in place, preventing it from shifting or moving during observation.

12. MECHANICAL STAGE:

Some compound microscopes feature a mechanical stage, which is adjustable platform that allows for precise movement of the specimen slide in both the x and y axes.

13. IRIS DIAPHRAGM:

An iris diaphragm is an adjustable mechanism located within the condenser. It comprises overlapping metal blades that form an adjustable circular aperture.

C. PRINCIPLE:

The principle of a microscope is based on the ability of lenses to bend or refract light. When light passes through a lens, it changes direction, allowing us to magnify and observe small objects. The principle of the microscope relies on the careful alignment of lenses and proper illumination to produce clear and magnified image.

D. PROCEDURE:

(CALIBRATION):

1. First, the eye piece graticule was located into the eyepiece, and the stage was set in place.

2. First, the observation began with 4x magnification. The major divisions of the eyepiece graticule was lined up and stage micrometer so that the first major bar on the left of the eyepiece graticule with the first bar on the left of the stage micrometer denoted as 0 µm.

3. As we know, the stage micrometer is 1000 µm in length and since it is divided into 10, each major division is worth 100 µm.

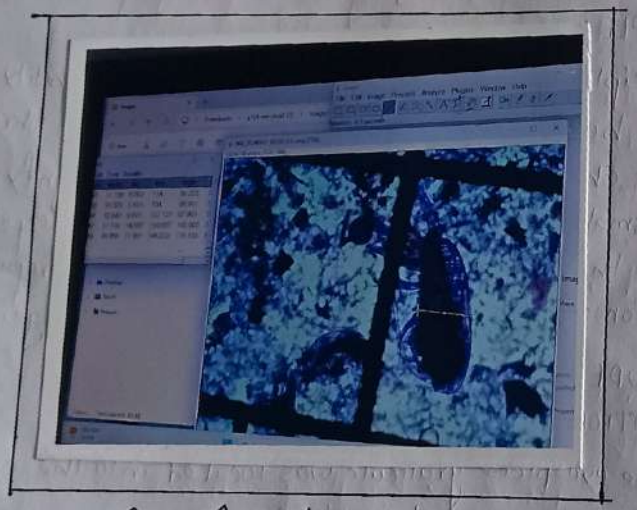


Fig.10: Copepods

4. The same process was repeated for the other magnification power (10x, 40x, 100x).

(MEASURING THE LENGTH OF THE COPEPODS):

1. First, slide with a water sample was placed under the microscope.
2. Then a place where the copepods are visible was focused.
3. Then a photo of that copepod was captured using the software; scopeimage, and it was saved.
4. After that, the known scales was set.
5. After opening the captured photo of that copepod, with the help of line tool and ctrl+M, the measurements of that copepod was taken.
6. With repeating this same process three measurements were taken.
7. Lastly the measurements were saved.

E. COLLECTED DATA:

No.	Measurements (mm)
1	212.77
2	211.548
3	208.603
4	219.333
5	116.496
6	209.333

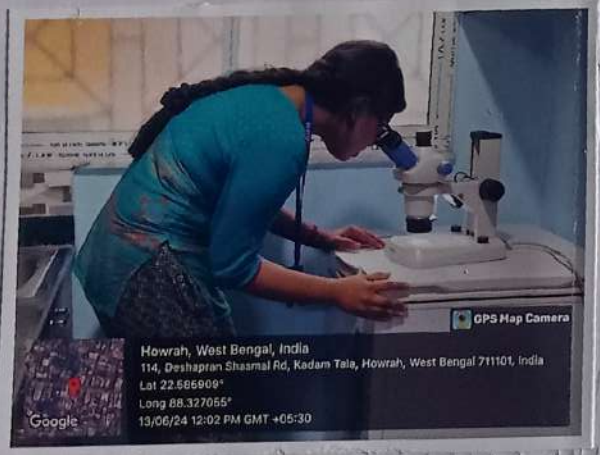


Fig.11: Stereozoom Microscope

DEMONSTRTION OF STEREOZOOM MICROSCOPE

A. INTRODUCTION:

Sterezoom microscope, also known as disecting microscope or stereo microscope, is a type of light microscope that allows scientists to see and manipulate specimens in three dimensions.

B. STRUCTURE OF THE INSTRUMENT:

1. BINOCULAR EYEPIECES:

Binocular eyepieces, or oculars are the lenses through which the observer observes the specimen in three dimensions.

2. OBJECTIVE LENSES:

Providing different magnification levels stereomicroscopes have objective lenses that provide a variety of magnification levels.

3. INTERPUPILLARY ADJUSTMENTS:

Interpupillary distance adjustment enables the eyepieces to be adjusted horizontally to match the observer's specific eye spacing.

4. FOCUS ADJUSTMENTS:

Getting precise clarity the focus adjusting mechanism allows users to get a good focus on the specimen.

5. ZOOM CONTROL:

The zoom control is an important component of stereomicroscopes, allowing users to alter magnification levels within the microscope's zoom range.

6. LIGHT SOURCE:

Specimen illumination stereomicroscopes are outfitted with a variety of illumination sources to illuminate the specimen.

7. STAGE AND SPECIMEN HOLDERS:

While stereomicroscopes lack a typical stage like compound microscopes, they frequently incorporate specimen holders or platforms that securely hold the specimen in place.

C. PRINCIPLE:

The stereomicroscopes, operates on a dualoptical system, utilizing two separate optical paths with distinct objective lenses and eyepieces. The design provides a three dimensional view of the specimen, particularly suited examining larger, solid objects with depth perception.

D. APPLICATION:

- SURGERY: The operating microscope, a variant of the stereo-microscopes, is used during microsurgery in many hospitals.
- ENTOMOLOGY: Used in the study of insects without having to disect them.
- BOTANY: Botanists study flowers and other plant structures using a stereo microscope.

E. PRECAUTION:

1. When observing opaque specimens, epi-illumination needs to be used.
2. When observing translucent specimen, transmitted illumination needs to be used.
3. If the specimen is black (and dark in color), a stage with a white porcelain surface should be used.
4. If transmitted illumination is being used, a glass stage needs to be used.

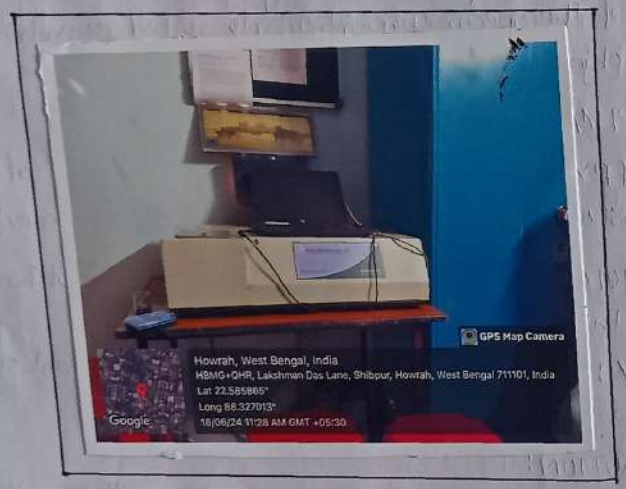


fig.12: Spectrophotometer

DEMONSTRATION OF SPECTROPHOTOMETER:

A. INTRODUCTION:

A spectrophotometer is a laboratory equipment than can measure the number of photons (the intensity of light) absorbed after passing through the solution of the sample. It can also detect the concentration of the solution by measuring the intensity of detected light.

B. THE STRUCTURE OF THE INSTRUMENT:

A spectrophotometer consists of four general parts: light source, an optical source (monochromator), sample holder and detecter (photometer).

A. LIGHT SOURCE:

Any spectrophotometer requires light of various wavelengths. Commonly tungsten lamp provides a visible spectrum of light in a spectrophotometer. Likewise, hydrogen and deuterium lamps provide ultraviolet radiation, and Nernest filament or global provide IR (infrared) radiation.

B. OPTICAL SYSTEM (MONOCHROMATOR):

An optical system of spectrophotometer consists of the following parts:

- LENSES: It collects the radiation from the source and directs it into the slit.
- ENTRANCE SLIT: It provides a narrow image of the radiation.
- COLLIMATOR LENS: It depicts the light from the entrance slit parallel.
- EXIT SLIT: It selects the desired spectrum of the light emitting from the exit slit.

prism and grating function as dispersive devices. These help in dispersing the incident ray of light. The action of the prism depends on the refraction of light. Quartz or fused silica prism is a must for ultra-violet spectrum below 350 nm. A diffraction grating consists of many parallel lines ruled at highly close intervals, likely 15000/30000 lines per inch on a highly polished surface like aluminum. The recommended ruling number is from 20 grooves/mm in infrared to as many as 3600 or more grooves/mm for the visible and ultraviolet rays. The grating is better than a prism.

- SAMPLE HOLDER:

The sample holder is placed in the cuvette (glass tubes) directly before the dispersive device. Cuvette varies from test tubes because it has uniform thickness and optical path length. Usually the cuvette is made up of glass or quartz.

- DETECTOR (PHOTOMETER):

After the desired light passes through the sample solution in the cuvette, the photometer detects the photons and gives the signals to the galvanometer for digital display.

C. PRINCIPLE:

The fundamental concept underpinning spectrophotometry is the photometric principle. When a light beam with an initial intensity of I_0 interacts with a solution, several events can occur: a portion of light might reflected (I_r), another portion absorbed (I_a) and the remainder transmitted (I_t). Mathematically, this relationship is expressed as: $I_a = I_r + I_a + I_t$

In spectrometric measurements, the objective is to determine I_a, the absorbed light, to achieve this, I_r is typically eliminated by using cells with identical properties, ensuring consistant reflection. Thus, measuring I_0 and I_t suffices to deduce I_a.

The relationship between the absorbed light and the concentration of the absorbing substances. in the solution is governed by two pivotal laws: Beer's law and Lambert's law.

Beer's law posits that the amount of light absorbed by a solution is directly proportional to its solute concentration.

Mathamatically,

$$\log 10/t/0 = asc$$ [where, as = Absorbancy index
c = Concentration of the solution]

Lambert's law, on the other, asserts that the absorbed light is directly proportional to the path length or thickness of the solution being analyzed. Represented as:

$$A = \log 10/t/0 = asb$$ [where, A = absorbance of the test
as = absorbance of the standered
b = Path length or thickness of the solution]

When combined, the Beer-Lambert law, is formulated as:

$$\log 10/t/0 = asbc$$

If the path length, represented by b, remains constant, the equation simplifies to: $\log 10/t/0 = asc$

The absorbancy index, as, is further defined by the equation:

$$as = c/A$$ [where, c = concentration of the absorbing material (in gm/L)
l = Distance travelled by the light in solution, (in cm)]

In essence, the spectrophotometer operates on the combined Beer-Lambert's law, which states that the absorbance of a coloured solution is directly proportional to its concentration and the path length of light through it. The relationship is concisely represented as: $A \propto cl$

or, when considering the absorption coefficient, ε: $A = \varepsilon cl$

In conclusion, spectrophotometry is a result and precise technique rooted in the principles of photometry. By understanding the interaction between light and matter, it provides invaluable insights into the properties of various compounds.

D. Absorption measurement with a spectrophotometer:

1. Spectrophotometer setup:

The instrument is turned on and allowed to warm up for the recommended duration. It is ensured that the instrument is properly calibrated according to the manufacturer's instructions.

2. Sample Preparation:

A solution of the sample required to analyze is prepared. It is ensured that the sample is dissolved completely and is in a homogenous state.

3. Appropriate wavelength selection:

The wavelength of light that corresponds to the sample is determined.

4. Blanking the spectrophotometer:

A blank sample is placed in the cuvette holder of the spectrophotometer. The blank should contain all the components of the sample except for the substance whose absorption is being measured. The blank is used as a reference for baseline correction.

5. The sample cuvette insertation:

The blank is removed and the cuvette containing sample is inserted into the spectrophotometer. It is ensured that the cuvette is properly aligned with the light beam and that there are no air bubbles or contaminents that could effect the measurement.

6. The absorbance measurement:

The lid of the spectrophotometer is closed and the measurement is initiated. The spectrophotometer will emit light at the selected wavelength through the sample cuvette. It will measure the intensity of the light transmitted through the sample and compare it to the intensity of the reference blank. The result displayed will be the absorbance (A) of the sample at the selected wavelength.

7. Data recording:

The absorbance value displayed on the spectrophotometer is noted down. This value indicates the extent of light absorbed by the sample at the given wavelength.

E. APPLICATIONS:

1. Concentration Determination:

Spectrophotometers are commonly used to determine the concentration of substances in a solution. By measuring the absorbance, of the solution at a specific wavelength the concentration of the analyte can be quantified using calibration curves or Beer-Lambert law.

2. Impurity detection:

Spectrophotometers are effective in detecting impurities in substances. By comparing the absorption spectra of the pure substance with that of a sample, any deviations or additional peaks can indicate the presence of impurities.

3. Structure Elucidation of organic compounds:

Spectrophotometric techniques, such as infrared (Ir) spectroscopy and nuclear magnetic resonance (NMR) spectroscopy, are used in conjuction with spectrophotometers to determine the structure of organic compounds. These techniques provide information about the functional groups and molecular connectivity of the compound.

f. PRECAUTIONS:

1. Warm-up Time:

The spectrophotometer should be turned on approximately 10 to 15 minutes before use. This allows the instrument to stabilize and ensures consistant performance.

2. Calibration:

The spectrophotometer needs to calibrated eachtime before use. Calibration involves using standard solutions of known concentration to establish a baseline and ensure accurate measurements. This step helps correct for any variations or drift in the instruments performance.

3. Selecting wavelength:

The appropriate wavelength for measurement is need to be chosen. The selected wavelength should be the maximum wavelength at which the solution absorbs light. This ensures that the absorbance readings are within the optimal range for accurate quantification.

DEMONSTRATION OF ANALYTICAL BALANCE:

A. INTRODUCTION:

Analytical balances are on extremely accurate laboratory balance created to precisely measure the mass of an object.

B. STRUCTURE OF THE INSTRUMENT:

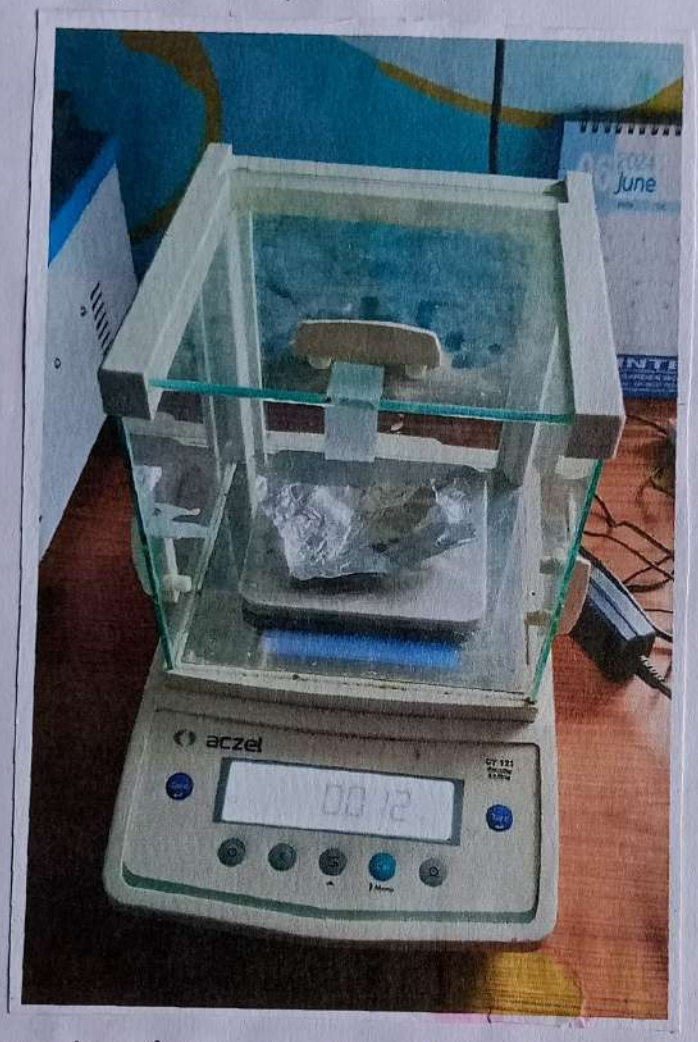


Fig.13: Analytical Balance

1. BALANCE PLATE (PAN): It is placed inside a draft shield, usually stainless steel.

2. WEIGHTS: It is an object whose weight is known and fixed.

3. DRAFT SHIELD: It is a see through enclosure that is rectangular.

4. DOOR HANDLE: It helps to open the draft shield to load the object in a balanced plate.

5. LEVEL INDICATOR: It helps to check balance is at the level.

6. POWER BUTTON:
It is used to switch on or off balance.

7. TARE BUTTON:
It helps to get the balance back to zero even after putting a container in which mass is to be placed on a balanced plate.

8. MODE BUTTON:
It sets the system needed to measure either mg, or gm mode.

9. DISPLAY PANEL:
It indicates various functions such as results, errors, information for function settings, and function on progress.

10. LEVEL ADJUSTMENT FIT:
These are moveable legs that can be adjusted to bring balance to the reference position.

C. PRINCIPLE:
Analytical balance works on the principle of "Magnetic force Restoration". It is an electromagnetic balance that measures the mass of an object using an electromagnet.

D. APPLICATION:
1. Used in the determination and analysis of the density of solvent. (In the chemical and pharmaceutical industries).
2. Used to prepare samples and reagents, (In biotechnology and microbiology laboratories).
3. Used in weighing small animals like insects. (In zoology laboratories).

Fig.14: Measurement of water salinity

OBJECTIVE: To study the physiochemical properties (salinity) of the area

A. INSTRUMENTS USED: Salinity meter

B. DESCRIPTION:

Salinity refers to how much dissolved salts are in the water. This measurement is typically expressed in percentage or parts per thousand.

C. PROCEDURE:

- First, the salinity meter was turned on.
- Then it was allowed to stabilise.
- The salinity meter was then inserted into the water where the water surface touches the sensor.
- Then the measurements was allowed to stabilise.
- Then the measurements were recorded.

D. COLLECTED DATA:

No.	Data (ppt)
1	0.1
2	0.1
3	0.1

E. IMPORTANCE:

By measuring water salinity, one can learn about the water quality of that area, Study about the creatures and organisms present in that waterbody.

Fig.15: Camera Trap

DEMONSTRATION OF CAMERA TRAP:

A. INTRODUCTION:

Camera trapping is an increasingly popular mammal monitoring technique.

B. DESCRIPTION:

- The camera trap is deployed in deep forests for observing animal behavior and their movement.
- Generally, for observing small animals, the trap is tied to an upright tree on a below knee length and for leopards like, tigers etc. the trap is placed on knee length, while for aerial animals it is placed on the branch of the tree.
- While, the animals are making a move, the sensor of the trap senses motion and clicks picture. It can take 30 seconds vedios too.
- After recordation, the data is then collected and analysed.

C. IMPORTANCE:

Camera traps can be left in the field to continuously watch an area of habital for weeks or even months recording the rarest events which occur in nature.

Fig.16: Measurement of solar radiation

OBJECTIVE: MEASUREMENT OF THE SOLAR RADIATION, WITH THE HELP OF LUX METER

A. INTRODUCTION:

A method for measuring solar radiation, which is much efficient is to use a lux meter.

B. DESCRIPTION:

- The lux meter is a handy instrument with a photodiode sensor, a lens, and electronic circuitry.
- When a lux meter is exposed to light, the lens collects and focuses the incoming light onto the photodiode sensor. It absorbes the photons generating an electrical current proportional to the intensity of the radiation.
- The voltage signal is further processed and calibrated by the internal circuitry to obtain a lux value.

C. PROCEDURE:

- First, the lux meter was turned on.
- After that, it was allowed to stabilise.
- The photodiode sensor was then hold up above and was rotated 360°.
- As the sensor was rotated 360°, few adjustments were also done in meanwhile (switching on the record, setting the range to 10x).
- Then with long pressing the 'Record' button, the maximum and minimum value of radiation was shown on the display.
- Then the value was recorded.

D. COLLECTED DATA :

NO.	Maximum val. (lux)	Minimum val. (lux)
1	1100	670
2	1049	552
3	1200	536

Fig.17: Measurement of soil humidity

OBJECTIVE: MEASURING THE SOIL HUMIDITY WITH THE HELP
HUMIDITY METER

A. INTRODUCTION:

To learn about an microclimate, its necessary to study the humidity.

B. DESCRIPTION:

The handy instrument has a stainless steel probe and a e display.

C. PROCEDURE:

1. First, the humidity meter was turned on.
2. Then, the instrument was allowed to stabilise.
3. Then the stainless steel probe was inserted into a hun place.
4. Measurements were then allowed to stabilise.
5. Shown measurements was then recorded.
6. At last, the tool was turned off.

D. DATA COLLECTED:

NO.	DATA (%)
1	12.8

E. IMPORTANCE:

With measuring soil humidity, one can learn about the soil of the selected area.

DEMONSTRATION OF MAGNETIC STIRRER WITH HOT PLATE

A. INTRODUCTION:

A magnetic stirrer is a laboratory device that employs a rotating magnetic field generated by a rotating magnet or stationary electromagnet to cause a stirrer bar immersed within a liquid to spin and thus quickly stir or mix solution.

B. STRUCTURE OF THE INSTRUMENT:

1. HOT PLATE:

Stainless steel or ceramic hot plates are usually used, which makes an idea working system.

2. STIR BAR:

The stir bar is a tiny, Teflon-coated, white rectangular magnet, which is used to stir solutions.

3. STATIONARY ELECTROMAGNET:

It is positioned inside the stirrer instrument that helps in generating a magnetic field and rotate the stir bar which helps in mixing the solution.

4. SPEED CONTROLLING KNOB:

The speed control knob is used to adjust the rotating speed (rpm) of the stir bar depending on the liquid's density or project needs.

5. TEMPERATURE CONTROLLING KNOB:

This knob controls the temperature based on the vessel size, the viscosity of the liquid, and its volume.

6. STIR BAR RETRIEVER :

The magnets are permanently embedded with PTFE (Teflon) rod, which faciliates the safe and easy recovery of magnetic stirring and spin bars from irritant and corrosive liquid samples in glass flasks.

C. PRINCIPLE :

A magnetic stirrer uses a rotating magnetic field to stir a non-magnetic liquid in a container. The rotating field is created by a magnet mounted on the stirrer underneath the container. As the magnet rotates, it creates a rotating magnetic field that extends into the liquid.

D. APPLICATION :

- It is widely used in chemistry laboratories to perform chemical experiments and synthesis by mixing two or more components.
- It is used to prepare a medium to culture microorganisms in microbiological laboratories.
- It is used to prepare samples and perform analysis in chemistry and biology experiments.

■ PRECAUTIONS:

- To prevent mishapes, the instrument housing needs to be correctly grounded.

- To avoid excessive vibration during operation, the medium-speed operation can run continuously for eight hours, and the high speed operation can run for four hours.

- The power should be turned off after usage and items need to be kept in a dry, ventilated area when not in use for an extended time.

fig.18: Magnetic stirrer with hot plate

DATA ANALYSIS AND DECISION MAKING:

Data analysis is a process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data.

• MEAN/AVERAGE:

The mean (average) of a data set is found by adding all numbers in the data set and then dividing by the number of values in the set.

$$A = \frac{1}{n} \sum_{i=1}^{n} a_i$$

A = arithmetic mean

n = number of values

a_i = data set values

• MEDIAN:

The median is the middle value of a dataset, which separates the highest and lowest values equally. It is calculated by arranging the data set in order from lowest to highest and finding the value in the exact middle.

Formula:

$$Med(X) = \begin{cases} X\left[\frac{n+1}{2}\right] & \text{if } n \text{ is odd} \\ \frac{X\left[\frac{n}{2}\right] + X\left[\frac{n}{2}+1\right]}{2} & \text{if } n \text{ is even} \end{cases}$$

X = ordered list of values in data set

n = number of values in data set

• NORMALITY:

Normality refers to the concept of data following a normal distribution, which is a symmetric bell-shaped curve where the data is evenly distributed around the mean.

FORMULA:

$$N = \frac{Eq}{V}$$

• N = normality

Eq = number of gram equivalents of solute

V = volume of solvent in liters

• MODE:

The mode is the value that appears most frequently in a data set.

• FORMULA:

$$\text{Mode} = l + \left\{ \frac{f_1 - f_2}{2f_1 - f_0 - f_2} \right\} \times h$$

• STANDARD DEVIATION:

Standard deviation (or σ) is a measure of how dispersed that data is in relation to the mean.

FORMULA:

$$\sigma = \sqrt{\frac{\Sigma_i (x_i - \mu)^2}{N}}$$

σ = population standard deviation

N = the size of the population

x_i = each value from the population

μ = the population mean

- Types of tests for data analysis:

■ T test for correlated Means:

A parametric test for statistical significance use to determine where there is a statistically significance difference between the means of two matched samples.

■ T test for correlated proportions:

A parametric test of statistical significance use to determine whether there is a statistical significance different between two properties based on same sample.

■ One way analysis of variance (ANOVA):

Analysis of variance, or ANOVA, is a statistical test that examines how the means of more than two groups differ from one another. One independent variable is used in a one way ANOVA and two independent variables are used in a two-way ANOVA.

■ Wilcoxon sign Rank Test:

This is the non parametric equivalent of the paired t-test. It makes no assumption about the distributions of the original population themselves, but it does assume that the distribution of the differences are at least symmetrical (though there is no need for the differences to be normally distributed).

• IMPORTANCE:

• Data analysis identifies inefficiencies and bottlenecks in business processes, providing opportunities to mitigate them.

• Forecasting potential issues and identifying risk factors before they become problematic is invaluable for all kinds of organizations.

• Data analysis promotes revenue growth by optimizing marketing efforts, product developement and customer retention strategies.

• DECISION MAKING: A non-parametric supervised learning approach called a decision tree is used for both regression and classification tasks. P value: The likelihood of receiving an uncommon outcome. The SHAPIRO test determines whether or not data is normal. If {normal}, a T test will be performed. If {not normal}, the Willcox U test will be performed. ANOVA test if there are three or more values.

• IMPORTANCE:

Decision making is crucial in data analysis because it enables:

1. Insightful conclusions: Data analysis informs decision-making by providing insights that supports or challenges assumptions.

2. Strategic choices: Decisions based on data analysis, drives strategic choices, optimizing resources and minimizing risks.

3. Problem-solving: Data-driven decision-making facilitates effective problem-solving by identifying key issues and opportunities.

4. Evaluation and improvement: Decision-making in data analysis enables the assessment of outcomes, leading to continuous improvement.

5. Accountability: Data-based decisions promote accountability by providing a clear rationale for choices.

6. Reducing bias: Data-driven decision making reduces personal biases and assumptions. leading to more objective choices.

7. Enhancing credibility: Data-supported decisions enhance credibility by demonstrating a reliance on evidence.

8. Informing future analysis: Decision making in data analysis informs future research directions and analysis approaches.

DEMONSTRATION AND HANDS-ON GEOGRAPHICAL INFORMATION SYSTEM (GIS):

INTRODUCTION:

A geographic information system (GIS) is a computer system for capturing, storing, checking and displaying data related to positions on Earth's surface.

APPLICATIONS:

GIS Technology can be used to display spatial relationships and linear networks. Spatial relationships may display topography, such as agricultural fields and streams. They may also display land-use patterns, such as the location of parks and housing complexes.

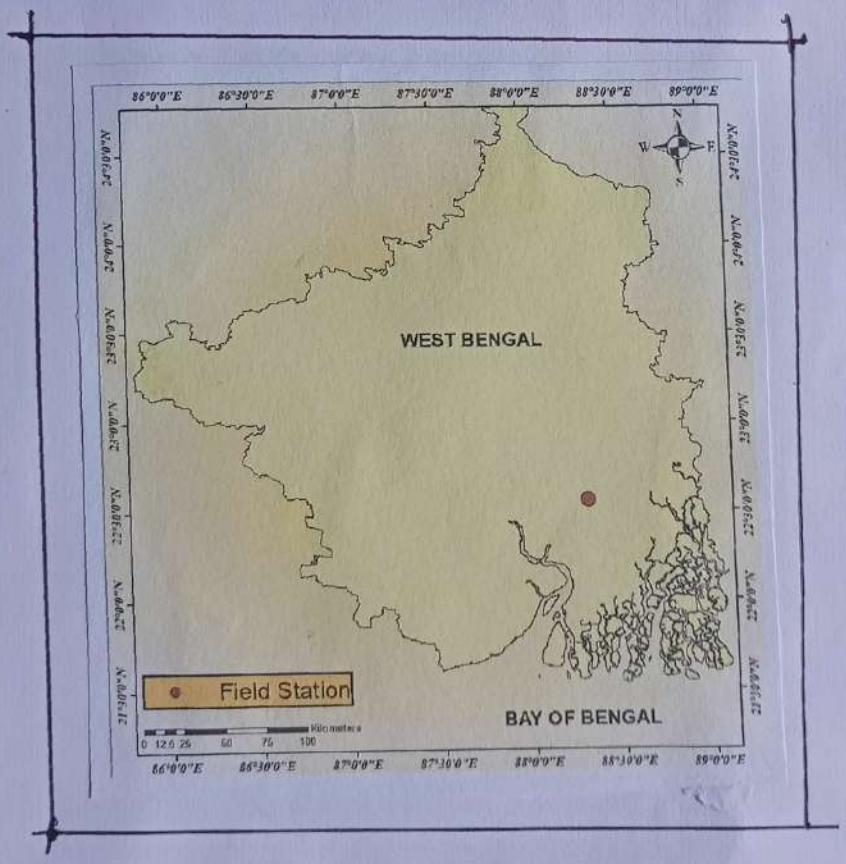


Fig.19: GIS MAP

· IMPORTANCE:

· One of the key benifits of GIS is its ability to help us understand and visualize geospatial data. This data can be anything from demographic information to climate data, and it can be used to create maps and visual representations of complex information.

· It enables us to make informed decisions about a wide range of issues. This data can be used to identify trends, patterns, and relationships that would be difficult to see otherwise.

· During natural disasters, it can provide information about the affected area, including the location of vulnerable populations, critical infrastructure, and potential evacuation routes.

CONCLUSION:

THE 15 day Internship has provided me a comprehensive understanding of the intigrative approach to environmental assessment, bridging the gap between field observations and laboratory analysis. Through this wonderful experience, I gained hands on-experience in:

- Field data collection and sampling techniques.
- Laboratory testings and analysis methods.
- Data integration and interpretation.

The internship highlighted for me the importance of combining field and laboratory approaches to accurately assess environmental quality and much more.

The internship has equipped me with practical skills, knowledge which will be my great asset for my further studies.

I would like to extend my gratitude to our Mentor, Dr. Bannali Bera and our supervisor Dr. Anunodaya Goutam for guiding us through out the internship and in implementation of the report.

ACKNOWLEDGEMENT

I would like to express my special thanks and gratitude to Dr. Debjani Dutta, Principal, Budge Budge College, Dr. Swati Sachdev, nodal officer, Budge Budge College and my Departmental Head and Teachers for organizing such an informative educational internship for us. I would like to express my gratitude to our internship Supervisor, Dr. Arunodaya Gautam and Director of Estuarine and Coastal Studies, Dr. Saurav Paul who guided us all through the internship and also guided us to prepare the project report. Lastly I would also like to thank all my classmates who cooperated with me during the whole internship and helped me in preparing this report.

B.Sc. Botany Honours & Botany MDC

Serial No.	Content
1.	Syllabus Extract indicating field work and project work 1
2.	List of students along with the details of title, place of work, duration etc. for the latest academic year (2023-2024) for Project 1
3.	Permission letter for field work from the competent authority for Project 1
4.	Objective and Outcome of field work for Project 1
5.	Sample photographs of the field work for Project 1
6.	Sample Report of Project 1
7.	Syllabus Extract indicating field work and project work 2
8.	List of students along with the details of title, place of work, duration etc. for the latest academic year (2023-2024) for Project 2
9.	Permission letter for field work from the competent authority for Project 2
10.	Sample photographs of the field work for Project 2
11.	Sample Report of Project 2
12.	Syllabus Extract indicating field work and project work 3
13.	List of students along with the details of title, place of work, duration etc. for the latest academic year (2023-2024) for Project 3
14.	Sample photographs of the field work for Project 3
15.	Sample Report of Project 3

Indian hotspots, 4.3. *In- situ* and *ex-situ* conservation, 4.4. Seed-banks, 4.5. Cryopreservation

…….16 lectures

EVOLUTION

1.1 Introduction, 1.2. Theories of evolution: Natural selection, Group selection, Neutral theory of molecular evolution, 1.3. Phyletic gradualism, Punctuated equilibrium and Stasis

…….6 lectures

2.1 Brief idea on: Stabilizing directional, disruptive and sexual selection; Speciation: Sympatric and allopatric speciation; Coevolution, Adaptive radiation, Reproductive isolation

…….4 lectures

3.1. Simplified phylogeny of bacteria, algae, fungi, bryophyte, pteridophyte and gymnosperm, 3.2. Phylogenetic tree.

…….6 lectures

PRACTICAL- PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION (BOT-A-CC-4-8-P)
(Credits 2)

1.Workout on ecological parameters

2.Classroom performance: (Lab records)

3. Field Records (Field note book of phytogeographical study and ecological study)

4. Viva

PLANT GEOGRAPHY

1. Field visit- at least one long excursion at different phytogeographical region of India.

2. Study of local flora and submission of a project report highlighting phytogeographical characteristics of the region.

ECOLOGY

1. Study of community structure by quadrat method and determination of (i) Minimal size of the quadrat, (ii) Frequency, density and abundance of components (to be done during excursion/ field visit).

2. Comparative anatomical studies of leaves form polluted and less polluted areas.

3. Measurement of dissolved O_2 by azide modification of Winkler's method.

4. Comparison of free CO_2 from different sources.

BUDGE BUDGE COLLEGE

DEPARTMENT OF BOTANY

Name of the course	Course code	Date and place	Serial no.	Name of the student	Registration no.	CU Roll no.	Name of the supervisor
1.Plant Geography, Ecology and evolution practical	BOT-A-CC-4-8-P BOT-A-CC-4-9-P	Sundarban 08.07.24-10.07.24	1.	Bidisha Naskar	561-1212-0282-22	223561-11-0035	Dr.Samiran Panday and Mrs.Piyali Das
			2.	Bristy Naskar	561-1212-0277-22	223561-11-0034	
			3.	Deboleena Chakraborty	561-1211-0279-22	223561-11-0009	
			4.	Ayanti Kuley	561-1211-0234-23	233561-11-0004	
			5.	Ritu Pandit	561-1211-0201-23	233561-11-0001	
			6.	Ayatulla Laskar	561-1111-0237-23	233561-21-0001	
			7.	Disani Mondal	561-1211-0227-23	233561-11-0002	
			8.	Snigdha Das	561-1211-0228-23	233561-11-0003	

Allowed Rs 10,000/= (Ten thousand only) for 2 staff (Teaching) for the Field trip @ 4/7/2024

Date: 02.07.2024

To
The Principal
Budge Budge College
7, DBC Road
Kolkata- 700 137

Dear Madam,

As per the B. Sc. CBCS syllabus of Botany Honours of the University of Calcutta it is mandatory to conduct an excursion to a different phyto-geographical region for the Semesters II & IV students. Therefore, the Department of Botany has arranged a field excursion on and from 08.07.2024 to 10.07.2024 to Sajnekhali, Sudhanyakhali and Pakhiralay areas of the Sunderban Biosphere Reserve, West Bengal. Dr. Samiran Panday and Mrs. Piyali Das would escort this Botanical Field excursion.

I would request you to kindly arrange the amount of Rupees Fourteen Thousand (Rs. 7000/- × 2 = Rs. 14,000/-) for the two above mentioned teachers in this purpose at the earliest.

Madam, Please allow me Rs (5000 x 2) = 10000/-

Thanking you,

With regards

Panday

Dr. Samiran Panday
Assistant Professor
Department of Botany
Budge Budge College

Budge Budge College

Estd. 1971

NAAC Accredited B+ & UGC 12B, 2(f)

Affiliated to the University of Calcutta

Ref. No..... Date ..... Date: **02/07/2024**

TO WHOM IT MAY CONCERN

The following is the list and details of B.Sc. Botany (Hons) Sem-II & Sem-IV students and teachers of **Budge Budge College** going for the field trip in the Sajnekhali, Sudhanyakhali and Pakhiralay of Sundarban areas from 08.07.2024 to 10.07.2024. The total number of students and teachers are 10.

Sl. No.	Name	Age	Sex	Father's/Guardian/ Husband's Name	Permanent Address	Mobile No. of Guardian
	I. LIST OF STUDENTS					
1	Bidisha Naskar	19	F	Rabin Naskar	Vill- Bagmari, P.O- Budge Budge, P.S- Budge Budge, Pin-700137	7688083624
2	Bristy Naskar	19	F	Bechuram Naskar	Vill- Buita, P.O- Budge Budge, P.S- Budge Budge, Pin-700137	8420308194
3	Deboleena Chakraborty	19	F	Debobrata Chakraborty	Vill- Baddirbandh, P.O- Batanagar, P.S- Maheshtala, Pin-700140	8617728868
4	Ritu Pandit	19	F	Surya Kanta Pandit	Vill - Poali, P.S - Nodakhali, P.O- Poali, Pin-743318	9874173080
5	Ayanti Kuley	19	F	Subhash Chandra Kuley	Vill+P.O- Kamra, P.S- Nodakhali, Pin-743318	7278761257
6	Snigdha Das	19	F	Ananda Das	180/2-F Dharmatala Road, P.O + P.S - Budge Budge, Pin-700137	6289231168
7	Disani Mondal	19	F	Srabanti Mondal	Vill – North Bawali, P.O - Nodakhali, Pin-700137	9903135427
8	Ayatulla Laskar	19	M	Nasim Laskar	Chatta Rameswarpur, P.S- Maheshtala, Pin- 700140	8017359079
	II. LIST OF TEACHERS					
1	Dr. Samiran Panday	36	M	Sri Sadananda Panday	Vill: Loknathnagar, Palpara East, P.O+P.S: Chakdaha, Dist: Nadia, Pin-741222	9641550776
2	Mrs. Piyali Das	35	F	Debasish Das	33, Chanditala Main Road, Kolkata-700041	8336936641

With regards,

(Dr. Debjani Datta)
Principal

DR. DEBJANI DATTA
M.Sc. (Gold Medalist), Ph.D
Principal
Budge Budge College
7, D.B.C. Road, Kol-700137
West Bengal, India

Verified
Budge Budge College

Budge Budge College

Estd. 1971

NAAC Accredited B+ & UGC 12B, 2(f)

Affiliated to the University of Calcutta

Ref. No..... Date .....

Date: 02/07/2024

To
The Officer-in-Charge
Gosaba Police Station
South 24 Parganas-743370
West Bengal

Respected Sir/ Madam,

This is to inform you that in accordance with the curriculum/ syllabus of B.Sc. Botany (Hons.), Calcutta University, a field excursion has to be arranged for the students in a different phytogeographical area. Accordingly, a field excursion has been arranged in the Sajnekhali, Sudhanyakhali and Pakhiralay of Sundarban areas, West Bengal by the Department of Botany, Budge College from 08.07.2024 to 10.07.2024. The details of travelling students and teachers are being enclosed for ready reference.

I shall be grateful if you provide appropriate cooperation, security and assistance in case the circumstances so demand or any problem arises.

With regards,

(Dr. Debjani Datta)
Principal

DR. DEBJANI DATTA
M.Sc.(Gold Medalist), Ph.D
Principal
Budge Budge College
7, D.R.C. Road, Kol-700137
West Bengal, India

Received
08/7/24.
Hotel Amsonar-Pakhiralay
9147888019

Verified
Budge Budge College

7, Deshbandhu Chittaranjan Road, Budge Budge, 24 Parganas (S), Kolkata - 700137, West Bengal, INDIA; Tel : (033)24701454, (033)24805168

E-mail : budgebudgecollege@gmail.com; Website : www.wbbudgebudgecollege.org

SUNDARBAN WILD ANIMAL PARK
JHARKHALI

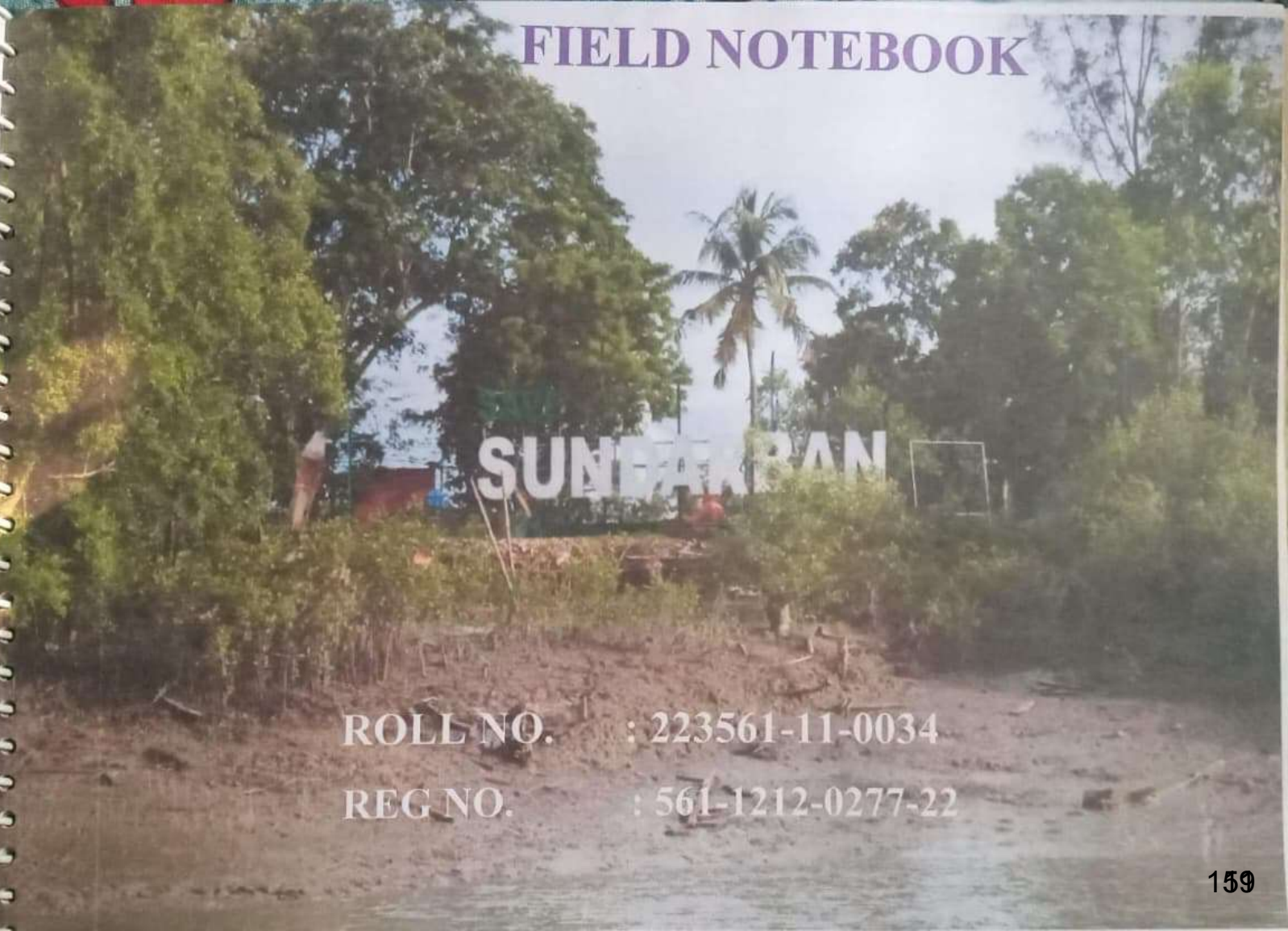
WELCOME
SAJNEKHALI WILDLIFE SANCTUARY
আপনি সি.সি. ক্যামেরার নজরবন্দী
SAJNEKHALI
SUNDARBAN TIGER RESERVE

FIELD VISIT TO ANOTHER PHYTOGEOGRAPHICAL REGION

OBJECTIVES: To acquaint the Honours students with the plant groups and the geographical habitat so that their field knowledge is corroborated by the theoretical studies.

OUTCOMES: All the students have learned the diversity of phytogeography regulated by the earths' surface and highly diverse plant groups namely Algae, Fungi to Angiosperms. Also they became aware of the practical technicalities and sustainability and evolutionary aspects of terrestrial and aquatic plants.

FIELD NOTEBOOK



ROLL NO. : 223561-11-0034

REG NO. : 561-1212-0277-22

ACKNOWLEDGEMENT

It is with great Pleasure that I express my depost gratitude to the Department of Botany, Budge Budge College for organising a Botanical field excursion at Sundarban (Pakhiralaya, Sajnekhali Jhorkhali)

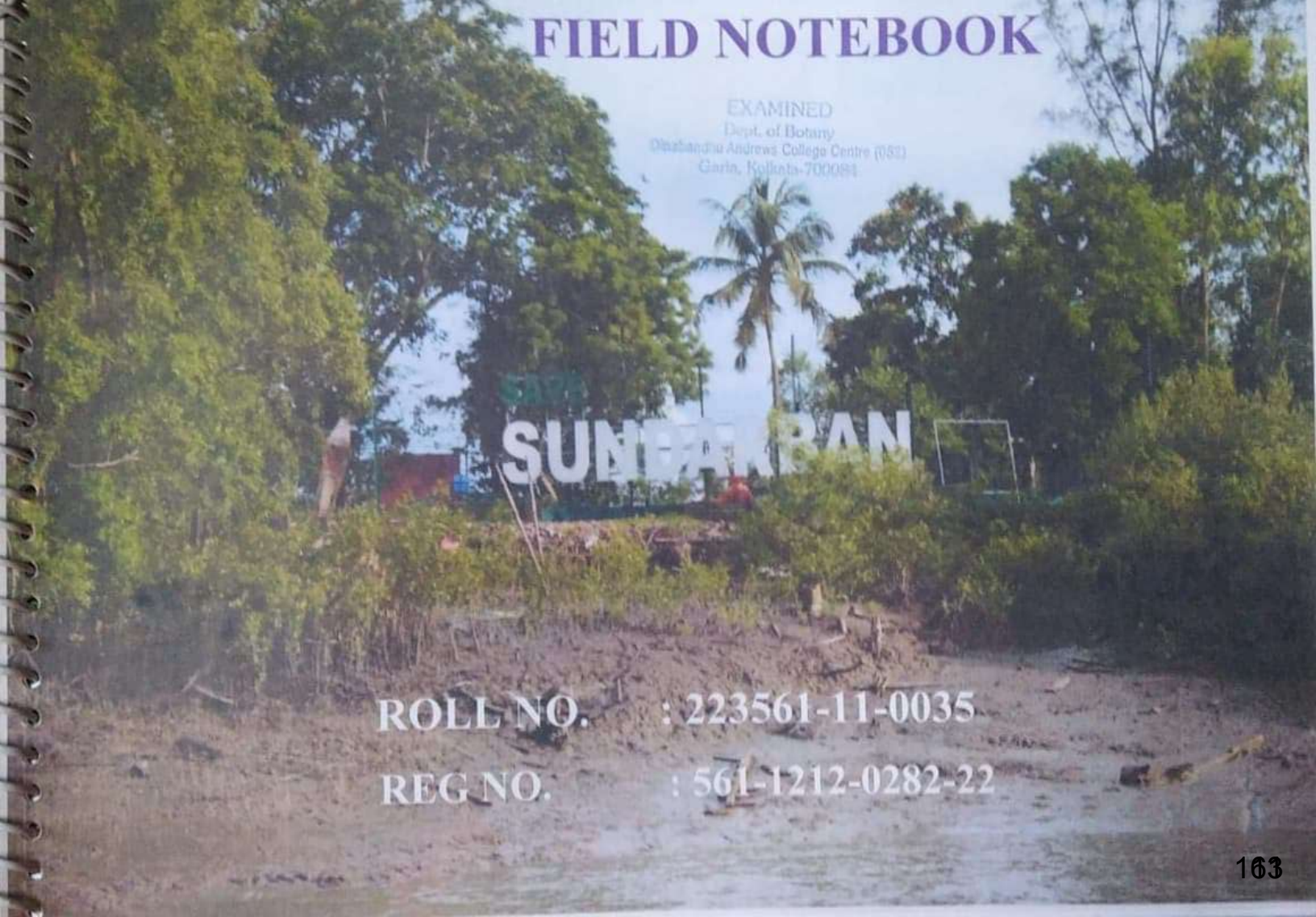
My Sincere thanks to go to [illegible] teacher of the department for giving me time to time Suggestions, advise and inspiration for making the field tour a grand Success. I am also thankful to Dr. Samiran Pandey and Mrs. Piyali Das for their advice and general help in Preparation of the field report.

I would also take the Opportunity to thank my Classmates for their kind Co-Operation rendered to my thoughout the tour.

EXAMINED
Dept. of Botany
Dinabandhu Andrews College Centre (DSC)
Garia, Kolkata-700084

FIELD NOTEBOOK

EXAMINED
Dept. of Botany
Dinabandhu Andrews College Centre (052)
Garia, Kolkata-700084



ROLL NO. : 223561-11-0035

REG NO. : 561-1212-0282-22

ACKNOWLEDGEMENT

CHECKED
Department of Botany, Budge Budge College

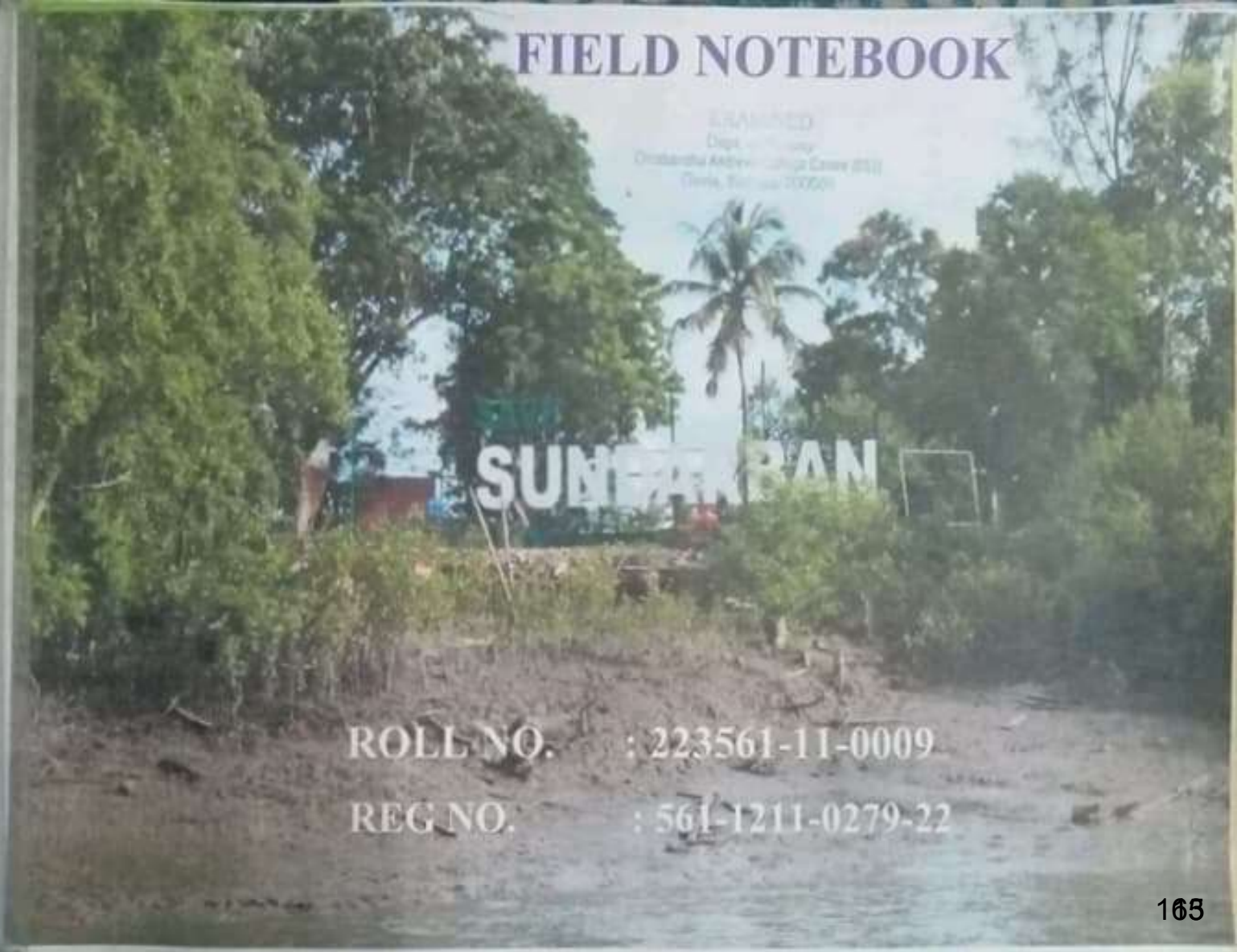
It is with great pleasure that I express my deepest gratitude to the Department of Botany, Budge Budge college for organising a botanical field excursion at Sundarban (Pakhiralaya, Sajnekhali, Jhankhali).

My sincere thanks to go to all teachers of the department for giving me time to time suggestions, advice and inspiration for making the field tour a grand success. I am also thankful to Dr. Saminan Panday and Mrs. Piyali Das for their advice and general help in preparation of the field report.

I would also take the opportunity to thank my classmates for their kind co-operation rendered to me thoughout the tour.

Forwarded
26/02/24

FIELD NOTEBOOK



ROLL NO. : 223561-11-0009

REG NO. : 561-1211-0279-22

ACKNOWLEDGEMENT

It is with great pleasure that I express my deepest gratitude to the Department of Botany, Budge Budge College for organising a Botanical field excursion at Sundarban (Pakhiralaya, Sojnekhali, Jhankhali).

My sincere thanks to go to all the teachers of the department for giving me time to time suggestions, advice and inspiration for making the field tour a grand success. I am also thankful to Dr. Samiran Panday and Mrs. Piyali Das for their advice and general help in preparation of the field report.

I would also take the opportunity to thank my classmates for their kind co-operation rendered to me throughout the tour.

EXAMINED
Dept. of Botany
Budge Budge College (Govt.)
Garia, Kolkata-700 084

Forwarded
26/2/24

PLANT SYSTEMATICS
PRACTICAL (BOT-H-CC2-2-P)
Total marks 25; Credit 1, Class 30 hours

1.	Work out on angiosperms	10 marks
2.	Spot Identification	3 marks
3.	Class room performance (Practical notebook)	2 marks
4.	Field records (field notebook, herbarium specimens)	5 marks
5. Viva-voce		5 marks

ANGIOSPERMS

1. Work out, description, preparation of floral formula and floral diagram, identification up to genus with the help of suitable literature of wild plants and systematic position according to Benthum and Hooker system of classification from the following families: Malvaceae, Leguminosae (Papilionaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Labiatae (Lamiaceae), Rubiaceae.

2. Spot identification (Binomial, Family) of common wild plants from families included in the theoretical syllabus .

FIELD WORK

At least three excursions including one excursion to Acharya Jagadish Chandra Bose Indian Botanic Garden (Shibpur, Howrah) and one to Central National Herbarium (CNH).

FIELD RECORDS

1. Field Note Book (authenticated) with field notes on the plants of the area of excursion and voucher specimen book.

2. Herbarium specimens: Preparation of 20 angiospermic specimens (identified with author citation, voucher number and arranged following Bentham and Hooker system of classification) to be submitted during examination.

PLANT SYSTEMATICS (PRACTICAL)
BOT-MD-CC2-2-P
Total marks 25; Credit 1, Class 30 hours

1.	Work out on angiosperms	10 marks
2.	Spot Identification	3 marks
3.	Class room performance (Practical notebook)	2 marks
4.	Field records (field notebook, herbarium specimens)	5 marks
5. Viva-voce		5 marks

ANGIOSPERMS

1. Work out, description, preparation of floral formula and floral diagram, identification up to genus with the help of suitable literature of wild plants and systematic position according to Benthum and Hooker system of classification from the following families: Malvaceae, Leguminosae (Papilionaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Labiatae (Lamiaceae), Rubiaceae.

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BUDGE BUDGE COLLEGE

DEPARTMENT OF BOTANY

Name of the course	Course code	Date and place	Serial no.	Name of the student	Registration no.	CU Roll no.	Name of the supervisor
Plant Systematics	BOT-H-CC-2-P and BOT-MD-CC-2-P	Botanical Garden 17.01.24	1.	Ayanti Kuley	561-1211-0234-23	233561-11-0004	Dr.Samiran Panday and Mrs.Piyali Das
			2.	Ritu Pandit	561-1211-0201-23	233561-11-0001	
			3.	Ayatulla Laskar	561-1111-0237-23	233561-21-0001	
			4.	Disani Mondal	561-1211-0227-23	233561-11-0002	
			5.	Smritikana Ukil	561-1212-1096-23	233561-12-0012	
			6.	Aritri Halder	561-1211-1098-23	233561-12-0005	
			7.	Tamanna Khatun	561-1211-1090-23	233561-12-0001	
			8.	Sumaiya Nasrin	561-1211-1106-23	233561-12-0008	
			9.	Sania Farhana	561-1215-1094-23	233561-12-0015	
			10.	Sangita Sanati	561-1211-1095-23	233561-12-0003	
			11.	Sabana Khatun	561-1211-1112-23	233561-12-0009	
			12.	Samima Parvin	561-1211-1093-23	233561-12-0002	
			13.	Souvic Adak	561-1111-1091-23	233561-22-0001	
			14.	Muskaan Mallick	561-1215-1104-23	233561-12-0016	
			15.	Dipanwita Pattanayak	561-1211-1097-23	233561-12-0004	
			16.	Dipannita Bhattacharjee	561-1211-0225-23	233561-11-0028	
			17.	Sarmin Khatun	561-1215-0224-23	233561-11-0032	
			18.	Chandrika Das	561-1212-0203-23	233561-11-0030	
			19.	Saswata Mondal	561-1112-0202-23	233561-21-0007	

Budge Budge College

Estd. 1971

NAAC Accredited B+ & UGC 12B, 2(f)

Affiliated to the University of Calcutta

Ref. No.....

Date .....
08/01/2024

To
The Head of Office
AJC Bose Indian Botanic Garden,
Botanical Survey of India,
Shibpur,
Howrah – 711103.

Sir,

The 1st & 3rd Semester Honours and 1st Semester General (MDC) students of the Department of Botany of Budge Budge College, 7, D. B. C. Road, Kolkata – 700137 led by Dr. Samiran Panday, Assistant Professor and Mrs. Piyali Das, SACT are going to visit and learn about the Acharya Jagadish Chandra Bose Indian Botanic Garden on 17.01.24 as a part of B. Sc. Botany Curriculum of the University of Calcutta. I would request you to assist the team so that they can learn about the phytodiversity and functions of the Garden.

This is for your kind information and necessary action.

With regards,

Yours faithfully

Dr. Debjani Datta
Principal
Budge Budge College

DR. DEBJANI DATTA
M.Sc. (Gold Medalist), Ph.D
Principal
Budge Budge College
7, D.B.C. Road, Kol-700137
West Bengal, India

Received and visited
Jitin Saha, Botanical Assistant,
17/01/24 AJCBIBG, BSI

7, Deshbandhu Chittaranjan Road, Budge Budge, 24 Parganas (S), Kolkata - 700137, West Bengal, INDIA; Tel : (033)24701454, (033)24805168
E-mail : budgebudgecollege@gmail.com; Website : www.wbbudgebudgecollege.org

Budge Budge College

Estd. 1971

NAAC Accredited B+ & UGC 12B, 2(f)

Affiliated to the University of Calcutta

Ref. No..... Date .....

08/01/2024

To
The Head of Office
Central National Herbarium,
Botanical Survey of India,
Shibpur,
Howrah – 711103.

Sir,

The 1st & 3rd Semester Honours and 1st Semester General (MDC) students of the Department of Botany of Budge Budge College, 7, D. B. C. Road, Kolkata – 700137 led by Dr. Samiran Panday, Assistant Professor and Mrs. Piyali Das, SACT are going to visit and learn about the Acharya Jagadish Chandra Bose Indian Botanic Garden on 17.01.24 as a part of B.Sc. Botany Curriculum of the University of Calcutta. I would request you to assist the team so that they can learn about the phytodiversity and functions of the Garden.

This is for your kind information and necessary action.

With regards,

Yours faithfully

Dr. Debjani Datta
Principal
Budge Budge College

DR. DEBJANI DATTA
M.Sc. (Gold Medalist), Ph.D
Principal
Budge Budge College
7, D.B.C. Road, Kol-700137
West Bengal, India

CENTRAL NATIONAL HERBARIUM
RECEIVED
Dt. 17.01.2024
Contents Not Verified
B.S.I.

Pooja Singh

7, Deshbandhu Chittaranjan Road, Budge Budge, 24 Parganas (S), Kolkata - 700137, West Bengal, INDIA; Tel : (033)24701454, (033)24805168

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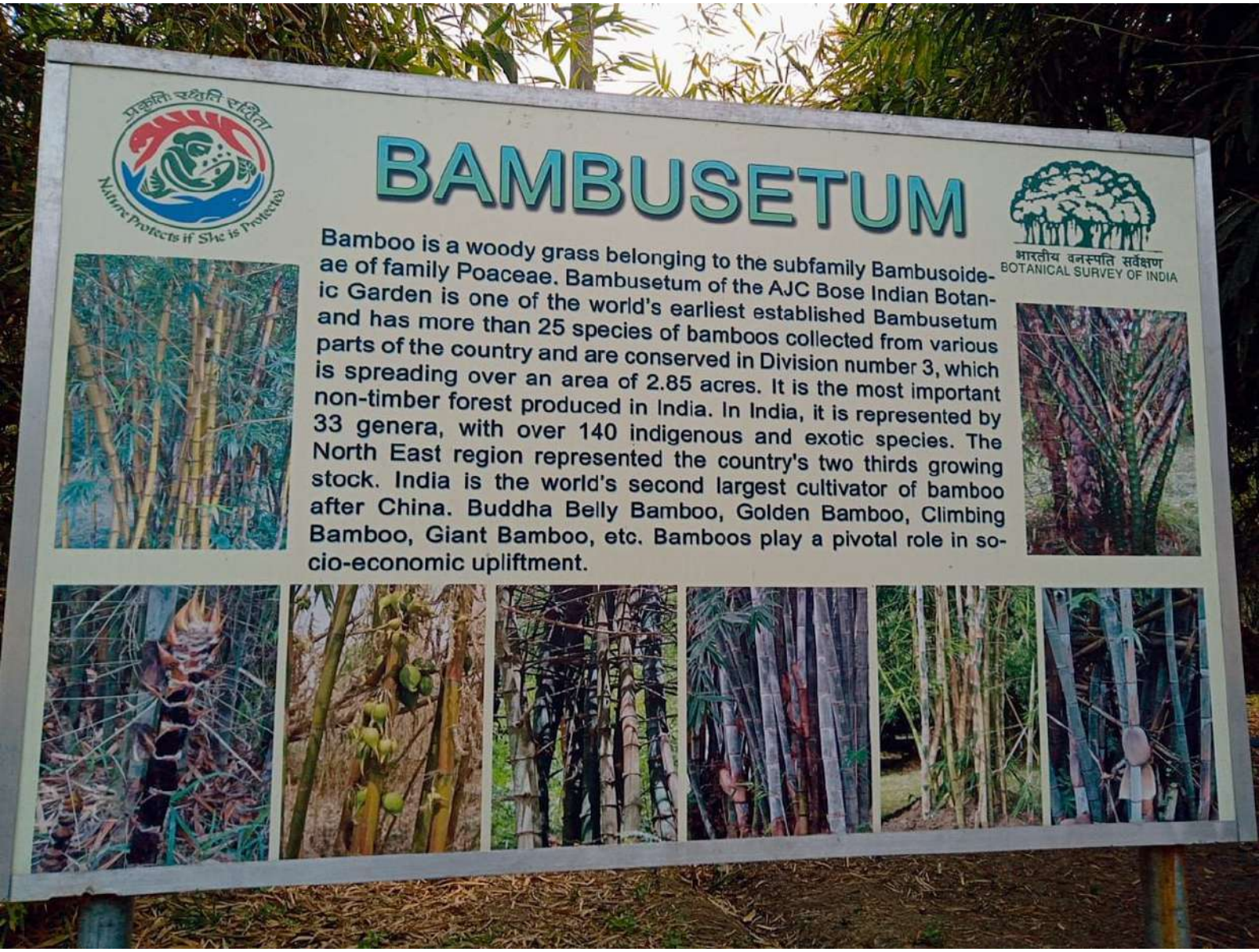
भारत सरकार
Government of India
PARKING

ভারত সরকার/भारत सरकार/GOVT OF INDIA
আচার্য্য জগদীশ চন্দ্র বোস ভারতীয় উদ্ভিদ উদ্যান
आचार्य जगदीश चन्द्र बोस भारतीय वनस्पति उद्यान
ACHARYA JAGADISH CHANDRA BOSE INDIAN BOTANIC GARDEN
ভারতীয় উদ্ভিদ সর্বেক্ষণ/भारतीय वनस्पति सर्वेक्षण/BOTANICAL SURVEY OF INDIA
হাওড়া-৭১১১০৩/हावड़ा-७११११०३/HOWRAH - 711103

ACHARYA JAGADISH CHANDRA BOSE INDIAN BOTANIC GARDEN
BSI, Govt. of India
Ministry of Environment, Forest & Climate Change
ZERO POLY BAG ZONE
1. Main Gate (55 Bus Stand)
2. Bicentenary Gate (Andul Road)
3. River View Gate
4. Garage and Parking
5. Wallich Monument
6. Pavilion No. 1
7. Curator's Office
8. Nursery No. 1
9. Kyd Monument
10. Mist Chamber
11. Griffith Monument
12. Kurz Monument
13. Small Palm House
14. Carl Mez Monument
15. Large Palm House
16. Small Banyan Tree
17. Nursery No. 2
18. Roxburgh Monument
19. Great Banyan Tree
20. Cactus House
21. Pavilion No. 6A & 6B
22. Medicinal Plant Garden (Charak Udyan)
23. Central National Herbarium (CNH)
24. Guest House
25. Cantees and IBG Office
26. Roxburgh Building
LEGENDS
IBG Boundary
Open Canal
Underground Canal
Garden Map
Boating
Enquiry & Public Relation Office
Drinking Water
Toilet
Bench
Dustbin
Pump House
Water Tank
Staff Quarter
Mounds
SCALE
0
150 m
North East Asia
Japan
Philippines
Thailand
Malaya
Vietnam
Australasia
Africa
Europe
North America
Central South America
Kerala
Burma
Tamil Nadu
Karnataka
Orissa
Bihar
Maharashtra
Rajasthan
Gujarat
Punjab and U.P.
Haryana
Himachal Pradesh
Student's Garden
Sikkim
Assam
Nagaland
Manipur
Meghalaya
Bangladesh
Lotus Pool
Kings Lake
Prem Lake
Jaladan Lake
Shadir Lake
Liram Lake
Wallich's Avenue
Hamilton's Avenue
RIVER HOOGLY


प्रकृतिः रक्षति रक्षिता
Nature Protects if She is Protected
BAMBUSETUM
भारतीय वनस्पति सर्वेक्षण
BOTANICAL SURVEY OF INDIA
Bamboo is a woody grass belonging to the subfamily Bambusoideae of family Poaceae. Bambusetum of the AJC Bose Indian Botanic Garden is one of the world's earliest established Bambusetum and has more than 25 species of bamboos collected from various parts of the country and are conserved in Division number 3, which is spreading over an area of 2.85 acres. It is the most important non-timber forest produced in India. In India, it is represented by 33 genera, with over 140 indigenous and exotic species. The North East region represented the country's two thirds growing stock. India is the world's second largest cultivator of bamboo after China. Buddha Belly Bamboo, Golden Bamboo, Climbing Bamboo, Giant Bamboo, etc. Bamboos play a pivotal role in socio-economic upliftment.

AQUATIC PLANT SECTION
जलीय पादप अनुभाग
REDMI 9 POWER | SAHIN

UNIVERSITY OF CALCUTTA

Three Year B.Sc Semester- II Examination 2024
UNDER CCF 2022

FEILD BOOK

ROLL NO- 233561-12-0012
REG. NO- 561-1212-1096-23

SUBJECT-BOTANY
PAPER-CC-2
YEAR-2024

Field study in the
Acharya Jagadish Chandra Bose Indian Botanic Garden

Date :- 17.01.2024

Weather :- Sunny and clear weather
Hight :- ~10m.
Prof's Name :- Dr. Saminan Panday, Dr. Piyali Das

Place :- Shibpur, Howrah

Forwarded
25/7/24

INTRODUCTION

হাওড়া জিলা পুরপরিষদ বোটানিক্যাল গার্ডেন চিড়িয়াখানার অধ্যাপক ড: সমীরণ পাত্র গার্ডেনের বিভিন্ন জায়গায় সভা হয়েছিল 17.01.2024 তারিখে, এই বোটানিকাল গার্ডেন হুগলী নদীর তীরে প্রায় 273 একর জমি নিয়ে অবস্থিত. এই বোটানিকাল গার্ডেন-এ বর্তমান চিড়িয়া প্রজাতির সংখ্যা প্রায় 15000, 1787 খ্রীষ্টাব্দে এই উদ্যান সামুদ্রিক সুপারিন্টেন্ডেন্ট লেফটেন্যান্ট কর্ণেল রবার্ট কিড দ্বারা প্রতিষ্ঠিত হয়, উঁর মৃত্যুর উইলিয়াম রক্সবার্গ যিনি একজন চিড়িয়াবিদ সুপারিন্টেন্ডেন্ট পদে নিযুক্ত হন, যিনি অনেক ওষধি এবং অনেক দুষ্প্রাপ্য চিড়িয়া এই উদ্যানে রোপণ করেন, ড: ন্যাথানিয়েল ওয়ালিচ এই উদ্যানে একটি হার্বেরিয়াম প্রতিষ্ঠা করেন যা বর্তমানে সেন্ট্রাল ন্যাশনাল হার্বেরিয়াম নাম-এ পরিচিত, এরপর, সুপারিন্টেন্ডেন্ট স্যার জর্জ কিং বোটানিকাল পরিকল্পনার দ্বারা এই উদ্যানকে পুনঃসজ্জিত করেন এবং এইভাবে সংরক্ষণ অঞ্চল, জলাশয়, জায়গাগুলির উদ্যান ইত্যাদি প্রস্তুত করা হয়.

এর অনেক পর 1980 সালে একটি পৃথক সংগঠনকে যুক্ত করা হয়েছিল যা সবজি চাষ এবং চিড়িয়ের অন্যান্য শাখায় গবেষণায় নিযুক্ত, যার নামকরণ করা হয় বোটানিকাল সার্ভে অফ ইন্ডিয়া (BSI) হিসাবে, এই ইন্ডিয়ান বোটানিকাল গার্ডেন বিভিন্ন উদ্দেশ্য, যেমন ব্যাপক হারে চারা চিড়িয়া এবং অন্যান্য চিড়িয়াবস্তু বিভিন্ন চাষদারী সরকারী, বেসরকারী প্রতিষ্ঠান, পুরসভা, সংগঠন, বৈজ্ঞানিক এবং জায়গাগুলিকে প্রদান করে.

SCALE

DESCRIPTION

আমরা বড়বড়া কলেজের প্রথম বর্ষের দ্বিতীয় (2nd) সেমিস্টারের জীববিজ্ঞানের ছাত্রছাত্রীরা গত 17.01.2024. তারিখে ইন্ডিয়ান বোটানিকাল গার্ডেন, উদ্ভিদবিদ্যার শিক্ষামূলক ভ্রমণের উদ্দেশ্যে উদ্যানের সামনে সকাল 9.00 টায় সমবেত হই, দিনটি রৌদ্রোজ্জ্বল এবং আবহাওয়া পরিষ্কার ছিল, উদ্যানে প্রবেশের পর আমরা কিছু উদ্ভিদনমুনা সংগ্রহ ও লিপিবদ্ধ করি যার তালিকা পরে তালিকাভুক্ত করা হয়েছে, আমরা সারাদিনের প্রায় বিভিন্ন বাসস্থানের উদ্ভিদ পর্যবেক্ষণ এবং সংগ্রহ করি, আমরা বিশেষ বাসস্থান (Habitat) যুক্ত অন্যান্য উদ্ভিদ যেমন – মহাণ, পরগাছা, অর্কিড ও পর্যবেক্ষণ করি, বিভিন্ন স্থানের মানচিত্র তৈরি হয় এবং আমরা সুস্বাদু খাওয়াদাওয়া করে নিই, এরপর আমরা বিখ্যাত বৃহদাকার প্রায় 240 বৎসর বয়স্ক বটবৃক্ষের পর্যবেক্ষণ উপভোগ করি যা দর্শনার্থী, বিজ্ঞানী ও পর্যটক সকলের কাছেই বিশেষ আকর্ষণের কেন্দ্র, আমরা জানতে পারি যে এই বটবৃক্ষটি প্রায় 425 মি. পরিধি বিশিষ্ট এবং প্রায় 16000 বর্গ. মি. স্থান জুড়ে অবস্থিত, এটি থেকে প্রায় 1825 টি ঝুরি নেমেছে, ঐগুলির উচ্চতম শাখাটি 24.5 মি. উচ্চ সমন্বিত এবং ঐগুলির সর্বশেষ অদ্ভুত বিষয়টি হল বৃক্ষটির মূলে গুঁড়িটি বিনষ্ট হয়ে গিয়েছে,

এরপর আমরা ফোর্ট নেপোলিয়ান ন্যাশনাল মিউজিয়ামে যাই এবং কিছু বিষয় অবলোকন করি, এখানে আমরা অনেকগুলি মিউজিয়াম সিট প্রত্যক্ষ করি যেগুলি 5. উইলিয়াম রক্সবার্গের সময় থেকে অত্যন্ত যত্নের সাথে রক্ষণাবেক্ষণ করা আছে, আমরা জাতীয় মিউজিয়াম-এর বিজ্ঞানীদের কাছে হতে গুরুত্বপূর্ণ বক্তৃতা শুনতে পারি এবং বহু প্রয়োজনীয় তথ্য জানতে পারি, এখানে মিউজিয়ামগুলি – Bentham এবং Hookers -এর শ্রেণিবিন্যাস অনুযায়ী সাজানো আছে,

—— 0 ——

আমরা প্রয়োজনীয় তথ্য সংগ্রহ করলাম এবং যে সমস্ত উদ্ভিদ সংগৃহীত হল তার তালিকা নীচে দেওয়া হল, দ্বিপ্রহর 2.00 নাগাদ আমরা ঐ উদ্যান ছাড়িয়া বাড়ির উদ্দেশ্যে রওনা দিই,

Hypha thabaica

Importance of the field Study

শ্রেণীকক্ষের মধ্যে Theoritical পাঠ গ্রহণের মধ্যে দিয়ে শুধুমাত্র সাধারণ একটি জ্ঞান অর্জন করা সম্ভব কিন্তু পরিপূর্ণ জ্ঞান অর্জন করিতে হইলে Field Study অবশ্যকীয়, Field Study-র মধ্যে দিয়ে নিম্নোক্ত নিয়মের জ্ঞান লাভ করা যায় বলিয়া মনে হয়ঃ—

1. বিভিন্ন উদ্ভিদের স্থানের এবং সাধারণ উদ্ভিদসমূহের পারিপার্শ্বিক আবহাওয়া সংক্রান্ত বিষয়ের প্রত্যক্ষ অভিজ্ঞতা অর্জন করা যায়।
2. উদ্ভিদসমূহের নিজ নিজ বাসস্থানের আকৃতি, স্বভাব, স্থানীয় নাম, বৈজ্ঞানিক নাম ইত্যাদির সম্বন্ধে নিজে জানতে পারা যায় এবং অর্থাৎ জ্ঞান অর্জনের দ্বারা উদ্ভিদজগতের সম্বন্ধে বিষয়ের শিক্ষার্থীদের স্বাভাবিক মনোভাব গড়ে তোলা।
3. নিজস্ব অভিজ্ঞতার দ্বারা স্থানীয় জীববৈচিত্র্য, এথনোবোটানী প্রভৃতি সম্পর্কে এবং অর্থনৈতিক এবং অন্যান্য প্রাকৃতিক বিষয়ের জ্ঞান অর্জিত হয়।
4. প্রকৃতির সঙ্গে উদ্ভিদের সম্পর্ক এবং Ecotypes যে বিভিন্ন প্রাকৃতিক উদ্ভিদ অ্যাডাপটেশনের সঙ্গে সংশ্লিষ্ট উদ্ভিদসমূহ বসবাস করে সেগুলির সম্পর্ক উদ্ভিদ জ্ঞান অর্জন করা যায়।
5. সংগৃহীত এবং অধ্যয়ন করা উদ্ভিদগুলির অর্থনৈতিক বা ভেষজ গুরুত্ব সম্বন্ধে ভালো ধারণা পাওয়া যায়।
6. Feild Study-র অন্যতম উদ্দেশ্য এলাকার ঋতু পরিবর্তনের সাথে সাথে বিভিন্ন উদ্ভিদের প্রাচুর্য বা অপ্রাচুর্য সম্বন্ধে শিক্ষার্থী ঐ এলাকার উদ্ভিদসমূহকে বিভিন্ন বৃদ্ধির সময়, পুষ্পোদ্গমের সময় অনুকূল আবহাওয়া ইত্যাদি সম্পর্কে সচেতন হওয়া যায়। আবার এই Feild Study-র পরে কোন এলাকা যদি ধ্বংস হয়ে যায় (যেমন বা অন্যান্য প্রাকৃতিক দুর্যোগের ফলে) সেই নির্দিষ্ট এলাকায় কি ধরনের Vegetation ছিল তা পূর্বের নিদর্শন থেকে বিশদভাবে অবগত হওয়া যায়।
7. কোন উদ্ভিদ প্রজাতি অবলুপ্ত বা অবলুপ্তির পথে কিনা ইত্যাদি বিষয়েও একই এলাকায় করবার Field excurtion এর মাধ্যমে জানা সম্ভব।

Charak Udyan :—

NAME	FAMILY	REMARKS
Plumbago indica	Plumbaginaceae	Shrub
Costus speciosus	Zingiberaceae	Large herb.
Solanum indicum	Solanaceae	Shrubs with with flowers
Ocimum bassilicum	Lamiaceae	Medicinally important plant.
Acorus calamus	Lamiaceae	Medicinally important plant.
Gymnema sylvastris	Lamiaceae	Medicinally important plant.
Cardiospermum helicocabum	Sapindaceae	Trailing herb.

Taxodium distichum

Amherstia nobilis

Napoleonaea imperialis

Nymphaea rubra

List of Observing Plants :—

NAME	FAMILY	REMARKS
Sida rhombifolia	Malvaceae	Herb with yellow flowers
Mangifera indica	Anacardiaceae	Tree
Croton bonplandiam	Euphorbiaceae	Herb with white flowers
Brassica nigra	Brassicaceae	Herb with yellow flowers
Achyranthus aspera	Amaranthaceae	Herb with spike inflorescence
Ficus religiosa	Moraceae	Tree
Nicotiana plumbaginifolia	Solanaceae	Herb with white flowers
Mikania cordata	Asteraceae	Climber with white flowers
Caesalpinia pulcherrima	Caesalpiniaceae	Tree with red flowers
Drynaria quercifolia	Polypodiaceae	Basket fern
Sterculia villosa	Malvaceae	Tree
Tamarindus indica	Caesalpiniaceae	Tree
Costus speciosus	Costaceae	Herb
Adansonia digitata	Bombaceae	Tree

Psilotum nudum

Gustavia superba

Rabenala madagascariensis	Strelitziaceae	Travellers tree
Thunbergia erecta	Thunbergiaceae	Herb
Calotropis gigantia	Asclepidiceae	Shrub
Albizia lebbeck	Mimosaceae	Tree
Shorea robusta	Dipterocarpaceae	Tree
Phoenix reclinata	Arecaceae	Plam tree
Bougainvillea spectabilis	Nyctaginaceae	Shrub
Terminalia catappa	Combretaceae	Tree
Cassia alata	Caesalpiniaceae	Shrub with yellow flowers in spike
Delonix regia	Caesalpiniaceae	Tree with red flowers.
Canna indica	Cannaceae	Large herb with red flowers.
Alternanthera sessilis	Amaranthaceae	Trradding herbs with white flowers
Polyalthia longifolia	Annonaceae	Tree
Alstonia schdaris	Apocynaceae	Medicinaly important tree.
Areca catachu	Arecaceae	Tree

Cocos nucifera	Palmae	Tree
Araucaria cookii	Araucariaceae	Tree
Cycas sp.	Cycadaceae	Tree
Pinus sp.	Pinaceae	Tree
Cryptomeria japonica	Cupressaceae	Tree
Thuja orientalis	Cupressaceae	Tree
Borassus flabellifera	Palmae	Tree
Dianthus chinensis	Caryophyllaceae	Herb
Petunia sp	Solanaceae	Flowering plant
Azolla pinnata	Azollaceae	Masarito fern
Chenopodium album	Chenopodiaceae	Annual plant
Asparagus racemosus	Liliaceae	Shrub
Boerhaaria diffusa	Nyctaginaceae	Herb
Chloris barbata	Poaceae	Herb

Dipteryx retusus

Victoria amazonica

Couroupita guianensis

Charak Uddyan

Amherstia nobilis	Caesalpiniaceae	Tree with long showy flowers
Nerium indicum	Apocynaceae	Small tree.
Sonchus oleraceus	Asteraceae	Annual herb
Brownea coccinea	Fabaceae	Tree
Tectona grandis	Lamiaceae	Hard wood tree
Thevetia neriifolia	Apocynaceae	Tree

Field study in the

"Acharya Jagadish chandra Bose Indian Botanic Garden"

Date : 17.01.2024

Weather : Sunny days later cloudy

Hight : ~ 10 m

Prof's Name : Dr. Samiran Panday

Place : Shibpur, Howrah

Forwarded
SG 24/7/24

INTRODUCTION

হাওড়া জিলাধীন বোটানিক্যাল গার্ডেন উদ্ভিদবিদ্যার অধ্যাপক ড. উদয়নারায়ণ, এম. পাত্র, সি. দাস এবং গাইডেন্স স্থানীয় কিল্ড স্টাডিতে যাওয়া হয়েছিল 17.01.2024 তারিখে. এই বোটানিক্যাল গার্ডেন হুগলী নদীর উত্তর তীরে আর 273 একর এলাকা নিয়ে অবস্থিত. এই বোটানিক্যাল গার্ডেনে বর্তমান উদ্ভিদ প্রজাতির সংখ্যা প্রায় 15000. 1787 খ্রী: এই উদ্যান আনুষ্ঠানিক সুপারিন্টেন্ডেন্ট লেফটেন্যান্ট কর্নেল রবার্ট কিড দ্বারা প্রতিষ্ঠিত হয়. এর মৃত্যুর পরে উইলিয়াম রক্সবার্গ নামে একজন উদ্ভিদবিদ সুপারিন্টেন্ডেন্ট পদে নিযুক্ত হন, তিনি অনেক ঔষধি এবং অনেক গুণসম্পন্ন উদ্ভিদ এই উদ্যানে রোপণ করেন. ড: ন্যাথানিয়েল ওয়ালিচ এই উদ্যানে একটি হার্বেরিয়াম প্রতিষ্ঠা করেন যাহা বর্তমানে সেন্ট্রাল ন্যাশনাল হার্বেরিয়াম নামে পরিচিত. এরপর, সুপারিন্টেন্ডেন্ট স্যার জর্জ কিং ভৌগোলিক সার্কুলেশনের দ্বারা এই উদ্যানকে পুনঃ সজ্জিত করেন এবং এইভাবে সংরক্ষণ আন্দোলন, জনসাধারণ, ছাত্রছাত্রীদের উদ্যান ইত্যাদি প্রযুক্ত করা হয়.

এর অনেক পরে 1980 সালে একটি পুরনো সংগঠনকে যুক্ত করা হয়েছিল যা সবজি উদ্ভিদ এবং উদ্ভিদের অন্যান্য শাখায় গবেষণায় নিযুক্ত, যার নামকরণ করা হয় বোটানিক্যাল সার্ভে অফ ইন্ডিয়া (BSI) হিসাবে, এই ইন্ডিয়ান বোটানিক্যাল গার্ডেন বিভিন্ন উদ্দেশ্যে, বিভিন্ন দেশ থেকে আনা উদ্ভিদ এবং অন্যান্য উদ্ভিদবস্তু বিভিন্ন উৎসাহী সরকারী, বেসরকারী প্রতিষ্ঠান, পুরসভা, সংগঠন, বৈজ্ঞানিক এবং ছাত্রছাত্রীদের ও প্রদান করে.

Group picture

Group picture

Botanical garden map

DESCRIPTION

আমরা বজবজ কলেজের দ্বিতীয় সেমিস্টারের উদ্ভিদবিজ্ঞানের ছাত্রছাত্রীরা গত 17.01.24 তারিখে ইন্ডিয়ান বোটানিক্যাল গার্ডেনে উদ্ভিদবিদ্যা বিষয়ক ভ্রমণের উদ্দেশ্যে উদ্যানের সামনে সকাল 9.00টায় সমবেত হই। দলটির প্রথমটি সুমালো চক্র পরে শেষটা। ছবি উদ্যানে প্রবেশের পর আমরা কিছু উদ্ভিদ নমুনা সংগ্রহ করি যার তালিকা পরে তালিকাভুক্ত করা হয়েছে। আমরা সারাদিনই এর বিভিন্ন বাসস্থানের উদ্ভিদ পর্যবেক্ষণ এবং সংগ্রহ করি। আমরা বিশেষ বাসস্থান (Habitat) যুক্ত অন্যান্য উদ্ভিদ যেমন- মথায়, পরাশ্রয়ী, অর্কিডও পর্যবেক্ষণ করি। বিভিন্ন স্থানের ফটোগ্রাফি নেওয়া হয় এবং এরপর আমরা খুলনা খাওয়া দাওয়া সেরে নিই। এরপর আমরা বিখ্যাত বৃহদাকার আম 240 বছরের বয়স্ক বৃক্ষের পর্যবেক্ষণ উপভোগ করি যা ছাত্রছাত্রী, বিজ্ঞানী ও সর্বোপরি সকলের কাছেই বিশেষ আকর্ষণের কেন্দ্র। আমরা জানতে পারি যে এই বৃক্ষটি প্রায় 425 কি. পরিধি বিশিষ্ট এবং প্রায় 16000 বর্গ মি. স্থান জুড়ে অবস্থিত, এটি থেকে প্রায় 1825 টি ঝুরি নেমেছে। ইহার উচ্চতম শাখাটি 24.5 মি. উচ্চতা সম্পন্ন এবং ইহার সর্বাপেক্ষা অদ্ভুত বিষয় হল বৃক্ষটির মূল গুঁড়িটি বলতে কিছু নেই।

এরপর আমরা গ্রেট সেন্ট্রাল হ্যাবারিয়ামে যাই এবং কিছু বিষয় অধ্যয়ন করি। এখানে আমরা তথ্যগুলি হার্বেরিয়াম শিট প্রত্যক্ষ করি যেগুলি ড. উইলিয়াম রক্সবার্গের সময় থেকে অত্যন্ত যত্নের সাথে রক্ষণাবেক্ষণ করা আছে। আমরা জাতীয় হার্বেরিয়ামের বিজ্ঞানীদের কাছ হইতে গুরুত্বপূর্ণ বক্তৃতা শুনতে পাই এবং বহু প্রয়োজনীয় তথ্য জানতে পারি। এখানে হার্বেরিয়াম গুলি- Bentham and Hooker এর শ্রেণীবিন্যাস অনুযায়ী সাজানো আছে।

Hyphaena thabaica

Taxodium distichum

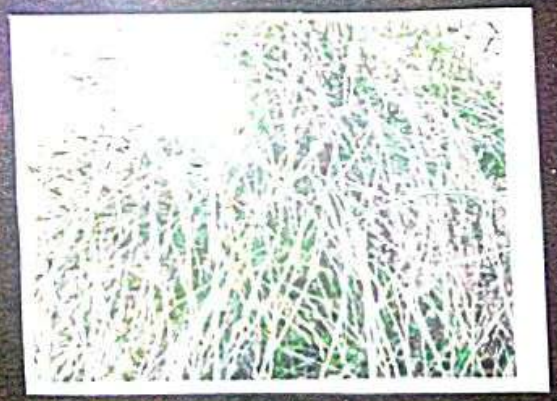
Large plam House

আমরা প্রয়োজনীয় তথ্য সংগ্রহ করলাম এবং যে সমস্ত উদ্ভিদ সংগৃহীত হল তার তালিকা নীচে দেওয়া হল। দুপুর 2.00 নাগাদ আমরা ঐ উদ্যান ছাড়িয়া বাড়ির উদ্দেশ্যে রওনা হই।

SR. NO.	PLANT'S NAME	FAMILY
1	Sagettaria Sagittifolia	Alismataceae
2	Victoria amazonica	Nymphaeaceae
3	Thysanolaena maxima	Poaceae
4	Mesua ferrea	Calophyllaceae
5	Lagerstroemia speciosa	Lythraceae
6	Cordia dichotoma	Boraginaceae
7	Strophanthus sp.	Apocynaceae
8	Lygodium flexuosum	Schizaeaceae
9	Ageratum conyzoides	Asteraceae
10	Asystasia gangetica	Acanthaceae
11	Begonia augustinei	Begoniaceae

Charbak uddyan

Dipterocarpus retusus



Psilotum nudum

SR. NO.	PLANT'S NAME	FAMILY
12	Bambusa vulgaris	Poaceae
13	Kleinhovia hospita	Malvaceae
14	Sansevieria sp.	Asparagaceae
15	Shorea robusta	Dipterocarpaceae
16	Pandanus sp.	Pandanaceae
17	Caryota urens	Arecaceae
18	Tectona grandis	Lamiaceae
19	Vernonia cinerea	Asteraceae
20	Thespesia populnea	Malvaceae
21	Michelia champaca	Magnoliaceae
22	Bougainvillea	Nyctaginaceae
23	Saraca asoca	Fabaceae.
24	Caesal pinia pulcherrima	Legumes
25	Ceasal pinia	Legumes
26	Tamarindus indica	Causalpiniaceae
27	Costus speciosus	Costaceae

Amherstia nobilis

Couroupita guianensis

Napoleonaea imperialis

SR. NO.	PLANT'S NAME	FAMILY
28	Delonix regia	Causalpiniaceae
29	Canna indica	cannaceae
30	Alternanthera sessilis	Amaranthaceae
31	Polythia longifolia	Annonaceae
32	Alstonia scholaris	Apocynaceae
33	Areca catchu	Arecaceae
34	Cocos nucifera	Palmae
35	Araucaria cookii	Arucariaceae
36	Cycas sp.	cycodaceae
37	Pinus sp.	pinaceae
38	Cryptomeria japanica	cupressaceae
39	Thuja orientalis	cuppressaceae
40	Barossus flabellifer	Palmae
41	Dianthus chinensis	caryophyllaceae
42	Petunia rotaceae	Solanaceae
43	Azolla pinnata	Azollaceae
44	Chenopodium album	chenopodiaceae
45	Asparagus racemosus	Liliaceae

Victoria amazonica

Gustavia superba

Asystasia gangetica

Nymphaea rubra

SR. NO.	PLANT'S NAME	FAMILY
46	Thevetia nerifolia	Apocyanaceae
47	Tectona grandis	Lamiaceae
48	Sanchus obraccus	Asteraceae
49	Nerium indicum	Apocynaceae
50	Amherstia nobilis	caesalpiniaceae

Importance of the field study

শ্রেণীকক্ষের মধ্যে Theoritical পাঠ গ্রহণের মধ্য দিয়েই কেবলমাত্র সাধারণ একটি জ্ঞান অর্জন করা সম্ভব কিন্তু পরিপূর্ণ জ্ঞান অর্জন করতে হইলে Field study অবশ্যপ্রয়োজনীয়। Field study-র মধ্যে দিয়ে যেগুলি অতি সহজেই জানা যায় সেগুলি হইল:-

১. বিভিন্ন উদ্ভিদের স্যাম্পল এবং লাইভ উদ্ভিদসমূহের পারিপার্শ্বিক আবহাওয়া সংক্রান্ত বিষয়ের প্রত্যক্ষ অভিজ্ঞতা অর্জন করা যায়।

2. উদ্ভিদসমূহের নিজ নিজ বাসস্থানের অবস্থিতি, স্থানীয় নাম, বৈজ্ঞানিক নাম ইত্যাদির সম্বন্ধে নিজে জানতে পারা যায় এবং এইভাবে জ্ঞান অর্জনের দ্বারা উদ্ভিদ জগতের সমগ্র বিষয়ের শিক্ষার্থীদের যুক্তিবাদী মনোভাব গড়ে তোলা।

৩. Field study-র দ্বারা স্থানীয় জীববৈচিত্র্য, ইকোলোজিক্যাল প্রভৃতি সম্পর্কে এবং ইকনমিক্স এবং অন্যান্য প্রয়োজনীয় বিজ্ঞানের জ্ঞান অর্জিত হয়।

৪. প্রকৃতির সঙ্গে উদ্ভিদের সম্পর্ক এবং ecotypes [যে ধরনের প্রাকৃতিক উদ্ভিদ অ্যাসোসিয়েশনের সঙ্গে সাদৃশ্য উদ্ভিদসমূহের বসবাস করে] সম্বন্ধে সম্যক জ্ঞান অর্জন করা যায়।

৫. সংগৃহীত এবং অধ্যয়ন করা উদ্ভিদগুলির অর্থনৈতিক বা ভেষজ গুরুত্ব সম্বন্ধে তথ্যাবলী পাওয়া যায়।

৬. Field Study-র অন্তঃভুক্ত এলাকার ঋতু পরিবর্তনের সাথে সাথে বিভিন্ন উদ্ভিদের প্রাদুর্ভাব বা অনুপস্থিতি সম্বন্ধে লিখে ঐ এলাকার উদ্ভিদসমূহের বিভিন্ন ঋতুর সময়, পুষ্পোদ্গমের সময় অনুকূল আবহাওয়া ইত্যাদি সম্পর্কে সচেতন হওয়া যায়। আবার এই field study র পরে কোন এলাকা নষ্ট হয়ে গেলে (বন্যা বা অন্যান্য প্রাকৃতিক দুর্যোগের ফলে) সংশ্লিষ্ট এলাকায় কি ধরনের vegetation ছিল তা পূর্বের কিছু খাতা থেকে বিশদ ভাবে অবগত হওয়া যায়।

৭. কোন উদ্ভিদ প্রজাতি অবলুপ্ত বা অবলুপ্তির পথে কিনা ইত্যাদি বিষয়ও একই এলাকায় বারবার field excurtion এর মাধ্যমে জানা সম্ভব।

PLANT DIVERSITY (PRACTICAL)
BOT-MD-CC1-1-P
Total marks 25; Credit 1, Class 30 hours

1.	**Work out: Morphology**	**10 marks**
2.	**Identification with reasons (other groups except angiosperms)**	**5 marks**
3.	**Class room performance (Practical notebook)**	**3 marks**
4.	**Field notebook**	**2 marks**
5.	**Viva-voce**	**5 marks**

1. Flower- dissection, drawing and study
   a) Different parts, b) Adhesion and cohesion, c) Placentation, d) Aestivation
2. Study of ovules: types (Fresh specimens/ permanent slides/ photographs)
3. Fruits:different types- study from fresh/ preserved specimens
4. Inflorescence types: study from fresh/ preserved specimens
5. Identification on the basis of reproductive and structural features from preserved specimens/ permanent slides: Algae (*Nostoc*, *Oedogonium* and *Ectocarpus*), Fungi (*Rhizopus*, *Ascobolus* and *Agaricus*), Bryophytes (*Marchantia*, *Anthoceros* and *Funaria*), Pteridophytes (*Selaginella*, *Equisetum* and *Pteris*), Gymnosperms (male cone and female cone/ megasporophyll of *Cycas, Pinus* and *Gnetum*).
6. A field notebook supported with photographs taken during field study to be submitted giving comprehensive idea about different types of inflorescence, flowers and fruits.

Textbook Reference:

1. Ganguli,H.C., Das, K.S.K. & Dutta, C.T. College Botany, Vol. I, latest Ed., New Central Book Agency

2. Ganguli,H.C. and Kar, A.K. College Botany, Vol. II, latest Ed., New Central Book Agency

3. Mukherjee, S. College Botany, Vol. III, latest Ed., New Central Book Agency

4. Uno, Storey& Moore, Principles of Botany, 2001, McGraw Hill.

5. Kenrick,P. & Crane, P. The Origin & early diversification of land plants (1997), Smithsonian Institute Press.

6. Bell, P.R. & Hensley, A.R. Green plants; their Origin & Diversity (2nd ed.), 2000, Cambridge University Press

PLANT DIVERSITY (PRACTICAL)
BOT-H-CC1-1-P
Total marks 25; Credit 1, Class 30 hours

1.	**Work out: Morphology**	**10 marks**
2.	**Identification with reasons (other groups except angiosperms)**	**5 marks**
3.	**Class room performance (Practical notebook)**	**3 marks**
4.	**Field notebook**	**2 marks**
5.	**Viva-voce**	**5 marks**

1. Flower- dissection, drawing and study
   a) Different parts, b) Adhesion and cohesion, c) Placentation, d) Aestivation
2. Study of ovules: types (Fresh specimens/ permanent slides/ photographs)
3. Fruits:different types- study from fresh/ preserved specimens
4. Inflorescence types: study from fresh/ preserved specimens
5. Identification on the basis of reproductive and structural features from preserved specimens/ permanent slides: Algae (*Nostoc*, *Oedogonium* and *Ectocarpus*), Fungi (*Rhizopus*, *Ascobolus* and *Agaricus*), Bryophytes (*Marchantia*, *Anthoceros* and *Funaria*), Pteridophytes (*Selaginella*, *Equisetum* and *Pteris*), Gymnosperms (male cone and female cone/ megasporophyll of *Cycas, Pinus* and *Gnetum*).
6. A field notebook supported with photographs taken during field study to be submitted giving comprehensive idea about different types of inflorescence, flowers and fruits.

Textbook Reference:

1. Ganguli,H.C., Das, K.S.K. & Dutta, C.T. College Botany, Vol. I, latest Ed., New Central Book Agency

2. Ganguli,H.C. and Kar, A.K. College Botany, Vol. II, latest Ed., New Central Book Agency

3. Mukherjee, S. College Botany, Vol. III, latest Ed., New Central Book Agency

4. Uno, Storey& Moore, Principles of Botany, 2001, McGraw Hill.

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6. Bell, P.R. & Hensley, A.R. Green plants; their Origin & Diversity (2nd ed.), 2000, Cambridge University Press

BUDGE BUDGE COLLEGE

DEPARTMENT OF BOTANY

Name of the course	Course code	Date and place	Serial no.	Name of the student	Registration no.	CU Roll no.	Name of the supervisor
Plant Diversity (Practical)	BOT-H-CC1-1-P AND BOT-MD-CC1-1-P	15.12.2023 Budge Budge old railway station and surrounding areas	1.	Sohini Adak	561-1211-0226-23	233561-11-0029	Dr.Samiran Panday and Mrs.Piyali Das
			2.	Saswata Mondal	561-1112-0202-23	233561-21-0007	
			3.	Sarmin Khatun	561-1215-0224-23	233561-11-0032	
			4.	Chandrika Das	561-1212-0203-23	233561-11-0030	
			5.	Smritikana Ukil	561-1212-1096-23	233561-12-0012	
			6.	Tamanna Khatun	561-1211-1090-23	233561-12-0001	
			7.	Sumaiya Nasrin	561-1211-1106-23	233561-12-0008	
			8.	Sania Farhana	561-1215-1094-23	233561-12-0015	
			9.	Sangita Sanati	561-1211-1095-23	233561-12-0003	
			10.	Sabana Khatun	561-1211-1112-23	233561-12-0009	
			11.	Samima Parvin	561-1211-1093-23	233561-12-0002	
			12.	Aritri Halder	561-1211-1098-23	233561-12-0005	

KOMAGHATA MARU SHAHEED GANJ

ECR

Expt No.

PAGE NO : 1
DATE :

FIELD NOTEBOOK ON LOCAL EXCURSION

Four Year B.Sc. SEMESTER-I Examination, 2023 (Under CCF, 2022)

Reg No: 561-1215-0224-23

Roll No: 233561-11-0032

Forwarded

03/05/24

HOMAGHATA NAZU SHAHEED GANJ

INTRODUCTOIN

Excursion in the younger cant a part of education. Excursion teaches us better than the books. We hear and yet doubt, We read and yet question and challenge. But if we go to field directly, all our doubts are set at rest. Our backiesh knowledges are confined with the help of field excursion. Knowledges of the book is theorisical and knowledge gain by excursion is practical. Excursion completes education, it refines our knowledge gained from books. The mental horizon is broadened it makes us liberal in thought and expands our out look. We gathered near Budge Budge railway station at 10:00 am on 15.12.23, started our local botanical excursion.

Expt No.

PLACE OF EXCURSION

- Locality : Budge Budge station to HP oil factory through railway track and surrounding areas.

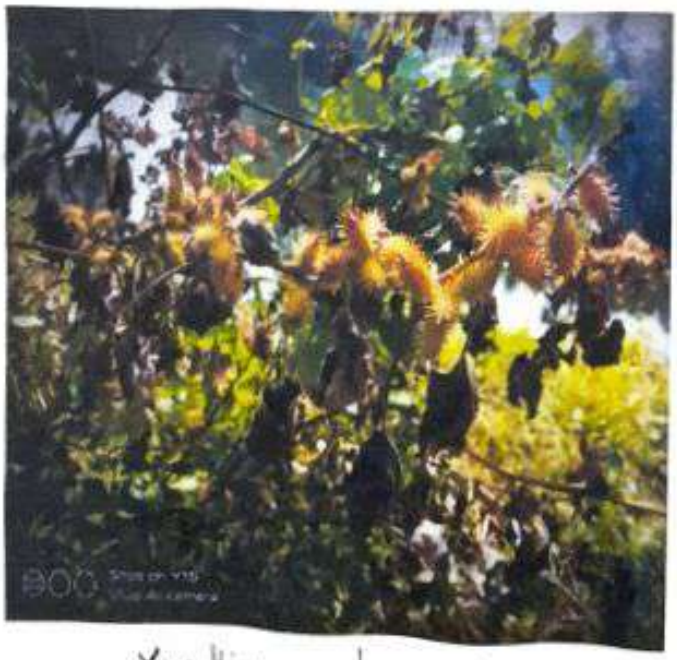
- Date : 15.12.2023

- Student : BSC (CCF) Sem 1 Students.

- Guided by : Dr. Samiran Panday.
  Mrs. Piyali Das.

Lulla aegyptiaca

Plumbago zeylanica



Xanthium strumarium

EXCURSION KITS

Expt No

The excursion kit essentially contains the following items along with the usual articles:

(i) Biological instrument box.

(ii) A pruning kit

(iii) Strings

(iv) Tags

(v) Blotting papers

(vi) Polythene bags.

(vii) Note book

(viii) Big Stapler

(ix) Camera

(x) First aid box

(xi) Containers

(xii) Pen, Pencil, eraser, scale

Chromolaena odorata

Calotropis procera

Expt No.

SPECIES OBSERVED DURING EXCURSION

In the excursion area we found different groups of plants like ferns, Gymnosperms, angiosperms, etc.....

We found various types of ferns like— ferns like. —

ⓐ Pteris vittata
ⓑ Adiantum Sp.
ⓒ Lepisorus sp.
ⓓ Drynaria Sp.

We found following gymnosperms :
a. Araucaria Sp.

Among angiosperms we observed the following species :

1/a. Urena lobata
2/b. Sida cordifolia
3/c. Sida rhombeidea → Malvaceae
4. Glycosmis pentaphylla → Rutaceae
5. Plumbago Zeylanica
6. Ficus bengalensis → Moraceae
7. Ficus hispida
8. Caesalpinia bonduc
9. Sonchus arvensis
10. Samania saman → Leguminocae

Teacher's Signature

Antigonon leptopus

Tridax procumbens

Expt No.

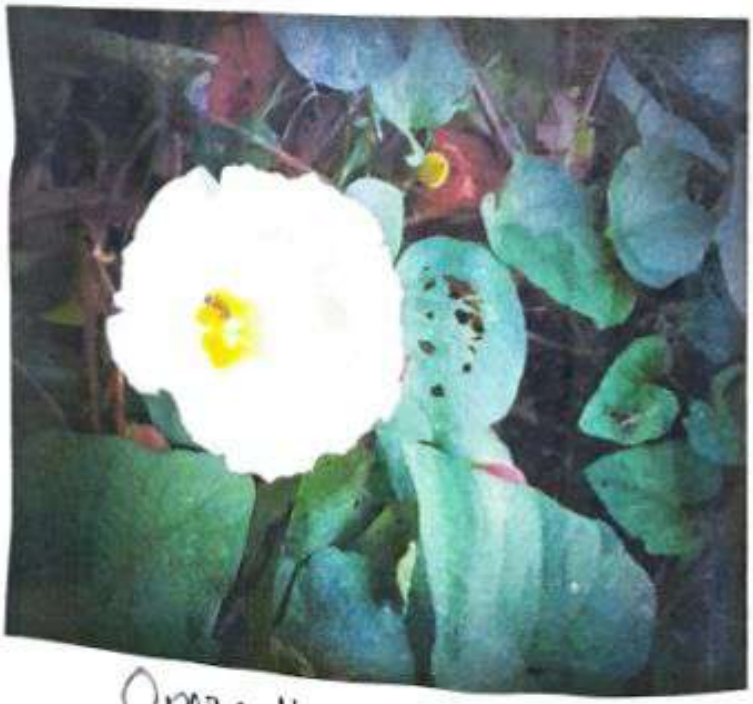
PAGE NO : 6
DATE :

11. Polyalthea longifolia
12. Boerhaavia repens → Nyctaginacae
13. Antigonon leptopus → Polygonaceae
14. Mikanea scandens → Asteraceae
15. Dregea synuata
16. Eupatorium odoratum → Asteraceae
17. Argimon mexicana
18. Vernonia cinerea
19. Phycunlus reticulatas
20. Oxalis corniculata
21. Ageratum conyzoides
22. Hyptes suaveolenca → Lamiaceae
23. Solanum nigrum → Solanaceae
24. Oldenlandia corimbosa → Rubiaceae
25. Leucus lanata
26. Eclipla alba
27. Hybanthus enispermus.
28. Upherbia hirta
29. Acalpha indica
30. Microcoera mercualis
31. Tridax procumbens → Asteraceae
32. Tausncia simplen
33. Alternanthera sessilis → Amaranthaceae
34. Parthenium histerophenous
35. Annona squamasa
36. Xanthium Strumarium
37. Zyphous mouritiana

Teacher's Signature

Acalypha indica

Senna sophera



Operculina turpethum

PAGE NO :
DATE :

38. Blumia lacera
39. Calotropis gigantea
40. Trema orientalis
41. Cascuta reflexa
42. Ricinus Sp.
43. Anysomelis ovata
44. Heliotropium Indicum
45. Commelinea Bengalensis

Lantana camara

Commelina benghalensis

CONCLUSION

The goal of our excursion is to understood the plant diversity like gymnosperms, angiosperms, ferns, algae, fungi, mosses etc....

The excursion is helped us in expression of our views, conception about nature and plants.

Our close study during stay and movement with our arise and learned teacher's such a long interaction with them and transparency of their mental transfer really enreached our knowledge in our subject nature and enviowrnment.

Expt No

ACKNOWLEDGEMENT

PAGE NO 9
DATE

It gladdens me immensely to recorded my thanks to the teachers of our department Dr. Soniram Panday and Mrs. Piyali Das for their advice and general help in preparation of this field report. They guided our tours and we helpful all respects including our curricular activities.

I am thankful to my friends who accompanied us for mutual company and helping to make the field study enjoyable.

FIELD NOTEBOOK ON LOCAL EXCURSION

BSC (MDC) Semester-1 Examination 2023

Reg NO: 561-1211-1095-23

Roll NO: 233561-12-0003

Forwarded
03/05/24

INTRODUCTION

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Locality: Budge Budge station to HP oil factory through railway track and surrounding areas.

Date: 15.12.2023

Student: BSC (MDC) Sem 1 students.

Guided by: Dr. Samiran Panday.
Mrs. Piyali Das.

Expt. No.

EXCURSION KITS

The excursion kit essentially content the following items along with the usual articles:

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(iii) Strings
(iv) Tags
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(Vi) Polythene bags
(Vii) Note book
(Viii) Big shopper
(IX) Camera
(X) Containers
(XI) First aid box
(XII) Pen, Pencil, eraser, scale

calotropis procera

Leucas aspera

chromolaena odorata

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In the excursion area we found different groups of plants like ferns, Gymnosperms, angiosperms, etc .....

we found various type of ferns like —

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we found following Gymnosperms —

a. Araucaria sp.
b. Thuja sp.

Among angiosperms we observed the following species:

① Urena lobata
② Sida cordifolia
③ Sida rhomboidea
④ Glycosmis pentaphylla
⑤ Plumbago zeylanica
⑥ Ficus hispida
⑦ Ficus bengalensis
⑧ Caesalpinia bonduc

Antigonon leptopus

Xanthium strumarium

Luffa aegyptiaca

Triday procumsens

9. Sonchus barvensis
10. Samania Saman
11. Polyalthea longifolia
12. Baerhaavia repens
13. Antigonon leptopus
14. Mikanea Scandens
15. Drcua synuata
16. Eupatorium odoratum
17. Argivnon mexicana
18. Vernonia cineria
19. Phyllanthus reticulatas
20. oxalis corniculala
21. Ageratum conyzoides
22. Hyptes suaviolence
23. Solanum nigrum
24. Oldenlandia corimboca
25. Leucus Lanata
26. Eclipla alba
27. Hybanthus enispermus
28. Uphorbia hirta
29. Acalpha indica
30. Micrococra mercualis
31. Tridax procumbens
32. Tausheia simplen

Acalpha indica

Senna sophera

Operculina turphetum

(33) Alternanthera sessilis
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(35) Annona squamosa
(36) Xanthium strumarium
(37) Zyphous mouritiana
(38) Bluria lacera
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(42) Ricinus sp.
(43) Anysomelis ovata
(44) Heliotropium indicum
(45) Commelinea Bengalensis

Lantana camara

Cleome gynandra

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The goal of our excursion is to understood the Plant diversity like gymnosperms, angiosperms, ferns, algae, fungi, mosses etc...

The excursion is helped us in expression of our views, conception about nature and plants.

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B.Com Honours

Sl. No.	Content
1.	Syllabus Extract indicating project work
2.	List of students along with the details of title, place of work, duration etc. for the latest academic year (2022-23) enclosed
3.	Sample report of the Project work 1 (certificate included as part of the report)

UNIVERSITY OF CALCUTTA

NISHAT ALAM
Secretary,
Councils for Undergraduate Studies,
University of Calcutta.

SENATE HOUSE
87/1, College Street, Kolkata-700 073.
Phone : 2257-3376, 2241-0071-74
e-mail: u.g.councilsc.u@gmail.com
Website: www.caluniv.ac.in

Ref. No. CUS/154/17

Dated the 26th May, 2017

To
The Principals
of all the Undergraduate Colleges
offering B.Com (Honours & General) courses
affiliated to the University of Calcutta.

Sir/Madam,

The undersigned is directed to forward you the University Notification No. CSR/26/17, dt. 26.05.2017 containing new course structure, syllabi and revised admission regulations for three-year B.Com. (*Honours & General*) Courses of Studies.

The above shall be effective for the students getting admission to the three-year six-semester B.Com. (Honours & General) Courses of Studies under CBCS, from the academic session 2017-18 and onwards.

The said notification along with detail course structure, syllabi and admission regulations are available in the Calcutta University website.

Thanking you,

Yours faithfully,

26/05/17

(NISHAT ALAM)
Secretary

26/5/17

Enclo.: C.U. Notification No. CSR/26/17, dt. 26.05.2017

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 26 /17

It is notified for information of all concerned that the Syndicate in its meeting dated 23.05.2017 (vide Item No.46) resolved to approve the **New Course Structure & Syllabi and revised Admission Regulations for the B.Com. (Honours and General)** courses of study under this University as laid down in the accompanying pamphlet.

The above shall be effective for the students getting admission to the 3-year 6-Semester B.Com. (Honours and General) courses of study under CBCS, from the academic session 2017-2018 and onwards.

SENATE HOUSE
KOLKATA-700073
The 26th May, 2017

(Prof. Dr. Rajagopal Dhar Chakraborti)

Registrar

Year 3: Semester VI

		Marks	Credit Hours	
AECC 6.1Chg	Environmental Studies	**100**	**2**	
SEC 6.1Chg	Computerised Accounting and e-Filing of Tax Returns	**100**	**4**	
CC 6.1 Ch	Project Work	**100**	**6**	
DSE 6.1 A**	Financial Reporting and Financial Statement Analysis	**100**	**6**	
DSE 6.2 A**	Financial Management	**100**	**6**	
			24	

Chg: Common for Honours and General; **Ch:** Core Course for Honours

Options:

**Or DSE 6.1 M (Retail Management and Marketing of Services (50+50)
& DSE 6.2 M (Rural Marketing and International Marketing (50+50)

**Or DSE 6.1 T (Indirect Tax: Laws and Practices)
& DSE 6.2 T (Tax Procedures and Planning)

**Or DSE 6.1 e-B (Internet & WWW and Functional e-Business System (50+50)
& DSE 6.2 e-B(Computer Applications and e-Business Applications – Practical (50+50)

Summary for B.Com. Hons.

		Marks	Credit Hours	
Ability Enhancement Compulsory Course (AECC)	Two Papers	**200**	**2 x 2 = 4**	
Skill Enhancement Elective Course (SEC)	Two Papers	**200**	**2x4 = 8**	
Generic Elective (GE)	Four Papers	**400**	**4 x 6 = 24**	
CORE COURSE (CC)	Fourteen Papers	**1400**	**14x 6 = 84**	
Discipline Specific Elective (DSE)	Four Papers	**400**	**4 x 6 = 24**	
		2600	**Total 144**	

Budge Budge College

AQAR for 2023-24

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year &
1.3.3: Number of students undertaking project work/field work/ internships

Department of Commerce

List of students undertaking project work/field work/internship

Sl. No.	Name of Student	University Roll No.	University Registration No.	Title of Project	Name of Supervisor
1	JEET DEY	211561-21-0042	561-1111-0408-21	COMPARATIVE STUDY BETWEEN FLIPKART AND AMAZON INDIA	MR. MRIGANKA MALLICK
2	ARPAN DAS	211561-21-0041	561-1111-0407-21	COMPARATIVE STUDY BETWEEN MINERAL DRINKING WATER	MR. MRIGANKA MALLICK
3	SUGATA DUTTA	211561-21-0040	561-1111-0405-21	E-COMMERCE : A COMPREHENSIVE ANALYSIS	MR. MRIGANKA MALLICK
4	ANIRBAN LATTU	211561-21-0039	561-1111-0404-21	CUSTOMER BUYING BEHAVIOUR AND STATISFACTION LEVEL OF AMUL PRODUCTS	MR. MRIGANKA MALLICK
5	AYAN SAMANTA	211561-21-0038	561-1111-0403-21	IMPACT OF GST ON SMALL SCALE BUSINESS	MR. MRIGANKA MALLICK
6	SAYAN METE	211561-21-0037	561-1111-0402-21	A STUDY ON CORPORATE SOCIAL RESPONSIBILITY	MR. MRIGANKA MALLICK
7	TAMAL DAS	211561-21-0036	561-1111-0401-21	FINANCIAL STATEMENT ANALYSIS OF HINDUSTAN UNILEVER LTD.	MR. MRIGANKA MALLICK
8	SHAN MONDAL	211561-21-0034	561-1111-0397-21	CONSUMER RELATIONSHIP MAMANGEMENT (CRM) OF DMART	MR. MRIGANKA MALLICK
9	PUSKAR SAU	211561-21-0032	561-1111-0395-21	RELATIONSHIP BETWEEN STOCK MARKET AND BOND MARKET: ASTUDY	MR. MRIGANKA MALLICK
10	SOUMODEEP DEWAN	211561-21-0030	561-1111-0393-21	WORKING CAPITAL MANAGEMENT- A CASE STUDY OF CEAT COMPANY LTD.	MR. MRIGANKA MALLICK
11	TONUSHREE DAS	211561-11-0006	561-1211-0360-21	FACTORS AFFECTING INVESTMENT DECISION: A STUDY ON CONSUMER BEHAVIOUR	DR. GAUTAM DAS
12	SUDESHNA PRAMANIK	211561-11-0009	561-1211-0370-21	FINANCIAL STATEMENT ANALYSIS OF INFOSYS LIMITED	DR. GAUTAM DAS
13	ZOYA AFREEN	211561-11-0029	561-1211-1233-21	CUSTOMER RELATIOSHIP MANAGEMENT	DR. SANDIP SINHA
14	SHRISTI ROY	211561-11-0028	561-1211-1231-21	AN ANALYSIS OF PERFORMANCE OF SELECTED INDIAN MUTUAL FUND	DR. SANDIP SINHA

Sl. No.	Name of Student	University Roll No.	University Registration No.	Title of Project	Name of Supervisor
15	RIKTA PAUL	211561-11-0025	561-1211-0427-21	AN ANALYTICAL STUDY ON THE FINANCIAL PERFORMANCE ANALYSIS OF TATA MOTORS LMITED USING RATIO ANALYSIS	DR. SANDIP SINHA
16	SNAHA PAUL	211561-11-0026	561-1211-1174-21	RATIO ANALYSIS: A STUDY OF SHREE CEMENT AND AMBUJA CEMENT	DR. SANDIP SINHA
17	DIPA DAS	211561-11-0024	561-1211-0425-21	WORKING CAPITAL MANAGEMENT – A CASE STUDY OF ZOMATO LTD.	DR. SANDIP SINHA
18	BRISHTI DALUI	211561-11-0023	561-1211-0382-21	E-COMMERCE	DR. SANDIP SINHA
19	MADHURI GHOSH	211561-11-0022	561-1211-0431-21	WORKING CAPITAL MANAGEMENT	DR. SANDIP SINHA
20	SWAGATA LAXMI DAS	211561-11-0011	561-1211-0378-21	ONLINE MARKETING STRATEGIES OF MYNTRA	DR. GAUTAM DAS
21	AYETRI ADAK	211561-11-0010	561-1211-0372-21	WORKING CAPITAL MANAGEMENT	DR. GAUTAM DAS
22	RUPAYAN MONDAL	211561-21-0016	561-1111-0373-21	COMPARATIVE STUDY BETWEEN KINLEY, BISLERI, AND AQUAFINA	MR. SUJIT KUMAR MAHATO
23	DEBRATO KHANRA	211561-21-0014	561-1111-0369-21	CUSTOMER BYUING BEHAVIOUR AND SATISFACTION LEVEL REGARDING “AMUL PRODUCTS”: ANALYTICAL STUDY	MR. SUJIT KUMAR MAHATO
24	SAGAR SANTRA	211561-21-0013	561-1111-0368-21	CUSTOMER PERCEPTION AND TRENDS IN ONLINE BANKING: AN ANALYTICAL APPROACH	MR. SUJIT KUMAR MAHATO
25	AKASH SANTRA	211561-21-0012	561-1111-0367-21	CONSUMER RELATIONSHIP MANAGEMENT (CRM) OF DMART	MR. SUJIT KUMAR MAHATO
26	SANDIP DAS	211561-21-0010	561-1111-0364-21	CUSTOMER SATISFACTION TOWARDS MINERAL DRINKING WATER [A COMPARATIVE STUDY BETWEEN KINLEY, BISLERI, AND AQUAFINA	DR. SANDIP SINHA
27	PURBAYAN BHOWMICK	211561-21-0011	561-1111-0365-21	WORKING CAPITAL MANAGEMENT- A CASE STUDY OF CEAT COMPANY LTD.	DR. SANDIP SINHA
28	SOHON DAS	211561-21-0009	561-1111-0362-21	IMPACT OF GST ON SMALL SCALE BUSINESS	DR. SANDIP SINHA
29	RITUSHREE MALICK	211561-11-0001	561-1211-0346-21	FINANCIAL STATEMENT ANALYSIS OF HINDUSTAN UNILEVER LIMITED	DR. GAUTAM DAS
30	SOURAV SAMANTA	211561-21-0044	561-1111-0413-21	GOODS AND SERVICE TAX	MR. MRIGANKA MALLICK
31	DIBAYAN SADHUKHAN	211561-21-0062	561-1111-0411-21	CUSTOMER SATISFACTION- A CASE STUDY ON FLIPKART	MR. SOURAV BHUIYA
32	NILOY GHOSH	211561-21-0061	561-1111-0391-21	FINANCIAL STATEMENT ANALYSIS OF INFOSYS LIMITED	MR. SOURAV BHUIYA

Sl. No.	Name of Student	University Roll No.	University Registration No.	Title of Project	Name of Supervisor
33	ARPHAN MIRDA	211561-21-0067	561-1115-1170-21	COMPARATIVE STUDY BETWEEN FLIPKART AND AMAZON INDIA	MR. SOURAV BHUIYA
34	ARPAN SHOW	211561-21-0073	561-1111-1232-21	WORKING CAPITAL MANAGEMENT – A CASE STUDY OF CEAT COMPANY LTD.	MR. SOURAV BHUIYA
35	SUVOJIT DAS	211561-21-0050	561-1111-0424-21	CORPORATE SOCIAL RESPONSIBILITY: RELIANCE	MR. SOURAV BHUIYA
36	MD. ARIF ANSARI	211561-21-0033	561-1111-0396-21	WORKING CAPITAL MANAGEMENT – A CASE STUDY OF CEAT COMPANY LTD.	MR. MRIGANKA MALLICK
37	PRIYAM ADAK	211561-21-0051	561-1111-0426-21	ONLINE BANKING	MR. SOURAV BHUIYA
38	ANISH SANTRA	211561-21-0049	561-1111-0422-21	ASSESSING CUSTOMER ACTION WITH BIG BAZAR	MR. MRIGANKA MALLICK
39	PRITAM BIJALI	211561-21-0048	561-1111-0421-21	ONLINE BANKING	MR. MRIGANKA MALLICK
40	SWGATAM KUMAR	211561-21-0047	561-1111-0420-21	ONLINE BANKING OF PUNJAB NATIONAL BANK	MR. MRIGANKA MALLICK
41	SANKIT PAUL	211561-21-0046	561-1111-0419-21	ONLINE BANKING	MR. MRIGANKA MALLICK
42	HIMANGSHU BERA	211561-21-0045	561-1111-0417-21	ONLINE BANKING OF ICICI BANK	MR. MRIGANKA MALLICK
43	ANIRBAN NAROO	211561-21-0065	561-11112-1171-21	A STUDY ON ONLINE BANKING IN INDIA	MR. SOURAV BHUIYA
44	SAGAR MONDAL	211561-21-0066	561-1112-1173-21	GOODS & SERVICES TAX	MR. SOURAV BHUIYA
45	KAUSHIK BACHAR	211561-21-0054	561-1112-0349-21	A STUDY ON ONLINE BANKING IN INDIA	MR. SOURAV BHUIYA
46	ARNAB PAUL	211561-21-0053	561-1111-0430-21	CONSUMER RELATIONSHIP MANAGEMENT (CRM) OF DMART	MR. SOURAV BHUIYA
47	ARITRA DUTTA	211561-21-0052	561-1111-0429-21	GOODS & SERVICES TAX	MR. SOURAV BHUIYA
48	RUPAM PATRA	211561-21-0024	561-1111-0384-21	WORKING CAPITAL MANAGEMENT – A CASE STUDY OF CEAT COMPANY LTD.	MR. SUJIT KUMAR MAHATO
49	SUBHASISH SARDAR	211561-21-0058	561-1112-0400-21	ONLINE BANKING OF HDFC BANK	MR. SOURAV BHUIYA
50	SK. NEERAJ	211561-21-0064	561-1111-1172-21	ONLINE BANKING	MR. SOURAV BHUIYA
51	MD. FARHAN	211561-21-0005	561-1111-0354-21	WORKING CAPITAL MANAGEMENT – A CASE STUDY OF CEAT COMPANY LTD.	DR. SANDIP SINHA
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56	SWARNALI PATRA	211561-11-0019	561-1211-0418-21	A COMPREHENSIVE STUDY ON E-COMMERCE	DR. GAUTAM DAS
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58	SWARNALI DAS	211561-11-0016	561-1211-0414-21	WORKING CAPITAL MANAGEMENT – A CASE STUDY OF CEAT COMPANY LTD.	DR. GAUTAM DAS
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60	SHREYA MAZUMDER	211561-11-0014	561-1211-0409-21	AN OVERVIEW OF MUTUAL FUNDS	DR. GAUTAM DAS
61	SNEHA SAMANTA	211561-11-0013	561-1211-0406-21	COMPARATIVE STUDY BETWEEN FLIPKART AND AMAZON INDIA	DR. GAUTAM DAS
62	SHREYA SETH	211561-11-0012	561-1211-0386-21	CORPORATE SOCIAL RESPONSBILITIES – A CASE STUDY OF TATA GROUP	DR. GAUTAM DAS
63	MARMAJEET MAJUMDAR	211561-21-0063	561-1111-1169-21	A COMPARATIVE STUDY ON THE FINANCIAL POSITION OF TCS AND WIPRO LTD.	MR. SOURAV BHUIYA
64	SAYAN PARAMANICK	211561-21-0060	561-1114-0383-21	MERGER AND ACQUISITION OF VODAFONE & IDEA LTD.	MR. SOURAV BHUIYA
65	MADHUMOY DAS	211561-21-0059	561-1114-0358-21	GOODS & SERVICES TAXE	MR. SOURAV BHUIYA
66	KIINGSHUK NANDI	211561-21-0023	561-1114-0381-21	CORPORATE SOCIAL RESPONSIBILITY OF RELIANCE INDUSTRIES LTD.	MR. SUJIT KUMAR MAHATO
67	SK. IRFAN	211561-21-0022	561-1114-0380-21	COMPARATIVE STUDY BETWEEN FLIPKART AND AMAZON INDIA	MR. SUJIT KUMAR MAHATO
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75	ABIR NANDI	211561-21-0003	561-1114-0352-21	CUSTOMER SATISFACTION- A CASE STUDY ON FLIPKART	DR. SANDIP SINHA
76	SUBHARAJ KUNTI	211561-21-0008	561-1114-0361-21	IMPACT OF GST ON SMALL SCALE BUSINESS	DR. SANDIP SINHA
77	RUPANKAR MAITY	211561-21-0006	561-1114-0356-21	ONLINE BANKING PROJECT: HDFC BANK	DR. SANDIP SINHA
78	DHRUBA ADAK	211561-21-0001	561-1114-0345-21	RISK AND RETURN ANALYSIS OF HDFC AND ICICI SECURITIES	DR. SANDIP SINHA
79	PRIYAM MONDAL	211561-21-0007	561-1114-0359-21	CORPORATE SOCIALL RESONSIBILITY OF RELIANCE LTD.	DR. SANDIP SINHA
80	JOYDEEP MUKHERJEE	211561-21-0004	561-1114-0353-21	AN ANALYSIS OF PERFORMANCE OF SELECTED INDIAN MUTUAL FUNDS	DR. SANDIP SINHA
81	KEYA MONDAL	211561-11-0002	561-1211-0347-21	FINANCIAL STATEMENT ANALYSIS OF HINUSTAN UNILEVER LIMITED	DR. GAUTAM DAS
82	PRIYANKA BARIK	211561-11-0007	561-1211-363-21	A STUDY ON THE FINANCIAL STATEMENT ANALYSIS OF HINUSTAN UNILEVER LIMITED	DR. GAUTAM DAS
83	MOUSAMI DAS	211561-11-0005	561-1211-357-21	ANALYSING FINANCIAL RATIOS: SHREE CEMENT VS. AMBUJA CEMENT	DR. GAUTAM DAS
84	SUBHRA BERA	211561-11-0004	561-1211-350-21	A STUDY OF NON-PERFORING ASSET MANAGEMENT IN STATE BANK OF INDIA AND CANARA BANK	DR. GAUTAM DAS
85	SANIYA DAS	211561-11-0003	561-1211-348-21	FINANCIAL STATEMENT ANALYSIS OF WIPRO LTD.	DR. GAUTAM DAS
86	ANANYA KHANRA	211561-11-0008	561-1211-366-21	A STUDY ON ONLINE BANKING	DR. GAUTAM DAS
87	KRISHANU SANYAL	211561-21-0018	561-1114-0375-21	CORPORATE SOCIAL RESPONSIBILITY: A CASE STUDY OF TATA GROUP	MR. SUJIT KUMAR MAHATO

Project Work

(Submitted for the Degree of B.Com Honours in Accounting & Finance under the University of Calcutta)

Title of the Project

"Corporate Social Responsibility in India & an analysis of CSR expenditure and relationship with the financial performance of Reliance Industries Ltd."

Submitted By:

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Name of the Supervisor	:	Dr. Gautam Das
Name of the College	:	Budge Budge College

May 2023

20/8/23

Budge Budge College
Department
Commerce

Annexure-IA

Supervisor's Certificate

This is to certify that Mr. Sayan Sardar, a student of B.Com (Honours) in Accounting & Finance of Budge Budge College under the University of Calcutta has worked under my supervision and guidance for his Project Work and prepared a Project Report with the title "Corporate Social Responsibility in India & an analysis of CSR expenditure and relationship with the financial performance of Reliance Industries Ltd."

The project report which he is submitting, is his genuine and original work to the best of my knowledge.

Signature :

Name : Dr. Gautam Das

Place : Kolkata/Budge Budge **Designation** : Assistant Professor

Date : May, 2023 **Name of the College** : Budge Budge College

Annexure-IB

Student's Declaration

I hereby declare that the Project Work with the title "Corporate Social Responsibility in India & an analysis of CSR expenditure and relationship with the financial performance of Reliance Industries Ltd." submitted by me for the partial fulfilment of the degree of B.Com (Honours) in Accounting & Finance under the University of Calcutta is my original work and has not been submitted earlier to any other University/Institution for the fulfillment of the requirement for any course of study.

I also declare that no chapter of this manuscript in whole or in part has been incorporated in this report from any earlier work done by others or by me. However, extracts of any literature which has been used for this report has been duly acknowledged providing details of such literature in the references.

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I being a benefited student of Budge Budge College, affiliated under the University of Calcutta, would like to take this opportunity to express my profound gratitude and regards to my supervisor, and to the entire Department of Commerce for their exemplary guidance, monitoring and constant encouragement throughout the course of the completion of the project "Corporate Social Responsibility in India & an analysis of CSR expenditure and relationship with the financial performance of Reliance Industries Ltd."

The guidance given by them time to time shall carry me a long way in the journey of my career on which I am about to embark. I would also like to express my thankfulness to the college and university committee for providing me with the opportunity to work on this project, and for their cordial support, valuable information and guidance, which helped me in completing this task through its various stages.

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Chapter 1:
Introduction

Background of the study

Profit maximization is the primary aim of a capitalist economy. The mantra of this kind of economy is profit, and only profit, but recently a new concept has emerged being referred to as co-operational capitalism. This "new" capitalism, though focuses on the profit motive, it also incorporates the essence of cooperation, being accountable, social values. Such an idea of modern capitalism is reflected in corporates, too. For the new generation of corporate leaders, optimization of profit is given more importance than maximization. Hence there is a change in accountability, from shareholders to stakeholders (including employees, consumers and affected communities), along with a growing realization that in the long-run business success can only be achieved by those companies who understand that the economy is a part of the earth's ecosystem which is finite, non-growing and materially closed.

Corporate Social Responsibility (CSR) can be considered as a self-regulating business model that helps a company become accountable—to itself, its stakeholders, and the public. By practicing CSR, companies can be conscious of the kind of impact they are having on all aspects of society i.e. economic, social, and environmental. To engage in CSR means that, in the course of business, a company is operating in ways that enhance society and the environment, instead of contributing negatively to them. The term CSR itself came into common use during the last decade of the 20th century and witnessed a shift in focus from charity and traditional philanthropic ways towards a more direct engagement of business in the development and concern for disadvantaged groups in the society.

The concept of CSR is not easy to define, various concepts and themes overlap this term. The ideas of sustainable business, environmental responsibility, social and environmental accountability, business ethics and corporate accountability are all very much linked with CSR. Different perspectives of individuals and organizations lead to different meanings and understanding of CSR. If we see it from a Business Perspective, it can be said that CSR is nothing but a new way for the businesses to gain the confidence of investors and increase the brand image leading to the reduction of investment risks and maximization of profits. From a Social Perspective, which understands the fact that social and environmental stability is required for the stability of the market in the long-run, CSR is a value and strategy to ensure the sustainability of the business. From the Perspective of Rights of various stakeholders like consumers, employees, affected communities, etc. who have a right to know about the businesses, CSR is a way to stress the business houses to be accountable and transparent in their dealings and policies. In a nutshell it can be said that CSR is an opportunity which if done wisely and impactfully would give a positive image of the company in the market and serve as a competitive edge for the company.

India is one of the fastest growing economies. However, it has several issues too which act as hindrances against development and progress. Hunger, malnutrition, unemployment, illiteracy, casteism, are some in the long list of issues.

The government is working tirelessly towards to remove these hindrances. However, poor accountability, corruption and favoritism are reducing the efforts. Lack of adequate methods of nurturing talent are forcing many young and talented individuals to move abroad causing the country to lose the workforce and the minds which are crucial to the development of the country.

But many of these issues are location and site specific which can be taken care of by specific customized solutions and some NGOs are doing very good work in this department. However, these NGOs rely on external funding which is often difficult to obtain. Accordingly, their focus then shifts from the cause to arranging of funds since they have to keep looking for investors to carry out their activities in the short as well as long-run.

In order to tackle these issues realistically, the country needs business-like approach towards its problems, a kind of approach which can be exhibited by corporate bodies who are known for their efficiency and logical decisions.

Corporates often work and gain profit in the resource rich rural areas and not giving something back to that place which leads to an imbalance and creating a feeling of hatred among the local population towards these corporates. The existence of big conglomerates in the area causes an increase in population and people from different places come in search of work and benefits which in turn sometimes leave the natives with almost nothing and thus creates a feeling of animosity not only towards the company but also the people who work for the company. In order to safeguard the organization from this imbalance which could often lead to violence, the corporates can initiate CSR projects in the area to ensure that the society as well as its functioning are moving towards a positive growth. Apart from this, the regular practice of CSR would tie the organizations to dedicate a budget for CSR. Corporates act with proper physical, legal and financial planning towards any project. They have accountability as they want to ensure that the money they spend is being used as planned. They can use these skills along with the superior knowledge of familiarity of the situations in the backward areas in which they are operating, gained by the extensive research, to turn the tables in the favor of the society. This will not only build a goodwill for the organization but will also boost national development.

Usually people have a view that India copies whatever products and policies they see prevailing in the foreign countries. But it can be said that the ideology of responsibility towards the society is something which dates back to Ancient India and is mentioned in various religious literature. Long before the time when the foreign industries started to think that they have a responsibility to give something to the society. Religious traditions like daan, seva, and zakat have been operated in India for centuries which tried to bridge the gap between the privileged and the underprivileged. One could also say that this ancient knowledge and wisdom has been the foundation of the modern CSR practices that we see today.

Many Indian philanthropists and industrialists have been engaged in CSR/charity since time immemorial, whether it was setting up of factories in areas where there was a dire need of

employment or building schools, hospitals, places of worship etc. Big Indian industrialists have always ensured that along with their expansion in business they also give back to the society. In India, big industrialists and pioneers like Tata, Birla, Ambani, etc. have been voluntarily engaging in various charitable works and helping the underprivileged class for a long period, some activities can be traced even during the Pre-Independence period. But it was seen that only these philanthropists were only contributing to these while others, even some big business houses were not engaging in these activities and were focused on supporting their own interests i.e. maximization their own profits, this led to an increase in the gap between the rich and poor, and nearly the whole burden of development of the society was on the Government. Government tried everything to motivate the industries to engage in social activities, setting up of various public sector undertakings for better distribution of wealth in the society. Still it was not enough to satisfy the needs and wants to an optimum level. Thus, in order to engage almost every corporate house to give back to the society, the Government of India, implemented The Companies Act, 2013 where they dedicated the entire Section 135 towards mandatory CSR regulations which must be followed by all the eligible corporates and make them engage in CSR activities.

Reliance Industries Ltd. (RIL) is world's leading and India's fastest revenue generating company. RIL group is a highly diversified group and is in to multiproduct businesses like oil and gas exploration, retail of petroleum and consumer products and manufacturing of petrochemical and textile products. They are also operating in infrastructure and transportation sectors. The Reliance Group, founded by Dhirubhai H. Ambani (1932-2002), is India's largest private sector enterprise, with business in the energy and materials value chain. Group's annual revenues are in excess of nearly Rs. 3,24,770 Crores. Reliance Industries Ltd. is a Fortune Global 500 company and is the largest public sector company in India. Starting with textiles in the late seventies, the Group's activities span exploration and production of oil and gas, petroleum refining and marketing, petrochemicals (polyester, fiber intermediates, plastics and chemicals), textiles, retail and special economic zones. Reliance enjoys global leadership in its businesses, being the largest polyester yarn and fibre producer in the world and among the top five to ten producers in the world in major petrochemical products.

At RIL, CSR is embedded in the long-term business strategy of the Company. For RIL, business priorities co-exist with social commitments to drive holistic development of people and communities. The Company's CSR initiatives help elevate the quality of life of millions, especially the disadvantaged sections of the society. It seeks to touch and transform people's lives by promoting healthcare, education and employment opportunities. RIL aims to continue its efforts to build on its tradition of social responsibility to empower people and deepen its social engagements.

Headquartered in Mumbai, Reliance possesses organizations all over India occupied with petrochemicals, materials, retail and media communications. Reliance is the most beneficial organization in India, the biggest traded on an open market organization in India by market capitalization, and the second biggest organization in India as estimated by income after the administration controlled Indian Oil Corporation. The organization is positioned 203rd on the Fortune Global 500 rundown of the world's greatest partnerships starting at 2017. It is

positioned 8th among the Top 250 Global Energy Companies by Platts starting at 2016. Reliance keeps on being India's biggest exporter representing 8% of India's all out stock fares with an estimation of Rs. 1,47,755 Crores and access to business sectors in 108 nations. Reliance is in charge of nearly 5% of The Government of India's all out incomes from traditions and extract obligation and is additionally the most astounding Income citizen in the private segment in India.

The company's equity shares are listed in the National Stock Exchange of India (NSE) and the Bombay Stock Exchange (BSE). The Global Depository Receipts (GDRs) issued by the company are listed on the Luxembourg Stock Exchange. It has issued approx. 56 million GDRs wherein each GDR is equivalent to 2 equity shares of the company. Approx. 3.46% of its total shares are listed in the Luxembourg Stock Exchange. Its debt securities are listed at the Wholesale Debt Market (WDM) Segment of the NSE.

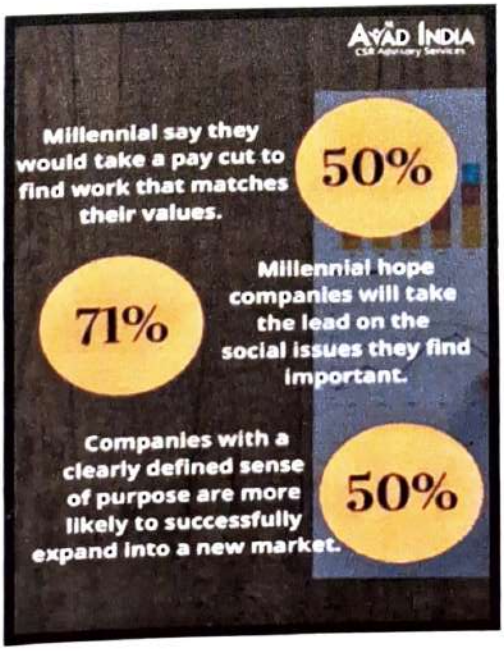
Major Subsidiaries and Associates of Reliance Industries Ltd. are:

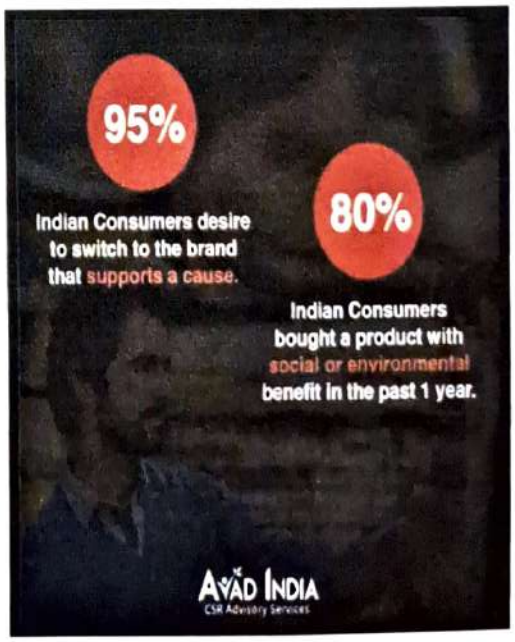
- Reliance Retail: The retail business wing of Reliance Industries. It is the largest retailer in India with many brands like, Reliance Fresh, Reliance Footprint, Reliance Digital, Reliance Trends, etc. under Reliance Retail.
- Reliance Institute of Life Sciences (RILS): Established by Dhirubhai Ambani Foundation, it is an institution offering higher education in various fields of life sciences and related technologies.
- Reliance Logistics: It is a single-window company selling transportation, distribution, warehousing, logistics, and supply-chain related products.
- Relicord: It is a cord blood banking service owned by Reliance Life Sciences. It was established in 2002.
- Reliance Jio Infocom Ltd. (RJIL): Previously known as Infotel Broadband, it is a broadband service provider which gained 4G licenses for operating across India.
- Reliance Industrial Infrastructure Limited (RIIL): It is an associate company of RIL. RIL holds 45.43% of total shares of total shares of RIIL. The infrastructure company constructed a 71,000 kilo-litre petrochemical product storage and distribution terminal at Jawaharlal Nehru Port Trust (JNPT) Area in Maharashtra.
- Network 18: It is a mass media company with interests in television, digital platforms, publication, mobile apps, and films. It operates two joint ventures, namely Viacom 18 and History TV 18 with Viacom and A+E Networks respectively. It also has acquired ETV network and renamed it under the Colors TV brand.

Justification of the Study

After studying the provisions of Section 135 of The Companies Act, 2013 and about the ethical views towards corporate social responsibility in Business Ethics in the 4th Semester, it created a view that The Companies Act 2013, in addition to the Companies (Corporate Social Responsibility Policy) Rules, 2014 has been a forward-looking move by the Government of India, calling on companies to partner in contributing to the country's development challenges by unleashing creativity and innovation. The mandatory CSR reporting has its unique advantages. It allows corporates to demonstrate their commitment towards organizational transparency and can act as a communication tool to engage with different stakeholders. 2018-19 is the 5th year of compliance of this Act and in my opinion, following are the reasons as to why there is a need of this study:

- Society and corporates are interdependent to each other, CSR is something which links these two. For the companies it is not only a statutory expense but also a way to increase their brand image, plus the corporate planning and strategies will be of no use if the society does not exist, they will have no resources to work with and gain profits. Similarly, for the upliftment of the underprivileged there is a need of corporates to bring in their financial capital as well as planning and an active role in the development of the society.
- It has been implemented for quite some time now and thus, almost every people have now acquired a brief idea of what this new provision is and how this has affected different companies and the society.
- Going into the 5th year, it is enabling us to see the trend of CSR expenditure of a company and see if it has a positive or negative impact on the financial performance of the company.
- Lastly, this study will help to know that whether the basic thought of implementing Section 135 of The Companies Act, 2013 (i.e. involving the corporates to have an active approach towards societal development), is actually taking shape and creating a benefit to the society or not.





Objective of the Study

- To know about the awareness and viewpoint of people towards the CSR regulations implemented through The Companies Act, 2013.
- To study and analyze the sector-wise CSR expenditure in India.
- To analyze the CSR expenditure and relationship with financial performance of Reliance Industries Ltd.

Research Methodology

Research Methodology is a way to systematically solve the research problem. It may be understood as science of study of a phenomenon. It is important for researcher to know not only the research method but also know methodology. The procedure by which researchers go about their work of describing, explaining and predicting phenomenon are called methodology. Method comprises the procedures used for generating, collecting and evaluating data.

Data collection is an important step in any project and success of it will largely depend upon how accurately you will be able to collect the data and how much time and money is required to collect the necessary data.

There are **two types** of Data Collection methods:

i. **Primary Data:** The data which is collected first hand and for the first time, which is original in nature. It can be collected through personal interview, questionnaire, etc.
   - In this project, a questionnaire using Google Forms was created and circulated it through the use of social media like WhatsApp and e-mail.

ii. **Secondary Data:** The data which is collected form past records, annual reports, magazines, journals, internet is called secondary data. The data which has been used previously and is therefore, old in nature unlike primary data is called secondary data.
   - In this project, Annual Reports of Reliance Industries Ltd., Report of High-Level Committee on Corporate Social Responsibility by the Ministry of Corporate Affairs, KPMG India CSR Survey and various other reports and websites were used.

Sampling Techniques: A sample is a representative part of the population. In sampling techniques, information is collected only from a representative part of the universe and the conclusions are drawn on that basis for the entire universe. A random sampling technique was used to collect the data from the respondents. A random sample is selected from a population in such a way that every member of the population has an equal chance of being selected and selection of any individual does not influence the selection of any other.

Sample Size: A sample size denotes the number of elements selected for the study.

- Based on the time and finances available, a sample size of 50 respondents were selected. All the 50 respondents were either students or working individuals.

Time Period of the study: F.Y. 2014-15 to F.Y. 2018-19 has been considered as time period for the study.

Area of the study: The study is limited to the area of Corporate Social Responsibility in India, state-wise and sector-wise expenditure. And the CSR expenditure and financial performance of Reliance Industries Ltd.

Limitation of the Study

1. In the study, the conclusive decision largely depends on the adequacy of the data. The sample study consists of 50 respondents and there has been an assumption that the feedback received from the population is true.
2. Some of the respondents were not ready to fill the questionnaire and were hesitant to give their views.
3. The study is based on the prevailing respondent's viewpoint but there's a chance that the viewpoint might change according to time, situations, etc.
4. Due to unavailability of data regarding sector-wise CSR expenditure in India for 2018-19, the comparisons could not be drawn perfectly.
5. A portion of the study has been based on a secondary data availed from annual reports and related studies. Non adequacy of time did not allow primary data collection possible by interviewing the executives of Reliance Industries Ltd. Primary data would have been more effective certainly.
6. If the actual point of CSR initiatives could have been analyzed, and studied by going through the places where Reliance is investing, more realistic data could have been obtained and the real picture could have become more evident rather than picturing a print data only.
7. Some of the information was confidential. Which the company and its employees only use, so such information is not revealed outside for the general public.

Chapter Planning

The study is divided into 4 chapters and references:

Chapter 1: Introduction

Chapter 2: Conceptual Framework

Chapter 3: Data Collection and Analysis

Chapter 4: Conclusion and Recommendation

Chapter 2:
Conceptual Framework

International Scenario

There is not a single historical event that marks the birth of CSR. Some of the researchers date its origins to the early 1960s. The long tradition of corporate philanthropy in the U.S. has remained a standard component and expectation of "responsible business" since the early days of the American Industrialization. The name has been changed throughout the years, during 1992 to 2000 it was known as Environment Reporting, later converted to Environment and Safety, and now since 2011 it has been known as Sustainability and Corporate Social Responsibility Reporting.

It remains voluntary in the European Union (EU) countries. However, some of the individual members of the EU have taken a more driven approach. In France, since 2001 all listed companies must submit information on their social and human resource activities in their annual reports. In the UK a similar requirement has been functioning since 2007. In 2008, Denmark passed a mandatory CSR reporting law which requires the largest 1100 Danish public companies to report on their CSR works. Sweden since 2009 has obliged the public companies to issue sustainability reports. Sweden is also the 1st country in the world to require CSR reports from all state-owned companies since 2007. Spain has also introduced mandatory CSR reporting for the companies and firms employing more than 1,000 employees. The Norwegian and Finnish governments have also been very active in promoting CSR.

KPMG international conducts surveys every 3 years to gain an insight into the CSR reporting globally and contribute to the evolving dialogue on transparency and accountability. The reports have shown that almost 95% of the largest 250 global companies report on their CSR activities. The reports have also shown that there is a difference in the level of disclosure along countries and industries as well. It is mainly due to the existence of rules and regulations in various countries like Japan, UK and Australia regarding disclosure of CSR activities while in the others, the companies report on a voluntary basis. Besides the rules and regulation, the level of adoption depends on the role of the enforcement. Companies will be slower in complying the norm in those countries where there are low levels of enforcement than those with high level.

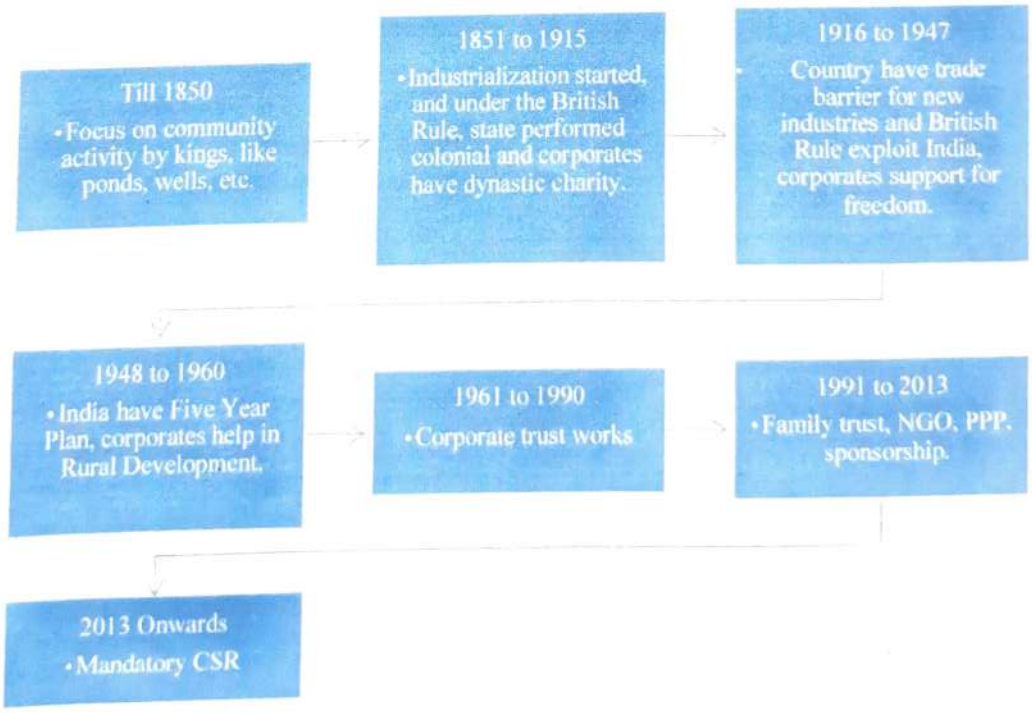
According to Economist Intelligence Unit (EIU) survey, approximately 40% of American and European respondents to the survey said that the main reasons for emphasizing CSR included the need to improve community relations and to deflect pressure from regulators. Whereas in Asia where companies are less sensitive to community relation and where regulators are less powerful, only 33% of respondent took this view.

Indian Scenario

CSR is not a new term in India. During the freedom fighting many companies helped in the freedom struggle. After WWI, in 1930, Jamshedji Tata had given steel plant for the nation so it's a part of corporate social responsibility for nation and communities. As far back as 1965, then Prime Minister of India, Lal Bahadur Shastri, prescribed over a national meeting that issued the following declaration on the Social Responsibilities of business:

"Business has responsibility to itself, to its customers, workers, shareholders and the community. Every enterprise, no matter how large or small, must, if it is to enjoy confidence and respect, seek actively discharge its responsibilities in all directions... and not to one or two groups, such shareholders and workers, as expense of community and consumer. Business must be just and humane, as well as efficient and dynamic."

India has lots of examples for CSR activity. In ancient times, kings made ponds, lakes and wells for the public. From 1850, industrialization started and India was under the British Rule, the corporate sector had done traditional charity for the society. But after 1915, Mahatma Gandhi had given new concept of trusteeship to the businessman. Trusteeship suggests that business is a trustee of the wealth. After Independence, India had lot of economic and social problems. So, the Indian government came with Five Year Plan for the growth of the country but it did not help the country to stand at international level. So, India adopted Liberalization, Privatization, and Globalization (LPG) policy. LPG policy helps for economic growth but it doesn't help in social development. CSR is done in a Public Private Partnership format and trust and NGO sponsorship. After the Companies Act, 2013, CSR has become mandatory for the corporate sector under specific conditions which would help the socio-economic growth of India. Pattern of disclosure is changed from qualitative to quantitative aspect.



CSR provisions in The Companies Act, 2013: The Companies Act, 2013 has formulated Section 135, Companies (Corporate Social Responsibility) Rules, 2014 and Schedule VII which prescribes mandatory provisions for companies to fulfill their CSR. It is applicable on:

i. Every company including its holding or subsidiary having:
   a. Net worth of Rs. 500 Crore or more, or
   b. Turnover of Rs. 1,000 Crore or more, or
   c. Net Profit of Rs. 5 Crore or more, during the immediately preceding financial year.
ii. A foreign company having its branch office or project office in India, which fulfills the criteria specified above.

However, if a company fails to meet the above criteria for consecutive 3 financial years then it is not required to comply with CSR provisions till such time it meets the specified criteria.

CSR Committee: Every company on which CSR is applicable is required to constitute a CSR Committee of the board:

- Consisting of 3 or more directors, out of which at least one director shall be an independent director. However, if a company is not required to appoint an independent director, then it shall have 2 or more directors in the committee.
- Consisting of 2 directors in case of a private company having only 2 directors on its Board.
- Consisting of at least 2 persons in case of Foreign Company of which one person shall be its authorized person resident in India and another nominated by the Foreign Company.

Functions of CSR Committee: The CSR committee shall:

- Formulate and recommend to the Board, a CSR Policy which shall indicate the activities to be undertaken by the Company.
- Recommend the amount of expenditure to be incurred on the activities referred in Schedule VII.
- Monitor the CSR Policy of the company from time to time.
- Institute a transparent monitoring mechanism for implementation of the CSR projects or programs or activities undertaken by the company.

Responsibility of the Board of Directors (BOD): The BOD of every company on which CSR is applicable shall:

- After considering the recommendations made by the CSR Committee, approve the CSR Policy for the Company and disclose contents of such Policy in Board report.
- Ensure that the activities as are included in CSR Policy of the company are undertaken by the Company
- Shall disclose the composition of the CSR Committee in Board Report
- Ensure that the company spends, in every financial year, at least **2% of the average net profits** of the company made during the 3 immediately preceding financial years, in pursuance of its CSR Policy. The CSR projects/programs/activities undertaken in India only shall amount to CSR Expenditure.

Note: The Company shall give preference to the local area and areas around it where it operates, for spending the amount earmarked for CSR activities and shall specify the reasons for not spending whole of earmarked amount (if it fails to spend some) in Board Report.

CSR Policy: CSR policy of the company shall include the following namely-

- A list of CSR projects or programs which a company plans to undertake specifying procedure of execution of such project or programs and implementation schedules for the same.
- Monitoring process of such projects or programs.
- A clause specifying that the surplus arising out of the CSR projects or programs or activities shall not form part of the business profit of the company.

CSR Activities:

- The CSR activities shall be undertaken by the company, as per its CSR Policy, excluding activities undertaken in pursuance of its normal course of business.
- The BOD may decide to undertake its CSR activities approved by the CSR Committee, through
  - A Section 8 company or a registered trust or a registered society, established by the company, either singly or along with any other company, or
  - A Section 8 company or a registered trust or a registered society, established by the Central Government or State Government or any entity established under an Act of Parliament or a State legislature, or
  - A Section 8 company or a registered trust or a registered society, other than those specified above, having an established track record of 3 years in undertaking similar programs or projects; collaboration with other companies, for undertaking projects or programs or CSR activities in such a manner that the CSR Committees of respective companies are in a position to report separately on such projects or programs.
- The CSR projects or programs or activities not to be considered as CSR Activities:
  - Expenses for the benefit of only the employees of the company and their families.
  - Contribution of any amount directly or indirectly to any political party.

Other Important Points:

- The balance sheet of a foreign company to be filed under section 381(1)(b) of the Act shall contain an Annexure regarding report on CSR.
- The Board of Directors shall ensure that activities included by a company in its CSR Policy are related to the areas or subjects specified in Schedule VII of the Act.

Schedule VII:

Activities which may be included by the companies in their Corporate Social Responsibility Policies relating to:

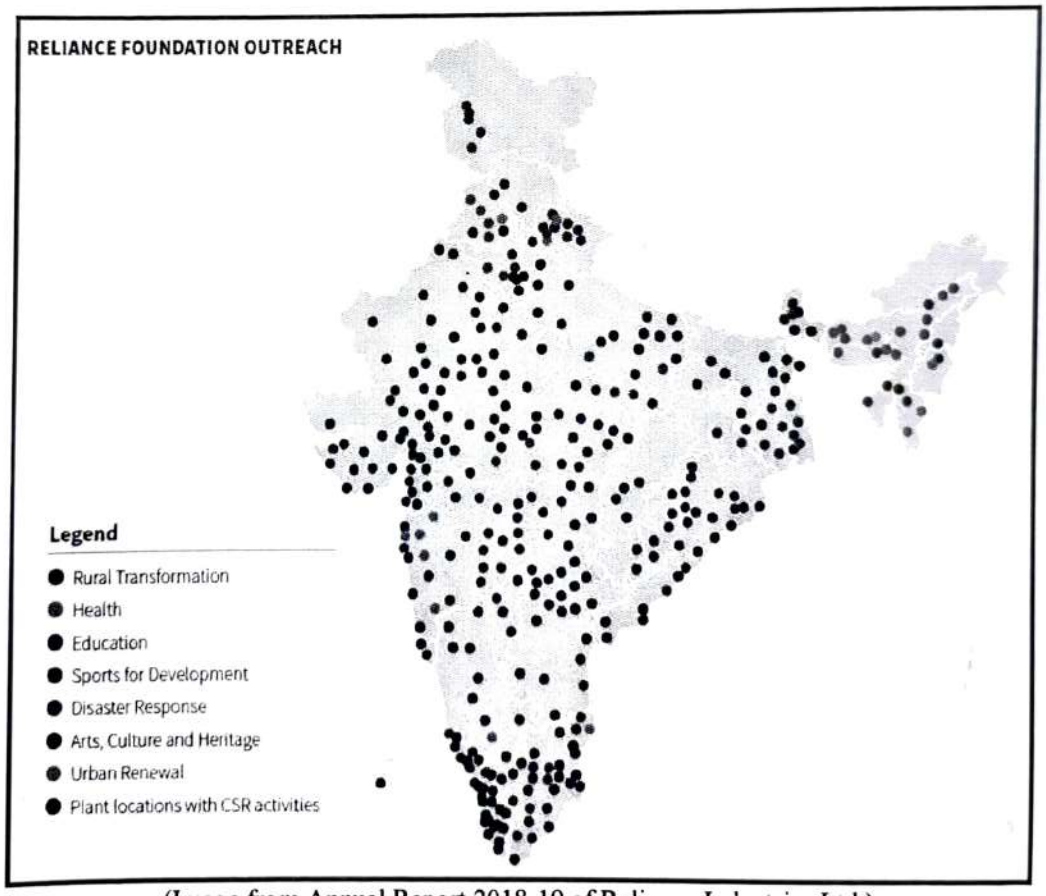
1. Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to the Swachh Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water.
2. Promoting education, including special education and employment enhancing vocation skills especially among children, women, elderly and the differently abled and livelihood enhancement projects.
3. Promoting gender equality, empowering women, setting up homes and hostels for women and orphans; setting up old age homes, day care centres and such other facilities for senior citizens and measures for reducing inequalities faced by socially and economically backward groups.
4. Ensuring environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agroforestry, conservation of natural resources and maintaining quality of soil, air and water, including contribution to the Clean Ganga Fund set-up by the Central Government for rejuvenation of river Ganga.
5. Protection of national heritage, art and culture including restoration of buildings and sites of historical importance and works of art; setting up public libraries; promotion and development of traditional art and handicrafts;
6. Measures for the benefit of armed forces veterans, war widows and their dependents;
7. Training to promote rural sports, nationally recognised sports, paralympic sports and olympic sports
8. Contribution to the Prime Minister's national relief fund or any other fund set up by the central govt. for socio economic development and relief and welfare of the schedule caste, tribes, other backward classes, minorities and women;
9. Contributions or funds provided to technology incubators located within academic institutions which are approved by the central govt.
10. Rural development projects
11. Slum area development.

CSR activities of Reliance Industries Ltd.

The vast majority of the CSR exercises of the Company are done under the aegis of Reliance Foundation (RF), which has risen as a main corporate establishment tending to country's various improvement challenges. The Foundation was built up in 2010 under the administration of Smt. Nita M. Ambani.

Schedule VII of The Companies Act, 2013 records out different regions in which corporates are relied upon to send their CSR assets and actualize programs for social advancement. Reliance has deliberately picked the organization's CSR activities with an attention on improving the personal satisfaction. The activities centre around Seven Territories: Rural Transformation, Health, Education, Sports for Development, Disaster Response, Arts, Culture and Heritage and Urban Renewal. The key logic of all the social advancement activities of RIL depends on three centre duties of Scale, Impact and Sustainability.

In F.Y. 2018-19, Reliance has spent Rs. 904 Crores on CSR activities under these certain territories. Till March 2019, Reliance's advancement activities have contacted the lives of 26 million individuals across India.



(Image from Annual Report 2018-19 of Reliance Industries Ltd.)

Rural Transformation: Reliance has been addressing the challenges of rural communities through its rural transformation programme. Key initiatives in this programme include building rural institutions, making villages water secure, mentoring producer companies and enabling alternative livelihood options on and off the farm. The programme also used technology-based solutions for securing the livelihoods of farmers, fisher folk and livestock owners across the country. In addition to direct engagement, Reliance supported several organizations working in the field of rural development with an aim to benefit the rural community.

Health: The health programme of Reliance addresses primary healthcare issues around affordability and accessibility of quality healthcare. The company also provides specialised services through tertiary healthcare facilities such as multi-speciality hospitals, at subsidised prices to the communities. Some noticeable institutions started by Reliance are Shri HN Reliance Foundation Hospital and Research Centre, Dhirubhai Ambani Hospital, Reliance Foundation Drishti, etc.

Education: Initiatives of Reliance in the education space are aimed at promoting primary and secondary education and enabling higher education through merit-cum-means scholarships across the country. Reliance has been leveraging appropriate technologies and learning resources for improving the quality of teaching and, in turn, student performance. Some initiatives are The Reliance Foundation Jr. NBA, Reliance University, Reliance Foundation Schools, etc.

Environment: The Foundation has made significant efforts in promoting ecological sustainability through resource conservation, promotion of biodiversity and use of cleaner energy sources. The Foundation has undertaken construction of bio-gas plants in rural households. The shift to cleaner fuel has led to reduction in indoor pollution thereby resulting in improved health of women and families.

Arts, Culture, Heritage and Urban Renewal: Reliance works to preserve heritage, art and culture of India for its future generations and make conscious efforts to improve the livelihood opportunities of traditional artisans and craftsmen. This is done by primarily undertaking various promotional projects and documenting India's heritage for the benefit of future generations. Some of the initiatives are Abbaji Annual Concert, 8 Prahar: Concert on Indian Classical Music, etc.

Disaster Response: Reliance aspires to respond swiftly and effectively to disasters that endanger human lives and livelihood, by directly engaging with affected communities. It leverages all its strengths, including human resources and information technology, to provide relief and rehabilitation support.

Improving Access to Sports Infrastructure: Reliance installed a multi-sports complex in two stadiums under Thane Municipal Corporation. This facility has specially designed net cage to suit all playing fields with LED illuminated line markings to facilitate the sports being played. The sports facility can accommodate six different games: football, ring hockey, volleyball, handball, cricket and tennis. With the space for sportspersons and fitness enthusiasts shrinking in urban areas, these multi-sports stadiums in the centre of densely populated cities address an acutely felt need.

Chapter 3:
Data Collection and Analysis

Viewpoint of people towards CSR

In this section, the viewpoint of people towards CSR is shown which has been obtained through questionnaire. The sample size is of 50 respondents.

Age	Frequency
18-30 Years	11
31-40 Years	7
41-50 Years	4
51-60 Years	3
More than 60 Years	3
Total	**50**

Age of the respondents are divided into five categories and among the respondents' majority belong from age group of 18-30 years.

Gender	Frequency
Male	32
Female	18
Total	**50**

Among all the respondents 64% are male respondents and 36% are female respondents for this survey.

Education	Frequency
Graduation	26
Post-Graduation	14
CA	4
CS	1
CMA	0
MBA	5
Total	**50**

Mostly students Graduates and Post-Graduates are respondents to the questionnaire.

Occupation	Frequency
Business	3
Consultant	5
Research Scholar	1
Service	23
Student	18
Total	**50**

The data is collected mostly from individuals working in a company or a consultancy firm and students.

Experience	Frequency
0-10 Years	35
11-20 Years	5
21-30 Years	5
More than 30 Years	5
Total	**50**

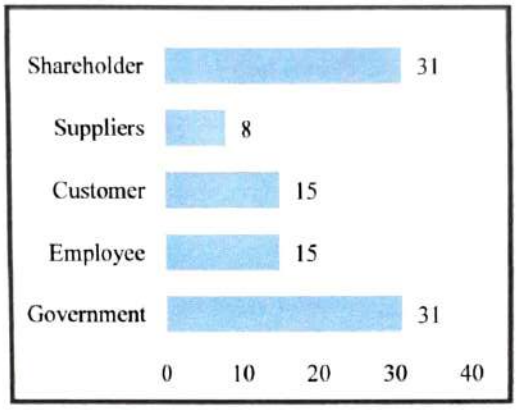
Experience of respondents are divided into 4 categories and among the respondents' majority belong to 0-10 years of experience.

Have you heard about the mandatory CSR for companies under The Companies' Act 2013?	
Yes	43
No	7
Total	**50**

Of the 50 respondents, 7 respondents have not heard about the CSR regulations implemented through The Companies Act, 2013 and hence did not answer further questions.

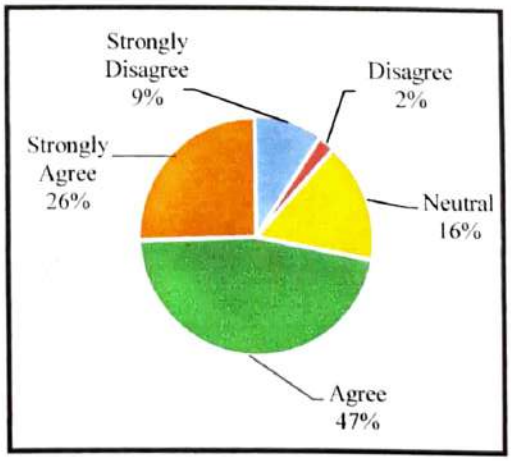
Which stakeholders need CSR disclosure policies by the company?

Particulars	Frequency
Government	31
Employee	15
Customer	15
Suppliers	8
Shareholder	31



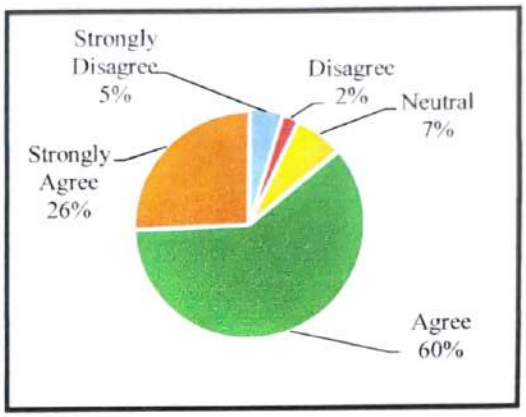
"Making CSR mandatory and make company more social makes sense"

Particulars	Frequency
Strongly Disagree	4
Disagree	1
Neutral	7
Agree	20
Strongly Agree	11



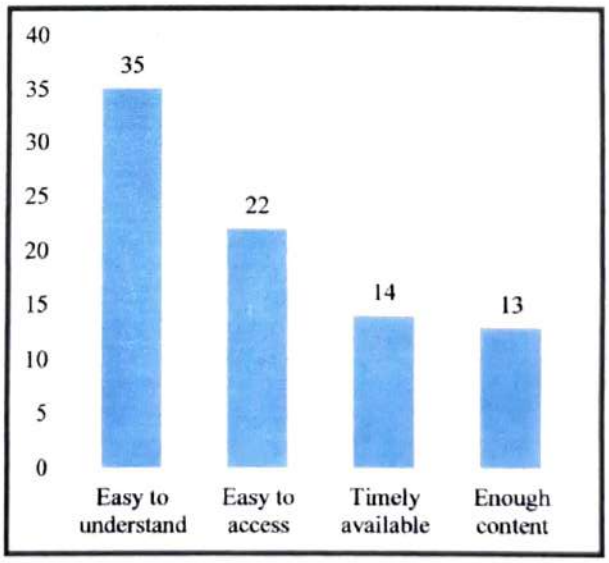
"CSR will be useful to Society for Social Development"

Particulars	Frequency
Strongly Disagree	2
Disagree	1
Neutral	3
Agree	26
Strongly Agree	11



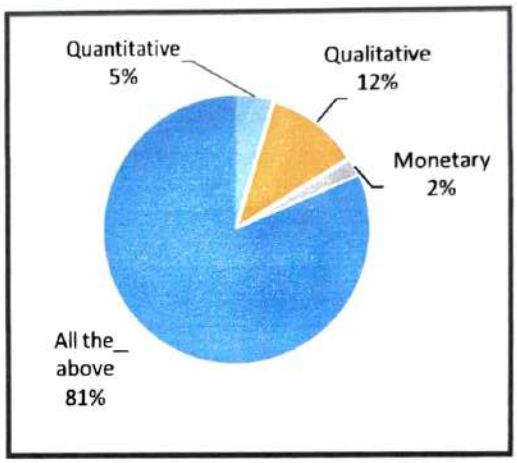
How CSR information should be and reported in the annual report?

Particulars	Frequency
Easy to understand	35
Easy to access	22
Timely available	14
Enough content	13



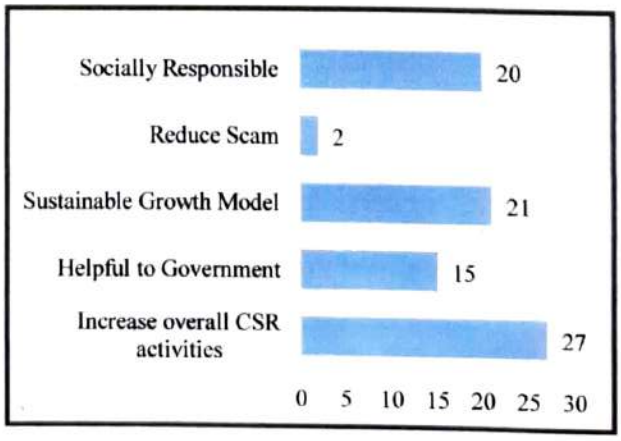
What is best for CSR disclosure?

Particulars	Frequency
Only Quantitative	2
Only Qualitative	5
Only Monetary	1
Only Pictorial	0
All the above	35



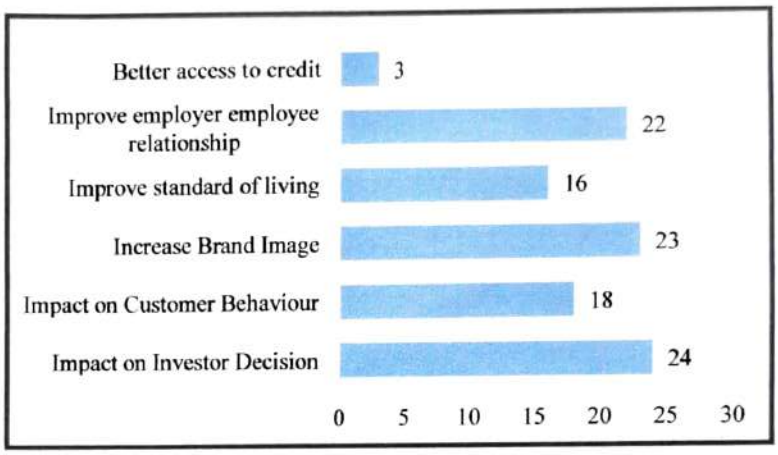
What is your opinion on new mandatory CSR for companies in India?

Particulars	Frequency
Increase overall CSR activities	27
Helpful to Government	15
Sustainable Growth Model	21
Reduce Scam	2
Socially Responsible	20



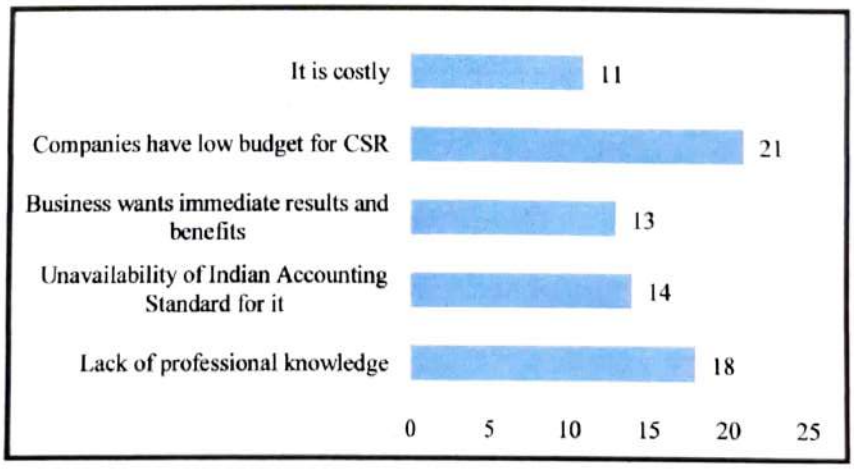
What are the benefits and effects of CSR reporting to companies?

Particulars	Frequency
Impact on Investor Decision	24
Impact on Customer Behaviour	18
Increase Brand Image	23
Improve standard of living	16
Improve employer employee relationship	22
Better access to credit	3



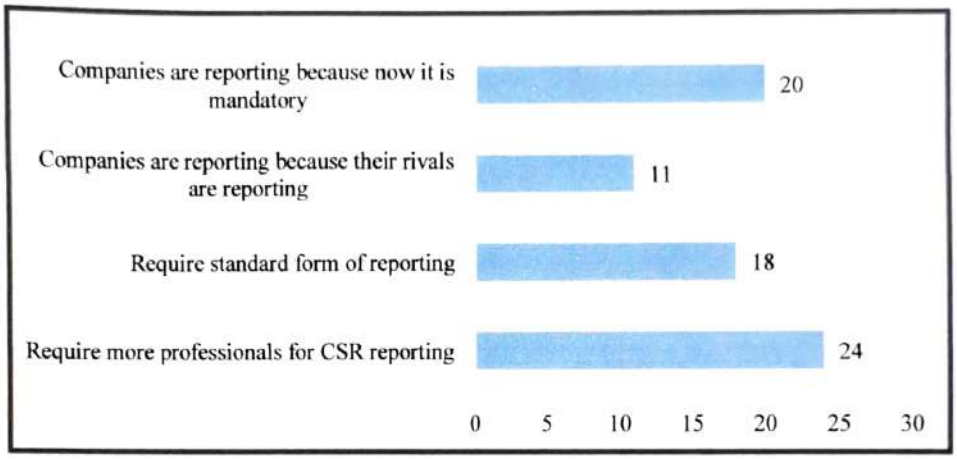
What is your opinion regarding problems faced by companies in CSR reporting?

Particulars	Frequency
Lack of professional knowledge	18
Unavailability of Indian Accounting Standard for it	14
Business wants immediate results and benefits	13
Companies have low budget for CSR	21
It is costly	11



What do you think about CSR reporting in India?

Particulars	Frequency
Require more professionals for CSR reporting	24
Require standard form of reporting	18
Companies are reporting because their rivals are reporting	11
Companies are reporting because now it is mandatory	20



Observation: Based on all the data collected and analysed in this section it can be said that the CSR disclosure by the companies is of utmost importance to the shareholders and the government. Making CSR mandatory is making social sense and is helping in the social development. The CSR initiatives must be disclosed in way which is easy to understand and covers all aspects: qualitative, quantitative, monetary and pictorial. This CSR regulation will increase the overall CSR activities of the companies, make them socially responsible and create a sustainable growth model. All of this creates a positive impact on the investor decision towards the company, better brand image and improve the employer employee relationship. But there are hindrances to successful implementation and getting desirable results, namely lack of professional knowledge towards CSR and low budget by the companies towards CSR. It has to be noted that some of the companies are now reporting it because it is mandatory. Through a standard form and more professionals in CSR reporting these hindrances can be removed to a great extent.

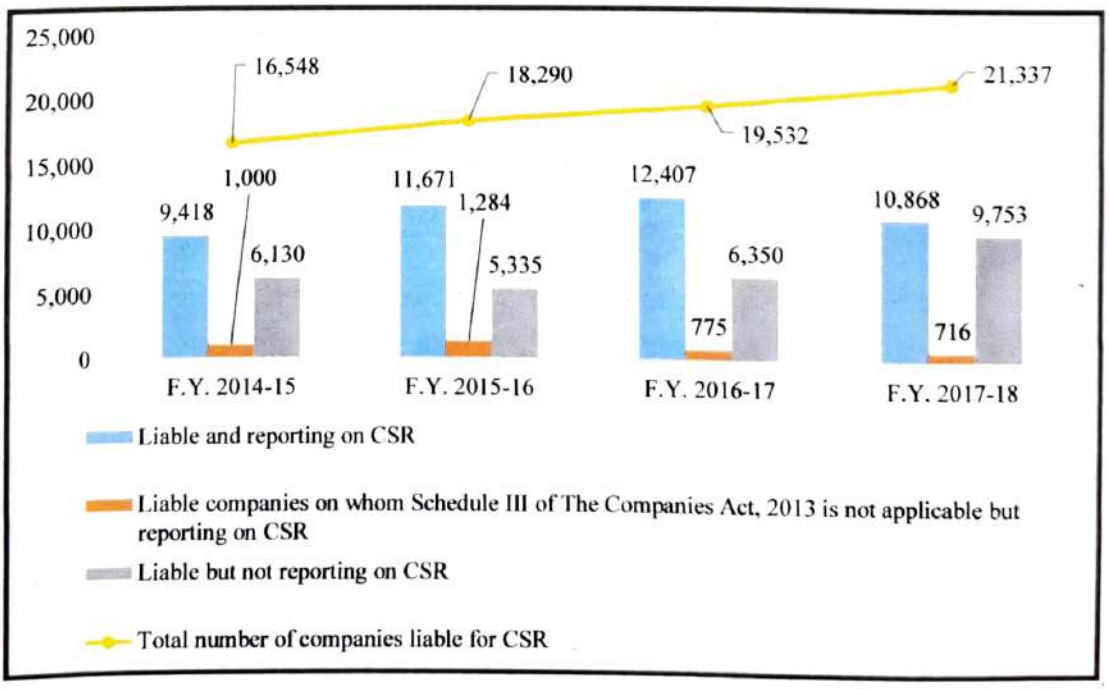
CSR in India

In this section, the state-wise and sector-wise CSR expenditure in India has been presented and analysed. To ensure the accuracy of data as much as possible:

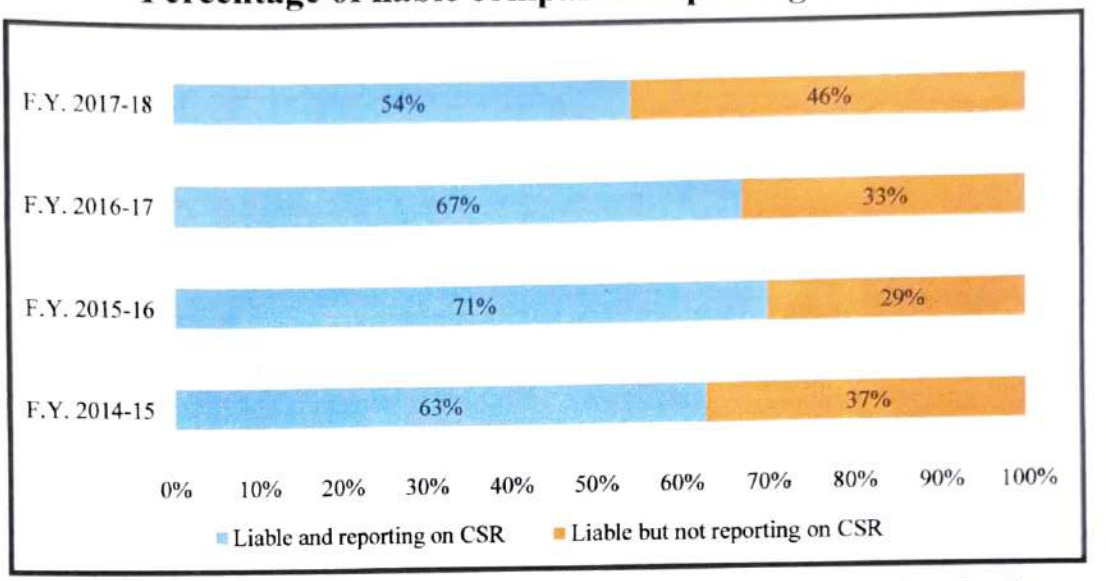
- The data has been collected from "Report of High Level Committee on Corporate Social Responsibility 2018" by the Ministry of Corporate Affairs (Govt. of India) dated August 7, 2019, which has considered the data from F.Y. 2014-15 to 2017-18. The sector-wise CSR expenditure of all the companies in India are collected from this source.
- The data has also been collected from "India's CSR reporting survey" by KPMG from F.Y 2014-15 to 2018-19. The report has considered "Top 100 Listed Companies in India by Market Cap" (the name of the companies are mentioned in the end of the project). The sector-wise CSR expenditure of these "Top 100" companies has been collected from this source.

Profile of companies liable for CSR based on their reporting status.

Company Profile based on reporting status	F.Y. 2014-15	F.Y. 2015-16	F.Y. 2016-17	F.Y. 2017-18
Liable and reporting on CSR	9,418	11,671	12,407	10,868
Liable companies on whom Schedule III of The Companies Act, 2013 is not applicable but reporting on CSR	1,000	1,284	775	716
Liable but not reporting on CSR	6,130	5,335	6,350	9,753
Total number of companies liable for CSR	**16,548**	**18,290**	**19,532**	**21,337**



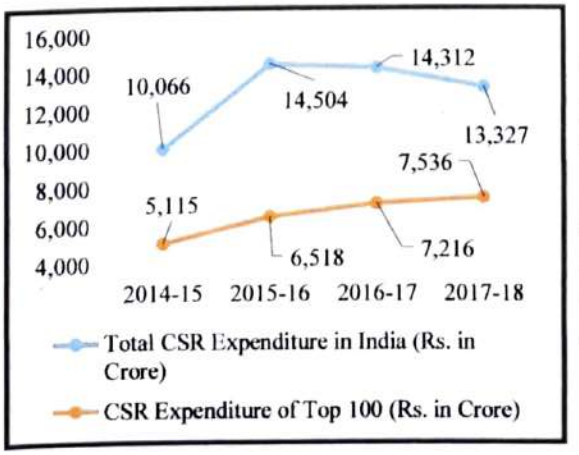
Percentage of liable companies reporting on CSR



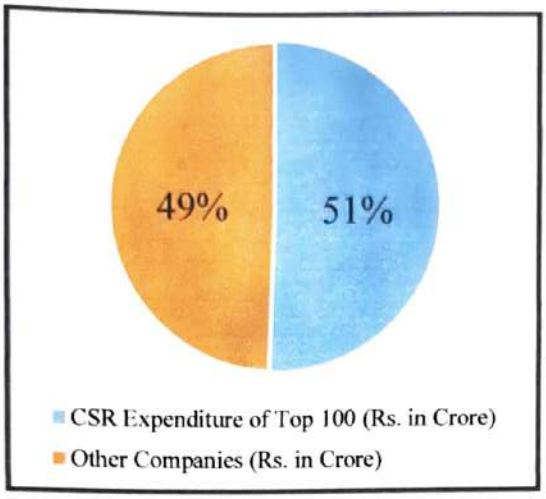
Observation: From the above table and diagrams, it can be observed that there has been a steady increase in the no. of companies liable for CSR reporting. However, the percentage of companies liable but not reporting on CSR was reduced in F.Y. 2015-16 but it is again increasing from F.Y. 2016-17.

Total CSR expenditure in India

Year	CSR Expenditure of Top 100 (Rs. in Crore)	CSR Expenditure of Other Companies (Rs. in Crore)	Total CSR Expenditure in India (Rs. in Crore)
F.Y. 2014-15	5,115	4,951	10,066
F.Y. 2015-16	6,518	7,986	14,504
F.Y. 2016-17	7,216	7,096	14,312
F.Y. 2017-18	7,536	5,791	13,327
Total	**26,385**	**25,824**	**52,208**



Observation: It can be seen that in the time period of the study, the total CSR expenditure in India was increasing in 2015-16, but since then it has kept on falling from 2016-17. On the other hand, it can be seen that although there has been a fall in the total CSR expenditure in the country, the expenditure of the Top 100 is increasing.



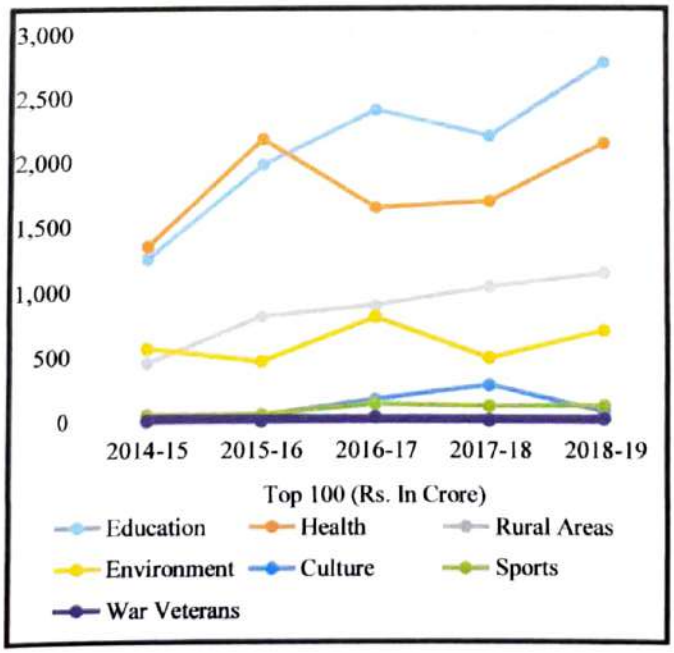
Observation: Considering the total CSR expenditure of the companies from 2014-15 to 2017-18. The Top 100 contribute to nearly 51% of the total expenditure.

Sector-Wise CSR Expenditure

(7 important activities according to the researcher out of the 11 activities mentioned in Schedule VII of The Companies Act, 2013 are considered for the analysis)

Top 100

Activities	2014-15	2015-16	2016-17	2017-18	2018-19
Education	1,249	1,978	2,404	2,202	2,775
Health	1,344	2,177	1,641	1,691	2,145
Rural Areas	443	804	889	1,029	1,143
Environment	559	455	797	483	700
Culture	49	47	168	279	78
Sports	48	52	133	120	123
War Veterans	0	1	31	7	20
Total	**3,692**	**5,514**	**6,063**	**5,811**	**6,984**

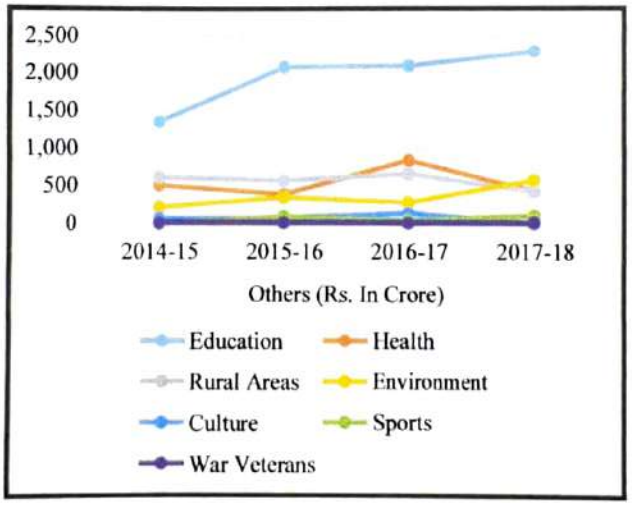


Observation: The Top 100 have been mostly engaged in Education and thus it is in a rising trend. The second highest expenditure is towards Healthcare, although there was a sharp fall in 2016-17 it is increasing. The highest fluctuation in expenditure is seen towards Environment. The activity with the lowest expenditure is towards the of War Veterans.

Other Companies

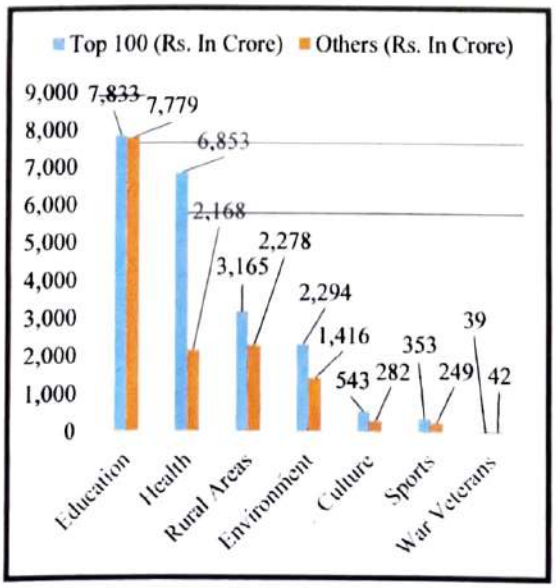
(Due to unavailability of data on Total CSR expenditure in India in 2018-19 the analysis is restricted till 2017-18)

Activities	2014-15	2015-16	2016-17	2017-18
Education	1,340	2,074	2,088	2,277
Health	504	387	841	436
Rural Areas	616	572	663	427
Environment	215	342	279	580
Culture	68	72	138	4
Sports	10	87	47	105
War Veterans	5	10	7	20
Total	**2,758**	**3,544**	**4,063**	**3,849**



Observation: It can be seen that other companies are mainly spending towards Educational activities and in comparison to other activities there is a big difference in expenditure.

Sector-wise total CSR Expenditure (F.Y. 2014-15 to F.Y. 2017-18)



Activities	Top 100	Others
Education	7,833	7,779
Health	6,853	2,168
Rural Areas	3,165	2,278
Environment	2,294	1,416
Culture	543	282
Sports	353	249
War Veterans	39	42
Total	**21,080**	**14,214**

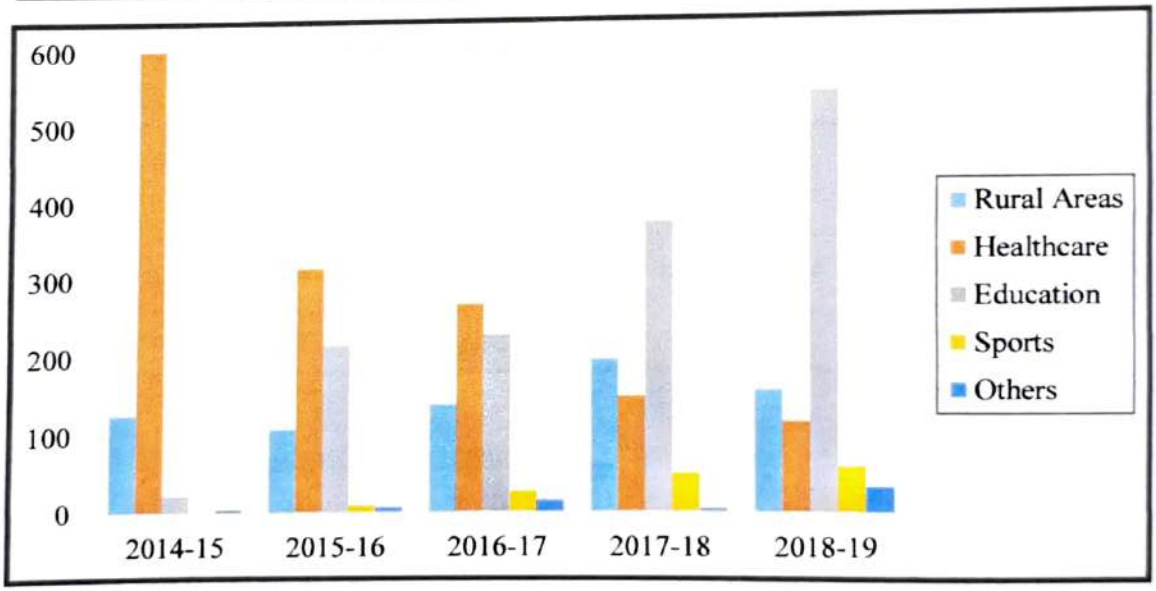
Observation: Other than expenditure towards war veterans, the Top 100 have been contributing more towards all the other activities and thus contributing more.

CSR activities of Reliance Industries Ltd.

In this section, the sector-wise CSR expenditure of Reliance Industries Ltd. (RIL) from F.Y. 2014-15 to 2018-19 has been presented and analysed and a relationship of the CSR expenditure with the financial performance of RIL has been formulated. To ensure the accuracy of data as much as possible, the data has been collected from the Annual Report of RIL from F.Y. 2014-15 to 2018-19.

Sector-wise Expenditure (Rs. in Crore)

Years	Rural Areas	Healthcare	Education	Sports	Others	Total
2014-15	126	608	22	0	4	761
2015-16	107	314	215	9	7	652
2016-17	138	267	227	27	15	674
2017-18	195	148	373	50	5	771
2018-19	156	116	540	59	33	904
Total	**722**	**1,453**	**1,377**	**145**	**64**	**3,762**



Observation: From the above diagram, it can be observed that initially i.e. till 2014-15, RIL had been heavily investing in Healthcare, but from the next year, there was a sharp decline in the expenditure towards it and there was a shift towards Education, which is now turning out to be the major CSR activity of RIL. It can also be observed that from 2014-15 to 2018-19, RIL have been spending mostly towards Education (39%) and Healthcare (36%).

Considering the total CSR expenditure of RIL from 2014-15 to 2018-19, there was a fall during 2015-16, but since then, the expenditure has been increasing at an average growth rate of 5.19%.

Relationship between CSR Expenditure and Financial Performance of RIL (Rs. in Crore)

Years	Total CSR Expenditure	Turnover	Profit After Tax	CSR as % of PAT
2014-15	761	3,88,494	23,566	3.23
2015-16	652	2,93,298	25,171	2.59
2016-17	674	3,30,180	29,901	2.25
2017-18	771	4,30,731	34,988	2.20
2018-19	904	6,22,809	39,588	2.28

Observation:

- **CSR as % of PAT:** The provisions of The Companies Act, 2013 specify that the liable companies must spend at least 2% of the Average Profit after Tax the company made over the last three financial years. RIL have been always spending more than the required rate, but the rate of spending has been declining and can be observed that RIL is spending only that much which is required to comply with the law.
- **Relationship between CSR Expenditure and Turnover of RIL:** From the data, it can be observed that the CSR expenditure and Turnover are positively and highly correlated with each other (+0.9856).
- **Relationship between CSR Expenditure and Profit After Tax of RIL:** From the data, it can be observed that the CSR expenditure and Turnover are positively and highly correlated with each other (+0.74750). Although compared with correlation of CSR Expenditure and Turnover, it is less related.

Note: Formula of Correlation: $r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$

Where, x = Total CSR Expenditure

y = Turnover/ Profit After Tax

$\bar{x}$ = Mean of Total CSR Expenditure

$\bar{y}$ = Mean of Turnover/ Profit After Tax

Chapter 4:
Conclusion and Recommendation

Conclusion

Corporate Social Responsibility (CSR) is essential in India as more than 65% of the population are living in Rural Areas and are devoid of many facilities. There is a huge difference between the privileged and underprivileged class in terms of Healthcare facilities, Education, Housing, Infrastructure, etc. In India, the concept of CSR is governed by Section 135 of The Companies Act, 2013 which encourages the companies to spend at least 2% of their average net profit in the last three years on CSR activities. The basic thought of implementing this Section was that CSR is viewed as a vital tool for social development, it can also be considered as a vital tool for increasing a company's competitive edge over their opponents as it can increase their brand image. However, it is seen that the companies are undertaking CSR and disclosing it just because it is mandatory now. Even then there is trend seen that although the total number of companies liable for CSR is increasing (i.e. the companies are growing in terms of their profitability and turnover), the companies who are liable but not disclosing is increasing since the time Section 135 came into force. Also of the total CSR expenditure in the country, majority of the expenditure is undertaken by the Top 100 only of the total number of companies that were reporting on CSR (11,584), which shows that the other companies have not enough motivation to spend towards CSR and are thus seeing the CSR provisions as only a provision to be complied with and a way to reduce tax burden.

Considering the Sector-wise CSR expenditure in India, every company undertaking CSR are mainly focused towards Education only. Although the Top 100 are also focusing towards other activities like Healthcare and Rural Areas, the other companies are not at all engaged too much in other activities. It can also be seen that the companies are undertaking those activities which directly or indirectly benefiting them (Education, Healthcare and Rural Areas) and not the ones which are benefiting the society (Culture, Sports, War Veterans).

After analysing the CSR Expenditure and Financial Performance of Reliance Industries Ltd. (RIL), a conclusion can be drawn that social welfare and community development is at the core of Reliance's CSR philosophy and this continues to be a top priority. Reliance embraces responsibility for impact of its operations and actions on all stakeholders including society and community at large. It revolves around a deeply held belief in principle symbiotic relationship with the local communities, recognising that business ultimately has a purpose- to serve human needs. RIL undertake activities towards Education, Healthcare, Rural Areas, etc. Also the CSR activities are positively correlated with the company's turnover and profit after tax, but more correlated with turnover, as the company spending towards CSR increases their brand image and in turn increasing their Revenue from Operations i.e. Turnover, as people are more likely to associate with a company who are doing something for the society.

Recommendation

After conducting the study, a basic conclusion can be drawn that even after 5 years since Section 135 came into force, the companies are mostly seeing it as only a compliance requirement and thus doing the bare minimum to avoid contravention of law and avail tax benefit as much as possible and not as a philanthropic initiative to do good something to the society which is failing the main intention behind passing this resolution.

The way to solve this problem is by the Government taking steps towards amending the provisions to make it more friendly to the companies and motivate them to look at the provisions as not just a law provision which is needed to be complied with but a responsibility of every company to give back to the society as much as possible. Engage and motivate the companies other than Top 100 to also increase their contribution so as to increase the total CSR expenditure in the country.

Regarding the activities of CSR, there is no denial that Education and Healthcare are very important but not the only activities which require spending in, there are other activities like Sports, Art and Culture, benefit towards War Veterans, etc. which also need spending for benefit of the society.

To sum it up, there is still need of many improvements and amendments to increase the CSR expenditure in the country and improve all the sectors of the society and bring in an all-round increase in the standard of living of people. All this can be achieved by motivating the companies to give have a more active participation towards CSR as not only it will benefit the society but also the company itself.

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- Mukherjee, A. & Roy, S. (2019). Entrepreneurship Development and Business Ethics. Oxford University Press.

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- www.moneycontrol.com

Questionnaire

Sir/ Ma'am,

I am currently pursuing B.COM(H) specializing in Accounting & Finance under University of Calcutta. For the partial fulfilment of this course I am preparing a project titled "Corporate Social Responsibility in India & an analysis of CSR expenditure and relationship with the financial performance of Reliance Industries Ltd." under the supervision of Professor Priyanka Banik.

I have prepared a questionnaire for understanding the viewpoint of the people on the CSR regulations implemented through The Companies Act, 2013. Following is the link to the questionnaire: https://forms.gle/LxRDtbuwRGfvBUeV7

Kindly provide your viewpoint through the questionnaire and also forward it to your colleagues and friends.

Regards,

Sayan Sardar

Mobile: 8335862943

Email ID: asayan74569@gmail.com

Questionnaire

Demographic Information
* Required

1. Name *

2. Age *

Mark only one oval.

- 18-30 years
- 31-40 years
- 41-50 years
- 51-60 years
- more than 60 years

3. Gender *

Mark only one oval.

- Female
- Male
- Others

4. Education *

Mark only one oval.

- Graduation
- Post Graduation
- CA
- CS
- CMA
-
- MBA

Other:

5. Occupation

Mark only one oval.

- Service
- Business
- Consultant
- Other: _____

6. Experience (If working)

Mark only one oval.

- 0-10 years
- 11-20 years
- 21-30 years
- more than 30 years

Project Specific

7. Have you heard about the mandatory CSR for companies under The Companies Act, 2013? (If the answer is no then no need to answer further questions) *

Mark only one oval.

- Yes
- No

8. According to you which stakeholders need this disclosure?

Check all that apply.

- [ ] Shareholder
- [ ] Suppliers
- [ ] Customer
- [ ] Employee
- [ ] Government

Other: [ ] _____

9. "Making CSR mandatory and make company more social makes sense".

Mark only one oval.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

10. "It will be useful to society for Social Development".

Mark only one oval.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

11. What is best for CSR disclosure?

Mark only one oval.

- Only Qualitative
- Only Quantitative
- Only Monetary
- Only Pictorial
- All of the above aspects should be covered

12. According to you how CSR information should be and reported in annual report of the companies?

Check all that apply.

- [ ] Easy to understand
- [ ] Easy to Access
- [ ] Timely available
- [ ] Enough Content

Other: [ ] _____

13. What is your opinion on new mandatory CSR for companies in India?

Check all that apply.

- [ ] It will increase overall CSR activities by companiesIt
- [ ] will be helpful to government in social activities
- [ ] Companies will work on sustainable growth model
- [ ] Reduces Scam
- [ ] Make them Socially ResponsilbeOther:
- [ ]

14. According to you what are the benefits and effects of CSR reporting to companies?

Check all that apply.

- [ ] Have positive impact on investor decision
- [ ] Have positive impact on customer buying behaviourIncreases brand
- [ ] image and reputation
- [ ] Improves the standard of living of people which will help business in long run Socially
- [ ] responsible business improves employer employee relationship Better access to credit

Other: [ ]

15. What is your opinion regarding problems faced by companies in CSR reporting?

Check all that apply.

- [ ] Lack of professional knowledge
- [ ] Unavailability of Indian Accounting Standard for it
- [ ] Business wants immediate results and benefits
- [ ] Companies have low budget for CSR so less focus on reporting It is
- [ ] costly

Other: [ ]

16. What do you think about CSR reporting in India?

Check all that apply.

- [ ] Require more professionals for CSR reportingRequire
- [ ] standard form of reporting
- [ ] Companies are reporting because their rivals are reporting
- [ ] Companies are reporting because now it is mandatory

Other: [ ]

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Google Forms

Top 100 Listed Companies on the basis of Market Capitalization					
Sl. No.	Company Name	Market Cap (Rs. In Crore)	Sl. No.	Company Name	Market Cap (Rs. In Crore)
1	Reliance	10,68,806.51	50	Eicher Motors	47,741.03
2	TCS	7,68,525.91	51	JSW Steel	47,619.24
3	HDFC Bank	5,67,697.09	52	Hero Motocorp	46,764.98
4	HUL	4,90,398.08	53	Biocon	46,752.00
5	Bharti Airtel	3,19,095.55	54	Interglobe Avi	45,796.53
6	HDFC	3,05,932.20	55	Adani Green Ene	44,449.29
7	Infosys	2,99,734.72	56	GAIL	44,382.41
8	Kotak Mahindra	2,65,080.63	57	Bharti Infratel	43,678.50
9	ITC	2,45,783.16	58	Aurobindo Pharm	43,596.76
10	ICICI Bank	2,31,329.96	59	United Spirits	42,581.03
11	Maruti Suzuki	1,73,658.27	60	Marico	42,178.45
12	SBI	1,67,604.20	61	Grasim	41,234.46
13	Nestle	1,64,849.66	62	Siemens	40,934.24
14	Avenue Supermar	1,61,746.10	63	Lupin	40,879.60
15	Asian Paints	1,57,308.44	64	Torrent Pharma	40,088.86
16	HCL Tech	1,56,279.97	65	IDBI Bank	39,861.48
17	Bajaj Finance	1,43,978.18	66	Bandhan Bank	39,846.15
18	Larsen	1,34,113.80	67	Vedanta	39,160.67
19	Wipro	1,25,010.38	68	DLF	38,911.90
20	Sun Pharma	1,18,563.14	69	Ambuja Cements	38,749.87
21	Axis Bank	1,14,416.67	70	Petronet LNG	38,392.50
22	UltraTechCement	1,11,735.81	71	Tata Steel	38,227.43
23	ONGC	1,09,385.53	72	Colgate	37,098.84
24	HDFC Life	1,04,249.90	73	Muthoot Finance	36,901.45
25	NTPC	96,966.66	74	Cadila Health	36,747.24
26	Power Grid Corp	89,721.76	75	Abbott India	36,299.65
27	Coal India	89,267.12	76	Yes Bank	36,145.36
28	Titan Company	87,984.05	77	Havells India	35,535.63
29	IOC	84,209.65	78	TATA Cons. Prod	35,005.14
30	Bajaj Finserv	83,305.98	79	IGL	34,212.54
31	Britannia	83,232.09	80	Tata Motors	34,194.94
32	Dabur India	81,753.21	81	Bosch	33,913.70
33	Bajaj Auto	80,365.90	82	UPL	33,545.42
34	BPCL	80,240.66	83	Hindalco	33,537.03
35	Shree Cements	79,743.68	84	Motherson Sumi	32,826.73
36	SBI Life Insura	79,727.38	85	P and G	32,606.81
37	Pidilite Ind	76,663.18	86	L&T Infotech	32,335.28
38	Hind Zinc	73,182.53	87	PNB	31,807.93
39	Adani Ports	69,292.89	88	HPCL	31,169.79
40	Dr Reddys Labs	66,933.28	89	Info Edge	30,651.71
41	Godrej Consumer	66,496.57	90	Vodafone Idea	30,229.63
42	Divis Labs	65,722.06	91	IndusInd Bank	29,306.37
43	M&M	60,214.03	92	Alkem Lab	28,647.18
44	ICICI Lombard	59,079.30	93	Embassy Office	27,538.81
45	SBI Cards	58,764.61	94	Bajaj Holdings	27,220.17
46	HDFC AMC	58,053.24	95	NMDC	27,219.84
47	Tech Mahindra	56,028.23	96	MRF	26,944.02
48	ICICI Prudentia	55,632.90	97	United Brewerie	26,908.51
49	Cipla	52,613.21	98	Whirlpool	26,249.78
50	Berger Paints	49,469.08	99	Piramal Enter	25,409.15
Data collected from website of NSE and Moneycontrol					

B.Sc. Food and Nutrition Honours

Serial No.	Content
1.	Syllabus Extract indicating project works
2.	List of students along with the details of title, place of work, duration etc. for the latest academic year (2023-2024) for Projects
3.	Sample photograph of the Project work
4.	Sample Report of Projects I, II, III

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

SPaul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

SCHEME AND SYLLABUS FOR CHOICE BASED CREDITSYSTEM FOR B.Sc. HONOURS FOOD AND NUTRITION

SEMESTER	CORE COURSE (14)	ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)	SKILL ENHANCEMENT COURSE (SEC)	DISPLINE SPECIFIC ELECTIVE COURSE (DSE)	ELECTIVE: GENERIC COURSE (GE)
I	FNT-A-CC-1-1-Th:BASIC FOOD SCIENCE-I FNT-A-CC-1-1-P:BASIC FOOD SCIENCE-I (PRACTICAL)	(2)	(2)	(4)	(4)
	FNT-A-CC-1-2-Th:HUMAN PHYSIOLOGY-I FNT-A-CC-1-2-P:HUMAN PHYSIOLOGY-I (PRACTICAL)				
II	FNT-A-CC-2-3-Th:BASIC FOOD SCIENCE-II FNT-A-CC-2-3-P: BASIC FOOD SCIENCE-II (PRACTICAL)				
	FNT-A-CC-2-4-Th:HUMAN PHYSIOLOGY-II FNT-A-CC-2-4-P:HUMAN PHYSIOLOGY-II (PRACTICAL)				
III	FNT-A-CC-3-5-Th: HUMAN NUTRITION-I FNT-A-CC-3-5-P: HUMAN NUTRITION-I (PRACTICAL)		SEC-A-(1/2)		
	FNT-A-CC-3-6-Th:COMMUNITY NUTRTION FNT-A-CC-3-6-P:COMMUNITY NUTRIION (PRACTICAL)				
	FNT-A-CC-3-7-Th: FOOD COMMODITIES FNT-A-CC-3-7-P: FOOD COMMODITIES (PRACTICAL)				

2. General concepts of weights and measures. Eye estimation of raw and cooked foods
3. Preparation of food from different food groups and their significance in relation to health.
4. Preparation of supplementary food for different age group and their nutritional significance.
5. Planning and preparation of low cost diet for Grade I and Grade II malnourished child

FNT-A-CC-3-6-Th: COMMUNITY NUTRITION 4 CREDITS

1. Concept of Community, types of Community, Factors affecting health of the Community.
2. Nutritional Assessment and Surveillance: Meaning, need, objectives and importance
3. Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods.
4. Diet survey: Need and importance, methods of dietary survey, Interpretation - concept of consumption unit, individual and total distribution of food in family, adequacy of diet in respect to RDA, concept of family food security.
5. Clinical Signs: Need & Importance's, identifying signs of PEM, vitamin A deficiency and iodine deficiency, Interpretation of descriptive list of clinical signs.
6. Nutritional anthropometry:Need and importance, standard for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements. Use of growth chart.
7. International, national, regional agencies and organisations. Nutritional intervention programmes to combat malnutrition.

FNT-A-CC-3-6-P:COMMUNITY NUTRITION (PRACTICAL) 4 CREDITS

1. Anthropometric Measurement of infant - Length, weight, circumference of chest, mid-upper arm circumference, precautions to be taken.
2. Comparison with norms and interpretation of the nutritional assessment data and its significance. Weight for age, height for age, weight for height, body Mass Index (BMI) Waist - Hip Ratio (WHR). Skin fold thickness.
3. Growth charts - plotting of growth charts, growth monitoring and promotion.
4. Clinical assessment and signs of nutrient deficiencies specially PEM (Kwashiorkor, marasmus) I vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies.

5. Estimation of food and nutrient intake: Household food consumption data, adult consumption unit, 24 hours dietary recall 24 hours record, Weighment method, food diaries, food frequency data, use of each of the above, information available through each individual, collection of data, estimation of intakes.

FNT-A-CC-3-7-Th: FOOD COMMODITIES 4 CREDITS

1. Cereals and Millets: Structure, processing, storage, use in various preparation, variety, selection and cost. Cereal products, breakfast cereals, fast food.

2. Pulses and Legumes: Structures, Selection and variety. Storage, Processing and use in different preparations, Nutritional aspects and cost.

3. Milk and Milk products : Composition, Classification, Selection Quality and Cost, Processing, Storage and uses in different preparations, Nutritional aspects, shelf life and spoilage.

4. Eggs: Production, grade, quality selection, storage and spoilage, cost nutritional aspects and use in different preparations.

5. Meat, Fish and Poultry: Types, Selection, Purchase, Storage, Uses, preparations Cost, Spoilage of fish Poultry and meat.

6. Vegetables and Fruits: Variety, Selection, purchase, storage, availability causes and nutritional aspects of raw and processed products and use in different preparations.

7. Sugar and sugar Products: Types of natural, sweeteners, manufacture, selection, storage and use as preserves, stages in sugar cookery.

8. Fats and Oils: Types and sources (animal and vegetable), Processing, uses in different preparations, storage, cost and nutritional aspects.

9. Raising and Leavening agents: Types, constituents, uses in cookery and bakery, storage.

10. Food Adjuncts: Spices, condiments, herbs, extracts; concentrates essences, food colours, origin, classification, description,uses, specifications, procurements and storage.
11. Convenience Foods: Role, types, advantages, uses, cost and contribution to diet.
12. Salt: Types and uses.
13. Beverages: Tea; Coffee. Chocolate and Cocoa Powder-Processing, cost and nutritional aspects, other beverages-Aerated beverages, juices.

FNT-A-CC-3-7-P: FOOD COMMODITIES (PRACTICAL) 2 CREDITS

1. Detection of starch, sucrose, sucrose, formalin, boric acid, and urea in milk.
2. Detection of urea in puffed rice.
3. Detection of Vanaspati in Ghee/Butter.
4. Detection of Khesari flour in besan.

FNT-A-DSE-A-5-1-P: PUBLIC HEALTH (PRACTICAL) 2 CREDITS

1. Preparation of 3 audio visual aids like charts, posters, models related to health and nutrition education.
2. Formulation and preparation of low cost and medium cost nutritious/ supplementary recipe.
3. Field visit(health centre, immunization centre, ICDS, MCH centre, NGOs etc.).

FNT-A-DSE-A-5-2-Th: MUSHROOM CULTURE 4 CREDITS

1 Definition and characteristics of mushroom.

2 Morphology and life cycle of Mushroom.

3 Identification and classification of mushroom

4 Nutritional and medicinal value of edible mushrooms; poisonous mushrooms

5 Types of edible mushrooms available in India- *Volvariella volvacea, Pleurotus citrinopileatus, Agaricus bisporus.*

6 Process of mushroom cultivation.

7 Storage and nutrition: short term storage (Refrigeration- upto 24 hours), long term storage (canning, pickles, papads), drying, storage in salt solutions.

FNT-A- DSE- A-5-2-P: MUSHROOM CULTURE(PRACTICAL) 2 CREDITS

1 Visit to Mushroom Culture Centers/ Farms for:

Process involved in mushroom cultivation
Types and varieties of mushroom
Visual Identification of edible and poisonous mushroom Marketing

2 Different Food preparation from mushroom

FNTA-DSE- A-6-3-Th : DIET COUNSELING AND PATIENT CARE 4 CREDITS

1. Introduction to term Dietician**:** Definition of Dietician , Difference between registered dietician & Nutrition
2. Role of dietician in hospital **:** work area of hospital dietician, role of dietician in hospital
3. Role of dietician in community :- work area of community dietician, role of community dietician

4. Introduction to Nutrition Care Process: Definition of Nutrition Care Process .Steps of Nutrition Care Process

5. Nutrition Assessment:-Definition , Nutrition assessment component, Critical thinking

6. Nutrition Diagnosis: nutrition diagnosis domain:- intake, clinical, behavioral – environmental

7. Nutrition diagnosis component• nutrition vs. medical diagnosis

8. Nutrition Interventions**:** Definition and objectives

9. Nutrition Monitoring & Evaluation **:** Definition, Nutrition monitoring & evaluation components, nutrition goals & objectives. Evaluation of nutrition care

FNT-A-DSE- A-6-3-P: DIET COUNSELING AND PATIENT CARE (PRACTICAL) 2CREDITS

Visit and training to hospitals/nursing homes for 7-15 days :

1 Taking Case history and study
2 Routine Hospital diet
3 Distribution of food from kitchen to individual patient with specific diet. 4 Dietary management of patient in different diseases and diet chart for the particular patient.
5 Role of dietitian /nutritionist in diet counselling

FNT-A-DSE- A-6-4-Th: GERIATRIC NUTRITION 4 CREDITS

1. Definition of ageing, senescence, old age or aged people, gerontology, geriatrics, and Geriatric nutrition. Classification of old population.
2 .Physiological and biochemical changes during old age.
3. Assessment of nutritional status of older adults.
4. Nutritional requirements and general dietary guidelines for elderly .
5. Major nutritional and health problems during old age.

FNT-A-DSE- A-6-4-P: GERIATRIC NUTRITION(PRACTICAL) 2 CREDITS

1. Visit to old- age homes.

2. Preparation of dishes suitable for older person- soft,semisolid and easily digestible balanced diet.

FNT-A-DSE-B-5-1-Th: THEORIES OF HUMAN DEVELOPMENT 4 CREDITS

BUDGE BUDGE COLLEGE

ACADEMIC SESSION: 2023-2024
B.Sc. FOOD AND NUTRITION

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year:

Serial No.	Registration Number	Roll Number	Name	I. Course Name and Project Tittle	Supervisor	II. Course Name and Project Tittle	Supervisor
1	561-1211-0308-21	213561-11-0012	Barsa Khamaru	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
2	561-1211-0310-21	213561-11-0013	Anisha Khatun	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
3	561-1211-0311-21	213561-11-0014	Rupsa Ghosh	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
4	561-1211-0312-21	213561-11-0015	Mahek Shaw	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
5	561-1211-0315-21	213561-11-0016	Sreemoyee Sengupta	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal

Serial No.	Registration Number	Roll Number	Name	I. Course Name and Project Tittle	Supervisor	II. Course Name and Project Tittle	Supervisor
6	561-1211-0317-21	213561-11-0017	Piyasa Ghosh	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
7	561-1211-0318-21	213561-11-0018	Nishat Sekh	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
8	561-1211-0319-21	213561-11-0019	Saptadipa Hazra	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
9	561-1211-0320-21	213561-11-0020	Sahina Khatun	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
10	561-1211-0321-21	213561-11-0021	Sneha Ghosh	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
11	561-1211-0322-21	213561-11-0022	Srijita Das	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal

Serial No.	Registration Number	Roll Number	Name	I. Course Name and Project Tittle	Supervisor	II. Course Name and Project Tittle	Supervisor
12	561-1214-0316-21	213561-11-0044	Rimita Pramanick	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
13	561-1215-0313-21	213561-11-0049	Monija Mollick	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
14	561-1212-1166-21	213561-11-0051	Priya Mondal	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
15	561-1212-1230-21	213561-11-0053	Trisita Mondal	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal
16	561-1115-0309-21	213561-21-0009	Ashik Ikbal Molla	(DSE-A-5-1-P) Public Health; Visit to ICDS Centre	Smita Sahu	(DSE A-6-4-P) Geriatric Nutrition, Assessment of nutritional status of an elderly person	Dr.Shruti Agrawal

Serial No.	Registration Number	Roll Number	Name	III. Course Name and Project Tittle	Supervisor
1	561-1211-0278-22	223561-11-0008	Mousumi Nath	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
2	561-1211-0299-22	223561-11-0016	Shreya Mondal	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
3	561-1211-0300-22	223561-11-0017	Sneha Samui	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
4	561-1211-0301-22	223561-11-0018	Indrani Bhandari	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
5	561-1211-0303-22	223561-11-0019	Sneha Roy	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
6	561-1211-0305-22	223561-11-0020	Pritisha Addhya	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
7	561-1211-0307-22	223561-11-0021	Sneha Das	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
8	561-1212-0302-22	223561-11-0039	Debolina Santra	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal

Serial No.	Registration Number	Roll Number	Name	III. Course Name and Project Tittle	Supervisor
9	561-1212-0308-22	223561-11-0040	Bristi Naskar	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
10	561-1212-0310-22	223561-11-0041	Ananya Naskar	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
11	561-1214-0306-22	223561-11-0049	Tuhina Sepai	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
12	561-1214-0311-22	223561-11-0050	Shraya Adhikary	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
13	561-1215-0304-22	223561-11-0055	Sannafa Perveen	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal
14	561-1215-0309-22	223561-11-0056	Sneha Khatoon	(CC-3-6-P) Community Nutrition, Visit to ICDS Centre	Dr.Shruti Agrawal

GPS Map Camera
Google
Maheshtala, West Bengal, India
3, Deshbandhu Chittaranjan Das Rd, Shyampur, Budge Budge, Maheshtala, West Bengal
700137, India
Lat 22.488442°
Long 88.190257°
05/01/24 10:35 AM GMT +05:30

UNIVERSITY OF CALCUTTA

Registration No. :⇒ 561-1214-0311-22.
Roll No. :⇒ 223561-11-0050.
B.Sc. SEMESTER-III (HONOURS)
Subject :⇒ FOOD AND NUTRITION.
Paper :⇒ CC6 (COMMUNITY NUTRITION)

DATE | PAGE NO. | EXPT. NO.

INDEX

Sl. No.	Topic	Page No.	Date	Signature
1.	Introduction to community	1-2	9/10/23	SA 12/10/23
2.	Anthropometric Measurement of infants weight, height, chest circumference, MUAC, Underweight, stunting, wasting, overweight	3-10	9/10/23	
3.	Nutritional Assessment comparison with norms and interpretation • Weight for age • Height for age • Weight for height • MUAC	11-30	12/10/23	SA 31/10/23 Good!
4.	Body Mass Index (BMI)	31-36	31/10/23	SA 4/11/23
5.	Waist-Hip-Ratio (WHR)	37-40	31/10/23	
6.	Growth chart and plotting	41-45	4/11/23	SA 23/11/23
7.	Clinical assessment and signs of nutrient deficiencies of PEM, Vitamin A and Anaemia	46-49	23/11/23	SA 2/12/23
8.	Diet survey – 24 hours dietary recall method (3 days)	50-62	2/12/23	SA 5/1/24
9.	Integrated Child Development services scheme (ICDS)	63-67	5/1/24	SA 15/1/24

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DATE 5/1/24 PAGE NO. 63 EXPT. NO.

ICDS (Integrated Child Development Services Scheme) Visit :=

Date of visit : 05/01/2024.

Teacher Accompanied: Dr. Shruti Agrawal.

Address: ICDS centre, Budge Budge,
South 24 Parganas
Kol - 700137.

INTEGRATED CHILD DEVELOPMENT SERVICES SCHEME (ICDS)

The Integrated Child Development Services (ICDS) Scheme is the country's most comprehensive and multi-dimensional Programme.

The ICDS Scheme (one of world's largest and most unique programme for early child development) was launched on 2nd October 1975 under the 5th Five year plan and in pursuance of the National policy for children in 33 experimental blocks.

The ICDS is the foremost symbol of India's commitment to her children; India's response to the challenge of providing preschool education on one hand and breaking the vicious cycle of malnutrition, morbidity, reduced learning capacity and mortality on the other.

Objectives of ICDS :- The objectives ICDS scheme are —

- to improve the nutritional and health status of in the age group 0 to 6 years.
- to lay the foundations for proper psychological, physical and social development of the child.
- to reduce the incidence of mortality, morbidity, malnutrition and school drop out.
- to acheive effective co-ordination of policy and implementation amongst the various departments to promote child development, and
- to enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.

Beneficiares :-

- Children below six years.
- Expectant and Nursing mothers.
- Adolescent girls.
- Women in the age group 15 to 45 years.

LOKENATH

ICDS SUPPLEMENTARY FOODS RECOMMENDATION		
Beneficiaries	Nutritional contribution	
	Energy (kcal)	Protein (g)
Children (0 to 3 years) (3 to 6 years)	500	12 to 15
Severely malnourished children (6 months to 72 months)	800	20 to 25
Pregnant woman and nursing mothers / adolescent girls (Under KSY)	600	18 to 20

ICDS MEAL COST ALLOCATED TO BENEFICIARIES	
Beneficiary	Cost of supplementary meal
Child (6 to 72 months)	Rs. 8.00 per child per day
Child (6 to 72 months) Severely malnourished	Rs. 12.00 per child per day
Pregnant and nursing woman	Rs. 9.50 per beneficiary per day

DATE | PAGE NO. 66 | EXPT. NO.

Programme Components :

The package of services provided by ICDS scheme includes :

- Supplementary nutrition : The supplementary nutrition is given to children below 6 years of age and pregnant and nursing mothers from low income families. The provision of supplementary nutrition includes supplementary feeding and distribution of nutrient supplements.

LOKENATH®

Age	Dose of Vitamin - A
Children (6 to 11 months)	One dose of 1,00,000 I.U of vitamin A orally (measles immunization is a good to give a routine dose).
Children (1 to 5 years)	One dose of 2,00,000 I.U. of vitamin - A orally every six months.

Beneficiary	Dose	Quantity
Pregnant woman	1 Big tablet (each tablet containing 100 mg of elemental iron and 0.5 mg (500 µg) folic acid	1 tablet / day for 100 days (In 3rd trimester of pregnancy)
Children (1 to 5 years)	1 small tablet (each tablet containing 20 mg elemental iron and 0.1 mg (100 µg) folic acid	1 tablet / day for 100 days every year.

DATE 5/1/24 PAGE NO. 67 EXPT. NO.

- **Vitamin-A supplementation:** At the AWC children are administered vitamin-A at periodic intervals according to their age to prevent vitamin A deficiency.
- **Iron and folic supplementation:** All pregnant women and children are given Iron and Folic Acid (IFA) tablets to prevent anaemia as per the following recommended dose irrespective of their haemoglobin status.

- Growth monitoring
- Health check-up
- Referral services
- Immunization
- Early childhood care and non-formal pre-school education.
- Health and nutrition education.
- Supportive services.
- Adolescent girls' scheme.

Avvaiyar Nagar College for Women
Dept. of Food & Nutrition
EXAMINED

B.Sc SEMESTER-V(H) PRACTICAL EXAMINATION-2023

ROLL NO- 213561-11-0013
REGISTRATION NO- 561-1211-0310-21
SUBJECT- FOOD & NUTRITION (H)
PAPER- PUBLIC HEALTH (DSE-A1)

Page No.
Date:

SL NO	TOPIC	DATE	PAGE NO	TEACHER'S SIGNATURE
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2.	Preparation of low cost Supplementary Foods:		10-29	
a.	Wheat Gram Porridge	24/11/23	10-11	
b.	Rice Porridge		12-13	
c.	Bajra Infants foods		14-15	01/12/2023
d.	Ragina		16-17	
e.	Sajina	24/11/23	18-19	
f.	Barfi	1/12/23	20-21	
g.	Wheat gram laddu		22-23	
h.	Wheat Payasam		24-25	05/01/2024
i.	Groundnut Biscuits		26-27	
j.	Bengal Sesame Biscuits	1/12/23	28-29	
3.	Field Visit → visit to ICDS Centre	5/1/24	30-36	10/01/2024

Teacher's Signature .....

INTEGRATED CHILD DEVELOPMENT SERVICE SCHEME (ICDS)

Date of Visit: 5/1/24

Teacher Accompanied: Shruti Agrawal.
Smita Sahu.

Address: ICDS centre (149)
Budge Budge, South 24 Parganas,
West Bengal - 700137

সত্যমেব জয়তে

পশ্চিমবঙ্গ সরকার

বজ বজ - ১

সুসংহত শিশু বিকাশ সেবা প্রকল্প

দক্ষিণ ২৪ পরগণা

অঙ্গনওয়াড়ী কেন্দ্র নং ও নাম - ১৪৯, সুভাষ উদ্যান, ওয়াড নং - ১৩

পৌরসভা - বজবজ

INTEGRATED CHILD DEVELOPMENT SERVICE SCHEME (ICDS):-

The Integrated Child Development Service Scheme (ICDS) is the country's most comprehensive and multi-dimensitional programme The ICDS was launched on 2nd october 1975 under 5th five-year plan and in pursuance of the National Policy for children in 33 experimental blocks.

The ICDS is the foremost symbol of India's commitment to her children. India's response to the challenge of providing pre-school education on one hand and breaking the viscious cycle of malnutrition, morbidity reduced learning capacity and ~~morbi~~ mortality on the other.

• Objectives:-

The objectives of the Scheme are-

i) to improve the nutritional and health status of children in the age group 0-6 years.

ii) to lay the foundation for proper psychological, physical and social development

of the child.

iii) to reduce the incidence of mortality, morbidity, malnutrition and school dropout.

iv) to achieve effective co-ordination of policy and implementation amongst the various departments to promote child development and

iv) To enchance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.

• Beneficiaries :-

i) children below six years
ii) Expectant and nursing mothers
iii) Adolescent girls
iv) Women in the age group of 15 to 45 years.

- One Packet of this nutritious food is supplied from the ICDS centre to every child for a month.

• Programe Components :-

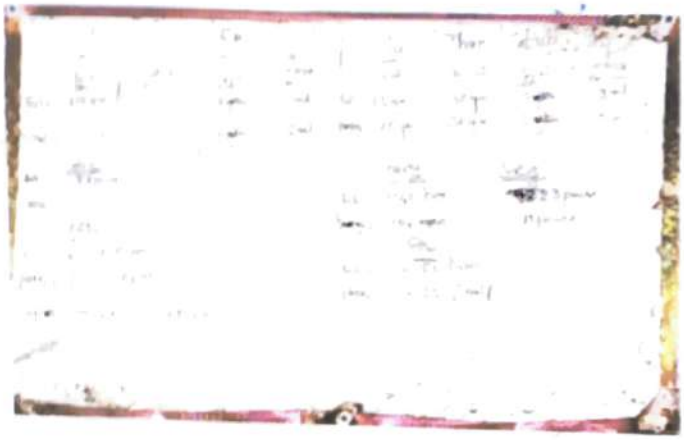
The package of services provided by ICDS scheme include-

i) Supplementary Nutrition :-

Supplementary Nutrition Programme is provided to children below 6 year of age, pregnant and nursing mothers and adolescent girls of low income group to improve health and nutritional status. The provision of supplementary nutrition includes supplementary feeding and distribution of nutrition supplements. The scheme is implemented through the network of Anganwadi workers under the ICDS.

Nutritional Contribution Of Supplementary Foods Provided by ICDS

Beneficiaries	Energy (Kcal)	Protein (gm)
Children (6 months to 72 months)	500	12-15
Severely malnourished children (6 months-72 months)	800	20-25
Pregnant and lactating mothers/adolescent girl (under KSY)	600	18-20



Cost of Supplementary Nutrition Provided at Anganwadis

Beneficiaries	Cost of supplementary Meal (Rs./day/beneficiary)
Children (6-72 months)	8.00
Children (6-72 months) Severely Malnourished	12.00
Pregnant and nursing mothers	9.50

ii) Vitamin A Supplementation :-

At the AWC children are administered vitamin A at periodic intervals according to their age to prevent vitamin A deficiency.

Age	Dose of vitamin A
Children (6-11 months)	One dose of 1,00,000 IU of vitamin A orally (measles immunization is good to give a routine dose)
children (1-5 years)	One dose of 2,00,000 IU of vitamin A orally every six months

Teacher's Signature .....

Maheshtala, West Bengal, India

iii) Iron and Folic Acid Supplementation:-

All the pregnant women and children are given Iron and Folic acid (IFA) tablets to prevent anaemia as per the following recommended dose irrespective of their haemoglobin Status.

Beneficiaries	Dose	Quantity
Pregnant women	1 Big tablet containing 100 mg elemental iron and 500 microgram Folic acid	1 tablet per day for 100 days (in 3rd trimester of pregnancy)
Children (1-5 years)	1 small tablet containing 20 mg elemental iron and 100 microgram Folic acid.	1 tablet per day for 100 days.

iv) Growth Monitoring
v) Pre-School non-formal education
vi) Nutrition & health education
vii) Immunization
viii) Health check-up and
ix) Referral Services

Teacher's Signature

GPS Map Camera

36
5/1/24

Observation:

In our visit to the ICDS Centre, we observed that Children sat in a room were their meal of the day was being prepared on a gas burner. The jute Sacks were stacked in that same room. This Sacks mostly contained rice & pulses supplied by the government. There was not sufficient place for children to play. Meal for the day Consist of only boiled rice, potato and egg which was devoid of any leafy vegetables and may be inadequate in micronutrients

Conclusion:

The ICDS has a huge potential as a platform to provide comprehensive child and maternal services. This visit to the ICDS centre or anganwadi was beneficial for us as we got the opportunity to watch implementation of the low cost supplementary feeding programme where several low cost food ingredients are used to prepare the nutrient dense foods for children and mothers.

10/01/2024

EXAMINED
21/2/24

B.Sc Sem-III/V (Hons./Gen) Examination 2023 (CU)
Dept. of Food and Nutrition
Behala College

B. Sc (HONOURS) Semester VI (Practical) Examination

University Roll No.- 213561-11-0015

University Registration No.- 561-1211-0312-21

Paper- DSE-A4 (Geriatric Nutrition)

Subject- Food & Nutrition

Expt. No.

CONTENT

Page No.
Date.

SL. NO.	TOPICS	DATE	PAGE NO.	SIGNATURE
1.	Nutritional Requirement & Preparation Of Suitable Dishes For Elderly Persons:			
	• Nutritional needs & whole day menu planning for an elderly man.	27/3/24	1-12	02/04/24
	• Preparation of whole day menu & semi soft, easily digestable dishes for elderly person.	2/4/24	13-50	20/04/24
	• Whole day menu planning for elderly persons suffering from swallowing difficulties:	2/4/24	51	
	• —Do— Preparation.	20/4/24	52-54	17/05/24
	• Mini nutritional Assessment & its interpretation.	18/5/24	55-69	14/06/24
	• Diet survey & its interpretation.	18/5/24	70-73	14/06/24

Teacher's Signature .....

Mini Nutritional Assessment
MNA®

Last name: Shaw	First name: Pratap		
Sex: Male	Age: 80	Weight, kg: 53	Height, cm: 156	Date: 24/05/24

Complete the screen by filling in the boxes with the appropriate numbers.
Add the numbers for the screen. If score is 11 or less, continue with the assessment to gain a Malnutrition Indicator Score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake — [1]

B Weight loss during the last 3 months
0 = weight loss greater than 3kg (6.6lbs)
1 = does not know
2 = weight loss between 1 and 3kg (2.2 and 6.6 lbs)
3 = no weight loss — [1]

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out — [2]

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no — [2]

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems — [2]

F Body Mass Index (BMI) = weight in kg / (height in m)^2 [ ]
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater — [2]

Screening score (subtotal max. 14 points) — [1][0]
12-14 points: [ ] Normal nutritional status
8-11 points: [✓] At risk of malnutrition
0-7 points: [ ] Malnourished
For a more in-depth assessment, continue with questions G-R

Assessment

G Lives independently (not in nursing home or hospital)
1 = yes 0 = no — [0]

H Takes more than 3 prescription drugs per day
0 = yes 1 = no — [0]

I Pressure sores or skin ulcers
0 = yes 1 = no — [1]

J How many full meals does the patient eat daily?
0 = 1 meal
1 = 2 meals
2 = 3 meals — [2]

K Selected consumption markers for protein intake
- At least one serving of dairy products (milk, cheese, yoghurt) per day — yes [ ] no [ ]
- Two or more servings of legumes or eggs per week — yes [✓] no [ ]
- Meat, fish or poultry every day — yes [ ] no [ ]

0.0 = if 0 or 1 yes
0.5 = if 2 yes
1.0 = if 3 yes — [0].[5]

L Consumes two or more servings of fruit or vegetables per day?
0 = no 1 = yes — [1]

M How much fluid (water, juice, coffee, tea, milk...) is consumed per day?
0.0 = less than 3 cups
0.5 = 3 to 5 cups
1.0 = more than 5 cups — [1].[0]

N Mode of feeding
0 = unable to eat without assistance
1 = self-fed with some difficulty
2 = self-fed without any problem — [ ]

O Self view of nutritional status
0 = views self as being malnourished
1 = is uncertain of nutritional state
2 = views self as having no nutritional problem — [1]

P In comparison with other people of the same age, how does the patient consider his / her health status?
0.0 = not as good
0.5 = does not know
1.0 = as good
2.0 = better — [1].[0]

Q Mid-arm circumference (MAC) in cm
0.0 = MAC less than 21
0.5 = MAC 21 to 22
1.0 = MAC greater than 22 — [1].[0]

R Calf circumference (CC) in cm
0 = CC less than 31
1 = CC 31 or greater — [1]

Assessment (max. 16 points) — [1][1].[5]
Screening score — [1][0].[ ]
Total Assessment (max. 30 points) — [2][1].[5]

Malnutrition Indicator Score

24 to 30 points	[ ]	Normal nutritional status
17 to 23.5 points	[✓]	At risk of malnutrition
Less than 17 points	[ ]	Malnourished

References
1. Vellas B, Villars H, Abellan G, *et al.* Overview of the MNA® - Its History and Challenges. *J Nutr Health Aging.* 2006; **10**:456-465.
2. Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF). *J. Geront.* 2001; **56A**: M366-377
3. Guigoz Y. The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us? *J Nutr Health Aging.* 2006; **10**:466-487.

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For more information: www.mna-elderly.com

INTERPEATATION OF MNA

Mini Nutritional Assessment (MNA) is a screening tool to help identify elderly persons who are malnourished or at risk of malnutrition.

The full MNA is the original version of the MNA & takes 10-15 minutes to complete. The revised MNA-SF is a short form of the MNA that takes less than 5 minutes to complete. It retains the accuracy & validity of the MNA. Currently, the MNA-SF is the preffered from of the MNA for clinical practices in community, hospital, or long term care settings, due to its ease of used & practicality.

Recommended intervals for screening with the MNA are anually in the community, every three months in institutional settings or in persons who have been identified as malnourished or at risk for malnutrition, and whenever a change in clinical condition occurs. The MNA was developed by Nestle and leading international geriatricians

The MNA proforma consists of two groups. First group is screening (A-F) and second group is assessment (G-R). The maximum points for screening is 14 whereas maximum points for assessment is 16. If the person score is between 24-30, it indicates normal nutritional status, score between 17-23.5 indicates risk of malnutrition & score less than 17 shows malnutrition among elderly.

In this survey, it was found that the screening score was 10 which indicates at risk of malnutrition.

The assessment score was 11.5 which indicates malnourishment of the person.

Thus total assessment score is 21.5 & the elderly person is at risk of malnutrition.

11/06/2024

DIET SURVEY BY 24 HOUR RECALL METHOD (ORAL QUESTIONNAIRE METHOD)

A) GENERAL INFORMATION OF THE SUBJECT

Household No.....; Name of the Respondent... Pratap Shaw**.....**
VillageVivekanonda Pally**..District**South 24 Parganas**..Address**West Pitkhali Mondal Para**.....Date of Visit.**26/4/24**

Name of the Respondent	Pratap Shaw
Age	80
Sex	Male
Religion	Hindu
Caste	General
Activity Type	Sedentary Worker - S.W
Educational Level	Class 2
Occupation	not applicable
Monthly Income(Rs)	dependent on son.

Activity Type : a) Sedentary worker-S.W
b) Moderate Worker-M.W
c) Heavy Worker-H.W

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B) SCHEDULE FOR DIET SURVEY

MEAL PATTERN (Veg/Non-Veg): **FOOD ALLERGY (Yes/No):**

DIETARY PATTERN:

(Foods to be consumed by the subject on the day of survey)

MEAL TIME	FOOD CONSUMED	HOUSEHOLD MEASUREMENT (BOWL/CUP/PLATE/SPOON) AMOUNT	APPROXIMATE INDIVIDUAL INTAKE OF COOKED QUANTITY (gm/ml)	APPROXIMATE INDIVIDUAL INTAKE OF RAW QUANTITY (gm/ml)
EARLY MORNING	• Tea (without sugar) • Biscuit	1 cup 2 pieces		•Milk - 180ml •Biscuit - 15gm
BREAKFAST	• Upma • Curd	1 bowl 1 small bowl		•Semolina - 30gm Carrot - 25gm Beans - 10gm Oil - 5gm •Curd - 50gm
LUNCH	•Rice (Parboiled) • Dal (Lentil) • Fish Curry (Rohu)	1 bowl 1 bowl 1 bowl		•Rice - 60gm • Dal - 30gm Tomato - 20gm • Fish - 50gm Oil - 10gm Potato - 30gm
EVENING SNACKS	•Tea (without sugar) • Biscuit	1 cup 2 pieces		• Tea - 100 ml (Milk) • Biscuit - 15gm
DINNER	•Roti • Bottle gourd Curry	2 pieces 1 bowl		• Whole wheat flour - 60gm • Bottle gourd - 70gm Potato - 50gm Oil - 5ml Tomato - 10gm.
OTHER MEAL(IF ANY)				

INTAKE OF FOOD IN TERMS OF FOOD GROUP (24 HOUR RECALL METHOD)

[A] CEREALS:

Name of the food stuffs	Intake of food (gm) as per meal timing						Total
	Early Morning	Breakfast	Lunch	Evening Snacks	Dinner	Other meal (if any)	
Rice (Parboiled) Milled			60				60
Rice (Raw) Milled							
Wheat Flour (Whole)					60		60
Wheat Flour/Maida (Refined)	15			15			30
Puffed Rice							
Flaked Rice							
Suji(Semolina)		30					30
Bread(white/Brown)							
Semolina							
Others(specify)							
	TOTAL CEREAL(gm)						180

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[B]PULSES & LEGUMES:

Name of the food stuffs	Intake of food (gm) as per meal timing						Total
	Early Morning	Breakfast	Lunch	Evening Snacks	Dinner	Other meal (if any)	
Green Gram							
Bengal Gram							
Lentil			30				30
Black gram							
Soyabean							
Others(specify)							
	Total pulses & legumes (gm)						30

[C] ROOT VEGETABLES:

Name of the food stuffs	Intake of food (gm) as per meal timing						Total
	Early Morning	Breakfast	Lunch	Evening Snacks	Dinner	Other meal (if any)	
Potato			30		50		80
Radish							

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Colocasia / Yam							
Onion							
Carrot		25					25
Others(specify)							
Total Root vegetable (gm)							105

[D] LEAFY VEGETABLES:

Name of the food stuffs	**Intake of food (gm) as per meal timing**						**Total**
	Early Morning	**Breakfast**	**Lunch**	**Evening Snacks**	**Dinner**	**Other meal (if any)**	
Cabbage							
Spinach							
Amaranth							
Kalmi							
Pumpkin Leaves							
Colocasia Leaves							
Others(Specify)							
Total Leafy Vegetables(gm)							

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[E] OTHER VEGETABLES:

Name of the food stuffs	Intake of food (gm) as per meal timing						Total
	Early Morning	Breakfast	Lunch	Evening Snacks	Dinner	Other meal (if any)	
Brinjal							
Cauliflower							
Papaya(Green)							
Beans		10					10
Pumpkin							
Tomato			20		10		30
Potol (Parwar)							
Ladies Finger							
Drumstick							
Plantain(green)							
Bottle gourd							
Bitter gourd					70		70
Cucumber							
Others(specify)							
Total Other Vegetables (gm)							110

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[F] FATS AND OILS & NUTS:

Name of the food stuffs	Intake of food (gm) as per meal timing						Total
	Early Morning	Breakfast	Lunch	Evening Snacks	Dinner	Other meal (if any)	
Mustard Oil		5	10		5		20
Groundnut Oil							
Butter							
Ghee							
Groundnut							
Cashew nuts							
Gingely seeds							
Others(specific)							
	Total Fats & Oils(gm/ml)						20

[G] MILK AND MILK PRODUCTS:

Name of the food stuffs	Intake of food (gm) as per meal timing						Total
	Early Morning	Breakfast	Lunch	Evening Snacks	Dinner	Other meal (if any)	

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Cow/ Buffalo Milk	100			100			200
Standard Milk							
Skimmed Milk Powder							
Curd		50					50
Channa							
Others							
	Total Milk & Milk Products (gm/ml)						250

[H] FLESH FOODS:

Name of the food stuffs	**Intake of food (gm) as per meal timing**						**Total**
	Early Morning	**Breakfast**	**Lunch**	**Evening Snacks**	**Dinner**	**Other meal (if any)**	
Egg(Duck/Hen)							
Fish			50				50
Meat							
Others(Specify)							
	Total Flesh foods (gm)						50

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[I] SUGAR AND JAGGERY:

Name of the food stuffs	Intake of food (gm) as per meal timing						Total
	Early Morning	Breakfast	Lunch	Evening Snacks	Dinner	Other meal (if any)	
Sugar							
Jaggery(specify)							
Others							
	Total Sugar & Jaggery (gm)						

[J] FRUITS:

Name of the food stuffs	Intake of food (gm) as per meal timing						Total
	Early Morning	Breakfast	Lunch	Evening Snacks	Dinner	Other meal (if any)	
Guava							
Ripe Banana							
Ripe Papaya							
Ripe Mango							
Orange							

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Sweet lime(Musambi)							
Others(Specify)							
				Total Fruits (gm)			

CONSUMPTION OF DIFFERENT NUTRIENTS BY THE INDIVIDUAL

Meal Pattern	Food Consumed	Energy (kcal)	Carbohydrate (gm)	Protein (gm)	Fat(gm)	Calcium (mg)	Iron (mg)	Dietary Fibre(gm)
Early Morning	• Tea (without sugar) • Biscuit	99.42	15.38	3.64	2.9	120	0.2	—
Breakfast	• Upma • Curd	194	27.04	5.06	7.3	104.3	0.891	0.54
Lunch	• Rice (Par boiled) • Dal (Lentil) • Fish curry (Rohu)	478.5	74.152	20.16	11.184	336.43	3.52	0.466
Evening Snacks	• Tea (without sugar) • Biscuit	99.42	15.38	3.64	2.9	120	0.2	—
Dinner	• Roti • Bottle gourd curry	308.5	55.05	8.29	6.16	52.6	3.56	1.84
Other meal(if any)								
Total		1179.84	187.002	40.79	30.44	733.33	8.371	2.846

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RESULTS
(RECALL METHOD)
(Nutrient wise)

NUTRIENTS	REQUIREMENT (as per RDA)	CONSUMPTION	DEFICIENCY (gm)	DEFICIENCY (%)	EXCESS (gm)	DEFICIENCY (%)
Energy (kcal)	1700	1179.84	520.16	30.59%		
Carbohydrate (gm)	255	187.002	67.99	26.66%		
Protein(gm)	54.0 (PDCAAS 85%) (63.52)	40.79	22.73	42.09%		
Fat(gm)	56.67	30.44	26.23	46.28%		
Iron(mg)	19	8.371	10.62	55.89%		
Calcium(mg)	1200	733.33	466.67	38.8%		
Dietary Fibre(gm)	30	2.846	28.154	93%		

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11/6/24

DIET SURVEY & ITS INTERPRETATION

The diet survey was done using 24 hour recall method.

It was found that the energy intake was 1179.84 kcal which was 30.59% less than the recommended amount. (EAR).

It was found that the carbohydrate intake was 187.002 gm which was 26.66% less than the recommended amount.

It was found that the protein intake was 40.79 gm which was 42.09% less than the recommended RDA.

It was found that the fat intake was 30.44 gm which was 46.28% less than the recommended amount

It was found that the iron intake was which was 55.89% less than the recommended RDA.

It was found that the calcium intake was 733.33 mg which was 38.8% less than the recommended RDA.

It was found that the Dietary fibre intake was 2.846 gm which was 93% less than the recommended RDA.

It can be concluded that the elderly person dietary intake is various macronutrients & micronutrients deficiency.

- The following suggestion can be given to the elderly person for the improvement in nutritional status:

1) As per the result of the survey the amount of energy taken by the elderly person was deficient,

hence the energy source was increased by carbohydrate consumption. Foods must be soft, easily chewable & easily digestable. Reduction in physical activity which affects the energy needs

2) The amount of carbohydrate (187gm) taken by the elderly person was deficient. It can be improved by including complex carbohydrate because it is better than simple carbohydrate. Complex carbohydrate have low GI index than the simple sugar. So, it can be enhanced by including foods like whole wheat flour, Brown bread, millets etc. Complex carbohydrate does not directly increased the glucose level like simple sugar. Sugar should be take in low amount.

3) Protein is important for building body mass. Deficiency of protein results in oedema, anaemia, weakness, fatigue etc. To recover this deficiency, adequate amount of protein rich foods such as milk, eggs & pulses can be included. The serum albumin level is the most reliable indicator of protein. So it should be checked to ensure proper level of protein in the body.

4) Fat from plant source (soyabean oil, rice oil) is included in daily diet proper amount also useful for stop fat deficiency. Sea fish like (salmon & Sardines) are also rich in required amount of fat which helpful in our body. It also helps in lowering the LDL

'bad cholesterol' & increased HDL 'Good cholesterol'.

So, appropriate amount of fat is necessary for better health as it is required for energy metabolism of other nutrient & proper absorbtion of fat soluble vitamins.

5) The iron deficiency is seen in the elderly person is due to inadequate iron intake, blood loss due to chronic disease etc. Vit-C deficiency may also impair iron absorbtion. Iron intake should be adequate to prevent anaemia. Consumption of liver once or twice a week, green leafy vegetables which are good source of iron like amaranth, whole grains, curry leaves & use of iron fortified salt will be helpful.

6) Calcium is important for maintaining proper bone, health & teeth.

Calcium rich food items like milk, fish with bone, calcium rich fruits such as coconut, Banana which help to delay tooth loss and lower the risk of osteopenia (pain in bone) & osteoporosis (Porous like structure in bone.

7) Elderly people have chances to develop constipation and thus dietary fibres are important in daily diet. Soluble fibre is better than insoluble fibre. Soluble fibre has a good water holding capacity & helps in bulk formation & enhances bowel movement & also lowering the risk of constipation. It has a lower GI Index so

it has very important role in our body function.

Excess of fibre may reduce the absorbtion of iron & certain trace elements. Whole wheat flours, fruits and some vegetables have a good source of dietary fibre.

By including this type of food items in the diet increased the amount of dietary fibre.

M. Gow 19/9/24

EXAMINED

Rajji Nagar College for Women
Dept. of Food & Nurition

11/06/24

B.A. & B.Sc. Geography Honours

Sl. No.	Content
1.	Syllabus Extract indicating field work and project work
2.	List of students along with the details of title, place of work, duration etc. for the latest academic year **(2023-2024)**
3.	Permission letter for field work from the competent authority
4.	Objective and Outcome of field work
5.	Sample photographs of the field work
6.	Sample field work completion certificate
7.	Sample Pages of Report of Project 1
8.	Sample Pages of Report of Project 2a Sample Pages of Report of Project 2b Sample Pages of Report of Project 2c Sample Pages of Report of Project 2d
9.	Sample poster project 3 (a, b, c, d.)

UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Paul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

CBCS Syllabus
for
Undergraduate Courses in Geography

TO BE EFFECTIVE FROM THE ACADEMIC SESSION 2018-19

University of Calcutta
May, 2018

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2.21 GEO-A-CC-5-11-TH – Research Methodology and Fieldwork 32
2.22 GEO-A-CC-5-11-P – Research Methodology and Fieldwork Lab 33
2.23 GEO-A-CC-5-12-TH – Remote Sensing, GIS and GNSS 35
2.24 GEO-A-CC-5-12-P – Remote Sensing, GIS and GNSS Lab 36
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1.4 Honours Course: Core Subjects

GEO-A-CC-1-**01**-TH/P – Geotectonics and Geomorphology

GEO-A-CC-1-**02**-TH/P – Cartographic Techniques

GEO-A-CC-2-**03**-TH/P – Human Geography

GEO-A-CC-2-**04**-TH/P – Cartograms, Thematic Mapping and Surveying

GEO-A-CC-3-**05**-TH/P – Climatology

GEO-A-CC-3-**06**-TH/P – Hydrology and Oceanography

GEO-A-CC-3-**07**-TH/P – Statistical Methods in Geography

GEO-A-CC-4-**08**-TH/P – Economic Geography

GEO-A-CC-4-**09**-TH/P – Regional Planning and Development

GEO-A-CC-4-**10**-TH/P – Soil and Biogeography

GEO-A-CC-5-**11**-TH/P – Research Methodology and Fieldwork

GEO-A-CC-5-**12**-TH/P – Remote Sensing, GIS and GNSS

GEO-A-CC-6-**13**-TH/P – Evolution of Geographical Thought

GEO-A-CC-6-**14**-TH/P – Disaster Management

1.5 Honours Course: Choices for Four Discipline Specific Electives [1]

GEO-A-DSE-A-5-**01**-TH/P – Fluvial Geomorphology

GEO-A-DSE-A-5-**02**-TH/P – Climate Change: Vulnerability and Adaptations

GEO-A-DSE-B-5-**05**-TH/P – Cultural and Settlement Geography

GEO-A-DSE-B-5-**06**-TH/P – Social Geography

GEO-A-DSE-A-6-**03**-TH/P – Environmental Issues in Geography

GEO-A-DSE-A-6-**04**-TH/P – Resource Geography

GEO-A-DSE-B-6-**07**-TH/P – Urban Geography

GEO-B-DSE-B-6-**08**-TH/P – Geography of India

1.6 Honours Course: Choices for Two Skill Enhancement Courses

GEO-A-SEC-A-3-**01**-TH – Coastal Management

GEO-A-SEC-A-3-**02**-TH – Tourism Management

GEO-A-SEC-B-4-**03**-TH – Rural Development

GEO-A-SEC-B-4-**04**-TH – Sustainable Development

1.7 General Course: Core Subjects

GEO-G-CC-1-**01**-TH/P – Physical Geography

GEO-G-CC-2-**02**-TH/P – Environmental Geography

GEO-G-CC-3-**03**-TH/P – Human Geography

GEO-G-CC-4-**04**-TH/P – Cartography

[1] Any two electives, one each from DSE-A and DSE-B, are to be chosen in each of Semesters-V and VI

CURRICULUM SCHEME

Semester	Course Type	Paper ID and Name	Credits	Marks Distribution *						Marks per Qn Type	
				Full Marks	Attendance	Internal Assessment	Theoretical Exam	Practical Exam		MCQ	Long-Answer Type
								Written	Project/Viva		
IV Marks: 500 Credits: 26	Core Course - VIII	GEO-A-CC-4-**08**-TH – Economic Geography	4	70	10	10	50	—	—	20	30
		GEO-A-CC-4-**08**-P – Economic Geography Lab	2	30	—	—	—	25	5	—	25
	Core Course - IX	GEO-A-CC-4-**09**-TH – Regional Planning and Development	4	70	10	10	50	—	—	20	30
		GEO-A-CC-4-**09**-P – Regional Planning and Development Lab	2	30	—	—	—	25	5	—	25
	Core Course - X	GEO-A-CC-4-**10**-TH – Soil and Biogeography	4	70	10	10	50	—	—	20	30
		GEO-A-CC-4-**10**-P – Soil and Biogeography Lab	2	30	—	—	—	25	5	—	25
	Skill Enhancement Course - II	GEO-A-SEC-B-4-**03**-TH – Rural Development / GEO-A-SEC-B-4-**04**-TH – Sustainable Development	2	100	10	10	80	—	—		
	Generic Elective - IV	TBD-TH	4/5	70/85							
		TBD-P/TU	2/1	30/15							
V Marks: 400 Credits: 24	Core Course - XI	GEO-A-CC-5-**11**-TH – Research Methodology and Fieldwork	4	70	10	10	50	—	—	20	30
		GEO-A-CC-5-**11**-P – Research Methodology and Fieldwork Lab	2	30	—	—	—	—	20+10	—	—
	Core Course - XII	GEO-A-CC-5-**12**-TH – Remote Sensing, GIS and GNSS	4	70	10	10	50	—	—	20	30
		GEO-A-CC-5-**12**-P – Remote Sensing, GIS and GNSS Lab	2	30	—	—	—	25	5	—	25
	Discipline Specific Elective - I	GEO-A-DSE-A-5-**01/02**-TH	4	70	10	10	50	—	—	20	30
		GEO-A-DSE-A-5-**01/02**-P	2	30	—	—	—	25	5	—	25
	Discipline Specific Elective - II	GEO-A-DSE-B-5-**05/06**-TH	4	70	10	10	50	—	—	20	30
		GEO-A-DSE-B-5-**05/06**-P	2	30	—	—	—	25	5	—	25
VI Marks: 400 Credits: 24	Core Course - XIII	GEO-A-CC-6-**13**-TH – Evolution of Geographical Thought	4	70	10	10	50	—	—	20	30
		GEO-A-CC-6-**13**-P – Evolution of Geographical Thought Lab	2	30	—	—	—	—	20+10	—	15
	Core Course - XIV	GEO-A-CC-6-**14**-TH – Disaster Management	4	70	10	10	50	—	—	20	30
		GEO-A-CC-6-**14**-P – Disaster Management Lab	2	30	—	—	—	—	20+10	—	—
	Discipline Specific Elective - III	GEO-A-DSE-A-6-**03/04**-TH	4	70	10	10	50	—	—	20	30
		GEO-A-DSE-A-6-**03/04**-P	2	30	—	—	—	25	5	—	25
	Discipline Specific Elective - IV	GEO-A-DSE-B-6-**07/08**-TH	4	70	10	10	50	—	—	20	30
		GEO-A-DSE-B-6-**07/08**-P	2	30	—	—	—	25	5	—	25

*Tutorials of 1 Credit will be conducted in case there is no practical component

2.22 GEO-A-CC-5-11-P – Research Methodology and Fieldwork Lab ✧ 30 Marks / 2 Credits

Every student needs to participate in fieldwork and prepare a field report according to the following guideline, failing which he/she will not be evaluated for GEO-A-CC-5-11-P.

1. Each student will prepare a report based on primary data collected from field survey and secondary data collected from different sources.
2. Students will select either one rural area (*mouza*) or an urban area (municipal ward) for the study, with the primary objective of evaluating the relation between physical and cultural landscape.
3. A specific problem or a special feature should be identified based on which, the study area will be selected.
4. The report should be handwritten in English on A4 size paper in candidate's own words within 5,000 words (Introductory Chapter: 1000 words; Physical Aspects: 1500 words; Socio-economic Aspects: 1500 words; Concluding Chapter: 500 words, approximately) excluding tables, photographs, maps, diagrams, references and appendices.
5. Photographs, maps and diagrams should not exceed 15 pages.
6. A copy of the bound report, duly signed by the concerned teacher, will be submitted during examination.
7. The field work and post-field work will include:
   a. Collection of primary data on physical aspects (relief and soil) of the study area. Students should use survey instruments like prismatic compass, dumpy level, Abney level or clinometer wherever necessary.
   b. Collection of soil samples from different land cover land use regions of the study area for determining pH and NPK values with help of a soil kit.
   c. Collection of socio economic data, at the household level (with the help of a questionnaire) in the selected study area.
   d. Plot to plot land use survey for preparation of a land use map, covering whole or part of the selected area.
   e. Visit to different organisations and departments for collection of secondary data.
   f. Any other survey relevant to the objective of the study.
8. The Field Report should contain the following sections (a–e).
   a. Introduction: Study area extent and space relations, reasons for selection of the study area on the basis of a specific problem or special feature, objectives, methods of data collection, analyses and presentation, sources of information, etc.
   b. Physical aspects: Lithology and geological structure, relief, slope, drainage, climate, soil, vegetation, environmental issues, proneness to natural hazards, etc.
   c. Socio-economic aspects:
      i. Population attributes: Number, sex ratio, literacy, occupational structure, ethnic and religious composition, language, per capita income, etc.
      ii. Settlement characteristics: Number of houses, building materials, number and size of rooms, amenities, etc.
      iii. Agriculture: General land use, crop-combination, use of fertiliser and irrigational facilities, production and marketing etc.
      iv. Other economic activities: Fishing, horticulture, brick-making, household and other industries, etc.

d. Conclusions: Relation between physical and cultural landscape. Evaluation of problems and prospects. General recommendations.

e. Bibliography.

9. The students will prepare (i) a chorochromatic land use land cover map on the basis of plot to plot survey; (ii) a profile of suitable length, surveyed and plotted, with different land use land cover superimposed on it.

10. All sections of the report should contain relevant maps, diagrams and photographs using primary and secondary data, clearly citing sources.

11. All surveys should pertain to the objective of the study. Surveys not relevant for establishing the relation between physical and cultural landscape should be avoided.

12. Marks division: 20 on report + 10 on viva-voce = 30

2.26 GEO-A-CC-6-13-P – Evolution of Geographical Thought Lab ✧ 30 Marks / 2 Credits

A laboratory notebook, comprising class assignments of topics 1 and 2, is to be prepared and submitted. The exercises are to be drawn in pencil with photocopied representation of source materials where necessary. All texts are to be handwritten.

1. Changing perception of maps of the world (Ptolemy, Ibn Batuta, Mercator)
2. Mapping voyages; Columbus, Vasco da Gama, Magellan, Thomas Cook
3. Group Presentation of five to ten students on any selected school of geographical thought (20 marks)
4. Viva-voce based on laboratory notebook on topics 1 and 2 (10 Marks)

References

Black, J. 2003. Visions of the World: A History of Maps, Mitchell Beazley.

Couper, P. 2015. A Student's Introduction to Geographical Thought: Theories, Philosophies, Methodologies, Sage.

Holt-Jensen, A. 2011. Geography: History and Concepts: A Student's Guide, Sage.

Whitfield, P. 2017. Charting the Oceans, British Library.

2.28 GEO-A-CC-6-14-P – Hazard Management Lab ✧ 30 Marks / 2 Credits

A Group Project Report is to be prepared and submitted based on any one case study among the following hazards from West Bengal, incorporating a preparedness plan, preferably in the vicinity of the candidates' institution / district:

1. Earthquake
2. Landslide
3. Land subsidence
4. Thunderstorm
5. Flood
6. Riverbank / Coastal erosion
7. Fire
8. Industrial accident
9. Road / Railway accident
10. Structural collapse
11. Environmental pollution
12. Biohazard

One case study will be done by a group of five to ten students. Different groups may choose different case studies from any one or different types of disasters. The report should be prepared on secondary data and handwritten on A4 page in candidates' own words not exceeding 2,000 words excluding references. The report should contain a proper title. The report should incorporate relevant tables, maps, diagrams, and references, not exceeding ten pages. Photographs are optional and should not exceed three. A copy of the stapled / spiral-bound report in a transparent cover, duly signed by the concerned teacher, is to be submitted during examination. Without the report the candidates will not be evaluated for GEO-A-CC-6-14-P.

Marks division: 20 on report + 10 on viva-voce = 30

Budge Budge College
AQAR (Academic Session: 2023-2024)
Department of Geography

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year: 03
1.3.3: Number of students undertaking project work/field work/internships: 39
List of students undertaking field / work follows:

B.A. / B.Sc. Geography Honours Semester-V
Research Methodology and Fieldwork (GEO-A-CC-5-11-P)

Serial No.	Registration Number	Roll Number	Name	Project Tittle	Name of Supervisors
1	561-1211-0103-21	212561-11-0060	Sanchari Samanta	Project Report on 'Agriculture, Water and Development Scenario in a Drought Prone Area Case Study of Peripathar Village, Bankura'	Dr. Swati Sachdev & Mr. Sajid Qamar & Ms. Sumana Das
2	561-1211-0229-21	212561-11-0118	Hina Khatun		
3	561-1211-0231-21	212561-11-0119	Bidisha Samanta		
4	561-1211-0233-21	212561-11-0120	Soumi Mondal		
5	561-1211-0235-21	212561-11-0121	Sayna Gorey		
6	561-1211-0236-21	212561-11-0122	Ankita Mondal		
7	561-1211-0237-21	212561-11-0123	Koyel Panda		
8	561-1211-0240-21	212561-11-0124	Arpita Sanfui		
9	561-1212-0232-21	212561-11-0182	Sohini Mondal		
10	561-1212-0234-21	212561-11-0183	Disha Pramanick		
11	561-1212-0238-21	212561-11-0184	Nisha Sardar		
12	561-1212-0241-21	212561-11-0185	Indira Mondal		
13	561-1214-0101-21	212561-11-0199	Srijoni Das		
14	561-1215-0227-21	212561-11-0222	Sahana Parvin		
15	561-1215-0230-21	212561-11-0223	Suhana Parbin		
16	561-1211-1161-21	212561-11-0234	Arpita Bag		
17	561-1211-1162-21	212561-11-0235	Aparna Adhikary		
18	561-1212-1228-21	212561-11-0243	Puja Panja		
19	561-1111-0228-21	212561-21-0027	Pritam Dey		
20	561-1112-0239-21	212561-21-0053	Ranajoy Nati		
21	561-1112-0242-21	212561-21-0054	Santanu Naskar		
22	561-1211-0323-21	213561-11-0023	Anusree Das		
23	561-1211-0324-21	213561-11-0024	Sreyashi Manna		
24	561-1211-0325-21	213561-11-0025	Srija Chakraborty		
25	561-1211-0330-21	213561-11-0026	Roumi Halder		
26	561-1211-0334-21	213561-11-0028	Sabana Khatun		
27	561-1211-0335-21	213561-11-0029	Shreya Ghosh		
28	561-1211-0337-21	213561-11-0030	Atashree Das		
29	561-1211-0340-21	213561-11-0031	Esha Mondal		
30	561-1211-0341-21	213561-11-0032	Anisha Santra		
31	561-1212-0327-21	213561-11-0037	Rimi Mondal		
32	561-1212-0336-21	213561-11-0038	Tanushree Naskar		
33	561-1212-0339-21	213561-11-0040	Beauti Sardar		
34	561-1212-0342-21	213561-11-0041	Nupur Sardar		
35	561-1214-0331-21	213561-11-0045	Sathi Mondal		
36	561-1111-0329-21	213561-21-0006	Alapan Chatterjee		
37	561-1112-0333-21	213561-21-0007	Sourav Mondal		
38	561-1114-0328-21	213561-21-0008	Souvik Sadhukhan		
39	561-1114-1168-21	213561-21-0011	Debjit Mal		

Budge Budge College
AQAR (Academic Session: 2023-2024)
Department of Geography

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year: 03
1.3.3: Number of students undertaking project work/field work/internships: 39
List of students undertaking field / work follows:

B.A. / B.Sc. Geography Honours Semester-VI
Evolution of Geographical Thought (GEO-A-CC-6-13-P)

Serial No.	Registration Number	Roll Number	Name	Project Title	Supervisor
1	561-1211-0103-21	212561-11-0060	Sanchari Samanta	Contribution of Indian Geographers	Mr. Sajid Qamar
2	561-1211-0229-21	212561-11-0118	Hina Khatun		
3	561-1211-0231-21	212561-11-0119	Bidisha Samanta		
4	561-1211-0233-21	212561-11-0120	Soumi Mondal		
5	561-1211-0235-21	212561-11-0121	Sayna Gorey		
6	561-1211-0236-21	212561-11-0122	Ankita Mondal		
7	561-1211-0237-21	212561-11-0123	Koyel Panda		
8	561-1211-0240-21	212561-11-0124	Arpita Sanfui		
9	561-1212-0232-21	212561-11-0182	Sohini Mondal		
10	561-1212-0234-21	212561-11-0183	Disha Pramanick		
11	561-1212-0238-21	212561-11-0184	Nisha Sardar	Contribution of Chinese Geographers	Mr. Sajid Qamar
12	561-1212-0241-21	212561-11-0185	Indira Mondal		
13	561-1214-0101-21	212561-11-0199	Srijoni Das		
14	561-1215-0227-21	212561-11-0222	Sahana Parvin		
15	561-1215-0230-21	212561-11-0223	Suhana Parbin		
16	561-1211-1161-21	212561-11-0234	Arpita Bag		
17	561-1211-1162-21	212561-11-0235	Aparna Adhikary		
18	561-1212-1228-21	212561-11-0243	Puja Panja		
19	561-1111-0228-21	212561-21-0027	Pritam Dey		
20	561-1112-0239-21	212561-21-0053	Ranajoy Nati		
21	561-1112-0242-21	212561-21-0054	Santanu Naskar	Ecological Approach in Geography	Ms. Sumana Das
22	561-1211-0323-21	213561-11-0023	Anusree Das		
23	561-1211-0324-21	213561-11-0024	Sreyashi Manna		
24	561-1211-0325-21	213561-11-0025	Srija Chakraborty		
25	561-1211-0330-21	213561-11-0026	Roumi Halder		
26	561-1211-0334-21	213561-11-0028	Sabana Khatun		
27	561-1211-0335-21	213561-11-0029	Shreya Ghosh		
28	561-1211-0337-21	213561-11-0030	Atashree Das		
29	561-1211-0340-21	213561-11-0031	Esha Mondal		
30	561-1211-0341-21	213561-11-0032	Anisha Santra		
31	561-1212-0327-21	213561-11-0037	Rimi Mondal	Regional Approach in Geography	Dr. Swati Sachdev
32	561-1212-0336-21	213561-11-0038	Tanushree Naskar		
33	561-1212-0339-21	213561-11-0040	Beauti Sardar		
34	561-1212-0342-21	213561-11-0041	Nupur Sardar		
35	561-1214-0331-21	213561-11-0045	Sathi Mondal		
36	561-1111-0329-21	213561-21-0006	Alapan Chatterjee		
37	561-1112-0333-21	213561-21-0007	Sourav Mondal		
38	561-1114-0328-21	213561-21-0008	Souvik Sadhukhan		
39	561-1114-1168-21	213561-21-0011	Debjit Mal		

Budge Budge College
AQAR (Academic Session: 2023-2024)
Department of Geography

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year: 03
1.3.3: Number of students undertaking project work/field work/internships: 39
List of students undertaking field / work follows:

B.A. / B.Sc. Geography Honours Semester-VI
Hazard Management (GEO-A-CC-6-14-P)

Serial No.	Registration Number	Roll Number	Name	Project Title	Supervisor
1	561-1211-0103-21	212561-11-0060	Sanchari Samanta	Road Accident Scenario in Kolkata: Spatio-temporal Study	Mr. Sajid Qamar
2	561-1211-0229-21	212561-11-0118	Hina Khatun		
3	561-1211-0231-21	212561-11-0119	Bidisha Samanta		
4	561-1211-0233-21	212561-11-0120	Soumi Mondal		
5	561-1211-0235-21	212561-11-0121	Sayna Gorey		
6	561-1211-0236-21	212561-11-0122	Ankita Mondal		
7	561-1211-0237-21	212561-11-0123	Koyel Panda		
8	561-1211-0240-21	212561-11-0124	Arpita Sanfui		
9	561-1212-0232-21	212561-11-0182	Sohini Mondal		
10	561-1212-0234-21	212561-11-0183	Disha Pramanick		
11	561-1212-0238-21	212561-11-0184	Nisha Sardar	Structural Collapse: A Case Study of Vivekananda Flyover, Kolkata	Dr. Swati Sachdev
12	561-1212-0241-21	212561-11-0185	Indira Mondal		
13	561-1214-0101-21	212561-11-0199	Srijoni Das		
14	561-1215-0227-21	212561-11-0222	Sahana Parvin		
15	561-1215-0230-21	212561-11-0223	Suhana Parbin		
16	561-1211-1161-21	212561-11-0234	Arpita Bag		
17	561-1211-1162-21	212561-11-0235	Aparna Adhikary		
18	561-1212-1228-21	212561-11-0243	Puja Panja		
19	561-1111-0228-21	212561-21-0027	Pritam Dey		
20	561-1112-0239-21	212561-21-0053	Ranajoy Nati		
21	561-1112-0242-21	212561-21-0054	Santanu Naskar	Noise Pollution: A Case Study of Kolkata	Dr. Swati Sachdev
22	561-1211-0323-21	213561-11-0023	Anusree Das		
23	561-1211-0324-21	213561-11-0024	Sreyashi Manna		
24	561-1211-0325-21	213561-11-0025	Srija Chakraborty		
25	561-1211-0330-21	213561-11-0026	Roumi Halder		
26	561-1211-0334-21	213561-11-0028	Sabana Khatun		
27	561-1211-0335-21	213561-11-0029	Shreya Ghosh		
28	561-1211-0337-21	213561-11-0030	Atashree Das		
29	561-1211-0340-21	213561-11-0031	Esha Mondal		
30	561-1211-0341-21	213561-11-0032	Anisha Santra		
31	561-1212-0327-21	213561-11-0037	Rimi Mondal	Socio-economic Impact of Amphan Cyclone in Indian Sundarban	Ms. Sumana Das
32	561-1212-0336-21	213561-11-0038	Tanushree Naskar		
33	561-1212-0339-21	213561-11-0040	Beauti Sardar		
34	561-1212-0342-21	213561-11-0041	Nupur Sardar		
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38	561-1114-0328-21	213561-21-0008	Souvik Sadhukhan		
39	561-1114-1168-21	213561-21-0011	Debjit Mal		

To
The Principal
Budge Budge College
Kolkata – 700137

7/8/2023

Subject: Field Trip for Geography Honours Students

Respected Madam,

This is to inform you that in accordance with the curriculum/ syllabus of B.A./ B.Sc. Geography (Honours), Calcutta University, a field report has to be prepared by the students. Accordingly, a field trip has been planned and is being arranged to Mukutmonipur-Bishnupur, West Bengal and surrounding areasby the Department of Geography through 'Dear Travels' in the first week of October 2023 (tentatively) for then, 5th Semester B.A. / B.Sc. Geography (Honours) students. The approximate cost per person as per the details provided by the travel agent is Rs. 5100/- (Rupees Five Thousand One Hundred Only).

We shall be grateful if permission is granted for the above field trip and we can undertake the ticketing and making other lodging, etc arrangements for the above field trip.

Three teachers from the Department of Geography Dr. Swati Sachdev, Mr. Sajid Qamar and Ms. Sumana Das, will accompany the students and conduct the field study. In addition, Shri Subrata Karmakar, attendant of the Department will be accompanying the students. I request you to please provide permission and 'on duty' for the teachers and staff concerned for the above duration.

I also request for the sanction of a grant of Rs. 22400/-(Rupees Twenty-Two Thousand and Four Hundred Only) to the Department to meet the expenses of the three teachers, staff and for other necessary related miscellaneous expenses.

I shall be obliged if you kindly sanction the above.

Thanking you,

regards,

Swati Sachdev. 07TH AUGUST 2023 (Swati Sachdev)

07/8/23 (Sajid Qamar)

Budge Budge College

Estd. 1971

NAAC Accredited B+ & UGC 12B, 2(f)

Affiliated to the University of Calcutta

Ref. No..... Date .....

27/09/02023

To

The Inspector in Charge

Budge Budge Police Station

24 Parganas (South)

Subject: Field trip for B.A. / B.Sc. Geography (Honours) students, Budge Budge College, 24 Parganas (South), Kolkata, West Bengal, 2023

Respected Sir/ Madam,

This is to inform you that in accordance with the curriculum/ syllabus of B.A./ B.Sc. Geography (Honours), Calcutta University, a field report has to be prepared by the students. Accordingly, a field trip has been arranged to Mukutmonipur - Bishnupur, West Bengal and surrounding areas by Budge Budge College for Semester V B.A. / B.Sc. Geography (Honours) students from 08th October 2023 to 12th October 2023. The contact number and details of traveling students, staff and teachers is being enclosed for ready reference.

I shall be grateful if you can provide appropriate and adequate security, cooperation and assistance in case the circumstances so demand or any problematic situation arises and forward necessary details to concerned officials in Khatra, Bankura to extend their kind cooperation, assistance and adequate security.

With regards,

Yours faithfully,

(Dr. Debjani Datta)

Principal

DR. DEBJANI DATTA
M.Sc. (Gold Medalist), Ph.D
Principal
Budge Budge College
7, D.B.C. Road, Kol-700137
West Bengal, India

Received, Content.
Not Verified
Dt: 3/10/23
Budge Budge P.S
D.D.H Police Dist.

Verified
Budge Budge College

Budge Budge College

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Affiliated to the University of Calcutta

Ref. No..... Date .....27/09/2023.....

TO WHOM IT MAY CONCERN

The following are the list and details of B.A./ B.Sc. Geography (Honours) Semester V students, staff and teachers of **Budge Budge College** going for the field trip to Mukutmonipur - Bishnupur, West Bengal and surrounding areas from 08th October 2023 to 12th October 2023. The total number of students, staff and teachers are 43.

Sl. No.	Name	Age	Sex	Father's/Guardian/ Husband's Name	Address for Communication	Phone
	I. LIST OF STUDENTS					
1	Anisha Santra	20	F	Samir Santra	Vill- Bawali, P.O- Bawali, P.S-Nodakhali. 24 Parganas (S) 700137	9830791393
2	Ankita Mondal	19	F	Amit Mondal	Ramchandrapur, Pujali, Budge Budge, South 24 Parganas , Pin – 700138	9163628941
3	Anusree Das	20	F	Ajoy Kumar Das	Daulatpur Madhyapaara North Phoolbagan,Maheshtala, Vivekananda Pally. 24 Parganas (S) 700139	9903967683
4	Aparna Adhikary	19	F	Mahamaya Adhikary	Vill- South Bawali, P.O- Bawali, P.S-Nodakhali. 24 Parganas (S) 743384	9748482623
5	Arpita Bag	20	F	Biswanath Bag	Purba Nischintopur. 24 Parganas (S) 700138	8981297822
6	Arpita Sanfui	19	F	Ashis Sanfui	Oriyant Nischintapur, Budge Budge. 24 Parganas (S) 700138	7478572990
7	Atashree Das	20	F	Bhabataran Das	Village - North Bawali, P.O - Bawali, P.S - Nodakhali. 24 Parganas (S) 700137	8017097321
8	Beauti Sardar	19	F	Prashanta Sardar	117 Khariberiya Road. 24 Parganas (S) 700137	9230490108
9	Bidisha Samanta	19	F	Sima Samanta	Vill- Paramananda Chalk, P.O- Santoshpur, P.S- Bauria, Dist- Howrah. Pin code - 711310	9830953065
10	Disha Pramanick	19	F	Tapati Pramanick	Vill-Moukhali, P.O-Mayapur, P. S-Budge Budge, . 24 Parganas (S) Pin: 743318	9831723683
11	Esha Mondal	20	F	Ananta Mondal	Vill- Kalinagar, P.O- Bawali, P.S - Noakhali. 24 Parganas (S) 743384	9231809000
12	Hina Khatun	19	F	Sk Anower	128/A R.L Ghosh Road, Budge Budge. 24 Parganas (S) Kolkata -700137	7439340974
13	Indira Mondal	19	F	Sushanta Mondal	Vil- Chalkgopal, Post-Buita, P.S - Budge Budge. 24 Parganas (S) 700137	9748229736
14	Koyel Panda	19	F	Joydev Panda	Budge budge Shank pukur Paschim Para. 24 Parganas (S) 700137	7980610059
15	Nisha Sardar	20	F	Niranjan Sardar	Village+ Post - Dakshin Raipur, Police Station - Nodakhali. 24 Parganas (S) 743318	9007806587
16	Nupur Sardar	19	F	Ajoy Sardar	Vill - Sanpukur, Sardar para, P.O - Chatta Kalikapur, P.S - Mahestala. 24 Parganas (S) 700140	8697512429 / 9143452033
17	Puja Panja	19	F	Uttam Panja	Village -Malangadar, P.O-Ghanashyambati, P.S-Nodakhali, District -South 24 Parganas. Pin Code -700137	8697121142
18	Rimi Mondal	20	F	Aloke Mondal	Khariberia 34/1 Budge Budge. 24 Parganas (S) 700137	9831926132
19	Roumi Halder	20	F	Rupak Halder	Bauria, Burikhali, Howrah 711310 (Near Udyaan Club)	9073090074
20	Sabana Khatun	19	F	Sk Yazul	Rajarampur, Achipur, Budge Budge. 24 Parganas (S) 700138	9073395747
21	Sahana Parvin	20	F	SK Anarul Haque	Pujali, Achipur, Indira Ghat Park. 24 Parganas (S) 700138	9330878934, (9330347935)

Contd.

Budge Budge College

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Affiliated to the University of Calcutta

Ref. No..... Date .....27/09/2023.....

Sl. No.	Name	Age	Sex	Father's/Guardian/ Husband's Name	Address for Communication	Phone
22	Sanchari Samanta	20	F	Utpal Samanta	27/1 Bachilor Road 1st lane Budge Budge. 24 Parganas (S) 700137	9836235611
23	Sathi Mondal	20	F	Ajoy Mondal	Surikhali, Panchla, Rajapur, Howrah 711322	9874687954
24	Sayna Gorey	20	F	Sabir Gorey	Vill- Bauria Rameswarbati, P.O - Chakkashi, P.S- Bauria, Howrah 711307	9062443274
25	Shreya Ghosh	19	F	Subrata Ghosh	Nabapally, Batanagar. 24 Parganas (S) 700140	9073533407 / 8017199581
26	Sohini Mondal	20	F	Gobinda Mondal	Vill: Rajibpur, PO.: Achipur, P.S: Pujali . 24 Parganas (S). Pin Code: 700138	9831314730 / 9330389966
27	Soumi Mondal	20	F	Mintu Mondal	Vill+Post - Raghudevpur , Dist- Howrah, P.S - Rajapur, Pin - 711322	6290390435
28	Sreyashi Manna	21	F	Sajal Manna	Nangi Morla para (Batanagar). 24 Parganas (S) 700140	9836313462 / 9836302369
29	Srija Chakraborty	19	F	Kashi Nath Chakraborty	Vill- North Bawali, P. O.- Bawali, P.S.- Nodakhali. 24 Parganas (S) 700137	9874750052
30	Srijoni Das	19	F	Shyamal Das	18 Bachelor Road, 1st lane Budge Budge. 24 Parganas (S). Kolkata -700137	9123944799
31	Suhana Parbin	20	F	Sahadot Ali Mollick	Vill-Chandipur, P.O-Bawali Chandipur, P.S-Nodakhali, Block: Budge Budge -II, District:South 24 Parganas. Pin-700137	9836868551
32	Tanushree Naskar	18	F	Vriguram Naskar	Akra Jagananathnagar Melaghata Maheshtala. 24 Parganas (S) 700140	7439370122
33	Alapan Chatterjee	20	M	Sabyasachi Chatterjee	Burikhali, Bauria, Howrah 711310	9830369647
34	Debjit Mal	20	M	Surajit Mal	Village- Makhalia, Post Office- Bakhrahat, Police Station- Bishnupur, 24 Parganas (S). Pin Code- 743377	9748404301
35	Pritam Dey	19	M	Prasanta Dey	Nangi Benepara, Batanagar. 24 Parganas (S) 700140	7044579059
36	Ranajoy Nati	21	M	Nemai Chandra Nati	Village-Mayapur, P.O.-Mayapur, Police Station-Nodakhali. 24 Parganas (S) 743318	8017177149
37	Santanu Naskar	20	M	Jyotirmoy Naskar	Vill- Moukhali, P.O- Mayapur, P.S- Budge Budge, South 24 Parganas, PIN-743318	9163378094
38	Sourav Mondal	19	M	Goutam Mondal	Vill-Parbati, P.O -Ghanashyambati, P.S- Budge Budge. 24 Parganas (S) 700137	9875362431
39	Souvik Sadhukhan	19	M	Ashok Sadhukhan	Village and Post Office: Paniara, Police Station: Panchla, District: Howrah, Pincode:711302	9432884462
	II. LIST OF TEACHERS AND STAFF					
1	Swati Sachdev	43	F	Savita Sachdev	4RB, 4/3 Purbachal Phase II, Sector III, Block G.A. Salt Lake. Kolkata – 700097.	9831043744
2	Sajid Qamar	32	M	Rabina Khatoon	43/1 K.B.M Road Champdani PO. Baidyabaty. PS. Bhadreshwar. District Hoogly. Pin-712222	8240009726
3	Sumana Das	30	F	Dulal Chandra Das	Hatpukur, Ramrajatala, P.O. G.I.P Colony. P.S - Jagacha. Howrah 711112	90387870341
4	Subrata Karmakar	50	M	Prathama Chakraborty	65 Dharmatala Road, Budge Budge, 24 Parganas (S). Pin-7000137	9331971584

(Dr. Debjani Datta)
Principal
DR. DEBJANI DATTA
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Verified

Budge Budge College

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E-mail : budgebudgecollege@gmail.com; Website : www.wbbudgebudgecollege.org

BUDGE BUDGE COLLEGE
DEPARTMENT OF GEOGRAPHY

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year: 03 (three)
1.3.3: Number of students undertaking project work/field work/internships: 39

B.A. / B.Sc. Geography Honours Semester-V: Research Methodology and Fieldwork (GEO-A-CC-5-11-P)

Topic of Fieldwork / Field Report (Academic Session: 2023-2024): 'Agriculture, Water and Development Scenario in a Drought Prone Area: Case Study of Peripathar Village, Bankura'

OBJECTIVES AND OUTCOME

Objective

A socio-economic household survey was conducted by the semester 5 Geography honours students at village Peripathar, in Bankura, West Bengal to ascertain the nature of agrarian economy, access to water and general developmental levels. Peripathar is located in Khatra block in Bankura, West Bengal. Its location adjacent to the Kangsabati Dam was one of the main reasons for selecting the village. It comprises a population of 117030 and nearly 90 per cent of its population is rural. It is located at an average elevation of 138 meters and in the western semi-arid drought prone area of West Bengal. This influences the climate, soil, density of forests, access to water resources, livelihood and developmental level of the people of the region. The main objectives of this fieldwork were:

- to study the relationship between physical and cultural factors and their impact on development levels in the region
- to examine the socio-economic characteristics and developmental levels of villagers at village Chorinda
- exploring the nature of agricultural economy
- identify the problems related mainly to access to water faced by the inhabitants of the village, especially in view of its location next to the Kangsabati Dam and being part of a drought prone area.

The research problem thus was to examine the above issues of development, economy and access to water resources and indicate suitable measures for enhancing access to water and improve livelihood of people in the region in order to promote sustainable development of inhabitants of the region.

Outcome

A number of surveys were conducted by the students to analyze the developmental level and water related aspects. Besides socio-economic rural household survey, a land use survey of the village coupled with analysis of the soil quality was undertaken to assess nature of agrarian economy and pattern of land use and standard of living. In addition, detailed analysis was undertaken of dimensions of agrarian economy and access to water resources, especially in the context of the role of the Kangsabati dam in the adjacent region. In addition, market survey, market morphology and nature of problems faced by inhabitants and perception regarding living conditions was also assessed.

Analysis reveals that in village Peripathar and adjoining areas one can distinctly see the impact of the physical environment on the economy and livelihood of the people. On one hand, the presence of river and consequent beautiful landscape, the Kangsabati Dam and undulating topography has resulted in growth of tourism industry, but it is a disjunct one with no linkage to the rural hinterland. On the other hand, extension of agriculture is resulting in reducing vegetation density and diversity of flora and fauna is being threatened, leading to problems of soil erosion coupled with natural disasters like floods.

On the socio-economic livelihood scenario, in the village, though social and gender disparities are not present, economic disparity is present. Although as a consequence of the Kangsabati Dam there is a good agrarian economy and a share of households have stable employment for part of the year, basic facilities, a significant share are still living in dire situations and have a BPL due to lack of other avenues of employment and seasonal unemployment. This indicates the lack of integration of inhabitants of the village with the main urban economy. Besides economic inequality, other problems in the area include the lack of access to proper roads in the village, adequate health and education infrastructure and poor access to safe drinking water and sanitation which are a serious concern for a considerable segment of households of the villages.

Thus, on one hand there is economic inequality and lack of access to infrastructure and on the other hand development has resulted in environment problems too: (i) the increasing density of population and extension of agricultural land coupled with use of wood as fuelwood is resulting in increased pressure on forested areas (ii) deforestation and silting have increased frequency of hazards like floods. The need of the hour is on one hand to improve the standard of living of the people and introduce schemes to reduce economic inequality and increase the accessibility to basic infrastructure and services especially drinking water; on the other hand, this has to be coupled with monitoring and management of the environment so that the ecological balance is maintained.

AGRICULTURE, WATER AND DEVELOPMENT SCENARIO IN A DROUGHT PRONE AREA

CASE STUDY OF PERIPATHAR VILLAGE, BANKURA

9 October 2023 09:19
09/10/2023 09:19 am

9 October 2023 10:24

9 October 2023 13:35

This is to certify that Roll No. 213561-11-0032, an examinee of the B.A. / B.Sc. Semester V Honours Examination (CBCS), 2023 of the University of Calcutta has visited the field area of study **VILLAGE PERIPATHAR, KHATRA BLOCK and its Surrounding Areas** in the month of **OCTOBER 2023**. She/ He has completed the field report within the assigned time, under the guidance of Dr. Swati Sachdev, Mr. Sajid Qamar and Ms. Sumana Das, who accompanied the Semester V Geography Honours students of Budge Budge College.

The field report partly completes Paper GEO-A-CC-5-11-P of the Three-Year-Six-Semester Geography Honours Course.

(Swati Sachdev) (Sajid Qamar) (Sumana Das)

UNIVERSITY OF CALCUTTA

BSC. SEMESTER-V GEOGRAPHY HONOURS

PRACTICAL EXAMINATION 2023 (CBCS)

PAPER GEO-A-CC-5-11-P

GEOGRAPHY PRACTICAL NOTEBOOK

REGISTRATION NUMBER: 561-1211-0341-21

ROLL NUMBER: 213561-11-0032

This is to certify that Roll No. 213561-11-0032, an examinee of the B.A. / B.Sc. Semester V Honours Examination (CBCS), 2023 of the University of Calcutta has visited the field area of study **VILLAGE PERIPATHAR, KHATRA BLOCK and its Surrounding Areas** in the month of **OCTOBER 2023**. She/ He has completed the field report within the assigned time, under the guidance of Dr. Swati Sachdev, Mr. Sajid Qamar and Ms. Sumana Das, who accompanied the Semester V Geography Honours students of Budge Budge College.

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(Swati Sachdev) (Sajid Qamar) (Sumana Das)

AGRICULTURE, WATER AND DEVELOPMENT SCENARIO IN A DROUGHT PRONE AREA
CASE STUDY OF PERIPATHAR VILLAGE, BANKURA

ACKNOWLEDGEMENT

I extend my gratitude to the individuals and organizations who collaborated with me on this work 'Field Book' I would like to thank my sincere gratitude to our college's principal smt. Dr. Debjani Dutta and the college academic council for providing me with facilities required to do my work.

I am highly indebted to our geography profesor Dr. Swati Sachdev for her valuable guidance which has promoted my efforts in all the stages of this field work. My thanks and appreciation go to other profesors like Mr. Sajid Qamar and Ms. Sumana Das. Even I want to know my thankful gratitude to our lab assistant subroto karmakar for his valuable help.

Also thanks to all departments and the gover. offices, like - panchayet office, Block land and land Reforms officer, Health centre, local school, police station of Khatra, Bankura, who also proper helped us to do this field study, And due thanks to the villagers of peripathar village for getting their personal informations.

Also thanks to kolkata - RMC Alipur and Kolkata Regional Meterological center, survey of India etc. who helped in geeting various secondary data for climate cenrus population etc for this survey Thanks to them too.

It would not have been possible without the kind support and help of my clarsmates and family members

I like to thank all my supporters who have motivated me to fulfill the 'Field work'.

Sincerely
Anisha Santra

PREFACE

Village Peripathar is located in Khatra Block in Bankura District in West Bengal. It is located on the bank of the Kangsabati River and the average height of the region is 138 meters. The nearest railway station is at Bankura at a distance of approximately 52 kilometres. The panoramic location adjacent to the Kangsabati Dam among rivers, forest, rugged tracts and vally influences both the demographic profile and livelihood of the people of the region.

A field survey was conducted by Geography Honurs students of semester 5 in village Peripathar and adjacent areas to study the nature of relationship between physical and cultural factors and their influence on the developmental levels in the region. In addition, focus was there on exploring the nature of agricultural economy and access to water, especially in view of its location next to the Dam and being part of a drought prone area. A number of surveys were conducted by the students to analyse there aspects of developmental in general and the access to water of the people in that region and assess the problems faced by them. The objective was to indicate suitable measures for enhancing access to water and improve livelihood of people in the region in order to promote sustainable development of inhabitants of the region.

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	Household Survey of Village Peripathar Khatra Bankura
	Market Survey and Land-Use of Market by Pacing (Market Morphology)
	Hotels Survey
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INTRODUCTION

Khatra is a developmental block in drought prone Bankura district of West Bengal. However, many villages in the block are located on the bank of kangsabati River and the average height of the region is 138 metres. The panoramic location among rivers, forest, rugged tract and valley influences both the developmental level of the people of the region. The location in drought prone area and adjacent to the kangsabati Dam influences their access to water resources and agrarian economy.

Khatra comprises of a population of 117030 and nearly 90 percent of its population is rural. Hence, the study area of village Peripathar was selected in Khatra Block in Bankura District in West Bengal. The village is at a distance of 52 km from the block headquarters at Bankura. It is located at an average elevation of 138 metres in the western semi-arid drought prone area of West Bengal. This influences the soil, access to water resources, livelihood and developmental level of the people.

As mentioned, 90 percent of the population of the block is rural. Hence a village was selected for the purpose of conducting a socio-economic survey. Accordingly, a **rural socio-economic household survey** was conducted by the semester 5 geography Honours students at **Village Peripathar** to ascertain the developmental levels and examine the agrarian economy and the problems in access to water faced by the inhabitants of the village and ascertain its relationship to physical environment.

Swati Gupta
22/11/2024

LOCATION OF STUDY AREA
PERIPATHAR AND SURROUNDING AREA

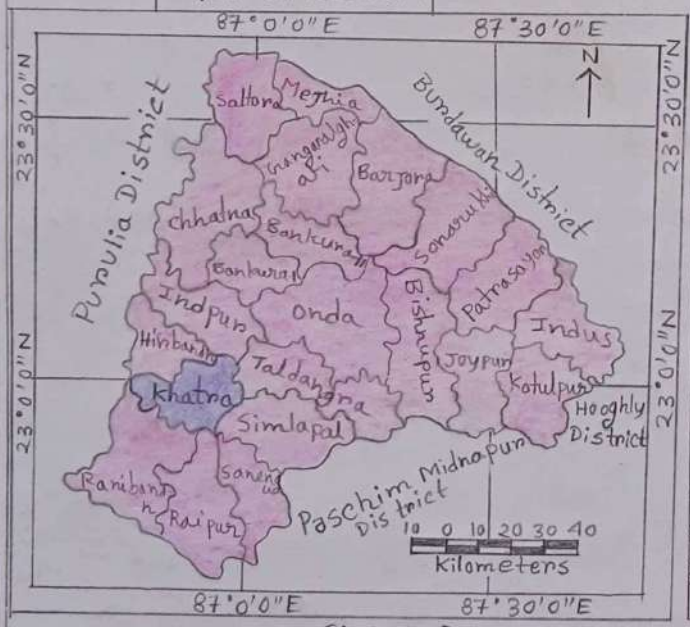
INDIA

SOURCE : NATMO

WEST BENGAL

SOURCE : NATMO

BANKURA



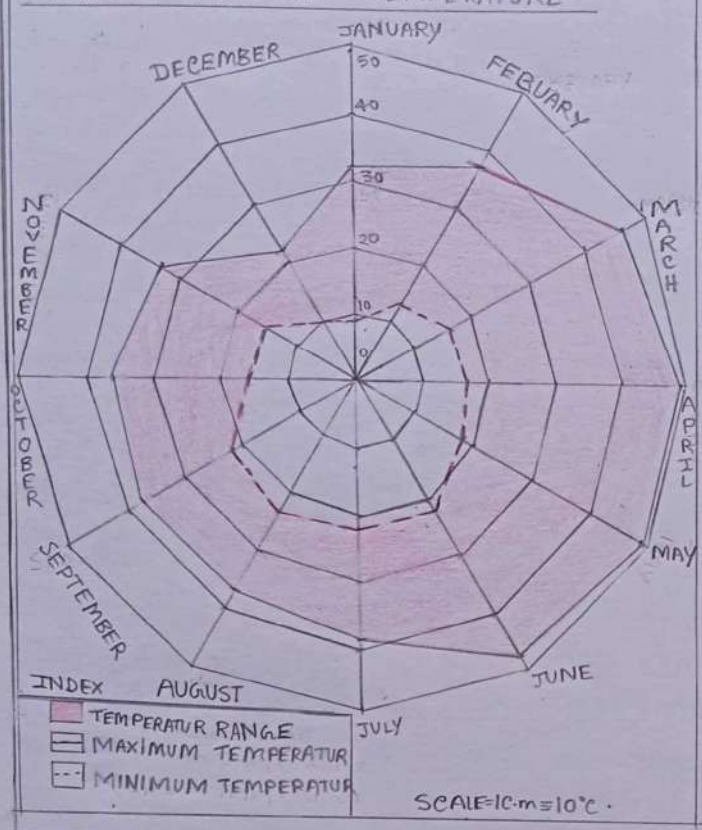
SOURCE : DISTRICT CENSUS HARD BOOK

KHATRA

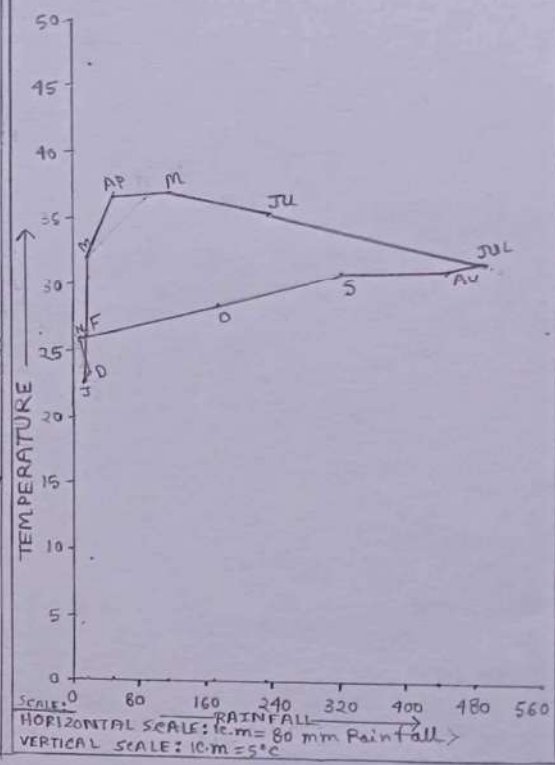
03/01/24

CLIMATIC SCENARIO AROUND BANKURA

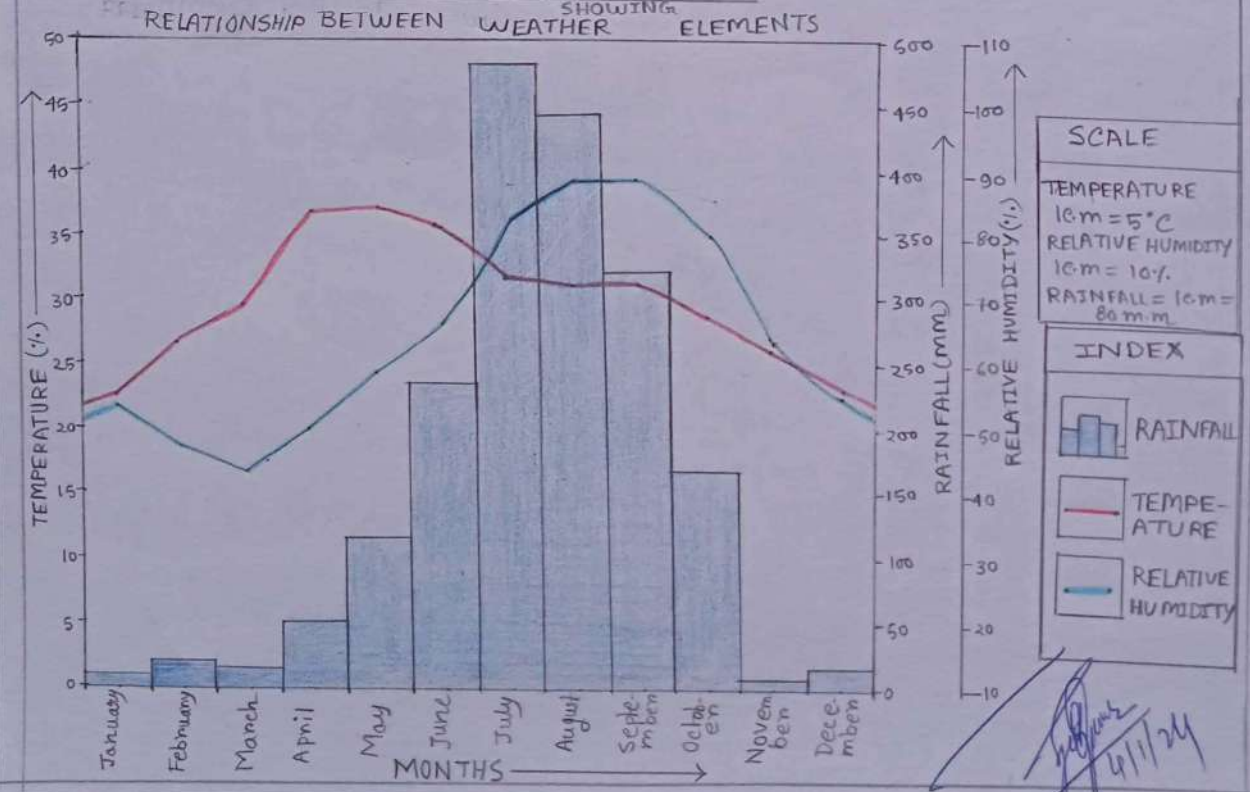
MAXIMUM MINIMUM TEMPERATURE



HYTHERGRAPH



CLIMATIC CHART SHOWING RELATIONSHIP BETWEEN WEATHER ELEMENTS

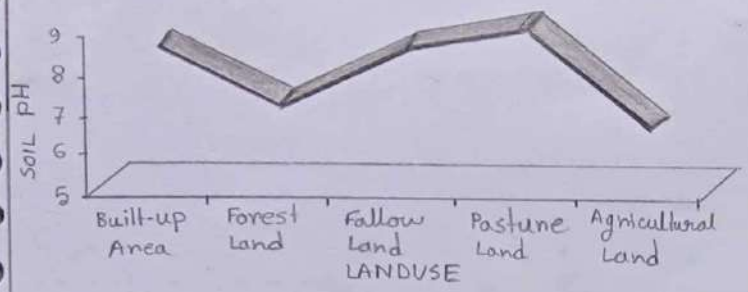


SOIL CHARACTERISTICS AND ITS VARIATION ACROSS DIFFERENT LANDUSE IN VILLAGE PERIPATHAR

SURVEYED ON: 09.10.2023

SURVEYED BY: SEMESTER 5 GEOGRAPHY HONOURS STUDENTS

VARIATION IN SOIL pH ACROSS DIFFERENT LANDUSE

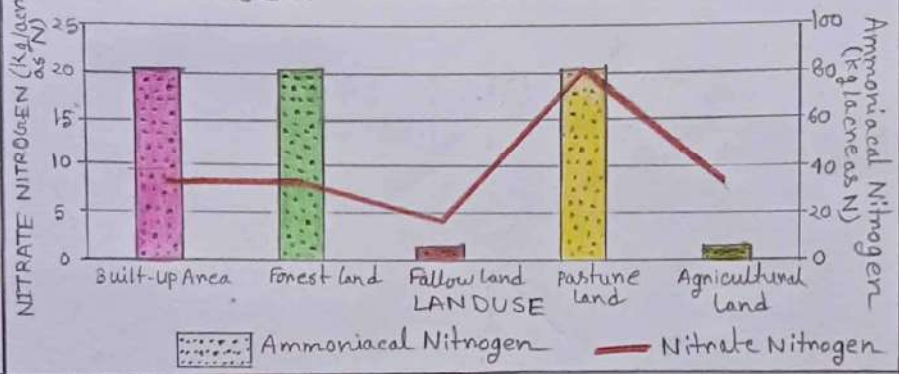


Built-up Area

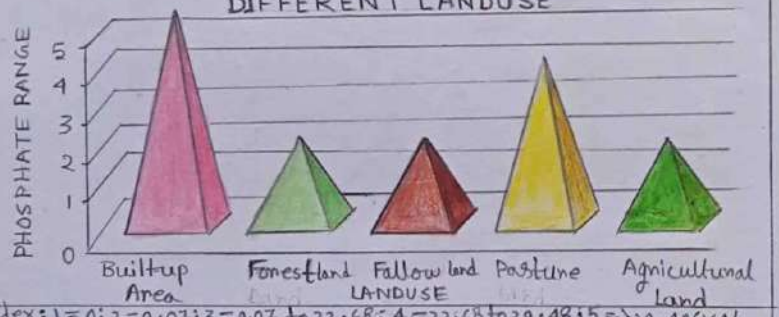
Forest Land

Pastune Land

VARIATION IN NITRATE NITROGEN AND AMMONIACAL NITROGEN ACROSS DIFFERENT LANDUSE



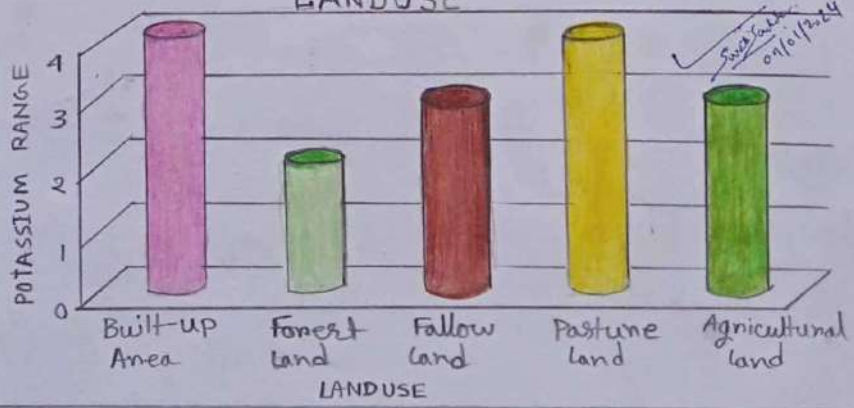
VARIATION IN SOIL PHOSPHATE AND ACROSS DIFFERENT LANDUSE



Index: 1 = 0; 2 = 9.07; 3 = 9.07 to 22.68; 4 = 22.68 to 29.48; 5 = >29.48 (Kg/acre as P2O5)

Fallow Land

VARIATION IN SOIL POTASSIUM ACROSS DIFFERENT LANDUSE



Agricultural Land

Index: 1 = < 45.36 kg/acre; 2 = 45.36 to 113.40 kg/acre; 3 = 113.40 to 158.76 kg/acre; 4 = > 158.76 kg/acre

Source Note: Based on Sample collected in the Village on 09.10.2023 and Tested in laboratory setting in Budge Budge, Kolkata on 8th and 09th January, 2024

ately 5 kms from the village. Social infrastructure is only marginally better and the village has a primary and middle school though the nearest Secondary and senior Secondary School is only at Gorabari. Health infrastructure too is not too rosy and the village doesn't have any PHC or sub centre as per Census 2011.

As the village relies on agriculture, the village has community tap tubewell and a canal to supply water. Ponds are also present and these are the various sources of irrigation.

Thus, the above discussion and review of literature provides an insight regarding the Khatra block, the focus of field work. Based on this a snow ball sample survey was undertaken of households in village Peripathar to assess the agrarian and developmental level and access to water resources as agriculture is one of the mainstay of their livelihood, it is drought prone area and as it is adjacent to Kangsabati Dam.

Suvamsahoo
22/01/24

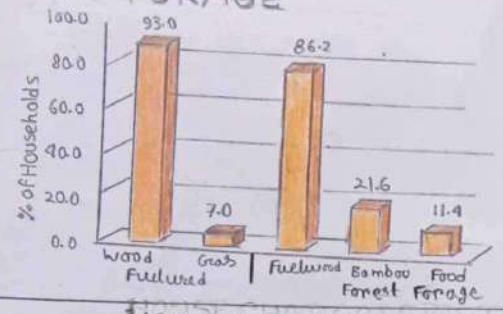
HOUSEHOLD SURVEY

STANDARD OF LIVING AND PERCEPTION, PERIPATHAR

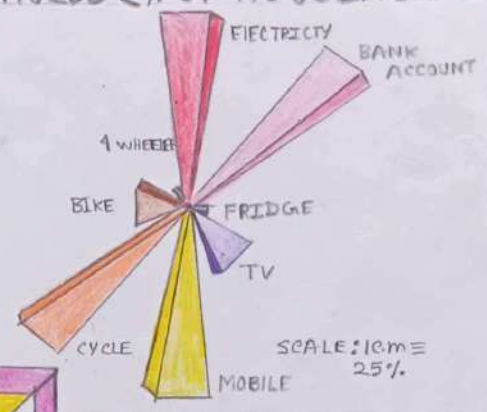
DATE: 09th OCTOBER 2023
TIME: 9:00 a.m. 12:30 p.m.

SURVEYED BY: 5th SEMESTER GEOGRAPHY HONOURS STUDENTS

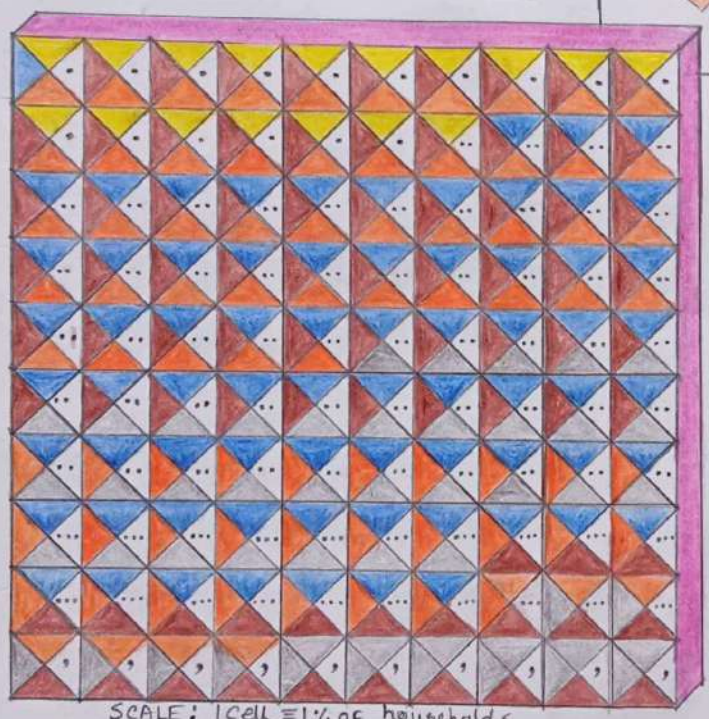
FUEL USED AND FOREST FORAGE



AMENITES OWNED BY HOUSEHOLDS (% OF HOUSEHOLDS)



HOUSE CHARACTERISTICS



SCALE: 1 cell ≡ 1% of households

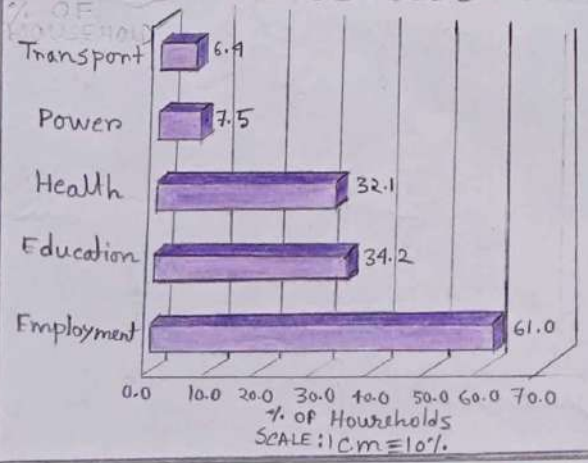
INDEX

- STRAW
- MUD
- TALI/BRICK
- TIN/ASBESTOS
- CEMENT

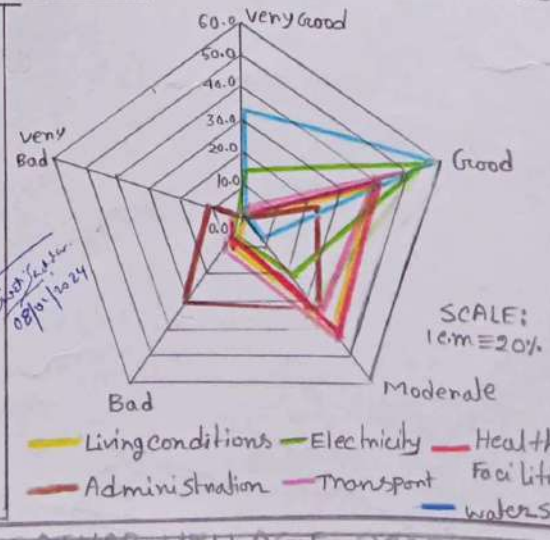
No. of Rooms

- ONE
- TWO
- THREE
- MORE THAN THREE

NATURE OF PROBLEM FACED BY HOUSEHOLDS



PERCEPTION OF HOUSEHOLD (% OF HOUSEHOLDS)



Sudipta Sarkar 08/01/2024

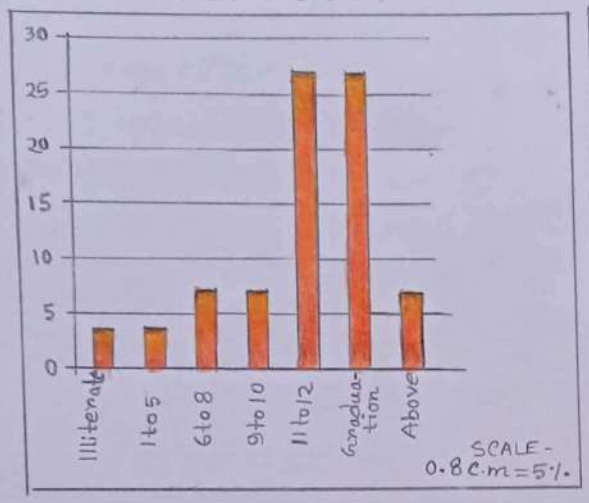
SOURCE: PRIMARY SURVEY, PERIPATHAR VILLAGE 2023

MARKET SURVEY

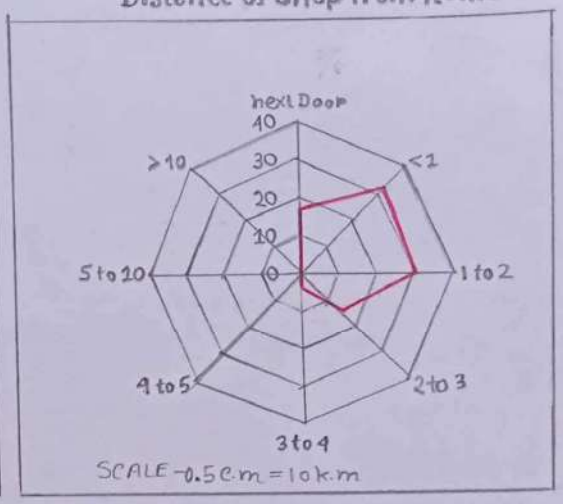
DATE : 10th OCTOBER 2023
TIME : 10 a.m

SURVIYED BY : 5th SEMESTER GEOGRAPHY HONOURS STUDENTS
PLACE : KHATRA MARKET

Educational level

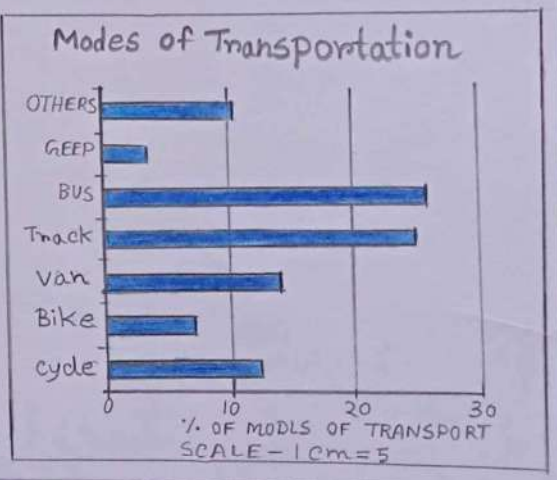


Distance of Shop from home %

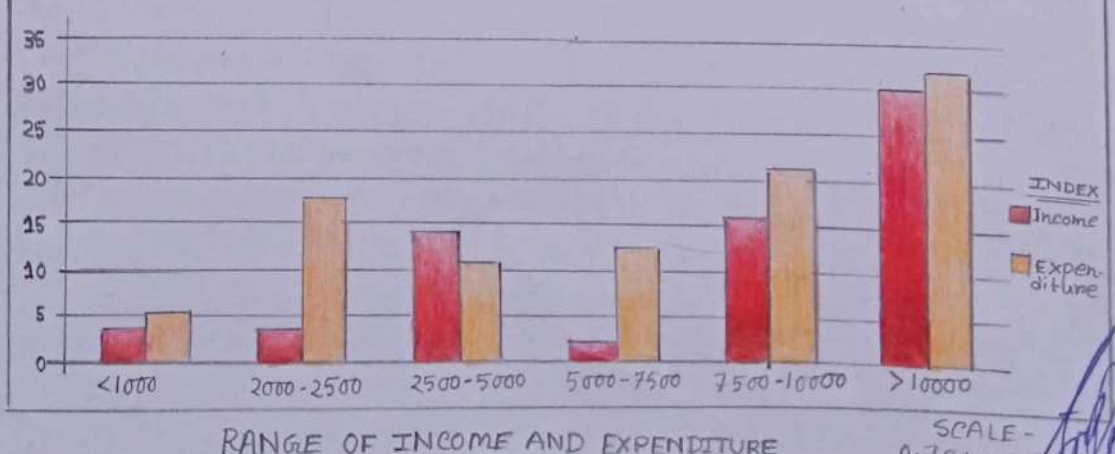


Nature of Shop

Modes of Transportation



Income and Expenditure of Shop keeper



Source : Primary survey.

and tourists visiting the surrounding area.

A variety of eateries, ranging from biscuit shops and snack vendors to tea stalls and restaurants, populate the market due to the profitability of these spots for commuters undertaking long journeys. On the left side of Khatna market's road, prominent establishments include mobile shops, eateries, telecom services, Xerox centers, hardware stores, tailoring shop, groceries, fruit and vegetable stalls, mobile and wooden shops, flower shops, and outlets offering daily necessities. The market's diverse range of shops caters to commuters from neighboring towns and villages who frequently purchase goods for various needs during their commute between work and residence. This reflects the evolving lifestyle showcased by the diversity of shops in the market.

An aggregation of similar shops located adjacent to each other appears to aim at attracting maximum customers and catering to different segments of the market. Consequently, the land use reflects both the clustering of identical shops and the diversity of establishments offering different goods.

Thus, on one hand there is economic inequality and lack of access to infrastructure and on the other hand development has resulted in environment problems too - (i) the increasing density of population and extension of agricultural land coupled with use of wood as fuelwood is resulting in increased pressure on forested areas (ii) deforestation and silting have increased frequency of hazards like floods.
These problems need to be addressed through proper planning.

Thus, on one hand while physical features are influencing the development of settlements and the nature of agrarian economy, human beings by their activities too are impacting on the environment. The need of the hour thus is on one hand to improve the standard of living of the people and introduce schemes to reduce economic inequality and provide other employment avenues, increase the accessibility to basic infrastructure and services especially drinking water; on the other hand, this has to be coupled with monitoring and management of the environment so that the ecological balance is maintained. This will ensure that development can move hand in hand with preserving the natural landscape and environment.

Swati Sarkar
22/01/2024

SOCIO-ECONOMIC IMPACT OF AMPHAN CYCLONE IN INDIAN SUNDARBAN

Examined
Tanushree Dutta
25.7.2024

Examined

Department of Geography
Vivekananda College for Women
Barisha, Kol-8

TO WHOM IT MAY CONCERN

This is to certify that Registration No. 561-1214-0331-21

Roll No. 213561-11-0045 , an examinee of the B.A. / B.Sc. Semester VI Honours Examination (CBCS), 2024 of the University of Calcutta has prepared the Hazard and Disaster Management Report on 'Socio-economic Impact of Amphan Cyclone in Indian Sundarban.' She/ He has completed the report within the assigned time, under the supervision and guidance of Ms. Sumana Das.

This report partly completes Paper GEO-A-CC-6-14-P of the Three-Year-Six-Semester Geography Honours Course.

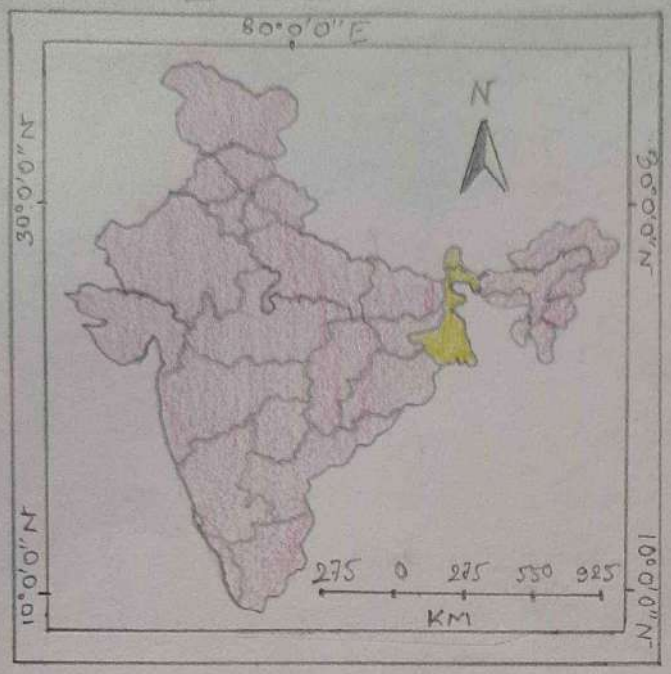
Sumana Das

(Sumana Das)

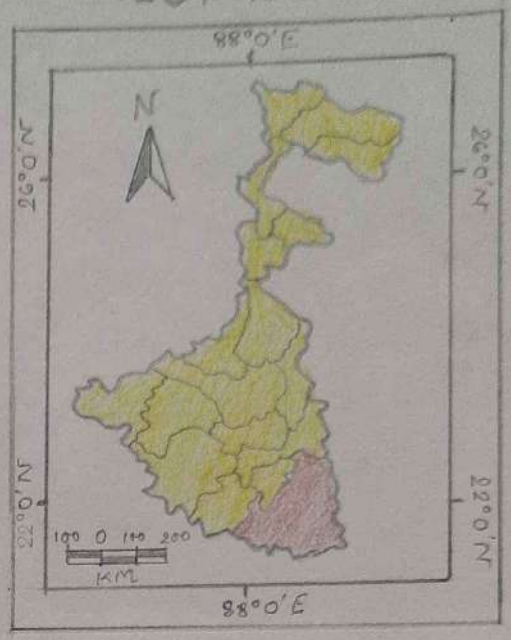
Dept. of Geography
Budge Budge College

LOCATION OF STUDY AREA

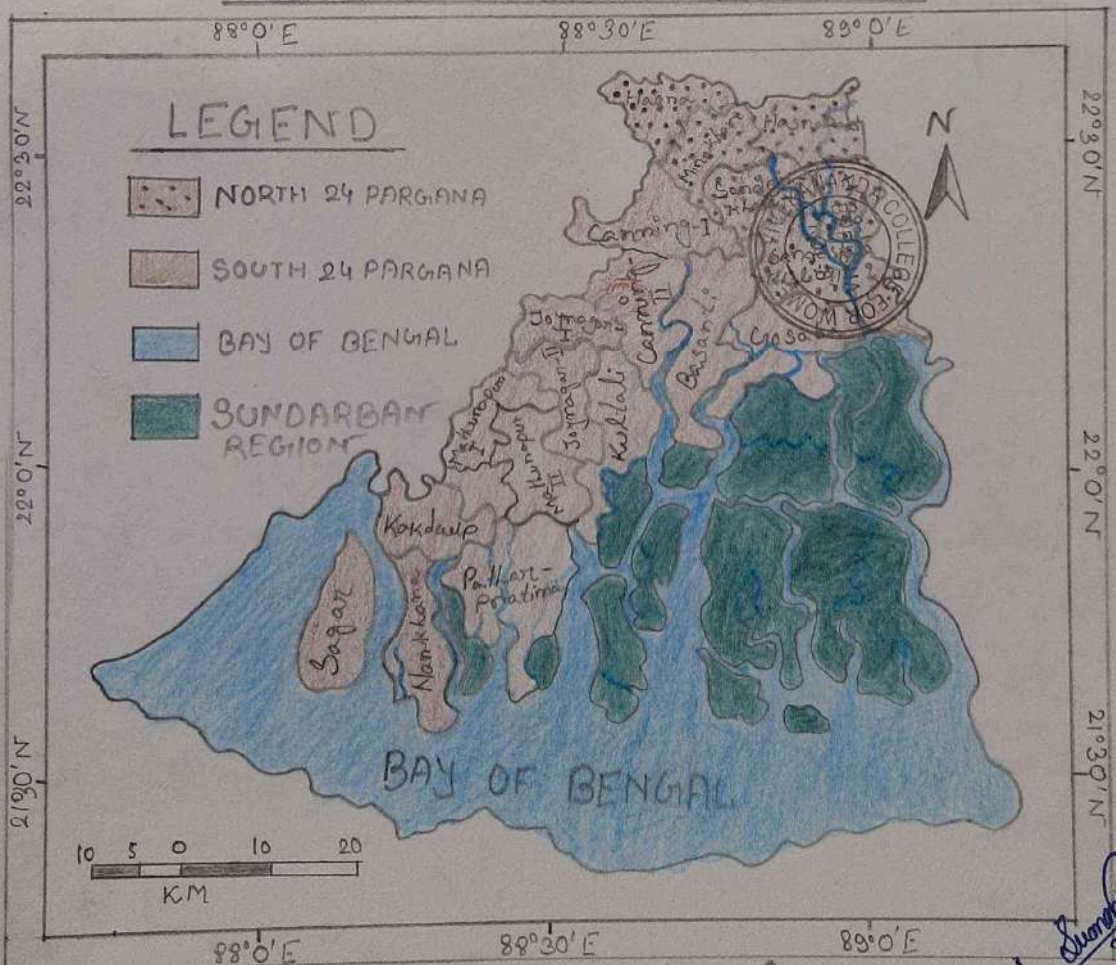
INDIA



WEST BENGAL



SUNDARBAN REGION, INDIA



Source:- NATMO

28/06/24

send out alerts to people in affected areas.

Capacity Building: The government of West Bengal also initiated efforts to build the capacity of government officials and other stockholders to better prepare for and respond to disasters. Training programmes were conducted to enhance the skills of government officials, emergency responders and other stockholders.

It is one of the most cyclone prone areas in the world. Though there are piecemeal efforts in tackling the menace of cyclone, a holistic cyclone preparedness plan with bottom-up approach is still missing.

Conclusion

The present study set out to assess the impact of tropical cyclone Amphan on the Indian Sundarban Biosphere Reserve. The study showed wide-scale damage due to the cyclone and notable changes in the LULC of Sundarban. The outcome showed that the severity of damage was excessive within the proximity of the trajectory of Amphan. The study exibits that the low land areas, especially less than 5m relief grater damaged by flood. The flood induced salinity caused huge damage in agricultural sector. It is recommended native species-based conservation and promotion approach a strengthen and extend the natural distribution of mangroves in the region. Rehabilitation of the population from high risk sites to safer-sites, as well as people skill development programmes for better employment opportunities in order to ensure socioeconomic security.

Summation
28/06/24

UNIVERSITY OF CALCUTTA

BSC SEMESTER-VI GEOGRAPHY HONOURS

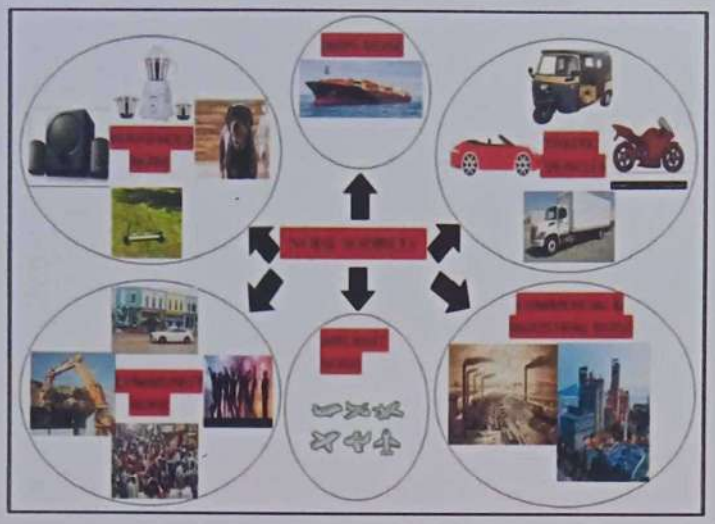
PRACTICAL EXAMINATION 2024 (CBCS)

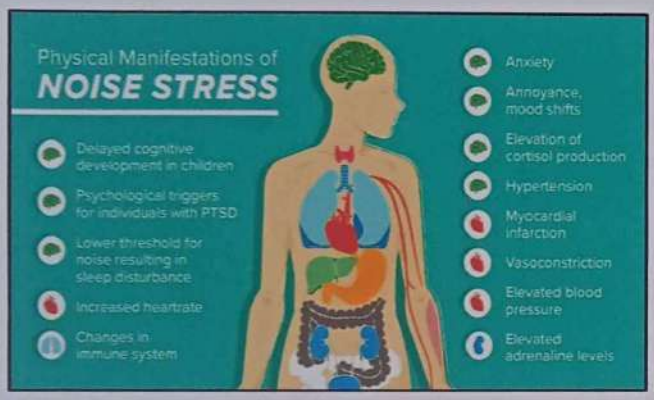
PAPER GEO-A-CC-6-14-P

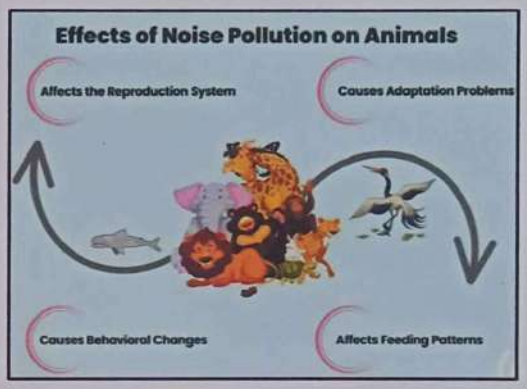
GEOGRAPHY PRACTICAL NOTEBOOK

REGISTRATION NUMBER: 561-1211-0341-21

ROLL NUMBER: 213561-11-0032







DISASTER MANAGEMENT PROJECT

NOISE POLLUTION: A CASE STUDY OF KOLKATA

TO WHOM IT MAY CONCERN

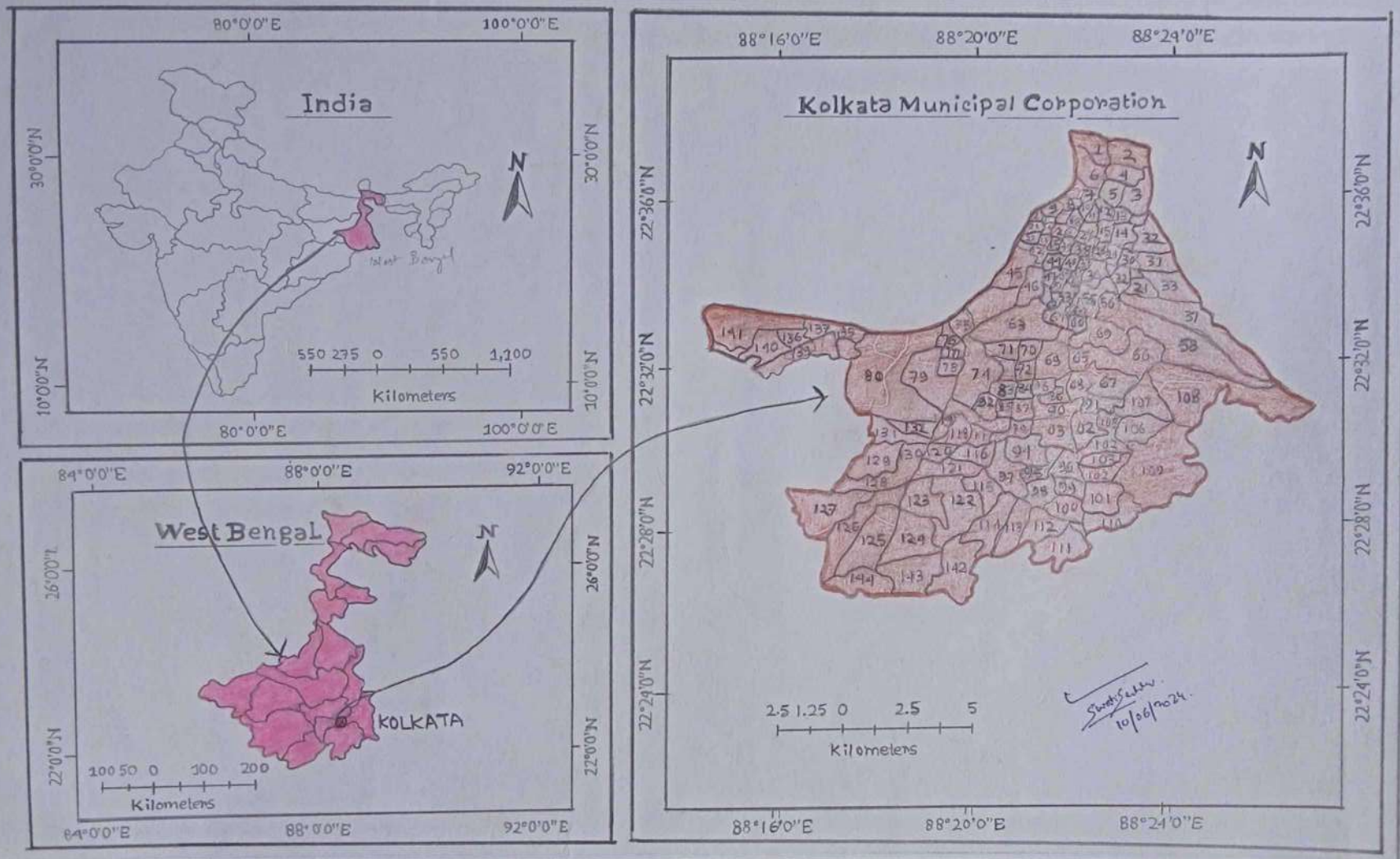
This is to certify that Registration No. 561-1211-0341-21 Roll No. 213561-11-0032, an examinee of the B.A. / B.Sc. Semester VI Honours Examination (CBCS), 2024 of the University of Calcutta has prepared the Hazard and Disaster Management Report on 'Noise Pollution: A Case Study of Kolkata.' She/ He has completed the report within the assigned time, under the supervision and guidance of Dr. Swati Sachdev.

This report partly completes Paper GEO-A-CC-6-14-P of the Three-Year-Six-Semester Geography Honours Course.

Swati Sachdev

(Dr. Swati Sachdev)
Dept. of Geography
Budge Budge College

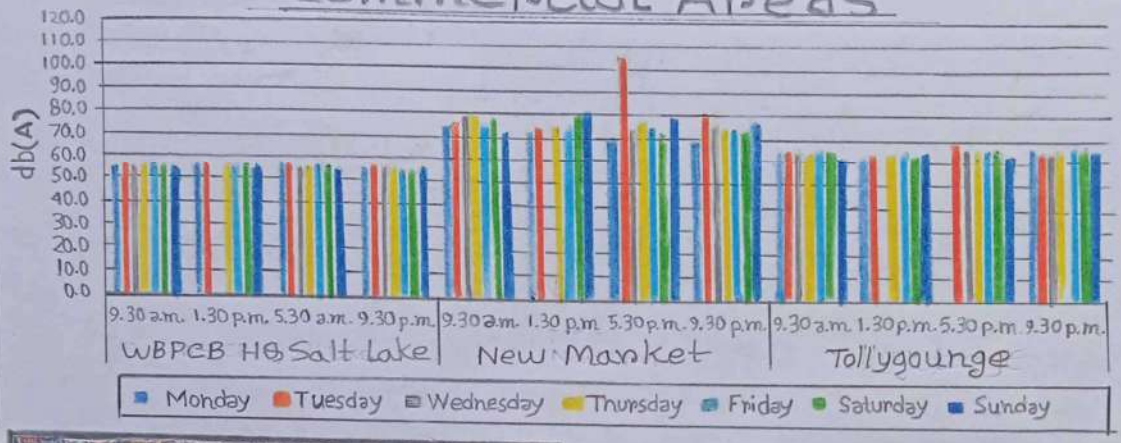
LOCATION OF STUDY AREA: KOLKATA



DAILY AND WEEKLY VARIATION IN NOISE POLLUTION LEVELS IN KOLKATA

30th April to 5th May 2024

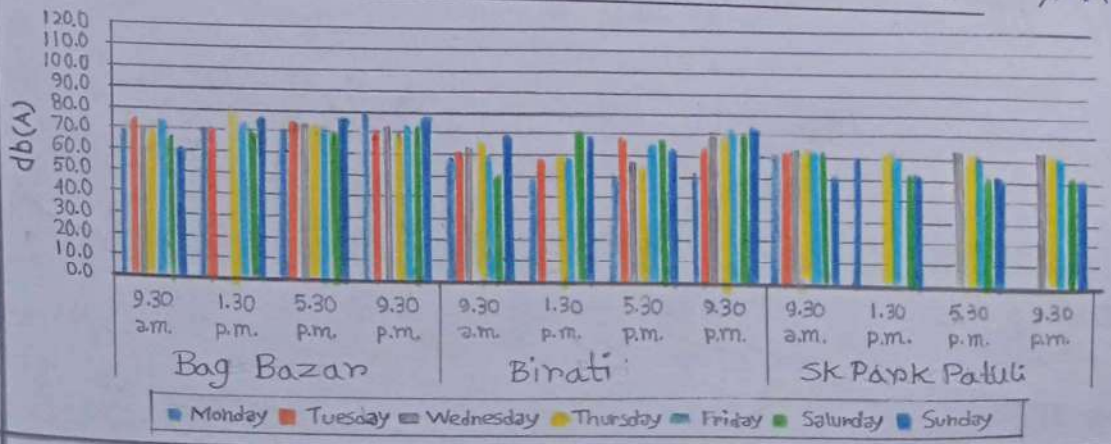
Commercial Areas



Commercial Area: New Market

Residential Area near Birati

Residential Area



SOURCE: http://120.57.32.56/Kolkata/

• Research and Innovation:

Special initiatives must be taken to support research and innovation in noise pollution monitoring techonologies, mitigation strategies, and sustainable urban development practices by fostering noise pollution challenges in kolkata. Measures to reduce noise emissions from commercial, industrial and construction activities must be initiated by encouraging the use of quieter equipment and techniques.

There must be accompanied by Health Survey in areas with high noise levels for assessment of impacts of noise pollution on human health like being undertaken in Assam are also necessary. By implementing a comprehensive disaster preparedness plan for noise pollution, kolkata can effectively mitigate the adverse impacts of excessive noise on public health, well-being, and the environment, ensuring a safer and more liveable city for its residents.

▭ Conclusion

Overall, addressing noise pollution in kolkata requires a multi-faceted approach involving government intervention, public awareness, and community participation and NGOs. The West Bengal Pollution Control Board is focused on improving the 4 'E' for better traffic management i.e, Education, Enforcement, Engineering & Emergency Responce, as traffic related noise pollution is the primary cause of concern in kolkata. The problem of noise pollution is a disaster that has long term unmeasurable health consequences. The preparedness and mitigation measures for such a disaster are interlinked and move in conjunction with each other to provide guidelines for urban planning.

Sustri Sutha. 02/07/2024.

UNIVERSITY OF CALCUTTA

BA SEMESTER-V

GEOGRAPHY HONDURS, PRACTICAL EXAMINATION, 2024 (CBCS)

PAPER: GEO-A-CC-6-14-P

UNIVERSITY ROLL NO = 212561-11-0121

REGISTRATION NO = 561-1211-0235-21

Examined

Tanushree Dutta

22/7/2024

Examined
Department of Geography
Jogamaya Devi College for Women
Bandra, Kol-8

TO WHOM IT MAY CONCERN

This is to certify that Registration No. 561-1211-0235-21 Roll No. 212561-11-0121, an examinee of the B.A. / B.Sc. Semester VI Honours Examination (CBCS), 2024 of the University of Calcutta has prepared the Hazard and Disaster Management Report on 'Road Accident Scenario in Kolkata: A Spatio – Temporal Study.' She/ He has completed the report within the assigned time, under the supervision and guidance of Mr. Sajid Qamar.

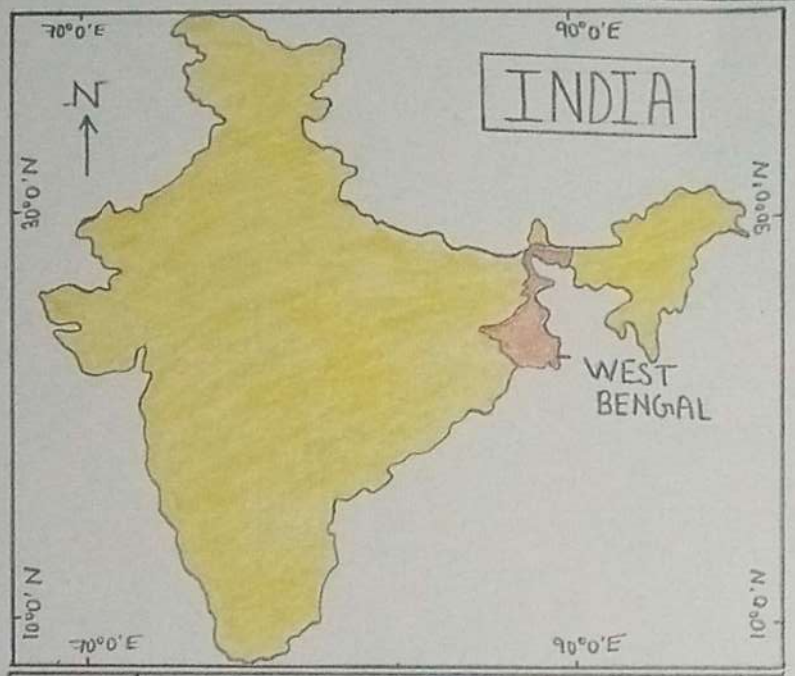
This report partly completes Paper GEO-A-CC-6-14-P of the Three-Year-Six-Semester Geography Honours Course.

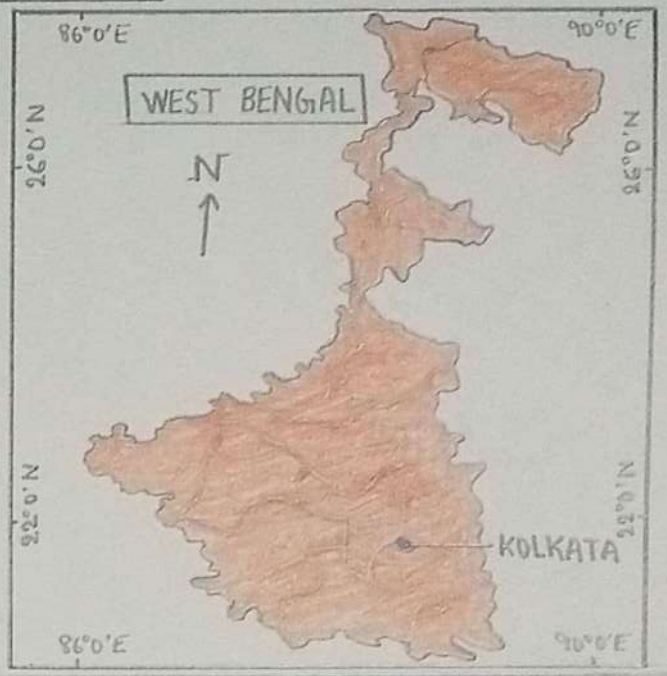
(Sajid Qamar)
Dept. of Geography
Budge Budge College

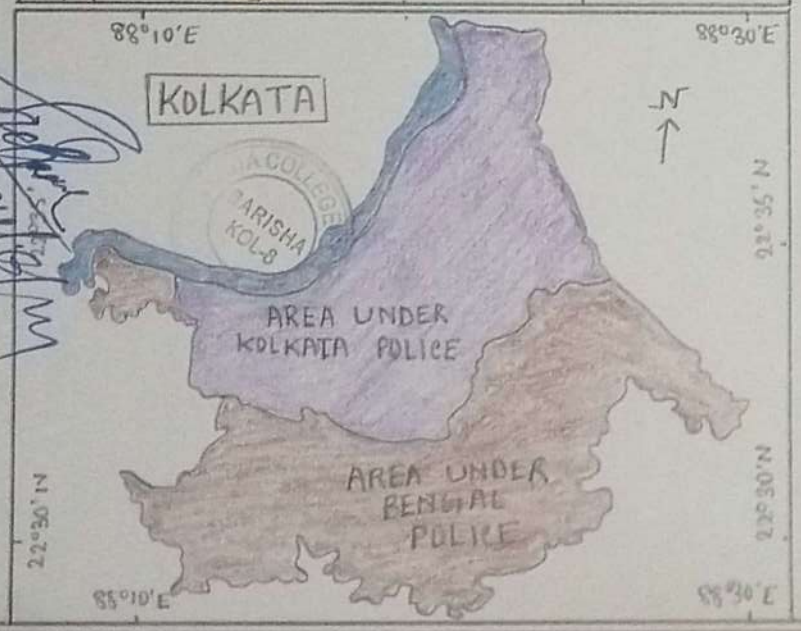
DISASTER MANAGEMENT PROJECT

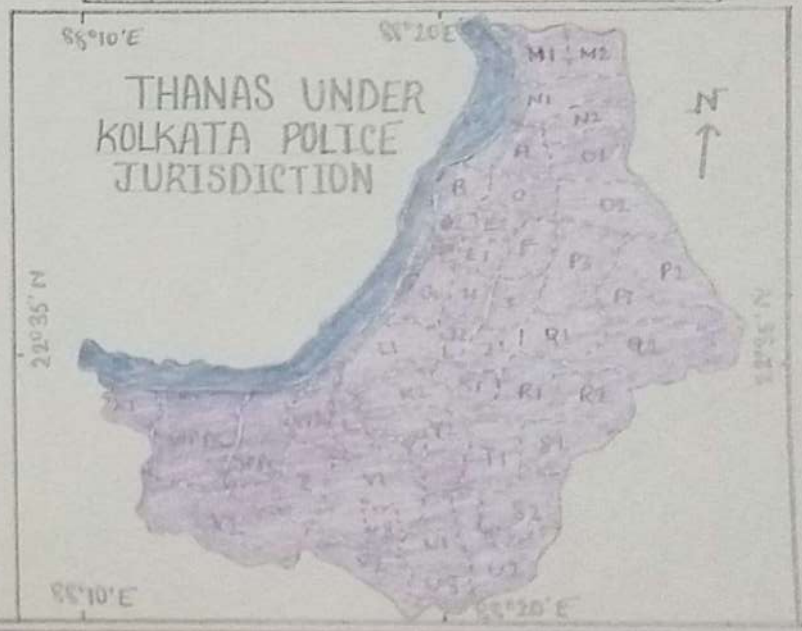
ROAD ACCIDENT SCENARIO IN KOLKATA: A SPATIO - TEMPORAL STUDY

STUDY AREA


INDIA
70°0'E
90°0'E
30°0'N
10°0'N
N
WEST BENGAL


WEST BENGAL
86°0'E
90°0'E
26°0'N
22°0'N
N
KOLKATA


KOLKATA
88°10'E
88°30'E
22°35'N
22°30'N
N
AREA UNDER KOLKATA POLICE
AREA UNDER BENGAL POLICE


THANAS UNDER KOLKATA POLICE JURISDICTION
88°10'E
88°20'E
22°35'N
N

CONCLUSION

The availability of road traffic accident data in Kolkata is severely limited, relying soley on police records which suffer from significant under reporting and lack standardized reporting formats. This undermines routine analysis and hampers effective safety measure pedest-rians particularly endangered at zebra crossing, faces substantial risk due to vehicle conflicts, speeding, careless driving and poor visibility. Addressing these challenges requires mitigating conflicts, enforcing speed limits and enhancing road visibility with measure like round humps and signal systems. Comprehensive corrective action, blostered by international support and local initiatives are circular to improving roadway safety and building sustainable programs, necessitating substantial resource and expertise.

24/5/24

UNIVERSITY OF CALCUTTA

B.A SEMESTER - VI

GEOGRAPHY HONOURS PRACTICAL EXAMINATION (2024 CBCS)

GEOGRAPHY LABORATORY NOTEBOOK

PAPER: GEO-A-CC-6-14-P

REGISTRATION NO: 561-1214-0101-21

ROLL NO: 212561-11-0199

Examined

Jayashree Dutta.

22. 7. 2024

Examiner

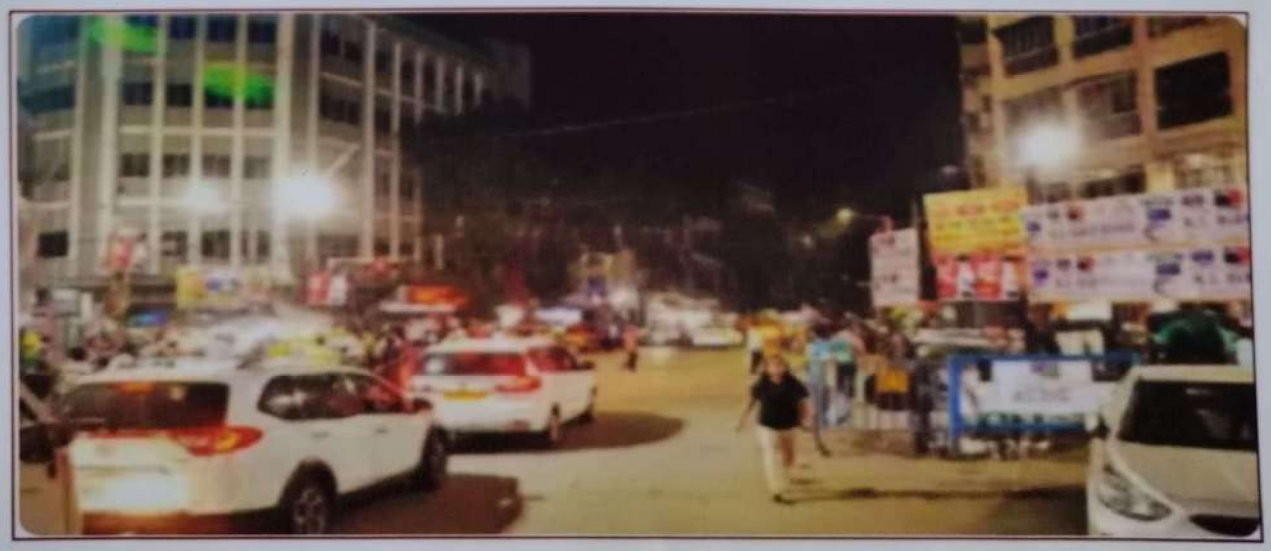
Department of Geography

University of Calcutta

DISASTER MANAGEMENT PROJECT

STRUCTURAL COLLAPSE

A CASE STUDY OF VIVEKANANDA FLYOVER, KOLKATA



TO WHOM IT MAY CONCERN

This is to certify that Registration No. 561-1214-0101-21 Roll No. 212561-11-0199, an examinee of the B.A. / B.Sc. Semester VI Honours Examination (CBCS), 2024 of the University of Calcutta has prepared the Hazard and Disaster Management Report on 'Structural Collapse: A Case Study of Vivekananda Flyover, Kolkata' She/ He has completed the report within the assigned time, under the supervision and guidance of Dr. Swati Sachdev.

This report partly completes Paper GEO-A-CC-6-14-P of the Three-Year-Six-Semester Geography Honours Course.

Swati Sachdev.

(Dr. Swati Sachdev)

Dept. of Geography

Budge Budge College

victims were timed to be rushed to nearest hospital, but due to large traffic blockage in the working hours the operation were difficult. These operations continued well into the night as well.

Besides this assistance, one technical team comprising of one assistant Engineer and 08 Junior Engineer was also deployed for providing technical assistance in clearance of debris. In order to closely supervise the operation, Sh. S S Gulenia, DIG NDRF was present round the lock from 31st March, 2016 to 02nd April, 2016.

Figure 5: Rescue operations continued well into Night

In addition, transport services were totaly suspened along the route to prevent chaos. Thirdly, sixty two families living in buildings near the accident site were asked to vacate temporarily for the safe removal of collapsed debris. Authorities isued an immediate alert to instruct them to move out of them area as soon as possible. In order to assist handling the situation, police, firefighters and other rescue teams were deployed for an orderly clearance.

Management and Rehabilitation:

Over long-term to tackle the situation and address the collapse of flyover, the policed the constructed company IVRCL's Kolkata office. The government appointment RITE (Rail India Technical and Economic services) for

02/07/2024

Current Scenario:

Initialy the government was undecided as to continue with the project or pull-down entire structure. However, till the final decision was taken at least 100 small, big and makeshift shops were present under the flyover and hundreds of homeless people slept on both the pavements each night under very risky circumstaces for many years.

Finally, nearly five years after collapse, based on a health audit report, it was decided to dismantle the flyover and after nearly two year since the demolination was started, it has been razed completely. The demoletion too place in four phases of 2-3 month each, the plan for which was discussed with the stakeholders, i.e postabazar Marchents association in presents of RITES and KMDA officials. RITES was the executing agency for dis-mantling of the flyover. The kolkata traffic police made necessaries traffic diversion to ensure smooth flow of traffic while the work for pulling down was executed and undertook precuationary measures to ensure no damage to the building adjacent to the flyover occured.

Recently, a proposal is being prepared for 6 km long flyover connecting posto market with ultadanga cutting down travel time from VIP road to howrah by 15 minutes while one flank will end on strand road at posto another flack will go onto kankurgachi and E.M Bypass at Bengal chemical.

Conclusion :

Structural collapse is a disaster which can be prevented by good engineering and regular inspection and maintenance. In this regard a research study has stated that, scheduling issues, faulty design, poor execution, improper inspection construction material and delay were among the prominent problems leading to collapse.

It can be concluded that effective planning, good engineering techniques coupled with proper inspestion maintaince and engineers with hand-on filled expertise can result in more stable structures and reduce the disasters occuring due to structural collapse of flyovers. Flyovers are critical links in any transportation network and detailed analysi of such failures and its wide discussion can ensure that other engineers who are involved in similar projects can learn from the incidents. Thus forsighted planning and construction, it is expected will help reduce and prevent such disasters.

Swati Gautam
02/07/2024

CONTRIBUTION OF CHINESE GEOGRAPHERS

INTRODUCTION

Chinese made an important contribution to geography particularly between 200 and 1000 A.D. They contributed significantly in any the field of astronomy, cartography, mathematical geography, map making, science, geography, historical writing, exploration and regional geography.

Main school of Cosmology and Astronomy

By Second Century AD, three main schools of cosmology and astronomy had emerged:

1. Hun Tian Theory: It envisioned heavens as a hemisphere covering the earth which was shaped like an upturned bowl. Hence the theory is known as the dome theory.
2. Gai Tian Theory: It compared earth with the dome and heavens to a revolving round of the globe.
3. Xuan Ye Theory: It envisioned the infinite space in which the heavenly bodies moved floated freely.

PROPONENTS OF CHINESE GEOGRAPHERS:

CONFUCIUS

- Confucius was a great thinker, teacher.
- He travelled almost 15 years and visited many princes of experiment.
- On top of that, he wrote 5 classical, which discussed the then ancient Chinese government, literature, religion and the law.
- Confucius came to be recognized as the [illegible] and his classic as epitaph in China and [illegible] highly studied from 136 BC to the 20th century. After 1905, those were even included in the curriculum of some schools.

CONFUCIUS (551-479 B.C.)

ZHENG HE (1371-1433 AD)

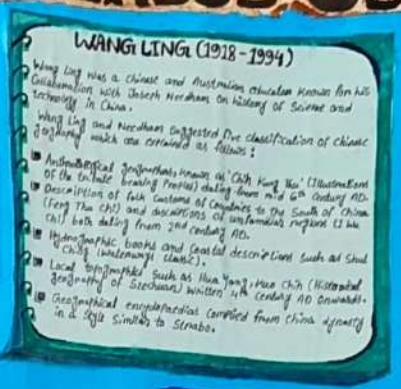
- His personal name is Ma Sanbao.
- He is an admiral and diplomat who helped extend the maritime and commercial influence of China through the vast region bordering the Indian Ocean.
- He commanded seven naval expeditions almost before the Portuguese reached India by sailing around the South African tip of Africa.
- From 1405-1433, he spent 28 years of his life travelling 50,000 km and more than 30 countries.
- The 50 vessels of his time collectively came to be known as "Eunuch Sanbao to the western Ocean" or "zhengHe to the western Ocean".
- He continued his journey to the remote shores of North Pacific Ocean, Indian Ocean, Persian Gulf, Africa etc.

ZHANG CHIEN (137-114 B.C.)

- One of China's ancient travelers was known as Chang Chien.
- He travelled to the vast lands of Samarkhand, Uzbekistan, Ferghana, Sogdiana and many other areas.
- Chinese silk trade with western countries increased because of his travels.
- He is believed to discover the Hetian Civilization in 128 B.C.
- Better spices of horse and plants such as Jinseng, alfa-alfa etc. became known to the chinese on his experience.

XU-XIAKE (1587-1641)

- He made discovery of the true source of the west rivers.
- He also discovered the Mekong and Salween rivers were in fact separate drainage with completely separate watersheds.
- In his remarkable book 'Xu Xiake's Travels' he made a detailed record of the karst phenomena in human, Guangxi, Guizhou and Yunnan during his trip.
- His contributions to karstology maybe karst landforms may be summarized as follow:
  - the classification of karst landforms based on particular landscapes of rocky mountains, three major patterns and many subtypes were distinguished in Guangxi, Southern Guizhou and Yunnan.
  - Detailed descriptions of various karst morphology definations of karst terms and explanations of some karst developing process.
  - The work first point out that the yimaqiang rivers is a upper reach of the changjiang river. All of those judgements have exerted a remarkable effect of studying origin of the changjiang river for successors.



WANG LING (1918-1994)

Wang Ling was a chinese and Australian scholar known for his collaboration with Joseph Needham on history of science and technology in China.

Wang Ling and Needham suggested five classification of chinese geography which are considered as follows:

- Anthropological geography known as 'Chih Kung Wu' (illustrated of the tribute bearing peoples) dating from mid 6th century AD.
- Description of folk customs of countries to the South of China (Feng Tu Chi) and descriptions of unfamiliar regions (Wu Chi) both dating from 2nd century AD.
- Hydrographic books and coastal descriptions such as Shui Ching (waterways classic).
- Local topographic such as Hua Yang Kuo Chih (Historical geography of Szechuan) written in 4th century AD Sawadeh.
- Geographical encyclopaedias compiled from China dynasty in a style similar to Strabo.

CHEN FAHU (1962)

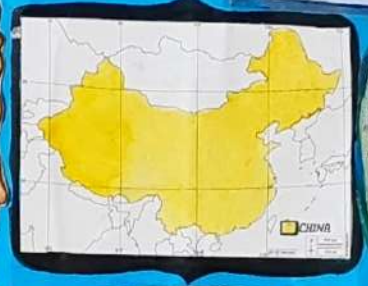
- He is a chinese geographer, geologist and climatologist.
- He has served as director of the institute of [illegible] of the Chinese Academy of Sciences since 2012.
- He is specially discussed on environmental changes, climatic changes, environmental archaeology, loess material, desert evolution and paleoenvironmental reconstruction, human environment interactions in Arid central Asia and the Tibetan plateau.

An Zhisheng (1941-)

- An Zhisheng is a chinese geographer and politician who specialized in quaternary geology, with particle paleoclimatology, control and global change.
- He is internationally known for his study on chinese loess and its implications for paleoclimate and paleoenvironment changes.
- He served as the vice chairman of international union for quaternary research (INQUA) from 1999 to 2007, and the vice chair of international Geosphere-Biosphere programme (IGBP) Steering committee from 2003 to 2006.

CHU SSU PEN (1273-1337 AD)

- Chu-Ssu-Pen was a scholar who did some important work on map making.
- He compiled the cartographic work to summarize the new information that was available due to unification to mongol with Asia. This map remained a reference for over two centuries.
- He recognized Africa was a south ward pointing triangle in contrary to contemporary European and Arabic maps where it was always recognized as pointing East-wards.
- He drawn 'Mongol Empire' (Title - Kuang Yu Tu)



YU KUNG (5th CENTURY)

- Yu Kung was a writer and very famous for his book written in 5th century B.C.
- He wrote a historical classic book 'Shu ching'. A chapter in this book 'Tribute of Yu' is the earliest chinese geographical document.
- This work provides an inventory of Chou empire, mainly in term of its physical geography and lists the traditional nine provinces, their kinds of soil, their characteristics, products and waterways running through the agriculture.

ZHANG HENG (78-139 A.D)

Zhang Heng, formally romanized as Chang Heng was a Chinese polymath, scientist and statesman who lived in Han dynasty.

- Educated in the capital cities of Luoyang and Chang'an, he achieved success as an astronomer, mathematician, seismologist, cartographer, poet, inventor, engineer, ethicist, and philosopher.
- In 123 A.D. he corrected the chinese calendar to reflect it on the basis of seasons.
- Zhang Heng made revolving globe.
- He invented the world's first water-powered armillary sphere to assist astronomical observation. He improved the armillary sphere by adding another ring.
- He invented seismometer, which is known as in chinese language "Houfeng Didong Yi".
- He wrote down his Cosmic theories in his famous book "Ling Xian" where he gave information about the universe.

PHEI HSIU (224-271 AD)

- Phei Hsiu is called as the father of chinese cartography. He was appointed minister of public works by the chinese Emperor 267 AD.
- In 267 AD he drew the political map of China on silk in large scale.
- He did some important work on cartography.
- Along with Chang Heng, he developed a scientific method of cartography based on a rectangular coordinate system.
- Phei Hsiu used the coordinate system and triangulation method to the beautiful cartography of China and the surrounded area.
- He is known as Father of cartography.

HUAN-TSANG / XUANZANG (602-664 A.D):

- Huan Tsang was the most famous chinese Buddhist pilgrim, travellers.
- He travelled Turkistan, Tashkhand, Bactria etc in 629 A.D for 16 years.
- He came to Kashmir and walked along the bank of the Ganges to reach the main land of India, where he studied Sanskrit and accepted Buddhism. In 645 A.D.
- He wrote description of the places he travelled.
- In 646 he composed his experiences in his famous book 'Ancient' Tang Records on the Western Region' that contain authentic records of medival central Asia and India.

Space and Place

Sense of place

YI-FU TUAN

Father of Humanistic Geography

CONCLUSION

Chinese geographers, such as the three geographers mentioned for their contributions to population geography, particularly his development of the Hu-Huanyong line, which delineates China's demographic divide, the long-charge studies in regional geography have provided critical insight into China's diverse landscapes and economic development patterns. These scholars have influenced policy and academic discourse with their rigorous research, addressing issues from urbanization to environmental management. This work continues to shape geographical understanding not only within China but also globally, highlighting the significance of Chinese geographers in advancing geographic knowledge and applications.

ROLL NO: 212561-21-0184
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REG NO: 561-111-0228-21
Dept. of Geography
Bodoland University

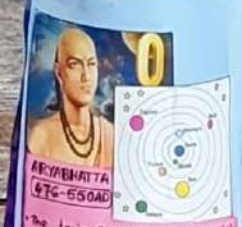
CONTRIBUTION OF INDIAN GEOGRAPHERS

INTRODUCTION

Indian geographers have profoundly shaped the understanding of both physical and human geography, from ancient to modern times. Ancient scholars like Aryabhata and Varahamihira made foundational knowledge in astronomical geography.

In the pre-modern period, visionaries exemplified geographic principles in field observations, with ancient design practices integrating the vital role of Indian geographers have significantly influenced policy and academia with their work in regional planning and Indian subcontinent.

Contemporary figures like Dr. R.P. Singh have advanced regional development and cultural geography, emphasizing interconnection of the vital role of Indian geographers have contributions collectively enriched knowledge and underpinning it as one of the world's most diverse regions.



ARYABHATTA
476-550AD

- The term Bhugol (that is geography) was found in the mentioned in "Surya Siddhanta" written by Aryabhatta around 500 BC.
- Aryabhatta described a geocentric model of Solar System. Solar and Lunar Eclipses were scientifically explained by him.
- Aryabhatta invented the Symbol of zero '0'.
- Aryabhatta invented an approximation of π, 62832/20000 = 3.146
- Aryabhatta correctly observed that the Earth rotates on its axis from west to east. He also believed that the Earth rotates around the Sun and the moon orbits the Earth.
- Aryabhatta observed that the stars' visible movement is relative caused by the Earth rotation.

VALMIKI
500AD

- Valmiki mentioned the 6 types of seasons in this holy text "Ramayana". Name of the six season are Basant (Spring), Greeshan (Summer), Varsha (monsoon), Sharad (Autumn), Hemant (Winter) and Shisir (Severe winter).
- In Ramayana, Inventory of mountain, rivers, Plateaus, Planets has been made.
- Valmiki describes the Geography of the area from the Kingdom of Videha (today Nepal) to the Kingdom of Kekay (today Northern Pakistan).
- He also describes the area from the Hastinapur (on the banks of Ganga to Lanka in the South.
- He said that the southern bank of the Sarayu river is 1.5 yojanas from Ayodhya.

BRAHMAGUPTA
598-668AD

- He wrote a book "Brahma Sphuta Siddhanta" a astronomical work. In this book, zero (0) has be considered as a figure.
- He laid the foundation of two major fields of Indian Mathematics, pati-ganita, and bij ganita.
- Khandakhadyaka as an astronomical hand book where he said about the shifting of days.

G.S. DASGUPTA
(1925 - 2008)

- Dasgupta's name garnered under geography, regional planning.
- He has also contributed to rural development in India.
- He made contribution to understanding urban growth.
- He works on sustainable development and land use map in India.

M.S. SWAMINATHAN
(1925 - 2023)

- Swaminathan was known as the father of the Green Revolution.
- He has contributed to agricultural science and food, sustainable development and agriculture.
- His work has interested with geography through his research on rural development.
- His areas of interested include botany, plant science, and plant physiology.

- R.P Mishra has contributed to regional Geography.
- He suggested a five level hierarchy of growth pole model in larger country.
  - Growth poles
  - Growth centre
  - Growth points
  - Service centre
  - market village
- He has contributed to sustainable Development for Smart cities.

R.P. MISHRA
(1930 - 2021)

ANCIENT MAP OF THE WORLD BY INDIAN GEOGRAPHERS

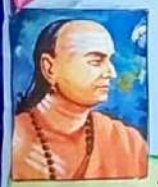
In ancient time, seven islands are mentioned

1. Jambu dwipa
2. Kusa dwipa
3. Plaksa dwipa
4. Pushkara
5. Salmali
6. Krauncha
7. Sama

BIRTH PLACES AND DATES OF INDIAN GEOGRAPHERS

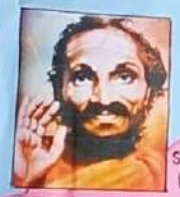
RANA P.B. SINGH
(1950 - NOW)

- Rana P.B. Singh worked as professor (specially cultural landscape, Heritage studies) at the department of Geography, Institute of Science, Banaras Hindu University.
- Rana Singh does research in cultural Geography and human Geography and landscape studies.
- His current project is understanding place and 'Emerging the Cosmos' and related aspect of cultural and sacred landscape and cosmic geometry.
- He has explored the relationship between religion, culture and geographical space.



VARAHAMIHIRA
(505-587)AD

- Varahamihira contributed in the field of mathematical and astronomical areas.
- He was the author of the Pancha-Siddhanta, Brihat-Samhita and Brihaj-jatakam.
- Varahamihira stated the Earth is spherical.
- Varahamihira was the first to state that the equinox shifts by 50.32 arc second per year.
- Varahamihira wrote about weather patterns, cloud formation, rainfall and how to predict the weather using astronomical observation.
- Varahamihira explained the the concept of eclipse.



SRIDHAR ACHARYA
870-930 AD

- He made contributions to the decimal number system.
- Sridhar Acharya also calculated an approximation of the value of π (π).
- In his book Trisatika, Sridhar Acharya explained that the practical application of Algebra.
- In his book Patigamita, he separated algebra from arithmatic.
- He was one of the first to give a formula for solving quadratic equation $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$
- He also made contribution to geometry, including the calculation of the areas of various geometric shapes. His work in this area helped lay the foundation for the development of geometric principles.

BHASKARACHARYA
(1114 - 1185 AD)

- Bhaskaracharya wrote a treatise on the gravitational force of the earth.
- He also told that all the celestial bodies move in their orbits in the universe due to their attractive power and remain stable.
- He wrote 'Siddhanta Shiromani', which was considered of 4 parts — Arithmatic, Algebra, Math and planets.
- He was perhaps the first to conceive the differential coefficient and differential calculus.
- Examing the orbit of the sun and moon.

RAJIV SINHA
(1964 - NOW)

- Sinha works for physical geography particularly in fluvial geo-morphology and sediment transport.
- His research has provided insights into river system sediment dynamics.
- He works on the impact of climate change on river environment.
- He also contributed on River Management Project.

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CONCLUSION

Indian geographers, from ancient scholars like Aryabhata, who advanced astronomical geography with accurate measurements of Earth's circumference, to modern experts like R.L. Singh, who authored "India: A Regional Geography", have profoundly shaped the field. Early modern planners Vidyadhar Bhattacharya's design of Jaipur integrated principles of Vastu Shastra with systematic urban planning. Contemporary figures like S.P. Chatterjee's extensive studies on the Himalayas and Ganga Plains exemplify the deep regional insights into India's diverse landscapes, their contributions highlight geography's crucial role in understanding and managing India's complex environmental and cultural variety.

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PROPONENTS OF REGIONAL GEOGRAPHY

Geography studies the different phenomena causally at in different parts of the earth surface — Hettner, 1930

Immanuel Kant (1724-1804)

ALEXANDER VON HUMBOLDT (1769-1859)

CARL RITTER (1779-1859)

FERDINAND VON RICHTHOFEN (1833-1905)

REGIONS

- Regions have different definitions & concept each as perceived which has changed and adapted overtime.
- Definition: Aristotle: Area and representation of phenomena of different original existing together in a particular place or time (homogeneity to region of areal geography) - Hettner (Kant) Independent
- Regions: Formal (homogeneity) - Hettner (Kant) Independent; Functional - Hettner (Kant) Independent; Spatial organization of city region - Dickinson; Complex (uniform region defined in terms of all variables) - Whittlesey committed.

REGIONAL GEOGRAPHY

- Regional approach studies all the unique characteristics of place.
- Regional geography examines the spatial patterns of human activities in particular parts of the earth surface.
- Two approaches: 1. Regional geography: analytical - inductive - aggregation of systematic - deductive - synthetic.
- Hettner & Hartshorne focused on analytical method.
- Hettner & Hartshorne: Regional geography - from focus on unique region to focus on place & space.

CHOROLOGY

Science of space relating geography as chorological science concerned with the systematic study of visible field & glorifying of region.

CHOROGRAPHY

Term comes from Thomas 'place' and graphein 'writing', that meaning literally writing about place. Hettner: study of a region including all aspects in areal combination as a study of reality.

Richthofen differentiated between chorology and chorography. Chorography show the areal differentiation of phenomena, chorology chorology show the areal differentiation of phenomena in addition to showing areal and effect relationship among them and their interrelations.

CRITICISMS

- Chorology: criticised exceptionalist claim of regional geography and focus on uniqueness. Also propounded geography about scientific positivism and generalization, theory building and formulating scientific explanation of phenomena on the earth surface, i.e. spatial patterns, shift from areal to spatial, to spatial interaction.
- Hettner: relative - areal relationship to spatial interaction.
- Hettnerian: role of physical / ecological individuality of region.
- Geography as aide-mémoire, neglected time.
- Geographers had prescriptive treated from other sciences.
- Regional approach lacked philosophical basis.
- Dickinson: overemphasized when desired regions: boundaries created did not matter and not exist.
- Whittlesey: Hettnerian concept of region only relevant to self-sufficient regions today's world.
- Regional method still prominent as means but not end.

CONCLUSION

- Contemporary regions are institutional construct hence are not permanent and these are related to notions of topophilia i.e. sense of place, and placelessness. Place & meaning and sense of place associated to socialist flow, regional movements, ethno national identity.
- Conceptualization of region has compounded effect on how we chart and experience regional development, globalization and the world.
- The strength of regional geography is with complexity of synthesizing pieces of analysis and synthesizing the whole. Recognize approach and identify how the historic geographical context of development in the studied region and thus forecasting / theorizing future changes.

PAUL VIDAL DE LA BLACHE (1845-1918)

ALFRED HETTNER (1859-1941)

- Established Geography as Chorological Science i.e. study of causal relation between diverse phenomena which gives place individuality.
- Essays on the Frameworks and methods of geography published in Geographische Zeitschrift which he founded in 1895, as Ludwig Neugebauer: Its History, Character and Method (Die Geographische Methode und Ihre Methoden) in 1927.
- Proposed dualism: 1. Classification of sciences: logical unity in material of study and Physical Unity in method of geography. Proceeds from the viewpoint of spatial variation.

Chorology describes examines localized differences, differences association of phenomena, analyzes their spatial interrelations, compares them on an inductive basis.

- Geography involves consideration of causal interrelationships of various sets of spatially arranged (Physical and human) in particular segments of earth's surface in a region.

[illegible] view of geography as a means [illegible] description then cause of dissimilarity [illegible] uniqueness.

[illegible] an geometric unique area [illegible] - unique raw material for general theory needed to identify uniqueness.

RICHARD HARTSHORNE (1899-1992)

- Hartshorne in its Nature of Geography (1939) advocated that geography and regional in its essence and put forward his concept of areal differentiation.
- Geography is a discipline that seeks to describe and interpret the variable character of the earth's surface as the world of man; i.e. areal differentiation.
- Components of areal interpretations: areal variations and causal complexes of phenomena in relation in that place different from other places. Relation of geography different for Hartshorne and Schaefer. Hartshorne concepts, methodologies and principles that shall apply to specific regions to all parts of the world VS identification of laws which patterns of spatial relationships - laws more than laws end.
- Perspectives on the Nature of Geography (1959) - [illegible] to Schaefer.
- No dualism between systematic and regional - [illegible] as continuum from analysis of elements [illegible] in areal variation over the world [illegible] which analyze the most complex [illegible] in areal variations in small areas.

[illegible] to smaller if negligible variation and homogeneity.

DOREEN MASSEY (1941 - 2016)

- Doreen Massey's: Geographer with Prominent writings in late - 1970s and early - 1980s
- Defined space as social relations, stretched out.
- Define place as particular articulations of these social relationship as they have come together at time in the particular locations.
- Considers place as a cross section of space.
- Regional concept proscribed by here was that region was a relation. Concept and time more bounded.
- Regions: a result of uneven economic development and accumulation, overlapping records of capital accumulation expressed spatially.
- Considers spatially constructed dimension of placed and [illegible] of communities.
- [illegible] plant from accumulation, rather than [illegible] this analysis should problematize [illegible] organization in terms of their [illegible] colours.

Anne Gilbert (1955-)

- Professor & [illegible] at the Geography Department of the University of Ottawa, Canada.
- [illegible] in Geography [illegible] the new regional geography [illegible] speaking countries [illegible]
- [illegible] looking at the [illegible] of social problems [illegible] made kinds of population [illegible] played by the [illegible] social processes.
- Region as a setting for [illegible] that plays a fundamental role [illegible] and production of social [illegible] space (lived, [illegible] and [illegible] economy), [illegible] of each city [illegible] and approach [illegible]

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ECOLOGICAL APPROACH IN GEOGRAPHY

Robert E. Park (1864-1944)

- Park coined human ecology to study the relationship between humans and their natural, social and built environments.
- [illegible] a type of analysis [illegible] applied to the interrelations of plants and animals.

◎ The Ecological Basis of Urban development (Robert Park)

- Park believe that human life always was motivated by the evolutionary principal of the struggle for existence.
- In the desire to satisfy their needs, people competed with each other for the same resources.
- Park saw a distinct social element in competition. People didn't just compete for economic gain, they also competed for power and prestige.

INTRODUCTION

Ernst Haeckel was given credit for first introducing the term 'Ecology' in the year 1866. But Eugene Odum known as father of ecological approach, heading to Mc Connach (1963) "ecology is no longer a scientific discipline – it an attitude of mind".

- An approach that is focused on the relationship of the individual to the system in which they act. This relationship is independent.
- It is receiving increasing attention as a research focus in geography.
- It emphasizes the interdependence of interactions and relationships between humans and their environment.

HUMAN ECOLOGICAL PYRAMID

HUTCHINSON – 1853

His contribution to political ecology are significant and interesting, become a deeper exploration.

- Hutchinson's work a Theoretical Framework for understanding the complexity between political
- He emphasis the need to analysis environmental issues through a less that considers power relation social and historical content.
- His political ecology is his focus on power dynamics. He examines how various actors, such governments, over industries, [illegible] and environmental policy.

Barrows, H.H (1923) "Geography as human ecology"

R.J Johnston (1941-2020)

- He is an Urban ecologist known for his research contribution to Understanding Ecological Theories in Urban environments.
- He discussed how urbanization impacts biodiversity.
- He examines how urban development can be designed to minimize negative ecological effects and promote sustainability.

FORMS OF HUMAN ECOLOGY

Ernest W Burgess (1886-1966)

- He also developed a Theory of urban ecology, which first appeared in his [illegible] "The Growth of the City" (1925).
- [illegible] of course, he proposed that [illegible] cities [illegible] Burgess suggested that cities were governed by many of the same forces of Darwinian 'evolution' that happen in ecosystems.
- He felt the most significant force was competition, which was created by groups fighting for urban resources, like land, which led to a division of urban space into ecological niches.

Within these niches, people shared similar social characteristics because they where subject to the same environmental pressure. Competition for land and resources within cities eventually leads to the separation of urban space into zones with the more desirable zones imposing higher rent.

CONCENTRIC ZONE MODEL

H.H Barrows (1877-1960)

- In 1923 Barrows declared that geography is the study of human ecology.
- He is the application of ecological principles to study the relationship between man and other biotic and abiotic elements of environment.
- In this human ecology, he considered humans as the most influencing and determining factor of the environment and modify the nature and intensity of interaction between biotic and abiotic elements.
- He explores not only the influence of humans on their surroundings but also the influence of environment on human behavior and their adaptive strategies as they come to accommodate their influence better.

Eugene Pleasants Odum

(September 17, 1913 – August 10, 2002)

- He was an American biologist known as the father of modern ecology.
- He wrote the popular ecology textbook, Fundamentals of Ecology (1953). The Odum School of Ecology is named in his honor.
- According to him, Ecology is the study of interaction among living organisms (plants, animals, microbes) as well as interaction with their abiotic environment (temperature, water and soil, light etc.). According to Odum, this is known
- His famous quotation is "Ecology is the study of structure and function of ecosystem."

"Cooperation for mutual benefit a survival strategy very common in natural system is one that humanity needs to emulate"

— Eugene Odum —

Carl Troll (1899-1975)

- Carl Troll was a German geographer who coined the term landscape ecology, in 1939.
- He developed this terminology of high mountain ecology, interpreting interactions between environment and vegetation in the mountainous regions of Asia, Africa and South America.

He discussed human impacts on landscape structures and functions. It includes the Landscape Stability Principle, which emphasizes the Importance of landscape structural heterogeneity in developing resistance to disturbances, recovery from disturbances, and promoting total system Stability.

FORMS OF PHYSICAL ECOLOGY

Murray Bookchin – (1921-2006)

- He was an American Social theorist who called Social ecology, concerned with the relationship between ecological and social issues.
- According to him, it is an approach to society that embraces an ecological reconstructive and communitarian view of society.
- This approach to society puts forth the idea that ecological problems are inherently the results of social dysfunctions in human society. The approach posits that problems in ecology will only be commonly resolved when ecological and social issues are addressed and resolved. Underlying social issues are addressed and resolved. These social issues involve things such as industrialization, a class structure that deepens exploitation, a class structure that deepens exploitation, and certain notions of humanity as "inferior" and a distorted view of what constitutes "progress". The approach links social factors such as racism, sexism, and exploitation of third world countries with environmental problems such as the deforestation of rainforests.

CONCLUSION

Although introduced the concept of radical geography by David Harvey, the ecological approach lost their importance.

Criticism:-
- Ecological approach is not deductive and analytical.
- It is based upon biological analogy and deprived of socio economic scope about human society.

Importance:-
- Ecological school of study is a multidisciplinary approach that provides perspectives to comprehensively address issues of environmental justice, sustainability and global ecology.
- Ecological school is an intellectual exploration and [illegible] study of the relationship between humans and their natural, social and built environments.

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B.Sc. Zoology – 4 Year Honours & Honours with Research & MDC

Serial No.	Content
1.	Syllabus Extract indicating field work
2.	List of students along with the details of title, place of work, duration etc. for the latest academic year (2023-2024)
5.	Sample photographs of the field work
6.	Sample Report of Fieldwork 1, II

PART I: SEMESTER 1
SEC-1: Applied Entomology
Major; SEC-1-TH

Full Marks 75	3 Credits	50 Hours
Unit 1 Basics of Entomology		12
Insect diversity and adaptation: Morphological adaptation of insects: Head and antenna; Mouthparts of honey bee and cockroach; Thorax and thoracic appendages- legs and wings [General concept]. **Physiological adaptation in cockroach:** Digestive system: Alimentary canal and digestive glands, digestion; Respiratory organs and mechanism of gaseous exchange; Sense organs compound eyes, chemoreceptors. **General Characteristics of Class Insecta and living orders with examples:**Orthoptera, Dictyoptera, Hemiptera, Coleoptera, Lepidoptera, Diptera, Hymenoptera, Anoplura, Siphonaptera(Imms, A.D., 1938); **Ticks and Mites:** General features; difference between ticks and mites; Soft ticks and Hard ticks.		
Unit 2 Medical Entomology		14
Concept of Vectors: Mechanical and biological vectors, modes of transmission; Biological vector and disease cycle. **Biology of *Anopheles*, *Culex* and *Aedes*:**Study of mosquito borne diseases- Malaria, Dengue, and Filariasis; control of mosquitoes. **Biology of *Musca domestica*:**Disease relationship; control of house fly. Biology and systematicsof Bed bug *Cimex lectularius*; disease relationship; Control of Bed Bug. Ticks as Causative agents and Vectors: Rickettsiosis, Tick-borne encephalitis. Forensic Entomology: General perceptions and status of Forensic entomology; Insects and other arthropods of forensic importance; Pattern of insect succession on carcass; Postmortem Interval (PMI) and its estimation process; Applications and limitations of Forensic Entomology		
Unit 3 Agricultural Entomology		14
Concept of insect pest; Economic Injury Level (EIL), Economic Threshold Level (ETL), Dynamics of EIL; Pests of major crops (Life cycle, Nature of damage and control measures): Pests of Paddy, *Scirpophagaincertulus*; Pests of Jute, *Anomissabulifera;* Pests of brinjal, *Leucinodesorbonalis*; Stored grain pest: *Sitophilusoryzae*; Invasive insect pests of India and their consequences. Insect Pest control: Chemical, Mechanical, Cultural and Biological control measures; Integrated Pest Management (IPM) Study of appliances used in pest control: Dusters; Sprayers- categories of sprayers, agricultural Aircrafts; Granule applicator; soil injectors.		
Unit 4 Sericulture		5
Types of Silk Moths with special reference to their scientific name, geographical distribution, and host plants. Life cycle of *Bombyx mori*; Structure of Silk Gland; Voltinism,Rearing of mulberry silkworm; Reeling and extraction of silk; Mulberry cocoon management; Mulberry plant types and cultivation; Common diseases and pests of mulberry silkworm and their control measures;Prospects of Sericulture in West Bengal; employment potential in sericulture.		
Unit 5 Apiculture		5
Various domesticated species of Honeybee; Social organization and life cycle of Honeybee; Modern method of Beekeeping: Newton Box and Langstroth Box; extraction of honey and composition of honey; Pests, Parasites and Diseases and their control measures; Bee-economy: Apiculture products and their uses.		

Applied Entomology Lab: SEC-1-P

Full Marks 25	1 Credit	20 Hours
List of Practical		

1. Dissection and temporary mounting of: - Antennae and mouth parts of Cockroach, House fly and Mosquito
2. Methods of collection, preservation, and identification of economically important insects.
3. Identification of following insect pests (Order, family and specimen characters only): *Scirpophagaincertulus; Sitophilusoryzae*; *Callosobruchuschinensis, Leucinodesorbonalis*; *Anomissabulifera; Pyrillaperpusilla.*
4. Morphological studies of various castes of *Apis* sp.
5. Identification of life stages of *Bombyx mori*; Identification of Bivoltine and multivoltine mulberry cocoon.
6. Identification and medical significance of following insects (adults) through permanent slides/photographs: *Aedes* sp., *Culex* sp., *Anopheles* sp. [for mosquito, larvae and both sexes of adults], *Musca* sp., *Phlebotomus* sp., *Cimex* sp., *Pediculushumanuscapitis*., *Xenopsylla* sp.
7. Visits to **any one place of applied entomological significance** (submission ofa field report):
   a. Agricultural field/ forest for on spot study of pests and damage caused.
   b. Any Sericulture farm for studying grainage and rearing activities
   c. Visit to an apiary to study various activities o Apiculture
   d. Any rural or urban health centre to study various aspects of vector surveillance

PART I: SEMESTER 2
SEC-2 Aquaculture
Major; SEC-2-TH

Full Marks 75	3 Credits	50 Hours
Unit 1 Basics of Idea of Fish Biology		**3**
Qualities of Cultivable fish, Indigenous and Exotic		
Unit 2Sustainable Aquaculture System		**17**
Sustainable Aquaculture Culture System: Extensive, Semi intensive, Extensive Water quality in culture ponds and factors controlling water quality. Preparation and Management of Fish Culture Ponds in Composite Fish Culture Cage Culture, Pen Culture, Raceways. Flow through system. Biofloc. Cold water fishery. Jeol Fishery. Sewage fed fishery. Mariculture with special emphasis on sea weed culture.(Basic concept) Induced Breeding of Carps. Synthetic Hormones in Hypophysation. Management of Fin Fish Hatcheries. Glass Jar Hatchery, Chinese Hatchery.		
Unit 3Recent Advancement of Aquaculture		**20**
Aquarium Fisheries. Preparation and Management of Fish Aquarium. Biology of Common Ornamental Fish: Guppy, Swordtail, Angel, Blue morph fish. Anemone fish, Butterfly fish, Molly. **Fish Nutritional Requirements:** Feed Formulations and Preparation of Compound Diets. **Capture Fishery:** Fishing Crafts and Gears, Post harvesting Technology. Fish Transport and Marketing. Fish Preservation and By-products. **Fish Biotechnology:** Transgenic Fish, Sex Reversal in Fish. Aquaponics,Application of GIS and Remote Sensing in Fisheries, Fishery Laws and Regulations.		
Unit 4 Fin Fish pathology		**5**
Name of Infective Disease. Causative Agents, Symptoms, Control.Bacteria- Dropsy, Fin and Tail rot. Protozoa- White Spot Disease; Fungal-Saprolegniasis; Ectoparasite-Gyrodactylosis, Dactylogyrosis. Virus- Rhabdovirus		
Unit 5Applied Aquaculture		**5**
Breeding Techniques in Shrimps and Prawns: Eyestalk Ablation in Shrimp and Salinity shock in Prawns.Techniques of Artificial Pearl Culture.		

Aquaculture Lab: SEC-2-P

Full Marks 25	1 Credit	20 Hours
List of Practical		

1. **Identification of different fish species using Meristic characters. (Systematic position, specimen characters)**
   Rohu, Catla, Cirhinus, Puntius, Amblyphyngodon, Channapunctatus, Lates, Mystus, Notopterus, Cyprinus, Hypopthalmichthys, Ctenopharyngodon, Oreochromisniloticus, Oreochromismossambicus
   Anabas, Clarias, Heteropneustis, Mugil, Macrobrachium, Paneus .
2. **Field visit to an Aquaculture farm/ Hatchery**

SEC G For MDC
Applied Zoology-Theory

Full Marks 75	3 Credits	50 Hours
Unit I: Agricultural Entomology		6
Pest- definition and types (major and minor pests with example); Lifecycle, nature of damage and control of Pests: *Scirpophagaincertulus*of paddy,*Anomissabuliferaof* Jute, *Bandicoota*–stored house pest; Insect Pest control: Chemical, Mechanical, Cultural and Biological control measures; Integrated Pest Management (IPM).		
Unit II: Sericulture		8
Types of Silkworms with special reference to their scientific name, geographical distribution and host plants; *Bombyx mori*: Silk gland, Composition of silk, Uses of silk; Lifecycle; Rearing, Extraction and Reeling of mulberry silk; Silkworm diseases, pests and their control.		
Unit III: Apiculture		7
Various domesticated species of Honeybee; Social organization of Honeybee; Bee keeping: Langstroth Box for rearing of honey bee, Extraction and processing of honey; Composition of honey, apiculture by products and their uses; Pests and Diseases of bees and their control measures		
Unit IV: Vermiculture		7
Scope of Vermiculture; Habit categories of earthworms; methodology of vermicomposting: containers for culturing, raw materials required, preparation of bed, environmental pre-requisites, feeding, harvesting and storage of vermicompost; Advantages of vermicomposting; Diseases and pests of earthworms.		
Unit V: Aquaculture		8
Principles, definition and scope; Prawn culture: Penaeid and Palaemonid features with examples; Semi-intensive method of prawn culture; Application of prawn culture; Difference between major and minor carps with examples; Composite fish farming: General concepts, advantages and disadvantages; Induced breeding: method and advantages; Integrated fish farming.		
Unit VI: Live Stock Management		8
Dairy: Introduction to common dairy animals: Types of Cattle breeds and their distribution in India; Exotic cattle breeds; Artificial insemination and MOET in breeding; Cattle feed: Roughage and Concentrate; dairy by products, preservation and uses. Dairy pathology and vaccination programme. Poultry: Types of breeds (fowl) with features and examples; Rearing method: Deep litter system; feed formulation for chicks; poultry by products with economic importance; Diseases of poultry and their control measures.		
Unit VII: Lac Culture		6
Life cycle, host plants and strains of Lac insect; Lac cultivation: Local practice, improved practice, propagation of Lac insect, inoculation period, harvesting of Lac; Lac composition, processing, products and uses; Natural enemies of lac insect and their management		

SEC G For MDC
Applied Zoology-Practical

Full Marks 25	1 Credit	20 Hours
List of Practical		

1. Identification of various castes of Honey bee, life stages of *Bombyx mori*, various life stages of *Kerrialacca*, various earthworm species used in vermiculture and ectoparasites of Poultry birds
2. Identification of the following fish and prawn specimens (Specimen characters only): *Labeorohita, Catlacatla, Cirrhinusmrigela, Cyprinuscarpio, L. bata, Penaeusmonodon, Macrobrachiumrosenbergi*
3. Collection of any two pests and submission of specimen it along with a small report on its identifying features, life cycle, nature of damage and control: *Sitophilusoryzae, Triboliumcastaneum, Nilaparvatalugens, Anomissabuliferaand*Leucinodesorbonalis
4. Visit to any one of the following and submission of report on the visit
   a) Apiary
   b) Freshwater fish farm
   c) Any agricultural field
   d) Poultry farm
   e) Sericulture farm
   f) Lac culture farm

Budge Budge College

AQAR for 2023-24

1.3.2: Number of courses that include experiential learning through project work/field work/internship during the year &
1.3.3: Number of students undertaking project work/field work/ internships

Department of Zoology

List of students undertaking project work/field work/internship I

Name of the course	Course code	Date and place	Serial no.	Name of the student	Roll No.	Name of the supervisor
Zoology Major - CCF a) Applied Entomology b) Aquaculture	a) SEC – 1 – P b) SEC – 2 - P	Field Visit to Nimpith 19/12/2023 a) Apiculture Study b) Aquaculture Study	1.	Dipannita Bhattacharjee	233561-11-0028	Dr. Papia Das, Dr. Barnali Bera, Dr. Uttariya Roy
			2.	Saswata Momdal	233561-21-0007	
			3.	Chandrika Das	233561-11-0030	
			4.	Sohini Adak	233561-11-0029	
			5.	Piona Sirin	233561-11-0031	
			6.	Sarmin Khatun	233561-11-0032	

Name of the course	Course code	Date and place	Serial no.	Name of the student	Roll No.	Name of the supervisor
Zoology Minor – CCF Applied Zoology	SEC - 1- P	Field Visit to Nimpith 19/12/2023 Apiculture Study	1.	Sania Farhana	233561-12-0015	Dr. Papia Das, Dr. Barnali Bera, Dr. Uttariya Roy
			2.	Muskaan Mallick	233561-12-0016	
			3.	Samima Parvin	233561-12-0002	
			4.	Tamanna khatun	233561-12-0001	
			5.	Shuvojit karak	233561-22-0002	
			6.	Sangita Sanati	233561-12-0003	
			7.	Smritikana Ukil	233561-12-0012	
			8.	Sabana khatun	233561-12-0009	
			9.	Souvic Adak	233561-22-0001	
			10.	Aritri Haldar	233561-12-0005	

STATE POULTRY FARM TOLLYGUNGE
42, GRAHAM ROAD, KOLKATA- 700 040
রাজ্যমুরগী
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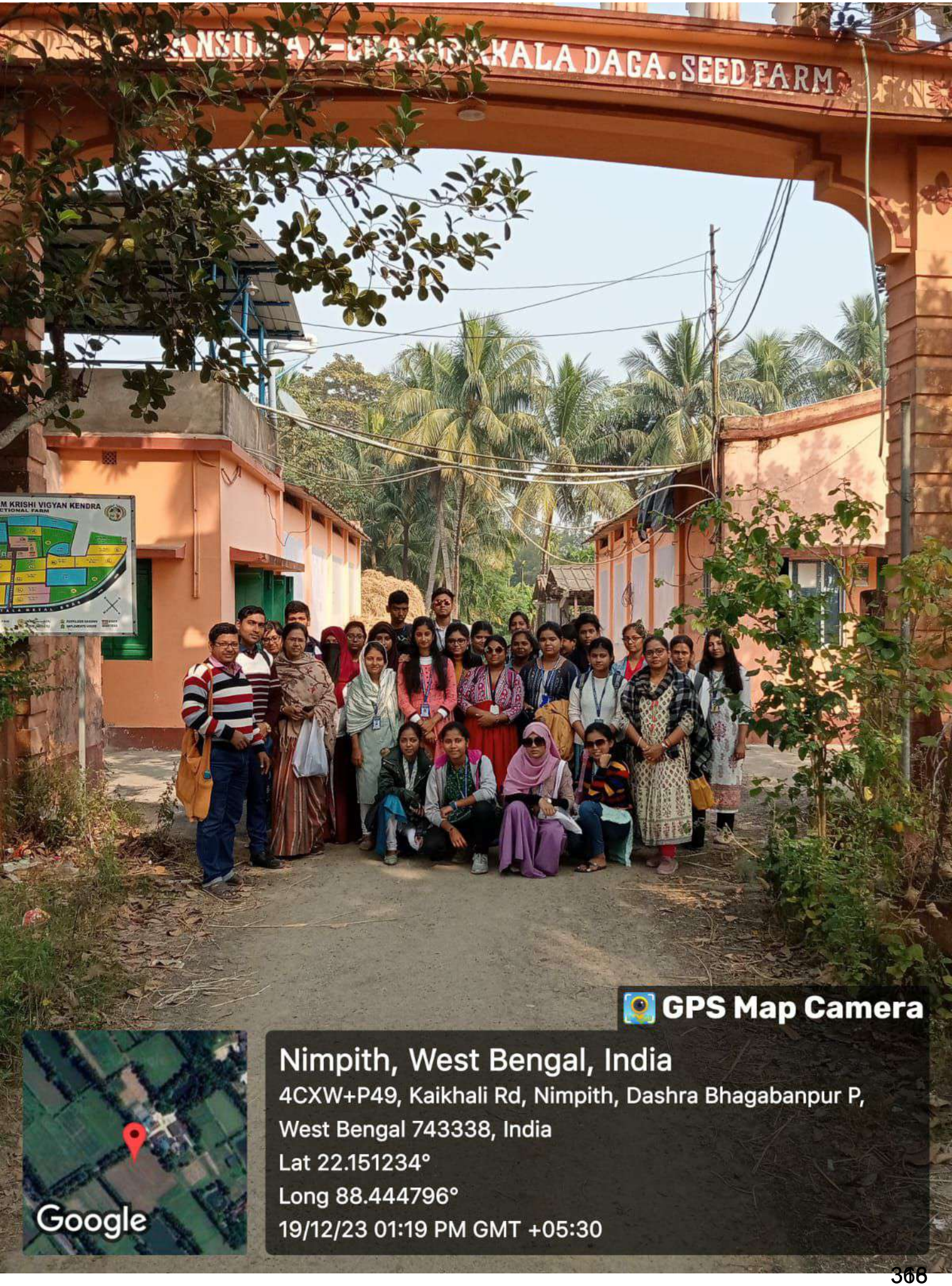
KALA DAGA. SEED FARM
M KRISHI VIGYAN KENDRA
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West Bengal 743338, India
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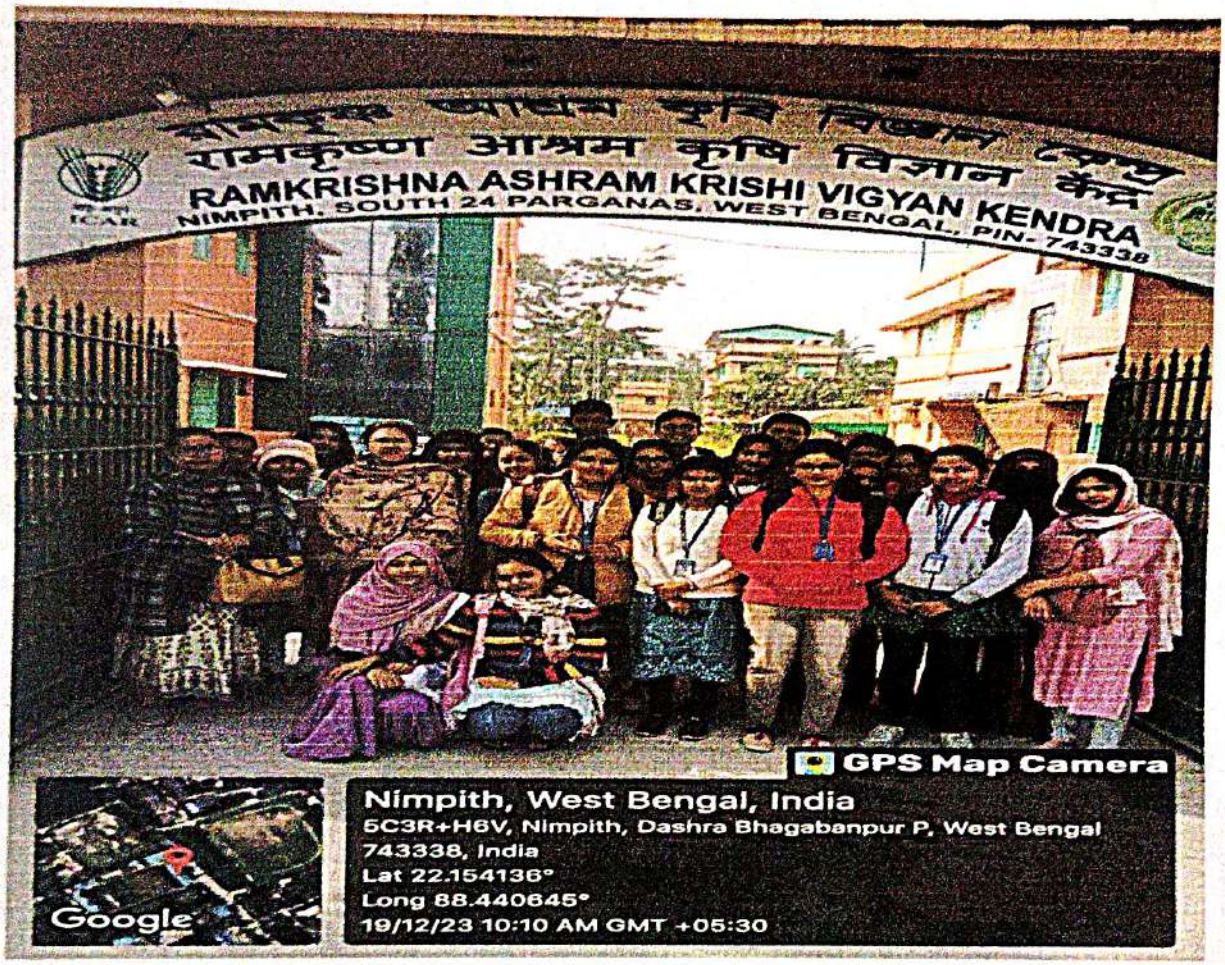
University of Calcutta

BSc. 4 Years (Honours), Semester-II (Under CCF): 2024

Visit to an Aquaculture farm : RKVK, Nimpith



Roll No: 233561-11-0032

Registration No: 561-1215-0224-23

Subject: ZOOM

Paper: SEC-2-PR

EXAMINED

Certificate

This is to certify that the project report has been prepared by a student of 2nd Semester (Under CCF,2022,University of Calcutta), Department of Zoology, Budge Budge College bearing Roll No 233561-11-0032 and Registration no 561-1215-0224-23 has completed his/her project report on "Visit to an Aquaculture farm" under the guidance of teachers which is undertaken as a part of Practical syllabus under CCF,2022 by University of Calcutta, West Bengal, India.

Dated: 6/8/24

SIGNATURE OF THE TEACHERS

Barnali Bera 6/8/24

Papia Das 6/8/2024

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Introduction

Aquaculture is the production of aquatic organisms, including fish, mollusks, crustaceans, and aquatic plants, and the cultivation of freshwater and marine plants and animals under controlled conditions for all or parts of their life cycles. Because of restrictions on the wild harvest of many fish species, demand for "farm-raised" options is very strong. Aquaculture sales exceed $1.4 billion annually in the United States, with Pennsylvania operations generating around $8.8 million in sales (2017 data). In Pennsylvania, trout farms make up approximately two-thirds of the total value of aquaculture production, with "all other farms" making up the remaining third. There is much diversification in Pennsylvania's aquaculture industry, with more than 30 species and varieties of aquatic animals raised.

Aims

Field visits to fish farms provide an opportunity for researchers, students, and professionals to learn about aquaculture practices firsthand. It allows individuals to gather practical knowledge about fish farming techniques, sustainability practices, and challenges faced by the industry. Sustainability is a critical concern in modern agriculture, including aquaculture. A visit can assess the farm's efforts to reduce its environmental impact. Understanding sustainability practices can help identify best practices that can be replicated or improved upon in other farming operations. Entrepreneurs, businesses and students may visit fish farms to assess the potential for investment, market demand, and market integration opportunities. It provides insights into the local and regional market dynamics, customer preferences, and potential partnerships for distribution and sales

Objective of the program

- To understand the fish farm's production methods.
- To learn about the techniques and technologies employed for fish farming.
- To assess sustainability practices: Evaluate the farm's efforts to minimize environmental impact.
- To explore the potential for expansion: Analyze the feasibility of scaling up fish production.
- To gather information on market integration: Understand how the farm connects with local and regional markets.

Brief Description of the program

A field visit was conducted to **Ramkrishna Ashram Krishi Vigyan Kendra** , Nimpith, South 24 Parganas, West Bengal by the students of B. Sc 1st Semester, Department of Zoology, Budge Budge College, as part of their syllabus of 2nd semester on 18th of December, 2023. A total of 27 number of students along with the 2 teaching staffs went to the trip. Krishi Vigyan Kendra is the district level agricultural extension wing of Indian Council of Agricultural Research which works with its mandate of Technology Assessment and Demonstration for its Application and Capacity Development. They have many disciplines. Fishery is one of them. The farm primarily focuses on the production of Indian Major Carps and native cat fishes has gained recognition for its contributions to the local aquaculture industry. The visit enriched the students with the practices of fish culture such induced breeding, rearing of fishes, feed formulation etc.

Study area

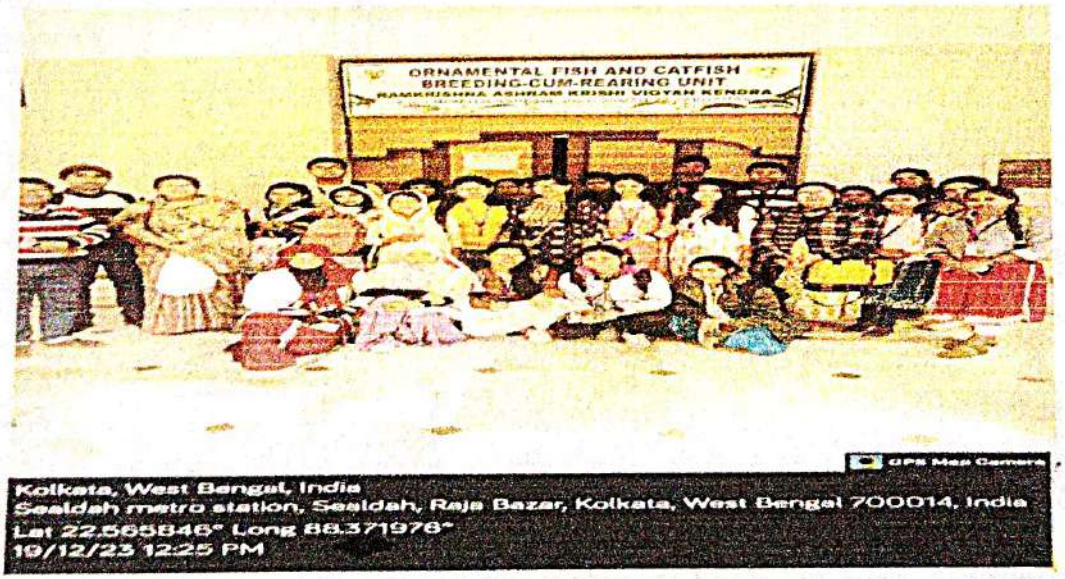
LATTITUDE: 22.157^0 N

LONGITUDE: 88.4398^0E

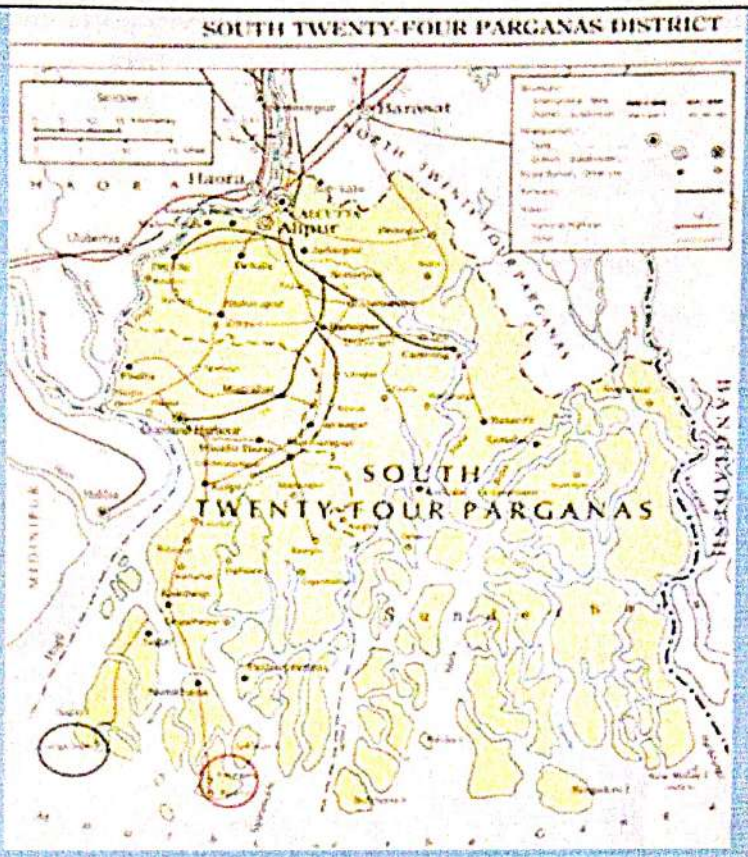
Address: P.O – Nimpith Ashram,-743338, South 24 Parganas, West Bengal, India

https://www.rakvknimpith.org.in/kvkh6.jpg

Date of Visit: 18/12/2023



	9,96,000 ha
Forest	15,566 ha
Gross cropped area	5,78,053.5 ha
Cultivable area	3,68,197 ha
Area under more than crop	2,18,205 ha
Area under than double crops	11,150 ha
Net cropped area	3,68,197 ha
Cropping intensity	159%
Current fallow area	35,275 ha
Soil Texture	Clay, Clay-loam, Sandy-loam
Net irrigated area	95,695 ha
Annual Rainfall (average)	1641.2 mm / 1787.5 mm (2015-16)
Total population (Census 2011)	8,161,961
Male	4,173,778
Female	3,988,183
No. of Agricultural Families	3,97,759
No. of Small Farmers	79,552
No. of Marginal Farmers	2,54,566
No. of Agricultural Laborers	4,44,692



List of Students of BSc. Four-year (Honours) Program: Zoology Major attending the field visit

Serial No.	Roll No of the Students	Name of the Students
1	233561-11-0028	Dipannita Bhattacharya
2	233561-21-0007	Saswata Mondal
3	233561-11-0030	Chandrika Das
4	233561-11-0029	Sohini Adak
5	233561-11-0031	Piona Sirin
6	233561-11-0032	Sarmin Khatun

Observation

FISH HATCHERY SYSTEMS

Fig: A well organized Hatchery Pond System

A fish hatchery is a place for artificial breeding, egg hatching, and rearing across the early life stages of aquatic animals (e.g. finfish and crustaceans). The output of a hatchery is normally fry, fingerlings or juveniles (with the respective name depending on the life stage/age of the fish). These young small fish are then transferred to an on-growing section to reach harvest size.

The quality of husbandry in the early life stages determines to a large extend the fitness, health and growth of fish in grow out settings. Aquaculture ID hatcheries provide just that; the optimal fish hatchery systems fitting each life stage in the development of African catfish, Tilapia and other fish species like common carp and ornamental fish. Our hatcheries are set up in a modular way. Each hatchery module is a small RAS (Recirculating Aquaculture System) capable of producing a fixed number of fingerlings of a certain size.

Role of Hatchery

The role of hatchery is vital and it has augmented the production of fish seed and created environment to enable to produce any quality and quantity of seed. State federal hatcheries are expected to become increasingly important as tools to preserve biodiversity by maintaining rare, threatened and endangered genotypes.

Essential Components of A Hatchery

- Brood fish pond to hold adult fish for spawning donors of pituitary gland and to accommodate spent male and female fishes.
- Nursery ponds to rearing larvae to fry stage.
- Rearing ponds for growing fry to fingerlings.
- Ponds for production of fish to supply brood fish ponds and donors of pituitary glands.

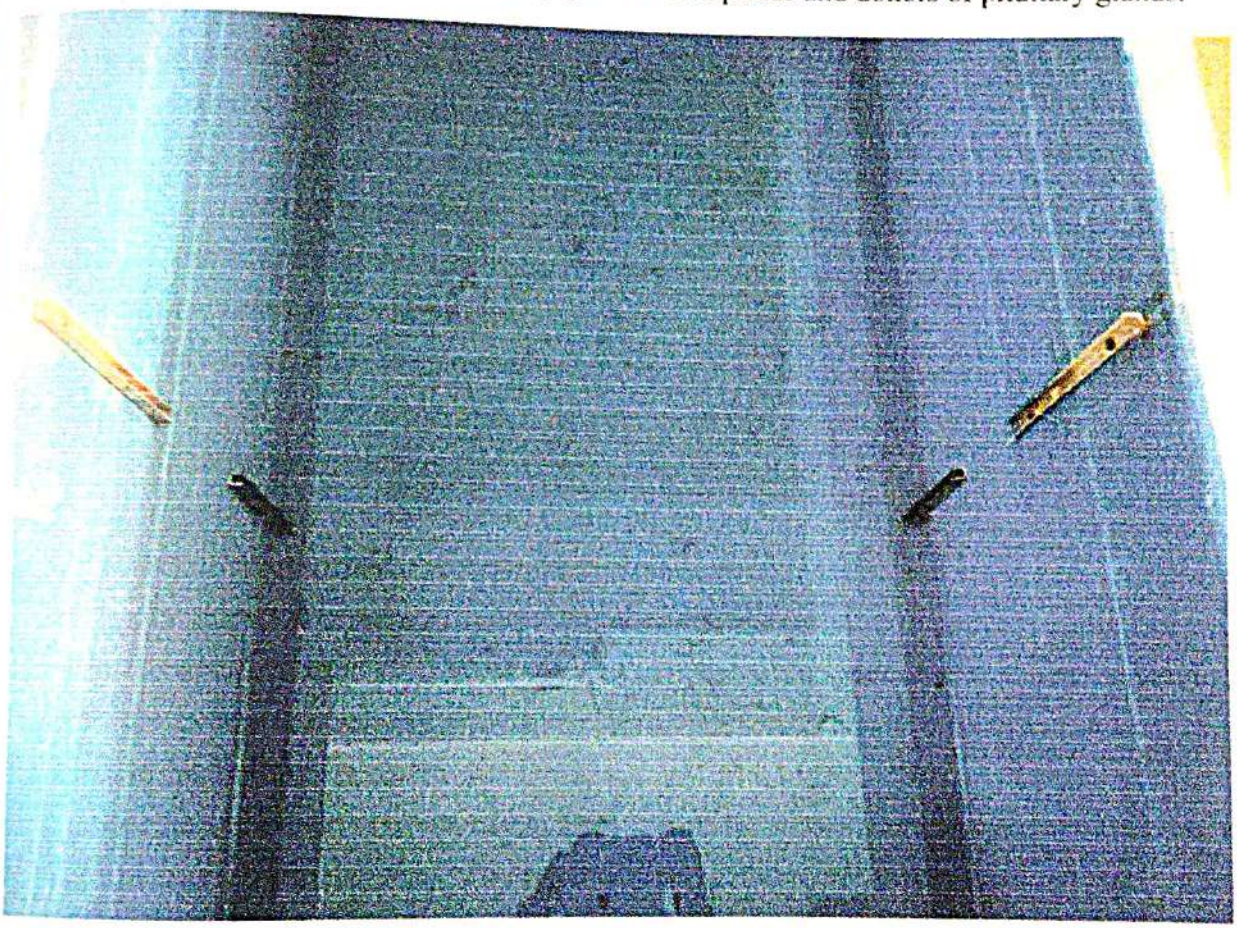


Fig: Nursery Pond

Traditional Hatchery

It is a traditional net enclosure with the inner net being smaller than the outer one.The outer net consists of a fine mesh (0.5 mm) seive-cloth tank about 2 x 1 x 1 m in dimension, while the inner chamber, made of the same material, has a mesh size of 2.0 – 2.5 mm. The whole device is placed in a protected water body where the water is well oxygenated. The fertilised eggs are evenly spread in the inner hapa.

The hatched larvae fall or pass through the larger meshes of the inner hapa and are retained by the outer hapa as the small meshes of the outer hapa prevent them from escaping. After hatching of the eggs get completed, the inner hapa is removed together with the dead eggs, egg shells and other debris to prevent deterioration of the water quality within the hapa.

Besides the above, hatching pits are also used. Hatching pits are a series of pits located very close to the breeding ground. The size of the pit is 8 feet x 4 feet x 2 feet. Several pits are interconnected (Fig. 6.24), so as to allow the water to flow from one pit to another.

- **Earthen Hatching Pits**

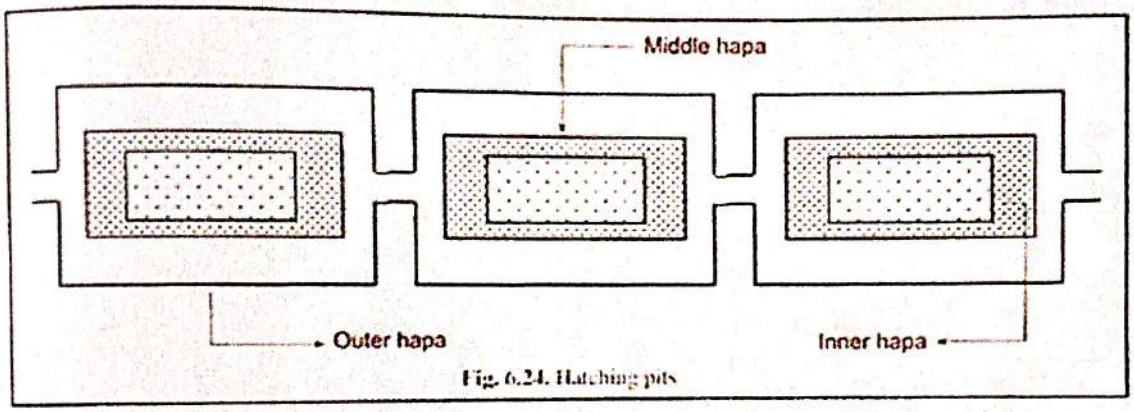


Fig. 6.24. Hatching pits

In each pit, 3 layers of cloth tanks or hapas of different dimensions are tied. The outer-most cloth tank is about 6 feet x 3 feet x 1½ feet in size and is made up of cheap cloth. For support 2 bamboo poles are fixed to which these cloth tanks are tied.

- **Earthen Pot Hatchery:**

This is one of the earlier method adopted for better hatching rates. The fertilized eggs are collected from the bund and are kept in a number of locally made earthen pots arranged in a particular way and this furnishes a flowing current of water, cooled by surface evaporation of the porous earthen pots in which the carp eggs hatched. In this method to some extent the fluctuations of temperature and pH are moderated baked clay, vessels though cheap, easily replaceable and porous have the disadvantage of being opaque.

Merits and demerits of Earthen Pot Hatchery:

(A) Merits of Earthen Pot Hatchery:

- Cool and running water condition which is essential for hatching, is maintained.
- Cost of making an earthen pot hatchery is very less.
- Very easy process to handle.

(B) Demerits of Earthen Pot Hatchery:

- Earthen pot is not capable of storing a large amount of eggs.
- Very laborious manual process and time consuming.
- Handling should be done with care as pots are liable to breaking.

Fig: Breeding Pair

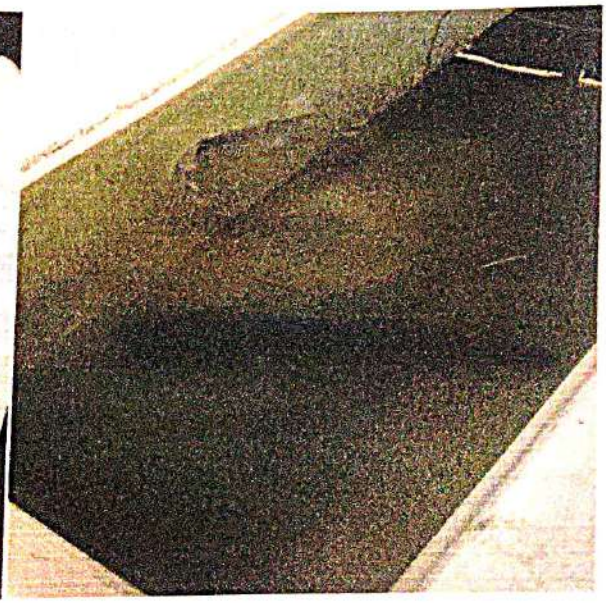


Fig: Earthen Pot Hatchery

Fig: Fish Hatchery System of Nimpith

Physico-Chemical Nature of Water/Water Quality Parameters at the Time of Hatching:

The water quality changes are fairly evident during the development of eggs and these are regulated to ensure greater hatching success in hatchery.

1) In case of Indian carp eggs a water temperature of 29.3°C results in mass hatching which starts about 11 to 12 hours after fertilization and gets completed within 4 hours. A slight decline of water temperature to 28.65°C and 28.7°C delayed mass hatching by 1 and 3 hours, respectively.

2) The oxygen amount ranging from 6 to 7.2 mg/ litre is found to be adequate to account for hatching success. It has been reported (Garside, 1959) that reduced oxygen tension retards development of fish embryo, while water rich in oxygen accelerates the process (Kinne and Kinne, 1962).

3) The total hardness and biocarbonate of hatching water increases markedly after the transfer of eggs. This marked rise in hatchery water after egg transfer might be due to liberation of Ca^{++} and Mg^{++} from egg mass. n.datta Page 15

4) Free carbon-dioxide of the hatchery water rises gradually as the length of the embryonic development advances, because of respiratory activity of the fertilised eggs and larvae. This, thus results in the decline of pH.

5) The nitrogenous compounds like ammonia, nitrate and nitrite increase at the time of hatching and these compounds are released by the developing embryos.

6) The phosphate level is greatly reduced during hatching period but tended to rise afterwards. It is due to food reserve in yolk that gets exhausted during hatching, and developing embryos utilise phosphate from the external water medium for their bone formation. The manipulation of the above limnological conditions would thus ensure an increase in the carrying capacity of the seed rearing system.

Conclusion

A **fish hatchery** is a place for artificial breeding, hatching, and rearing through the early life stages of animals—finfish and shellfish in particular.Hatcheries produce larval and juvenile fish, shellfish, and crustaceans, primarily to support the aquaculture industry where they are transferred to on-growing systems, such as fish farms, to reach harvest size. Some species that are commonly raised in hatcheries include Pacific oysters, shrimp, Indian prawns, salmon, tilapia and scallops.

The value of global aquaculture farming is estimated to be US$98.4 billion in 2008 with China significantly dominating the market globally however, the value of aquaculture hatchery and nursery production has yet to be estimated.Additional hatchery production for small-scale domestic uses, which is particularly prevalent in South-East Asia or for conservation programmes, has also yet to be quantified.

There is much interest in supplementing exploited stocks of fish by releasing juveniles that may be wild caught and reared in nurseries before transplanting, or produced solely within a hatchery.Culture of finfish larvae has been utilised extensively in the United States in stock enhancement efforts to replenish natural populations.The U.S. Fish and Wildlife Service have established a National Fish Hatchery System to support the conservation of native fish species.

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Acknowledgement

I would like to express my special thanks and gratitude to **Dr. Debjani Datta**, Principal, Budge Budge College, for organizing such an informative educational tour for us. I would also like to express my special thanks to our teachers of Zoology Department **Dr. Parthapratim Chowdhury, Dr. Papia Das** and **Dr. Barnali Bera** for helping us in the whole tour and in preparing the project report. I would like to convey my special gratitude to **Sri Tapas Kumar Sahana** for guiding us during the whole visit in **KVK Nimpith**. I would also like to thank to my all classmates who co-operated with me during the whole visit and helped me in preparing this report.

6/8/24

6/8/2024

Examined
21/9/25

EXAMINED

University of Calcutta

Four Year B.Sc. Semester-I Examination 2023

(Under CCF, 2022)

A Report On The Visit To Agricultural Farm of Nimpith Krishi Vigyan Kendra

Roll Number: 233561-11-0032

Registration Number: 561-1215-0224-23

Paper: SEC-1-P

EXAMINED
Dept. of Zoology
Vivekananda College for Women
Barisha, Calcutta

To Whom It May Concern

This is to certify that....Samin Khatun....., student of Department of Zoology of Budge Budge College has participated in the one-day educational field visit to Nimpith Krishi Vigyan Kendra as a part of their curriculum. The tour was organized by the Department of Zoology of Budge Budge College under the guidance of the teachers of the department.

29/4/2024

Acknowledgement

I would like to express my special thanks and gratitude to **Dr. Debjani Datta,** Principal, Budge Budge College and **Dr. Partha Pratim Chaudhuri,** Head, Department of Zoology for organizing such an educational excursion for us. I would like to express my gratitude to our teachers **Dr. Papia Das, Dr. Barnali Bera and Dr. Uttariyo Roy** who guided us all through the trip and also guided us to prepare the project report. Lastly, I would also like to thank all my classmates who cooperated with me during the trip and helped in preparing this report.

Samin Khatun
29.04.2024

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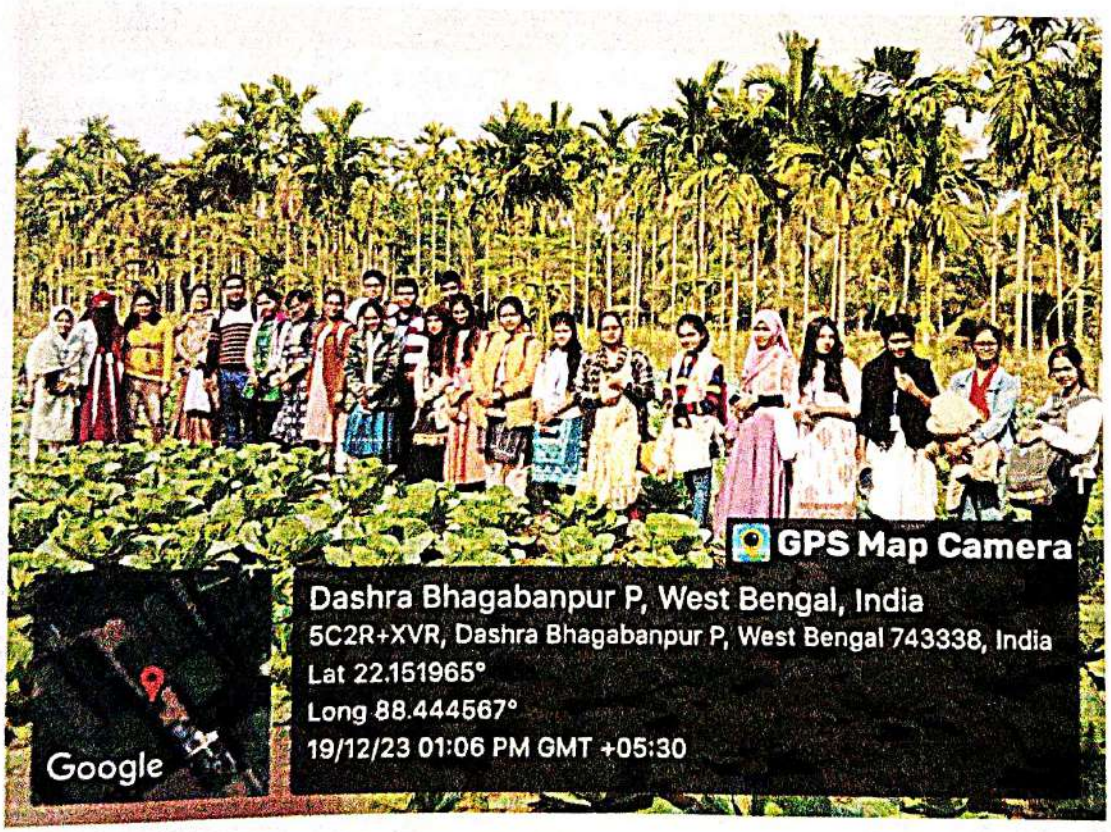
EXAMINED
Dept. of Zoology,
Tiruchirapalli College for Women
Bellary, 583-3

Introduction

Krishi Vigyan Kendra, Nimpith is the district level agricultural extension wing of Indian Council of Agricultural Research which works with its mandate of Technology Assessment and Demonstration for its Application and Capacity Development. It was established in 1979 and covers total 21.11 ha land. The agricultural farm of Nimpith Krishi Vigyan Kendra constitute 8.783 ha land. The major crops cultivated in the farm are paddy (aman), *Lathyrus*, Sunflower, brinjal, cabbage etc. Besides the agricultural farm, Krishi Vigyan Kendra has different demonstration units like **soil and water testing laboratory** for recommendation of proper doses of fertilizer in different crops according to the soil analysis report, **bio-control laboratory** for on-farm mass production of fungal bio-control agents, **Meteorological Unit** for day to day weather information for proper crop care, **Seed Farm** to produce good quality seeds of paddy, greengram, vegetables and flowers to supply to the farmers field, **Plant Nursery** for selling good quality planting materials to the farmers at a very nominal cost, **Vermicomposting Unit** or organic farming and improving soil health, **Drip Irrigation Unit** for proper utilization of harvested rain water, **Seed HUB** for production of seeds of oilseed crops like Sunflower, Sesame etc., **Bee Keeping Unit** for honey production and better crop production through improved pollination and various other units.

One day educational visit to Krishi Vigyan Kendra, Nimpith was organised by department of Zoology, Budge Budge College on 19th December 2023 for the students of BSc Semester 1. Twenty-seven students of BSc Semester 1 (Major and Minor) participated in this educational tour. The faculty coordinators Dr. Papia Das, Dr. Barnali Bera and Dr. Uttariyo Roy along with one supporting staff accompanied the students.



Our team

Objective of the visit

- The main aim to visit an agricultural farm was to get an information about the types of crops planted there and the diseases and pests associated with those crops.
- To gather idea about the pest and disease management of the crops.
- To get an insight about the latest innovative ideas, new technologies and best practices available in the field of agriculture.

Observations

We visited different fields of agricultural farm where brinjal, cabbage, paddy, sunflower etc. plants are cultivated and one staff of the farm who acted as our guide for the day explained us about the mode of cultivation of these crops. We observed some pests in brinjal and cabbage plants. The guide informed us about the different methods of pest management.

Common insect pests of Cabbage

1. **Aphids:**

   Aphids, also known as plant lice, which are small insects, suck the sap from leaves, stems and apical portion by inserting their stylets into the host plants. Feeding by aphids cause discoloration, distortion and mosaic that result in stunted plant growth. They also secrete honeydew on which black sooty mold develop under high atmospheric relative humidity, which interferes with photosynthetic activity. Due to their quick multiplication rate they could complete one generation in 7-10 days and by giving birth to six to ten young ones per day with 50-100 in total life span. Enormous populations can thus build up in a relatively short period.

2. **Diamond backmoth:** *Plutella xylostella*

   DBM is a cosmopolitan major defoliating caterpillar that hampers the successful cultivation of cole crops. The young caterpillars look green-creamish in colour and scrape the green tissues that turn to white patches in later stage. Whereas, grown up caterpillar makes holes in the leaves and cause defoliation resulting in huge crop loss.

3. **Cabbage butterfly** *Pieris brassicae*

   It is the most serious defoliator of cole crops in nursery as well as in main crop. Adult lays yellowish eggs on the leaves in clusters (Fig. 3a). The young neonates are greenish to velvety, with yellowish lateral stripes and black spots and white hairs. Grown up larvae appear in gregarious form on plants and defoliates it.

4. **Cabbage semilooper** *Trichoplusia ni*

   Young caterpillars feed primarily on leaves and cause irregular holes. Whereas, older one feed on the tissue between the veins thereby skeletonising the leaves (leaving only the midribs and veins) or giving them a ragged appearance. Plants thus appeared severely defoliated and stunted, producing no heads/curds.

5. **Tobacco caterpillar,** *Spodoptera litura*

Larvae, slender green with light wavy lines, appear in cluster at early stage and individually on later stage on plants. Defoliation is the major damage caused by Spodoptera thatresulted in considerable loss to the crops.

6. **Leaf Webber:** *Crocidolomia binotalis*

Very serious pest at early stages of the plants as the gregarious larvae attack the tender plants and at later stage webs the leaf and feed by remaining inside. The apical portion will become stunted and no formation of head/curd. Excreta of the caterpillar will be left over the leaves and hearts of cabbages.

7. **Head borer:** *Hellula undalis*

The borers attack the young developing heads of cabbage and curd of cauliflower. It bores deep inside the growing point/head and feed by remaining within (Fig.5). Faecal pellets of the pest give an indication of its presence. Under severe incidence of the pest, huge crop loss can be expected.

Eco-friendly management of pests of cabbage

- Regular Monitoring of the plants randomly for the presence of pests on both the leaf surface as well as between the leaves
- Hand picking and destruction of leaf webber and *S. litura* egg masses and early instar larvae to reduce further multiplication of pests in the field
- Hooking out the head borer and destroy mechanically
- Spraying neem seed powder extract 4% @ every 10 days interval starting from 30 days after planting (DAT) and alternate spray with Neem cake (5%) – petrol extract (0.1%) to keep the pest in check.
- Spraying neem soap 1% to manage the sucking pests at 10 days interval from 30 to 90 DAT.
- Spraying Lipel 8 SP (Bt var. kurstaki) @ 0.2% at 15 days interval after 22-25 DAT to manage DBM
- Encouraging bio-control agents instead of chemical insectisides.

Common insect pests of Brinjal

1. **Fruit and shoot borer, *Leucinodes rbonalis***

It is the most dangerous pest of brinjal.The newly hatched larva begins to bore near the growing stage, flower buds, or fruits. It feeds on tender shoots during the early vegetative phase of crop development. The larva fills the entry hole with excreta shortly after drilling into the fruits. The larva tunnels within the shoot, feeds on the inner material, and then excretes into the feeding tunnels. This resulted in the withering of the plant.

2. **Whitefly, *Bemisia tabaci***

Nymphs and adults suck the plant sap and secrete honeydew, which favors the growth of sooty mould on leaf surface and reduce the photosynthetic efficiency of the plants. In case of severe infestations, the leaves turn yellow and drop down.

3. **Leafhopper, *Amrasca devastans***

Both nymphs and adults suck the cell sap from the lower leaf surface. "hopper burn".

4. **Brinjal hadda beetle, *Epilachna vigintioctopunctata***

This pest beetles as well as grub scrape the chlorophyll from the epidermal layers of the leaves. They eat up regular areas of the leaf tissue, leaving parallel bands of uneaten tissue in between. The leaves, thus, present a lacelike appearance. They turn brown, dry up, fall off and completely skeletonize the plants.

5. **Brinjal lace wing bug, *Urentius hystricellus***

The nymph and adults suck the sap from leaves and cause yellowish spots which, together turn with black scale like excreta and exuviae deposited by them. The pest is most abundant in August-September. When the attack is severe, about 50 per cent of the crop may be destroyed.

6. **Stem borer, *Euzophera perticella***

The stem borer is a minor pest of brinjal and is widely distributed in India. Larva starts boring into the stem near ground level and in the branching area or in leaf axis which results top shoots of young plants droop and wither. The older plants become stunted.

7. **Aphid, *Aphis gossypii***

Both nymphs and adults suck the plant sap. They occur in large numbers on the tender shoots and lower leaf surfaces, and suck the plant sap. Slightly infested leaves exhibit yellowing. Severe aphid infestations cause young leaves to curl and become deformed. Like whitefly, aphids also produce honeydew, which leads to the development of sooty mould.

8. **Brown leaf hopper: *Cestius phycitis***

Reduction in size of leaves and shortened the petioles. Due to excessive growth of branches general stunting of plants. Brinjal floral parts convert into leafy structure and plants become bushy. This pest is act as vector of little leaf of brinjal.

Eco-friendly management of pests of brinjal

- The extract of Neem leaves and Patabahar leaves highly effective against borer insect of Eggplant.
- Deep ploughing in summer season helps in exposing resting stages of pests to sunlight.
- Collection and destruction of egg masses, larvae and adult of Hadda beetle, tobacco cutworm, etc.
- Soil solarization after irrigation with 60-100 gauge black polythene sheets in nursery beds for about 15-21 days, helps in killing weed seeds, nematodes, and resting stages of insects and diseases.

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- Drenching of hukka water, once in a week keeps various insect pests away from the nursery. Spraying of hukka water is also effective to control the pests on transplanted seedlings. Hukka water contains nicotine sulphate which acts as controlling substance for caterpillars and other pests.

Common pests of Paddy plants

1. **Stem Borers:** Rice stem borers from the order Lepidoptera and families Pyralidae and Noctuidae form the major group of tissue borers. Five different species are reported from different regions of the country. Based on the colour and appearance of the larvae that bore the stem or the adult moths these species are given the common names. 1. **Yellow stem borer** (YSB), *Scirpophaga incertulas*, 2. **Pink stem borer** (PSB), *Sesamia inferens*, 3. **White stem borer** (WSB), *Scirpophaga innotata*, 4. **Dark headed borer** (DHB), *Chilo polychrysus*, 5. **Striped stem borer** (SSB), *Chilo suppressalis.*

   The yellow stem borer is widely spread across the country and is far more abundant than any other species.

   The affected tillers are unproductive and result in yield loss. Early damage in vegetative stage is slightly compensated by production of new tillers while white ear head damage leads to total loss of the grains by the dried panicle. Stem borer damage may be initiated even in the nursery stage but generally seen within one month after transplanting. Dead heart damage may escape the notice of farmer when it is low to moderate scale, but white ear damage is distinct.

2. **Plant Hoppers:** Three species of planthoppers reported on rice are: **1. Brown planthopper** (BPH), *Nilaparva talugens* **2. White-backed planthopper** (WBPH), *Sogatella furcifera* and **3. Smaller brown planthopper** (SBPH), *Laodelphax striatellus*

   The planthoppers suck the plant sap from the phloem vessels through their proboscis. Due to this, plant starts wilting with outer most leaves drying first and then the entire plant dries up – a symptom often called "Hopper burn".

3. **Gall Midge**: Rice gall midge is a key dipteran pest, belonging to family Cecidomyiidae, of irrigated and rainfed shallow low land rice. Two species of the pest are known: **1. Asian rice gall midge**, Orseolia oryzae (Wood-Mason) and **2. African gall midge** *Orseolia oryzivora*

   Due to formation of gall, the tiller becomes sterile and does not bear panicle and grain, thus causing the yield loss. Pest attack is generally restricted to vegetative stage of the crop. Initial damage leads to active tillering response by the plant to compensate the damage. If weather continues to be favorable, these tillers are also turned into galls by the next generation of maggots and the plant bears bushy appearance with galls. Occasionally, pest damage is also seen during reproductive stage turning spikelets in thepanicle into tiny galls. Since egg stage is very sensitive to humidity, cloudy weather with continuous rains favor pest build up. Early onset of monsoon followed by dry spell leading to delayed transplanting of the crop often leads to severe pest damage in the endemic areas.

4. **Leaf Folders:** Four species in three genera have been reported as leaf folders: 1. ***Cnaphalocrocis medinalis***, 2. ***Marasmia patnalis*** 3. ***M. exigua*** 4. ***Brachmia arotraea*** However, C. medinalis is the dominant and wide spread species. Leaf folder damage can be observed at any stage of the crop, but generally conspicuous during active tillering to booting stage. Use of high level of nitrogenous fertilizer and cloudy weather with low sunlight favor pest buildup. Often there are overlapping generations in the field with large number of moths but not commensurate damage. Application of insecticide in early stage of the crop growth generally has more adverse effects. Low level of damage is compensated by the plant while yield losses due to severe damage at post booting stage are common.
5. **Leafhoppers:** A range of leafhoppers is seen in all the rice ecosystems. Most common being the green leafhoppers ***Nephotettix virescens*** and ***N. nigropictus*** Both the species transmit viruses associated with rice tungro disease. Like their counter parts – planthoppers, the adults lay eggs in the leaf sheath while both nymphs and adults feed on phloem sap.
6. **Gundhi Bugs (Ear Head Bugs)** Gundhi bugs or earhead bugs cause serious damage to the grains during filling stage. Three species of ear head bugs are reported: 1. ***Leptocorisa oratorius*** 2. ***L. acuta*** 3. ***L. pesudolepida***
   Both adults and nymphs suck the milk from the developing grains in the early stage of grain formation. Infestation is characterised by the discolouration of the panicles as well as the presence of some empty or ill-formed grains in the panicles.
7. **Rice hispa, *Dicladispa armigera*:** Both adult beetle and grubs feed on leaves. Entire life cycle is completed within the rice leaves. The grubs begin mining the leaf and feed on the mesophyll tissue keeping both the epidermal layer intact. This results in hollow papery leaves that dry up. Pupation also occurs within the leaf mine. Adults cut open the mine and emerge out. Adults scrape the surface of leaf and leave white strips as mark of feeding similar to the leaf folder damage but for lack of leaf folding. In case of severe damage, the entire crop bears whitish look and the leaves soon dry and turn yellow.

Eco-friendly management of pests of Paddy

- The most effective means of Green leaf hopper management is to use GLH-resistant and tungro-resistant varieties like IR 50, IR 54, IR 64, CR 1009, PY 3, Co 46 and white ponni .
- Applying neem cake @ 12.5 kg/20 cent nursery as basal dose.
- Transplanting older seedlings (>3 weeks) reduces viral disease susceptibility transmitted by leafhoppers.
- Good weed control in the field and on the bunds removes the preferred grassy hosts of Green leaf hopper and promotes crop vigor.
- Crop rotation with a non-rice crop during the dry season decreases alternate hosts for diseases.
- Upland rice intercropped with soybean reduces the incidence of leafhoppers on rice compared to rice alone.

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Common insect pests of Sunflower

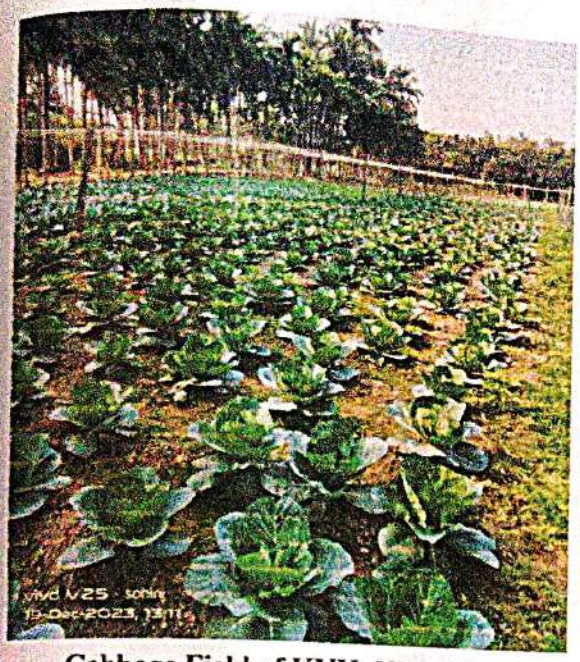
1. **Leaf hopper (*Amrasca biguttula*):** Both nymphs and adults suck the sap from the under surface of the leaves. Leaves become crinkled and cup shaped, growth gets stunted, brownish red colour develops on the edges of leaves and the condition is known as "hopper burn".
2. **Capitulum borer (*Helicoperva armigera*):** Larva feeds on leaves and capitulum.
3. **Tobacco caterpillar (*Spodoptera litura*):** Green caterpillar feed on the leaves voraciously and present an appearance to the field as if grazed by cattle. Faecal pellets are seen on the leaves and on the ground which is the indicator of the pest incidence.
4. **Bihar hairy caterpillar (*Spilosoma obliqua*):** Causes defoliation.
5. **Semi looper (*Trichoplusia ni*):** Causes holes in the leaves and severe damage results in skeletonization and defoliation.

Eco-friendly management of pests of Sunflower

Since the sunflower crop attracts several species of beneficial insect fauna, hence attention needs to be focused on conservation of activity of promising biocontrol agents and pollinators by adopting ecofriendly approaches like use of biopesticides, mechanical methods and cultural practices, which play very important roles in reducing pest load without affecting beneficial insect fauna . The following integrated pest management (IPM) approaches are suggested for pest populations below ETL:

- summer ploughing which exposes resting stages of insects to predatory birds as well as to hot sun.
- seed treatment with imidacloprid@5 g/kg seed keeps sucking pests below the threshold level up to 35-40 days after sowing without affecting natural enemies.
- removing alternate hosts which act as an initial source of infestation.
- keeping field bunds and crop weed free to avoid high pest load as weeds favor the pest build up on the main crop.
- hand collection and destruction of egg masses, early and late instar larvae of *S. litura* and *S. obliqua*.
- mixed cropping of sunflower with cotton will result in lower thrips and leafhopper infestation on sunflower whereas *H. armigera* will be low on sunflower in the sunflower+redgram intercropping system,
- spraying NSKE (5%) or other neem formulations against defoliators and capitulum borer.
- using *Spodoptera* and *Helicoverpa* NPV@250 LE/ha in case there is an outbreak of pests. NPV can also be used in sequence with NSKE (5%) for effective management of these pests.

Picture Plate 1



Cabbage Field of KVK, Nimpith

Observed leaf webber pest in cabbage

Leaf scrapping of cabbage by leaf webber caterpillar as observed in agricultural farm of KVK, Nimpith

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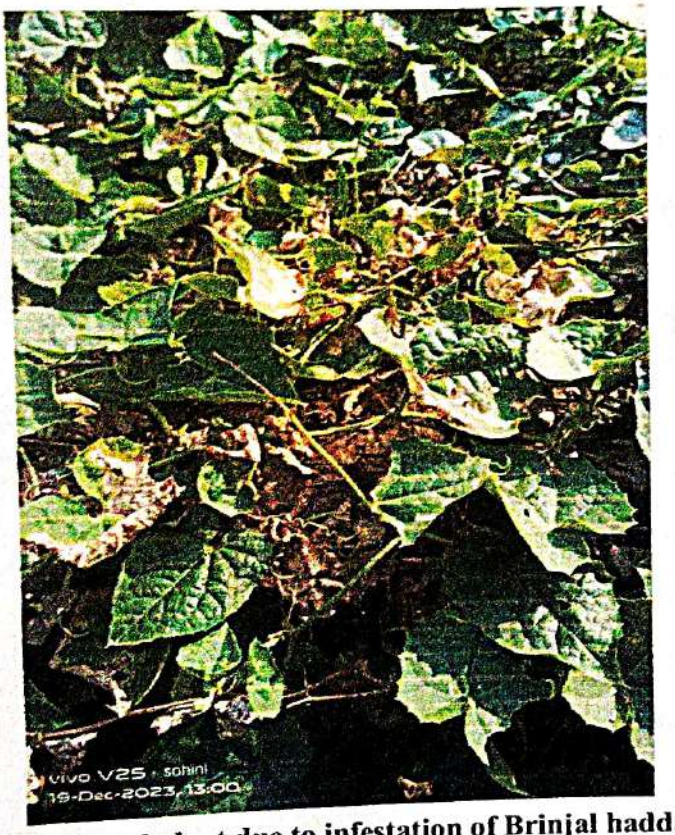
Picture Plate 2

Brinjal cultivation in KVK, Nimpith

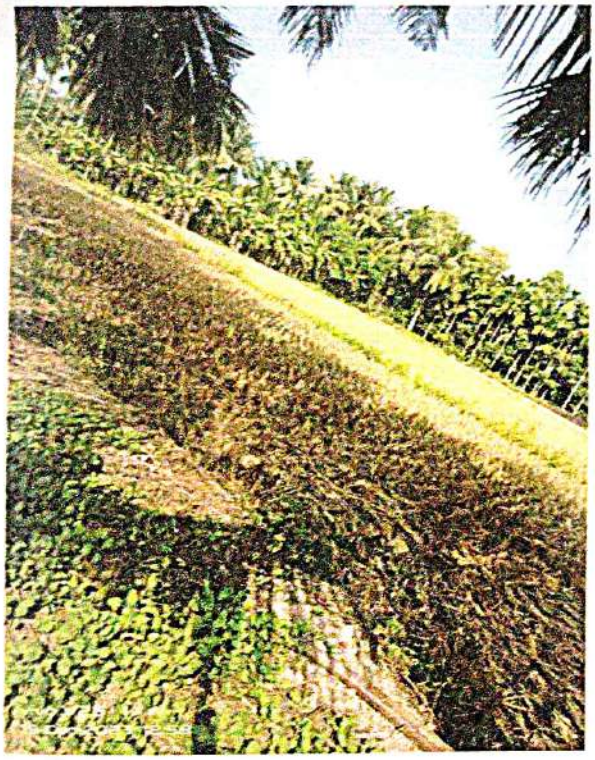
Brinjal hadda beetle on brinjal plant of KVK



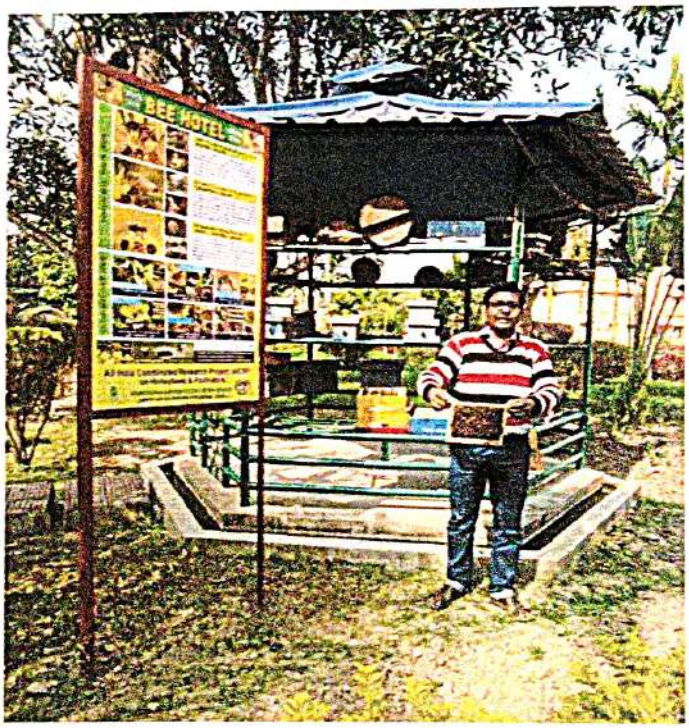
Affected brinjal plant due to infestation of Brinjal hadda bettle

Picture Plate 3

Sunflower cultivation in KVK, Nimpith



Paddy field of KVK, Nimpith after havesting



Apiary Unit of KVK, Nimpith

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Different demonstration units of KVK, Nimpith

We visited some of the demonstration units of KVK and gained knowledge about their operational technologies.

1. Bio-control laboratory

The laboratory is equipped with modern instruments like stereo microscope, dissection microscope with photographic arrangement, laminar flow hood, BOD incubator, fermenter, shaker, mixer, hot air oven, refrigerator, UV chamber, Centrifuge, Automatic *Corcyra* rearing system, Egg cleaning device, Insect collection device, etc.

- The following bio-control agents are presently maintained in the laboratory for mass production and distribution to farmers:

Species	Nature	Use
Trichoderma viride	Beneficial Fungi	Against various fungal diseases
Trichoderma harzianum	Beneficial Fungi	Against various fungal diseases
Pseudomonas fluorescens	Beneficial Bacteria	Against various bacterial & fungal diseases
Metarhizium anisopliae	Beneficial Fungi	Against various insect pests
Trichogramma chilonis	Beneficial Insect	Egg parasitoid against various insect pests
*S*NPV	Beneficial Virus	Against insect pest (*Spodoptera litura*)

2. Seed Farm

Good quality seeds of paddy, greengram, vegetables and flowers produced and supplied to the farmers field

3. Bee Keeping Unit

Established for honey production and better crop production through improved pollination

4. Vermicomposting Unit

Promotion of small unit at farmers' level with two spices of worm (*Eisenia foetida, Udrilus ugeniae*) for organic farming and improving soil health

5. Drip Irrigation Unit

Proper utilization of harvested rain water in coastal saline zone for different horticultural crops during rabi-summer season.

6. Soil and Water Testing Laboratory :

Laboratory is equipped with modern instruments to test soil and water quality for recommending proper doses of fertilizer in different crops according to the soil analysis report and for proper pond management.

Conclusion

Visit to the Krishi Vigyan Kendra, Nimpith widened our knowledge through demonstration of new technologies and practices, usage of organic manures, biofertilizers and knowledge about the machines and equipment required for carrying out various agricultural works and strengthening the future of the Indian agriculture sector. We had a very enriched experience as we were exposed to new and improved varieties of crops, fruits, vegetables, flowers and also different plant pathogens and harmful insects which greatly impairs the productivity of various crops. We gained knowledge on various types of biofertilizers, vermicompost and organic manures which can be used along with chemical fertilizers and thus, can reduce greater dependency on chemical fertilizers. At the same time, organic manures play an important role in improving soil quality and ultimately enhancing crop productivity. We got an insight about the concept of natural farming. Natural Farming is a chemical free, traditional farming method and considered as an agro-ecology based diversified farming system which integrates crops, trees and livestock with functional biodiversity

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