



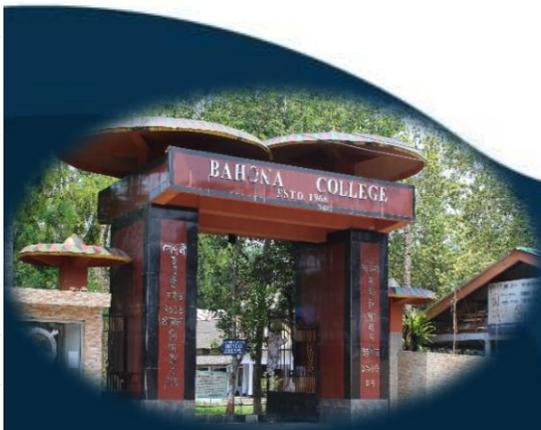
BAHONA COLLEGE
বাহনা মহাবিদ্যালয়
Affiliated to Dibrugarh University

**Supporting Documents for
NAAC Self Study Report (SSR)
(3rd Cycle)**

Period: 2016-2021

Criterion 2	Key Indicator: 2.3
Teaching- Learning and Evaluation	Teaching- Learning Process
Metric Number: 2.3.1	Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences

**Prepared and submitted by
Bahona College**





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Metric No:	Heading
2.3.1	Student centric methods, such as experiential learning, participative learning and problem-solving methodologies are used for enhancing learning experiences.

List of Students who Participated in Experiential Learning through Project Work/Field-Work/Internships in Academic Year 2020-21



Internal Quality Assurance Cell

Bahona College

P.O: Bahona, Jorhat- 785101 (Assam)
Affiliated to Dibrugarh University

Email : iqacbahonacollege@gmail.com
iqac@bahonacollege.edu.in

List of students participated in the experiential learning through project work/field work/internship during the year 2020-21.

Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code	Name of the student studied course on experiential learning through project work/field work/internship
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Prachurzya Dutta
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Mrigen Saikia
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Probhati Pegu
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Kandarpa Gayan
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Pranjit Dutta
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Susmita Saikia
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Rajashree Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Anupam Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Rajdeep Neog
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Kaustav Moni Neog
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Plabita Bora
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Prasujya Kashyap
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Hrisikesh Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Himashri Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Trishna Das
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Trishna Rani Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Bornisha Borah
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Bijoy Krishna Nath
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Dipankar Gogoi
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Mondeep Gogoi
B.Sc. Botany	UG-Bot	Plant ecology	BOTMP-605	Porismita Kalita
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Nayan Nilim Ozah
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Abhijit Pachani
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Chandan Jyoti Borah
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Bedanta Bora
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Arindam Borah
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Noni Gopal Nath
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Udai Sankar Mudoi
B.Sc. Chemistry	UG-Chem	Project work	MM-608	Tapash Jyoti Hazarika


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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Internal Quality Assurance Cell

Bahoma College

P.O: Bahoma, Jorhat- 785101 (Assam)
Affiliated to Dibrugarh University

Email : iqacbahonacollege@gmail.com
iqac@bahonacollege.edu.in

B.Sc Chemistry	UG-Chem	Project work	MM-608	Prastuti Saikia
B.Sc Chemistry	UG-Chem	Project work	MM-608	Sirky Gogoi
B.Sc Chemistry	UG-Chem	Project work	MM-608	Priyadarshini Gogoi
B.Sc Chemistry	UG-Chem	Project work	MM-608	Abinash Hazarika
B.Sc Chemistry	UG-Chem	Project work	MM-608	Gitartha Gaurab Das
BA Education	UG-Edn	Field Report	Paper 602	Popy Borah
BA Education	UG-Edn	Field Report	Paper 602	Disha Hazarika
BA Education	UG-Edn	Field Report	Paper 602	Neha Dutta
BA Education	UG-Edn	Field Report	Paper 602	Dirina Saikia
BA Education	UG-Edn	Field Report	Paper 602	Pranjit Saikia
BA Education	UG-Edn	Field Report	Paper 602	Nilav jyoti Bordoloi
BA Education	UG-Edn	Field Report	Paper 602	Samikhya Nath
BA Education	UG-Edn	Field Report	Paper 602	Pinku Neog
BA Education	UG-Edn	Field Report	Paper 602	Sumki Boruah
BA Education	UG-Edn	Field Report	Paper 602	Shymal Krishan Borah
BA Education	UG-Edn	Field Report	Paper 602	Pranjal Bora
BA Education	UG-Edn	Field Report	Paper 602	Kongkon Jyoti Saikia
BA Education	UG-Edn	Field Report	Paper 602	Siranta Bora
BA Education	UG-Edn	Field Report	Paper 602	Ankita Das
BA Education	UG-Edn	Field Report	Paper 602	Sumitra Das
BA Education	UG-Edn	Field Report	Paper 602	Pankaj Das
BA Education	UG-Edn	Field Report	Paper 602	Madhab Kutum
BA Education	UG-Edn	Field Report	Paper 602	Disanta Dutta
BA Education	UG-Edn	Field Report	Paper 602	Pinky Dutta
BA Education	UG-Edn	Field Report	Paper 602	Perona Das
BA Education	UG-Edn	Field Report	Paper 602	Monalisha Dutta
BA Education	UG-Edn	Field Report	Paper 602	Trishna Moni Kalita
BA Education	UG-Edn	Field Report	Paper 602	Prandeep Dutta
BA Education	UG-Edn	Field Report	Paper 602	Rupam Baruah
BA Education	UG-Edn	Field Report	Paper 602	Monju Pegu
BA Education	UG-Edn	Field Report	Paper 602	Mayur Dutta
BA Education	UG-Edn	Field Report	Paper 602	Prasanta Borah
BA Education	UG-Edn	Field Report	Paper 602	Gautam Dutta
B.Sc Statistics	UG-Stats	Project work	STSM 604	Faiza Almas Ahmed
B.Sc Statistics	UG-Stats	Project work	STSM 604	Lakhyajit Kalita
B.Sc Statistics	UG-Stats	Project work	STSM 604	Nabhajyoti Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Debasish Hatibaruah


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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 P.O: Bahona, Jorhat- 785101 (Assam)
 Affiliated to Dibrugarh University
 Email : iqacbahonacollege@gmail.com
 iqac@bahonacollege.edu.in

B.Sc Statistics	UG-Stats	Project work	STSM 604	Alongkrita Goswami
B.Sc Statistics	UG-Stats	Project work	STSM 604	Kamal Gam
B.Sc Statistics	UG-Stats	Project work	STSM 604	Dhananjay Teye
B.Sc Statistics	UG-Stats	Project work	STSM 604	Geetanjali Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Pranjal Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Sanjib Bhuyan
B.Sc Statistics	UG-Stats	Project work	STSM 604	Omprakash Shah
B.Sc Statistics	UG-Stats	Project work	STSM 604	Udit Gogoi
B.Sc Statistics	UG-Stats	Project work	STSM 604	Pranjal Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Pallav Raj Bora
B.Sc Statistics	UG-Stats	Project work	STSM 604	Sankarjyoti Saikia
B.Sc Statistics	UG-Stats	Project work	STSM 604	Uday Pratim Saikia
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Pallabi Bez
		Practical and Project work	ZooMP-605	
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Arpita Hazarika
		Practical and Project work	ZooMP-605	Madhumita Borah
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Rajib Bora
		Practical and Project work	ZooMP-605	Janmoni Teye
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Jitu Nath
		Practical and Project work	ZooMP-605	Abidit Dutta
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Aikyata Sharma
		Practical and Project work	ZooMP-605	Kaustav Moni Gogoi
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Dikshita Bora
		Practical and Project work	ZooMP-605	Swasti Banaspati
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Mahananda Payung
		Practical and Project work	ZooMP-605	Pundarikashya Goswami
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Chirojyoti Pamegam
		Practical and Project work	ZooMP-605	Ananya Thakur
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Bisakha Borah
		Practical and Project work	ZooMP-605	Pujashree Devi
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Priyobrat Tamuli
		Practical and Project work	ZooMP-605	Baspi Gam
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Moni Sankar Borah
		Practical and Project work	ZooMP-605	Binita Kumari Sahu
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Nidarshan Nath
		Practical and Project work	ZooMP-605	Trinayana Sonowal
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Rupjyoti Dutta


 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IQAC
 Bahona College, Jorhat
 Pin-785101



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Affiliated to Dibrugarh University

Email : iqacbahonacollege@gmail.com
iqac@bahonacollege.edu.in

		Practical and Project work	ZooMP-605	Tribeni Shyam Gohain
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Aditya Nath
		Practical and Project work	ZooMP-605	Liza Boruah
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Akangsha Bhuyan
		Practical and Project work	ZooMP-605	Kaustav Moni Nath
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-506	Mrinmoy Borah
		Practical and Project work	ZooMP-506	Akash Borkotoky
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-605	Bhargav Kr. Dutta
		Practical and Project work	ZooMP-506	Mridupawan Das
B.Sc Zoology	UG-Zoo	Practical and Project work	ZooMP-605	Jadumoni Das

(Dr. Pankaj Bora)
Coordinator,
Coordinator, IQAC
Bahona College, Jorhat
Pin-785101

(Dr. P.K. Dutta)
Principal,
Bahona College



Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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Email : iqacbahonacollege@gmail.com
iqac@bahonacollege.edu.in

IQAC report on

Students' participation at Field Work and Project Work 2020-21

In the Academic Session 2020-21, total 204 students of Botany, Chemistry, Economics, Education, History, Political Science, Statistics and Zoology department of Bahona College participated in the field work or in project works. Names of students participated in Field Work, Project Works in 2020-21 are mentioned below.

Sl No	Name
1.	Prachurzya Dutta
2.	Mrigen Saikia
3.	Probhati Pegu
4.	Kandarpa Gayan
5.	Pranjit Dutta
6.	Susmita Saikia
7.	Rajashree Borah
8.	Anupam Borah
9.	Rajdeep Neog
10.	Kaustav Moni Neog
11.	Plabita Bora
12.	Prasujya Kashyap
13.	Hrisikesh Borah
14.	Himashri Borah
15.	Trishna Das
16.	Trishna Rani Borah
17.	Bornisha Borah
18.	Bijoy Krishna Nath
19.	Dipankar Gogoi
20.	Mondeep Gogoi
21.	Porismita Kalita
22.	Nayan Nilim Ozah
23.	Abhijit Pachani
24.	Chandan Jyoti Borah
25.	Bedanta Bora
26.	Arindam Borah

27.	Noni Gopal Nath
28.	Udai Sankar Mudoj
29.	Tapash Jyoti Hazarika
30.	Prastuti Saikia
31.	Sinky Gogoi
32.	Priyadarshini Gogoi
33.	Abinash Hazarika
34.	Gitartha Gaurab Das
35.	Meghashri Bhuyan
36.	Puja Saikia
37.	Pallabi Pegu
38.	Popy Borah
39.	Disha Hazarika
40.	Neha Dutta
41.	Dirina Saikia
42.	Pranjit Saikia
43.	Nilav jyoti Bordoloi
44.	Samikhya Nath
45.	Pinku Neog
46.	Sumki Boruah
47.	Shymal Krishan Borah
48.	Pranjal Bora
49.	Kongkon Jyoti Saikia
50.	Simanta Bora
51.	Ankita Das
52.	Sumitra Das
53.	Pankaj Das



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List of Students who Participated in Experiential Learning through Project Work/Field-Work/Internships in Academic Year 2020-21

54.	Madhab Kutum
55.	Disanta Dutta
56.	Pinky Dutta
57.	Prerona Das
58.	Monalisha Dutta
59.	Trishna Moni Kalita
60.	Prandeep Dutta
61.	Rupam Baruah
62.	Monju Pegu
63.	Mayur Dutta
64.	Prasanta Borah
65.	Gautam Dutta
66.	Dipanka Dutta
67.	Himanshu Bora
68.	Jyotishna Dutta
69.	Manalisha Nath
70.	Manash Jyoti Bhuyan
71.	Mayuri Hazarika
72.	Mousumi Deka
73.	Pallabi Bora
74.	Pankaj Das
75.	Pranjal Kalita
76.	Preeti Rekha Gogoi
77.	Rija Bora
78.	Rimpi Neog
79.	Satabdi Hazarika
80.	Shabana Yesmin
81.	Susmita Sarma
82.	Samirranjan Saikia
83.	Shekhor Das
84.	Sourav Dutta
85.	Anindita Saikia
86.	Debajoni Borah
87.	Jaishree Saikia
88.	Joyshree Das
89.	Hamida Yesmin Begum
90.	Hillary Pegu
91.	Indrani Gogoi
92.	Jahnobi Kalita
93.	Juribul Bora
94.	Krishnashree Dolakashria
95.	Minakshi Patir
96.	Nishi Hazarika

97.	Porinita Nath
98.	Pori Kalita
99.	Priyanka Das
100.	Rupanjali Dutta
101.	Sangita Das
102.	Simpy Deka
103.	Ankur Rajkhowa
104.	Ashish Utpal Dutta
105.	Bidyut Bikash Das
106.	Biki Das
107.	Debabrot Saikia
108.	Debajit Sarmah
109.	Dhiren Saikia
110.	Diganta Khanikor
111.	Dipu Bora
112.	Farhan Mashud
113.	Ghanashyam Gayan
114.	Goutam Saikia
115.	Gyandeep Kumar Neog
116.	Jatindra Yein
117.	Madhujya Nath
118.	Mithilesh Routh
119.	Mrinmoy Borah
120.	Mrinmoy Bordoloi
121.	Nilutpol Das
122.	Pranab Jyoti Gam
123.	Prandeep Baruah
124.	Ananta Nath
125.	Bishnu Das
126.	Dashagrib Boruah
127.	Debanga Borah
128.	Hirok Jyoti Borah
129.	Jyotishmoy Saikia
130.	Palash Jyoti Saikia
131.	Prinyanku Dutta
132.	Ritick Borbora
133.	Anamika Bora
134.	Anamika Gogoi
135.	Anushmita Bharali
136.	Anusmita Bordoloi
137.	Chari Hazarika
138.	Debojoni Bora
139.	Dimpi Borah
140.	Dimpi Kalita



BAHONA COLLEGE
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List of Students who Participated in Experiential Learning through Project Work/Field-Work/Internships in Academic Year 2020-21

141.	Dipika Saikia
142.	Dipshika Bora
143.	Gitashree Kalita
144.	Liza Nazir
145.	Manashree Borah
146.	Nabanita Saikia
147.	Panchami Bhuyan
148.	Panchurita Dutta
149.	Parli Dutta
150.	Pikumoni Bora
151.	Priyanka Saikia
152.	Priyanki Sarmah
153.	Rupshree Pahadi
154.	Silphisikha Saikia
155.	Faiza Almas Ahmed
156.	Lakhyajit Kalita
157.	Nabajyoti Bora
158.	Debasish Hatibaruah
159.	Alongkrita Goswami
160.	Kamal Gam
161.	Dhananjay Teye
162.	Geetanjali Bora
163.	Pranjal Bora
164.	Sanjib Bhuyan
165.	Omprakash Shah
166.	Udit Gogoi
167.	Pranjal Bora
168.	Pallav Raj Bora
169.	Sankarjyoti Saikia
170.	Uday Pratim Saikia
171.	Pallabi Bez
172.	Arpita Hazarika
173.	Madhumita Borah

174.	Rajib Bora
175.	Janmoni Teye
176.	Jitu Nath
177.	Abidit Dutta
178.	Aikyata Sharma
179.	Kaustav Moni Gogoi
180.	Dikshita Bora
181.	Swasti Banaspati
182.	Mahananda Payung
183.	Pundarikashya Goswami
184.	Chirojyoti Pamegam
185.	Ananya Thakur
186.	Bisakha Borah
187.	Pujashree Devi
188.	Priyobrat Tamuli
189.	Baspi Gam
190.	Moni Sankar Borah
191.	Binita Kumari Sahu
192.	Nidarshan Nath
193.	Trinayana Sonowal
194.	Rupjyoti Dutta
195.	Tribeni Shyam Gohain
196.	Aditya Nath
197.	Liza Boruah
198.	Akangsha Bhuyan
199.	Kaustav Moni Nath
200.	Mrimoy Borah
201.	Akash Borkotoky
202.	Bhargav Kr. Dutta
203.	Mridupawan Das
204.	Jadumoni Das

Coordinator
IQAC
Bahona College, Jorhat
Pin-785101

(Dr. P.K. Dutta)
Principal
Bahona College



Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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Individual Departments of the College with Required Practical Work in the Curriculum are Equipped with Laboratories for Hands-on Learning Oriented towards Problem-solving



Students of Dept of Chemistry Engaged in the Laboratory


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Students of Dept of Zoology engaged in the Laboratory [Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College

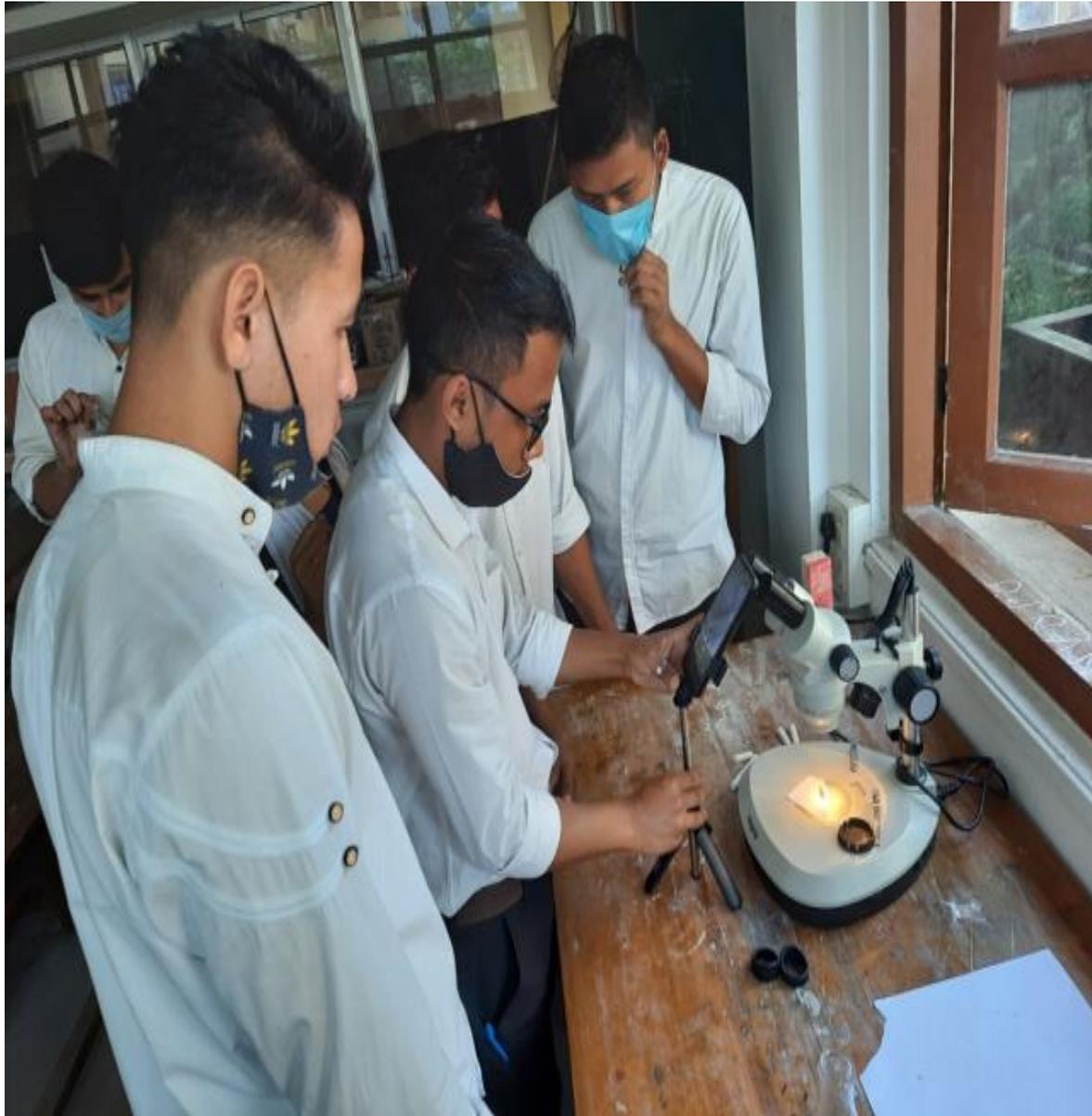



Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Students of Dept of Zoology engaged in the Laboratory [Page 2]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Students of Dept of Zoology engaged in the Laboratory [Page 3]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Students of Dept of Zoology engaged in the Laboratory [Page 4]


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Students of Dept of Zoology engaged in the Laboratory [Page 5]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Students of Dept of Zoology engaged in the Laboratory [Page 6]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Affiliated to Dibrugarh University

Focus on Experiential Hands-on Learning Makes the Learning Process More Enjoyable, Immersive and Participative, while Orienting Them towards Problem-solving based Education



GPS Map Camera



Bahona, Assam, India
R65Q+WXX, Bahona, Assam 785101, India
Lat 26.809769°
Long 94.239888°

Students working in the Institutional Bio-Tech Hub [Page 1]


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Focus on Experiential Hands-on Learning Makes the Learning Process More Enjoyable, Immersive and Participative, while Orienting Them towards Problem-solving based Education



Bahona, Assam, India

R65Q+WXX, Bahona, Assam 785101, India

Lat 26.809724°

Long 94.239915°

Students working in the Institutional Bio-Tech Hub [Page 2]

Focus on Experiential Hands-on Learning Makes the Learning Process More Enjoyable,


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IOAC
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Students working in the Institutional Bio-Tech Hub [Page 3]


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Students Involved in Mushroom Culture [Page 1]


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Principal,
Bahona College




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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
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Students in a Training Programme of Blood Pressure Measurement [Page 1]


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Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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Vol.: 1, Issue: 1, Year: 2019, Month: March

BOLETUS



ज्ञान-विज्ञान विमुक्तये

News bulletin of UGC-COC Mushroom Culture Program, Botany Department, Bahona College, Jorhat



UGC sponsored COC on Mushroom Culture was initiated from April, 2014 - March, 2019 in the Botany Department, Bahona College at the undergraduate level to ensure that graduates who pass out after completing this course will have knowledge, skill and aptitude for gainful employment in the wage sector in general and self employment in particular. This course was successfully carried out in the Botany Department and necessary teaching and awareness facilities regarding the various techniques of mushroom cultivation was provided theoretically as well as practically by the faculty members.

From the desk of Principal



Dr. Prasanna Dutta,
Principal,
Bahona College,
Jorhat

At the very outset, I would like to thank the members of Botany Department for successfully carrying out this UGC sponsored COC on Mushroom Culture. This course will add on skill to the students which will further enhance their employability. I wish good luck and also expect such type of activities from the Department which will help the students in particular.

From the desk of HOD



Mrs Protiva Borah,
Head,
Department of Botany
Bahona College,
Jorhat

UGC sponsored COC on Mushroom Culture was initiated from 2014-2019 in the Botany Department with an aim to enhance the skill among the students in the undergraduate level. I hope this program has benefitted the students greatly and it will open up new opportunities for the students in future.

From the desk of Coordinator



Dr. Sangeeta Das,
Assistant Professor,
Department of Botany
Bahona College, Jorhat

It is my immense pleasure for having this opportunity to disseminate knowledge as well as skill regarding mushroom cultivation techniques among the students as program coordinator. This bulletin 'Boletus' is an effort to showcase the different activities which were carried out throughout these years (2014-2019) under this UGC sponsored Career Oriented Course (COC) on Mushroom Culture.

MUSHROOM FACTS



Hieroglyphics found in Egyptian tombs showed pharaohs considered mushrooms "the plant of immortality".



Truffle mushrooms are one of the most expensive edible mushrooms in the world which cost between \$800 and \$1500 a pound.



The English believed that mushrooms had to be gathered under a full moon to be edible.



A mushroom has almost as much potassium as a small banana.

MUSHROOM MYTHS

- *Panicum molle* mushrooms are toxic when eaten during cooking, edible mushrooms do not.
- Mushrooms eaten by cats, dogs, and monkeys are always safe to eat.
- *Panicum molle* mushrooms will lose their protein when cooked with vinegar.
- Mushrooms having a fruity smell are safe to eat.



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News bulletin of UGC-COC Mushroom Culture Program, Botany Department, Bahona College, Jorhat

Page 1

Newsletter of UGC-COC Mushroom Culture Programme at the College [Page 1]

(Dr. P.K. Dutta)
Principal,
Bahona College



Coordinator
IQAC
Bahona College, Jorhat
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OUTREACH PROGRAMS CONDUCTED

Sl. No.	Name of the Programs	Duration	No. of Participants	Level of participants
1	Outreach Students' Awareness Program on National Science Day at Kalyani High School, Jorhat	1 day, Feb. 28, 2019	98	School students
2	Outreach Classroom Teaching Program at Charigaon Girl's High School, Jorhat	1 day, May 07, 2018	20	School students

PROGRAMS CONDUCTED

Sl. No.	Name of the Programs	Duration	No. of Participants	Level of participants
1	Hands on Training Program on Biological Databases and Sequence analysis	1 day, March 02, 2019	30	B.Sc. Students
2	Training program on Mushroom Cultivation	2 days, Jan.24 &25, 2019	12	B.Sc. Students
3	Training program on Bioinstrumentation and Mushroom Culture	1 day, April 28, 2018	20	School students
4	Daylong workshop on Bioinformatics	1 day, March 16, 2018	44	B.Sc. Students
5	Hands on students program on oyster mushroom cultivation	2 days, March, 22 &23, 2018	24	B.Sc. Students
6	Workshop on Mushroom Cultivation	2 days, Nov. 27 &28, 2017	67	Teachers and B.Sc. Students
7	Hands on Training Program on Mushroom Cultivation	2 days, Nov.25 &26, 2016	20	B.Sc. Students

News bulletin of UGC-COC Mushroom Culture Program, Botany Department, Bahona College, Jorhat

Page 2

Newsletter of UGC-COC Mushroom Culture Programme at the College [Page 3]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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List of students awarded with merit certificates under UGC-COC Mushroom Culture Program

Sl. No.	Name of the student	Grade	Sl. No.	Name of the student	Grade
2014-15			2017-18		
1	KAMALA KANTA TAID	A	1	TRIDIBJYOTI DUTTA	A
2	RUPAK SARMA	A	2	BABLI PATIR	A
3	KHUSBOO BEGUM	B	3	ANUSMITA DUTTA	A
4	HIROK JYOTI DOEY	B	4	JATINDRA NATH	A
5	PAROSH BORA	B	5	PINKU DUTTA	B
6	MUKUT KALITA	A	6	MOHIT KR. SINGH	A
2015-16			7	RUBI NATH	A
1	SANGITA HAZARIKA	A	8	TULAN PAYENG	B
2	BOHNIMAN BORDOLOI	A	9	JUTIKA SAIKIA	A
3	NIMISHA BORUAH	A	10	BISHAKHA HAZARIKA	A
4	RUBI HAZARIKA	A	11	GEETASHREE BORAH	B
5	ANURAG KOLSHIK GOSWAMI	A	12	DEEPIKA KALITA	B
6	BOBITA BHUYAN	A	13	ARPITA BORA	B
7	BHRIGUPATI HAZARIKA	A	14	JAHNABI DUTTA	B
8	PORISMITA HAZARIKA	A	15	SUPRIYA SARMAH	A
9	MALLIKA BARUAH	A	16	SUSHMITA HAZARIKA	A
10	SHASHWATI HAZARIKA	B	17	PUJA GOGOI	A
11	PUBALI KONWAR	A	18	AMLANJYOTI SAIKIA	B
12	JYOTSHNA SAIKIA	B	19	PANKAJ SAIKIA	A
13	KAJAL GUPTA	A	20	PARTHA PROTIM NEOG	A
14	ANKURAN BORAH	A	21	PORISMITA BHARALI	A
15	SUDIPTA KIAMAL DAS	B	22	SHILPIKA DUTTA	A
16	VIBHA DEVI	A	23	ZAKARIA AHMED	B
17	RUNJUN PEGU	A	2018-19		
18	SANGITA BHUYAN	A	1	BIDYUT PHUKON	B
19	MADHURJYA MADHAE MORANG	A	2	DEBASHREE BORUAH	B
2016-17			3	SMRITI SHYAMOLEE BORA	A
1	PARIKSHIT DUTTA	A	4	NAYANIKA DUTTA	A
2	DIPANKAR NATH	A	5	SANGITA BORUAH	B
3	PRIYANSHU JYOTI DUTTA	A	6	ANGELIKA HATIBORUAH	B
4	WASHIMA BEGUM	A	7	PRIYANKA KHANIKAR	B
5	JOYSHREE DUTTA	A	8	ANUSMA BARUAH	B
6	ASHMITA BHUYAN	A	9	SUSHMITA DUTTA	B
7	TRISHNA MONI DAS	A	10	PRINCESS RANI DAS	B
8	SINU BORAH	A	11	BARSHA RANI BORAH	B
9	JAHNABI DAS	A	12	PAPORI BORAH	B
10	SUNITA BHAGAT	A	13	TAPASHI SAIKIA	B
11	SANKARJYOTI BORA	A			
12	AMLANJYOTI BARUAH	B			
13	JYOTI PRASAD PATIR	B			
14	GAYATRI PEGU	A			
15	PRARTHANA KASHYAP	A			
16	DEBOJANI NATH	A			
17	BEDANTA GOSWAMI	B			
18	ANKITA BARUAH	A			

News bulletin of UGC-COC Mushroom Culture Program, Botany Department, Bahoma College, Jorhat

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Newsletter of UGC-COC Mushroom Culture Programme at the College [Page 4]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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A Teaching-Learning Method Based on Problem-Solving Orient Students towards Entrepreneurial Activities



Piyush Bharali, a Student of Dept of Zoology has Started his Own Art-Based Entrepreneurship
[Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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**A Teaching-Learning Method Based on Problem-Solving Orient Students towards
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Piyush Bharali, a Student of Dept of Zoology has Started his Own Art-Based Entrepreneurship
[Page 2]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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A Teaching-Learning Method Based on Problem-Solving Orient Students towards Entrepreneurial Activities



Bhargav Bora, a Student of Dept of Zoology has Started his Own Business of Pets and Exotic Fishes


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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Principal,
Bahona College




Coordinator
IOAC
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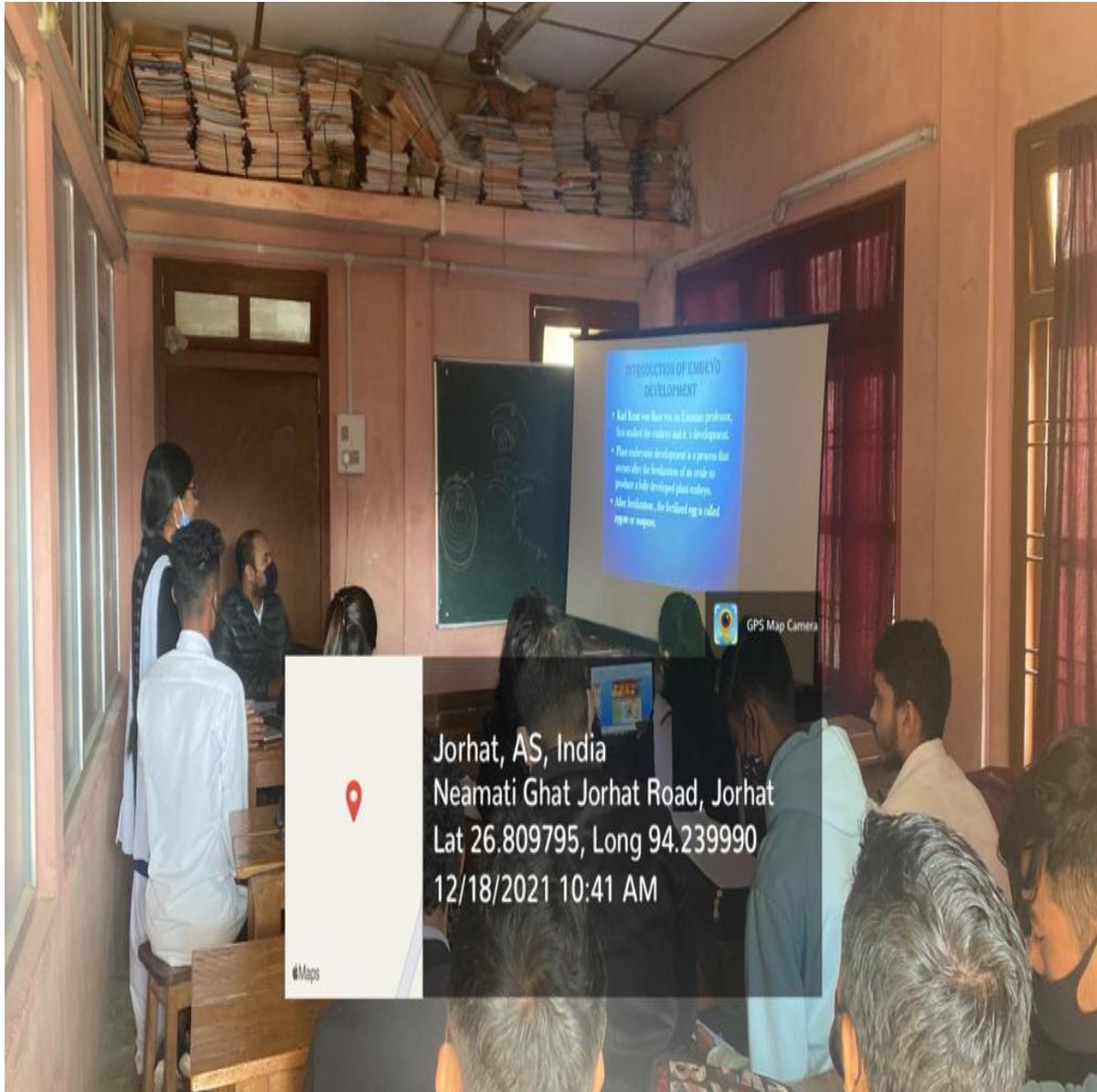


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Seminar for Students Organised by Dept of Botany [Page 1]


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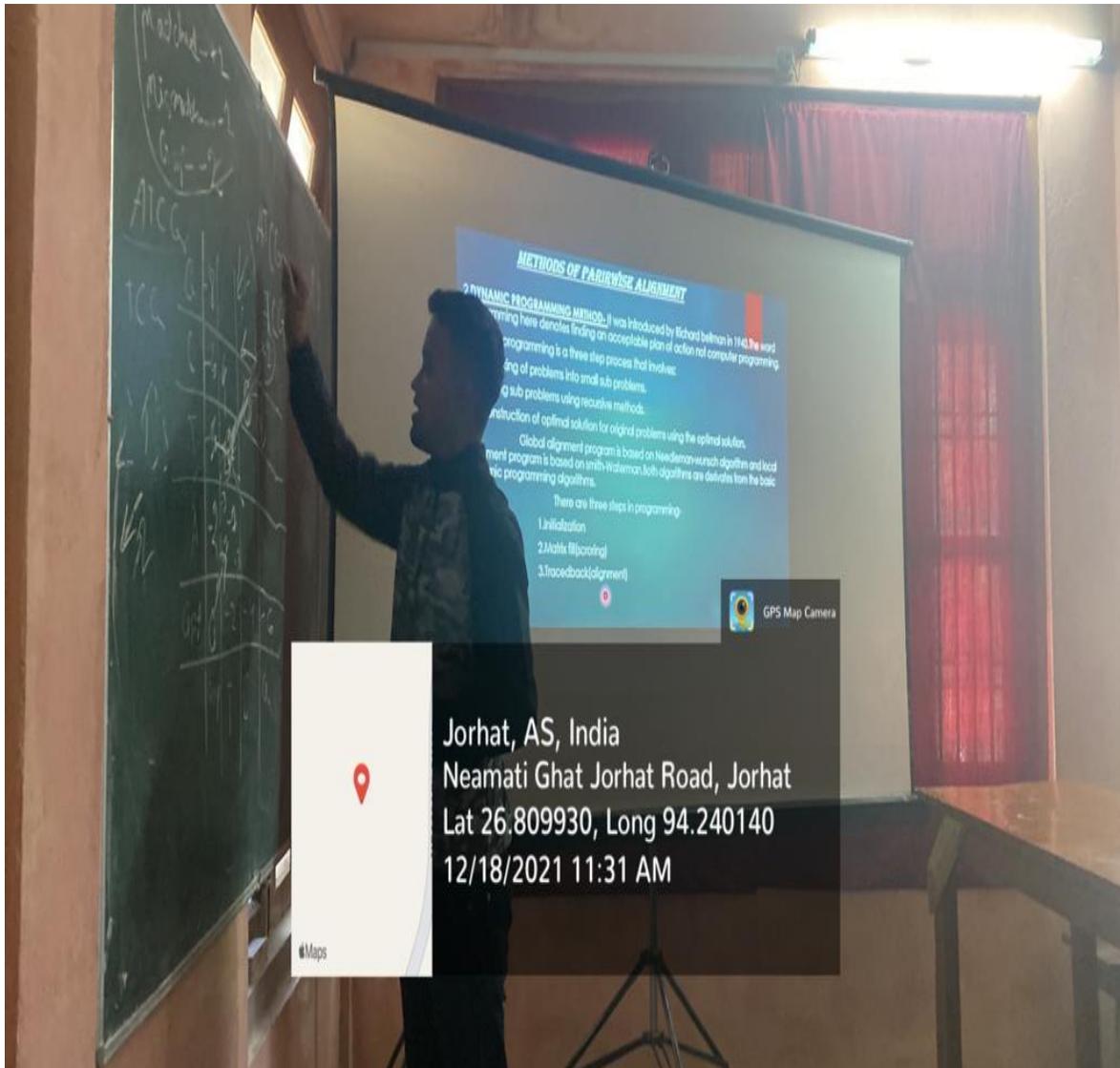



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Principal
Bahona College




Coordinator
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Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101

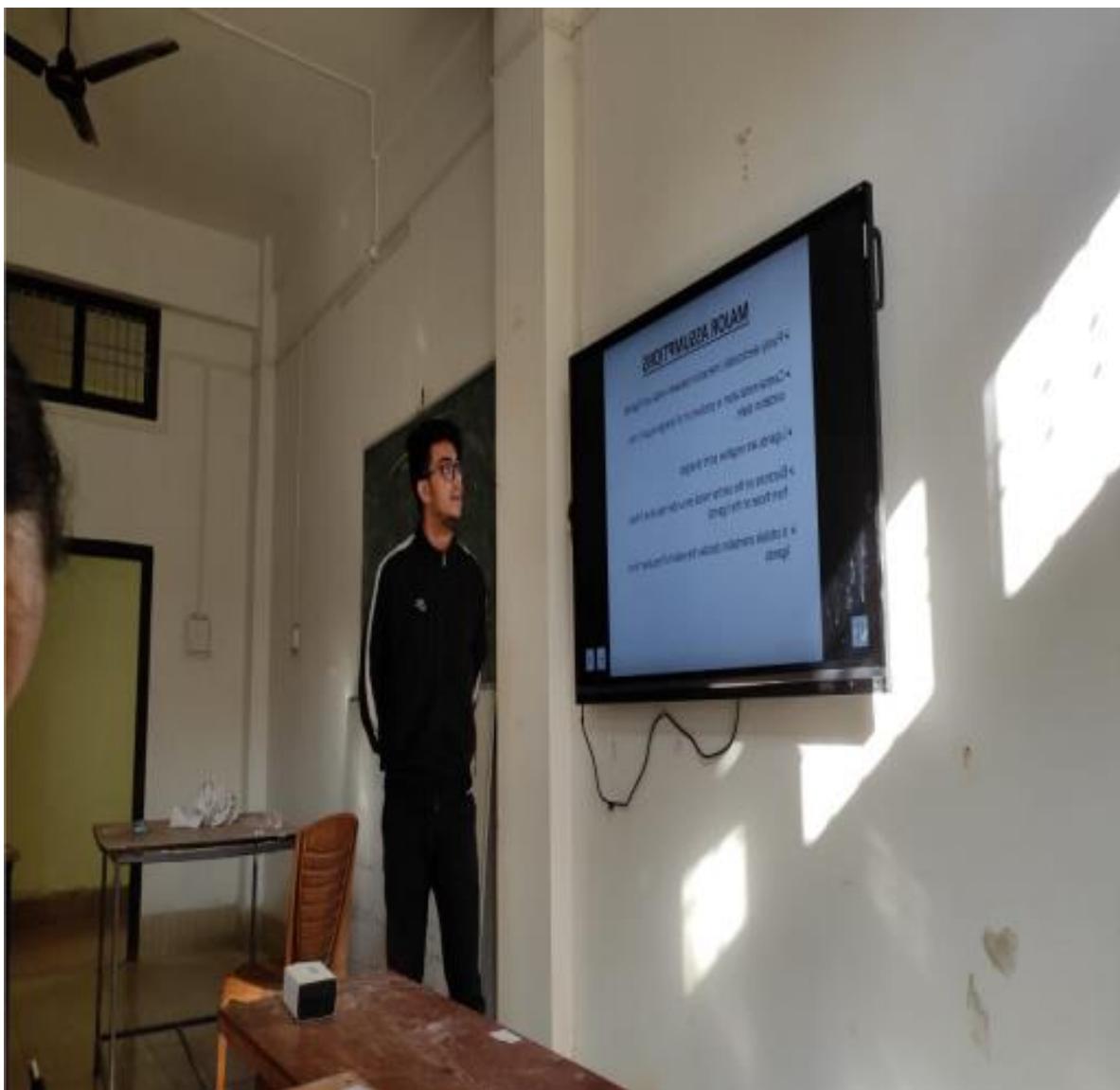


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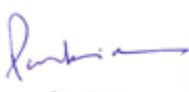
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Principal,
Bahona College




Coordinator
IOAC
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Coordinator
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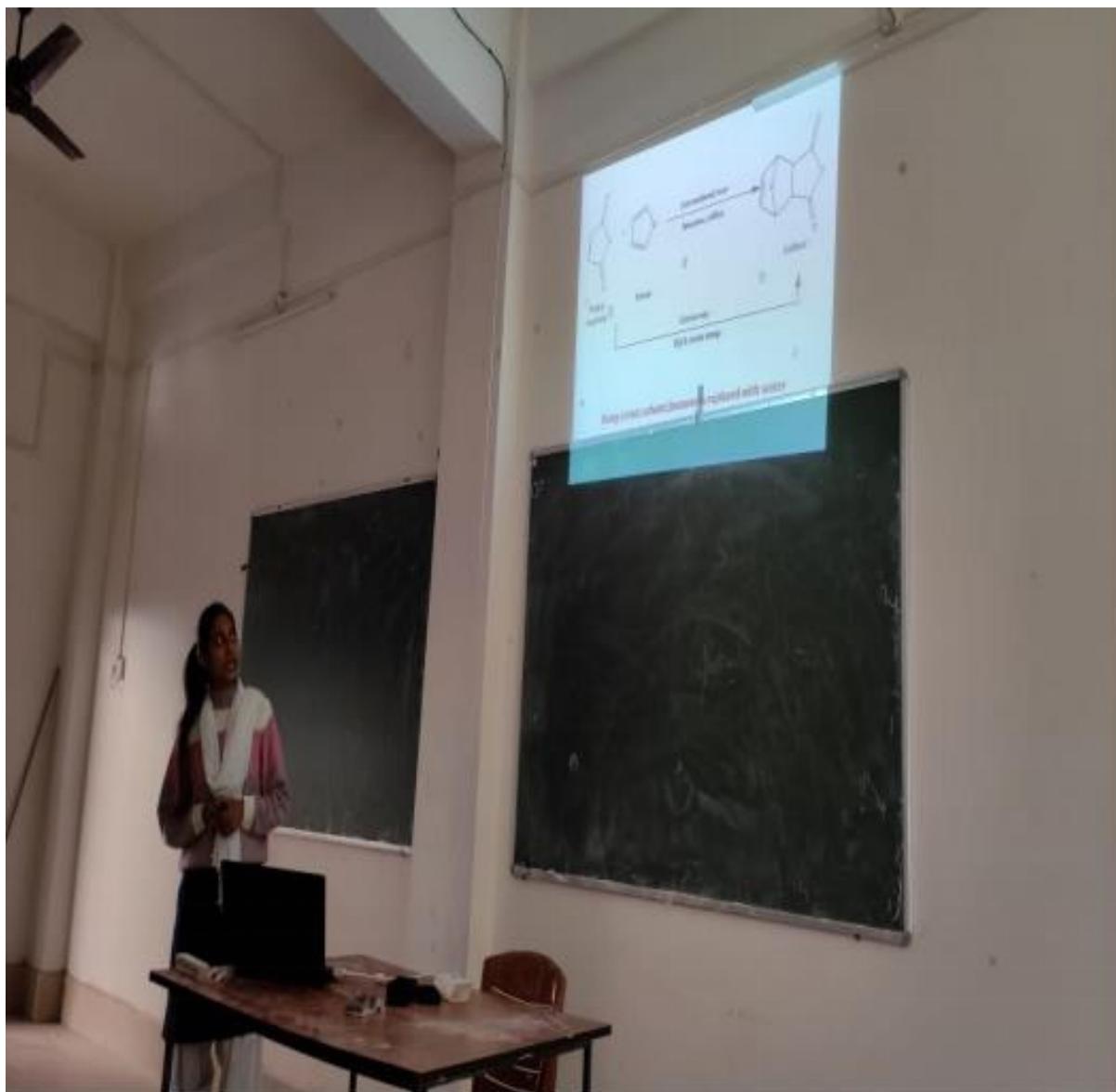


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Bahona College




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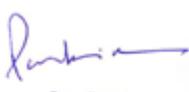
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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Seminar for Students Organised by Dept of Zoology [Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Departmental Museums Allow a More Immersive Learning Experience for both Advanced and Slow Learners



Museum of Dept of History


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Museum of Dept of Zoology [Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Museum of Dept of Zoology [Page 2]


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Museum of Dept of Zoology [Page 3]


(Dr. P.K. Dutta)
Principal,
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Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Museum of Dept of Zoology [Page 6]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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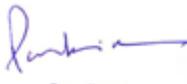
সূচীপত্র

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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শ্বিনা ভ্ৰমণ

শ্ৰী মানস প্ৰদীপ কলিতা
তৃতীয় বাৰ্ষিক



২০১৫ বৰ্ষৰ ২০ জুনটো - সেই মোৰ বন্ধু হুজন, কাম সন্মতিক্ৰম সেইটি এটাৰ মৈতে এখন জেঙাতিয়া পাড়িবে ম'হা আৰম্ভ কৰিলো, আমাৰ নম্বৰ স্থান চুবুৰীয়া বাক্য 'শ্বিনা'ৰ বাক্যনী পূৰ্বৰ ফুটনেও বুলি জনাজাত 'শ্বিনা', শ্বিনা এখন স্বাধুকেৰ আৰু প্ৰাকৃতিক সৌন্দৰ্যে উৰণৰ পাহাৰীয়া বাক্য।

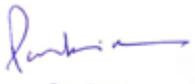
একা-টোকা পথ আৰু পথৰ কাষৰ প্ৰাকৃতিক হৃদয়কালি চাই কেতিয়াও শ্বিনা পালোনে নমৰে নাপালে। তত আমি 'পীতি' নামৰ এখন হোটেলত থকা মোকাৰ ব্যৱস্থা কৰিলো। শিহুদিনা আমি এখন স্থানীয় টেক্সীৰে চেপাৰুঞ্জী লৈ বুলি ওলালোঁ, কিমকিনীয়া বৰফুগজাকে আমাৰ আমনি কৰিছিল, অথমে আমি বাম কক্ষ মিছন নামৰ আপন্নপন চাৰ্ভান মোমালোঁ, তাৰ প্ৰত্যুগমৰ পৰা মই বাম-কক্ষ পৰম হংসৰ জীৱনী কিতাপখন কিনিলা, তাৰ পাছত আমি (নামটো পাহৰিলোঁ) এটা গুহা চাই কামলৈ আহিলো, দ্বিতীয় দিন শ্বিনাৰ আগে-পাশে থকা ঠাইবোৰ চানো, উত্তৰ-পূৰ্বফলনৰ বৃহত্তৰ শীতা, শ্বিনা লিক, বায়ু সেনাৰাহিনীৰ মিউজিয়াম, বাজিকো সংগ্ৰহালয়, ষ্ট্ৰিফাম উই. আদি চানোঁ, ইয়াৰ উপৰিও চেভেন চিষ্টেমছ, নৌসনিকাই আৰু এলিফেণ্ট, ফনছ নামৰ জনপ্ৰপাত আৰু এছিয়া মহাদেশৰ তিতৰতে দ্বিতীয় বৃহত্তম গলফ খেলা ঠাই বুলি জনজাত, নম্বৰ লিক চাই পুনৰ হোটেললৈ ঘূৰি আহি নিশাৰ আহাৰ গ্ৰহণ

কবি মোৰহটলৈ বুলি বাওনা হ'লো, মজৰে পৰাই এটা আশা পুহি স্বাধিছিনোঁ যে একা-বেৰে পথেৰে শ্বিনালৈ যাব আৰু-শ্বিনাৰ প্ৰাকৃতিক সৌন্দৰ্য্য উপভোগ কৰিম, সেই আশা মোৰ দুৰ্গ হ'ল, মোৰ সেই জ্বৰনীয়া দিন কেইটাৰ কথা কেতিয়াও নাপাহৰো, ২০ জুনটোৰ দিন আমি ঘৰ পালোহি আৰু তেনেদৰে মোৰ শ্বিনা ভ্ৰমণৰ সম্ভাৱন পৰিল।

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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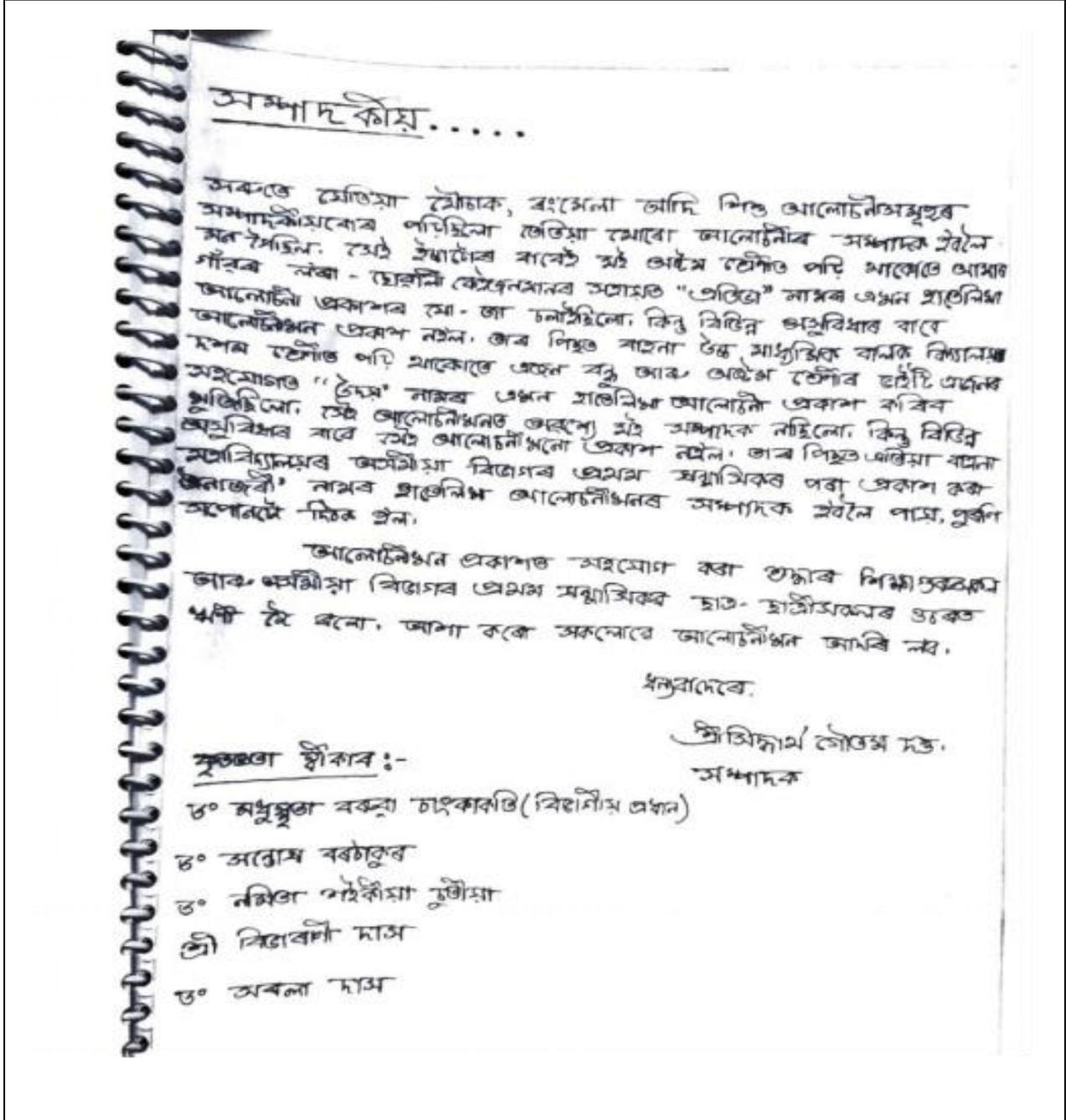

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Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
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হাতমুখ যন্তুত সৃষ্টিত মানুহৰাৰ্য বিচাৰু পুনৰ
 কোচবিহাৰৰ বৈকুণ্ঠমুৰ মতৰ মৰা আনি মানুহৰ মাৰ্
 মতত সৃষ্টি দেৱতাৰূপে প্ৰতিস্থা কৰে। নিমতে দ্যাক্ষাৰ
 দেৱৰ দ্বাৰা সৃষ্টিত অজানি জালগ্ৰাম মতত প্ৰতিস্থা
 কৰি মত মত জাৰ পুনৰা আন কৰে। উল্লেখযোগ
 যে মত প্ৰতিষ্ঠাত জুলোকা ব্যক্তিমাৰ্ আৰ্ ৩৫৫
 যত্বে নিবৰাষ্টিৰূপে জুলি জাৰে জাৰ ব্যক্তিমাৰ্
 বৰঙোনত- মং-বৰ্মন কৰি বৰ্মা- হৈছে। মত বৰ-
 তেৰালীয়ে ব্যক্তিমাৰ্ জল, জালিতা দি জোৰাষ্টি
 কৰি জাৰিছে।

মানুহীৰ অৰ্থব্যয় নদীদ্বীপ বাঙালীৰ বুদ্ধত
 প্ৰতিষ্ঠিত- অৰ্ জীজীদ্বীপমাৰ্ মতক বাজমতৰূপে
 জাৰ্মা দিহা- মত-। মিত্ৰত্ৰুকে কোচবিহাৰৰ অৰ্থব্যয়
 আননাৰাৰ্মন জাৰ্ জল- বনমানীৰূৰৰ অৰ্ম-
 বাজমিত্ৰ।

শ্ৰীজী দ্বীপমাৰ্ নামঘৰ :- শ্ৰীজী দ্বীপমাৰ্ মত মত
 নামঘৰী অধাৰী জাৰ্ জালিৰ জাৰ- জী বৃত্ত
 জাৰ্ জাৰৰ নামঘৰ-। মতী বৃত্ত জাৰ্ জাৰৰ মতীৰে-
 নামঘৰৰ জৌদ্ৰ বৃত্তি কৰিছে। প্ৰতিদে মতী- জুত
 জুমা বৰল- বিমান জাৰ্ জাৰ-। অধাৰ মতী-
 জুমাৰে জাৰৰ যে জাৰে জাৰে কৰাৰে-
 বাৰ্ জে মতীজানি দি মতীৰ মতায়ত জুলিব মাৰ্ জলি
 জুল মতীজাৰ জে ১২ জুল জাৰ- বাৰী মতীজাৰ ৬-জুল।
 মতীজাৰ মতল, মত জাৰ- জুলী মতৰ।

জুমাৰ্ জাৰ :- জুল নামঘৰৰ জিউৰত মত দিলে-
 মতীৰূপে মতায়ত জাৰ ৩৫ জাৰ মত জুল জুমাৰ্ জাৰ।
 জাৰৰ জিনিত- মতায়তৰ বৃত্তায়নত্ৰুকে মতৰে জাৰে-

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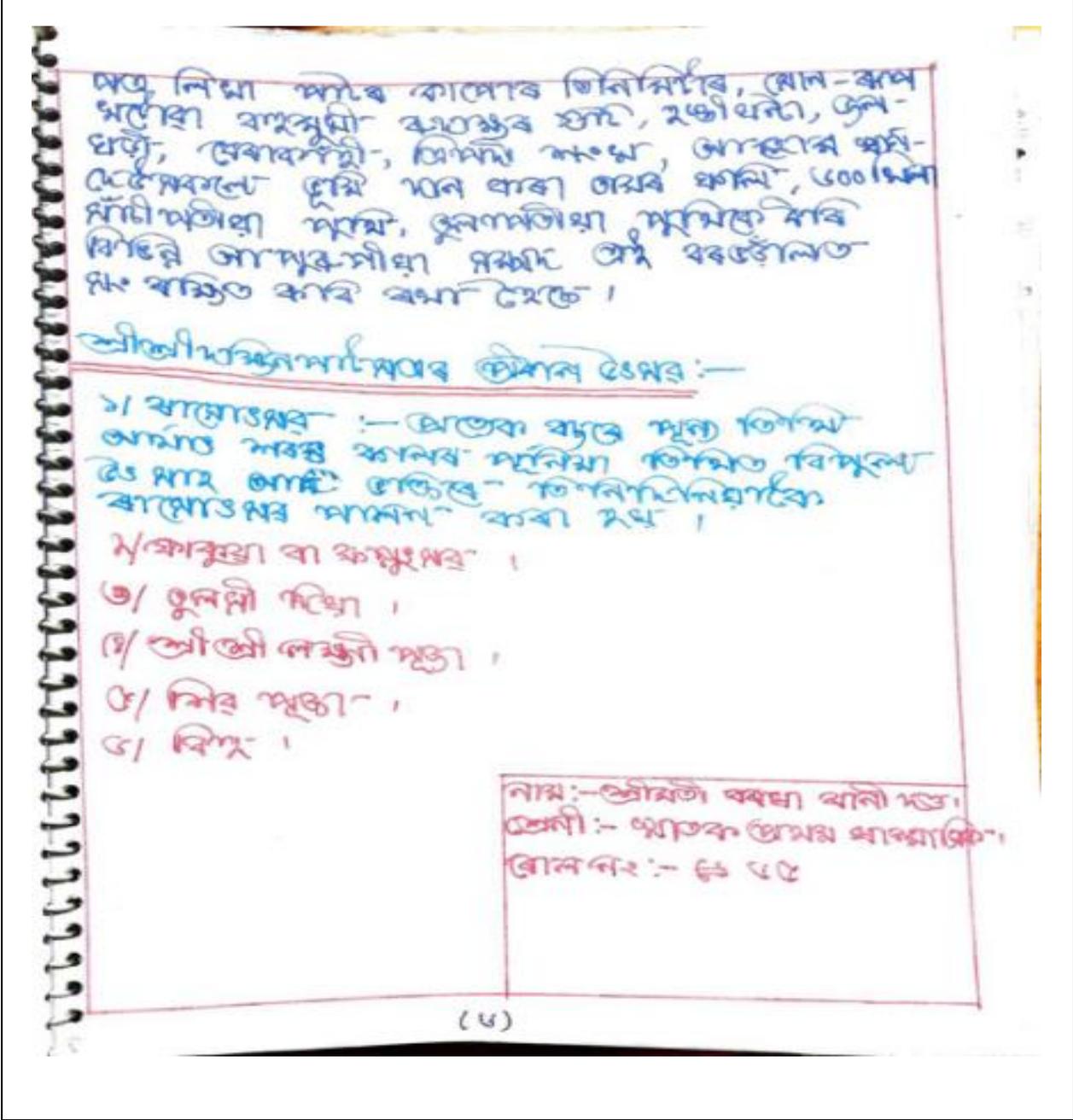

 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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 (Dr. P.K. Dutta)
 Principal,
 Bahona College

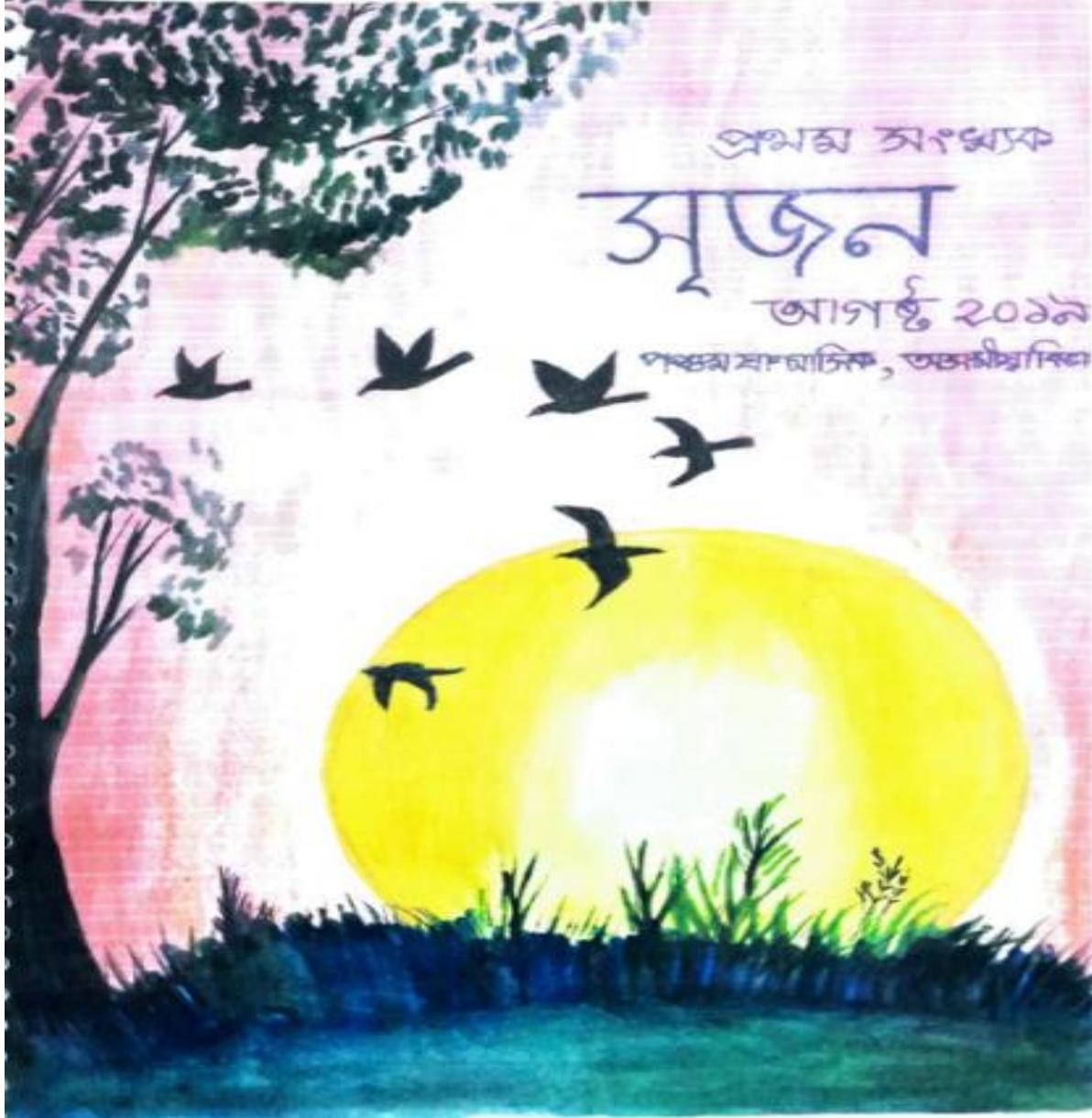



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 Bahona College, Jorhat
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IOAC
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২

ক্রমিক নং	কবিতা	লিখোঁজৰ নাম
১	যে নাথী নাম কৰা আত্মাব-বৰ্তি বিতৰ্কিত	চিনাকনি দত্ত
২	স্মৃতিৰ নিগমি	পৰিষ্কৃত শোনাপতি
৩	জীৱৰ হুমা	দিপী আইকীয়া
৪	বৰষা	জিতপানি নাম
৫	অপনৰ লক্ষ্য	চন্দ্ৰমা আইকীয়া
৬	জীৱক সৌন্দৰ্য হুসি	বিচিলা কল্লা
৭	বৰ্তিৰ বুকুৰ স্বপ্ন	জ্যোতিকা দত্ত
৮	জীৱ	জেশুদা বৰা
৯	জন্মৰ ওচা দিব	শিল্পীশিলা বৰা
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১১	ঈশ্বৰ	প্ৰজিলা শঙ্কৰীয়া
১২	মৰী হুসি অপৰাধ	সনানিচা বৰা
১৩	পেছা, শব্দ	বন্দুৱী শঙ্কৰিকা

Hand-Written Magazine of Dept of Assamese [Page 2]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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ক্রমিক নং	অনুষ্ঠান	নিবেদনকাৰী নাম
১.	* বিহাৰীস্বৰ্গদেৱ * ১০০-তম দৈ. স্মৃতিসন্মেলনা	প্ৰিয়ংবতী বৰুৱা
২.	শুভ এগুৱা আৰু শ্ৰেষ্ঠ গুৱাহাটী	প্ৰিয়ংবতী বৰুৱা
৩.	অৰ্পিত	প্ৰিয়ংবতী বৰুৱা
৪.	অৰ্পিত প্ৰতিভা হৰণ প্ৰতিভা হৰণ অৰ্পিত হৈছে অৰ্পিত	প্ৰিয়ংবতী বৰুৱা
৫.	অৰ্পিত প্ৰতিভা হৰণ প্ৰতিভা হৰণ অৰ্পিত হৈছে অৰ্পিত	প্ৰিয়ংবতী বৰুৱা
৬.	অৰ্পিত প্ৰতিভা হৰণ প্ৰতিভা হৰণ অৰ্পিত হৈছে অৰ্পিত	প্ৰিয়ংবতী বৰুৱা
৭.	অৰ্পিত প্ৰতিভা হৰণ প্ৰতিভা হৰণ অৰ্পিত হৈছে অৰ্পিত	প্ৰিয়ংবতী বৰুৱা
৮.	অৰ্পিত প্ৰতিভা হৰণ প্ৰতিভা হৰণ অৰ্পিত হৈছে অৰ্পিত	প্ৰিয়ংবতী বৰুৱা
৯.	অৰ্পিত প্ৰতিভা হৰণ প্ৰতিভা হৰণ অৰ্পিত হৈছে অৰ্পিত	প্ৰিয়ংবতী বৰুৱা

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 (Dr. P.K. Dutta)
 Principal,
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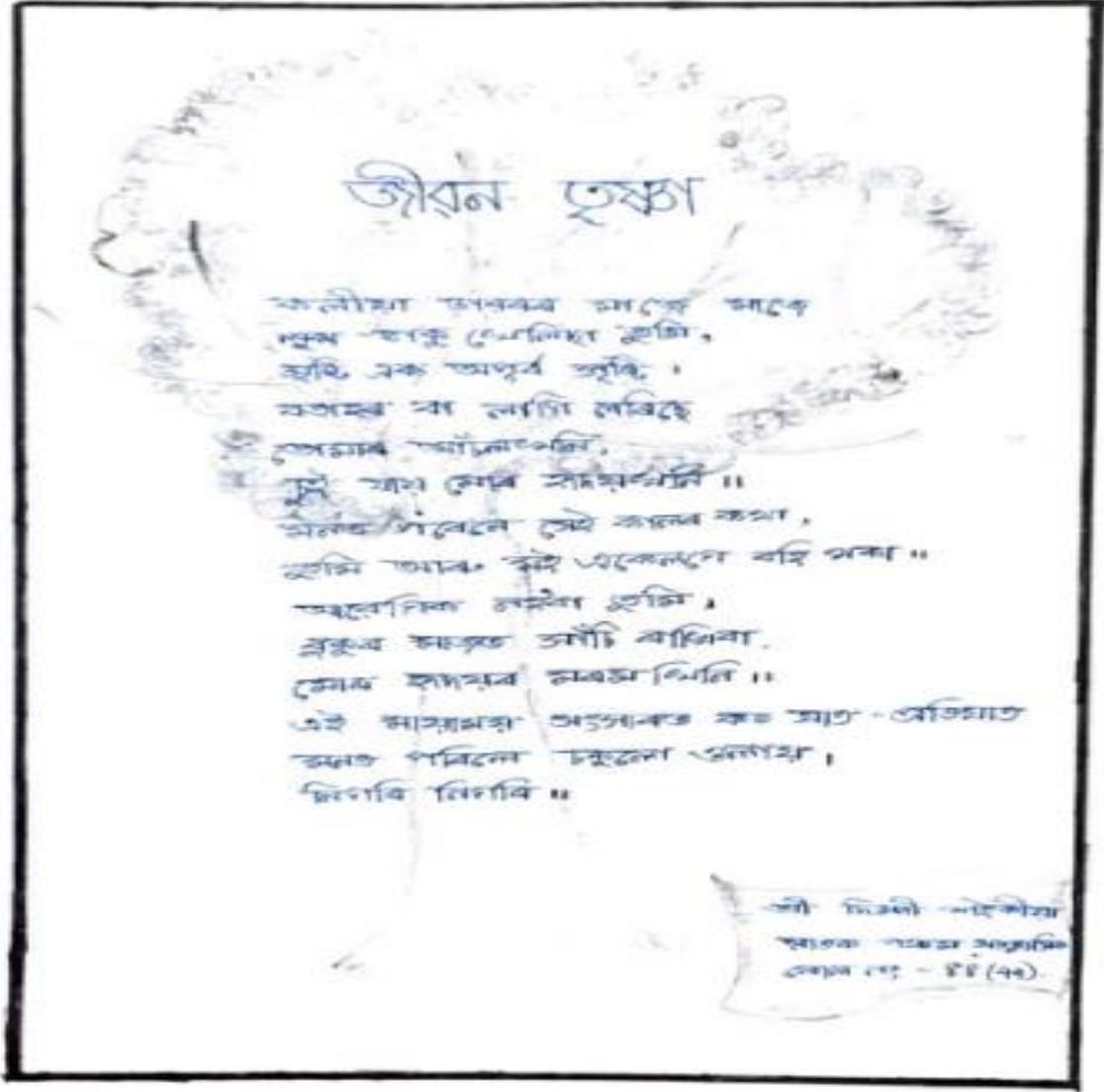



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(Dr. P.K. Dutta)
Principal,
Bahona College




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সংস্কৃতি
আৰু
অসমীয়া সংস্কৃতিত আধুনিকত্ব প্ৰভাৱ

সংস্কৃতি কোনো এটা নিৰ্দিষ্ট জাতি বা জনগোষ্ঠীত একচেতীয়া সম্পত্তি নহয়, ই মানবস্বৰ্গ জন্ম কৰাৰ সাক্ষ্য পৰিহৰিত তথা পৰিহৰিত জগত কীৰ্তি প্ৰদ, দ্বিবিহীত প্ৰত্যেকটো জাতি বা জনগোষ্ঠীত নিজ নিজ সংস্কৃতি আছে। বিভিন্ন জাতি, জনগোষ্ঠীত সংস্কৃতিৰ সংশ্লিষ্টত অসমীয়া সংস্কৃতি গঠিত হৈছে, সেয়ে ক'ব পাৰি যে, বিশাল ভাৰতীয় জনগোষ্ঠীত সংস্কৃতিৰ দৰে অসমীয়া সংস্কৃতিও এক মিলনৰ বস্তু,

অসমীয়া তথা ভাৰতৰ বিভিন্ন প্ৰদেশৰ লগত ই, যাকী 'কোলছাৰ' ভাষ্য Culture পদত সন্দৰ্ভ কৰে সংস্কৃতি পদটো ব্যৱহাৰ কৰা দেখা যায়, সংস্কৃতি পদটো সংস্কৃত ভাষাত বিশেষভাৱে কথিত, য'ত সংস্কৃত হৈছে নিজে সংস্কৃতি, কৰ্মৰ লগত বৃদ্ধিৰ সঙ্গৰ ওত-প্ৰোত জন্ম কৰিব সংস্কৃত কৰি লগেই সংস্কৃতিৰ জন্ম হয়, এনে জিহাৰ ব্যৱহাৰ আচৰণকো বৃদ্ধি বা কৰ্মৰ আশ্ৰয় দিব পাৰি, এই বৃদ্ধিৰ সংস্কৃত কৰি - লেজাটো নামেই সংস্কৃতি,

স: ১৮৩০ চনত ওয়াৰ্ড টাইলাৰে সৰ্ব-প্ৰথম ব্যৱহাৰ কৰা Culture পদটোৰ মূল ইপি লেটিন ভাষাত 'কোল' বাহুল্যত Calce বা Cultura ভাষ্য মূলৰক, Culture পদত ভাষ্য কৰ্মৰ কৰা বা পোতি কৰা, গতি কৰে ক'ব পাৰি যে সংস্কৃতি বৃদ্ধি জন্ম লোৱাৰ Culture

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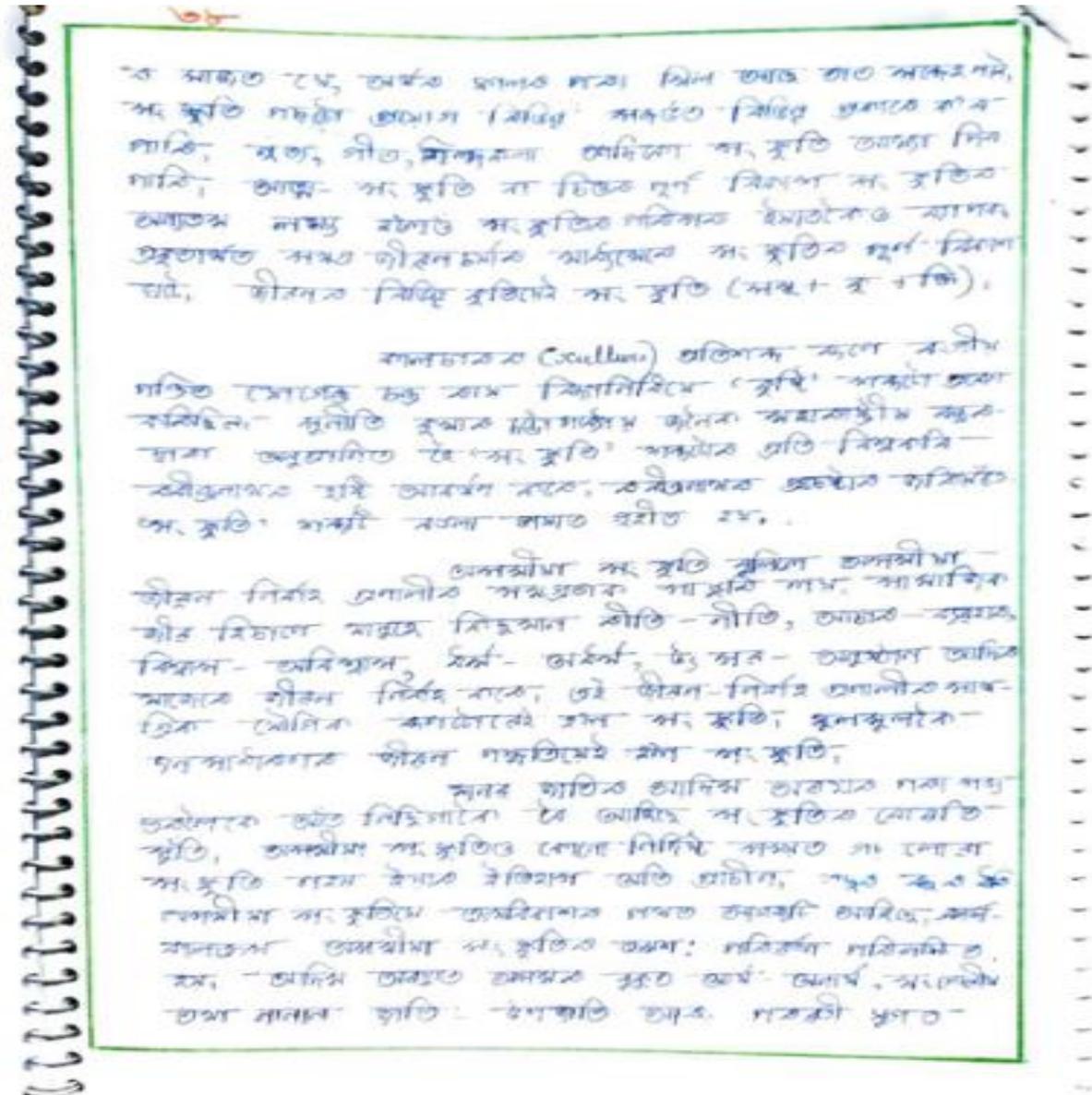

 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
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Wall Magazine of Dept of Chemistry [Page 1]


(Dr. P.K. Dutta)
Principal
Bahona College

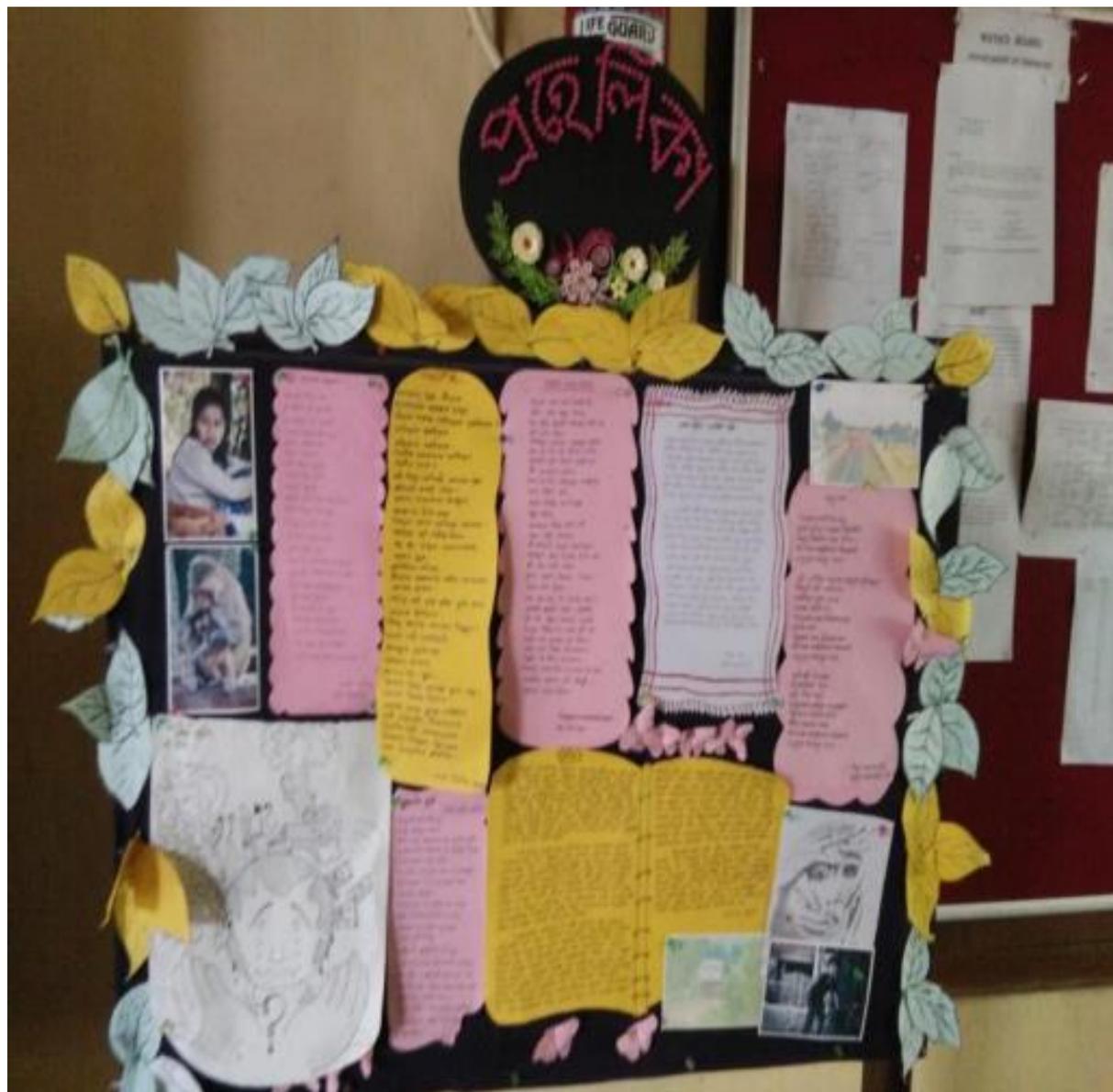



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Wall Magazine of Dept of Chemistry [Page 2]


(Dr. P.K. Dutta)
Principal,
Bahona College

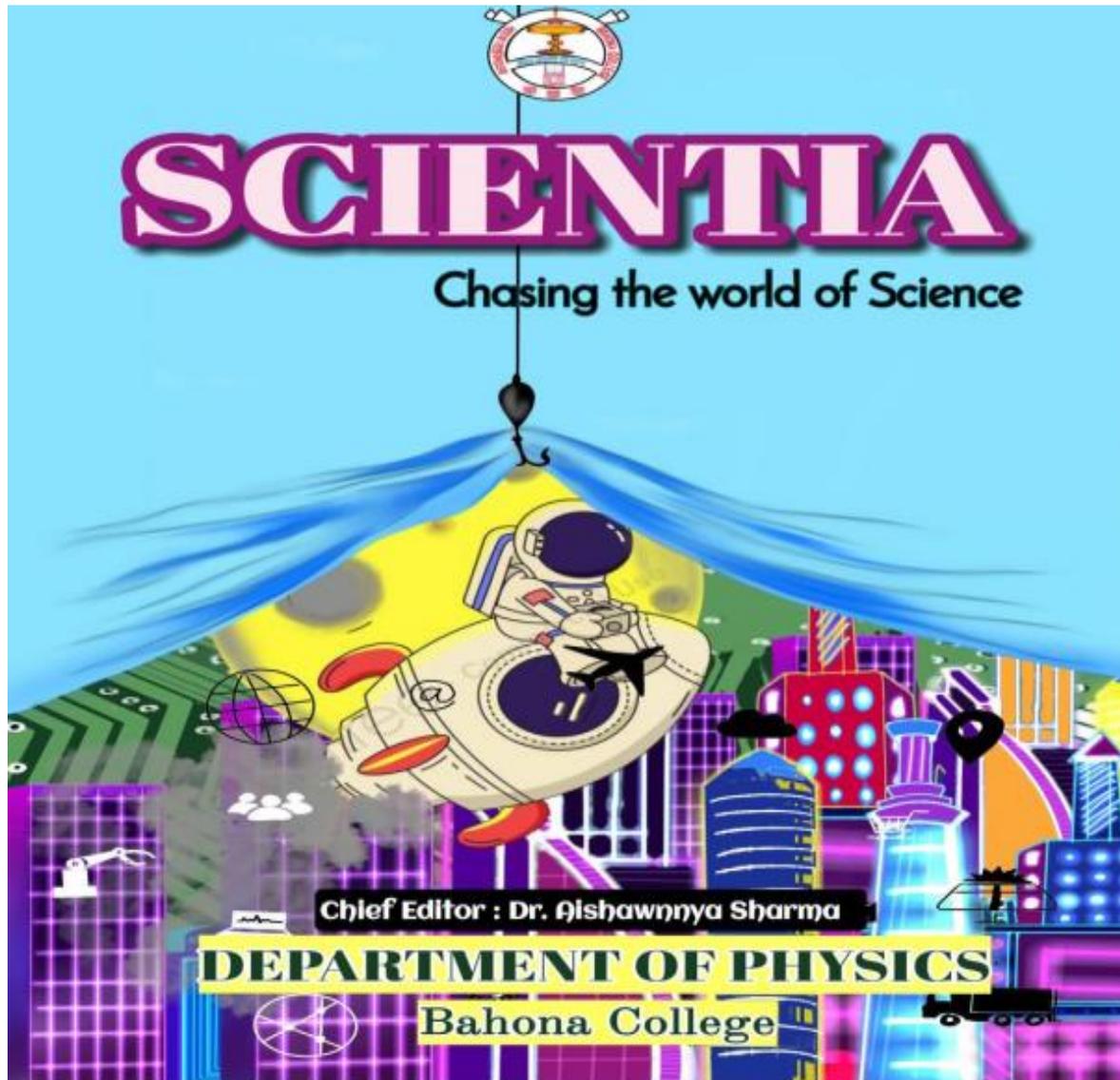



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E-Magazine of Dept of Physics


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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Newsletter of Dept of English


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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প্ৰস্তাৱনা -

চূপা-কাঠমা বা ইলেক্ট্ৰনিক মাধ্যমে ব্যক্তিগত, আলাপী, মূল্য আদিক যথেষ্ট পৰিমাণে আধুনিকীকৰণ কৰিলেও প্ৰতীক্ষণীয় চিন্তা-ভেদা আৰু অধ্যয়ন আদি, এনে ক্ষেত্ৰত সত নিম্ন আলাপী আৰুত কনস্পিচুৱা বা উল্লেখ কৰা নাই।

সহনা মহাবিদ্যালয়ত প্ৰতীক্ষণীয় বিজ্ঞান বিষয়ত সত নিম্ন আলাপী 'সুভাৱ' ৪ ২৫-মংগা প্ৰকাশক পত্ৰত বুলি কান আৰুত টাইটো, চূপা-চূপী মংগাৰ আৰুত - কানমিঠ চিহ্নত স্বেচ্ছা গবেষণা - সৃষ্টিগীল অণোততে স্বেচ্ছাৰত বীৰ্য পত্ৰত মংগাৰ বুলি আৰু সঁচিলে।

আধুনিক বিজ্ঞান-নামেৰে গবেষণা প্ৰতীক্ষণীয়ত চূপা-চূপী মংগাৰ কানমিঠ দিনত বিজ্ঞান কতি কানমিঠ। স্বেচ্ছাৰত মংগাৰ অধ্যয়ন মংগাৰ।

স্বাক্ষৰ
 ২/১২/২০২০
 অধ্যক্ষ
 অধ্যক্ষ মহাবিদ্যালয়

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(Dr. P.K. Dutta)
 Principal,
 Bahona College



Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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Message and good wishes.

It is my pleasure to learn that Bahona College Political Science Department is going to published Annual Department Magazine "SWARAJ". I hope the magazine will help to enthuse the young generation to acquire bright carrier in life.

I wish success of the magazine & offer my best wishes to all concerned related to publication of the magazine.

Date.

09/12/2020

President
Bahona College
Students Union.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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Pin-785101



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‘স্ববাহু’ৰ নৈপথ্যত-
 স্মৃণ্য উদ্যোগত : ড° অক্ষয় কুমাৰ দাস (সম্পাদক)
 উদ্যোগত : শ্ৰী যুত সঞ্জয় কলি (প্ৰবন্ধী অধ্যাপক-
 বাৰ্জনীতি-বিজ্ঞান, বিজ্ঞান)
 শ্ৰী যুত-বজ্জিত নেও
 ড° অক্ষয় কুমাৰ
 ড° গণকজ বৰা
 সম্পাদকসমূহ : দলপত্ৰীৰ বৰুৱা-
 দেৱাঙ্গনা এৰা-
 সহিত সম্পাদকসমূহ : ডিৱনী এৰা-
 পঞ্চমী কুমাৰ
 সহস্বাক্ষৰক : বাৰ্জনীতি বিজ্ঞান বিজ্ঞানৰ সন্মত
 ছাত্ৰ-ছাত্ৰী
 তত্ত্বনিগ্ৰহ : গীতাজী এৰা, জে. প্ৰসাদী শাক্তবীকা, বিহাৰ
 বিকাশ দাস, অমলিকা এৰা, বিষ্ণু
 দাস, নৱনীতা কলিতা
 অ্যকণ : হুগাৰু শাক্তবীকা
 প্ৰসংগক : বাৰ্জনীতি বিজ্ঞান বিজ্ঞান, বাহনা
 মহাবিদ্যালয়।
 প্ৰকাশ কাল : ২০২০
 দ্বিতীয় বছৰ, দ্বিতীয় সংখ্যা।

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
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অনুক্রমিকা

- * দ্বিবিীন- ৰাৰতৰ- বিষ্ণৱী- মন্ত্ৰ - অংকুৰ বৰা-
- * বিষ্ণৱ- স্ক্ৰ - - টুথৰ আণ- বৰা
- * অসমৰ- পাত্ৰিক- বাৰ্হনীতি - অসংকা শৰ্হনীমা-
- * অসমৰ- বাৰ্হনীতি ; মোৰ এক বীৰণা - গীতৰ্হী বৰা-
- * অসমৰ- বাৰ্হনীতি এক অসন্য ক্ৰ্হমা - ক্ৰাংগনা নাম-
- * অসমত- আঞ্চলিকতাৰাৰ- ৰ্হম্য - ক্ৰ্হনী বৰা
- * অসমৰ- অৰ্হনৰ- দামণ্য - - বীৰ্হন শৰ্হনীমা-
- * বৰ্হমানৰ- বাৰ্হনীতি কিম- কিল - - অসংকা দাম
- * অসমৰ- বাৰ্হনীতি- অসম- অৰ্হন - গাৰ্হ দত্ত
- * গাৰ্হ, বাৰ্হনীতিৰ- আৰ্হ জ্ঞতা জ্ঞান - জ্ঞাতিমা শৰ্হনীমা
- * অসমৰ- বাৰ্হনীতি- ব্ৰ্হনীতি - ক্ৰ্হনী গোলাকামৰ্হীমা-
- * অসমৰ- জ্ঞান- দামণ্য-দামণ্য - - দিমা বৰা
- * দামণ্য- জ্ঞান- বাৰ্হনীতি - - নিদামিকা দত্ত
- * দামণ্য- অসম- দামণ্য - - Hillary pegu
- * অসমৰ- বাৰ্হনীতি- অসম- জ্ঞান - গীতৰ্হী কালতা-
তৰা গৰ্হ- দামণ্য-
- * অসমৰ- বাৰ্হনীতি- দামণ্য - দামণ্য-দামণ্য - - দিমা কালতা
- * দামণ্য- অসম- বাৰ্হনীতি - - জ্ঞান- বৰা -
- * তৰা গৰ্হ - - অসমী কামা

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(Dr. P.K. Dutta)
Principal,
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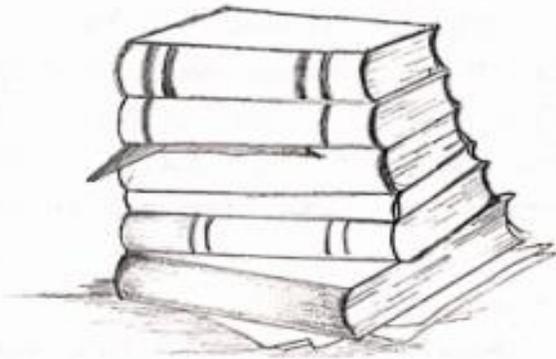

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- * অসমৰ- বাতৰীতি- আৰু- অসমীয়াৰ- আন্তৰ্জ - সুন্দৰ বৰা
- * অসমৰ- বাতৰীতি- আৰু- আঞ্চলিক- দলৰ- দুবলতা - Ankita Senmah
- * ২০২১ চনৰ- নিৰ্বাচন- আৰু- অসমৰ- বাতৰীতি- ১ - দিৱিনী কলিতা,
বিকল্প- পক্ষ
- * অসমত- নৃগোষ্ঠী- বাতৰীতি - অৰ্পিতা দেৱালী
- * আমাৰ- গণতন্ত্ৰ- দিৱস - নৱনীতা বৰুৱীয়া ।
- * অসমৰ- বাতৰীতি- চণ্ডেশানা- অক্ষয় - স্নাতকী বৰা -
- * জেৱ- ভাল- নেতাৰ- পৰিচয় - গণেশ বৰুৱীয়া -
- * অসমৰ- বাতৰীতি- জালমাৰ- ইন্ডিয়া - চৈৱাংগ- বৰা .
- * অসমৰ- বাতৰীতি- সিলঙীয়া- লোকক- জেতাৰণ - ইন্ডিয়া গগৈ -
- * অসম- মুক্তি - গৌতম বৰুৱীয়া -
- * আঞ্চলিকতা- আৰু- অসম - স্নাতকী ন্যাম ।
- * নাগৰিকত্ব- সংশোধন- আৰ্হন, ২০২১ - বিকি দাস ।



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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সম্পাদকীয় একলম

সাহিত্য- বিভিন্ন উপাদান সম্বন্ধ- বিষয়ত "হাতে
 লিখা" আলোচনীৰ এক পুৰ্বীক্ষা আদৰ্শতা আছে। আলো-
 চনী সম্বন্ধ- প্ৰথমভাগত হাতে লিখি চপোৱা হৈছিল।
 এগৰাকী সাহিত্যিকৰ সাহিত্য কৰ্মৰাজি- সমীৰণতে প্ৰথম
 অধ্যায়ত আলোচনী, স্থলভাগ, প্ৰচিৰ- প্ৰসিদ্ধ আদিভেদে-
 বিকাশ ঘটে। বিশ্বৰ বহুতো জ্যোতস্বামী সাহিত্যিকো
 সাহিত্যৰ পৰামৰ্শত এনেদৰেই- কঠিন- পেন্সাইছিল। পুৰীক্ষা-
 হাতৰ- আঙৰ এজন ব্যক্তিৰ- কলা। হাতে- হাতেলিখা-
 আলোচনীখনৰ- মনুষ্যেৰ প্ৰথম আদৰ্শতা হ'ব নাগিব-
 হুন্দৰ হাতৰ আঙৰ।

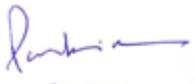
সকলো ব্যক্তিয়ে- এটা অৰ্থাৎ- অন্য অৰ্থে-
 পৰা- গঢ় লৈ উঠে। হাতে- লিখা- পঢ়া কৰি- পঢ়া-
 ছাত্ৰ- ছাত্ৰী গৰাকীৰ- বৌদ্ধিক- মানসিক- বিকাশ হোৱাত
 হাতেলিখা- আলোচনীয়ে সহায় কৰে। বৰ্তমান সম্বন্ধ
 আলোচনী- সম্বন্ধ- আধুনিক- ডিজিটেল হেৰা বা ডি. টি.
 পি. আদিৰ সহায়ত- প্ৰস্তুত- কৰি- গেনে। কিন্তু
 হাতেলিখা- আলোচনীৰ- দ্বাৰা- ছাত্ৰ- ছাত্ৰী সকলে এনে-
 ধৰণে মানসিকভাৱে- প্ৰস্তুত- কৰি- তোলাটো- ছাত্ৰ- ছাত্ৰীৰ
 প্ৰতিভা- বহিঃ- প্ৰকাশ- আৰু- বৌদ্ধিক- দিশৰ উৎকৰ্ষ
 সাধন- উত্তৰণ- যাৰ বাবে আমি হাতে- হাতেলিখা-
 আলোচনীখন প্ৰস্তুত কৰি উলিখানো।

আমি ৰাজনৈতিক- বিজ্ঞানৰ ছাত্ৰ- ছাত্ৰী সকলে
 হুন্দৰ বাৰ "হাতেলিখা"ৰ- দ্বিতীয় সংস্ক- প্ৰস্তুত কৰি

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
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অস্বীকৃত জাৰত্ব বিপ্লৱী সৰ্ব

অভিশোৰ্ষৰ দাবানলে জ্বলিছে সাদৰ
কা- পুৰুষৰ তেজ নার্স মোৰ
কুৰাঙ্গত অসীম জোৰ ।
জাৰ মাধ মাঠক
নার্স সৰগৰ তধ
অস্বীকৃত জাৰত্ব বিপ্লৱী সৰ্ব !



ঘেৰোণ ছুৰোণ জেজেবে
দেশ বাঙালী মূল
বিপ্লৱী আজি কাৰাগাৰত
গণতন্ত্ৰ ধৰ্ম মূল,
জাৰ জাৰ মূৰ তেজ
ৰাজপক্ষত নামিবৰ মূল
বিষ্ণু-জ্যোতিৰ সপোনৰ দেশ
বন্দাতলে গ'ল ।

অস্বীকৃত বৰা
পঞ্চম যুগ্মাধিকা

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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অসমৰ- ৰাজনীতিঃ হোৱাৰ এক বীৰণা-

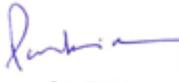
ৰাজনীতি- হৈছে ব্যক্তি আৰু- ৰাষ্ট্ৰৰ- ৰাজ্য- সম্পৰ্ক। ৰাজনীতি- হৈছে ব্যক্তি বা- ব্যক্তি সম্পৰ্কে- আৰু- ৰাষ্ট্ৰ বা- ৰাষ্ট্ৰ সম্পৰ্কে- ৰাজ্য- প্ৰশ্ন বা- পৰোক্ষ সম্পৰ্ক।

এখন- নিকা- আৰু- হু- ৰাজনীতিয়ে দেশৰ- উন্নতি- তাৰিহণা- খোলায়। পুৰণি- অসমৰ- ৰাজনীতিলৈ- নতুন- কৰিলে- নিৰ্বাচন, সত্তা- ও- ন্যায়- পৰায়ণতা- আৰু- হুনীতি- শীলতা- প্ৰতিশ্ৰুতি- হৈছিল। কিন্তু- বৰ্তমান- অসমৰ- ৰাজনীতি- প্ৰায়- অকিত- অৱস্থা- প্ৰাপ্ত। অত্যা- লুঠন, প্ৰভাৱনা- ও- প্ৰত্যাধাৰ- , “ ৰাইজৰ- বাবে, ৰাইজৰ- দ্বাৰা, ৰাইজৰ- চৰকাৰ ” হোৱা- কথাখাৰ- প্ৰায়- বিলুপ্ত- প্ৰায়। কিয়নো- বৰ্তমানৰ- ৰাজনৈতিক- ব্যৱস্থাত- ৰাইজৰ- কোনো- স্থান- নোহোৱা- হৈ- পৰিছে। তাৰ- বিপৰীতে- ৰাজনীতি- কেন্দ্ৰীভূত- হৈ- পৰিছে- স্থিতিস্থাপন- কেইজন- মান- নোকৰ- হাত-। ৰাইজৰ- হাত- কেৱল- ছোটমানৰ- অধিকাৰ- হৈছে; হুই- ছোটমান- বিবেক-হীন। তাৰেগৰ- দ্বাৰা- পৰিচালিত- হৈ- কোনো- বিচাৰ- নকৰাকৈ- নিজ- লৌচি- কতক- হুৰ্ন- কৰি- বৰ্তমান- ৰাইজে- ছোট- মান- কৰা- দেখা- গৈছে।

যদিও- ভাৰতবৰ্ষক- এখন- অফল- জনতান্ত্ৰিক- দেশ- বুলি- কোৱা- হয়, তথাপিও- কিন্তু- আমি- আমাৰ- জন- তান্ত্ৰিক- ব্যৱস্থাক- অফল- বুলি- ক’ব- নোৱাৰো। কিয়নো- যি- এখন- দেশত- জনসংঘৰ- প্ৰায়- প্ৰায়- তকুৰ- বুলি- হ’ব- নগা- হয়, হুই- দেশত- কেতিয়াও- অফল-


 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



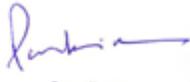
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সংস্কৃত, ৰাজনীতিৰ আৰু জনতা-
 জনাৰ্দন

জাতি, ধৰ্ম, বৰ্ণ, ভাষা, সংস্কৃতি, ঐতিহ্যৰ
 ভিত্তিত- স্নানুহৰ- স্মাৰণে গঢ় টেল উঠে। নিজ ভাষা-
 সংস্কৃতি- ঐতিহ্যৰ- স্মৃতি স্নানুহ- সন্দায় বৰ- সংবেদন-
 স্কীল। ভাষতৰ- দৰে এখন বহুত্ববাদী সন্মাজ মকা-
 দেশত সংকীৰ্ণ আবেগৰ- উৰ্দ্ধিত- হৈ সাম্ৰাজিক লগ্ন্য,
 সন্মতা, জাত্ববোধ- স্মৃতিষ্ঠা কৰিব পাৰিলেহে দেশৰ-
 স্মাৰ্তি আৰু প্ৰগতি নিশ্চিত হ'ব। দেশৰ সংস্কৃতি
 ইয়াৰ- প্ৰস্তাৱনাতে এই- বিস্ময়ত জোৰ দি নগৰি সাকলক
 সতৰ্ক কৰি দিছে। কিন্তু, বহুদলীয় স্মৃতি মকা- সংস্কৃতি
 স্মাৰন ব্যৱস্থাৰ- দেশখনত- ৰাজনৈতিক দল সন্মুহে স্মৃতা-
 স্মাৰনৰ বাবে জাতি- ধৰ্ম, জাতি- পাতিৰ- ভিত্তিত যি নিষ্কৰ্ত
 স্মাৰন আৰুগিক- ৰাজনীতি কৰা দেশৰ- স্মাৰ স্মাৰ পৰা
 স্মাৰিকৈ- ক'ব পাৰি হে এনে হোটে কেন্দ্ৰীক- নিৰ্বাচন-
 স্মাৰুহে বাবে বাবে সংস্কৃতিৰ স্মাৰুহে স্মৃতাৰ স্মাৰুহে কৰি-
 স্মাৰিছে। একক সংস্কৃতিৰ স্মাৰুহে- স্মাৰুহে কৰি স্মৃতা-
 স্মাৰুহে কৰাৰ স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে
 স্মাৰুহে ৰাজনৈতিক- দলবোৰৰ স্মাৰুহে যি নেত্ৰে, অ-
 স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে
 স্মাৰুহে ই- জাতীয় বহুত্ববাদী সন্মাজখনক- জাত্ববোধ-
 স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে
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 স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে স্মাৰুহে
 স্মাৰুহে কৰি জাতীয় সংস্কৃতি- হৰ্বল কৰি স্মাৰুহে।


 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
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Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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চিত্রঃ চৰম্বল অৰ্থসন্মৰ্ষণ এৰা 'নম্বুনা

Field-Based Study Conducted by Students of Dept of Economics


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Long 93.406437°
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Field-Based Study Conducted for Students by from Dept of History


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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Field-Based Study Conducted for Students by from Dept of Political Science [Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Field-Based Study Conducted for Students by from Dept of Political Science [Page 2]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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Birding trip to Jhanjimukh - Kokilamukh IBA site. Jan, 2020

Field-Based Study Conducted for Students by from Dept of Zoology


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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At Hoolongapar Gibbon Wildlife Sanctuary, Jorhat. Feb, 2019

Field-Based Study Conducted for Students by from Dept of Zoology


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Students visiting Hoolongapar Gibbon Wildlife Sanctuary, Jorhat. 2018

Field-Based Study Conducted for Students by from Dept of Zoology


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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B.Sc. Students during a Bird Census Project, Sarala Wetland, Nimati Ghat, Jorhat

Field-Based Study Conducted for Students by from Dept of Zoology


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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B.Sc. 6th Semester students and Teachers during a trip to Central Muga Eri Research and Training Institute, Gol, Lahdoigarh Jorhat Feb. 2019.

Field-Based Study Conducted for Students by from Dept of Zoology


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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**At Central Muga Eri Research and Training Institute , Lahdoigarh,
Under Central Silk Board, Gol**

Field-Based Study Conducted for Students by from Dept of Zoology


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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Educational Tours are Useful Avenues for Students to Learn in an Immersive, Experiential and Participative Manner.

REPORT ON THE BAHONA COLLEGE EXCURSION TO DELHI, AGRA, JAIPUR UNDERTAKEN FROM 13.12.2017 TO 21.12.2017

**SUBMITTED BY:
SHANTANA SAIKIA
TEACHER-IN-CHARGE
DEPARTMENT OF ENGLISH
BAHONA COLLEGE**

Altogether 42 members, including the teacher in charge and a junior teacher, Ms Shrutidhara Saikia of the Department of English, went on this educational tour to the national capital city of Delhi, Agra and Jaipur.

The students consisted of a good mix from both the Arts and the Science stream from the Degree classes. (List enclosed)

The idea behind this excursion was to acquaint the students with the historical, social and cultural milieu and diversity of the country. Further, as the students were basically from rural pockets of the small city of Jorhat in Assam and also majority being from economically straitened backgrounds, the excursion was undertaken with the intention of exposing them to the mainstream and acquainting them with opportunities that they might further explore. Therefore, visits to the IIT, JNU and Delhi University were kept on the agenda.

The excursion began with an overnight journey by train from Jorhat to Guwahati on 13.12.2018 where the group was to board the North East Express early next morning. However, a twelve hour delay in the train schedule upset the itinerary and the plan to visit the universities had to be dropped.

Delhi: 16.12.2018. Having arrived late, the students were given a tour of Connaught place and given a ride in the metro on the first day. The highlight being the students being made to get their tickets themselves and ask for general directions with a view to improve their communication skills both in Hindi and English. While the accompanying teachers kept a general eye on the group, the students were encouraged to take their own and their group's responsibilities. Small groups with group leaders were formed and time and place set for them to meet. Post dinner, it was made mandatory for the groups to share their experiences.

17.12.2017: It was agreed with the tour operator that a bus would be kept in the service of the group on all days, there being no male teacher with the group. Accordingly, the group went to Agra on the morning of 17.12.2017 by a Volvo accompanied also by the tour operator and his assistant, two very responsible and energetic young men. The drive through the expressway was an excitement in itself for the students as was the Breakfast at a dhaba set in a lush yellow-green field.

The visit to Agra began with a tour of the Agra Fort. A tourist guide was engaged who told the students of the chequered history of the Mughals. The view from the window to Tajmahal and the tale of Emperor Shah Jahan's arraignment silenced the chirpy youngsters.

The much anticipated visit to the Tajmahal became trying as the group had to wait in the queue for nearly three hours to get inside. However, once inside, everybody was transported to another world. There was much photo clicking and everybody had to be literally dragged out! And the road journey to Jaipur commenced.

Report of Excursion Conducted in 2017 [Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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The arrival at Jaipur was late and post dinner everybody retired for the night.

18.12.2017

The next leg began with a tour of the Amber Fort where a guide was engaged to explain the Rajput history to the students. The students were enraptured by the recounted valour of the Rajput history and the magnificence of the fort. Much more than the stipulated time was spent at the fort and the students were taken to see the Jai Mahal after that. Camel rides, shopping for baubles and posing in traditional clothes kept the students happy and they were allowed to indulge in these activities and communicate with the local people. Post lunch, a general tour of the pink city was given by bus. More sight-seeing had to be cancelled as winter nights were foggy and the group had to return to Delhi. Arrival in Delhi was late, post-midnight and the next morning the students were allowed to rest till late.

19.12.2018-20.12.2018

Local tour of Delhi began with visiting the Qutub Minar, India Gate, Rajghat, Rashtrapati Bhavan and the Lotus Temple. As some of the students were showing signs of fatigue, the pace was slowed and more rest was given. The 20th was kept for shopping at collective request and the students with their group leaders and teachers went to the Sarojini Nagar Market to shop for friends and family.

21.12.2017

The group had an early train to catch to Guwahati and had to leave the hotel at 2AM on the morning of the 21st only to be informed of a 17hour delay. Finally, after a delay of 27 hours an exhausted group reached Guwahati on the 23rd and left for Jorhat the same night.

SUMMING UP:

The students showed exemplary resilience, good conduct, responsibility and smartness. There was no untoward incident and they bore with the discomforts and the unfamiliar-to-their-palate food with equanimity. They took each other's responsibility and on the tiring journey back on a very slow and dirty train, were solicitous of the accompanying teachers' comfort. It is also worth mentioning that on the way back from Jaipur to Delhi the boys took turns to sit near the bus driver on the floor to keep him company and awake! We have been informed that some of them have maintained contact still with the driver, the hotel staff and the tour operators extending them invitations to visit which is a natural part of the Assamese culture. The same spirit was noticed on the train as they took up lower berths on the sides putting the girls in the middle.

A spirit of bonhomie developed among all the students across streams and semesters as they sang and danced together to the accompaniment of the karaoke that they had carried with them. Many students in their reports have expressed their resolve to study harder and go to Delhi for higher studies. Thus, this trip has definitely been an enriching experience for the students and the teachers alike.

Counter Sign

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Pin-785101

Head of Dept.

Dept. of English
Bahona College

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(Dr. P.K. Dutta)
Principal
Bahona College



Coordinator
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REPORT ON BAHONA COLLEGE EXCURSION, 2018, TO RAJASTHAN (From 05/12/18 to 12/12/18)

Submitted by: Ajit Kumar Borah,
Teacher –in-Charge,
Department of English
Bahona College.

Bahona College, Jorhat, has been imparting quality higher education to a large number of undergraduate students both in Arts and Science since its inception nearly six decades ago. Since travelling is an integral part of education, the college authority arranges study tours, field studies, awareness camps and excursions for the greater interests of the students from time to time. Earlier, the expenses were exclusively borne by the participating members. Fortunately, the government of Assam has been gracious enough to grant a substantial amount for annual excursions by college students for the last few years, our college too readily grabbed the opportunity and organized such excursions annually. Excursion for the year 2018 was to be led to Rajasthan as instructed and the same was scheduled to take place during winter vacation cum semester break. A group of 22 students (boys & girls), from both Arts and Science stream with three Teachers-in-charge undertook the journey by train on 05/12/2018. It came to a successful end on 12/12/2018 with a rewarding series of experiences for the students and the teachers alike. The following is a brief report on the itinerary and rich experiences garnered from the excursion.

The excursion began with a happy anecdote as 5th December was coincidentally the birthday of one of the Teachers-in-charge in the group. As all were on board the Abadh Assam Express at Mariani Station, all the members of the group wished her a very happy birthday and a happy journey. The teacher entertained all with a very melodious song. Almost all the members of the group joined her and the students started singing and dancing providing much entertainment to all present. The teacher offered dinner to all which was relished with thankfulness by all. Thus, the journey to Delhi from Mariani railway station became a memorable event for most

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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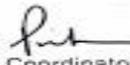
of the group members for whom it was the first train journey and first experience of going out of their home state.

The teachers kept an eye on the movement of the students while allowing them to mix up and communicate with other co-passengers, preferably in Hindi and English with the intention to help improve their communication skills. The students readily complied with the instructions and the enjoyed each and every moment of the journey. They shared berths, talks and personal belongings quite happily and accepted even inconvenience to make room for their fellow group members and other passengers. The group was accompanied by a young travel guide from Guwahati who had been engaged for making the whole excursion enjoyable. Nothing unpleasant or inconvenient happened to the team and it reached New Delhi hale and hearty on 07/12/18. We headed towards a hotel arranged by our travel guide who worked for the D.S. Excursions. The accommodation and the food were quite satisfactory and all enjoyed sound sleep after a sumptuous dinner.

Early in the morning of 8th December the team boarded a luxury bus driven by a handsome Punjabi driver who seemed to be quite expert in his profession. As the bus headed towards Jaipur, the students started singing and dancing and sharing experiences with each other. On the way, the team had breakfast and lunch. We visited Tajmahal at Agra, one of the best monuments of the world, enroute Jaipur. Then we headed towards our destination- Jaipur. Accommodation in a Jaipur hotel had been arranged beforehand by the tour operator. All seemed to be happy on reaching Jaipur though it was pretty late due to heavy traffic on the way. All enjoyed mutton curry over dinner and had a good night's sleep as the next days were to witness history, culture and society of Rajasthan, one of the most colourful states of India.

On 9th December we set out early in the morning and headed towards Amber Fort, one of the most attractive and popular places of historical importance in North India. Students were explained in details the importance of these historical monuments and rich cultural heritage of Rajasthan. The group were amazed to know many things of Indian history and noted down the important pieces of information written on plaques. They were also taken to Neer mahal, the Jantar-Mantar, to the busy market areas of the pink city, to the Birla Temple and to a replica of rural Rajasthan- Chokki Dhani. All members participated in the

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IQAC
Bahona College, Jorhat
Pin-785101

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(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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Excursion Report 2020 Excursion to Digha & Kolkata

A team of young energetic students of Bahona College, led by Assistant Professor of English Mr. Ajit Kr. Borah and Assistant Professor of Mathematics, Dr. Manashjyoti Borah, set out on an Excursion to Digha & Kolkata on 4th March 2020. The team boarded a bus that took reached the Mariani Railway station on time to catch the Kolkata bound Kamrup Express.

The Team reached Howrah station in the wee hours of 6th March. They got fresh in the station, took breakfast and boarded the Digha Super Express. The students enjoyed this trip very much. All were excited to have a look at the Digha sea beach as for all of them it was the maiden trip to a sea beach. The team reached Digha railway station and moved to a pre-booked sea facing lodge near the beach. In the afternoon, all went out to the sea beach, studied the life style of the small vendors selling eateries and hand-made crafts. Some of the students collected few specimens of sea weeds and stones.

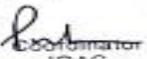
Next day, i.e. 7th March, the team moved to Mandarmani sea beach, some 80 K. M away from Digha. Most of the students eagerly observed the potentiality of rural sea side or river side tourism projects and innovative livelihood ways like fish farming and homestays in rural areas. The students enjoyed their time in riding speed boats and playing on the sea beach. Almost all of them collected specimen of sea life and memorabilia from the sea side stalls. In the evening they moved back to Digha Railway station and boarded the train to Howrah station. They stayed in a hotel in Kolkata and took rest for the night.

On 8th March, the team set out early in the morning to Alipore Zoological Park. All the students were excited and happy to see as wide range of flora and fauna the vast park offered to the visitors in the heart of the city. They talked to a few officials of the park and came to know much about its history, present management system and the way of treating the animals in captivity.

Then the students were taken to Kolkata science city which was a kind of wonderland for them. What they enjoyed most was the animation programme like the evolution of the homo-sapiens, time machine and the well managed museum showing the landmarks in scientific innovation and inventions.

Then the students were taken to Victoria Memorial where they excitedly witnessed the pieces of Indian history laden the colonial regime of the British. They could witness the historical marvels in the museum and felt the worth of the priceless socio-political and cultural heritage of the country. Then the team moved towards the hotel and took rest for the night.

On 9th March, the team checked out off their lodge and moved towards Birla Science City which offered them a scope to learn about many landmark events in scientific research and development. They were taken to have a glimpse of the famous Eden Garden stadium at


Coordinator
IQAC
Bahona College, Jorhat
Pin-785101

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(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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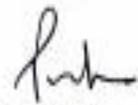
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salt Lake. Then the team moved to the Dakshineswar Temple, one of the serene and beautiful places to visit in Kolkata. In the evening the team moved towards Howrah station and boarded the Marianin Bound Kamrup Express. The team reached Mariani in the morning of 11th March, 2020. Everyone was safe and sound in spite of the rising cases of covid-19 infection in the Country. All the members of the team reached home happily with loads of happy memories of the excursion, 2020.


Principal
Bahona College



Report prepared by,
Mr. Ajit Kr. Borah
Assistant Professor, English
Teacher – in-charge for Excursion, 2020.
Bahona College.


Coordinator
IQAC
Bahona College, Jorhat
Pin-785101

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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গৱেষণা পত্ৰ

ভাষাৰ ব্যৱহাৰৰ এক বিস্তৃত
অধ্যয়ন

স্বত্ব
প্ৰকল্পটো প্ৰস্তুত
কৰোঁতামহল

১. দ্বিপক্ষীয়া স্বাক্ষৰীকৃত
২. স্বীতা ভাষুন্দী
৩. প্ৰনামী বৰা
৪. জনিন্দীতা পাতিৰ
৫. পলি অৰ্থকাৰীয়া

তৃতীয় স্বাপ্নাপনিক
অপ্ৰায়ীয়া-বিভাগ.

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Project Report by Students of Dept of Assamese [Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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সূচীপত্র

- ১.০০ আমচক্ষণি
- ২.০০ অৰ্শ্যনৰ উদ্দেশ্য
- ৩.০০ অৰ্শ্যনৰ সন্মল
- ৪.০০ বিস্তৃত অৰ্শ্যন
- ৫.০০ সামৰণি
- ৬.০০ প্ৰসাংগ পুষ্টি

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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১.০০ বিদ্যুত ভাব্যস্থানঃ

মিলেছে হেমাচিলাফ ক্ৰেতিম্বা ষ্ট্ৰোণোমিক দিশৰ পৰা, ক্ৰেতিম্বা পাবিগালৰ দিশৰ পৰা আৰু ক্ৰেতিম্বা আকৃতিৰ দিশৰ পৰা ষ্ট্ৰোণী বিভাচন কৰি পাবিগালৰ কবিবৰ্ণে বন্ধু কৰা ষ্ট্ৰেছে পাতিকে প্ৰেছৰে হোমাব ষ্ট্ৰোণীবিভাচন কৰা প্ৰক্ৰিয়াৰে 'হোমাব বৰ্ণীকৰণ' বুলি কোৱা হয়,

হোমাবিভাচনীসকলে হোমাব বৰ্ণীকৰণ বন্ধীতে তলত দিয়া পদ্ধতিসমূহৰ অনুসৰা কবিবৰ্ণে যত্ন কৰিছে -

- ১) আকৃতিমূলক বা অণতক্ৰমূলক
- ২) ঐতিহাসিক বা কংসানুগত
- ৩) ষ্ট্ৰোণোমিক ভাব্যস্থান অনুসৰি -

- ১) অম্বাচেশীম্বু ভিত্তিত - ঐহিম্বাৰ হোমাব ঐহিম্বাচনীম্বু হোমাব, আক্ৰোম্বিকাৰ হোমাব ঐহিম্বাচনীম্বু, ৩) অম্বাচেশীম্বু ভিত্তিত - চীমা হোমাব, হোমাব হোমাব

ঐহিম্বাচনীম্বু ভিত্তিত ঐহিম্বাচনীম্বুৰ বিভাচনৰ ভিত্তিত আকৃতি মূলক আৰু ঐতিহাসিক বৰ্ণীকৰণকে বিভাচন সন্মত বুলি কৈছে - যিবা ষ্ট্ৰেছে। তাম্বাচনীম্বু ষ্ট্ৰোণোমিক ভাব্যস্থান অনুসৰি কৰা বিভাচনৰে বিভাচনসন্মত বুলি যিবা নহয়। আৰু অম্বাচেশীম্বুৰ অম্বাচেশীম্বু বুলি হোমাবিভাচনীম্বু চীমাৰ বৰ্ণীকৰণ।

তিনিভবিৰ্ণ বৰ্ণীকৰণৰ বিষয়ে তলত চমুকৈ আলাচনা কৰা হ'ল -



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কথা হৈছে।

এনেদৰে - 'হামাৰ' দেশীবিহাজন কথা শুদ্ধিগুণ
- 'কৰ্ম' 'হামাৰ' বৰ্গীকৰণ বুলি কোৱা হয়।

২.০০

অৰ্ধস্মনৰ উদ্দেশ্যঃ

'হামা' বৰ্গীকৰণৰ এক বিস্তৃত অৰ্ধস্মন' এৰ্ বিনয়
টো অৰ্ধস্মনৰ উদ্দেশ্য হ'ল আমি এৰ্ হামাৰ
বৰ্গীকৰণ অক্ষিমাৰ বিষয়ে পুৰোধানুপুৰোধাত
জ্ঞাত হোৱা আৰু জানকো এৰ্ বিষয়ে অৱগত
কৰোৱা। এৰ্ বৰ্গীকৰণৰ বিষয়ে অৰ্ধস্মনৰ
এক বিশেষ- প্ৰকল্পকাৰ্য কৰা হ'ল ই আমাৰ
পাঠ্যপুস্তিক- অন্তৰ্গত। এনেদৰে আলোচনা
কৰি অৰ্ধস্মন কৰিলে- আমাৰ- বিশেষভাৱে
মাত্ৰ হোৱা পৰিৱৰ্তিত হয়।

৩.০০

অৰ্ধস্মনৰ সন্ধানঃ

সন্ধানৰণতে - অৰ্ধস্মনৰ সন্ধান হ'ল একমুখ হয়।
সন্ধানতো সন্ধানসন্ধান আৰু দ্বিতীয়টো সোণ
সন্ধান। সন্ধান- সন্ধান বৰ্গীকৰণৰ সৰ্বা প্ৰত্যক্ষ
হয়। আৰু সন্ধান- সন্ধান বুলি কোৱা
কাৰোৱাৰ- সন্ধান টো সন্ধান সন্ধান বৰ্গীকৰণ
সোণসন্ধান বুলি কোৱা হয়। আমি
আলোচনা কৰা 'হামা' বৰ্গীকৰণৰ বিস্তৃত
অৰ্ধস্মন' হৈছে - সোণসন্ধান।

Project Report by Students of Dept of Assamese [Page 5]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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DEPARTMENTAL SEMINAR ON

“CRYSTAL FIELD SPLITTING IN OCTAHEDRAL COMPLEX”

PRESENTED BY-

NAME:- DHRUBAJYOTI SAIKIA

B.Sc. 5th SEMESTER, 2021

ROLL NO: 25

DEPARTMENT OF CHEMISTRY

BAHONA COLLEGE,

DATE: 27/11/2021

Seminar Paper by Student of Dept of Chemistry


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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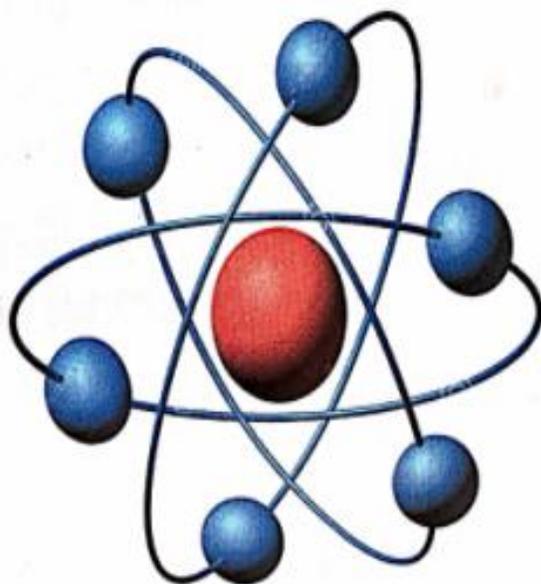
বাহনা মহাবিদ্যালয়

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**AN INTRODUCTION TO DISCONNECTION APPROACH
THROUGH IMAGINARY BOND CLEAVAGE**



27/11/2021

**PRESENTED BY
-SOURABH BORAH
BSC 5TH SEMESTER
ROLL NO -24
BAHONA COLLEGE,
JORHAT
YEAR-2021**

-1

Seminar Paper by Student of Dept of Chemistry


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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Bahona College

Electroanalytical methods:

p^H metric titrations, potentiometric titrations,
conductometric titrations

Department of Chemistry

Prodip Borah.

Roll no : 01.

B.Sc. 5th sem.

Year : 2021-22

Date : 27/11/2021

Seminar Paper by Student of Dept of Chemistry


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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Bahona College

Electroanalytical methods:

p^H metric titrations, potentiometric titrations,
conductometric titrations

Department of Chemistry

Prodip Borah.

Roll no : 01.

B.Sc. 5th sem.

Year : 2021-22

Date : 27/11/2021

Seminar Paper by Student of Dept of Chemistry


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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প্রকল্প প্রতিবেদন

বাহনা মহাবিদ্যালয়ৰ ছাত্ৰ-ছাত্ৰীসকলৰ
অর্থনৈতিক প্ৰেক্ষাপট



তত্ত্বাবধায়ক : ড° বফিক আহমেদ

প্ৰস্তুতকৰ্তা :

শ্ৰী বন্দনা ভূঞা
শ্ৰী বাজশ্ৰী দত্ত
শ্ৰী দেবান্ধীষ দত্ত


Principal
Bahona College

পঞ্চম বাৰ্ষিক, অর্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৮ চন।


HoD, Department of Economics
Bahona College, Jorhat

Project Report by Student of Dept of Economics


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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প্রকল্প প্রতিবেদন

উজনি অসমৰ পর্যটন উদ্যোগৰ
সমস্যা আৰু সম্ভাৱনা



তত্ত্বাবধায়ক : ড° বফিক আহমেদ

প্রস্তুতকৰ্তা : শ্ৰীমতী হিমাশ্ৰী গগৈ

ষষ্ঠ শাণ্মাষিক, অর্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৭ চন।

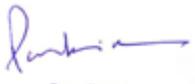

Principal
Bahona College


HOD, Department of Economics
Bahona College, Jorhat

Project Report by Student of Dept of Economics


(Dr. P.K. Dutta)
Principal,
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প্রকল্প প্রতিবেদন

নৈপৰীয়া অঞ্চল আৰু নগৰ উপকণ্ঠ অঞ্চলৰ
মাজৰ জীৱন নিৰ্বাহৰ মানৱ পৰ্থক্য



তত্ত্বাবধায়ক : ড° বফিক আহমেদ


Principal
Bahona College

প্রস্তুতকৰ্তা :
শ্রী মেঘাশ্রী ভূঞা
শ্রী পূজা শইকীয়া
শ্রী পল্লৱী পেগু

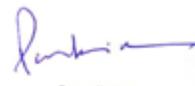

HOD, Department of Economics
Bahona College, Jorhat

চতুৰ্থ ষান্মাষিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৭ চন।

Project Report by Student of Dept of Economics


(Dr. P.K. Dutta)
Principal,
Bahona College




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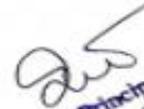
A Project-work/Fieldwork Based Learning Provides Useful Avenues for Students to Learn in an Immersive, Experiential and Participative Manner

বুম খেতিৰ ওপৰত এটি আলোকপাত
ইয়াৰ অবহনক্ষমতাৰ প্ৰসংগসহ



তত্ত্বাবধায়ক : বীমা ৰাভা

প্ৰস্তুতকৰ্তা :
প্ৰিয়দৰ্শন বৰুৱা
প্ৰিয়ংকা বৰা
মনীষা গোস্বামী
সংকল্পিতা বৰা


Principal
Bahona College

পঞ্চম বাৰ্ষিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৭ চন।


HoD, Department of Economics
Bahona College, Jorhat

Project Report by Student of Dept of Economics


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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প্রকল্প প্রতিবেদন

বাহনা মহাবিদ্যালয়ৰ ছাত্ৰ-ছাত্ৰীৰ
মোবাইল ফোন ব্যৱহাৰৰ ধৰণ



তত্ত্বাবধায়ক : ড° ৰফিক আহমেদ

প্ৰস্তুতকৰ্তা :

শ্ৰী দেবাসী গগৈ
শ্ৰী দিপশিখা ভূঞা
শ্ৰী পাৰ্থপ্ৰতিম শইকীয়া


Principal
Bahona College

পঞ্চম বার্ষিক, অর্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৮ চন।


Coordinator
Department of Economics
Bahona College, Jorhat

Project Report by Student of Dept of Economics


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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প্রকল্প প্রতিবেদন

নৈপৰীয়া অঞ্চল আৰু নগৰ উপকণ্ঠ অঞ্চলৰ
মাজৰ খাদ্য সুৰক্ষাৰ পৰ্য্যক্য



তত্ত্বাবধায়ক : ড° বফিক আহমেদ

প্ৰস্তুতকৰ্তা :
শ্ৰী মানসজ্যোতি শৰ্মা
শ্ৰী বাজেশ গোস্বামী
শ্ৰী সক্ষজিৎ বৰা
শ্ৰী বিক্রম দাস

Dutta
Principal
Bahona College

চতুৰ্থ যান্মাষিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৯ চন।

Dutta
HoD, Department of Economics
Bahona College, Jorhat

Project Report by Student of Dept of Economics

Dutta
(Dr. P.K. Dutta)
Principal,
Bahona College



Dutta
Coordinator
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প্রকল্প প্রতিবেদন

অসমৰ গ্ৰাম্য পৰ্যটনৰ বিকাশ



তত্ত্বাবধায়ক : ড° বীমা বাভা

প্রস্তুতকৰ্তা :
শ্ৰী পংকজ তামুলী
শ্ৰী পৰিণিতা বৰা
শ্ৰী স্বতূপৰ্ণা দত্ত
শ্ৰী পিয়ংকা কলিতা


Principal
Bahona College

ষষ্ঠ যান্মাষিক, অর্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৮ চন।


Coordinator
Department of Economics
Bahona College, Jorhat

Project Report by Student of Dept of Economics


(Dr. P.K. Dutta)
Principal
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**PREPARATION OF CHEMICALLY DEPOSITED
NANOCRYSTALLINE CdS THIN FILMS AND
ITS OPTICAL PROPERTIES**

Project Report

Submitted By

**Mitra Handique
Hirok Jyoti Borah
Arponjit Buragohain
Manas Saikia
Anupam Goswami**

**B.Sc 6th Semester, 2018
Physics Department, Bahona College**

*19.6.18
H.O.D.*

Project Report by Student of Dept of Physics


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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John Mazumder 604 Project Report



Bahona College
Department of Statistics
Project Paper Code – 604

The dissertation on
“Fitting of Regression Line and Calculation of
Multiple Correlation Coefficient”

Prepared By:
John Mazumder
Roll No.: 12220052
Regd. No.: S1625296
B.Sc. 6th Semester
Department of Statistics.
Bahona College, Bahona

Supervised by:
Lalit Kakoty
Associate Professor &
HOD, Statistics
Bahona College, Bahona

2018-2019

Project Report by Student of Dept of Statistics


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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**A STUDY ON SEX DISTINCTION IN CASE OF
EMPLOYMENT IN NOPOMUA GAON OF
JORHAT DISTRICT**



**Prepared By
Sri Monoj Borah
B.Sc. 6th Sem.**

**Department of Statistics
Bahona College
2017**

Project Report by Student of Dept of Statistics


(Dr. P.K. Dutta)
Principal,
Bahona College

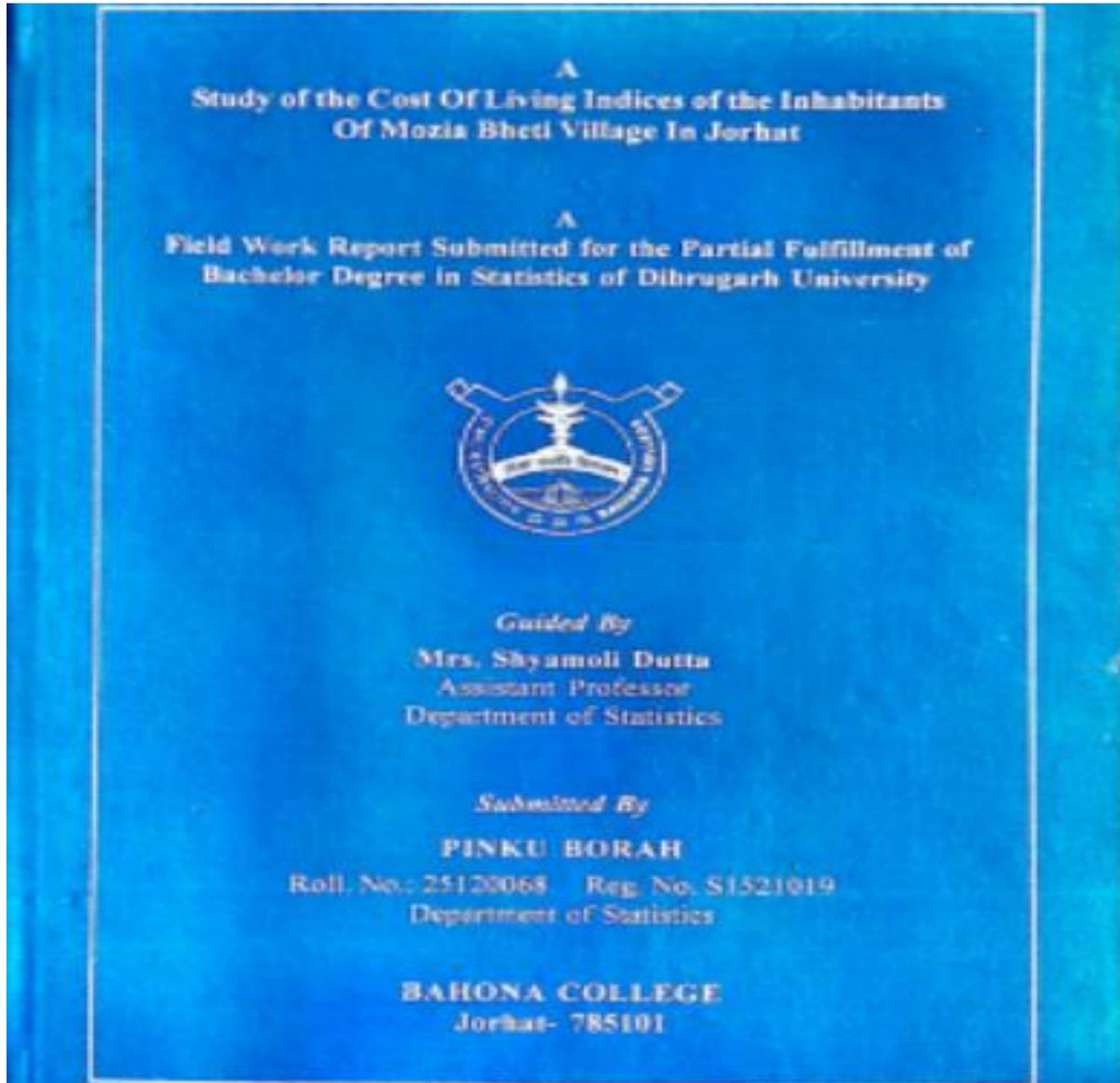



Coordinator
IOAC
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Project Report by Student of Dept of Statistics


(Dr. P.K. Dutta)
Principal,
Bahona College

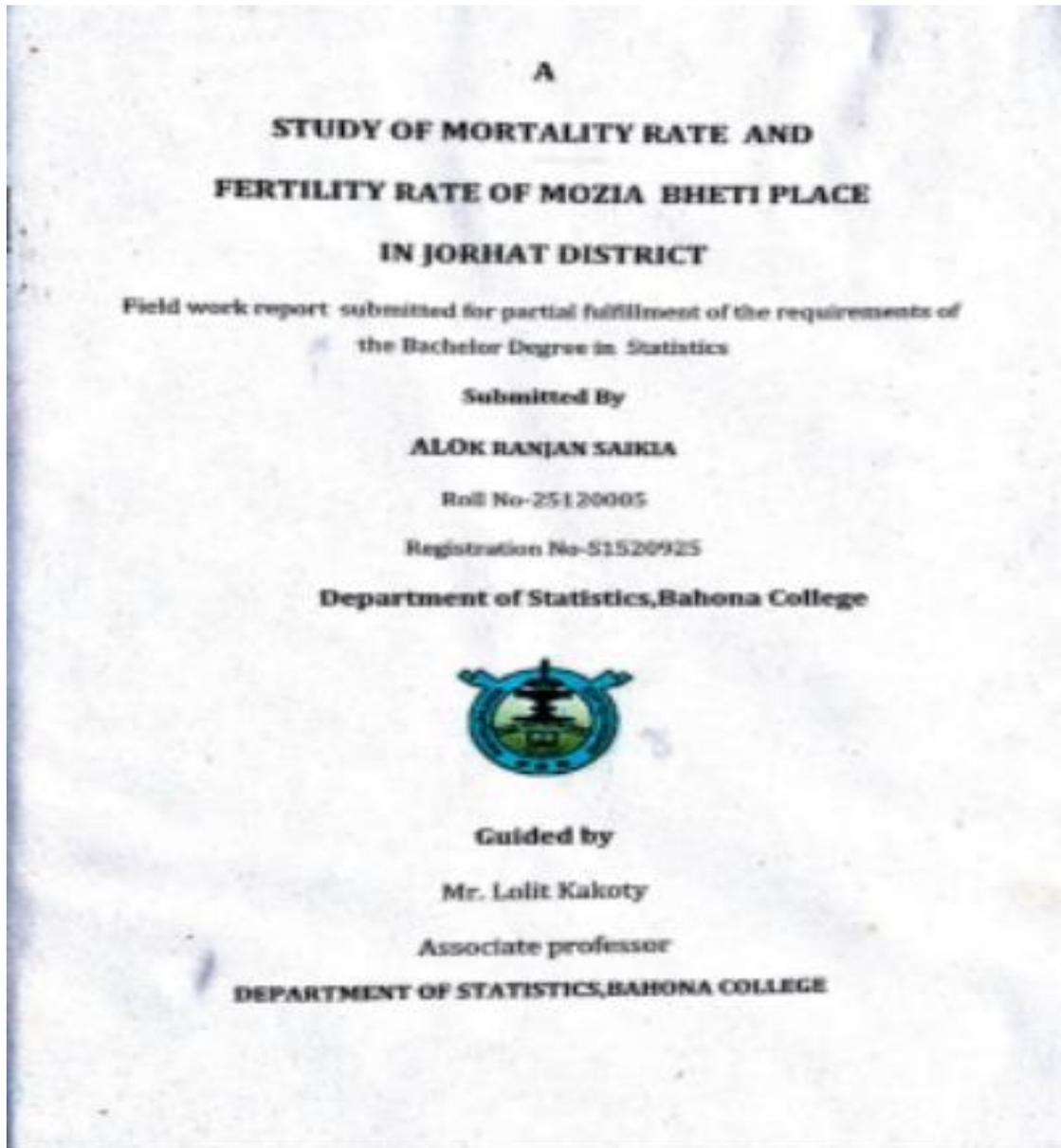



Coordinator
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Project Report by Student of Dept of Statistics


(Dr. P.K. Dutta)
Principal,
Bahona College

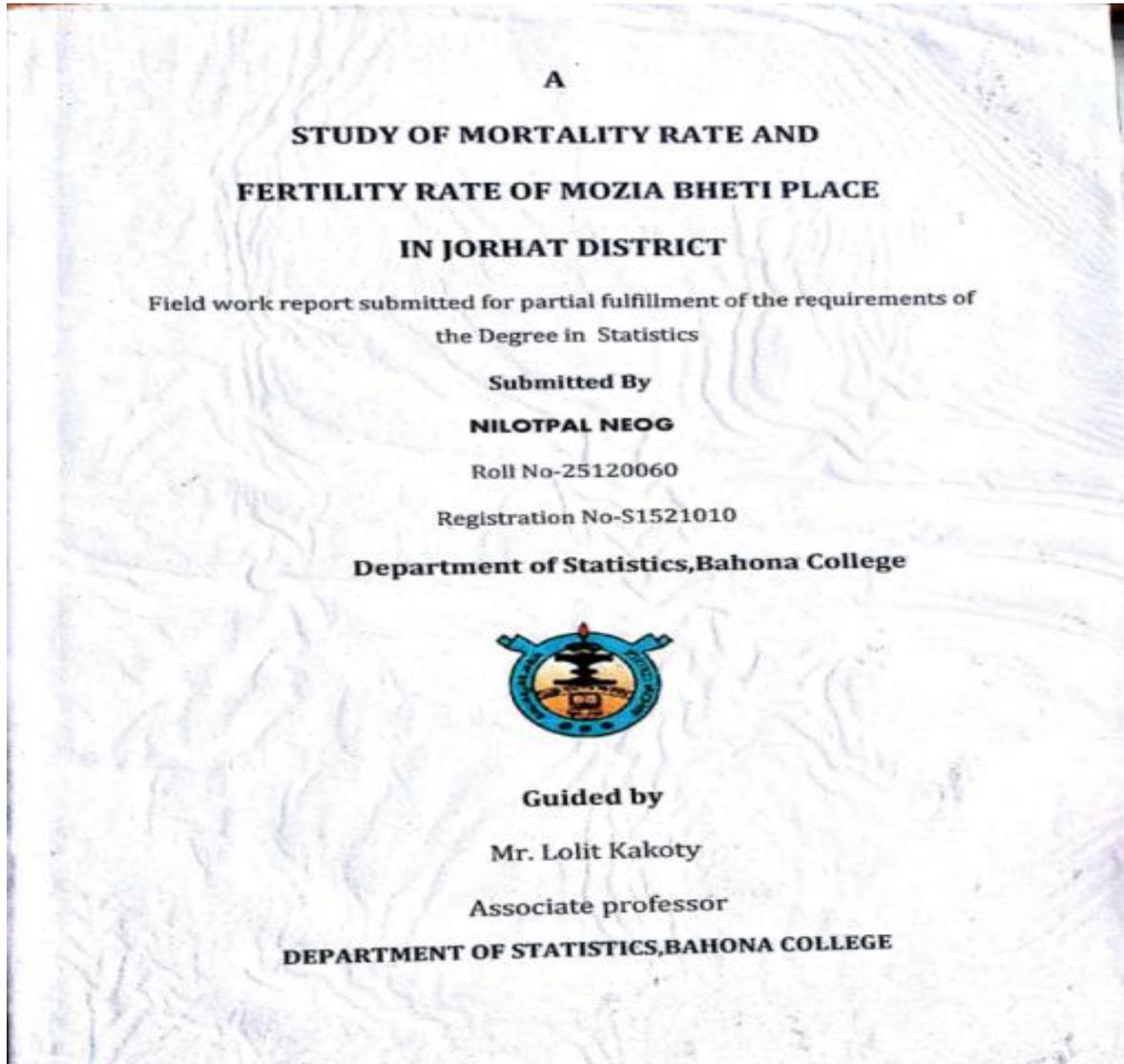



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Project Report by Student of Dept of Statistics


(Dr. P.K. Dutta)
Principal,
Bahona College




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A Project-work/Fieldwork Based Learning Provides Useful Avenues for Students to Learn in an Immersive, Experiential and Participative Manner

A

**Study of the Cost Of Living Indices of the Inhabitants
of Mozla Bheti Village In Jorhat**

A

**Field Work Report Submitted for the Partial Fulfillment of Bachelor Degree in Statistics of
Dibrugarh University**



Guided By

Mrs. Shyamoli Dutta

Assistant Professor

Department of Statistics

Submitted By

JOSEPH PATIR

Roll. No.: 25120043 Reg. No. S1520781

Department of Statistics

Bahona College

Jorhat- 785101

Project Report by Student of Dept of Statistics


(Dr. P.K. Dutta)
Principal,
Bahona College

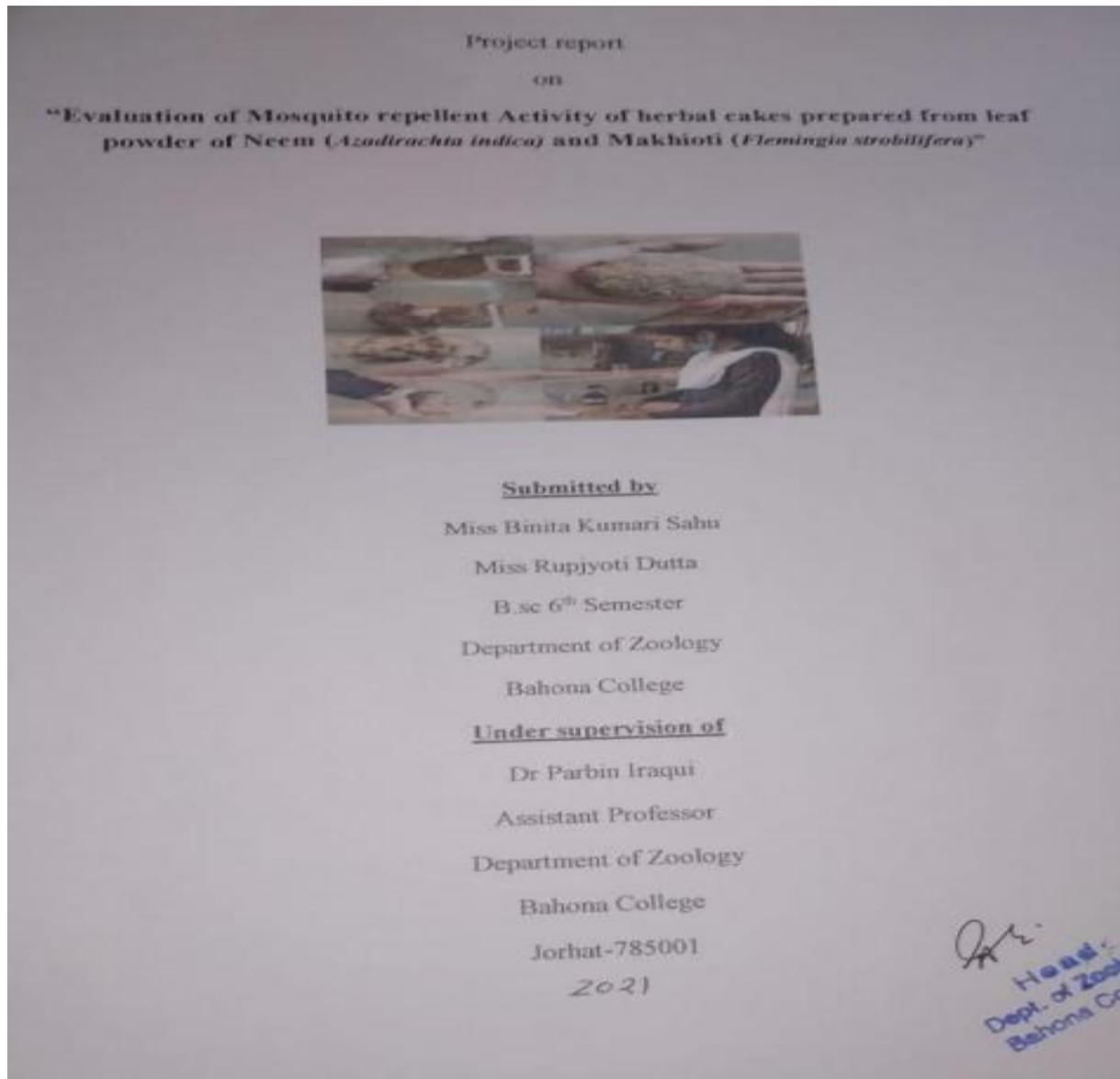



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Project Report by Student of Dept of Zoology [Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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CERTIFICATE

This is to certify that Miss Binita Kumari Sahu and Miss Rupjyoti Dutta, B.Sc. 6th Semester students of Dept. of Zoology, Bahona College have carried out the research project entitled "*Evaluation of Mosquito repellent activity of herbal cake prepared from leaf powder of Neem (Azadirachta indica) and Makhioti (Flemingia strobilifera)*" under my guidance and supervision. This project work was assigned to them as project work under the banner of **Environment and Climate Cell** of Bahona College.

This is also stated that the research work is original and not copied from other sources.

Parbin Iraqui

Dr. Gayatri Agni Borah
HOD, Department of Zoology

Dr. Parbin Iraqui
Supervisor,
Asst. Professor, Dept. of
Zoology Bahona College

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(Signature)
(Dr. P.K. Dutta)
Principal,
Bahona College



(Signature)
Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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ACKNOWLEDGEMENT

At first, we would like to express our gratitude to Dr. Gayatri Agni Borah (Head of the Dept.) for allowing us to conduct the project work. I would like to express my special thanks to our teacher Dr. Parbin Iraqui for her guidance and supervision to carry out and complete this project work. I am really thankful to them. Secondly, I would like to thank our parents and friends who helped us a lot in finalizing this project within the limited time frame.

Binita Kumari Sahu

Rupjyoti Dutta

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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ABSTRACT

Mosquitoes transmit serious human diseases causing millions of deaths every year. They are the vectors of diseases like dengue, Malaria, Filariasis, Encephalitis, Chikungunya etc. In India the most common disease causing mosquito species are *Aedes aegypti*, *Anopheles stephensi* and *Culex quinquefasciatus*. So from protect us from mosquito bites chemical mosquito repellent coils have been used by people for a long time. But the mosquito repellent coils which are available in the market give harmful effects on our health. It is also not good for our environment. So to combat these problems an alternative way to get rid of mosquitoes is very much needed. Plants are the source of many bioactive components and these components make them antibacterial, antifungal, larvicidal as well as mosquito repellent. So in his study we had selected Neem and makhoti plant leaves to prepare herbal mosquito repellent cakes and compared their activity with market available mosquito repellent coils. The leaves of these two plants have been used traditionally to repel insect as well as mosquitoes. Neem oil is used to kill harmful insects. In this study we had found that these herbally prepared mosquito repellent cakes gave better results than the chemical mosquito repellent coils. These herbal cakes are also eco-friendly as well as not injurious to our health.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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INTRODUCTION

Controlling mosquitoes is of utmost importance in the present day scenario with rising number of mosquito borne diseases [1]. The mosquitoes take a lead role in carrier of parasites like protozoa, virus, fungus, etc. They can cause some serious diseases like Dengue, Hepatitis-B, etc. which may cause death. Chickengunya causes fever and joint pain which can be severe and lasting for many days [2]. The risk of developing a serious disease is most dangerous outcome of mosquito bite. Mosquito borne diseases became a burning health problem in developing countries.

An alarming increase in the range of mosquitoes is mainly due to deforestation, industrialized farming and stagnant water [3]. There are 100 of mosquito species around the world but they all have two things common-they can all spread serious diseases and they all need water to breed in. Thus, special products like mosquito repellents for combating mosquitoes are required. There are various technologies and tools for the control of vector borne diseases, but still this problem is not solved yet [4]. One of the methods available for the control of mosquito borne diseases is the use of chemical insecticides but a main drawback in it is that they are non-selective and could be harmful to human and other non target organisms also. Market available chemical mosquito repellent coils which are used to repel mosquitoes gave adverse effects on our health as well as on the environment. The emission of formaldehyde from one burning coil can be as high as that released from fifty one burning Cigarettes [5]. This is because of the chemical found in mosquito coils. Making a mosquito coil out of natural ingredients may remove this problem.

Due to the harmful effects of chemical pesticides, insecticides and mosquito repellent coils an alternate method for vector control is essentially preferred and that is undoubtedly the biological control [6]. Plants have evolved a variety of secondary compounds, which are bioactive [7,8]. Due to presence of these compounds plants show activities like antibacterial, antifungal, antimalarials, larvicidal and mosquito repellent [9,10]. Plant extracts with insecticidal properties are used in the form of biological eco-friendly pesticides. So far more than five thousand plants have been searched for biopesticides [12,13]. The parts of plants like leaves, seed can be used to prepare mosquito repellent cakes which are not effective against mosquitoes but also eco-friendly [14].

Keeping all things in mind we had selected this project work of preparing mosquito repellent cakes from plant leaves. Mosquito repellent cakes made up of plant leaves can be used to repel mosquitoes. They will not be injurious to health as well as to the environment. In this study to traditionally used plants Neem and Makhioti were used to prepare mosquito repellent cakes and compared their repellent activity with market available mosquito repellent coil.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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AIM AND OBJECTIVES

The objectives of the study are listed below---

1. Preparation of herbal mosquito repellent cakes from the leaf powder of Makhioti plant (*Flemingia strobilifera*) and Neem (*Azadirachta indica*).
2. Comparison of mosquito repellent activity of herbal cake prepared from leaf powder of Neem with market available chemical mosquito repellent coil.
3. Comparison of mosquito repellent activity of herbal cake prepared from leaf powder of Makhioti with market available chemical mosquito repellent coil.
4. Comparison of mosquito repellent activity of herbal cake prepared from leaf powder of Makhioti and Neem with market available chemical mosquito repellent coil.

HYPOTHESIS OF THE STUDY

If Neem and Makhioti leaves are extracted its natural component for making the mosquito repellent cake. We will observe its activity by applying the fog of mosquito repellent cake against mosquitoes. If it is effective against mosquitoes it will repel mosquitoes away and long time exposure may kill mosquitoes also. Then we can say the cakes prepared herbally have mosquito repellent activity.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Methodology [11]

1. After collection of leaves we washed those leaves with the help of clean water and kept for dry under shade.
2. After 15 days, the dry leaves were grinded by mixer grinder, then it stored in a air tight container.
3. On 18 December, we collected the coconut fibre, extract of wood, candle and Maida flour. These material are important to prepared herbal mosquito repellent cakes.
4. After the collection of all materials, we take 4gm of each neem and makhiti leaves extract, 2gm of wood extract, 1gm of coconut fibre, 4gm of melted candle and 30mL. Maida. Then all these materials are mixed well and added hot water with these materials.
5. After mixing properly, the mixture of leaf powder with other substances kept under sun for drying .
6. After drying cakes were kept in air tight containers for further use.
7. On 26th of December 2020, we had started our experiment.
8. For this experiment , we took three containers, in one container we had put some burning pieces of herbal cake prepared from makhiti leaves, in one container we had put burning pieces of herbal cake prepared from neem and in one container chemical mosquito repellent coil (Maxo) was added. We had waited few minutes to let them create fog.
Then 20 mosquitoes were added to the both containers.
9. This way we had done repeated the experiment for three times and we had counted the senseless and dead mosquitoes in every 5 minutes in each container.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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MATERIAL AND METHODS

To start our experiment we had to collect selected plant leaves first. We had started to collect the plant leaves of project from two different areas. The details of the collection of leaves are given below:

Makhiati:

Area: Dakhinpat puroni satra gaon,

Majuli Date: 21.09.2020

Time: 4 PM(Taking picture of leaves) Time: 4.04 PM(Taking picture of plant)

Neem:

Area: Rajamaidam new colony, Jorhat Date: 20.09.2020

Time: 11.15 AM(Taking picture of leaves) Time: 11.16 AM(Taking picture of plant)



Photographs of Neem and Makhioti plant leaves



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RESULT AND DISCUSSION

In this experiment the mosquito repellent activity of herbally prepared cakes was compared with the activity of market available mosquito repellent coil. Their activity measured on the basis of mosquitoes that became senseless and mosquitoes became after exposed to the fog that arise from burnt cakes and chemical coils.

From the experiment it was found that the herbally prepared mosquito repellent cakes are more efficient than the market available mosquito coil. These herbal cakes are also eco-friendly as well as not harmful for our health. The experiment was examined comparatively. We compared our herbal cakes with market available mosquito repellent coil and found that herbal cakes are more effective on mosquitoes than the chemical coils.

From the above observations, we find that among the three cakes, the cake made from Neem (*Azadirachta indica*) leaves and Makhoti is more effective than the chemical based products available in markets. This cake is able to make the mosquitoes unconscious in 10 minutes after consumption and sacked to the brink of death after 15 minutes.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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Table 1: Comparison of effectiveness of herbal cake prepared from leaf powder of Neem with Maxo Coil by counting senseless and dead mosquitoes.

Neem Leaf Cake				Chemical Substance (Maxo coil)			
Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count	Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count
5 min	20	0	0	5 min	20	0	0
10 min		1	0	10 min		0	0
15 min		2	0	15 min		3	0
20 min		2	0	20 min		5	2
25 min		4	3	25 min		6	2
30 min		2	2	30 min		3	1
35 min		4	5	35 min		3	5
40 min		4	6	40 min		0	7
45 min		4	7	45 min		0	3
50 min		0	8	50 min		0	3

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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Table 2: Comparison of effectiveness of herbal cake prepared from leaf powder of Makhioti with Maxo Coil by counting senseless and dead mosquitoes

Makhioti Leaf Cake				Chemical mosquito repellent (Maxo coil)			
Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count	Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count
5 min	20	0	0	5 min	20	0	0
10 min		1	0	10 min		0	0
15 min		1	0	15 min		0	0
20 min		4	0	20 min		4	2
25 min		4	0	25 min		6	2
30 min		1	0	30 min		3	1
35 min		3	2	35 min		3	2

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Principal,
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40 min	3	3	40 min	0	3
45 min	5	3	45 min	0	3
50 min	4	2	50 min		4
55 min	2	4	55 min		5
60 min	0	5	60 min		5
65 min	0	8	65 min		5

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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Makhroti + Neem Leaf Cake				Chemical mosquito repellent (Maxo coil)			
Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count	Time	Total no. of mosquitoes	Senseless Mosquitoes count	Dead Mosquitoes count
5 min	20	0	0	5 min	20	0	0
10 min		2	0	10 min		0	0
15 min		2	2	15 min		3	0
20 min		3	1	20 min		5	2
25 min		6	2	25 min		6	2
30 min		6	5	30 min		3	1
35 min		1	7	35 min		3	5
40 min		0	3	40 min		0	7
45 min				45 min		0	3

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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CONCLUSION

Since the use of synthetic chemicals to control mosquitoes raises several concerns related to environment and human health. An alternative of it is to use natural products that possess good efficacy and are environmentally friendly. Among those chemicals essential leaves from plants belonging to several species have been helpful in repellent properties as a valuable resource. Neem (*Azadirachta indica*) and Makhiloti (*Flemingia strobilifera*) leaves are the essential whose repellent activities have been demonstrated also smell nice. There are hundreds of ways to repel the mosquitoes naturally and all are cheap and simple to make and with a little inventiveness we will soon compile our own list of homemade natural remedies.

PHOTOGRAPHS



Preparation herbal mosquito repellent cakes from the leaf powder of Neem and Makhiloti

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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PROJECT REPORT ON
**FEEDING HABIT OF CERTAIN LOCAL
FISHES THROUGH RLG VALUE**



SUBMITTED BY

SANGITA BORUAH

B.Sc 6th sem , ZOOLOGY (Major)

Roll no – 17020142

Reg. no – 51726483

Bahona College, JORHAT

*Examined
31/10/2020*

[Signature]
Head -
Dept. of Zoology
Bahona College

Project Report by Student of Dept of Zoology [Page 1]

[Signature]
(Dr. P.K. Dutta)
Principal,
Bahona College



[Signature]
Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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CERTIFICATE

This is to certify that Miss Sangita Boruah bearing Rollno 17020142 of B.Sc 6thsem of Zoology Department, Bahona College Jorhat, affiliated to 'Dibrugarh University' has completed this research project entitled "FEEDING HABIT OF CERTAIN LOCAL FISHES THROUGH RLG VALUE", herself under my guidance and supervision. This is an original research work and not submitted elsewhere for any degree or award. This report has been submitted in partial fulfillment of the B.Sc 6thsem practical paper 605 requirement of Dibrugarh University.

Dr. Gayatri Agni Borah
Department of Zoology
Bahona College
Assam

Project Report by Student of Dept of Zoology [Page 2]

(Dr. P.K. Dutta)
Principal,
Bahona College



Coordinator
IOAC
Bahona College, Jorhat
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CERTIFICATE

This is to certify that Sangita Boruah (17020142), Pratim Das (17020087) and Kettrina Patik (17020125), students of B.Sc. 6th semester Zoology Department of Bahona College have carried out the project work "Feeding Habit of Certain of Local Fishes Through RLG Value". Under my guidance and supervision of Department of Zoology of Bahona College. This project is a part of UG Zoology Major syllabus of Dibrugarh University 6th semester and the instructions has been followed by this research activity.

It is also stated that the research work is original and not directly copied from other sources. Further, it was not submitted anywhere else for any degree or award. Any part of the report left without citation is purely unintentional and the credit remains to the original author(s).

The level of participation of each student in the project work:

High	Medium	Low	Equal
------	--------	-----	-------

B. Bakalial

(Dr. Bikramaditya Bakalial)

Supervisor

Assistant Professor

Dept. of Zoology

Bahona College, Jorhat

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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ACKNOWLEDGEMENT

In the accomplishment of my project report on "*FEEDING HABIT OF CERTAIN LOCAL FISHES THROUGH RLG VALUE*" successfully, many people have owned upon me their blessings and the heart pledged support.

At the very honest I am happy to acknowledge the teachers of Zoology Department for providing us the facilities in successful completion of the project report. I would like to pay sincere thank to Dr. P. Dutta (principal name) for financial support and permission.

I extended my heartfelt gratitude to Dr. Gayatri Agni Bora, HOD of the department for the arrangements and who also help me during the journey of my survey.

I express my deep sense of gratitude to our respected Dr. Bikramaditya Bakalial, assistant professor of the department whose suggestions, instructions and constant encouragement throughout the tenure of this investigation has served as the major contributor towards the completion of this project. I also thank him for sharing some of the photographs.

I am also thankful to my team members for field data record as well as report preparation.

Sangita Boruah.
(full signature of student)

Roll No- 17020442

Date-

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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INTRODUCTION

Every organism on earth requires energy for growth, reproduction and other metabolic activities. These life sustainable processes take place utilizing food energy. Hence, food is considered as the most essential component for the growth of all living organisms.

The growth of a fish is influenced by the quality and quantity of food materials available and consumed. Fishes like any other organisms depends on the energy received from its food to perform its biological processes. Any variation in quality and quantity of food materials will affect the growth rate of the fish. Food consumption is the major factor controlling fish production. Information on the natural food of fish is important in understanding its nutritional requirements, its interaction with other organisms and its potential use for aquaculture (Royce, 1987).

Studies on food and feeding habit of fishes have importance on fishery biology (Sarkar and Deepak, 2009). Studies associated to feeding of fishes in their natural environments are of major importance for the management of their fishery and also for the environment (Al-Kahem et al., 1988, 1990). Understanding of food and feeding habit provides information on the aquatic ecosystem, fish health, trophic relations of fishes and other aquatic organisms.

Food availability is a factors which strongly influence fish community biomass. Woodward & Hildrew (2002) stated that the food web model is an effective tool for describing trophic relationships among organisms. Grouping organisms by trophic level (i.e., producer, herbivore, predator) loosely characterizes their relative position within a food web, but this categorical approach does not account for complex trophic interactions such as omnivory (Kling et al. 1992).

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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Pin-785101



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The underwater observation of feeding habit of fish is easy. But there are some indirect methods through which the feeding nature can be understood. Analysis of Relative Length of Gut (RLG) is one of such approach which together with other observations helps to determine the feeding guild of a fish. The herbivore fishes possess very long alimentary canal whereas carnivorous fish have short gut length. The larger the value the more herbivory and value close to 1 indicate omnivory whereas value towards zero indicate pure carnivory.

In this project work, we tried to find out the feeding habit of different locally available fish species by using the RLG value method.

CONTENT

- INTRODUCTION
- MATERIALS AND METHODS
- PHOTOGRAPHS
- RESULT AND DISCUSSION
- CONCLUSION
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(Dr. P.K. Dutta)
Principal,
Bahona College




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MATERIALS AND METHODS

Collection of Fish:

Fresh fishes were collected from weekly market of Bahona College area, Jorhat during Pre Covid Pandemic Lockdown period. The fishes are brought to the market from pond, wetlands, ditches of nearby area. Occasionally, harvested fishes are supplied from Majuli also.

The study was carried out from August 2019 to October 2019.

RLG measurement.

The length of the gut was measured and the relative length of the gut was estimated (RLG) for the different length groups by the method of AlHussaini (1949).

$$\text{RLG} = \text{Length of the alimentary canal} / \text{Total length of the body}$$

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A Project-work/Fieldwork Based Learning Provides Useful Avenues for Students to Learn in an Immersive, Experiential and Participative Manner



Project Report by Student of Dept of Zoology [Page 8]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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RESULTS & DISCUSSION

The relative gut length of 22 native fish species were studied and the species specific values are given in Table 1. The comparative data are also shown in Fig 1.

Table 1: Fish species and their RLG value

	<i>Species studied</i>	Gut Length (Avg.)	Total Length (Avg.)	RLG Value
1	<i>Ailia coila</i>	10.7	8.23	0.77
2	<i>Amblypheryngodon mola</i>	6.3	19.1	3.02
3	<i>Anabas testudineus</i>	8.9	12.6	1.51
4	<i>Channa gachua</i>	9.6	3.4	0.35
5	<i>Channa punctatus</i>	10.1	4.5	0.44
6	<i>Esomus danricus</i>	5.3	12.66	2.39
7	<i>Glossogobius giuris</i>	9.6	3.93	0.41
8	<i>Heteropneustes fossilis</i>	15.7	20.7	1.31
9	<i>Labeo bata</i>	8.02	58.7	7.32
10	<i>Labeo boga</i>	11.2	54.9	4.73
11	<i>Lepidocethalichthys guntea</i>	8.1	6.5	0.8
12	<i>Macrognathus aral</i>	11.4	9.91	0.87
13	<i>Macrognathus punctatus</i>	14.1	9.8	0.68
14	<i>Mystus tengara</i>	6.94	3.74	0.54
15	<i>Neotropius atherinoides</i>	7.1	3.9	0.54
16	<i>Notopterus notopterus</i>	9.9	6.5	0.64
17	<i>Nundus nundus</i>	9.1	13.7	1.5
18	<i>Ompok bimaculatus</i>	12.2	6.58	0.54
19	<i>Puntius sophore</i>	9.6	17.1	1.74
20	<i>Puntius ticto</i>	7.2	15.26	2.12
21	<i>Salmostoma bacaila</i>	8.8	15.5	1.7
22	<i>Trichogaster fasciata</i>	7.9	67.9	8.6

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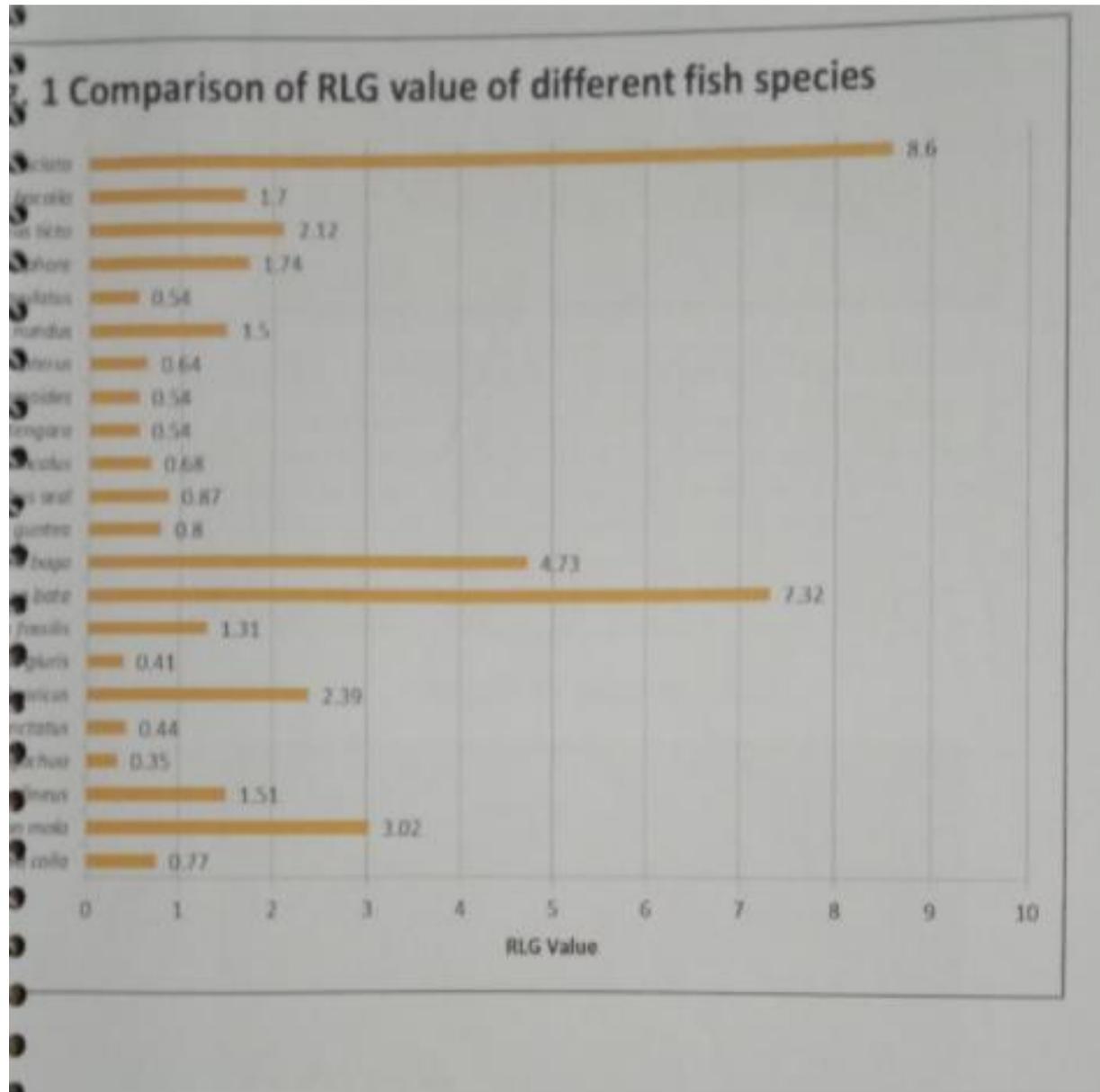

(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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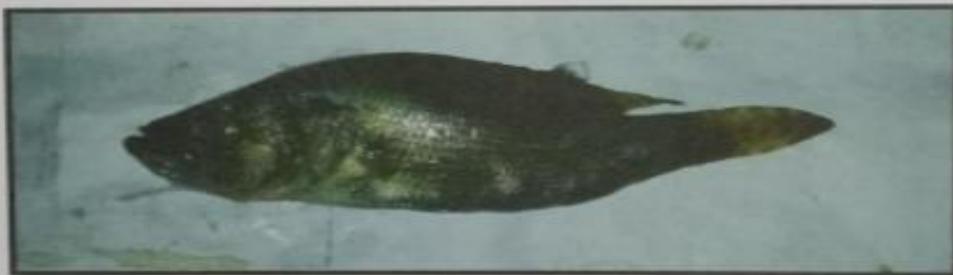
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Singora (Mystus tengara)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8.9	4.8	0.54
Sp 2	7.7	4.3	0.56
Sp 3	6.1	3.2	0.53
Sp 4	6.8	3.7	0.55
Sp 5	5.2	2.7	0.52
Average	6.9	3.7	0.54

Gedgedi (Nundus nundus)



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	9.5	14.5	1.53
Sp 2	7.2	10.4	1.45
Sp 3	11.2	17.6	1.58
Sp4	6.9	9.7	1.42
Sp 5	10.4	16.2	1.56
Average	9.04	13.7	1.50

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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Chengeli (*Channa gachua*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	10.5	4	0.39
Sp 2	8.3	2.7	0.32
Sp 3	9.6	3.3	0.34
Sp4	10.2	3.8	0.37
Sp 5	9.4	3.2	0.33
Average	9.6	3.4	0.35

Kanduli (*Notopterus notopterus*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	11.1	10	0.9
Sp 2	9.8	5.9	0.6
Sp 3	10.5	8.4	0.8
Sp4	8.7	3.5	0.4
Sp 5	9.4	4.7	0.5
Average	9.9	6.5	0.64

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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Puthi (*Puntius sophore*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	10	20.7	2.07
Sp 2	9.8	19.6	2.01
Sp 3	10.7	22.4	2.09
Sp4	8.5	10.1	1.18
Sp 5	9.2	12.7	1.39
Average	9.6	17.1	1.74

Goroi (*Channa punctatus*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	10.2	4.5	0.45
Sp 2	9.5	3.9	0.42
Sp 3	11.5	5.7	0.49
Sp4	8.9	3.7	0.41
Sp 5	10.6	4.7	0.44
Average	10.1	4.5	0.44

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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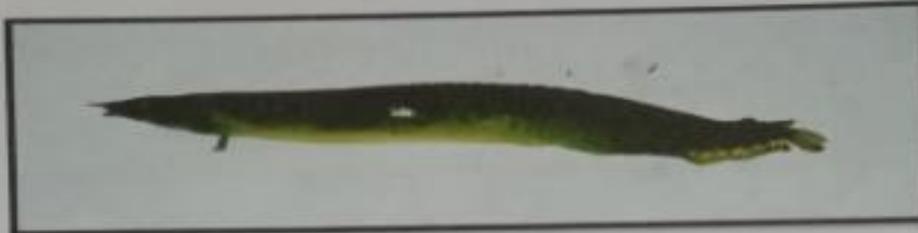
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Tura (*Macrornathus punctatus*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	15	12	0.8
Sp 2	13	7.8	0.6
Sp 3	14.6	10.2	0.7
Sp4	15.8	14.3	0.9
Sp 5	12.2	4.9	0.4
Avarage	14.1	9.8	0.68

Bheseli (*Trichogaster fasciata*)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8	70	8.8
Sp 2	8.7	79.2	9.1
Sp 3	7.5	62.3	8.3
Sp4	9.2	87.4	9.5
Sp 5	7.9	67.9	8.6

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



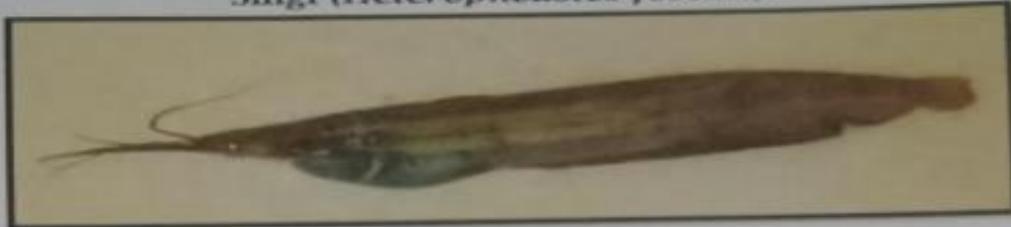
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Singi (Heteropneustes fossilis)



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	16.8	22.7	1.35
Sp 2	15.2	19.9	1.31
Sp 3	16.2	21.5	1.33
Sp4	14.9	19.1	1.28
Sp 5	15.5	20.4	1.32
	15.7	20.7	1.31

Borduwa Neotropius atherinoides



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	6.7	3.5	0.53
Sp 2	7.5	4.5	0.59
Sp 3	6.2	2.9	0.48
Sp4	8.3	5.1	0.62
Sp 5	6.9	3.5	0.51
Average	7.1	3.9	0.54

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Botia *Lepidocephaleichthys guntea*



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	7.9	6.2	0.78
Sp 2	7.2	5.2	0.73
Sp 3	8.5	7.1	0.83
Sp4	7.7	6.2	0.81
Sp 5	9.1	8.1	0.89
Average	8.1	6.5	0.80

Selkona (*Salmophasia*)



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8	8	1
Sp 2	8.8	13.2	1.5
Sp 3	10	30	3
Sp4	9.2	17.4	1.9
Sp 5	8.3	9.1	1.1
Average	8.8	15.5	1.7

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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Kawoi *Anabas testudineus*



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8.8	12.5	1.42
Sp 2	8.1	11.1	1.38
Sp 3	9.3	13.2	1.41
Sp4	8.6	11.9	1.39
Sp 5	9.9	14.5	1.47
Average	8.9	12.6	1.41

Mowa *Amblypheryngodon mola*



Specimen	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	6.2	18.5	2.98
Sp 2	6.7	20.8	3.11
Sp 3	5.5	15.7	2.87
Sp4	5.9	17.4	2.95
Sp 5	7.2	23.1	3.22
Average	6.3	19.1	3.02

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Labeo boga



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	11.4	54.2	4.75
Sp 2	10.2	45.9	4.50
Sp 3	11.9	58.5	4.92
Sp4	11.6	56.3	4.86
Sp 5	10.8	49.8	4.62
Average	11.2	54.9	4.73

Labeo bata



Specimen (Locality)	Total Length (TL)	Gut Length (GL)	Relative length of gut (RLG)
Sp 1	8.2	60	7.31
Sp 2	8.5	62.5	7.36
Sp 3	7.8	56.8	7.28
Sp4	6.9	50.2	7.27
Sp 5	8.7	64.3	7.39
Average	8.02	58.76	7.32

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Understanding the feeding habit of fish species is of great importance in understanding their ecological interaction (Alberto *et al.*, 2003). The alimentary canal of fishes is well adapted and modified in accordance with their nature of diet and mode of feeding habits. The structure of alimentary canal and external morphology are influenced greatly by ecology of the food and feeding regimes (Thomas, 1962; Sinha, 1968). The variation in position, shape and size of mouth can be correlated to the dietary habits of fishes. The feeding behavior is a species characteristic formed during its life history (Nilkolsky, 1963).

According to Fukusho, (1969) The length of intestine in fish depends up on its feeding habits, Modification of the intestine (short, moderate, long or coiled) is an indication of its feeding habit- carnivores, omnivores or herbivores.

The length of fish intestine is clearly related to the trophic status of the species, being in the order, carnivores < omnivores < herbivores < detritivores (Fryer and Iles 1972). Junger *et al.* (1989) stated that short intestine indicates a tendency towards carnivory. Carnivore fishes normally have short and more or less straight intestine because the meat gets digested more easily, whereas in herbivore fishes, the intestine is long and coiled as the cellulose containing food items take more time for digestion (Pandey and Shukla, 2005; Serajuddin and Ali, 2005). According to Nikolsky (1963), gut length less than 100% of body length indicates carnivory while more than 100% indicates herbivory and an intermediate value indicates omnivorous mode of feeding (Das and Nath, 1965). According to Jobling (1995), the ratio of the intestinal length to body length is usually less than unity in carnivores species. In omnivores, the ratio may increase to around 2-3, and the ratio is even higher in herbivores and those fish species which consumes diet with a high roughage content. Relative gut lengths may range from 0.5 to 2.4

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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for carnivores, 0.8 to 4 for omnivores and 2 to 21 for herbivores (Al-Hussaini, 1949, Kapoor *et al.* 1975) .

In the present study the RLG value for *Channa gachua*, *Glossogobius giuris*, *Channa punctatus*, *Mystus tengara*, *Neotropius atherinoides*, *Ompok bimaculatus*, *Notopterus notopterus*, *Macragnathus punctatus*, *Ailia coila*, *Lepidocethalichthys guntea* and *Macragnathus aral* were found in between 0.35-0.87 indicating their carnivory nature.

On the other hand, the RLG value (range 1.31-3.02) for *Heteropneustes fossilis*, *Nundus nundus*, *Anabas testudineus*, *Salmostoma bacaila*, *Puntius sophore*, *Puntius ticto*, *Esomus danricus*, and *Amblypheryngodon mola* showed that they are omnivore in feeding habits.

The remaining three species *Labeo boga*, *Labeo bata*, *Trichogaster fasciata* are herbivorous and their RLG values were 4.73, 7.32, and 8.6 respectively.

CONCLUSION

In the present study, we reported the feeding habit of 22 species based on their Relative Length of Gut (RLG) value. Information on the food and feeding habit of many native species are still incomplete and proper study including other biological and physiological condition should be undertaken.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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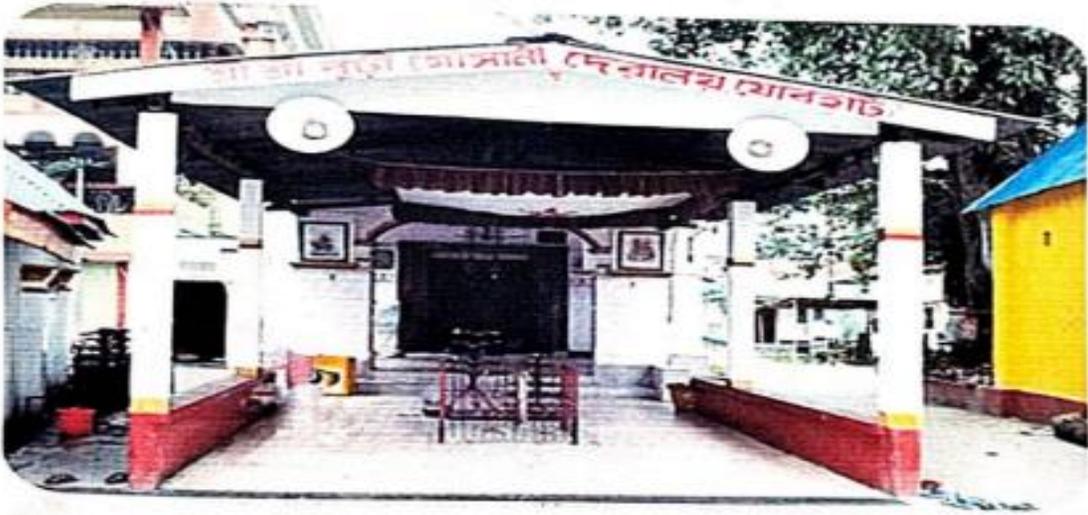


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ক্ষেত্র ভিত্তিক অধ্যয়ন

বুঢ়ী গৌঁসানী দেৱালয়, যোৰহাট



প্ৰস্তুতকৰ্তা :

শ্ৰীমতী পবিস্মীতা বেজবৰা

স্নাতক প্ৰথম শাখাসিক

বোল নং - ১৬৩

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Report of Field-Based Study Submitted by Student from Dept of Assamese [Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College



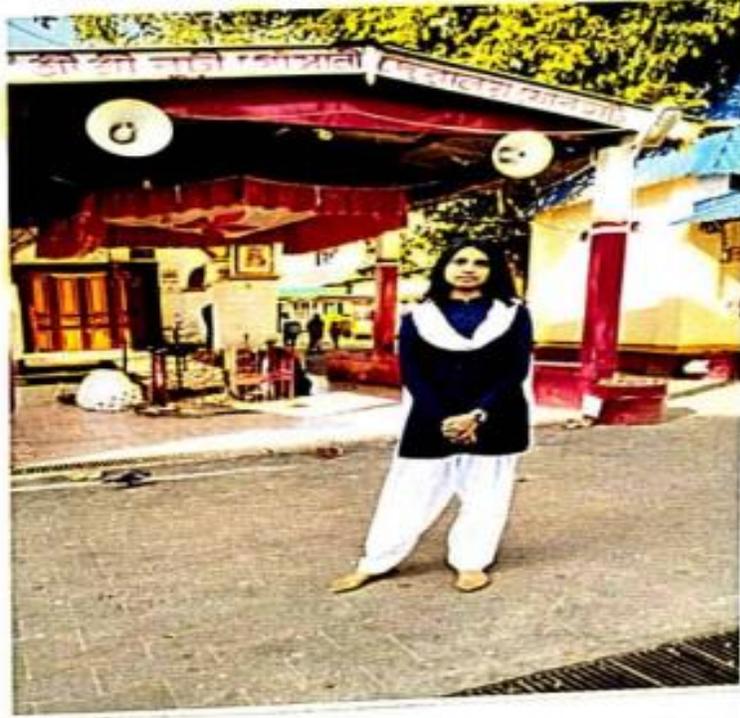

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IOAC
Bahona College, Jorhat
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Report of Field-Based Study Submitted by Student from Dept of Assamese [Page 2]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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অসমত বিভিন্ন ষ্ট্ৰীয়া ষ্ট্ৰীয়াৰে লেখুৰ হৈ আদে।
ই ষ্ট্ৰীয়া মণ্ডিত ষ্ট্ৰীয়া অনুষ্ঠান অমূহে যোগে যোগে উচ্চ গুণ
যুক্ত আকৰ্ষিত কৰি আহিছে। তেনে এক ষ্ট্ৰীয়া ক্ষেত্ৰ বিষয়ে
ই প্ৰকল্পৰ জৰিয়তে পাঠকক অৱগত কৰাই এই প্ৰকল্পৰ মূল
মুদ্দেশ্য।

উদ্দেশ্য

অসমৰ পাঠকৰ অৱগত এই গোট হৈছে ক্ষেত্ৰ ভিত্তিক
অধ্যয়ন, গতিকে অসমৰ বিভিন্ন ষ্ট্ৰীয়া ক্ষেত্ৰ ভিত্তিক যোগাযোগ
যুক্তি সোঁআনী দেৱালয়ক ক্ষেত্ৰ ভিত্তিক অধ্যয়ন হিচাপে নিৰ্বাচন
বিজ্ঞান, গতিকে এই দেৱালয় গুলৰ মাজৰ বিষয়ে পাঠকক জ্ঞাত
কৰাৰে হৈছে ক্ষেত্ৰ ভিত্তিক অধ্যয়নৰ মূল উদ্দেশ্য।

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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মোহনগাঁওৰ বৃদ্ধী পোজাৰী দেৱালয়ত ডাঙৰ কুলকত জাপচত বিষয়ে আলোচনা কৰাৰ পাছত এই দেৱালয়খনৰ আ-স্বৰূপৰ ব্যৱস্থা চৰকাৰী আৰু কি চৰকাৰী আঁচনী নৈদে তাক বিশ্লেষণ কৰি চালে দেখা যায় যে দেৱালয়খনত স্বল্প অল্পত পুজাৰী সকলে আৰু আনুষ্ঠানিক ওপল কৰ্মীসকলৰ বিশেষ প্ৰাচীৰ কলত অক্লীৰিত হৈ আছে, গতিকে আৰু অল্পত ডাঙৰ পুনে কৰ্মীসকলে আলোচনা কৰি চৰকাৰী পুঁজি আ-স্বৰূপ কৰি বিশেষ ভাৱে আ-স্বৰূপ কৰি স্বল্প টাট্টে, এই ক্ষেত্ৰত অৱস্থা চৰকাৰে কি চৰকাৰে পদক্ষেপ নৈদে আঁচনী অৱলম্বনা চিন্তা কৰিব লগা কথা, গতিকে এই পৰিত স্বানুষ্ঠান অল্পত স্বগ্ৰহীয়া কৰি স্বল্পটো টাট্টে।

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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বাহনা মহাবিদ্যালয়
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Age Specific Distribution of Population in Bahona Area



Guide : Reema Rabha

Prepared by :

Pallabi Saikia
Shamima Yasmin
Dipsikha Bora
Rajat Saikia


Principal
Bahona College

TDC Third Semester
Department of Economics
Bahona College
Year : 2016


HoD, Department of Economics
Bahona College, Jorhat

Contents

- ❖ Introduction
- ❖ Objective
- ❖ Methodology
- ❖ Result and Discussion
- ❖ Conclusion
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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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INTRODUCTION:-

In developing country, the economic development is also depending upon their age structure of population. Classification of people according to age is called age structure. Age structure of a population refers to the number of people in different age groups. It is important to study age structure of population to relate and study the work efficiency, social status, education, occupational patterns of the people. A larger size of the population in the age group of 15-60 years indicates the chances of having a large work force in the country. If the percentage of working population of a country is higher, then it can be stated that the country is in favourable stage of economic development. It is not favourable, if the number of children in the population, that is, the dependency ratio is higher. Similarly, a growing population in the age group 60 plus indicates greater expenditure on the care of the aged and it is somehow burden to the government. The more is the population of age group less than 15 and more than 60, the less is economic efficiency in the country particularly in primary sector dependent country like India.

Therefore, the types of age structure have a direct influence on the future of a nation. Since both sides, old

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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RESULT AND DISCUSSION...

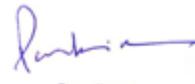
From the following table, it is seen that the above objectives are fulfilled.

Area Indicator	Parameter	Social groups			
		Gen	OBC	MUS	SC
HH expenditure	Average	2746.67	1715.48	2231.59	1148.89
	CV	65.57	50.35	52.10	31.05
Male & female both	Average	37.45	35.38	37.78	28.90
	CV	14.59	15.27	18.98	16.84
Male age	Average	43.62	42.43	37.87	28.95
	CV	32.34	22.10	22.36	26.50
Female age	Average	37.52	32.70	40.81	29.78
	CV	22.80	26.63	21.12	20.81
life expectancy	Average age	78.07	83.60	76.53	74.07
	% death in total	100	100	100	100
Life expectancy Male	Average age	78.38	85.33	77.50	69.44
	% death in total	53.33	80	53.33	60
Life expectancy Female	Average age	77.71	76.67	75.43	81
	% death in total	46.67	20	46.67	40

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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দৈনন্দিন জীৱনত বিজ্ঞাপনৰ ভূমিকা
- যোৰহাট জিলাত এক ক্ষেত্ৰভিত্তিক অধ্যয়ন



তত্ত্বাবধায়ক : ড° বফিক আহমেদ

প্ৰস্তুতকৰ্তা : মেঘাশ্ৰী ভূঞা
পূজা শইকীয়া
পল্লবী পেঙ


Principal
Bahona College

ষষ্ঠ বান্ধাষিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০২০ চন।


HoD, Department of Economics
Bahona College, Jorhat

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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পাতনি :- বিজ্ঞানৰ মানৱ জীৱনত বিভিন্ন ক্ষেত্ৰত জ্ঞান আহৰণ কৰাত সহায় কৰে।
মানৱ জীৱনৰ বিকাশৰ প্ৰধানী স্তৰ হৈ উদ্ভুদ্ধ, উত্তৰোক্তে কিম্বা ভাগে বা বাল্যে, উত্তৰোক্তে কি কাৰণে বা জেতা শিকিৰ ভাগে বা বাল্যে ইত্যাদি জ্ঞানত সহায় কৰে।
কিছুমান সামাজিকনীতিগতৰ ক্ষেত্ৰ, বিজ্ঞানসন্মতৰে মানুহক বেনেগে এখন সুস্থিত প্ৰাণী স্বাৰণা দি পাৰে। জৰিমান বহুদূৰ হাত বৰ্তমান জীৱন নিৰ্বাহ কৰি বৰ্তি আছে। জৰিমাৰে বিজ্ঞানসন্মতৰে ব্যক্তিগত আচৰণ সুস্থিত পৰিচালনা কৰাৰ।
বৰ্তমান সমস্ৰত বিজ্ঞানৰ আমাৰ জৈৱজীৱনৰ প্ৰতি প্ৰতি সন্মোহনীতৰ অংশ হৈ পৰিছে। ওঁই বিজ্ঞানসন্মতৰে বিভিন্ন সন্মিগতৰ চৰিত্ৰত বিজ্ঞানৰ সন্মতৰ প্ৰমাণ কৰি প্ৰমা হাম, ঘেৰে-বেতিমে, ছব্দশৰিৰ ব্যৱহাৰকত, জন-জীৱন বিজ্ঞানৰ ইত্যাদি বিভিন্ন সাম্প্ৰায়িকমতে বিজ্ঞানৰ জৰিমাৰে উত্তৰোক্তৰ উৎসাহিত ডৰা আমজী সন্মতৰ ক্ষেত্ৰ কৰাৰ বাবে মানুহক আকৰ্ষণ কৰাৰ। বিজ্ঞানৰ সন্মতৰে কেৱল আকৰ্ষণ কৰাৰ আহিলা বহুদূৰ বৰ্তক বিজ্ঞানৰ দ্বাৰা প্ৰচলিত তথ্য কৰিমাৰি নিলে।
কিছুমান বিজ্ঞানৰ দ্বাৰা জৈৱজীৱনত বেয়া প্ৰভাৱ পৰাত দেখা হাম। ঘেৰে- কিছু বিজ্ঞানৰে মানৱ জীৱনত বিৰূপ, মনুষ্যত্ব ইত্যাদি ক্ষেত্ৰত প্ৰতি বেয়া প্ৰভাৱিত দাঙি ধৰিব পাৰে, আৰু কিছু ক্ষেত্ৰত বিজ্ঞানৰে মানুহৰ জীৱনৰ প্ৰমাণে বহু প্ৰমাণ পোৱা দেখা হাম। বিশেষকৈ সন্মিগত ক্ষেত্ৰত ইয়াৰ প্ৰমাণক প্ৰমাণ পোৱা দেখা হাম।

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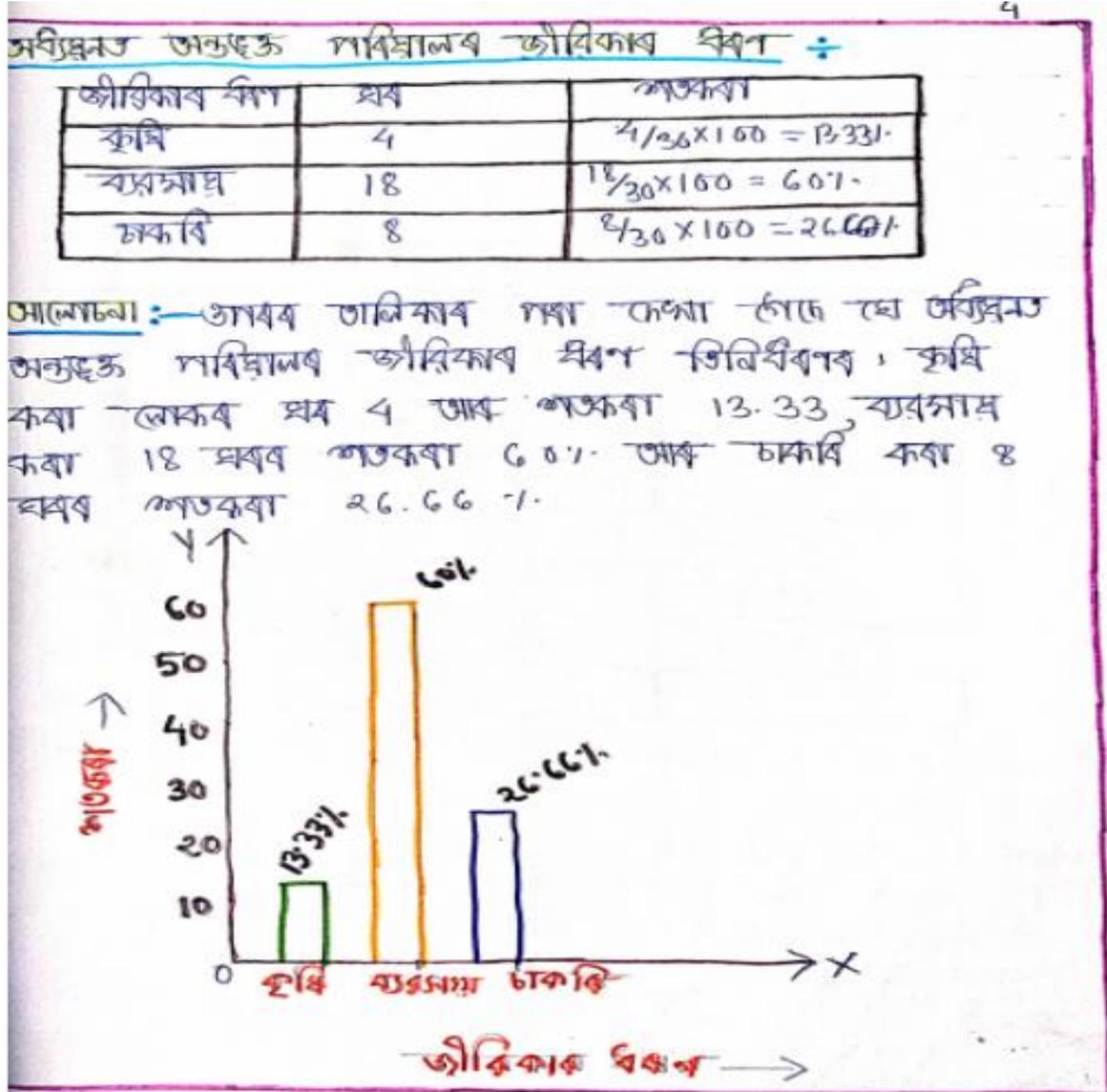

(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College



Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



BAHONA COLLEGE
বাহনা মহাবিদ্যালয়
Affiliated to Dibrugarh University

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অসমৰ গোলাঘাট জিলাৰ প্ৰসংগত চাহ বাগানৰ
মহিলা কৰ্মীসকলৰ জীৱন নিৰ্বাহৰ
এক ক্ষেত্ৰভিত্তিক অধ্যয়ন



তহাবধায়ক : বীমা বাভা

প্ৰস্তুতকৰ্তা : স্বতূপৰ্ণা দত্ত
বন্দী নাথ
সূৰজ পাটিৰ


Principal
Bahona College

পঞ্চম ব্ৰাহ্মণিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৭ চন।


HoD, Department of Economics
Bahona College, Jorhat

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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আমতনি

চাহ উদ্যোগ আমতনিৰ বৃহৎ মাত্ৰাৰ নিৰ্দেশনা সুবিধাকৰী
 উদ্যোগ। ভাৰতবৰ্ষৰ উত্তৰত চাহ উৎপাদনৰ হেতুত
 আমতনিৰ স্থান আমতনি। আমতনিৰ আৰম্ভণিত চাহ উদ্যোগ
 অতি সুস্বাদুৰূপৰ স্থান দখল কৰি আছে। আমতনি
 ভাৰতবৰ্ষৰ বৃহৎ গুৰু উৎপাদন ৬৪% আৰু উত্তৰ
 পূৰ্বাঞ্চলত চাহ উৎপাদনৰ হেতুত আমতনিৰ
 বৰ্তমান আমতনিৰ অধিভাগ। আমতনি উৎপাদিত ৯৯%
 গুৰু বৰ্তমান কৰা হয়। আমতনি উৎপাদিত ৭৫%
 গুৰুতৰ বা আমতনিৰ চাহ উৎপাদনৰ বুলি কলেও কুল কৰা
 নহয়। আমতনিৰ উ-গৰ্ভত যিদৰে কোটি কোটি টকা ব্যয়
 কৰা আৰু আমতনিৰ তেল আমতনিৰ ফল; উক্তি মোহিতৰে
 আমতনিৰ উৎপাদিত আমতনিৰ বৰ্তমান কোটি কোটি টকা ব্যয়
 কৰা হয়। আমতনিৰ উৎপাদিত আমতনিৰ কৰে। আমতনিৰ
 আমতনিৰ উৎপাদিত আমতনিৰ কৰে। আমতনিৰ
 আমতনিৰ উৎপাদিত আমতনিৰ কৰে। আমতনিৰ

চাহ উদ্যোগ আমতনিৰ কিয়া ভাৰতবৰ্ষতে নতুন। উত্তৰাঞ্চল
 আমতনিৰ উৎপাদিত আমতনিৰ উৎপাদিত আমতনিৰ
 আমতনিৰ উৎপাদিত আমতনিৰ উৎপাদিত আমতনিৰ

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(Dr. P.K. Dutta)
 Principal,
 Bahona College



Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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বাহনা মহাবিদ্যালয়
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আমাদেৰ গাৰ উদ্যোগত আহিলা কৰ্মী সকলৰ আঁম
আঁম :

দেহন ফাৰ্ম গাৰ উদ্যোগত আহিলা কৰ্মী সকলৰ আঁম
 পুৰুষতকৈ অধিক । তলত এহাৰ তালিকাৰ ফাৰ্ম হিচাপক
 দেখুওৱা হৈছে -

আমাদেৰ আহিলা কৰ্মী সকলৰ আঁম

বৰ্ষ	দৈনিক গড়ে নিয়োজ হোৱা অধিকৰ আংগা			
	পুৰুষ	আহিলা	মিশ্র অধিক	মুঠ
২	২	৩	৪	৫
১৯৯৮	২৮৮-২৮৭	২৫৩০৩৬	৩৭৩৯৯	৫৮৬৭৯৪
১৯৯৯	২৯২৩২৩	২৫৫৭৯৪	৩৭৯০৬	৫৯৬৯৪৩
২০০০	২৯৩৬৫৬	২৭০৬৯৯	৩৮৯৬৪	৫০২৫৩৫
সংগত ২০০০	৫৭০২৬৭	৫৯৩৫৭৯	৪৬২৯৭	৯২০০৫৫

তালিকাৰ পৰা দেখা গৈছে যে আমাদেৰ এফাৰ্ম পুৰুষ
 আঁম আহিলাৰ আঁম অধিক হৈছে, গতাত পুৰুষতকৈ
 আহিলাৰ আঁম গাৰ উদ্যোগত অধিক ।

তালিকাত মিশ্র অধিকৰ আংগাও দেখুওৱা হৈছে ।
 মিশ্র অধিক সকলে গাৰ কামত আহুত, পাৰ্শ্বিক
 পৰ্যায় দিয়া, তলচাৰা কৰা ইত্যাদি কামত নিয়োজিত
 হৈ থাকে ।

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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বাহনা মহাবিদ্যালয়
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বংদৈ অঞ্চলত বাজহুৰা বিতৰণ ব্যৱস্থা
- এক ক্ষেত্ৰভিত্তিক অধ্যয়ন



তত্ত্বাবধায়ক : বীমা বাভা

প্ৰস্তুতকৰ্তা :
প্ৰিয়ংকা বৰা
সংকল্পিতা বৰা
নবজ্যোতি শইকীয়া


Principal
Bahona College

তৃতীয় বাৰ্ষিক, অৰ্থবিজ্ঞান বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৬ চন।


HoD, Department of Economics
Bahona College, Jorhat

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Introduction

ভাৰতৰ স্বাধীনতা বিচাৰন ব্যৱস্থা বিশ্বস্ত বিবেচনা সৰ্ব্বমুঠ চৰকাৰী প্ৰাদ্য বিচাৰন ব্যৱস্থা। এই ব্যৱস্থা ভাৰত চৰকাৰৰ প্ৰায়ক মন্ত্ৰালয়, প্ৰাদ্য ভাৰত-স্বাধীনতা বিচাৰনৰ দ্বাৰা আৰম্ভ হৈছিল। ১৯৭৩ চনত ভাৰতীয়া মুম্বাইত ভাৰতীয় কৰ্মী এই ব্যৱস্থা আৰম্ভ হোৱাত কলকতা বিলাস্বৰ্গীকৈ চ্ৰমিক শাৰ্টিংকৰ ২০ জনক ইয়াত সন্মিলন ঘটাই হয়। স্বাধীনতা চৰকাৰৰ জৰিয়তে ই দুৰ্ঘাৰ্থ লোকসকলে ভাৰতীয়কৈ প্ৰাদ্য ভাৰতীয় কৰ্মী এই ব্যৱস্থাত বিচাৰন কৰ্মী হ'ব, চাৰ্টেৰ হ'ব, কৰ্মচাৰী আদি।

ভাৰতীয় প্ৰাদ্য মন্ত্ৰালয়ে স্বাধীনতা বিচাৰন ব্যৱস্থা আৰম্ভ কৰে। স্বাধীনতা চৰকাৰ চৰকাৰ সন্মিলনত এই বিচাৰন চৰকাৰ সন্মিলনত হয়। ইয়াত প্ৰাদ্য মুম্বাইত চৰকাৰী ব্যৱস্থাপনা বিলাস্বৰ্গীকৈ কৰ্ম হয়।

স্বাধীনতা বিচাৰন ব্যৱস্থাই এটি দুৰ্ঘাৰ্থকৰণৰ সন্মিলন প্ৰদান কৰিব আৰু সন্মিলন সন্মিলন হ'ব। ভাৰতীয়কৈ এটি দুৰ্ঘাৰ্থকৰণৰ সন্মিলনত কৰ্মী বিচাৰন কৰ্মী সন্মিলনৰ সন্মিলন হ'ব লগ হৈছে, ভাৰতীয়কৈ প্ৰাদ্য সন্মিলনৰ সন্মিলন

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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জাতিয় বিলাস দুৰ্বিধমান বস্তু যেনে:- আঁৰি, চাউল, নৌ আৰু কেজাটিন এইকেইটাৰে বিচৰন কৰণ হয়। লেভেল কেজাটনত সমীক্ষা অনুসৰি বৰ্তমান দেশত শুচন কাৰ্ডে জাতিয়ত সুলভ সুলভত দেশজনত যোগেদি এই প্ৰকল্পৰ দ্বাৰা বিচৰন কৰণৰ ব্যৱস্থা কৰা হৈছে। এই অনুষ্ঠানত যোগেদি এই প্ৰকল্পৰ দ্বাৰা সৰ্বস্বতন লেভেলত প্ৰতি Blue card ত যোগেদি শুচন লেভেল বিচৰন কৰণৰ ব্যৱস্থা কৰা হৈছে। তিনিবিধ অৰ্থসংস্কাৰী সমস্ৰী জন-সৰ্বস্বতনত সম্ভৱ বিচৰন কৰণৰ ব্যৱস্থা ১৯৫৫ ত Act ত জাতিয়ত কৰা হৈছে। ই বৰ্তমানত সুস্থিত। জেন কাৰ্ড প্ৰকাশকালত দ্বাৰা দৰ ১৬.০৪.২০০৫ তেজিত পৰা সম্ভৱসম্ভৱত সুলভ এনেদৰে নিৰ্ভাৰন কৰা হৈছে -

Commodity	APL	BPL	AAW
Wheat (per kg.)	২.৫০	৩.৬০	২.০০
Rice (per kg.)	৪.৬০	৫.২০	৩.০০
Sugarc (per kg.)	non entitled	১২.৫০	১৩.৬০
Kerosene oil (Lit)	৯.০৪	৯.০৪	৯.০৪

অৰ্থসংস্কাৰী পদ্ধতি:-
 জাতিয় বিচৰন ব্যৱস্থাৰ সুবিধা জাতিয়ত সম্ভৱ উল্লেখ কৰিছে নাই সেয়া পৰীক্ষা কৰিবলৈ হোৱাৰ

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 (Dr. P.K. Dutta)
 Principal,
 Bahoma College




 Coordinator
 IOAC
 Bahoma College, Jorhat
 Pin-785101



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সনিক্ষ - ৩
বিছন্দন জাতিৰ এওঁ উল্লেখন

Items	Total amount of consumption	Total PDS	Average consumption
Rice	1275	486	38.11%
Sugar	171	56.5	33.05%
Kerosene oil	135.5	121	89.29%
Atta	109	9	5.33%

অন্যান্য বিছন্দন জাতিৰ এওঁ উল্লেখনৰ পৰা দেখা গৈছে ক্ৰমাটিকৰ উল্লেখনৰ পৰিমাণ সৰ্বাধিক ৪৩.২৯ শতাংশ আৰু আধিক সৰ্বনিম্ন ৫.৩৩ শতাংশ। উক্ত উল্লেখনৰ পৰিমাণ লক্ষ্য কৰি আমি পুলনামূলক-ভাৱে পৰ্যাপ্ত হৈ মৰ্মনৰ উল্লেখনৰ পৰিমাণ সৰ্বাধিক জাতি আৰু বিছন্দন জাতিৰ ক্ষেত্ৰত প্ৰায় সমান। চলেদেওঁ চেনীৰ উল্লেখনৰ পৰিমাণ প্ৰায় সমন্বয়ৰ। ক্ষেত্ৰটোৰ উল্লেখনও প্ৰায় সমন্বয়ৰ। অন্যান্য আধিক ক্ষেত্ৰ সৰ্বাধিক জাতিৰ একেৰাৰে উল্লেখন কৰা নাই আৰু বিছন্দন জাতিৰ লোকসকলে উল্লেখন কৰিছে যদিও ইয়াৰ পৰিমাণ কম। ইয়াৰ পৰা বৰ নাই যে আধিক মনদেওঁ নিম্নমানৰ বোকা বাবে ইয়াৰ উল্লেখনৰ পৰিমাণ কম।

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



BAHONA COLLEGE
বাহনা মহাবিদ্যালয়
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আলোচনাৰ বিষয়

বাহনা মহাবিদ্যালয়ৰ ছাত্ৰ- ছাত্ৰী সকলৰ অৰ্থনৈতিক প্ৰেক্ষাপট
(বাহনা মহাবিদ্যালয়ৰ এক ক্ষেত্ৰ ভিত্তিক অধ্যয়ন)



তত্ত্বাবধায়ক-

ড° বফিক আহমেদ
অৰ্থনীতি বিভাগ

প্ৰস্তুতকৰ্তা -

শ্ৰী বন্দনা ভূঞা
শ্ৰী বাজশ্ৰী দত্ত
শ্ৰী দেৱাশীষ দত্ত

পঞ্চম বার্ষিক, অৰ্থনীতি বিভাগ
বাহনা মহাবিদ্যালয়, ২০১৮ ।

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101

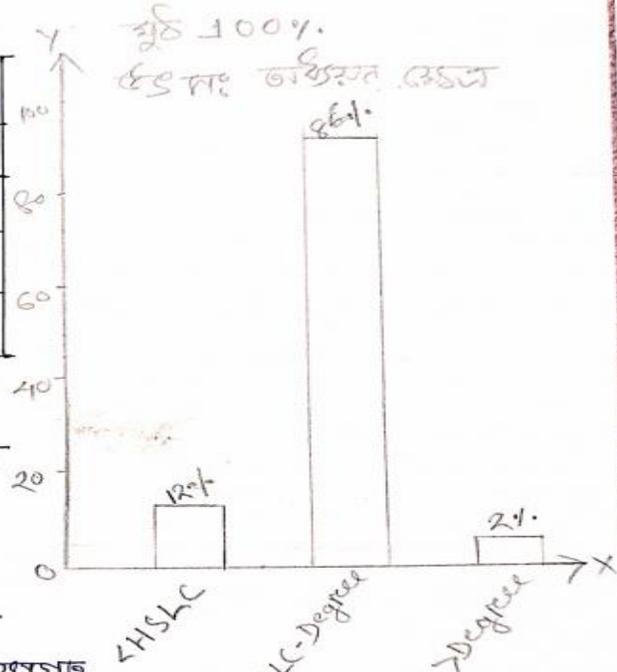


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তলোচনোক প্ৰদৰ্শন শিতান সমূহ →

A) অৰ্থনৈতিক অন্তৰ্ভুক্তি কৰা-ছাৰী সকলৰ সৰ্বশেষ বিবেচনা :-
তালিকা ২ :- অৰ্থনৈতিক অন্তৰ্ভুক্তি কৰা-ছাৰী সকলৰ-
 পৰিস্থিতিৰ সূচকীয় শিষ্টাঙ্গত অৰ্থনৈতিক শক্তিকতা হ'ব -

Level of HH Edu.	%
< HSLC	12.00
HSLC-Degree	86.00
> Degree	2.00
Total	100.00



ওপৰৰ তালিকাৰ-
 পৰ্যায় দেখা গৈছে যে সৰ্বমুঠ
 বাহনা মহাবিদ্যালয়ৰ ছাৰী-ছাৰী-
 সকলৰ H.S.L.C তলৰ শিষ্টাঙ্গত
 অৰ্থনৈতিক শক্তিকতা হ'ব
 সূচকীয় শক্তিকতা হ'ব হ'ল
 12% । H.S.L.C-Degree শিষ্টাঙ্গত
 অৰ্থনৈতিক শক্তিকতা হ'ব হ'ল 86% তলৰ
 >degree-ৰ ওপৰৰ শিষ্টাঙ্গত অৰ্থনৈতিক
 শক্তিকতা হ'ব হ'ল 2% ।

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College



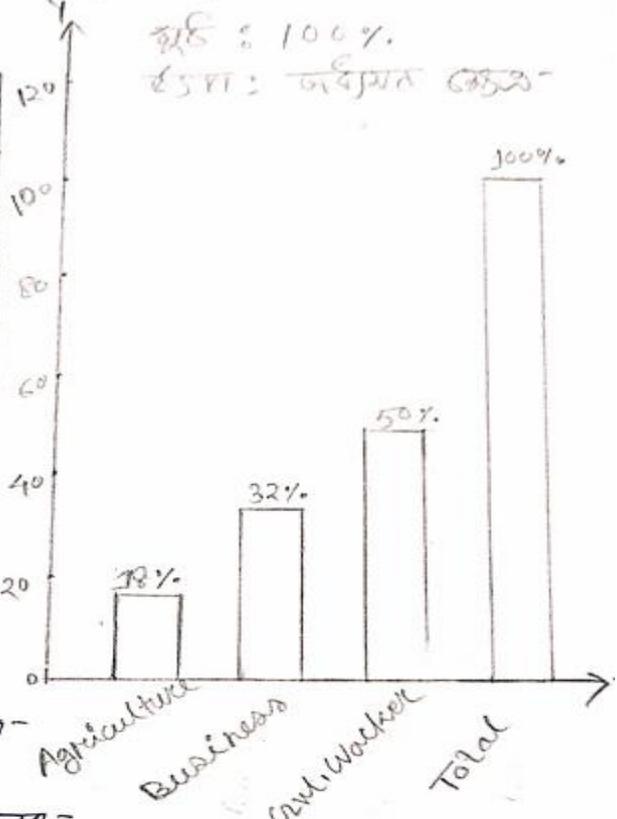

 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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তালিকা ২ঃ- অস্তিত্বৰ অন্তর্ভুক্ত ছাত্র-ছাত্রীসকলৰ পৰিচালন
 বিলাসকৰ- মূল জীৱিকাৰ ধৰণৰ পাতকতা হাৰ -

Main Occupation	%
Agriculture	18.00
Business	32.00
Govt. Worker	50.00
Total	100.00



ওপৰৰ তালিকাৰ
 পৰা দেখা গৈছে যে
 জমি অধ্যয়নৰ বাবে যদি
 জোয়াৰা বাহনা মহাবিদ্যালয়ৰ
 ছাত্র-ছাত্রী ৩০ জন - ছাত্র -
 ছাত্রীৰ পৰিচালনবিলাকৰ -
 প্ৰতিভা ১৪ জনৰ পৰিচালন -
 মূল জীৱিকা হৈছে # ক্ষেত্ৰ
 কৃষি । ৩২ জনৰ পৰিচালন -
 মূল জীৱিকা হৈছে ব্যৱসায় জৰণে বাকী ৫০ জনৰ
 হৈছে চৰকাৰী চাকৰিয়াল ।

(Dr. P.K. Dutta)
 Principal,
 Bahona College



Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101

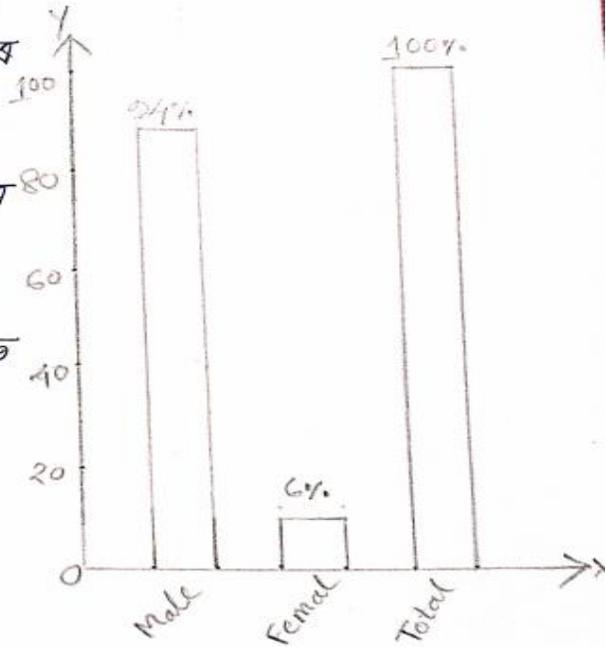


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তালিকা ৩ :- অৰ্থস্বল্পত্ব হ্রাস-দাৰ্শনিকবলক-পৰিষ্কাৰ
 বিলাকৰ মূল্য কাৰিকৰত ব্যক্তি পৰমা সন্দৰ্ভৰ পাতকতা
 হাৰ —

Person	%
Male	94.00
Female	6.00
Total	100.00

আলোচনা :- ওপৰৰ তালিকাৰ
 পৰা দেখা গৈছে যে
 আমি অৰ্থস্বল্পত্ব গৰে হ্রাস
 কৰা বাহনা মহাবিদ্যালয়ৰ
 ৫০ জন-দাৰ্শনিক-
 পৰিষ্কাৰ বিলাকৰ হিতকৰ
 ১৫ ৰ মূল্য কাৰিকৰত ব্যক্তি
 পৰমা পুৰুষৰ পাতকতা
 হাৰ হৈছে ৯৪%। আৰু
 মহিলাৰ পাতকতা হৈছে
 ৬%।



মুঠ 100%।
 উৎস : অৰ্থস্বল্পত্ব হ্রাস

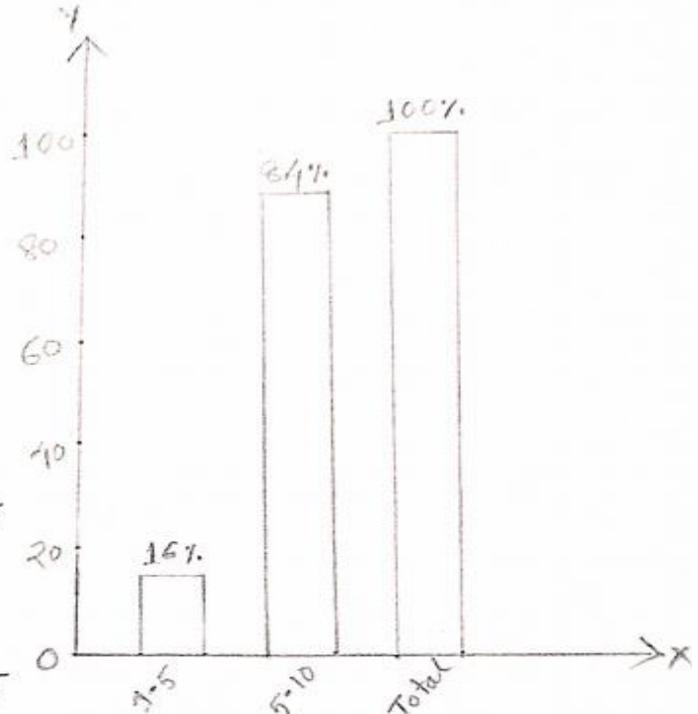


BAHONA COLLEGE
বাহনা মহাবিদ্যালয়
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তালিকা ১ঃ - তথ্যসংগ্রহ অন্তর্ভুক্ত ছাত্র - ছাত্রী সংখ্যকৰ
পৰিমাণ বিলাকত মূল জীৱিকাৰ সড়ে দিওঁ
খোচা কৰা সময় (ঘণ্টা)ৰ শতাংশ হ'ব -

Time (hours)	%
1 to 5	16.00
5 to 10	84.00
Total	100.00



মাল্যলোঃ - ওপৰৰ
তালিকাৰ পৰা দেখা
গৈছে যে মূল জীৱিকাৰ
দিওঁ 1-5 ঘণ্টা সময়
খোচা কৰাৰ শতাংশ
হ'ব হৈছে 16%. অন্য
5-10 ঘণ্টা সময়
কৰাৰ শতাংশ হ'ব
হৈছে 84%।

মুঠ 100%
কেনঃ ভুক্তিৰ ক্ষেত্ৰ

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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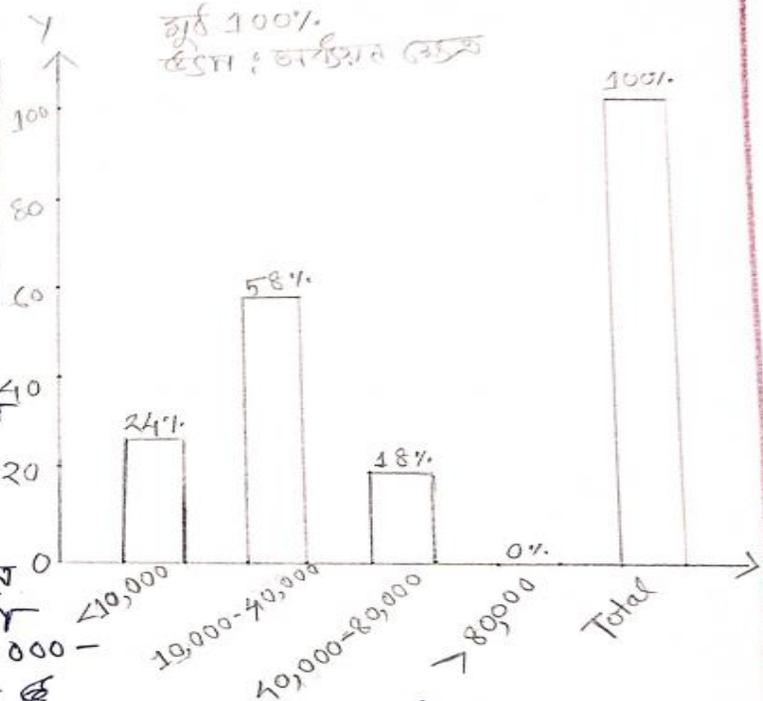
বাহনা মহাবিদ্যালয়

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তালিকা ৫ :- অধ্যয়নৰ অন্তর্ভুক্ত ছাত্র-ছাত্রীসকলৰ পৰিয়াল
বিল্যকৰ মূল্য ভীৰিকৰ পৰা হোৱা মাসিকী উপাৰ্জনৰ
প্ৰত্যেকটা হাৰ

Income	%
<10,000	24.00
10,000-40,000	58.00
40,000-80,000	18.00
>80,000	0.00
Total	100.00



উল্লেখ্য :- ওপৰত
তালিকাৰ পৰা দেখা
গৈছে যে পৰিয়াল
বিল্যকৰ 10,000
তলত মূল্য ভীৰিকৰ
পৰা মাসিকী উপাৰ্জন
হোৱা জন্মৰ প্ৰত্যেকটা
হাৰ হৈছে 24%। 10,000 -
40,000 টকা মাসিকী
উপাৰ্জন হোৱা জন্মৰ প্ৰত্যেকটা
হাৰ হৈছে 58%।
40-80 হাজাৰ টকা উপাৰ্জন হোৱা জন্মৰ
প্ৰত্যেকটা হাৰ হৈছে 18%। জন্ম 80 হাজাৰৰ ওপৰত
মাসিকী
উপাৰ্জন হোৱা জন্মৰ প্ৰত্যেকটা হাৰ হৈছে 0%।
সুতৰাৰ পৰা দেখা গৈছে যে জন্মবিল্যক পৰিয়ালেই
হৈছে মৰ্যবিশিষ্ট পৰিয়াল।

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(Dr. P.K. Dutta)
Principal
Bahona College



Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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তালিকা ৬ :- অবস্থার অন্তর্ভুক্ত ছাত্র-ছাত্রীমণ্ডলৰ
 পৰিয়ালবিন্যাসৰ উপৰোৱা কৃষিকৰ-বিষয়ৰ মতকথা
 হ'ল -

Others Occupation	%
Agriculture	40.00
Business	8.00
Total	48.00

মুঠ 100%
 উদাহৰণ: অবস্থার
 উদাহৰণ

তালিকা ৬ :- জাৰি অবস্থার কৰি দেখিবলৈ পাইছো
 যে জাৰি গাৰ্হিনোৱা হ'ল তৰ-জাত ছাত্ৰীৰ
 পৰিয়াল বিন্যাসৰ ক্ষেত্ৰত মাত্ৰ ২৭ টা পৰিয়াল
 হৈ অৰ্থাৎ ৫৪% হৈ উপৰো কৃষিকৰ লক্ষ্যত
 উঠি। ইয়াত উপৰো কৃষিকৰ ক্ষেত্ৰত
 পৰিয়ালৰ মতকথা হ'ল হৈছে ৫০% অৰ্থাৎ
 ৪৭% হৈছে ব্যৱসায়ৰ লক্ষ্যত উঠি।

তালিকা ৭ :- অবস্থার অন্তর্ভুক্ত ছাত্র-ছাত্রীমণ্ডলৰ
 পৰিয়ালবিন্যাসৰ উপৰোৱা কৃষিকৰ-বিষয়ৰ
 মতকথা হ'ল -

Person	%
Male	30.00
Femal	30.00
Total	60.00

উদাহৰণ: অবস্থার উদাহৰণ

তালিকা ৭ :- জাৰি অবস্থার কৰি দেখিবলৈ পাইছো
 যে পৰিয়ালবিন্যাসৰ উপৰোৱা কৃষিকৰ-বিষয়ৰ
 মতকথা হ'ল মতামত। অৰ্থাৎ উপৰো
 কৃষিকৰ-বিষয়ৰ মতকথা হ'ল হৈছে ৩০%
 অৰ্থাৎ মহিলাৰ মতকথা হ'ল হৈছে ৩০%।

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(Dr. P.K. Dutta)
 Principal,
 Bahona College



Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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তালিকা ৪ :- অর্থায়নৰ অন্তর্ভুক্ত দাস-দাসীসকলৰ পৰিয়াল বিলাকে ইপকৰা জীৱিকাত দিলে ঋণ কৰা সময়ৰ পাতৰতা হাৰ —

Time (hours)	%
1-2	38.00
3-4	10.00
Total	48.00

মুঠ ১০০%।
 উৎস: অধ্যয়ন মেডু

সংলোচনা :- ওপৰৰ তালিকাৰ পৰা দেখা গৈছে যে ইপকৰা জীৱিকাত দিলে ১-২ ঘণ্টা সময় ঋণ কৰা পৰিয়ালৰ পাতৰতা হাৰ হৈছে ৩৪%। তেওঁ ৩-৪ ঘণ্টা সময় ঋণ কৰা পৰিয়ালৰ পাতৰতা হাৰ হৈছে ১০%। ইপকৰা জীৱিকাত দিলে ঋণ কৰা সময়ৰ মুঠ পাতৰতা হাৰ হৈছে ৪৪%।

তালিকা ৭ :- অর্থায়নৰ অন্তর্ভুক্ত দাস-দাসীসকলৰ পৰিয়াল বিলাকে ইপকৰা জীৱিকাত পৰা হোৱা মাহিলী-ইপকৰাৰ পাতৰতা হাৰ —

Income	%
< 1,000	8.00
1,000 - 2,500	28.00
2,500 - 5,000	12.00
Total	48.00

মুঠ ১০০%।
 উৎস: অধ্যয়ন মেডু

সংলোচনা :- ওপৰৰ তালিকাৰ পৰা দেখা গৈছে যে পৰিয়ালবিলাকে ১,০০০ তলত ইপকৰা জীৱিকাত পৰা মাহিলী-ইপকৰাৰ পাতৰতা হাৰ হৈছে ৮%। ১,০০০-২,৫০০ টকা মাহিলী-ইপকৰাৰ পাতৰতা হাৰ হৈছে ২৮%। তেওঁ ২,৫০০-৫,০০০ টকা মাহিলী-ইপকৰাৰ পাতৰতা হাৰ হৈছে ১২%।

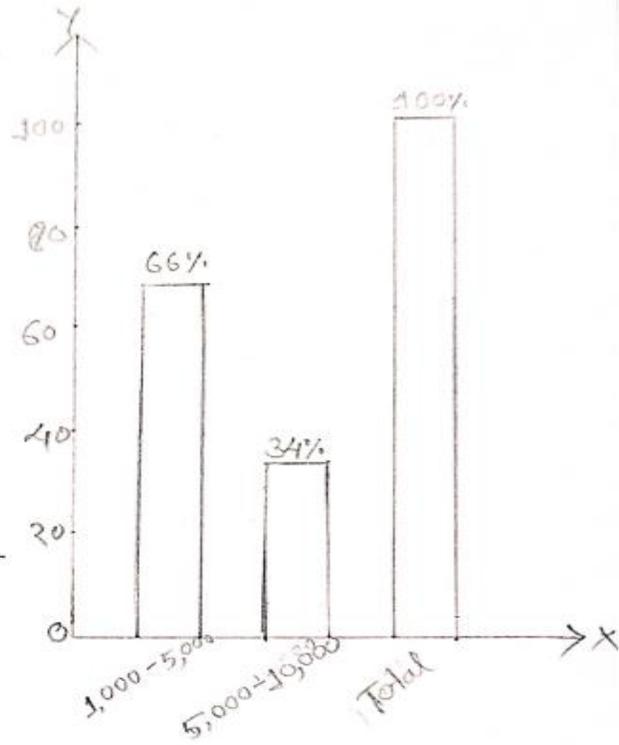


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তালিকা ১০ :- অর্থায়নৰ অন্তর্গত দ্বাৰা-দ্বাৰী মতামতৰ পৰিস্থিতিৰ লোভনমতলৈ স্বত্বেনি ক্ষেত্রাধেৰা, শিক্ষা জন্ম স্পন্দিত ক্ষেত্রত তৰা ব্যৱৰ পাতকতা স্বৰ -

১) ক্ষেত্রাধেৰা ক্ষেত্রত ব্যৱ

Expenditure	%
1,000-5,000	66.00
5,000-10,000	34.00
Total	100.00



তালিকা ১১ :- তালিকাৰ পৰা দেখা গৈছে যে পৰিস্থিতি বিলাকৰ ক্ষিত্তত স্বত্বেনি ক্ষেত্রাধেৰা ক্ষেত্রত 1,000-5,000 টকা ব্যৱ কৰে 66% লোকে তৰা 5,000-10,000 টকা ক্ষেত্রাধেৰা ক্ষেত্রত ব্যৱ কৰে 34% লোকে।

মুঠ 100%
 উৎস : অর্থায়ন ক্ষেত্র

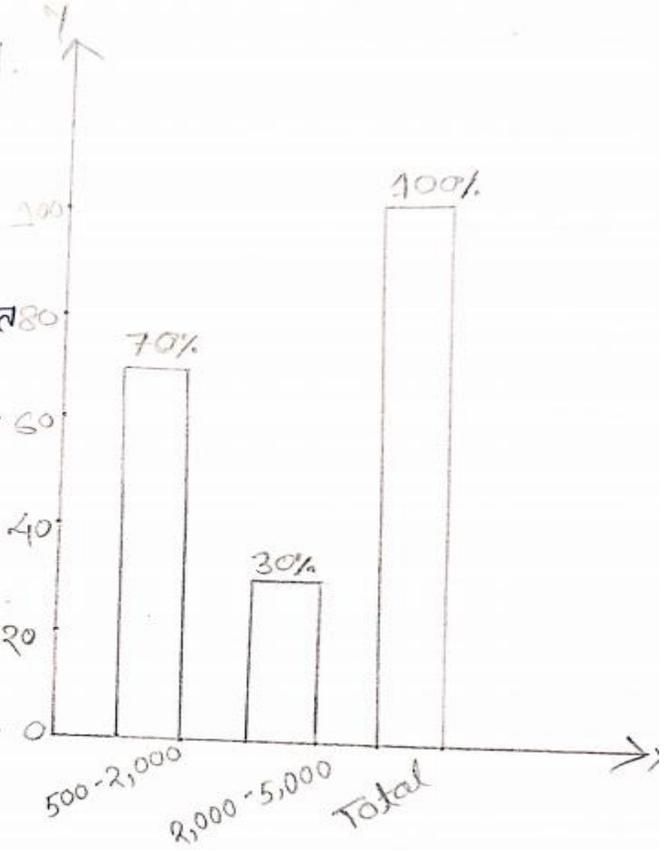


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(ii) শিক্ষা ক্ষেত্ৰত ব্যয়

Expenditure	%
৫০০-২,০০০	৭০.০০
২,০০০-৫,০০০	৩০.০০
Total	১০০.০০

অনুশীলন : জনমি অৰ্থায়ন
কিমে দেখিবলৈ পাইছো
যে অস্থিৰ শিক্ষা ক্ষেত্ৰত
৫০০ টকাৰ পৰা ২,০০০
টকা ব্যয় কৰে ৭০%
পৰিয়ালে আৰু বাকী
৩০% পৰিয়ালে শিক্ষা
ক্ষেত্ৰত অস্থিৰ ৩,০০০
টকাৰ পৰা ৫,০০০ টকা
পৰ্যন্ত ব্যয় কৰে।



মুঠ ১০০%
জনমি অৰ্থায়ন ক্ষেত্ৰত


(Dr. P.K. Dutta)
Principal,
Bahona College



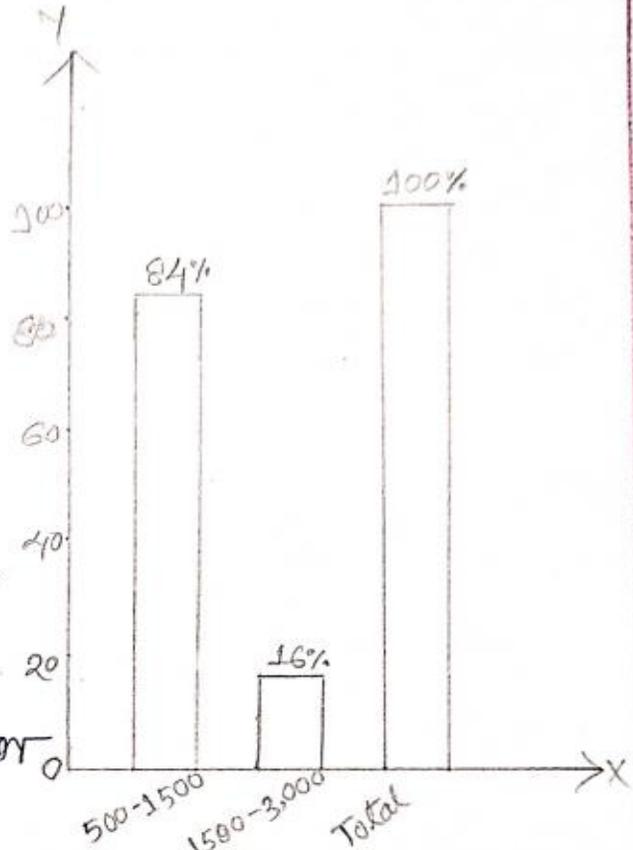

Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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iii) ব্যয় ক্ষেত্রে ব্যয় %

Expenditure	%
500-1,500	84.00
1,500 - 3,000	16.00
Total	100.00



লক্ষ্যণ্যঃ - তালিকাৰ
 পৰ্য্যবেক্ষণৰ পৰা দেখা গৈছে যে
 সৰ্বমুঠ ৪৪% লক্ষ্যণ্য
 ক্ষেত্ৰত ৫০০ টকাৰ পৰা ১,৫০০
 টকা ব্যয় কৰে। বাকী
 ১৬% লক্ষ্যণ্যে ১,৫০০
 টকাৰ পৰা ৩,০০০ টকা
 পৰ্য্যন্ত ব্যয়
 কৰে।

মুঠ ১০০%
 উৎস: জৰিয়ৰ ক্ষেত্ৰ

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101

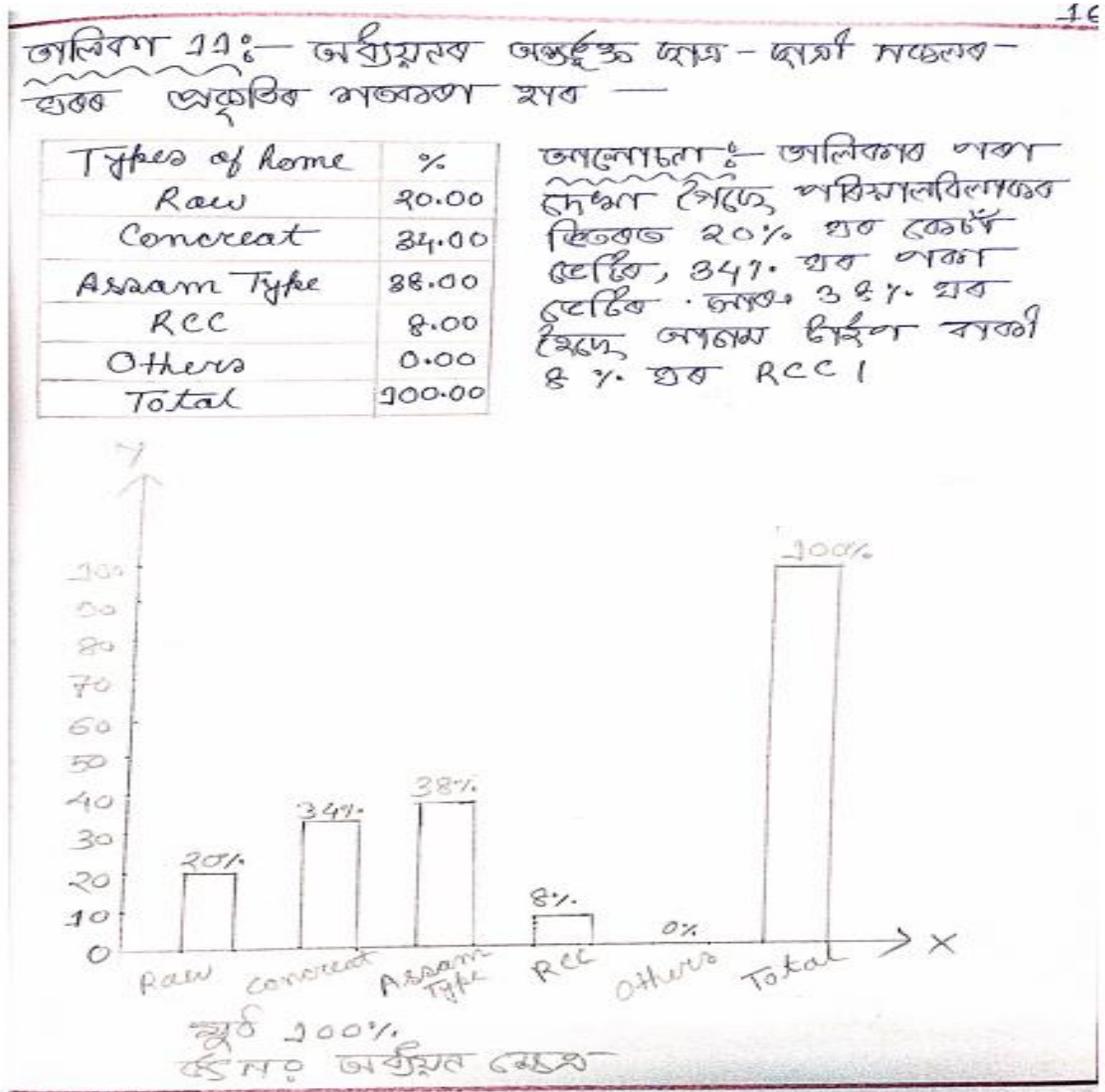


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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101

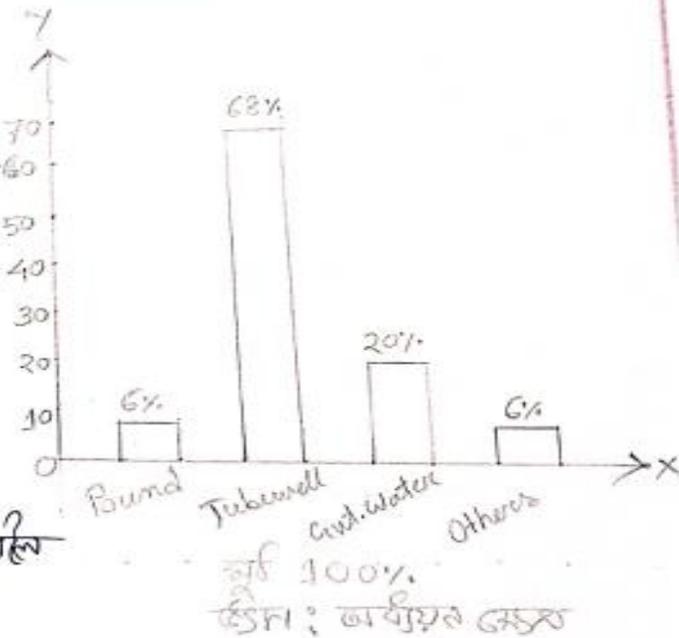


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তালিকা ১২ঃ- অধ্যয়নৰ অন্তর্ভুক্ত জাতি-জাতীয়তালয়-
 পানীয়পানীয়বিলাকৰ পানী সঞ্চয়নৰ প্ৰভাৱ হ'ল :-

Water Connectivity %	
Bound	6.00
Tubewell	68.00
Cunt. Water	20.00
Others	6.00
Total	100.00

মালোচনাঃ- আমি
 অধ্যয়ন কৰি দেখিবলৈ
 পানীয়ে যে সঞ্চয়নৰ
 প্ৰভাৱ অৰ্থাৎ ৬৪% ৰ
 পানী সঞ্চয়নৰ প্ৰভাৱ
 হৈছে চিহ্নিত ২০%।
 প্ৰায় ৬% লোকৰ
 পানী সঞ্চয়নৰ
 প্ৰভাৱ অৰ্থাৎ
 পানী সঞ্চয়ন
 হৈছে।



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(Dr. P.K. Dutta)
 Principal,
 Bahona College



Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101

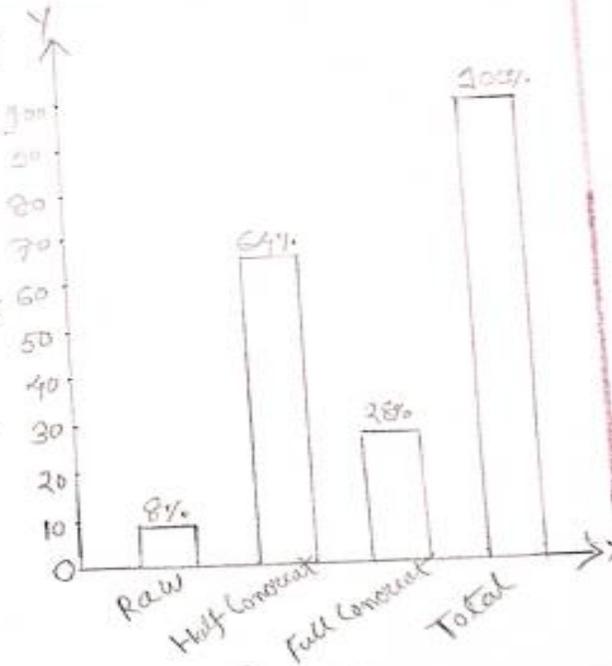


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শালিকা ১৩ :- অতিমূল্যবান জলসমৃদ্ধ জল-জলসীমা পৰিষ্কাৰবিহীন
 জলসমৃদ্ধ কৃষিক্ষেত্ৰৰ প্ৰকৃতিৰ প্ৰভাৱ হ'ল -

Types	%
Raw	৪.০০
Half Convert	৬৭.০০
Full Convert	২৪.০০
Total	১০০.০০

শালিকা ১৪ :- ওপৰৰ শালিকাৰ
 পৰা দেখা গৈছে যে
 মূলতঃ অধিক পৰিষ্কাৰ-
 মৰ্য্য ৬৭% পৰিষ্কাৰ-
 জলসমৃদ্ধ কৃষিক্ষেত্ৰৰ প্ৰকৃতি
 হৈছে অধিক পৰিষ্কাৰ। ২৪%
 পৰিষ্কাৰ জলসমৃদ্ধ কৃষিক্ষেত্ৰৰ
 প্ৰকৃতি পৰিষ্কাৰ-
 মৰ্য্য ৪% পৰিষ্কাৰ-
 জলসমৃদ্ধ কৃষিক্ষেত্ৰৰ প্ৰকৃতি
 হৈছে অধিক।



মুঠ ১০০%
 অতিমূল্যবান জলসমৃদ্ধ

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College

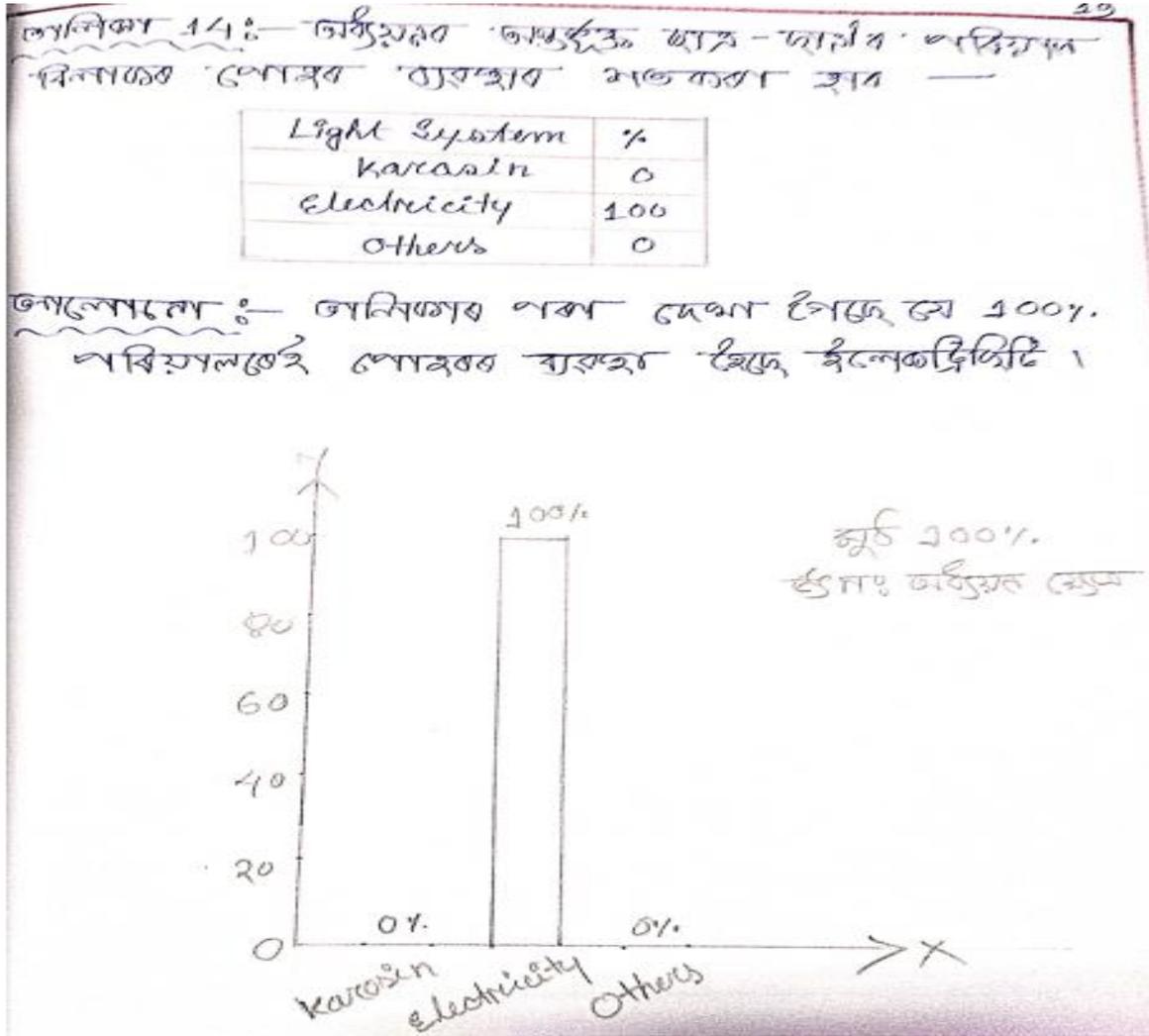



 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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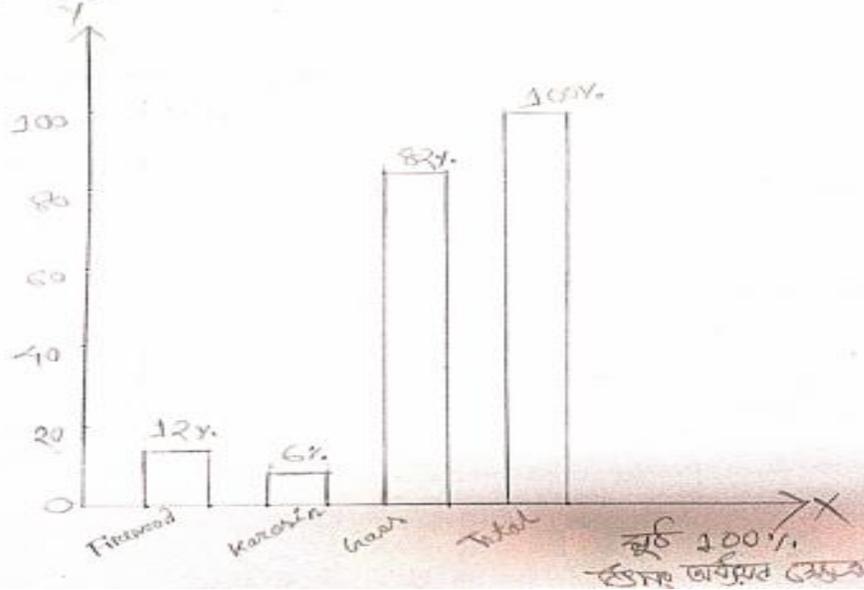
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তালিকা 15 :- জৰ্জিয়াৰ অৰ্দ্ধশতাব্দীৰ আগ-হেৰীপৰ সময়
পৰিস্থিতিৰ ইন্ধন ব্যৱহাৰ শতকৰা হাৰ -

Provision of fuel	%
Fire Wood	12.00
Kerosin	6.00
Gas	82.00

তলোৱা :- তামি অৰ্দ্ধশতাব্দীৰ কালি দেখিবলৈ পাইছে যে
82% লোকেই ইন্ধন ব্যৱহাৰ হিচাপে বন্ধৰ পেছা ব্যৱহাৰ
কৰে যদিও বৰ্তমান সময়তো 6% লোকে ইন্ধনৰ বাবে থাকি
আৰু 3% লোকে কেৱলি ব্যৱহাৰ কৰা দেখিবলৈ
পোৱা গৈছে।



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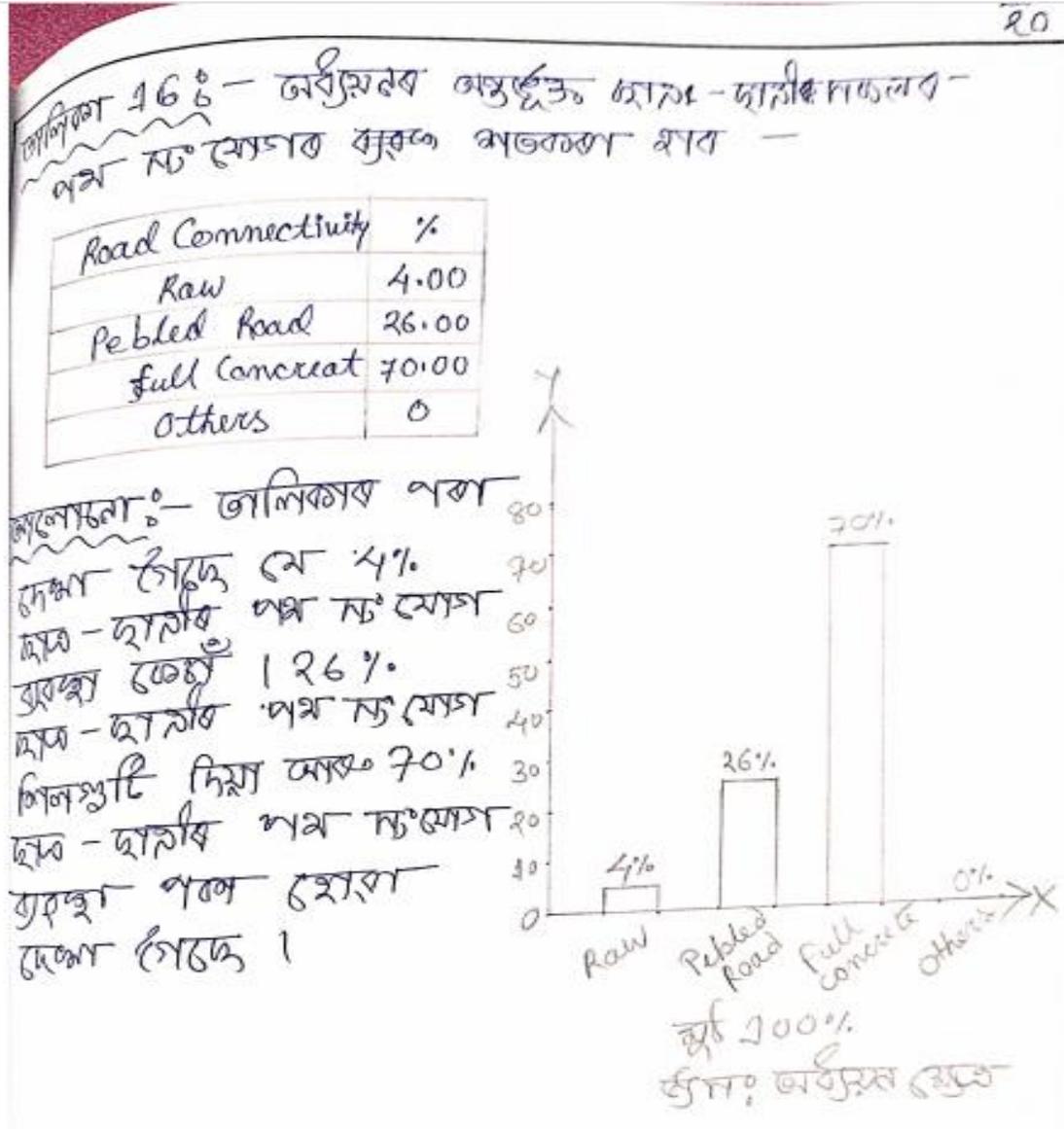

(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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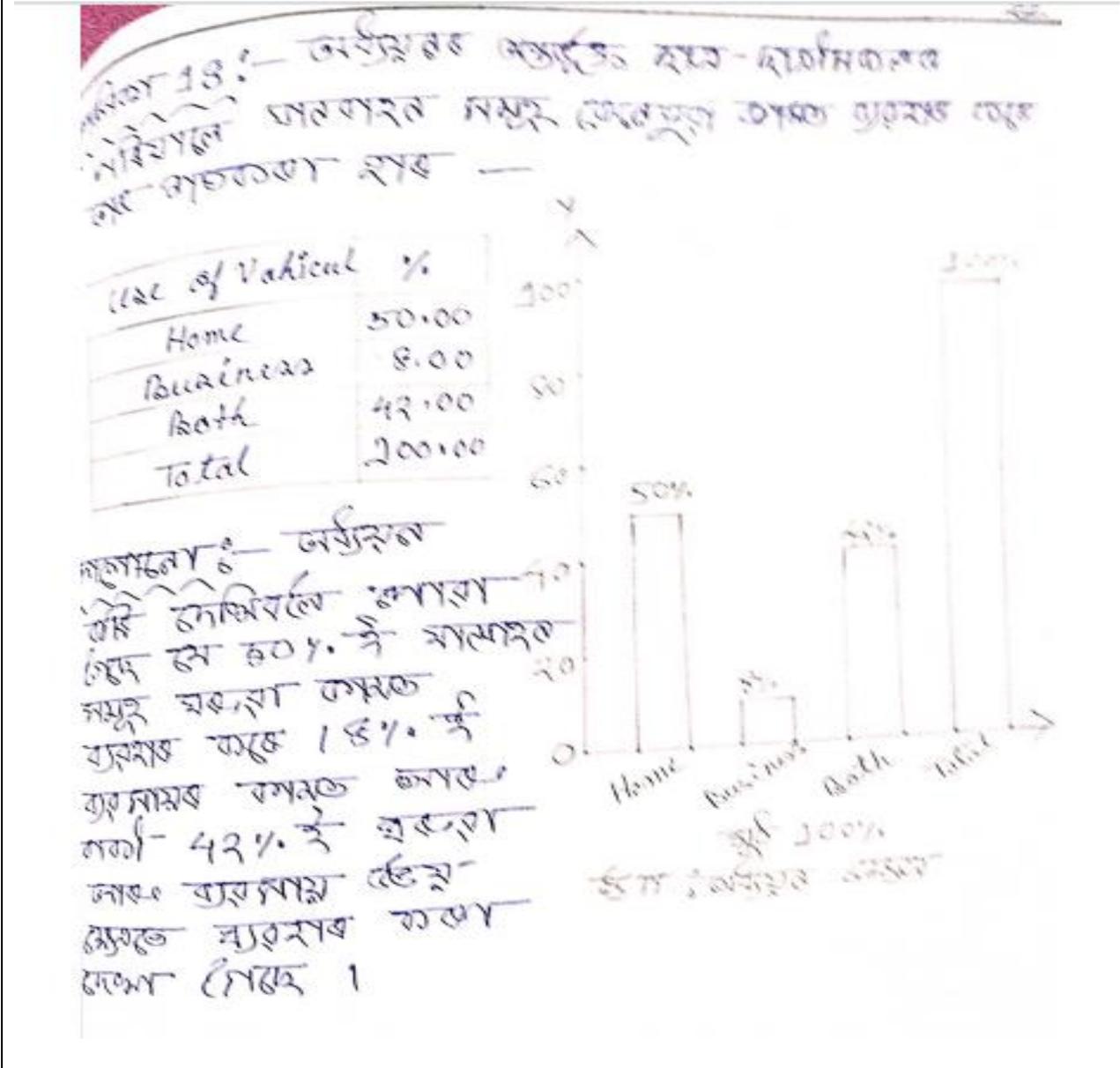
(Dr. P.K. Dutta)
 Principal,
 Bahona College



Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



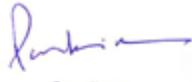
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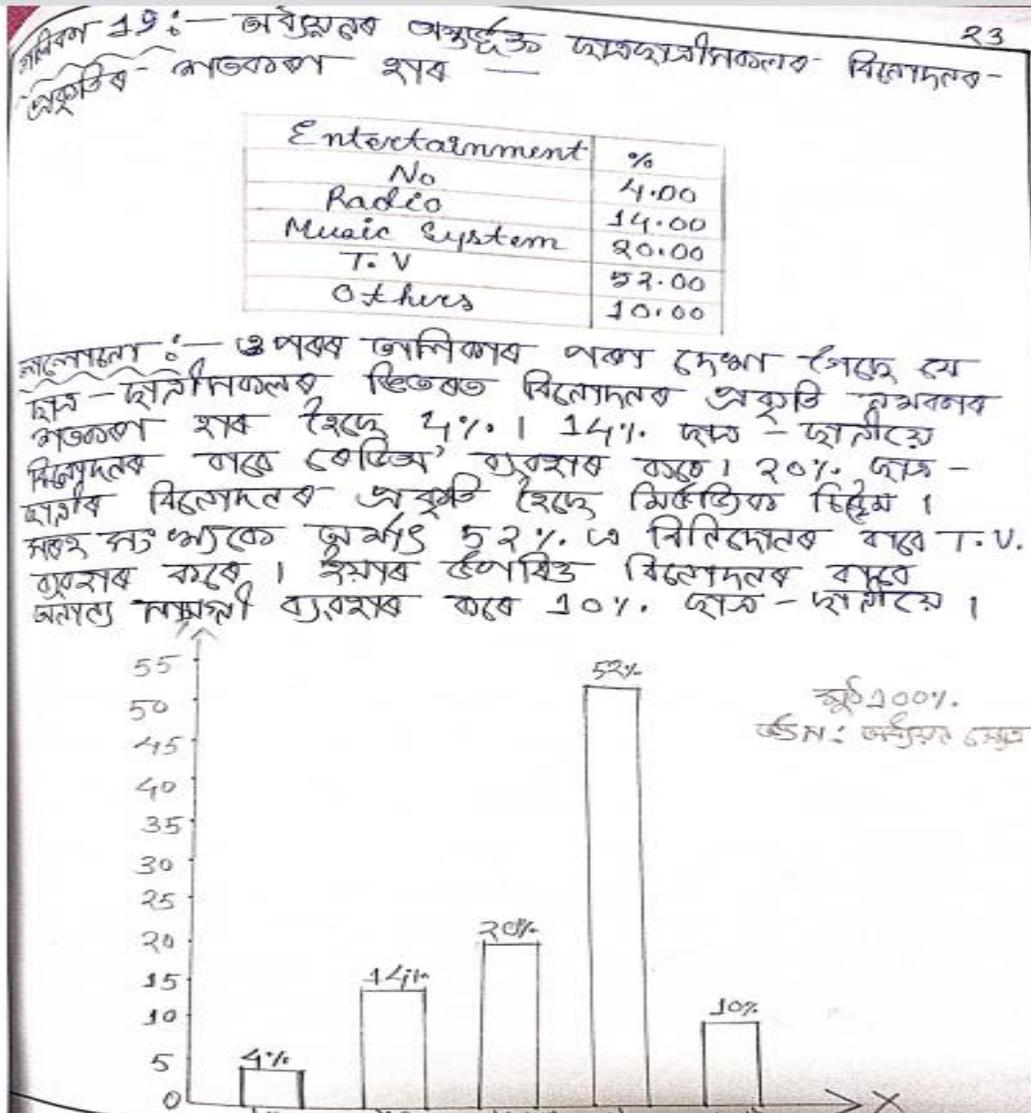

 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
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 Pin-785101



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Report of Field-Based Study Submitted by Student(s) from Dept of Economics [Page 22]

(Dr. P.K. Dutta)
 Principal,
 Bahoma College



Coordinator
 IOAC
 Bahoma College, Jorhat
 Pin-785101



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বাহনা মহাবিদ্যালয়ৰ ছাত্ৰ-ছাত্ৰীৰ অৰ্থনৈতিক পরিস্থিতি
 ওপৰত
 উল্লেখ
 কৰা
 মিত্ৰ
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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
 Pin-785101



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১) বাহনা মহাবিদ্যালয়ৰ দ্বাৰা - জাৰ্মী সঞ্চালনা - পৰিচালনা
 বিভাগৰ প্ৰতিষ্ঠাপিত পৰৱৰ্তী প্ৰকল্পৰে পৰিচালনা কৰা
 ব্যৱস্থা হৈছে সফল। 'প্ৰকল্প' দেখাযোৱাৰে সঞ্চালনা
 পৰিচালনা কৰাৰ ব্যৱস্থা কৰা হৈছে। সঞ্চালনা
 ব্যৱস্থাৰ সুবিধা হয়। সেয়েহে দ্বাৰা - দ্বাৰী - পৰিচালনা
 বিভাগৰে বিশুদ্ধ পৰিচালনা কৰাৰ ব্যৱস্থা
 কৰা হৈছে।

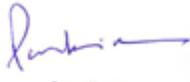
২) জাৰ্মী সঞ্চালনা পৰিচালনা কৰাৰে
 বাহনা মহাবিদ্যালয়ৰ দ্বাৰা - জাৰ্মী - সঞ্চালনা
 পৰিচালনা কৰাৰে 100% পৰিচালনা কৰা
 হৈছে ইলেকট্ৰনিক্স।

৩) জাৰ্মী সঞ্চালনা পৰিচালনা কৰাৰে
 সঞ্চালনা কৰাৰে ইলেকট্ৰনিক্স কৰাৰে
 কৰা হৈছে। বৰ্তমান সঞ্চালনা কৰাৰে
 ইলেকট্ৰনিক্স কৰাৰে
 কৰা হৈছে।

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 (Dr. P.K. Dutta)
 Principal,
 Bahona College




 Coordinator
 IOAC
 Bahona College, Jorhat
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**A Field Report
on
Hoollongapar Gibbon Sanctuary**



Submitted to -

Department of Zoology
Bahona College

Submitted by -

Name – Centwin Gogoi
Class – B.Sc 1st Semester
Roll No – 119
Session – 2021-22

[Signature]
Head,
Dept. of Zoology
Bahona College

Report of Field-Based Study Submitted by Student(s) from Dept of Zoology [Page 1]

[Signature]
(Dr. P.K. Dutta)
Principal,
Bahona College



[Signature]
Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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CERTIFICATE

I hereby recommended that the field study report in Hoolongapar Gibbon Wild life sanctuary , Mariani , carried out under the supervision of our teacher to the accepted as full filling the requirement of the syllabus of B.Sc. 1st semester , Zoology(major) under Dibrugarh University . The report in my opinion is worthy for its approval guidance teacher.

ACKNOWLEDGEMENT

At the point of completion of our field study report I would like to pay my sincere thanks to our honourable teachers DR. Bikaramaditya Bakalial , DR. Parbin Iraqui ,DR. Rupjyoti Saikia and DR. Swarupa Bhattacharjee who accompanied us on this field study and for providing us valuable guidance and constructive criticism throughout the course if completion of our report . Finally I would like to thank my friends for their help to fulfil this field study report successfully.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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INTRODUCTION

The Hoollongapar Gibbon Sanctuary, formerly known as the Gibbon Wildlife Sanctuary or Hoollongapar Reserve Forest is an isolated protected area of evergreen forest located in Assam, India. The sanctuary was officially constituted and renamed in 1997. Set aside initially in 1881, its forests used to extend to the foothills of the Patkai mountain range.

Since then, the forest has been fragmented and surrounded by tea gardens and small villages. In the early 1900s, artificial regeneration was used to develop well-stocked forest, resulting in the site's rich biodiversity. The Hoollongapar Gibbon Sanctuary contains India's only gibbons the hoolock gibbons, and Northeastern India's only nocturnal primate-the Bengal slow loris.

The upper canopy of the forest is dominated by the Hollong tree (*Dipterocarpus macrocarpus*), while the Nahar (*Mesua ferrea*) dominates the middle canopy. The lower canopy consists of evergreen shrubs and herbs.. The habitat is threatened by illegal logging, encroachment of human settlements, and habitat fragmentation.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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HISTORY

The Hoollongapar Gibbon Sanctuary derives from a patch of forest once part of the Hollongapar Reserve Forest in the civil district of Jarhat in Assam, India. Set aside as a Reserve Forest" (RF) on 27 August 1881, it was named after its dominant trees species, Hoollong or Dipterocarpus macrocwpus. At the time, it was considered an "integral part" of the foothill forests of the Patkai mountain range. Although the sanctuary is currently completely surrounded by tea gardens and a few small villages, it Used to connect to a large forest tract that ran to the state of Nagaland. The protected area started with 206 ha (0.80 sq mi) and then shrank in 1896 as sections were de-reserved. As tea gardens began to emerge between 1880 and 1920, and villages were established during the 1960s to rehabilitate people from Majuli and adjoining areas who had lost their lands to floods, the forest became fragmented and the reserve became isolated From the foothills.

Historically, sporadic evergreen trees covered the area along with Bojalbamboos (Pseudodactyium sp). In1924,artificial regeneration was introduced in an attempt to develop well-stocked, even-aged forest. These plantations Subsequently created a forest stocked with a rich variety of flora and fauna (biodiversity). During the 1900s, forest areas were added to the reserve, eventually

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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totaling 2,098.62 ha (8.1sq mi) by 1997. However, the sanctuary remains fragmented into five distinct segment. On 30 July 1997, in notification no. FRS 37/97/31, the Sanctuary was constituted under the civil district of Jorhat and named it the "Gibbon Wildlife Sanctuary" after the only apes found in India : the hoolock gibbons (genus Hoolock). It is the only sanctuary India named after a gibbon due to its distinction for containing the densest gibbon populations in Assam. On 25 May 2004, the Assam Government renamed it as the Hoollongapar Gibbon Sanctuary" through notification no. FRP 37/97/20.



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(Dr. P.K. Dutta)
Principal,
Bahona College

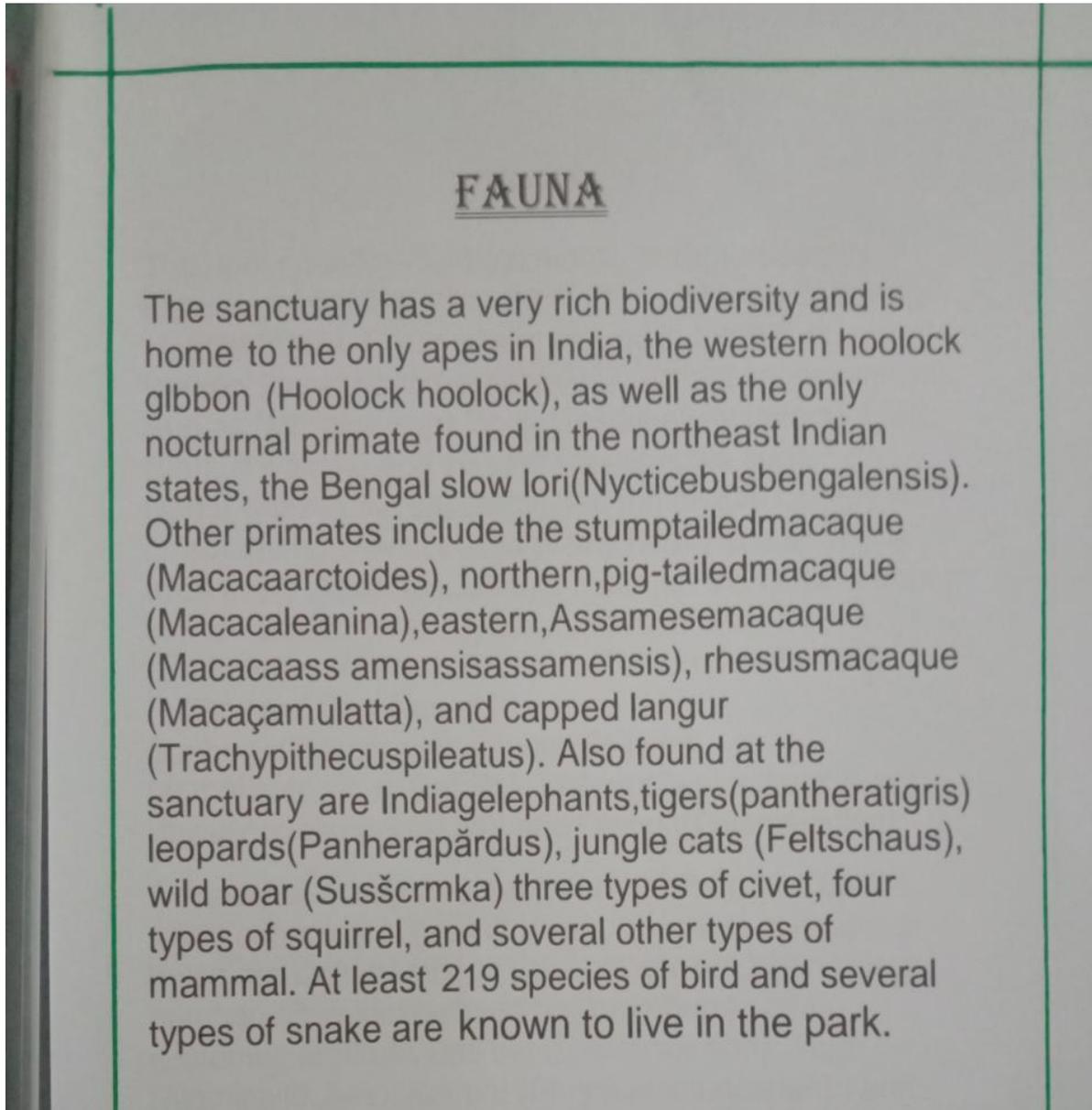



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IOAC
Bahona College, Jorhat
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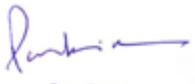
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(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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FLORA

The upper canopy consists mostly of Dipterocarpus macrocarpus rising 12 to 30 m (39 to 98 ft) and having straight trunks. Other species found in the top canopy include Sam(Artocarpus chaplata), Amari(Annoorawalichi), Sop as (Mcheliai spp), Bhelu(Tetramelismudiflora), Udal(Sterculia villosa) and Hingori Castanopsis spp), Nahar (Mesug forrea) dominates the middle canopy with its spreading crown, casting fairly heavy shade over a wide area. Other species that make up the middle canopy include Bandordima (Dysoxylum procerum), Dhuna (Conarimresi uiferur), Bhomora(Terminalia bellerica), FulGomari(Gmelina sp.)

Bonbogri(Pterospermum lanceafolium), Morhal(Vatica lanceafolia), Selleng(Sapium baccatum), Sassi(Aqualaria golacha), and Otenga(Dillenia indica)

A variety of evergreen shrubs and herbs make up the lower canopy and ground layers. The most common of these are Dolu bamboo (Teinosstachyum dullooa) Bojal bamboo (Pseudostachyum polymorphum), Jengu (Calamus erectus), Jati bet (Calamus spp). Tora (Alpinia allughas), Kaupat (Phrynium imbricatum) , and Sorat (Laportea cremulata). Bamboo spp), and Houka bet(calamus spp).

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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CONSERVATION

The isolation of the park by numerous tea garden creates a geographic barrier for migrating animals. The growing populations of tea garden workers also threatens the habitat since many people rely on the forest for firewood, traditional medicine and food. Large quantities of leaves and grass are collected from the forest to feed cattle. During the rainy season, herbicides and pesticides from the tea garden wash through the sanctuary.

The tea garden are also used by elephant as a migration route to Nagaland, making them vulnerable to frequent poaching. Railway lines further divide the park, standing a single group of gibbon in the smaller fragment, illegal logging and encroachment by local people employed by the tea gardens degraded the habitat quality.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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CENSUS REPORT

According to a census conducted in 2010 by the Jorhat forest department, they recorded :

- 25 Bengal Slow Loris
- 41 Assamese Rhesus Macaques
- 33 Golden Langurs
- 75 Pig – Tailed Macaques
- 154 Capped Langurs
- 174 Stump tailed Macaques
- 95 Hoolock Gibbons

BIBLIOGRAPHY

The data of this field study report

have been collected from the following source :

1. From office of Hollongapar Gibbon sanctuary.
2. Flora and Fauna from Wikipedia encyclopedia.
3. Various reference books.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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PHOTOGRAPH :-



way between Gibbon

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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Hoolock tree



Medicine plant

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(Dr. P.K. Dutta)
Principal,
Bahona College

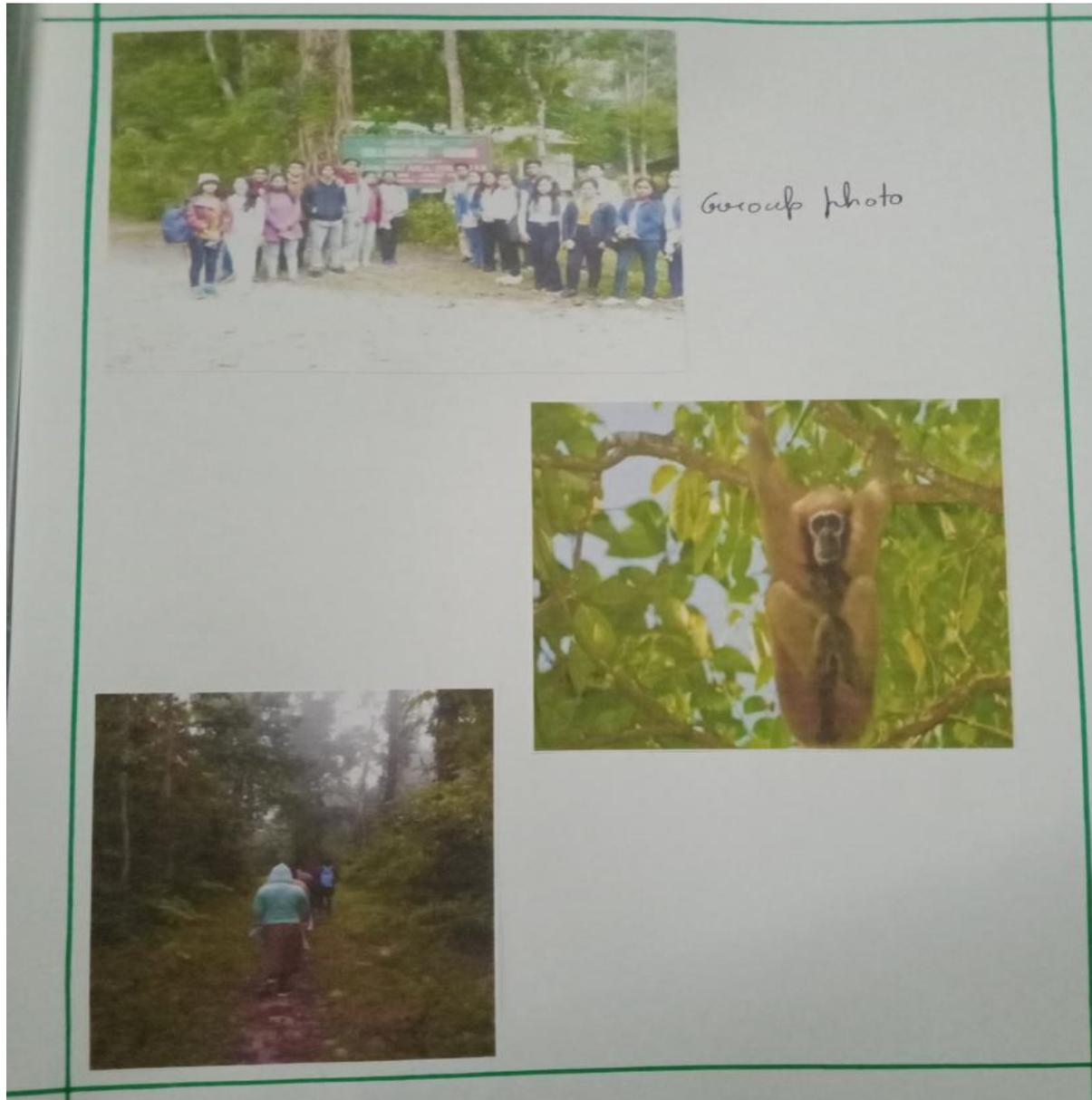



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IOAC
Bahona College, Jorhat
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Group photo

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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**A FIELD STUDY REPORT ON
KAZIRANGA NATIONAL PARK**



Under Supervision Of:
Dr. Gayatri Agni Bora
HOD, Department of Zoology
Bahona College

[Signature]
Head,
Dept. of Zoology
Bahona College

Prepared By:
Bishakha Bora
Roll No.- 82
5th Semester
Zoology Department

*Examined by
Bishakha Bora
12/11/2021*

Report of Field-Based Study Submitted by Student(s) from Dept of Zoology [Page 1]

[Signature]
(Dr. P.K. Dutta)
Principal,
Bahona College



[Signature]
Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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বাহনা মহাবিদ্যালয়
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ACKNOWLEDGEMENT

We are sincerely thankful to our Principal sir Dr. Prasanna Kumar Dutta Sir for financial support and permission and also thanks to our Head of The Department Dr. Gayatri Agni Bora ma'am for arrangement. Thanks to our faculty Dr. Bikramaditya Bakalial Sir, Dr. Rupjyoti Saikia ma'am and Dr. Parbin Iraqi ma'am for support and guidance. Thanks to our team members for field data record as well as for report preparation. Thankful to the Park authority for granting student concession, jeep safari drivers for their active guidance. At last thanks to crew of Bus who safely picked up and dropped the team across the journey.

Report of Field-Based Study Submitted by Student(s) from Dept of Zoology [Page 2]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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বাহনা মহাবিদ্যালয়
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CERTIFICATE

This is to certify that Miss Bishakha Bora, student of B.Sc. 5th semester bearing roll no. ৪২ has taken part in the field study trip to Kaziranga National Park under guidance and supervision of the faculties of Department of Zoology, Bahona College and has also submitted a report for the same.

Prof. Dr. Bikramaditya Bakalial
Department Of Zoology
Bahona College


Prof. Dr. Gayatri Agni Bora
HOD, Department of Zoology
Bahona College

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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DESCRIPTION ABOUT THE JOURNEY

A visit to Kaziranga National Park was made on 7th January, 2021 by the students of 5th semester of zoology department of Bahona College at about 6.30 am. Proper arrangements were made by our department to make the journey pleasant one. The visit was a one day visit; we reached Bokakhat at about 7.45 am. After being refreshed there, we resumed our journey and reached Kaziranga at about 9.30 am. First we visited Kaziranga Orchid Park situated in the Kohora range. The place is a huge site for different flora. From there we resumed our journey to our final destination, i.e., Kaziranga National Park. We reached there at about 11.40 am and after completing the official documentation, we went to have our lunch since the jeep safari time was from 1 pm. So after having our lunch we came back and divided into 6 groups. We took 7 jeep, each group consist of 6 members took each jeep. At about 1 pm, our visiting time started in the National Park. After completing the jeep safari we returned from the sanctuary at about 5 pm. The total safari time inside the park was almost two hours.

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(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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1. INTRODUCTION

Kaziranga National Park, which hosts two-thirds of the World's great one horned rhinoceros, is a world heritage site. It is solitary among the foremost national parks in the earth and also famous as the pleasure of the North East India. Situated in the intense geographical place, the park presents a massive range of natural beauty. Kaziranga National Park is located fairly in the Golaghat and Nagaon regions of Assam in India. It is the oldest park in Assam covering an area of 430 sq kms along the river Brahmaputra on the North and the Karbi Anglong hills on the South. Edged by fertile tea bushes, Kaziranga National Park offers a splendid scenic sight. The park is also recognized as an Important Bird Area making it not only an ideal wildlife sighting destination in India but a birdwatcher's paradise as well.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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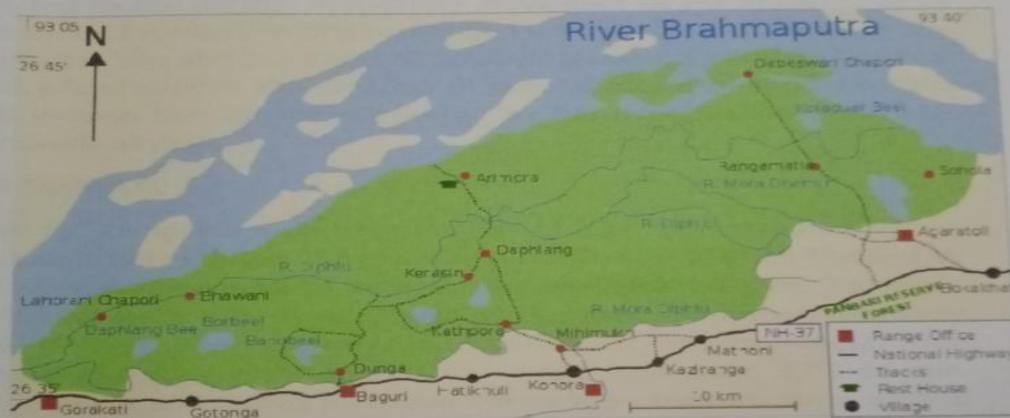
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STUDY AREA

2.1 LOCATION

It is situated on the Southern bank of the Brahmaputra River at the foot of the Mikir-Karbi Anglong Hills about 8 km from Bokakhat and 220 km east of Guwahati, the Assam state capital. It is situated between latitude $26^{\circ}30' N$ and $26^{\circ}45' N$ and longitudes $93^{\circ}08' E$ and $93^{\circ}36' E$.



2.2 History

- 1908: Declared as a Reserve Forest.
- 1916: Declared as Game Sanctuary.
- 1938: Opened for visitors.
- 1950: Designated as Wildlife Sanctuary.
- 1974: Declaration as National Park.
- 1985: Inscribed as World Heritage Site by UNESCO-IUCN.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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2.3 GEOGRAPHY & GEOLOGY

Located between the two districts of Assam – the Koliabar subdivision of Nagaon district and the Bokakhat subdivision of Golaghat district on the edge of the Eastern Himalaya biodiversity hotspots, Kaziranga National Park covers an area of about 378.22 sq. km in which 51.14 km² has been lost to erosion by the Brahmaputra.

Assam is in the easternmost projection of the Indian Plate according to the Plate Tectonics. It is believed that due to the force exerted by the north eastwardly movement of the Indian plate at the time of Himalayan origin, a huge fault was created between the Rajmahal hills and the Karbi Meghalaya plateau. Kaziranga National Park's landscape is the creation of natural forces of slit deposition and erosion that has been effected by the river Brahmaputra over hundreds of years.

2.4 CLIMATE

Due to its location in the middle of the Brahmaputra valley, Kaziranga gets around 250 cm of rain per year. It is often flooded by the river Brahmaputra to maintain the biological balance. 3 seasons are being experienced every year by the park – Summer, Monsoon and Winter. The summer is experienced approximately from February to May with temperature range from max. 37°C to min. 7°C. The hot and humid monsoon covers the sanctuary from June to September with rainfall of 2,220 mm. The winter extends from November to February with temperature range from max. 25°C to min. 5°C.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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3. MATERIALS AND METHODS

This field study report is prepared by using observation method. The primary data were collected during jeep safari in the Kaziranga National Park. Some secondary data were also collected as it is not possible to perform survey of the whole sanctuary in a day.

For field observation of different animals in their natural habitat, few monocular and binocular were used; digital camera and mobile camera were also employed to record different habitat types and other data in the field. Some guidebooks were also used for identification of the animals.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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4. OBSERVATION

4.1 VEGETATION PATTERN

The varied vegetation at the Kaziranga National Park creates the ideal habitat for a number of wild animals and birds and specially the one horned rhino.

Four types of vegetation are found in the sanctuary –

- Tropical wet evergreen forest
- Tropical deciduous forest
- Grasslands
- Swamp areas (beel)

The tropical deciduous forest vegetation are home to different animals of Kaziranga. The evergreen forest vegetation are home to a large variety of wildlife such as deer, wild boar and different species of water birds. The swampy areas inside the park, located near the River Brahmaputra are natural habitats for different species of reptiles and birds. The western area of the national park has grasslands. Tall grasses like sugarcanes, elephant grass and spear grass are found in the western grassland zones.

4.2 FAUNAL DIVERSITY PATTERN

Being one of the famous world heritage sites, Kaziranga helps in protecting some of the globally threatened and near endangered species of animals and birds. Kaziranga, home to the world's largest remaining populations of Indian one horned Rhinos, Eastern Barasingha and wild water buffalo, Elephant and Tiger, also offers one of the most cosmopolitan outdoor activities called birding.

Following are the faunal diversity found in Kaziranga National Park—

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(Dr. P.K. Dutta)
Principal,
Bahona College




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4.2.1 MAMMALS

The Kaziranga National Park supports more than 35 species of mammals of which 15 belong to Schedule I of Wildlife Act 1972. It harbours the world's largest population of Indian Rhinoceros and many more species. Here is the list of mammals found in the sanctuary –

ENGLISH NAME	SCIENTIFIC NAME
INDIAN RHINOCEROS	<i>Rhinoceros unicornis</i>
ASIATIC WILD BUFFALO	<i>Bubulas bubalis</i>
ROYAL BENGAL TIGER	<i>Panthera tigris</i>
CAPPED LANGUR	<i>Presbytis pileatus</i>
HOOLOCK GIBBON	<i>Hylobates hoolock</i>
LEOPARD	<i>Panthera pardus</i>
INDIAN ELEPHANT	<i>Elephus maximus</i>
SLOTH BEAR	<i>Melursus ursinus</i>
GANGETIC DOLPHIN	<i>Platanista gangetica</i>
OTTER	<i>Lutra lutra</i>
WILD BOAR	<i>Sus scrofa</i>
GAUR	<i>Bos gaurus</i>
SAMBAR	<i>Cervus unicolor</i>
SWAMP DEER	<i>Cervus duvauceli</i>
HOG DEER	<i>Axis porcinus</i>
COMMON LANGUR	<i>Presbytis entellus</i>
INDIAN PORCUPINE	<i>Hystrix indica</i>
LARGE INDIAN CIVET	<i>Viverra zibetha</i>
SMALL INDIAN CIVET	<i>Viverricula indica</i>
COMMON MONGOOSE	<i>Herpestes edwardsi</i>
JACKAL	<i>Canis aureus</i>

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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4.2.2 BIRDS

Numerous water bodies constitute rich reservoir of food and thousands of migratory birds visit the park seasonally during winter from as far as Siberia. A total of 478 species has been recorded (M. Barua and P. Sharma, 1999) including 25 globally threatened species and 21 near threatened species. The bird species found in the park are listed as follows –

ENGLISH NAME	SCIENTIFIC NAME
Swamp Francolin	<i>Francolinus gularis</i>
Lesser White fronted Goose	<i>Anser erythropus</i>
Ferruginous Pochard	<i>Aythya nyroca</i>
Baer's Pochard	<i>A. baeri</i>
Blyth's Kingfisher	<i>Alcedo Hercules</i>
Pale capped Pigeon	<i>Columba punicea</i>
Bengal Florican	<i>Houbaropsis bengalensis</i>
Nordmann's Greenshank	<i>Tringa guttifer</i>
Greater spotted Eagle	<i>Aquila clanga</i>
Imperial Eagle	<i>A. heliaca</i>
Palla's Fish Eagle	<i>Haliaeetus leucoryphus</i>
Dalmatian Pelican	<i>P. crispus</i>
Spot billed Pelican	<i>Pelecanus philippensis</i>
Greater Adjutant	<i>Leptoptilos dubius</i>
Lesser Adjutant	<i>L. javanicus</i>
Rufous vented Prinia	<i>Prinia burnesii</i>
Bristled Grassbird	<i>Chaetornis striatus</i>
Mah Babbler	<i>Pellorneum palustre</i>
Jerdon's Babbler	<i>Chrysomma altirostre</i>
Black breasted Parrotbill	<i>Paradoxornis flavirostris</i>
White bellied Heron	<i>Ardea insignis</i>
Finn's Weaver	<i>Ploceus megarhynchus</i>
Black bellied Tern	<i>Sterna acuticauda</i>

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(Dr. P.K. Dutta)
Principal,
Bahona College




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4.2.3 REPTILES

About 42 species of reptiles have been reported from the Kaziranga National Park. Two of the largest snakes in the world as well as the longest venomous snake in the world inhabit the park. Kaziranga is also home to the endangered gharial and about 15 species of turtles, including the endemic Assam roofed turtle and a regional lizard species too. Here is the list of reptiles found in the park –

ENGLISH NAME	SCIENTIFIC NAME
BLACK KRAIT	<i>Bungarus niger</i>
COMMON KRAIT	<i>Bungarus caeruleus</i>
BANDED KRAIT	<i>Bungarus fasciatus</i>
BENGAL COBRA	<i>Naja kaouthia</i>
KING COBRA	<i>Ophiophagus hannah</i>
INDIAN COBRA	<i>Naja naja</i>
ROCK PYTHON	<i>Python molurus</i>
RETICULATED PYTHON	<i>Python reticulatus</i>
RUSSEL'S VIPER	<i>Vipera russellii</i>
PIT VIPER	<i>Trimeresurus spp.</i>
RAT SNAKE	<i>Ptyas mucosus</i>
GHARIAL	<i>Gavialis gangeticus</i>
ASSAM ROOFED TURTLE	<i>Kachuga sylhetensis</i>
INDIAN ROOFED TURTLE	<i>Kachuga tecta</i>
INDIAN TENT TURTLE	<i>Kachuga tentoria</i>
INDIAN EYED TURTLE	<i>Morenia petersi</i>
GANGETIC SOFTSHELL TURTLE	<i>Aspideretes gangeticus</i>
INDIAN BLACK TURTLE	<i>Melanochelys trijuga</i>
BROWN ROOFED TURTLE	<i>Kachuga smithii</i>
BROWN HILL TORTOISE	<i>Manouria emys</i>
COMMON INDIAN SKINK	<i>Mabuya carinata</i>
TUCKTO GECKO	<i>Gecko gecko</i>

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(Dr. P.K. Dutta)
Principal,
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TICTICKY HOUSE GECKO	<i>Hemidactylus frenatus</i>
COMMON BENGAL MONITOR	<i>Varanus bengalensis</i>
INDIAN WATER MONITOR	<i>Varanus salvator</i>
ASSAM GARDEN LIZARD	<i>Calotes maria</i>
DOTTED GARDEN SKINK	<i>Lygosoma punctata</i>

4.2.4 AMPHIBIA

The amphibians residing in the sanctuary are listed below –

ENGLISH NAME	SCIENTIFIC NAME
PYGMY TREE FROG	<i>Chiromantis simus</i>
POINTED NOSE FROG	<i>Clinotarsus alticola</i>
COMMON ASIAN TOAD	<i>Duttaphrynus melanostictus</i>
INDIAN SKIPPER FROG	<i>Euphlyctis cyanophlyctis</i>
INDIAN CRICKET FROG	<i>Fejervarya limnocharis</i>
PIERREI'S CRICKET FROG	<i>Zakerana pierrei</i>
JERDON'S BULL FROG	<i>Hoplobatrachus crassus</i>

4.2.5 FISH

The Kaziranga National Park is home to a wide variety of aquatic life including about 42 species of freshwater fish. Here is the list of the fishes found in the park –

ASSAMESE NAME	SCIENTIFIC NAME
BAHU	<i>Catla catla</i>
CHANDA	<i>Chanda nama</i>
CHENGA	<i>Channa amphibia</i>
CHENGELI	<i>Channa orientalis</i>
SAL	<i>Channa marulius</i>
KOKILA	<i>Xenentodon cancila</i>
GARUA	<i>Bagarius bagarius</i>

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(Dr. P.K. Dutta)
Principal,
Bahona College




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ROHU	<i>Labeo rohita</i>
KUCHIA	<i>Amphipnous cuchia</i>
BANHHPUTHI	<i>Amblypharyngodon mola</i>
GROI	<i>Channa punctata</i>
GONGATUP	<i>Tetraodon cutcutia</i>

4.2.6 INVERTEBRATE FAUNA

Kaziranga National Park is also home to a large number of invertebrate animal diversity which includes butterflies (*Papillo paris*, *Papillo castor*, *Parides aidoneus* etc.), many spiders, ants, various molluscans (*Pila globosa* etc.), Indian earthworm, locust, mosquitoes, various worms (like silkworm, tongue worm etc.), millipedes, dragon fly, beetles etc.

4.3 FLORAL DIVERSITY

The floristic composition of the Kaziranga National Park comprises of following forest types and biomes –

- Eastern Wet alluvial grasslands
- Assam Alluvial plains Semi-evergreen forests
- Tropical moist mixed deciduous forests
- Eastern Dillenia Swamp forests
- Wetlands
- Sandy “chars”

The percent coverage by vegetation is – Moist mixed deciduous forest 29.13%, Grass land 51.91%, Water logged/Beels 6.62%, Swampy/Marshy area 5.21% and Sand 7.12%.

Some of the common species of flora found in the park are elephant grass, sugarcane, spear grass, common reed, kumbhi, Indian gooseberry, *Talauma hodgsonii*, *Duabanga grandiflora*, *Aphania rubra* and *Leea indica*. There are also many different aquatic flora in the lakes and ponds, and along the river shores.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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5. DISCUSSION

5.1 FAUNA

The Kaziranga National Park is very rich in faunal diversity. Varieties of common as well as unique animals are found here. The diverse habitat type such as dense forest, fragmented vegetation, lowland grassland, aquatic bodies support different animals for their food and shelter. The altitudinal slope, pleasant climate, enough rainfall maintain the rich fauna.

5.2 FLORA

The park is quite rich in floral diversity too. The geology and soil parameters of the Himalayan foothill region are favourable for the growth and development of many evergreen, deciduous and epiphytic plants. Heavy rainfall during the monsoon and the Brahmaputra River maintain a good content of humidity in the soil and air of the national park.

5.3 ECOTOURISM

Kaziranga National Park is a tourist destination and conservation area particularly notable as a refuge for the endangered Indian one-horned rhinoceros, hosting the largest population of wild one horned rhinoceros in the world. Central govt. has included Kaziranga in eco-tourism circuit of the integrated Development Tourism Circuit Scheme. The park contains significant stock of other large and small animals too. It also has the highest density of tiger in the world. It is also recognised as an important bird area for conservation of avifaunal species.

The means of travel inside the park is on the back of trained elephants with mahout guides or in jeep or 4WD vehicles. The park has three tourist routes under three ranges – Kohora, Bagori and Agaratoli. These roads are open for tourists from November to mid May and remains closed during monsoon. For spotting wildlife with better view, some observation towers are also situated at Sohola,

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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Mihimukh, Kathpara, Foliamari and Harmoti. Wildlife watching, including birding is the main activity inside the park.

Tourist can make entry to the Central, Eastern and Western zone of the park after paying a requisite entry fee to the park authority. Private sector investment in this tourist spot helps in changing the state tourism scenario. There are so many hotels and restaurant near Kohora and Bagori range of Kaziranga National Park, where tourist able to find best places to stay.

5.4 THREATS

At present Kaziranga National Park is facing so many problems. Some of these are discussed below.

FLOOD: Kaziranga National Park is situated in the bank of mighty Brahmaputra. The entire area is has been formed by silt deposition carried by different river systems flowing through it. Each year with increase in the water level of Brahmaputra River, the water level in the various water bodies and stream also raise .As the southern boundary of the national highway is at a height, animals often move to take shelter there during floods. This also invites poachers.

POACHING: The Park has continuously in the headlines in past few years, especially with poaching accounting for the loss of 27 rhinos in 2013.

POLLUTION: The petroleum refinery (Numaligarh Refinery Limited) is situated closely to the eastern range of the park. Water pollution due to run from NRL pose a hazard to the ecology of the region .The use of insecticides by the tea garden always get leached to the rivers and pollute the park lands and wetlands.

HABITAT LOSS: Brahmaputra River erodes large area along the northern boundary of Kaziranga, which reduces the total

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(Dr. P.K. Dutta)
Principal,
Bahona College




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6. CONCLUSION

Kaziranga for the last few years has been a successful wildlife conservation site for the world's famous Indian one horned rhinoceros and many more rare and threatened faunal diversity. Being one of the famous World Heritage Site, the sanctuary hosts two thirds of the world's great one horned rhinoceros. Providing home to many wildlife including the fascinating migratory birds from as far as Siberia, the National Park has been the theme of several books, songs and documentaries too. Thus, visiting this National Park is indeed a great experience.

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To make this field study report, secondary data have been collected from following sources –

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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(Dr. P.K. Dutta)
Principal,
Bahona College




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Lesser Adjutant



Ruddy Shelduck



Bar Headed Goose



Goose



Ibis



Cinnamon Teal

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Tortoise



Rhinoceros with baby



Jeep Safari



Water body



Eagle



Red Wattled Lapwing

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Indian Roller



Asian Openbill Stork



Group visiting the National Park

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Visits to Higher Educational Institutions of Repute Acquaint Students with the Career Options Available to Them, as well as with Methods of Teaching-learning Practiced Elsewhere in an Immersive, Experiential Manner.

**A FIELD REPORT ON THE
EDUCATIONAL TOUR TO TEZPUR UNIVERSITY**

**SUBMITTED BY
STUDENTS OF B.SC 6TH SEMESTER
BAHONA COLLAGE
YEAR 2017**

Report of Visit to Tezpur University by students of Dept of Chemistry [Page 1]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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ACKNOWLEDGMENT

We take immense pleasure in thanking our honorable principal DR. P.K. DUTTA for having permitted to carry out of this tour. We want to express our deep sense of gratitude to all the teachers of CHEMISTRY DEPARTMENT for guidance and valuable advice. We the students of CHEMISTRY DEPARTMENT of BAHONA COLLEGE along with our teachers went to TEZPUR UNIVERSITY as an Educational Tour as well as for a picnic on 24/01/2017. Here is a descriptive report on our tour to TEZPUR UNIVERSITY

Report of Visit to Tezpur University by students of Dept of Chemistry [Page 2]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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HISTORY OF TEZPUR UNIVERSITY

The establishment of Tezpur University is considered to be one of the outcomes of the Assam Accord along with the of Assam University and Indian Institute of Technology Guwahati.

Tezpur University was established, by an Act of Parliament, in 1994. Then the prime minister of India, P. V. Narasimha Rao, chaired the opening of the university.

Initially, the university operated from the premises of the Darrang College, in Tezpur. For a while it also operated from the Tezpur Law College premises. Land was acquired at Napaam, a suburb of Tezpur, about 15 kilometers east, of 242 acres (0.98 square kilometers), and the premises shifted.

Kalaguru Bishnuprasad Rava (Rabha) donated an ancestral estate of 2500 bigha of land received from the British government in favour of the peasants. The present-day Tezpur University stands on the land donated by him. Recently the university acquired an additional plot of land.

DETAILS ON TEZPUR UNIVERSITY

Campus

The university campus is at Napaam about 15 km east of Tezpur, the headquarters of the Sonitpur district of Assam. Napaam is a rural area surrounded by peoples of diverse caste, religion and language. The Napaam campus is in a plot of an area of 262 acres (1.06 km²) of land. The campus is bounded by pucca walls. Napaam is linked by a PWD road from the National Highway No. 37A at almost the midpoint between Kalia-Bhomora bridge and Misson Chariali. Tezpur is linked by road and rail with the rest of the state and the country. There is a tri-weekly flight between Kolkata and Tezpur.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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There are provisions for visitors to stay in the university guest house. Students may choose to stay in any of the men's or women's hostels. The university is primarily a residential university.^[6] The university has five men's hostels (listed in order of construction):

- **Charaideo Men's Hostel: Named after the burial land of Ahom kings in Sivasagar, Assam.**
- **Nilachal Men's Hostel: Named after the Nilachal Hill in Guwahati**
- **Kanchenjunga Men's Hostel: Named after Kangchenjunga, the third highest mountain in the world (after Mount Everest and K2).**
- **Patkai Men's Hostel: Named after the Patkai-Bum, the Khasi-Jaintia-Garo and the Lushai hills mountain range in the eastern Himalayas.**
- **Saraighat C. V. Raman Men's Hostel: Named after the Saraighat Bridge at Guwahati and the famous Indian physicist and Nobel laureate Sir C. V. Raman.**

There are seven women's hostels:

- **Bordoichilla Women's hostel: Named after the seasonal storm that occurs in Assam every spring, before and after the festival of Bihu.**
- **Dhansiri Women's hostel**
- **Pragjyotika Women's Hostel**
- **Suwansiri Women's hostel**
- **Kopili Women's Hostel**
- **New Women's Hostel**
- **Pobitara Madam Curie Women's Hostel: Named after the Pobitara Wildlife Sanctuary and the physicist Marie Curie.**

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(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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There is also a married-scholars hostel, which is at present serving as a makeshift accommodation for newly recruited faculty of the university.

Communications

Auto Rickshaws, the chief mode of public transport in and around Tezpur, run between Tezpur University and Tezpur city. There is an ASTC bus utility between the university and the ASTC bus stand located at the heart of Tezpur city. ASTC and private buses run daily between Tezpur and some other major places like Guwahati (ISBT, Lokhra), North Lakhimpur, Dibrugarh, Tinsukia etc. 20-seater cabs ply between Tezpur and Paltan Bazaar, Guwahati. The nearest railway station is Dekargaon Railway Station which offers a link between Tezpur and the other parts of Assam. Travellers can also opt for flying to and from Tezpur where the nearest airport - Tezpur Airport provides air link with Kolkata and Silchar.^[7] For other destinations, the nearest airport is the Lokapriya Gopinath Bordoloi International Airport at Guwahati.

Education

The university has four schools of studies which is divided into 21 departments and additional centers and cells.

- School of Sciences
- School of Humanities & Social Sciences
- School of Management Sciences
- School of Engineering

Schools and departments

The School of Science is divided into five departments, which provides postgraduate degrees in Science and carry on research in science and mathematics.

- Department of Chemical Sciences

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Principal,
Bahona College




Coordinator
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- **Department of Mathematical Sciences**
- **Department of Molecular Biology and Biotechnology**
- **Department of Physics**
- **Department of Environmental Science**

This School of Humanities & Social Sciences provides education as well as diploma, undergraduate, postgraduate, and research programmes related to arts and social sciences in following departments:

- **Department of English and Foreign Languages**
- **Department of Cultural Studies**
- **Department of Mass Communication and Journalism**
- **Department of Sociology**
- **Department of Hindi**
- **Department of Education**
- **Department of Social Work**



Department of Business Administration, Tezpur University

The School of Management Sciences provides education as well as diploma, undergraduate, postgraduate, and research programs related to business management in the following departments:

- **Department of Business Administration**
- **Department of Commerce**
- **Centre for Disaster Management**
-



Department of Computer Science and Engineering

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The School of Engineering offers courses in engineering and technology. The offering masters and B.Tech programmes in the various disciplines. Admission to the B.Tech programs is on the basis of JEE (Main). Besides B.Tech and M.Tech programs, School of Engineering, the university provides Ph.D programs in specialized fields.

- Department of Computer Science & Engineering
- Department of Electronics and Communication Engineering
- Department of Mechanical Engineering
- Department of Food Engineering and Technology
- Department of Civil Engineering
- Department of Energy

Special centres and cells

- Centre for Assamese Studies (CAS)
- Centre for Endangered Languages (CFEL)
- Centre for Inclusive Development (CID)
- Centre for Innovation Incubation and Entrepreneurship(CIIE)
- Teaching and Learning Centre (TLC)
- Centre for Women Studies (CWS)

Cells

- Research & Development (R & D) Cell
- Intellectual Property Rights (IPR) Cell
- DBT Nodal Centre
- ONGC Centre for Petroleum Biotechnology (CPBT)
- Bioinformatics Infrastructure Facility (BIF)
- Institutional Biotech Hub
- Internal Quality Assurance Cell (IQAC)

Rankings

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University rankings	
General - International	
QS (Asia) (2018) ^[9]	247
Times (World) (2018) ^[10]	601-80
General - India	
NIRF (Overall) (2017) ^[11]	48
NIRF (Universities) (2017) ^[12]	30

Tezpur University was ranked 601-800 in the world by the Times Higher Education World University Rankings of 2018. The QS World University Rankings ranked it 247 in Asia in 2018. In India it was ranked 48 overall by the National Institutional Ranking Framework of 2017 and 30 among universities.

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DEPARTMENT OF CHEMICAL SCIENCE



Department of Chemical Sciences is one of the most active department of prestigious Best Visitor's Award winning educational institute, Tezpur University. Decorated by well-trained and extremely motivated faculty as well as bright students, the department constantly strives to maintain a culture of excellence in research and uphold the highest standards in chemical education. The Department of Chemical Sciences was started in the year 1997, when it offered M. Sc. course in Polymer Science. From July 2006 the Department has been offering M. Sc. program in Applied Chemistry with specialization in Catalysis, Medicinal Chemistry and Polymer Chemistry. The Department consists of 15 research laboratories, 3 M. Tech. laboratories and 5 M.Sc. laboratories. This Department is supported by DST-FIST and UGC-SAP (DRS-II) level.

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Faculty members are actively engaged in high quality research in several international collaborative projects. There are many national collaborative projects are going on apart from UGC, CSIR, DBT, DAE, AICTE etc.

They are well placed across the globe and have contributed significantly in their respective domain.

Central Library



Central Library is the focal point of all user community of Tezpur University. The Library caters to the educational and research needs of the academic community and its resources are consulted by scholars from all over the country. Central Library has been started functioning since 1994. At present, the library holds about 78,318+ books, 10000+ e-journals and 8380 back volumes of journals (as on 15 February 2018). Apart from the online journals and database provided by e-ShodhSindhu consortium and DeLCON consortium, the library

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also holds more than 2550 CDs scattering to different thought contents. Library users can access book database, theses database, journal database, e-journals and other e-resources from any terminal within the University campus. Central Library remains open throughout the year

OUR JOURNEY

The day after, it was waiting for. Planning for week long was going to turn into execution. A group of our so called "senior most students" of our department were the organizers of the picnic cum educational tour to TEZPUR UNIVERSITY. We had so many duties that had to be done for our tour, Managing the tour bus, shopping the food items, the utensils, and so on.

All the preparations were done. The bus was house packed with all the students of our department. At last bus stopped on the GANESH GHAT, our teachers asked us to visit AGNIGAR which is near to the GANESH GHAT . After taking our meal we went to the destinations i.e., the TEZPUR UNIVERSITY which is the most important part of the tour . The senior staffs in the job shown us the CHEMICAL SCIENCE DEPT along with the apparatus they use and explained to us the various mechanisms which is related to the apparatus .Then we visit the central library of the university. We were much lucky to get such a good opportunity to get that valuable knowledge from the senior people.

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Bahona College, Jorhat
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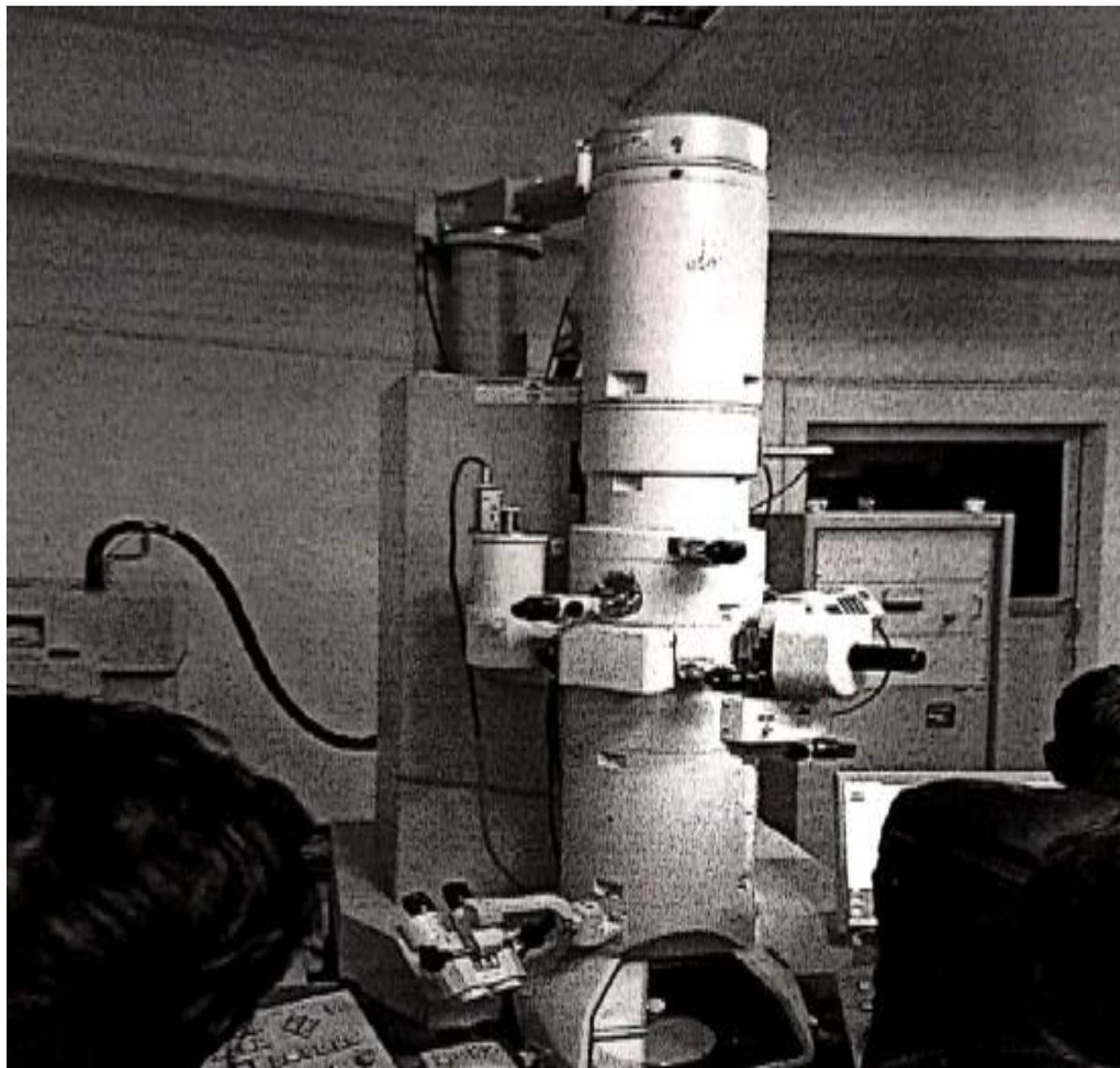


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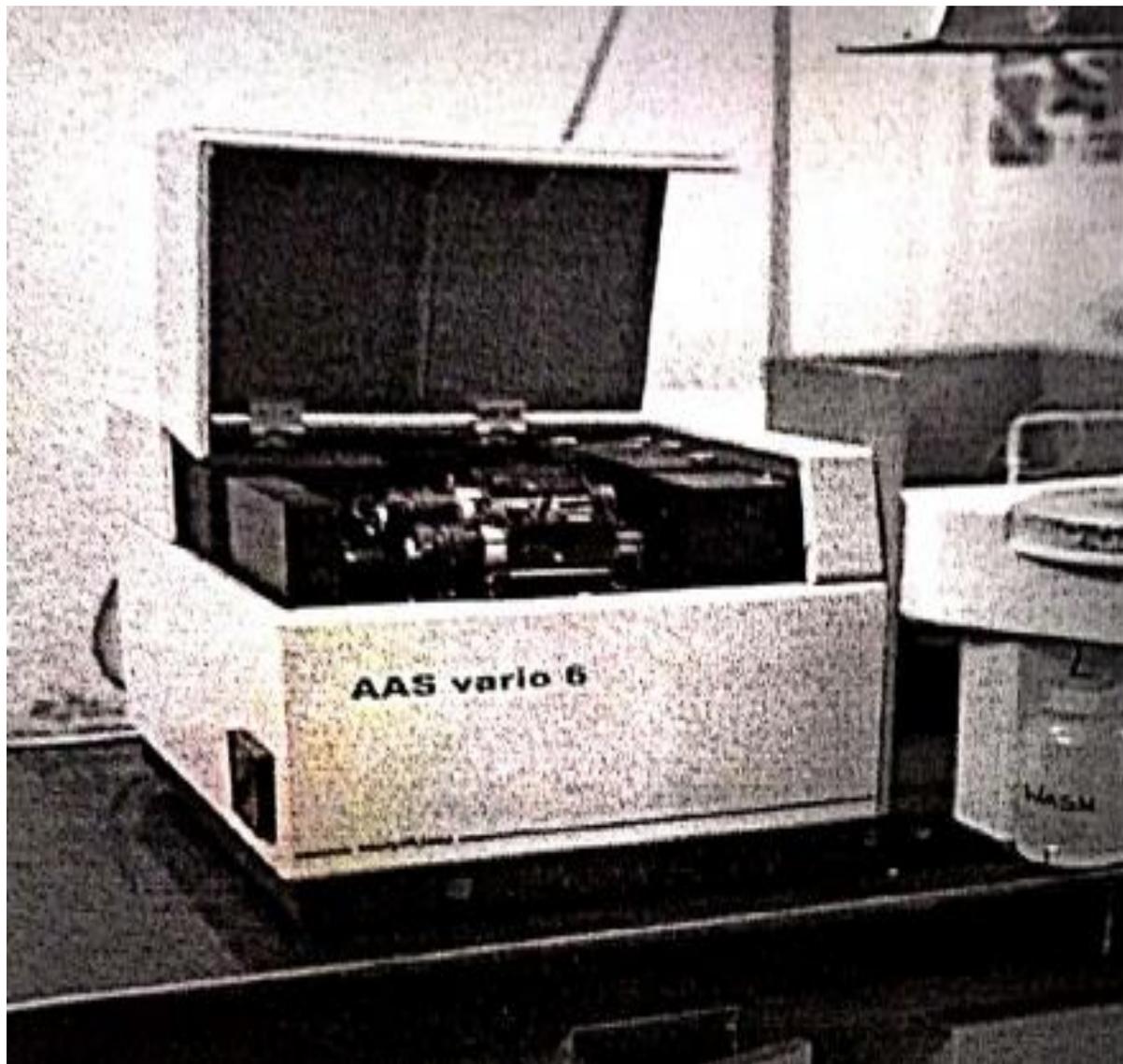


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Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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**A FIELD REPORT ON THE
EDUCATIONAL TO GELEKI OIL FIELD,
SIVASAGAR**

Submitted by

Students of

BSc. 6th semester

BAHONA COLLEGE, JORHAT

Year 2016

P.K. Dutta
Head
Department of Chemistry
Bahona College, Bahona

Report of Visit to Geleki Oil Fields by students of Dept of Chemistry [Page 1]

P.K. Dutta
(Dr. P.K. Dutta)
Principal,
Bahona College



P.K. Dutta
Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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ACKNOWLEDGMENT

We take immense pleasure in thanking our honourable principal **DR. P.K. DUTTA** for having permitted to carry out of this field work.

We want express our deep sense of gratitude to all the teachers of **CHEMISTRY DEPARTMENT** for guidance and valuable advice.

We the students of **CHEMISTRY DEPARTMENT** of **BAHONA COLLEGE** along with our teachers went to **GELEKI OIL FIELD** as an Educational Tour as well as for a picnic on 28/01/2016 .Here is a descriptive report on **GELEKI OIL FIELD** .

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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HISTORY OF THE OIL INDUSTRY:

The discovery of petroleum in British North East India (NE) began with the onset of amateur geological exploration of the region since the 1820s. Like tea plantations, exploration of petroleum also attracted international capital. Since the last quarter of the 19th century, with the arrival of global technology, the region's petroleum fields became part of a larger global petroleum economy, and, gradually, commercial exploration of petroleum became a reality. It was a time when geologists had not yet succeeded in shaping an understanding of the science of oil and its commercial possibilities. Over the next century, the Assam oilfields played a key role in the British imperial economy. After decolonisation, these oilfields not only turned out to be the subject of intense competition in the regional economy, but also became centrally identified with questions of community rights. Immediately after independence, the Indian state encountered political opposition to its stake on oil from Assam. This happened at a time when the share of natural resources between the province and centre was still not well-defined. Such opposition continued until a later period, when an economic blockade, with the aim of restricting oil flows outwards from Assam, was successfully imposed as part of the assertion of regional politics. This also became a counter in the political negotiations between the Indian state and its federal province. As in the US, China and Iran, oil seeped out of the soil in India as well; British travelers in Assam reported such pools from 1825 onwards. Once fractionation technology was proved in the US, industrial refining of oil became feasible. Assam Railways & Trading Company Limited was registered in London in 1881 to exploit Assam's natural resources. It struck oil in exploitable volume near Digboi in 1889; at that point it transferred its oil interests to a separate company Assam Oil Company. AOC built a refinery in Digboi in 1901. AOC was taken over in 1917 by Burmah Oil Company, which later became Burmah Shell and then Shell. Expanded and modernized a number of times, the Digboi refinery continues to function till today. Today, Digboi boasts two energy wonders of the world—a hundred-year-old oil field that is still operational and the world's oldest operating oil refinery, which produces in excess of its capacity. Digboi Well No. 1 is preserved as a monument to the oil pioneers and their endeavours. Some important year and events in Assam related to oil industry are mentioned below:

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1866: Hydrocarbon exploration began in India when Mr. Goodenough of the Calcutta-based McKillop Stewart Co. drilled a well near Jaypore in Upper Assam and struck oil. He, however, failed to establish satisfactory production.

1867: H. B. Medicott of the Geological Survey of India (GSI) first started oil exploration in India in the Makum area of Assam. The most astounding Indian oil history was made on 26 March by Mr. Goodenough when he struck oil at 35.97 metres at Makum (with a total production of 1135.62 litres). It was Asia's first mechanically drilled well. Before this discovery, three wells had been drilled in Jaypore which encountered some gas but little oil.

1889-1893: The first taste of commercial success came when a well was struck at Digboi in 1889 by the Assam Railways & Trading Company (AR&T). AR&T subsequently acquired a 77.7 square kilometre petroleum-rights concession in the Makum area of Assam, and by 1893 had drilled 10 wells at Digboi producing 757.08 litres/day.

1917: The oil production in Assam, mainly from Digboi, at 43 bopd in 1901, trebled to 120 bopd in 1902. It further increased to 247 bopd in 1911, 435 bopd in 1917 and 5,500 to 7,000 bopd during the war years (i.e. the first half of the 1940s).

1953: Attock Oil Company AOC discovered oil in Nahorkatiya (Upper Assam) in 1953, the first oil discovery after independence.

1956: AOC discovered the Moran oil field (Southwest of Nahorkatiya, Upper Assam), the first deepest drilled well in Asia. The Oil and Natural Gas Division (within the Geological Survey of India) became the Oil and Natural Gas Commission (ONGC).

1964: ONGC discovered oil in Lakwa (Southwest of Moran, Upper Assam).

1968: ONGC discovered an oil field in Geleki in Assam.

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Principal,
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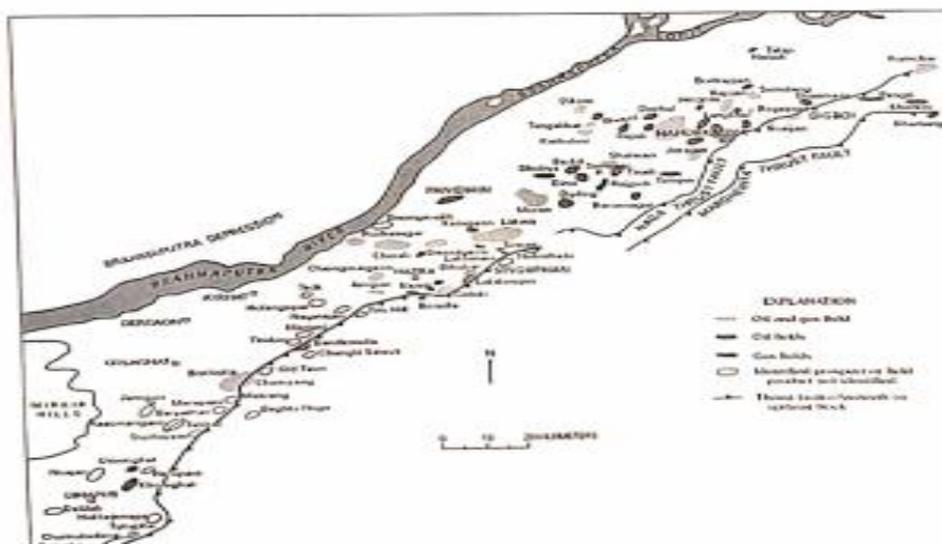


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GELEKI OIL FIELD:

Sivasagar District of Assam houses several Mining Lease (ML) areas for oil and gas exploration. The present request for Environmental Clearance pertains to drilling of eight (8) exploratory wells falling in 5 ML areas viz. Charali ML, Geleki ML, SE Geleki ML, Mekeypore-Santak-Nazira ML and Lakwa ML areas.

Charali Mining Lease (ML) is one of the important oil producing fields of ONGC situated in Sivasagar District of Assam. The area of this lease is 51.63 square kilometers. This ML area forms the part of North Assam shelf. A 20 years ML was obtained with effect from 20.03.1999 (Ref: MOPNG, Govt. of India, Letter No. O-12012/94/2002-ONG/D-IV, dated 29 th April-2002) and is valid upto 19.03.2019. Charali ML is highly prospective where oil and gas have been discovered and produced from a large stratigraphic column ranging from Barail Group to Girujan Formation. However there are areas within the ML which still have untapped hydrocarbons. These locations are proposed for exploiting these pools. In view of the above it is proposed to grant the environmental clearance at the earliest so that the drilling commitments as well post drilling evaluations could be carried out.



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Fig: Location of Geleki Oil Field with other identified prospects in Assam Geological Province.

Geleki and its satellite fields Mekeypore, Santak & Nazira are some of the important oil producing fields of ONGC situated in Sivasagar District of Assam. These areas form the part of North Assam shelf and had been producing hydrocarbons for more than three decades from Barails and Tipams. ONGC has received Mining Lease of these areas from MOPNG, Govt of India for exploring and producing hydrocarbons. The Mining Lease (ML) areas with their respective validity are - 1. Geleki ML (Area: 27.94 sq km, with effect from 16.08.1990 to 15.08.2030), 2. SE Geleki ML (Area: 20.5 sq.km, with effect from 30.01.2006 to 29.01.2026) and 3. Mekeypore-Santak-Nazira ML (Area: 77.0 sq km, with effect from 30.01.2006 to 29.01.2026). Reservoirs in different stratigraphic levels starting from various sand units of Barail Group (BMS, BCS sands) to sands within Tipam Group (TS-6, TS-5, TS-4, TS-3, TS-2 & TS-1) have been charged in different part of the MLs depending on favorable entrapment conditions. Shales/Claystones of within these formations and clays in Girujan & Namsang have acted as cap rock facies. Geleki ML is highly prospective where oil and gas have been discovered and produced from a large stratigraphic column ranging from Pre- Barails to Girujan Formation. However, there are areas within the ML which still have untapped hydrocarbons. These locations are proposed for these exploiting these pools.

Lakwa Mining Lease (ML) contains important oil producing fields of ONGC situated in Sivasagar District of Assam. The area of this lease is 172.49 square kilometers. This ML area forms the part of North Assam shelf and has been producing hydrocarbons for more than three decades from Barails and Tipams. A 20 years ML has been obtained with effect from 29.09.2008 and is valid upto 28.09.2028. So far, 681 numbers of wells (including exploratory and development wells) have been drilled in this mining lease with depths ranging from 2259m to as deep as 5113m. Lakwa Mining Lease is highly prospective where oil and gas have been discovered and produced from a large stratigraphic column ranging from Tura to Girujan Formation. However there are areas within the ML which still have untapped hydrocarbons. These locations are proposed for these exploiting these pools.

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DRILING FLUID:

Drilling fluid -mud - is usually a mixture of water, clay, weighing material and a few chemicals. Sometimes oil may be used instead of water, or oil added to the water to give the mud certain desirable properties. Drilling fluid is used to raise the cuttings made by the bit and lift them to the surface for disposal. But equally important, it also provides a means of keeping underground pressures in check. The heavier or denser the mud, is the more pressure it exerts. So weighing materials - barite - are added to the mud to make it exert as much pressure as needed to contain formation pressures. The equipment in the circulating system consists of a large number of items. The mud pump takes in mud from the mud pits and sends it out a discharge line to a standpipe. The standpipe is a steel pipe mounted vertically on one leg of the mast or derrick. The mud is pumped up the standpipe and into a flexible, very strong, reinforced rubber hose called the rotary hose or kelly hose. The rotary hose is connected to the swivel . The mud enters the swivel the swivel goes down the kelly, drill pipe and drill collars and exist at the bit. It then does a sharp U-turn and heads back up the hole in the annulus. The annulus is the space between the outside of the drill string and wall of the hole. Finally the mud leaves the hole through a steel pipe called the mud return line and falls over a vibrating, screen like device called the shale shaker. Agitators installed on the mud pits help maintain a uniform mixture of liquids and solids in the mud. If any fine silt or sand is being drilled, then devices called desilters or desanders may be added. Another auxiliary in the mud system is a device called degasser.

Functions of Drilling Fluids

In the early days of rotary drilling, the primary function of drilling fluids was to bring the cuttings from the bottom of the hole to the surface. Today it is recognized the drilling fluid has at least ten important functions:

A- Assists in making hole by:

1. Removal of cuttings
2. Cooling and lubrication of bit and drill string
3. Power transmission to bit nozzles or turbines

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B. Assists in hole preservation by:

4. Support of bore hole wall
5. Containment of formation fluids

C-It also:

6. Supports the weight of pipe and casing
7. Serves as a medium for formation logging

D-It must not:

8. Corrode bit, drill string and casing and surface facilities
9. Impair productivity of producing horizon
10. Pollute the environment.

Types of Drilling Fluids:

Many types of drilling fluids are used in industry. Major categories include air, water- and oil base fluids. Each has many subcategories based on purpose, additives, or clay states.

Water Based Muds:

Water based mud's consist of four basic phases;

- Water
- Active colloidal solids
- Inert solids
- Chemicals

Water is the continuous phase of any water-based mud. Primary function of the continuous phase is to provide the initial viscosity which can be modified to obtain any desirable rheological properties. The second function of the continuous phase is to suspend the reactive colloidal solids, such as bentonite, inert solids, such as barite. Water also acts as a medium for transferring the surface available hydraulic horsepower to the bit on the bottom of the hole. Water is also a solution medium for all conditioning chemicals which are added to the drilling fluid. In water

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based mud's, clay is added to increase density, viscosity, gel strength and yield point, and to decrease fluid loss. Clays used in water based drilling fluids are mainly in three groups:

- Montmorillonites (bentonite)
- Kaolinites
- Illites

Chemicals used in water based mud's can be grouped according to their functions as:

- Thinners
- Dispersants
- Deflocculants

Oil Based Muds

Oil based mud's has been defined as a system the continuous or external phase of which is any suitable oil. At the present time, there are two mud systems the external phase of which is oil, i.e., true oil mud's and invert emulsion mud's. True oil mud systems consist of the following components:

- Suitable oil
- Asphalt
- Water
- Emulsifiers
- Surfactants
- Calcium hydroxide
- Weighting materials
- Other chemical additives

Among all of these, only oil and asphalt are necessary for the proper functioning of oil mud's. The others are only used for the purpose of enhancing and stabilizing rheological properties and plastering characteristics.

Different types of oils have been used as the continuous phase in oil mud's. The following commonly available oils have gained widespread acceptance:

- Lease crude oil
- Refined oils

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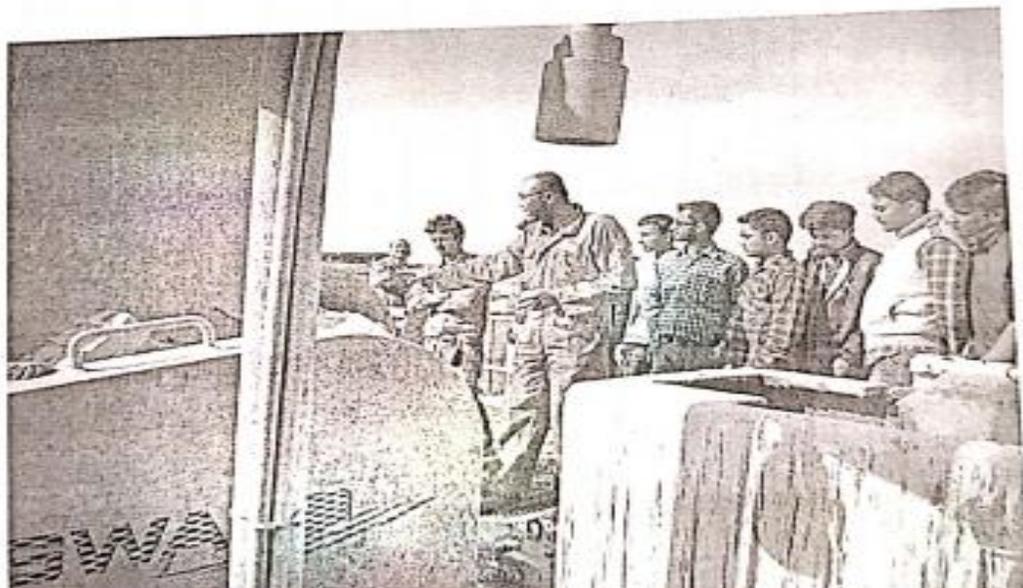
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Our journey:

The day after, it was waiting for. Planning for week long was going to turn into execution. A group of our so called "senior most students" of our department were the organizers of the picnic cum educational tour to Geleki. We had so many duties that had to be done for our tour. Managing the tour bus, shopping the food items, the utensils, and so on.

All the preparations were done. The bus was house packed with all the students of our department.

At last bus stopped at the destination. Our teachers asked us to visit oil fields which were much important in the tour. As we travelled down the road, we saw various spots where fumes were glowing like the superior sun. Those were oil fields. We went to the destinations and the senior staffs in the job explained to us the various mechanisms going on in the huge mechanisms in the field. We were much lucky to get such a good opportunity to get that valuable knowledge from the senior people.



Report of Visit to Geleki Oil Fields by students of Dept of Chemistry [Page 10]


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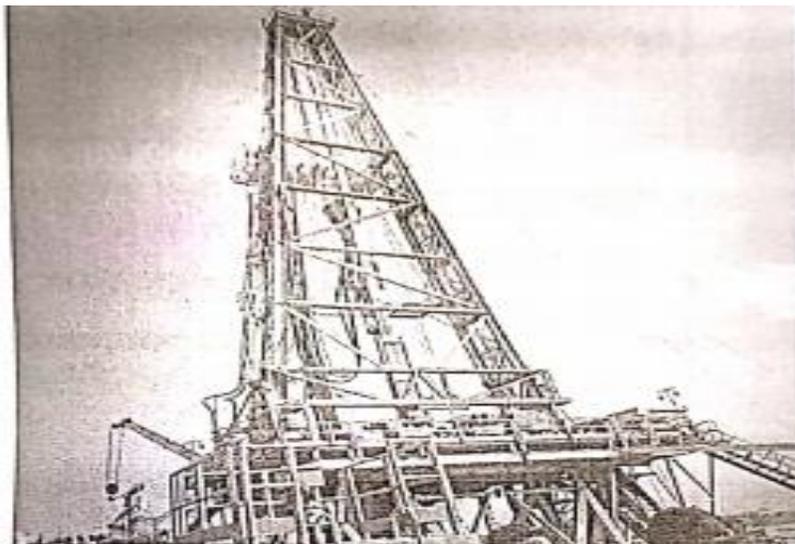


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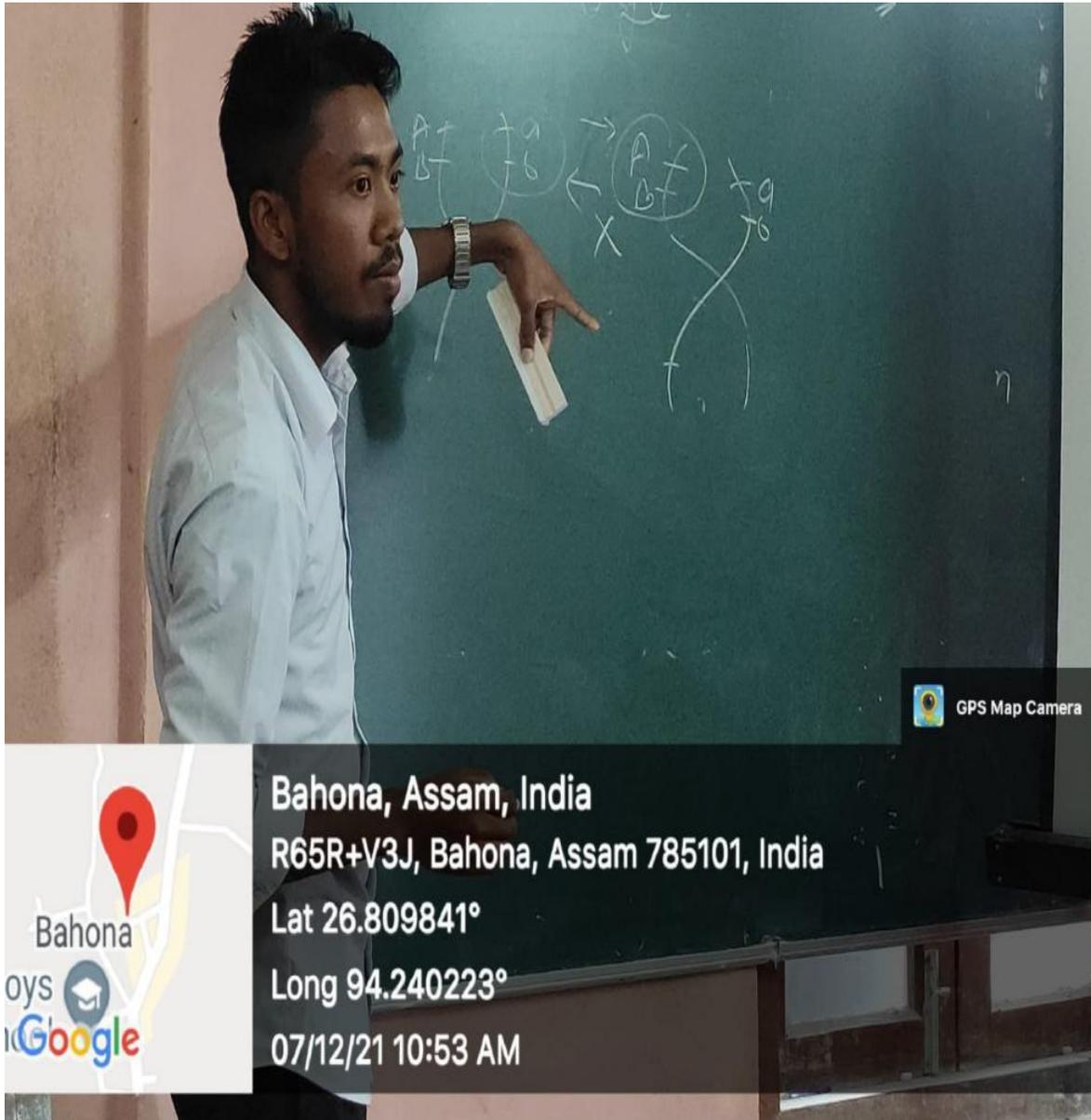



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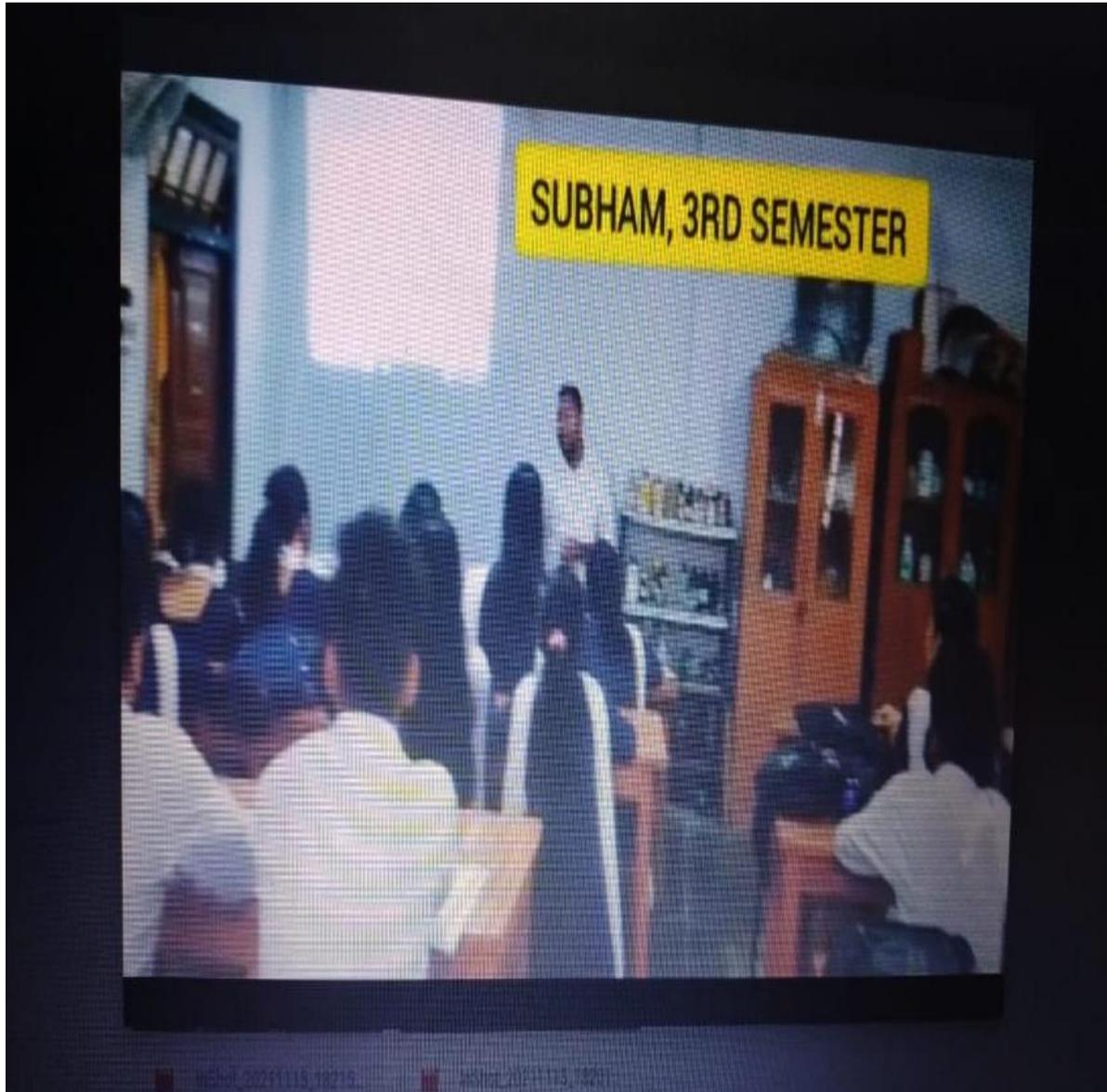



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Sustainable and cost-effective waste water treatment in rural areas

Swarajdeep Saikia¹, Anil Engti¹
Sangeeta Das¹

Registration No.:- SKMU-DCN/CONF2019:047

¹Department of Botany, Bahona College, Jorhat, Assam, India. PIN: 785101.
Corresponding author email-ID: sangeeta.ranidas@gmail.com

ABSTRACT
Wastewater contains lots of organic matter and the three main nutrients for plant growth and development like nitrogen, phosphorus and potassium. The nutrients in domestic wastewater and organic household waste can be utilized to produce enough food for the world population. However, taking decisions on sustainable and cost-effective waste-water treatment system is a real problem in India specifically in rural areas. Therefore, the main purpose of this paper is to provide information as well as guidance on taking decisions for an efficient and cost-effective wastewater management system in rural areas. Specifically, the paper aims to inform on the various cost-effective and sustainable options for wastewater collection and their treatment and offers guidance to select appropriate system for sanitation and wastewater management. This paper briefly reflects the sustainability analysis of wastewater treatment system such as recycling. The main focus is on sustainable technologies for wastewater treatment which may be beneficial for both rural and urban areas.

Keywords: Sustainability, water, waste, cost-effective.

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SYNTHESIS OF SOME POTENT INTERMEDIATES FOR HETEROCYCLES

(Winter Research Program: Dec' 2016 –Jan'2017)

Submitted by,

Chayanika Dutta

B.Sc. 6th sem, Bahoma College,

Jorhat; Assam



Carried out under the Supervision of

Dr. Pranjal Gogoi

Scientist, Applied Organic Chemistry Group

Chemical Science and Technology Division

CSIR-North East Institute of Science & Technology

Jorhat-785006, Assam

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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Declaration

I, Ms. Chayanika Dutta, winter trainee, Chemical Science and Technology Division, CSIR-North East Institute of Science and Technology, Jorhat-785006, Assam, declare that this report entitled "SYNTHESIS OF SOME POTENT INTERMEDIATES FOR HETEROCYCLES" is the result of my winter project. The duration of this project is Dec' 2016- Jan' 2017. I have carried out my project work under the guidance of Dr. Pranjal Gogoi, scientist, Applied Organic Chemistry Group, Chemical Science and Technology Division, CSIR-North East Institute of Science and Technology. I have fulfilled all the requirements for this winter project.

Chayanika Dutta
Chayanika Dutta.

CERTIFICATE
TO WHOM IT MAY CONCERN

It is to certify that Chayanika Dutta, a student of BAHONA COLLEGE, JORHAT of B.Sc. 6th semester has completed a project report on "SYNTHESIS OF SOME POTENT INTERMEDIATES FOR HETEROCYCLES" under my guidance and supervision. She has fulfilled the requirement laid down in the project report.

Pranjal Gogoi
(Dr. Pranjal Gogoi)

Scientist, Applied Organic Chemistry Group
Chemical Science and Technology Division
CSIR-NEIST, JORHAT

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(Dr. P.K. Dutta)
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ACKNOWLEDGEMENT

The preparation and completion of this report is not an individual effort. This gives me immense pleasure to express my sense of gratitude to **Dr. Pranjal Gogoi**, outstanding scientist, Applied organic Chemistry Division, CSIR-NEIST for his individual guidance, suggestions and encouragement throughout my whole project. I express my deepest sense of gratitude for giving me his valuable time and support.

I express my gratefulness to Dr. D. Ramaiah, Director, CSIR-NEIST, Jorhat, for allowing me and providing with the laboratory facilities to carry out my winter project work.

I also acknowledge the help and support rendered by head of the Applied Organic Chemistry Group, Chemical Science and Technology Division, CSIR-NEIST, Dr. P.J. Bhuya and the entire scientific staff for their constant encouragement.

The project would not have been possible for me without the help and support of Limi ba, Kashmiri ba, Aswini da, Avilash da and Kumud da. I have been very fortunate to be around very pleasing and helpful people who were always there to help me in any kind and make me feel comfortable in a completely new environment.

Last but not the least, I would take the opportunity to thank my parents for their innumerable support through everything I do.

Chayanika Dutta.

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10. Conclusion
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ABBREVIATIONS USED

1. DCM : dichloromethane
2. DMF : dimethylformamide
3. Et : ethyl
4. g : gram
5. h : hour
6. TLC : Thin layer chromatography
7. Me : methyl
8. Min : minute
9. mg : miligram
10. mol : mole
11. IR : infrared
12. NMR : nuclear magnetic resonance
13. R_f : Retension Factor
14. Hz : Hertz
15. MHz : Mega Hertz
16. °C : Degree centigrade

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GENERAL INTRODUCTION

The main focus of this project is the synthesis of β -chloro- α,β -unsaturated aldehyde as intermediate which could be used as a synthon for various heterocycles. Most of the biologically active compounds are comprised of heterocycles, many of which are employed in regular chemical practice. The heterocyclic compounds are widely distributed in nature and play a vital role in the metabolism of all living cells. Some of these are natural products; for example, antibiotics such as penicillin, cephalosporin; alkaloids such as quinine, morphine and reserpine etc.

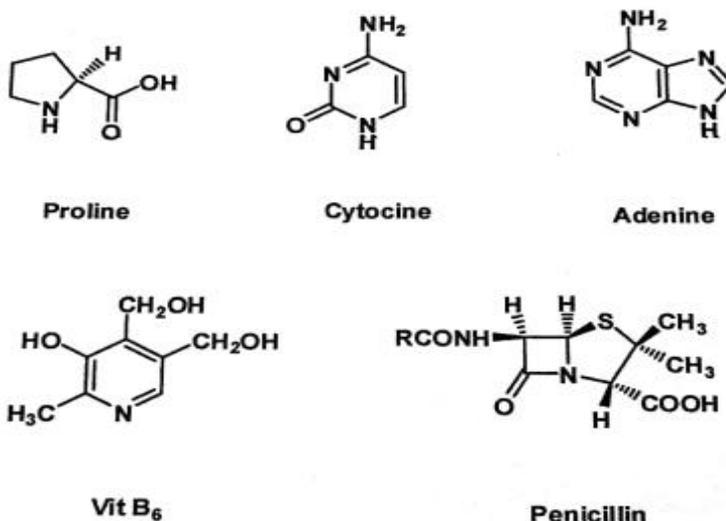


Fig 1: Structures of some biologically important molecules containing heterocyclic ring

In addition, synthetic heterocyclic compounds are also found in various drugs and they exhibit various activities such as anticancer agents, hypnotics, modifiers, veterinary products, agrochemicals etc.

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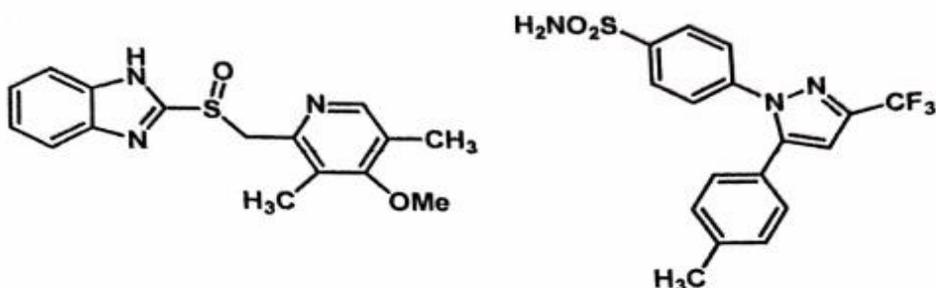


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Omeprazole(antiulcurative)

Celecoxib(antiarthritic)

Fig 2: examples of some drugs containing heterocyclic ring

The β -halo aldehydes are very interesting compounds, which could be transformed to various fused heterocycles by using the reactivity of halide for nucleophilic substitution in combination with the various possibility of transformation of aldehyde functionality. Some examples of β -chloro- α , β - unsaturated aldehyde are shown in Fig 3.

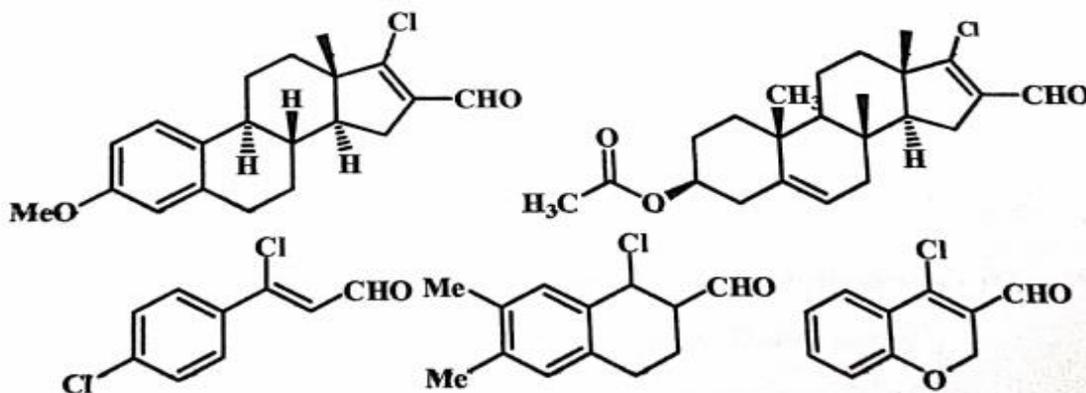


Fig 3: Examples of some β -chloro- α , β - unsaturated aldehydes

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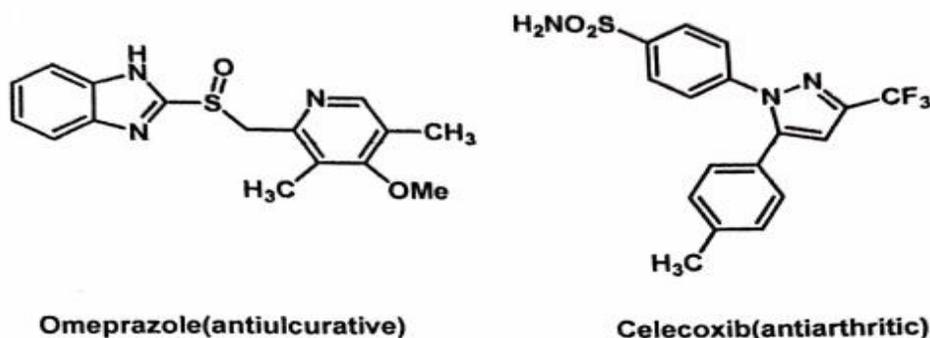


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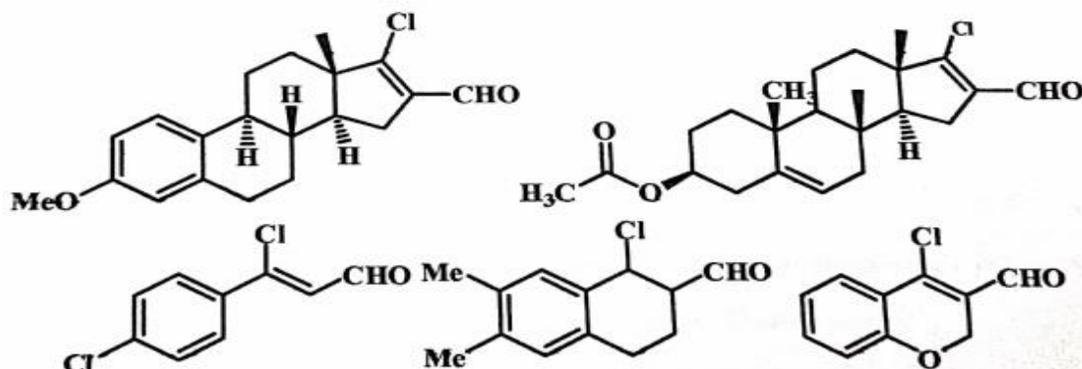


Fig 3: Examples of some β -chloro- α, β - unsaturated aldehydes

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β -Chloro- α,β -unsaturated aldehyde (chloroformyl): The β -chloro- α,β -unsaturated aldehyde (chloroformyl) has been explored as synthetic synthon for different heterocycles as shown in fig 4. They have been used for the synthesis of various heterocycles such as pyridine, pyrimidines, thiophene, furan, coumarin etc.

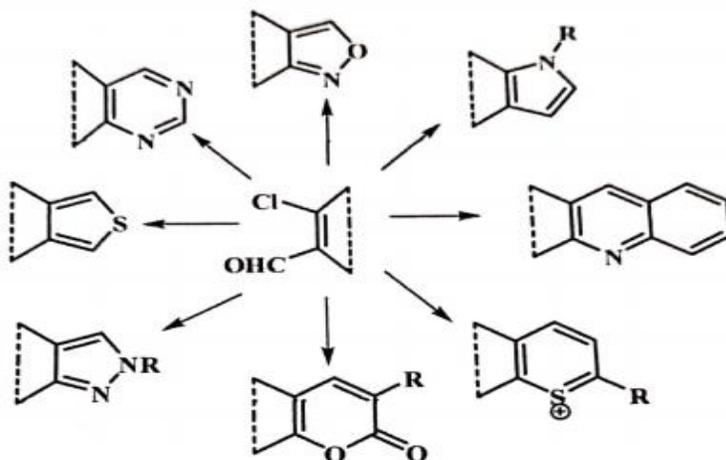
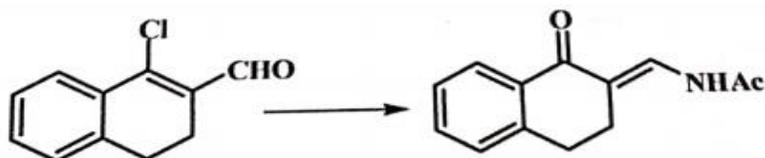


Fig 4: Some synthetic applications of β -chloro- α,β -unsaturated aldehyde

SOME SYNTHETIC APPLICATIONS OF CHLOROVINYL ALDEHYDE:

1. **Synthesis of β -ketoenamide:** 1-Chloro-3,4-dihydronaphthalene-2-carboxaldehyde can be used as starting material for the synthesis of ketoenamide.



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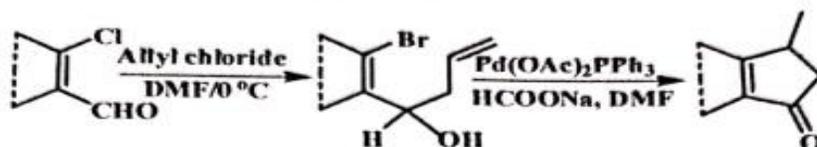



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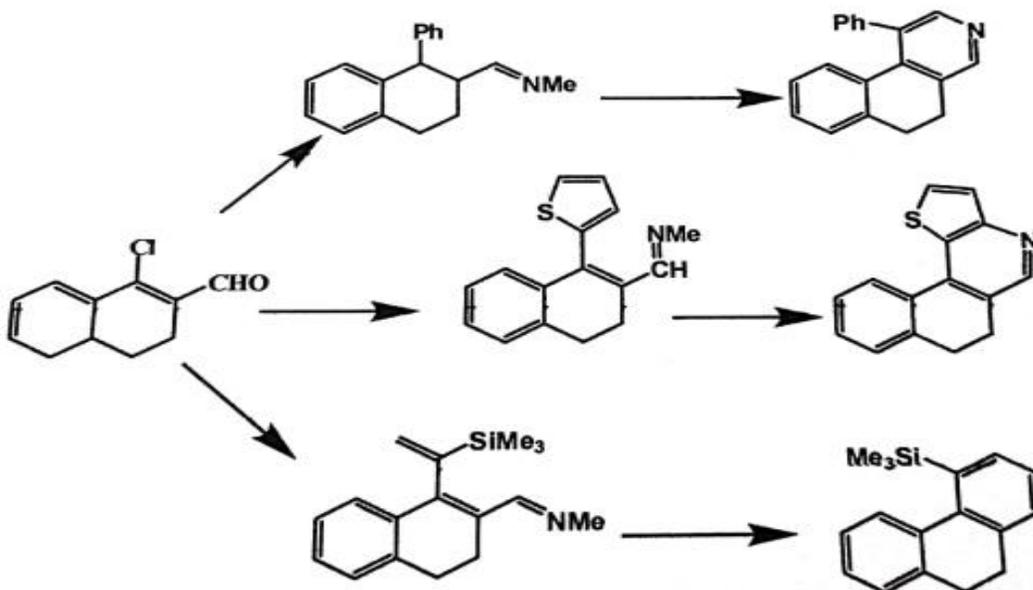


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2. Synthesis of cyclopentanone containing fused rings: Fused carbocycles can be synthesized from chlorovinyl aldehyde.



3. Synthesis of 5,6-dihydrobenz isoquinoline: Using 1-chloro-3,4-dihydronaphthalene-2-carboxyaldehyde as starting materials, 5,6-dihydrobenz isoquinolines can be synthesized.



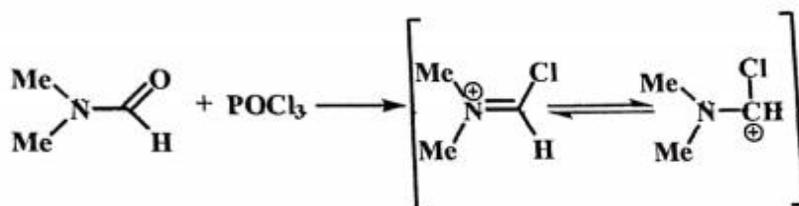
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VILSMEIER-HAACK REACTION

The Vilsmeier- Haack reaction (also called the Vilsmeier reaction) is the chemical reaction of a substituted amide with phosphorous oxychloride and an electron-rich arene to produce an aryl aldehyde or ketone. In 1927, Vilsmeier and Haack discovered that N,N-dimethylformamide formylated aniline derivative in presence of phosphorous trichloride. The classical Vilsmeier Haack reaction involves electrophilic substitution of a suitable carbon nucleophile with a chloromethyleneiminium salt. Chloromethyleneiminium salt is prepared by treating DMF with POCl_3 , at a low temperature.



Vilsmeier reaction is one of the most widely used reactions especially for formylation of various organic substrates in organic chemistry. It plays an important role in the conversion of organic compounds into its corresponding chlorovinyl aldehydes.

Due to the importance of chlorovinyl aldehydes in synthesis of various organic compounds, it is important to synthesize these compounds. Therefore, I have synthesized some chlorovinyl aldehydes using various acetophenones as starting materials.

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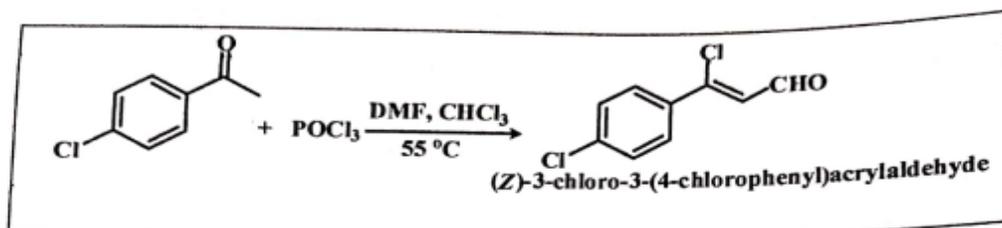
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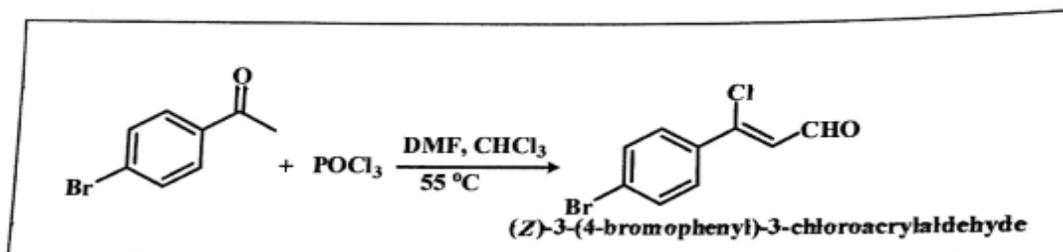
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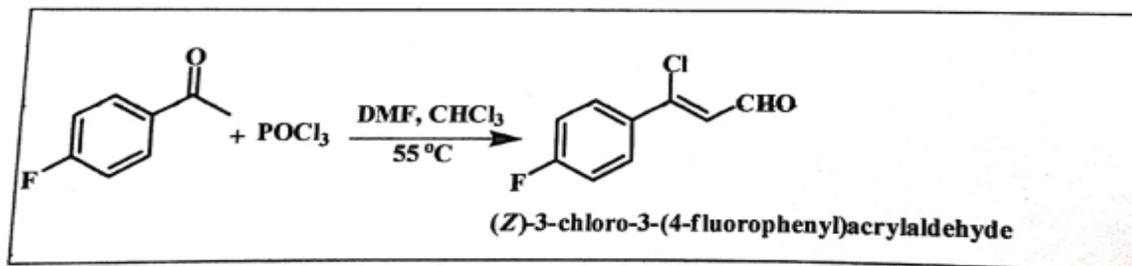
Scheme 1: Preparation of (Z)-3-chloro-3-(4-chlorophenyl)acrylaldehyde from 4'-chloroacetophenone.



Scheme 2: Preparation of (Z)-3-(4-bromophenyl)-3-chloroacrylaldehyde from 4'-bromoacetophenone.



Scheme 3: Preparation of (Z)-3-chloro-3-(4-fluorophenyl)acrylaldehyde from 4'-Fluoroacetophenone.



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General procedure for the preparation of β -chloro- α,β -unsaturated aldehyde:

A solution N, N-dimethylformamide (0.7 ml, 10 mmol) in anhydrous chloroform (15 ml) was cooled in ice bath. Phosphorous oxychloride (0.46 ml, 5 mmol) was added drop-wise over a period of 10 minutes. The resulting white suspension was warmed to room temperature and stirred for another 30 minutes. A solution of acetophenone (0.13 ml, 1 mmol) in chloroform (15 ml) was added drop-wise and the reaction mixture was refluxed for three hours. The reaction mixture was then poured into ice water. NaHCO_3 was carefully added to neutralize the acids and the mixture was extracted with chloroform (three times). The organic part was then washed with cold water followed by dried over sodium sulphate. The crude was purified using column chromatography [silica gel (60-120 mesh)]

CONCLUSION

We have synthesized some β -chloro- α,β -unsaturated aldehydes using various substituted acetophenones. All the products were isolated with satisfactory yields and characterised by ^1H and ^{13}C NMR. The synthesized β -chloro- α,β -unsaturated aldehydes could be used as intermediates for the synthesis of various heterocyclic compounds.

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Bahona College




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Project Title:

**To study the major nutrients content in
three different types of Organic Manures**

Raktim Dutta
Department of Chemistry
Bahona College
Jorhat

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Acknowledgement

The project work at **Tocklai Tea Research Institute** was a great privilege and opportunity for me to learn many things regarding activities of a Chemistry Lab. I would like to offer my heartiest thanks to Dr. A K Barooah, Director, Tocklai Tea Research Institute, for giving permission to work in this institute and liberty to access various facilities in the laboratory.

I also express my gratitude to Dr. Raktim Pal, Senior Scientist and In-charge, Analytical Service Department, for his valuable suggestions, encouragement and support during the course of the project.

It is a great pleasure to offer my gratitude and express my deep appreciation and indebtedness to my supervisor Mr. P.K Dutta, Sr. Technical Officer, Analytical Service Department, Tocklai Tea Research Institute, Jorhat, for his valuable guidance. It was a wonderful experience for me to work under his supervision. His necessary suggestions and advices during preparation of the project are duly acknowledged.

At last but not the least, I would like to express my sincere gratitude to the faculty members of Chemistry Department, Bahona College, especially Head of the Department Dr. Parinita Borah, for recommending me for this summer research training at Tocklai Tea Research Institute.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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August 3, 2017

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This is to certify that **Sri Raktim Dutta**, who is pursuing B. Sc., Chemistry, (5th Sem), from Bahona College, Jorhat, has successfully completed his Training Programme on the topic of **"To study the major nutrients content in three different types of organic manures"** under the supervision of Mr. P.K. Dutta, Sr. Technical Officer and Dr. R. Pal, Sr. Scientist & Incharge, of the Department of Analytical Service of this institute for the period of June - July, 2017.

He was found to be sincere, hardworking, technically sound and result oriented. He worked well as a part of the team during the period.

We wish him success in future.


Administrative Controller

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- 2. Introduction**
- 3. Materials and Methods**
- 4. Results and discussion**
- 5. Summery and conclusion**
- 6. References**

Abstract

A study was undertaken to determine the major nutrient contents (N, P, K) in three different organic manures viz. Vermicompost, Decomposed cattle manure and a commercial Organic manure sample collected from different sources. The samples were analysed by standard methods and test results were compared for their nutrient contents. Amongst the three organic manures analysed Vermicompost was found to be rich in terms of nutrient contents followed by Decomposed cattle manure.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Introduction

Manures may be defined as materials which are organic in origin, bulky and concentrated in nature and capable of supplying plant nutrients and improving soil physical environment having no definite chemical composition produced from animal, plant and other organic wastes and by products.

Organic manures are included well rotten farm yard manure (FYM), compost, vermicompost, green manures etc. Generally farm yard manures and composts are the decomposed products of agricultural by-products (animals and crops). Whereas green manures may be defined as materials which are un-decomposed green plant tissues susceptible to decomposition in the soil after incorporation.

The objective of organic cultivation is to have an ecologically sustainable plantation, aimed at the conservation of ecology and natural habit without polluting soil, air and water. So, Organic farming is a method of crop and livestock production that involves much more than choosing not to use pesticides, fertilizers, genetically modified organisms, antibiotics and growth hormones.

Organic manures are of different types i.e. mainly **bulky** and **concentrated** in nature

Bulky organic manures generally contain fewer amounts of plant nutrients as compared to concentrated organic manures. The concentrated organic manures are mainly derived from raw materials of animal or plant origin.

The amount of nutrients content varies with the nature and kind of manures. No definite composition of NPK and other micro-nutrients can be given. However, all oil cakes either edible or non-edible contains differential amount of N, P and K etc.

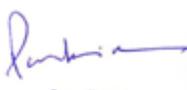
Concentrated organic manure may be defined as a material of organic origin derived from raw materials of animal or plant, without bulky in nature having no definite composition of plant nutrients.

Some most common such organic manures are oil cakes "edible to cattle (e.g. mustard oil cake, groundnut oil cake, till oil cake etc.) and non-edible to cattle (e.g. neem oil cake, mahua oil cakes etc.); blood-meal, fish manure, bone meal etc.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Materials and Methods

(A) DETERMINATION OF MOISTURE CONTENT IN ORGANIC MANURE

(a) Equipments and Apparatus:

1. Balance
2. Hot air oven
3. Porcelain crucible

(b) Procedure:

5g of the fresh organic manure sample (in replicate) was accurately weighed in previously weighed clean, dry porcelain crucibles. The crucibles were placed in a hot air oven at 105°C for overnight, and then transferred to a desiccator for cooling. The dry weight of the samples was taken to a constant mass. The loss in mass is the moisture content.

(c) Calculation:

The moisture content was calculated by using the following formula:

$$\% \text{ Moisture content (on fresh weight basis)} = \frac{W2 - W3}{W2 - W1} \times 100$$

Where, W1 is the weight of the empty basin

W2 is the weight of the fresh sample with basin

W3 is the weight of the sample with basin after drying

(B) DETERMINATION ORGANIC MATTER IN ORGANIC MANURE

(a) Equipments and Apparatus:

1. Balance
2. Hot air oven
3. Porcelain crucible

(b) Procedure:

5g of well mixed fresh organic manure sample (in replicate) was weighed in a previously clean dry silica crucible. The crucible was placed in a muffle furnace at 550°C for four hours. The crucible was removed from the furnace when temperature goes down below 200°C and allowed to cool in a desiccator and weighed to constant mass. The residue represents the ash and loss in mass represents the moisture and organic matter.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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(c) Calculation:

The organic matter content was calculated by using the following formula:

$$\% \text{ Organic matter content} = 100 - M - Z$$

Where, M is the moisture content in the sample and
Z is the total ash content

(C) DETERMINATION OF pH:

(a) Equipments and Apparatus:

1. Weighing balance
2. pH meter (Fig-1)



Fig-1: pH meter

3. Horizontal rotary shaker
4. Conical flask (capacity-100ml)
5. Beaker (capacity-100ml)
6. Measuring cylinder (capacity-50ml)

(b) Principle: pH is a measure of hydrogen ion concentration in a solution. Mathematically it is the negative logarithm of hydrogen ion concentration.

$$\text{pH} = -\log[\text{H}^+]$$

A pH meter is used to measure the hydrogen ion activity in aqueous solutions, indicating its acidity or alkalinity express as pH. The pH meter measures the difference in electrical potential developed between a glass electrode and a reference electrode (calomel electrode). The difference in electrical potential relates to the pH of the solution.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(c) Procedure:

20 g of test sample (air dried and sieved) is taken into a 100ml conical flask and added 50 ml of distilled water of pH 7.00 with a measuring cylinder. The content was shaking on a horizontal rotary shaker for 30 minutes. The suspension was transferred into a beaker and immersed the combine electrode into the suspension. The pH of the samples was measured in the digital pH meter after calibrating the same with standard buffer solution of pH 7.00 and 4.00.

(D) DETERMINATION OF CARBON IN TEST SAMPLE:

(a) Reagents and Apparatus:

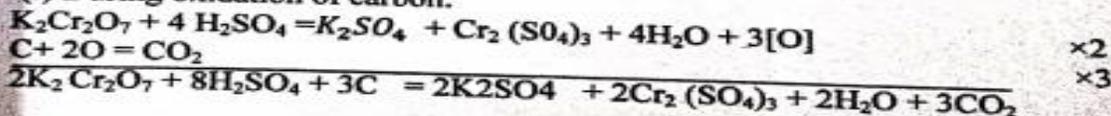
1. Weighing balance
2. Conical flask (500ml capacity)
3. Volumetric flask (capacity-1000ml)
4. Burette (capacity-50ml)
5. Pipette (capacity-10ml)
6. 1N Potassium dichromate solution
7. Concentrated sulphuric acid (98%)
8. Distilled water
9. Solid sodium fluoride
10. Diphenylamine
11. 0.5N Ammonium ferrous sulphate solution

(b) Principle:

The sample is treated with a known excess volume of standard $K_2Cr_2O_7$ solution in presence of concentrated H_2SO_4 . The $K_2Cr_2O_7$ reacts with the H_2SO_4 to produce nascent oxygen which oxidizes carbon to CO_2 . The heat of dilution of the acid facilitates the reaction. The excess unused $K_2Cr_2O_7$ is titrated back against a standard solution of ferrous ammonium sulphate in presence of orthophosphoric acid and NaF using diphenylamine indicator. At the end point of titration the colour changes through blue to green. The NaF flocculates the sample particles in suspension and orthophosphoric acid sharpens the colour change at end point.

(c) Reaction:

(i) During oxidation of carbon:



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



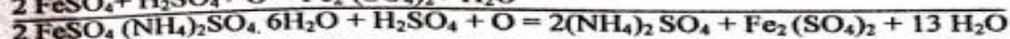
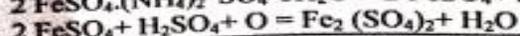
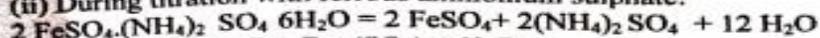
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(ii) During titration with ferrous ammonium sulphate:



(d) Procedure:

0.50g of test sample is taken into a 500ml conical flask and added 10ml of 1N Potassium dichromate solution. Then 20ml of sulphuric acid is added to the above mixture and mixed the content gently for one minute. Then the content is allowed to stand for 20-30 minutes for complete the reaction and then the mixture is cooled down to the room temperature. Then 170ml of water is added to the mixture. Then 0.2g of sodium fluoride and 10ml of orthophosphoric acid is added to the content and shaken gently. Finally 30 drops of diphenylamine indicator is added to the content and titrated against 0.5N Ammonium ferrous sulphate solution taken into a burette.

(e) Calculation:

$$\% \text{ Carbon} = \frac{(B - S) \times 3.869}{S \times w}$$

Where, B is the volume (in ml) of 0.5N Ammonium ferrous sulphate solution consumed in titration with blank determination

S is the volume (in ml) of 0.5N Ammonium ferrous sulphate solution consumed in titration with sample determination

W is the sample taken for test in gram

(E) NITROGEN IN ORGANIC MANURE

(a) Equipments, Apparatus and Reagents :

1. Weighing Balance
2. Kjeldahl digestion unit
3. Kjeldahl distillation unit.
4. Burette and pipette
5. Conc. Sulphuric acid salicylic acid mixture
6. Catalyst mixture (Potassium sulphate & Copper sulphate in 10:1 ratio)
7. Sodium hydroxide solution 45%
8. Hydrochloric acid or Sulphuric acid 0.1N
9. Boric acid 4%
10. Mixed indicator solution
11. Glass bead

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
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Bahona College, Jorhat
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(b) Procedure:

(i) **Digestion:** 0.20g of air dried and ground organic manure sample is taken in 100ml digestion tube. To it added 4g of catalyst mixture and then added 10ml of Conc. Sulphuric acid with rotating the flask to ensure complete contact of the acid with the sample. The mixture is shaken for some time after adding a few glass bid to avoid bumping and then placed in Kjeltac block digestion unit by raising the temperature from 250°C to 400°C in 15min and finally kept at 400°C for 45min. Then the content is allowed to cool. The digested mixture is transferred to a 300ml Kjeldahl flask quantitatively and diluted accordingly.

(ii) **Distillation:** 25ml of 4% boric acid solution is pipette out in a receiver flask and added 5 drops of mixed indicator solution. The flask is connected to the distillation apparatus so that the end of the delivery tube is dipped into the boric acid solution. Then the Kjeldahl flask containing the digested material is connected to the distillation apparatus and added about 50ml of 45% Sodium hydroxide solution it in such a way that it runs downs to the bottom of the flask without mixing. The mixture is heated for boiling and continued distillation steadily till about 150ml of the distilled have been collected.

(iii) **Titration:** The distillate is titrated against 0.1N HCl or H₂SO₄ till the blue color just disappears and tends to turn pink. A blank was done without adding the substance under analysis and titrated in the same way.

(c) Calculation:

$$\% \text{ Total N} = \frac{(T - B) \times S \times 0.014 \times 100}{W}$$

Where, T is the volume of standard acid used in the titration of sample determination

B is the volume of standard acid used in the titration of blank determination

S is the strength of the standard acid used in the titration

W is the weight of the sample in gram taken for the test

(F) PHOSPHOROUS AND POTTASIAM IN ORGANIC MANURE

(a) Apparatus and reagents:

1. Weighing Balance
2. Colorimeter
3. Flame photometer
4. Volumetric flask (Capacity-250ml & 50ml)
5. Whatman No 42 filter paper
6. Reference standard of Phosphorous and Potassium
7. Concentrated nitric acid

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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8. Perchloric acid
9. Ammonium molybdate
10. Concentrated hydrochloric acid
11. Stannous chloride

(b) Digestion:

0.50g of air dried and sieved test sample was taken in a conical flask and added gently 30ml of Conc. Nitric acid and 5ml Perchloric acid and boiled the mixture on a hot plate until dense white fumes ceases to form. The mixture is cooled and transferred the digested material to a 250ml volumetric flask, diluted with distilled water and made the volume up to the mark. Then mixed well and filtered using Whatman No.42 filter paper. The filtrate is used for the determination of phosphorous and potassium.

(c) Determination of Phosphorous:

(i) Principle:

The determination of phosphorous is based on Lambert and Beer's law using a colorimeter or a spectrometer.

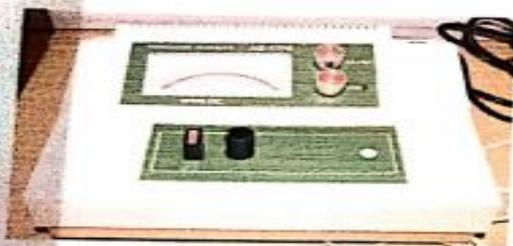


Fig-2(a): A ERBA colorimeter

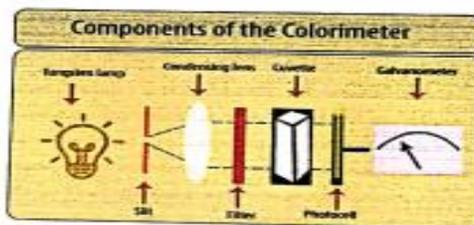


Fig-2(b): Component of a colorimeter

When light falls upon a homogeneous medium a portion of the incident light is reflected, a portion is absorbed within the medium, and the remainder is transmitted. If the intensity of the incident light is expressed by I_0 , that of the absorbed light I_a , that of the transmitted light by I_t and that of the reflected light by I_r , then:

$$I_0 = I_a + I_t + I_r$$

As per Lambert law, when monochromatic light passes through a transparent medium, intensity of the emitted light decreases exponentially as the thickness of the absorbing medium increases, arithmetically express by

$$I = I_0 e^{-kx} \text{----- (i)}$$

Where, k is the constant for the wavelength and absorbing medium used,

(Dr. P.K. Dutta)
Principal,
Bahona College



Coordinator
IOAC
Bahona College, Jorhat
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I is the light intensity after it passes through the medium, and x is the thickness of the absorbing medium.
As per Beer law, the intensity of a beam of light decreases exponentially as the concentration of the absorbing substance increases, now replacing the constant k of Lambert law by its equivalent ϵc for solution, we can sum up the two laws into a single equation as,

$$I = I_0 10^{-\epsilon c x} \text{ ----- (ii)}$$

Where c is the concentration of the solute in moles/litre and ϵ is a constant characteristic of the solute but independent of its concentration in solution. This constant is known as molecular absorption coefficient.
Equation (ii) may be put in the form:

$$\text{Log } I_0 / I = \epsilon c x \text{ ----- (iv)}$$

The quantity $\text{log } I_0 / I$ is called *optical density D*, or *absorbance A* or *extinction E*.

Experimental measurements are usually made in terms of **transmittance (T)**, which is defined as:

$$T = I / I_0$$

where I is the **light intensity** after it passes through the sample and I_0 is the **initial light intensity**. The relation between absorbance A and transmittance T is:

$$A = \text{log } 1/T = \text{log } (I_0 / I)$$

(ii) Procedure:

1ml of filtrate as prepared in F (b) is transferred to a 50ml of volumetric flask then 10ml of ammonium molybdate solution is added to it. Little amount of water is added to the above content and then 1ml of stannous chloride is added to it. The volume is made up to 50ml mark by adding distilled water and then the content is shaken well to complete the formation of blue colour. Then the intensity of colour develop is measured in a previously calibrated colorimeter to find the concentration of phosphorous in the test samples

(iii) Calculation:

The concentration of phosphorous in the sample extract is obtained by comparing its absorbance/Transmittance reading with the standard curve. The result are expressed as % of P_2O_5

$$\% \text{Phosphorous (as } P_2O_5) = \frac{SR \times V_1 \times V_3 \times 2.29}{W \times V_2 \times 10000}$$

Where, SR is the sample reading from standard curve as P (mg/kg)

V_1 is the original volume of the extractant (in ml)

V_2 is the volume of extractant taken for the test (in ml)

V_3 is the final volume of the extractant (in ml), and

W is the weight of the test sample taken (in gram)

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
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(d) Determination of Potassium:

(i) Principle: The determination of Potassium is based on flame emission spectroscopy by using a flame photometer.



Fig-3a: A Corning Flame Photometer

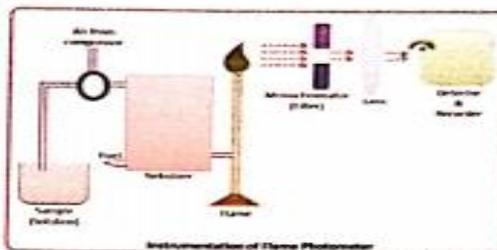


Fig-3b: Schematic diagram of a Flame photometer

The absorption and emission of radiant energy by atoms provide strong analytic determination, qualitatively and quantitatively. In flame emission spectroscopy, the concentration of the analyte present in sample is proportional to the intensity of the emitted radiation.

Let us consider a simplified energy level, where E_0 represent the ground state in which the electrons of an atom are at their lowest energy level and E_1, E_2, E_3 etc represent higher energy levels.

Transitions between two quantized energy levels, say from E_0 to E_1 , correspond to the absorption of radiant energy, and the amount of the energy absorbed (ΔE) is measured by Borh's equation

$$\Delta E = E_1 - E_0 = hv, \text{ Where } h = \text{plank's constant and } v = \text{frequency of radiation}$$

Clearly, the transition from E_0 to E_1 corresponds to the emission of radiation of frequency v .

The intensity of the light emitted could be described by the Scheibe-Lomakin equation:

$$I = k \times c^n$$

Where:

I = Intensity of emitted light

C = the concentration of the element

k = constant of proportionality

$n \sim 1$ (at the linear part of the calibration curve)

Then,

$$I = k \times c$$

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(Dr. P.K. Dutta)
Principal,
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IOAC
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That is the intensity of emitted light is directly related to the concentration of the sample.

(ii) Procedure:

The filtrate as obtained in F(b) is subjected to flame photometer for determination of potassium after calibrating the same with standard Potassium solution.

(iii) Calculation:

The concentration of potassium in sample extract is obtained by comparing the flame photometer reading with the standard curve. The results are express as % K_2O

$$\% \text{Potassium (as } K_2O) = \frac{SR \times V_1 \times V_3 \times 1.2}{W \times V_2 \times 10000}$$

Where, SR is the sample reading from standard curve as K (mg/kg)

V_1 is the original volume of the extractant (in ml)

V_2 is the volume of extractant taken for the test (in ml)

V_3 is the final volume of the extractant (in ml), and

W is the weight of the test sample taken (in gram)

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(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Result and discussion

The tests results are given in table-1:

Table-1

Sample identity	Moisture content* (%)	Organic matter content* (%)	pH (1:2.5)	Total nutrient content % (w/w)**				C N Ratio
				Nitrogen as N	Phosphorous as P ₂ O ₅	Potassium as K ₂ O	Organic carbon	
(1) Vermi compost	66.74	13.55	6.73	1.04	2.34	1.69	17.19	16.5:1
(2) Decomposed cattle manure	49.47	10.43	6.77	0.81	0.20	0.19	10.07	12.4:1
(3) Commercial Organic manure	3.35	58.82	7.44	0.11	0.08	0.05	0.13	1.2:1

*On fresh weight basis; ** on air dry weight basis

The pH of the samples (1) Vermicompost and (2) Decomposed cattle manure are found to be slightly acidic in nature, whereas the sample (3) Commercial organic manure is found to be alkaline in nature (Fig-4).

The organic matter content is found to be very high in Commercial organic manure sample; however it is moderate in case of Vermicompost & Decomposed cattle manure (Fig-5).

The organic carbon level is found to be high in Vermicompost and Decomposed cattle manure samples, however it is very poor in Commercial organic manure sample (Fig-5).

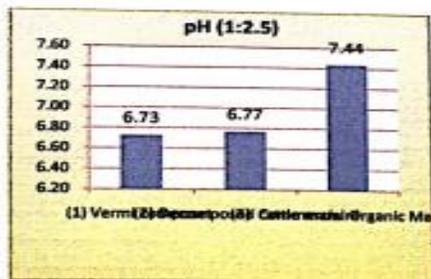


Fig-4

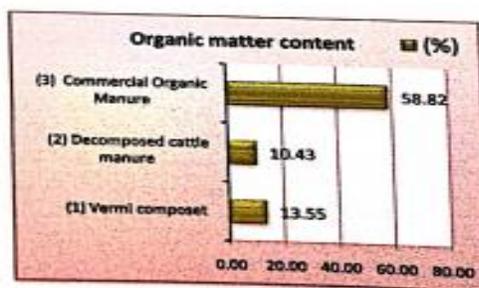


Fig-5

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Bahona College



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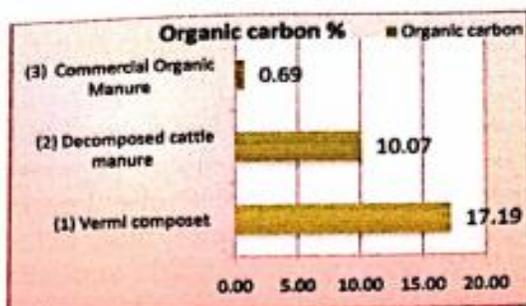


Fig-6

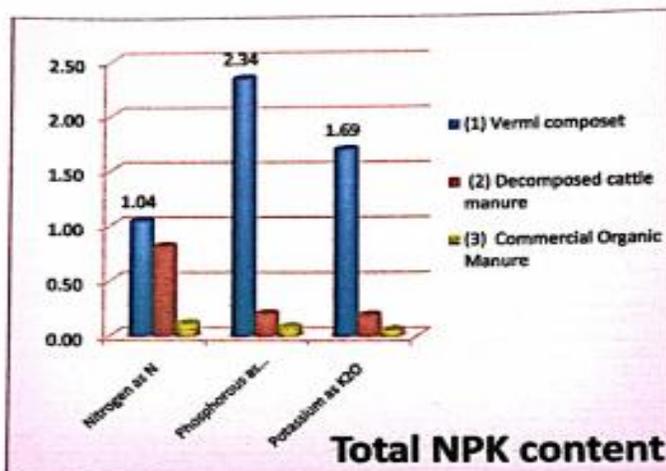


Fig-7

The sum total of NPK content is highest in Vermicompost sample followed by Decomposed cattle manure, while Commercial organic manure sample contains very poor NPK (Fig-7).

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
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Summery and conclusion

From the test results it is observed that the 'Vermicompost' sample under test contains highest amount of major nutrients (5.1% NPK) amongst the three manure samples analysed, which has satisfied the tolerance limit of Organic fertilizer (which is, the sum total of nitrogen, phosphorus and potassium nutrients shall not be less than 2.5% in case of Vermicompost) as per "Biofertilizers and Organic Fertilizers in Fertilizer (Control) Order, 1985". However the quality of organic manure produced is dependent upon the inputs and method employed.

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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101

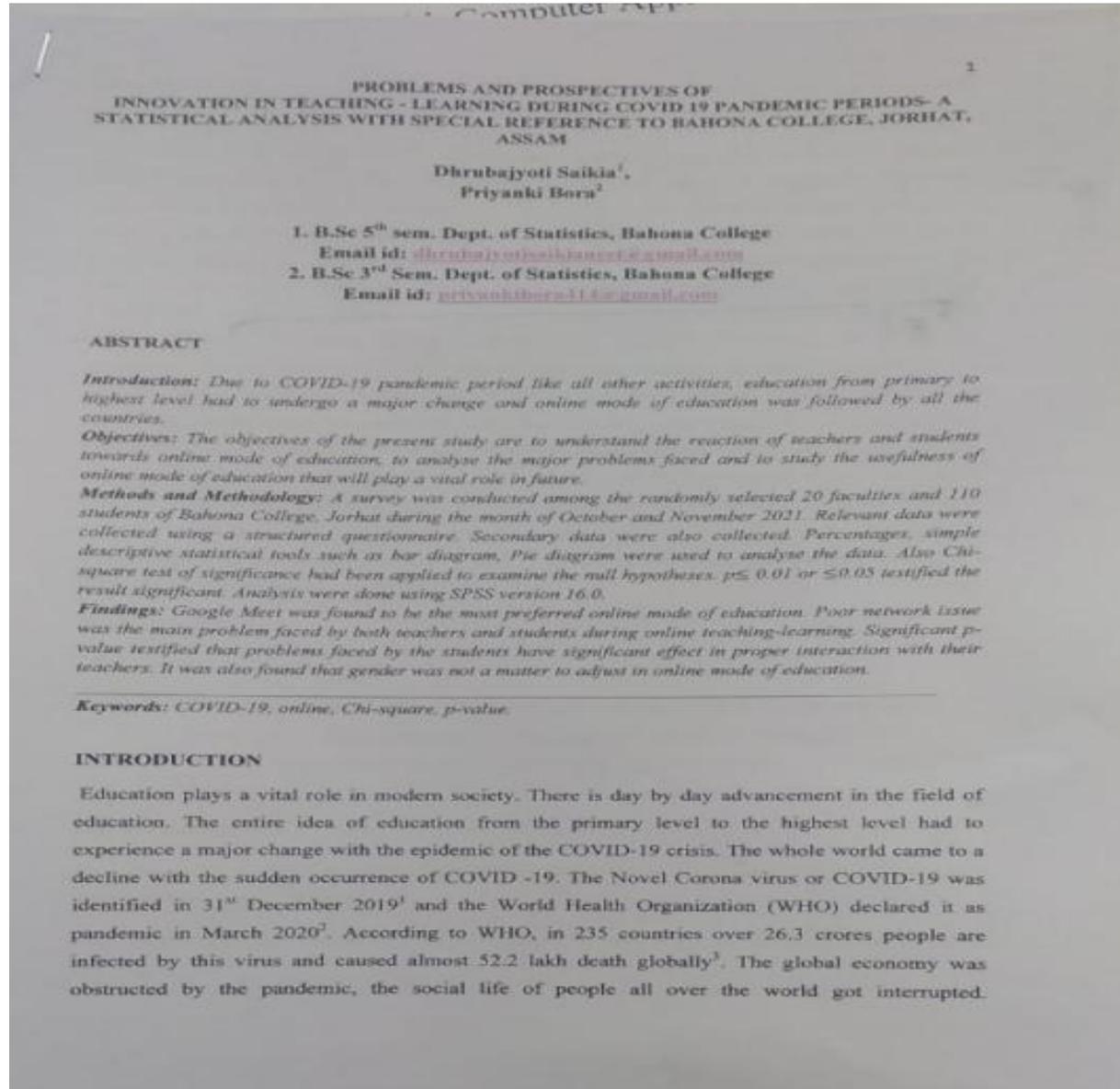


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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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International Labour Organization estimated that almost 2.7 billion workers will get affected by this pandemic¹. Over 40 million people lost their jobs in India itself due to COVID-19².

With the spread of COVID-19, educational institutions all over the world were closed down. The only way to stop the spread of this deadly virus was to maintain social distancing. India went under complete lockdown from 25th of March³. All sorts of educational institutions, offices, shops, transports and communication facilities were closed. It was thought that children were more likely to be affected by the virus. Thus almost all the educational institutions moved towards online mode of delivering education to the students in different parts of the world. In a country like India where classroom teaching is followed everywhere, the transformation to online mode of teaching was harsh. But this was the only alternative. The closure of educational institutions all over the world put the future of the young students at stake. To deal with this problem online mode of education was followed by all the countries. This was not new for technologically developed European countries. But in India students faced a lot of trouble as they suddenly faced a situation which was unusual. Even the teachers had a harsh time to deal with this alteration. Network connectivity was one of the major problems faced by the teachers as well as students. Keeping these points of view, this paper is a humble attempt to understand the impact of online education on the students of Bahoma College, Jorhat. Thus this study will help in understanding the problems and concerns of the students during online learning and will provide new way to cope with these problems.

OBJECTIVES

The objectives of this study are-

- i) To understand the reaction of teachers and students to the online mode of education
- ii) To analyse the major problems of online education among the students
- iii) To study the usefulness of online mode of education that will play an important role in future.

HYPOTHESES

H₀₁: The problems faced by the students are not obstructive in smooth interaction with teachers during online mode of education.

H₀₂: There is no association between the genders in adjusting with the new mode of online learning.

Papers Presented by Students from Dept of Statistics [Page 2]


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Students are Encouraged Towards Finding New Avenues of Experiential Learning such as Undertaking Research.



Papers Presented by Students from Dept of Statistics [Page 3]

(Dr. P.K. Dutta)
 Principal,
 Bahona College



Coordinator
 IQAC
 Bahona College, Jorhat
 Pin-785101



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Safai Abhiyan by Dept of Assamese


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Students of Dept of Zoology Raising Awareness about Conservation of Avian Species [Page 1]


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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UG students distributing Torch Light to Forest Guard.
Gibbon Sanctuary, Feb 2019

Students of Dept of Zoology Distributing Torch Lights among Forest Guards


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IQAC
Bahona College, Jorhat
Pin-785101



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Students of the College Raising Awareness about Sanitation and Drinking Water


(Dr. P.K. Dutta)
Principal,
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Outdoor Classes are Conducted during Winter to break the Monotony and for a Rejuvenating Experience



Dept of History [Page 1]


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101



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Dept of History [Page 2]


(Dr. P.K. Dutta)
Principal
Bahona College




Coordinator
IOAC
Bahona College, Jorhat
Pin-785101