Manoharbhai Shikshan Prasarak Mandal Armori's
MAHATMA GANDHI ARTS, SCIENCE &
LATE NASARUDDINBHAI PANJWANI COMMERCE
COLLEGE ARMORI
Dist. Gadchiroli (Maharashtra) 441 208
Affiliated to Gondwana University, Gadchiroli.
Re-accredited by NAAC 'A' with 3.24 CGPA

ANNUAL QUALITY ASSURANCE REPORT
(AQAR) 2021-22

CRITERION – VII

INSTITUTIONAL VALUES & BEST PRACTICES

METRIC NO: - 7.3.1.

METRIC NAME: - *Portray the performance of the Institution in one area distinctive to its priority and thrust.*

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MANOHARBHAI SHIKSHAN PRASARAK MANDAL ARMORI'S
MAHATMA GANDHI ARTS, SCIENCE AND
LATE NASARUDDHINBHAI PANJWANI COMMERCE COLLEGE
ARMORI Dist. Gadchiroli (M.S.) 441 208
NAAC Re-accredited 'A' Grade 3.24 CGPA (2022)

INTERNAL QUALITY ASSURANCE CELL

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Date 13/12/22

Certificate of Verification

The document herewith is a testimonial of the following specifics;

- AQAR 2021-22
- Criterion - **VII (Institutional Values and Best Practices)**
- Metric no. - **7.3.1**
- Metric Particular – ***Portray the performance of the Institution in one area distinctive to its priority and thrust.***

It is affirmed that the attached document pertinent to the above cited specifics are duly verified and approved by the IQAC.

Criterion Head

IQAC Coordinator

IQAC Chairman

M.G. Arts, Science & Late N.P. Commerce College Armori

PRINCIPAL
M.G. Arts, Science &
Late N.P. Commerce College
ARMORI, Dist. Gadchiroli

CRITERION – VII

INSTITUTIONAL VALUES & BEST PRACTICES

METRIC NO	7.3.1
METRIC NAME	*Portray the performance of the Institution in one area distinctive to its priority and thrust.*

MANOHARBHAI SHIKSHAN PRASARAK MANDAL'S

MAHATMA GANDHI ARTS, SCIENCE AND LATE N.P. COMMERCE COLLEGE ARMORI

DISTRICT GADCHIROLI (M.S.)

Re-accredited by NAAC 'A' 3.24 CGPA

BIODIVERSITY AND SURVEY REPORT OF WAGHALA VILLAGE 2021-22

❖ *From the Desk of Principal*

Bio- diversity is the variety of life on Earth, in all its forms, from genes and bacteria to entire ecosystems such as forests or coral reefs. The biodiversity we see today is the result of 4.5 billion years of evolution, increasingly influenced by humans. Biodiversity forms the web of life that we depend on for so many things – food, water, medicine, a stable climate, economic growth, among others. More than 1 billion people rely on forests for their livelihoods. And land and the ocean absorb more than half of all carbon emissions. But nature is in crisis. Up to one million species are threatened with extinction, many within decades.

Extinction is a law of nature and as a result some species have evolved while others have died ever since life originated on the earth. But this extinction has come to an alarming rate due anthropogenic activities that affects the biota. As human population continues to grow and per capita consumptions has grown higher, Earth's biological diversity is being demoralized at an unrestrained rate.

Peoples Bio-diversity register is an attempt to find out local relationship with the natural things that exist on the earth. Students in communication with local people especially person having information of Ayurveda medicine (vaidu), having knowledge of sharp change in the diversity, and collected data and recorded in register.

Our College is the leading educational hub in Gadchiroli District and more emphasize towards student support services and staff is devoted. Recently our institution in Fourth cycle NAAC Bengaluru is graded with highest CGPA (3.24) which is topmost in Gondwana University Gadchiroli. This Peoples Biodiversity Register (PBR) project plays little bits about nature study and social awareness among the rural people.

From the Desk of Coordinator

Biodiversity refers to the variety of living species on Earth, including plants, animals, bacteria, and fungi. While Earth's biodiversity is so rich that many species have yet to be discovered, many species are being threatened with extinction due to human activities, putting the Earth's magnificent biodiversity at risk. Much of the Earth's biodiversity, however, is in jeopardy due to human consumption and other activities that disturb and even destroy ecosystems. Pollution, climate change, and population growth are all threats to biodiversity. These threats have caused an unprecedented rise in the rate of species extinction. Some scientists estimate that half of all species on Earth will be wiped out within the next century. Conservation efforts are necessary to preserve biodiversity and protect endangered species and their habitats.

Over the last century, humans have come to dominate the planet, causing rapid ecosystem change and massive loss of biodiversity across it. Major direct threats to biodiversity include habitat loss and fragmentation, unsustainable resource use, invasive species, pollution, and global climate change. The underlying causes of biodiversity loss, such as a growing human population and overconsumption of natural resources are often complex and stem from many interrelated factors.

In present scenario world is fenced in technology and internet. We are using extreme natural assets for our progressive life style but in unacceptable way. Corona pandemic has resulted in severe global social and economic disruption including the largest global recession. It has led to wide spread supply shortage by panic buying, agricultural disruption, food shortage, and positively decreased emission of pollutant as one of the benefit to planet.

M.G. College of Armori, the Unique College in the Gondwana University formulated people's biodiversity registers by communication with local people. As a coordinator of People Biodiversity Register I am fortunate and thankful to the principal Dr. L.H. Khalsa for implementing such a study based project in our college for the national development.

CERTIFICATE

This is to certify that as per Maharashtra University act 1994, 14(7) of Gondwana University and Biodiversity Act 2008, the project of People's Biodiversity register (PBR) has been completed by student of Second year studying in the college under the guidance of concern teacher of respective department and submitted to college in academic session 2021-22

Principal

Dr. L. H. Khalsa

PRINCIPAL
M.G. Arts, Science &
Late N.P. Commerce College
ARMORI, Dist. Gadchiroli

CERTIFICATE

This is to certify that Environment Study Center of Mahatma Gandhi Arts, Science and Late N.P. Commerce College Armori of various departments with their respective guides have successfully completed the project of people biodiversity register and Socio-economic survey under the supervision of People Biodiversity Register committee of the college in the academic session 2021-2022.

Coordinator
Environmental Study Centre
M.G. College Armori
(S. M. Sontakke)
Co-ordinator EVS

UNDERTAKING

We all the Guides of concerned departments have undertaken to all the necessary data collection, figures, and resources given in this PBR and Socio-economic Survey are best of our Knowledge and Information available with us and solemnly responsible.

1. Department of Botany –
2. Department of Chemistry–
3. Department of Zoology
4. Department of Geology –
5. Department of Physics –
6. Department of Computer Sc.
7. Department of Geography –
8. Department of English –
9. Department of Marathi
10. Department of History & Soc.
11. Department of Economics
12. Department of Political Sc.
13. Department of Commerce –
14. Department of Home-economic

ACKNOWLEDGEMENT

We the students of Mahatma Gandhi Arts, Science and Late N.P. Commerce College Armori of various department under Gondwana University, Gadchiroli studying in 2nd years B.A., B. Com and B.Sc. (2021-22), feel very fortunate to ourselves, being a student of enforced environmental education program started by Gondwana University.

Also we are very grateful to get the chance to prepare People Biodiversity register, socio-economic Survey and to study different parameter of environment.

Under this project we have been divided in to fourteen departments and studied and recorded various parameter with respect to Botany, Zoology, Chemistry, Geology, Physics, Computer Science, Political Science, Sociology and History, Music, Economics, HE, Languages, Commerce and Geography in Waghala village. We could complete this project with the great support of Principal Dr. L. H. Khalsa and Prof. S.M. Sontakke; coordinator of People Biodiversity Register and concerned guides of the various departments.

PEOPLES BIODIVERSITY REGISTER

2021 – 22

SR NO	SCIENCE DEPARTMENTS
1.	DEPARTMENT OF BOTANY
2.	DEPARTMENT OF CHEMISTRY
3.	DEPARTMENT OF ZOOLOGY
4.	DEPARTMENT OF GEOLOGY
5.	DEPARTMENT OF PHYSICS
6.	DEPARTMENT OF COMPUTER SCIENCE

People Biodiversity Register of Botany

Department of Botany

People Biodiversity Register (PBR) Report entitled

"Plant Diversityof Waghala village of Armori tehsil, Gadchiroli district Maharashtra"

PBR submitted by: **B. Sc. II** (Department of Botany) students' group **2021-2022**

Under the supervision of **Dr. Seema Nagdeve and, Dr. Vasanta Kahalkar**

Introduction:-

Plants are highly significant, valuable, and essential to our survival because they provide us with two vital life requirements: food and oxygen. Plants provide us with a variety of small and large benefits in addition to keeping us alive. As a result, plants are essential for the existence of all living things. Plants play an important role in maintaining a healthy ecology. Animals, insects, birds, and fungi all live in trees, creating a diverse environment. Plants produce their own food and are found at the bottom of the food chain. They manufacture their own food through a process known as photosynthesis, and they play an important role in the whole ecosystem. Furthermore, plants are a rich source of medicines that are used in Ayurvedic medicine to treat human problems in a natural way. During the summer and rainy season, trees also provide cool shelter.

Objective:-

1. To identify the plant diversity of Waghada village.
2. To enlisting and documentation of vegetation.

Methodology:-

The present study is being undertaken with local people a view to explore the plant resources of Waghada of Taluka Armori Gadchiroli Districts. The study was carried out in the month of 27th November 2021. Entire region explored by random survey and prepare list of plant. All the plant specimens were identified by using flora.

In the enumeration, the sequence of families has been followed after Bentham and Hookers classification System. The nomenclature has been adapted based on latest taxonomic literature and in recommendation made by International Code for Botanical Nomenclature (IUCN). Local name has been given wherever available.

Observation:-

List of Plant Species-

Sr. No.	Family	Botanical Name	Local name
1	Annonaceae	Annona squamosa L.	सीताफळ
2		Polyalthia longifolia (Sonner.) Thw.	शोभेचा अशोक
3	Menispermaceae	Cissampelos pareira L.	-
4		Cocculus hirsutus (L.) Diels.	-
5	Papavaraceae	Argemone mexicana L.	-
6	Brassicaceae	Brassica juncea (L.) Czern.	मोहरी
7	Cleomaceae	Cleome viscosa L.	-
8	Capparaceae	Capparis zeylanica L.	-
9	Violaceae	Hybanthus enneaspermus (L.) F. V. Muell	-
10	Polygalaceae	Polygala erioptera DC. Prodr.	-
11	Tamaricaceae	Tamarix ericoids Rottl.	
12	Elatinaceae	Bergia ammannioides Roxb. ex Roth.	-
13	Malvaceae	Abelmoschus ficulneus (L.) Wight & Arn.	-
14		Abutilon indicum (L) Sweet	-
15		Abutilon pannosum (Forst.*f.*) Schlecht	
16		Gossypium herbaceum L.	कापूस/पराठी
17		Hibiscus panduraeformis Burm.f. S	--
18		Hibiscus rosa-sinensis L.	जास्वंद
19		Hibiscus sabdariffa L.	अंबाडी
20		Malachra capitata (L.) L.	-
21		Sida acuta Burm.f.	चिकना
22		Sida cordifolia L.	-
23		Urena lobata L.	-

24	Sterculiaceae	Melochia corchorifolia L.	-
25	Tiliaceae	Triumfetta rhomboidea Jacq.	-
26		Triumfetta rotundifolia Lam.	-
27	Oxalidaceae	Biophytum sensitivum (L.) DC, Prodr.	-
28	Rutaceae	Aegle marmelos (L.) Correa	बेल
29		Citrus aurantifolia (Chrism) Sw.	निंबू
30		Murraya koenigii (L) Spreng	गोडनिंब
31	Meliaceae	Azadirachta indica A. Juss.	निम
32		Melia azedarach L.	-
33	Flindersiaceae	Chloroxylon swietenia DC. Prodr.	भेरा
34	Olacaceae	Olax scandens Roxb.	हरतकपाळी
35	Rhamanaceae	Ziziphus mauritiana Lam.	बोर
36		Ziziphus oenoplia (L.) Mill.	येरूणी
37	Vitaceae	Cayratia trifolia (L) Domin.	-
38	Sapindaceae	Cardiospermum helicacabum L.	कापर्फोडी
39	Anacardiaceae	Lannea cormandelica (Houtt.) Merr.	मोहई
40		Mangifera indica L.	आंबा
41	Fabaceae	Abrus precatorius L.	गुंजा
42		Aeschynomene aspera L.	-
43		Alysicarpus bupleurifolius (L.) DC. Prodr.	-
44		Alysicarpus monilifer (L.) DC. Prodr.	-
45		Alysicarpus vaginalis (L) DC. Prodr.	-
46		Butea monosperma (Lam.) Taub.	पळस
47		Cajanus cajan (L.) Millsp.	तुळ
48		Cajanus scarabaeoides (L.) du Petit-Thouars	-
49		Canavalia gladiata (Jacq) DC.	
50		Cicer arientum L. Chana	
51		Clitoria ternatea L.	
52		Crotalaria montana Roth.	-
53		Cyamopsis tetragonoloba (L) Taub.	ग्वारशेंग

54		Desmodium dichotomum (Willd) DC. Prodr	-
55		Desmodium triflorum (L.) DC. Prodr.	-
56		Glciricidia sepium Steud.	-
57		Indigofera linifolia (L.f.) Retz.	-
58		Indigofera linnaei Ali	-
59		Lablab purpureus (L.) Sweet	पोपट
60		Lathyrus sativus L.	लाकोरी
61		Melilotus alba Desv.	-
62		Mucuna purpuriens (L) DC. Prodr.	कवसकुरी
63		Phaseolus mungo L.	मुंग
64		Pisum sativum L.	
65		Pongamia pinnata	करंज
66		Rhynchosia minima (L.) DC. Prodr.	-
67		Smithia conferta Smith.	-
68		Stylosanthes fruticosa (Retz.) Alston.	-
69		Tephrosia puepurea (L) Pers.	दिवाळी
70		Tephrosia villosa (L.) Pers.	दिवाळी
71		Teramnus labialis (L.f) Spreng.	-
72		Trigonella foenum-graecum L.	-
73		Vigna unguiculata (L.) Walp.	-
74		Zornia gibbosa Span.	-
75	Caesalpinaceae	Bauhinia racemosa Lam.	आप्टा
76		Cassia fistula L.	बाहवा
77		Cassia mimosoides L.	-
78		Cassia occidentalis L.	देव तरोटा
79		Cassia siamea Lamk.	गुलमोहर
80		Cassia tora L.	तरोटा
81		Delonix regia (Boj.) Raf.	गुलमोहर
82		Peltophorum pterocarpum (DC) Bark ex Heyne	गुलमोहर
83		Tamarindus indica L.	चिंच

84	Mimosaceae	Acacia leucophloea (Roxb.) Willld	हिवर
85		Acacia nilotica (L.) Del.	बाबुळ
86		Albizia lebbeck (L.) Willd	चिचवा
87		Albizia procera (Roxb.) Benth.	किन्ही
88		Leucaena leucocephala (Lamk) de Wit.	सुबाबुळ
89		Pithecellobium dulce (Roxb.) Benth.	चिचबिलाई
90	Combretaceae	Combretum albidum G. Don.	
91		Terminalia arjuna (Roxb.) Wight & Arn.	
92		Terminalia bellirica (Gaertn) Roxb.	बेहळा
93		Terminalia elliptica	ऐन
94	Myrtaceae	Eucalyptus sp.	निलगिरी
95		Psidium guajava L.	पेरू
96		Syzygium cumini (L) Skeels	जांभुळ
97	Lecythidaceae	Careya arborea Roxb.Naud.	कुंभी
98	Lythraceae	Ammannia baccifera L.	-
99		Rotala indica (Willd) Koehne	-
100		Woodfordia fruticosa (L.) Kurtz.	-
101	Onagraceae	Ludwigia perennis L.	-
102	Caricaceae	Carica papaya L.	पपई
103	Cucurbitaceae	Cucumis sativus L.	-
104		Cucurbita maxima Duch. *ex* Lamk.	कोहळा
105		Diplocyclos palmatus (L.) Jeffrey	-
106		Lagenaria siceraria (Molina) Standl	लवकी
107		Luffa acutangula (L.) Roxb.	दोडके
108		Luffa cylindrica (L.) Roem.	गलगला
109		Momordica charantia L.	कारले
110		Trichosanthes cucumerina L.,	-
111	Cactaceae	Nopalea dejecta Salm-Dyck	-
112	Molluginaceae	Glinus lotoides L.	-

113		Glinus oppositifolius (L.) A. DC.	-
114	Apiaceae	Coriandrum sativum L.	सांभार
115	Aliangiaceae	Alangium salvifolium (L.f.) Wangerin.	-
116	Rubiaceae	Hedyotis corymbosa (L.) Lam.	-
117		Spermacoce articularis L.	-
118		Spermacoce pusilla Wall.	-
119	Asteraceae	Ageratum conyzoides L.	-
120		Blumea lacera (Burm.f.) DC.	-
121		Blumea oxyodonata DC.	-
122		Caesulia axillaris Roxb.	-
123		Cyathocline purpurea (D.Don) O Kuntze	-
124		Eclipta prostrata (L) L. Mant	-
125		Elephantopus scaber L.	-
126		Emilia sonchifolia (L) DC.	-
127		Gnaphalium polycaulon Pers.	-
128		Grangea maderaspatana (L.) Poir.	-
129		Parthenium hysterophorus L.	-
130		Pentanema indicum L.	-
131		Sphaeranthus indicus L.	गुड्डी
132		Spilanthus paniculata L.	अक्कलखडा
133		Tagetes erecta	झेंडू
134		Tridax procumbens L.	कंबरमोडी
135		Vernonia cinerea (L.) Less.	-
136		Xanthium indicum L.	-
137	Lobeliaceae	Lobelia alsinoides Lam.	-
138	Plumbaginaceae	Plumbago zeylanica L.	
139	Primulaceae	Anagalis arvensis L.	-
140	Sapotaceae	Madhuca longifolia (J. Koenig) Macbr.	मोहा
141	Oleaceae	Nyctanthes arbor-tristis L.	पारीजातक

142	Apocynaceae	Catharantus roseus (L) G. Don.	**जगनाथ**
143		Ichnocarpus frutescens (L.) R. Br.	-
144		Nerium indicum Mill.	कनेर
145		Plumeria rubra L.	
146		Tabernaemontana divaricata (L.) R. Br.	सदाफुली
147		Thevetia peruviana (Pers.) Schum.	-
148	Asclepiadaceae	Calotropis gigantea (L) R. Br.	रूई
149		Pergularia daemia (Forsk) Chiov.	उतरणवेल
150		Wattakaka volubilis (L.f.) Stapf.	-
151	Periplcaceae	Criptolepis buchnani Roem. & Schult.	-
152		Hemidesmus indicus (L.) R.Br.	खोबरजळी
153	Gentianaceae	Canscora decussata Schult & Schult.	-
154		Canscora diffusa (Vahl) R. Br.	-
155		Enicostema axillare (Lam.) Roynal	-
156		Exacum pedunculatum L.	-
157	Boraginaceae	Cordia dichotoma Forst f. Prodr.	शेलवट
158		Heliotropium indicum L.	-
159		Rotula aquatica Lour	-
160		Trichodesma indicum (L) R. Br.	-
161	Convolvulaceae	Evolvulus alsinoides (L) L.	-
162		Ipomoea aquatic Fosrk.	-
163		Ipomoea fistulosa Mart ex Choisy	बेशरम
164		Ipomoea obscura (L) Ker-Gawl.	-
165		Merremia gangetica (L) Cuf.	-
166		Merremia hederacea	
167		Opercuilna turpethum (L.) Silva	
168		Rivea hypocrateriformis (Desr.) Choisy	-
169		Volvulopsis nummularia (L) Roberty	-
170		Xenostegia tridentate (L) Austin & Staples	-
171	Solanaceae	Cuscuta chinensis	अमरवेल
172		Capsicum annuum L.	मिरची
173		Datura metal	धोतरा

174		Lycopersicon esculentum Mill	टमाटर
175		Physalis minima L.	-
176		Solanum nigrum L.	-
177		Solanum melongena L.	वांगा
178		Solanum virginianum	कडभटई
179	Scrophulariaceae	Lindernia antipoda (L) Alston	-
180		Lindernia ciliata (Colsm.) Pennell	-
181		Lindernia crustacea (L) F. Muell.	-
182		Scoparia dulcis L.	-
183		Stemodia viscosa Roxb.	-
184		Striga angustifolia (D. Don) Sald.	-
185		Verbascum chinense (L) Santapau.	-
186	Martyniaceae	Martynia annua L.	-
187	Bignoniaceae	Tecoma stans (L.) Juss. *ex* Kunth	-
188	Acanthaceae	Adhatoda zeylanica Medic.	आडूळशा
189		Andrographis paniculata (Burm.f.) wall ex Nees	भुईनिंब
190		Barleria prionites L.	-
191		Eranthemum purpurascens Nees in Wall	-
192		Hemigraphis latebrosa (Heye ex Roth) Nees in DC	-
193		Hygrophila schulli (Buch..Ham.) M.R. & S.M. Almeida	काटेकोरंटी
194		Hygrophilla polysperma (Roxb.) T. And	-
195		Indoneesiella echioides (L.) Sreem	-
196		Justicia glauca Rottl.	-
197		Justicia japonica Thunb.	-
198		Lepidagathis cristata Willd.	-
199		Peristrophe paniculata (Forssk) Brummitt.	-
200		Rungia pectinata (L.) Nees in DC.	-
201		Rungia repens (L.) Nees in Wall.	-
202	Verbenaceae	Clerodendrum phlomidis L.f.	-
203		Clerodendrum serratum (L.) Moon	
204		Duranta erecta L.	मेहंदी

205		Gmelina arborea Roxb.	शिवण
206		Lantana camara L.	कामिनी
207		Lantena salvifolia Jacq.	-
208		Phyla nodiflora (L.) Greene	-
209		Tectona grandis L.f.	सागवण
210		Vitex negundo L.	निरगुळी
211	Lamiaceae	Anisochilus carnosus (L.) Wall	
212		Anisomeles indica (L.) O. Ktze.	
213		Hyptis suaveolens (L) Poit.	-
214		Leonotis nepetifolia (L.) R. Br.	-
215		Leucas cephalotes (Roth) Spr.	-
216		Ocimum sanctum L.	तुळशी
217		Ocimum basilicum L.	सब्जा
218	Nyctaginaceae	Boerhavia diffusa L.	पुनरनवा
219		Bougainvillea glabra Choisy	-
220	Amaranthaceae	Achyranthes aspera L.	कुत्री
221		Aerva sanguinoleta (L.) Bl.	-
222		Alternanthera sessile (L.) R. Br. ex DC.	-
223		Alternanthera tenella Colla	-
224		Celosia argentea L.	-
225		Gomphrena serrata L.	-
226	Chenopodiaceae	Chenopodium album L.	माठ
227	Polygonaceae	Persicaria barbata (L) Hara	-
228		Persicaria glabra (Willd) Gomez	-
229		Polygonum plebejum R. Br.	-
230		Rumex dentatus L.	-
231	Loranthaceae	Dendrophthae falcata (L.f.) Etting	-
232	Euphorbiaceae	Acalypha ciliata Forsk.	-
233		Bridelia retusa (L.) Spreng	कसई
234		Emblica officinalis Gaertn	–
235		Euphorbia hirta L.	-
236		Jatropha gossypifolia L.	चंद्रजोती

237		Mallotus philippensis (Lamk.) Muell.-Arg.	शेंद्री
238		Phyllanthus lawii Grah	.
239		Phyllanthus maderaspatensis L.	-
240		Phyllanthus reticulatus Poir	-
241		Phyllanthus urinaria L.	-
242		Phyllanthus virgatus Forst.f.	-
243		Ricinus communis L.	एरंडी
244		Sebastiana chamaelea (L.) Muell- Arg.	-
245	Moraceae	Ficus benghalensis L.	वड
246		Ficus hispida L.f.	--
247		Ficus religiosa L.	पिंपळ
248		Ficus racemosa L.	उंबर
249		Streblus asper Lour.	
250	Hydrochartiaceae	Hydrilla verticillata (L.f.) Royle.	-
251	Orchidaceae	Vanda tessellata (Roxb.) Hook.	वांदा
252	Musaceae	Musa paradisiaca L.	केळ
253	Amaryllidaceae	Crinum viviparum (Lam.) R. Ansari & V. J. Nair	
254	Taccaceae	Tacca leontopetoides (L) O. Ktze.	-
255	Dioscoreaceae	Dioscorea bulbifera L.	मटनारु
256	Liliaceae	Allium sativum L.	-
257		Gloriosa superb L.	करकरी
258	Commelinaceae	Commelina benghalensis L.	-
259		Cyanotis cristata (L.) D. Don.	-
260		Murdannia spirata (L.) Brueck.	-
261		Tonningia axillaris (L.) O.Ktze.	-
262	Arecaceae	Phoenix sylvestris (L.) Roxb	शिंदी
263		Roystonea regia (Kunth) Cook	-
264	Typhaceae	Typha angustifolia L.	
265	Araceae	Amorphophallus sp.	सुरन
266	Eriocaulaceae	Eriocaulon quinquangulare L.	-
267	Cyperaceae	Bulbostylis barbata (Rottb.) C.B.Cl.	-
268		Cyperus compressus L.	-
269		Cyperus difformis L.	-
270		Cyperus iria L.	-

271		Cyperus pangorei Rottb	-
272		Cyperus tenuispica Steud.	-
273		Cyperus rotundus L.	-
274		Eleocharis acutangula	-
275		Fimbristylis dichotoma (L.) Vahl.	-
276		Fimbristylis miliacea (L) Vahl.	-
277		Fuirena ciliaris (L.) Roxb.	-
278		Kyllinga tenuifolia Steud.	-
279		Schoenoplectus lateriflorus (Gmel.) Lye	-
280	Poaceae	Bambusa vulgaris Schrad	
281		Chloris barbata Swartz.	गवत
282		Coix lacryma-jobi L.	गवत
283		Cynodon dactylon (L.) Pers.	गवत
284		Dactyloctenium aegyptium (L.) Willd.	गवत
285		Dendrocalamus strictus (Roxb.) Nees.	गवत
286		Dichanthium annulatum (Forssk.) Stapf.	गवत
287		Digitaria abludens (R. & S.) Veldk.	गवत
288		Digitaria ciliaris (Retz.) Koel.	गवत
289		Echinochloa colona (L.) Link.	गवत
290		Eleusine indica (L.) Gaertn.	गवत
291		Elytrophorus spicatus (Willd) A. Camus.	गवत
292		Eragrostis japonica (Thunb.) Trin.	गवत
293		Eragrostis unioloides (Retz.) Nees ex Steud.	गवत
294		Heteropogon contortus (L.) P. Beauv.	गवत
295		Ischaemum indicum (Houtt.) Merr.	गवत
296		Iseilema laxum Hack. in DC.	गवत
297		Oryza sativa L.	धान
298		Phragmites karka (Retz.) Trin. *ex* Steud	-
299		Saccharum spontaneum L.	पाढर
300		Sacciolepis indica (L.) A. Chase	गवत
301		Setaria pumila (Poir) R. & S. Syst.	गवत
302		Triticum aestivum L.	गहू
303		Vetiveria zizanioides (L.) Nash.	खस

Economic aspects of the plant diversity of Waghada:

List of the common crop plant and other important plant.

Pulses : *Cicer arientum* (Chana, herbara), *Cajans cajan* (Tur), *Vigna mungo* (Udid), *Vigna radiata, Vigna unguiculata* are the pulses species cultivated in the village.

Cereals : *Oryza sativa* (Dhan), *Triticum aetivum* (Gahu) is also cultivated in the village.

Vegetable : *Lycopersicon esculentum* (Tomato), *Solanum melongena* (Wange), *Cucurbita maxima* (Kohala), *Cucumis sativa* (Kundru), *Luffa culindrica*, *Luffa acutangula* (Dodka), *Momardica charantia* (Karale), *Hibiscus sabdariffa* (Ambadi), *Cyamopsis tetragonaloba* (Gawarsheng) *Trigonella foenum-graecum* (Methi), etc are commonly grown in the village.

Fruit : *Aegle marmelos* (Bel), *Ziziphus mauritiana* (Bor), *Annona squamosa* (Shitafal), *Emblica officinalis (Awala), Mangifera indica* (Amba), *Tamarindus indica* (Chinch), *Pithecellobium dulce* (Wilaiti chinch/ Chihbilai), *Psidium guajava* (Peru, Jam), *Syzygium cumini* (Jamun), *Carica papaya* (Papaya), *Musa paradisiaca* (Kela), *Ziziphus mauritiana* are encountered.

Medicinal plant : *Abrus precatorius***,** *Achyranthes aspera, Adhatoda zeylanica, Aegle marmelos, Andrographis paniculata, Azadirachta indica, Cassia tora, Curculigo orchioides, Elephantopus scaber , Emblica officinalis, Mucuna pruriens, Phyllantus amarus, Terminalia arjuna, Terminalia bellirca, Tridax procumbens* are some example of medicinal plans.

Timber tree : *Tectona grandis* (Sagawan), *Lannea coromandelica* (Mowai), *Acacia nilotica* (Babul), *Albizia lebbeck* (Chichwa), *Careya arborea* (Kumbhi), *Madhuca longifolia* (Moha), *Bridelia retusa* (Kasai) etc.

Oil yielding plant: *Brassica* sps. (Mohari, Sarso), *Ricinus communis* (Erandi), Pongamia pinnata etc.

Gum yielding plant : *Acaccia leucocephala* (Hiwar), *Acaccia nilotica* (Babul), *Lannea coromandelica* (Mowai) etc.

Agriculture Weed: *Achyranthes aspera, Aerva sanguinoleta, Ageratum conyzoides, Alternanthera sessile, Ammannia baccifera, Anagalis sp., Argemone mexicana, Caesulia axillaris, Cardiospermum helicacabum, Celosia argentea, Chenopodium album, Commelina benghalensis, Cyperus difformis, Cyperus iria, Echinochloa colona, Eclipta prostrata, Euphorbia hirta, Leucas cephalotes, Lobelia alsinoides, Ludwigia perennis, Parthenium hysterophorus, Pentanema indicum, Solanum nigrum, Sphaeranthus indicus, Spilanthus paniculata, Stemodia viscosa, Trichodesma indicum, Tonningia axillaris, Vernonia cinerea,* are encounter.

Aquatic Plant: *Alternanthera sessile, Ammannia baccifera, Bergia ammannioides, Caesulia axillaris, Coix lacryma-jobi, Crinum viviparum, Cyathocline purpurea, Cyperus difformis, Cyperus iria, Cyperus pangorei, Echinochloa colona, Eclipta prostrata, Eriocaulon quinquangulare, Fimbristylis miliacea, Fuirena ciliaris, Hygrophila schulli, Hygrophilla polysperma, Ipomoea aquatic, Ipomoea fistulosa, Limnophila aromatica, Lindernia antipoda, Lindernia ciliata, Lobelia alsinoides, Ludwigia perennis, Persicaria barbata, Persicaria glabra, Phyla nodiflora, Rhynchospora wightiana, Rotula aquatica, Schoenoplectus lateriflorus, Smithia conferta, Spilanthus paniculata, Tonningia axillaris, Vetiveria zizanioides* were found.

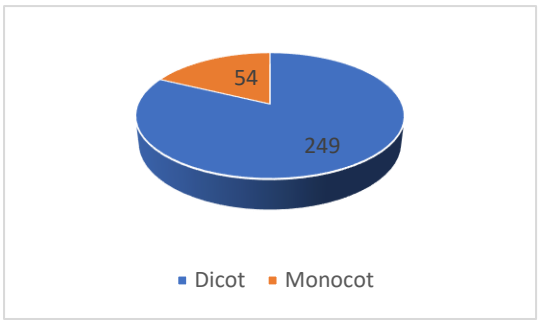
Result and Conclusion:-

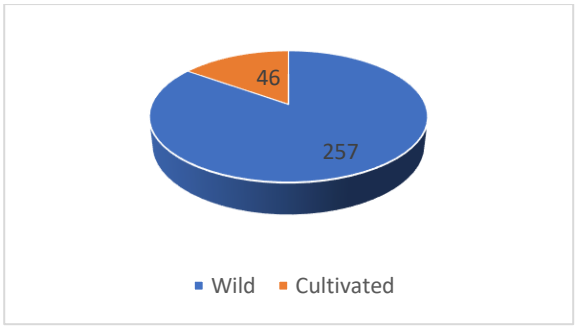
In total, 303 species of flowering plants were observed and identified in the study area, belongs to the 252 genera and 76 families. All the enlisted 303 species enumerated in the table.

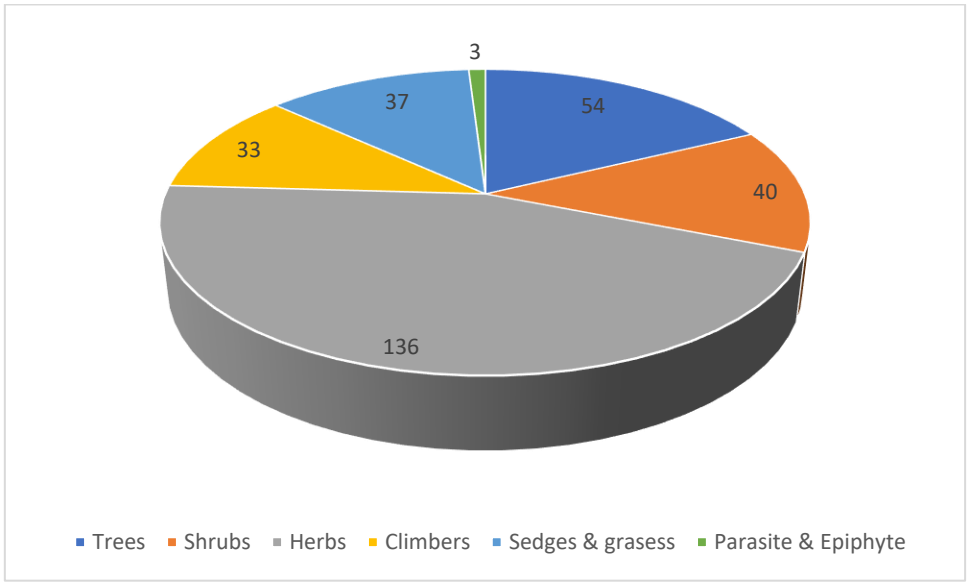
In a recent study, 303 species were identified and classified as trees (54), climbers (33), shrubs (40), herbs (136), sedges and grasess (37), parasitic and epiphytic plants (03). The figures in the parenthesis represent their numbers.

A total of 257 wild species are represented out of 303 species. There are 46 species which are cultivated and planted.

Floristic Spectrum


54
249
Dicot
Monocot


46
257
Wild
Cultivated


3
37
54
33
40
136
Trees
Shrubs
Herbs
Climbers
Sedges & grasess
Parasite & Epiphyte

Field Photo

Students and Teacher interact in the field

Student observe the plant in field

Students collect plant for identification and documentation

Student observe the plant in field

Group Photo with local People

Students Collection of Plant sample for Identification

A Big Tree of Tamarindus indica L. (Chinch)

लोकमत - ०७।१२।२१

महाविद्यालयीन विद्यार्थ्यांनी केले वघाळा परिसरातील वनस्पतींचे सर्वेक्षण

माहिती संकलन : पर्यावरणातील महत्त्व तज्ज्ञांकडून जाणले

लोकमत न्यूज नेटवर्क

आरमोरी : स्थानिक महात्मा गांधी कला, विज्ञान व स्व. न. पं. वाणिज्य महाविद्यालय, आरमोरीचा वनस्पतीशास्त्र विभाग व लोकांचे जैवविविधता रजिस्टर (पी.बी.आर.) यांच्या संयुक्त विद्यमाने आरमोरी तालुक्यातील वघाळा परिसरातील आढळणाऱ्या वनस्पतींचे अध्ययन करण्याच्या दृष्टीने वनऔषधी व इतर वनस्पतींचे सर्वेक्षण केले गेले. विशेष यामध्ये विद्यार्थ्यांनी परिसरातील वनस्पतींचा अभ्यास केला.

या सर्वेक्षणामध्ये परिसरातील चिंच, पळस, उंबर, बाभूळ, कडुनिंब, भुईनिंब, चित्रक, खापरखुटी अशा अनेक वनस्पतींचा अभ्यास करून त्याविषयीची माहिती संकलित करण्यात आली. या सर्वेक्षणाप्रसंगी पक्षी संरक्षण व संवर्धन समिती अध्यक्ष प्रधान व डाकराम उपस्थित होते. याप्रसंगी वनस्पतीशास्त्र विभागप्रमुख प्रा. डॉ. सीमा नागदेवे, प्रा. डॉ. वसंता कहालकर, बाबुराव शेंडे उपस्थित होते. या सर्वेक्षणामध्ये बी.एस्सी. भाग २ च्या अर्पीत जुआरे, चेतन चापले, मनीष धम्मेजा, मयूर रायसिडाम, संध्या ठाकरे, प्रतीक्षा हाडगे, रोहिणी नंदनवार आदींसह एकूण १९ विद्यार्थ्यांनी सहकार्य केले.

वनस्पतीच्या सर्वेक्षणात सहभागी झालेले महाविद्यालयीन विद्यार्थी.

Plant Photo

Abutilon pannosum

Aeschynomene aspera

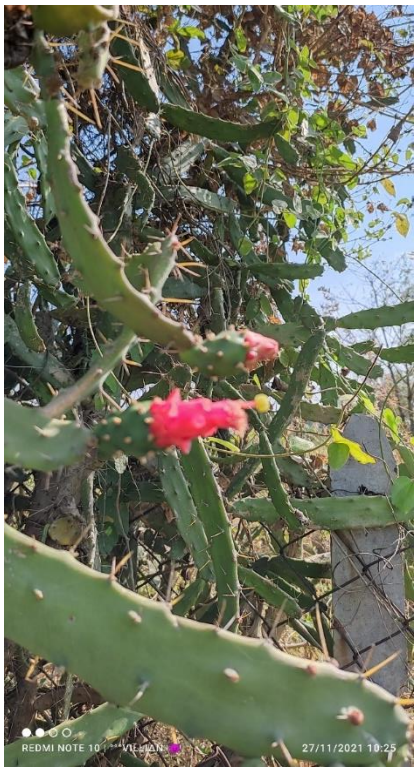
Boerhavia diffusa

Cardiospermum helicacabum

Clitoria ternatea

Ipomoea obscura

Lantena salvifolia



Nopalea dejecta

Pentanema indicum

Peristrophe paniculata

Rotula aquatica

Rungia pectinata

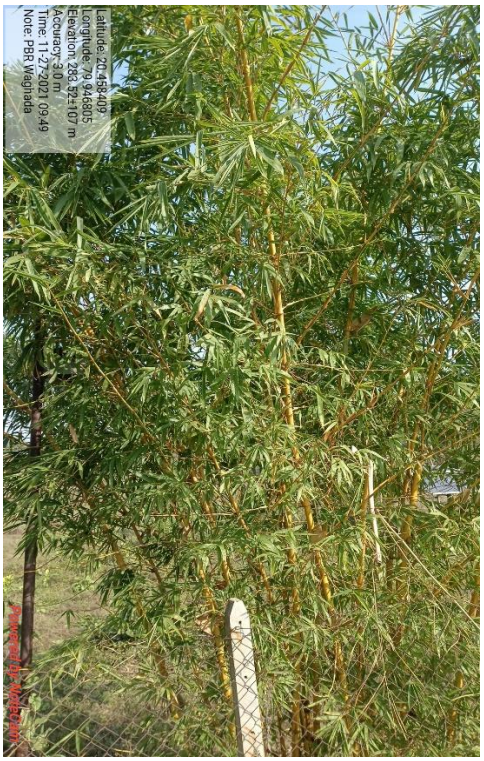
Solanum virginianum

Tecoma stans

Urena lobata

Xanthium indicum

Apluda mutica



Bambusa vulgaris

People Biodiversity Register of Chemistry

Department of Chemistry

People Biodiversity Register (PBR) Report entitled

"Survey and Physico-Chemical analysis of water and soil of Waghala village of Armori tehsil, Gadchiroli district Maharashtra"

PBR submitted by: **B. Sc. II** (Department of Chemistry) students' group **2021-2022**

Under the supervision of **Prof. Satendra M. Sontakke, Dr. Satish S. Kola, Dr. Naresh Bansod**

Introduction

Gadchiroli emerged as a separate district on 26 Aug 1982 having area about 14412 sq. Km. Armori is a municipal taluka in the Gadchiroli district in the Indian state of Maharashtra. It is connected with NH-353D. It is located on the left of the Wainganga River. It is about 120 km from the city of Nagpur and about 36 km from district headquarters, Gadchiroli. In present survey, we have selected Waghala village.

Waghala village is located in Armori tehsil of Gadchiroli district in Maharashtra, India. It is situated 5km away from sub-district headquarter Armori (tehsildar office) and 37km away from district headquarter Gadchiroli. As per 2009 stats, Vaghala is the gram panchayat of Waghala village.

The total geographical area of village is 314.79 hectares. Waghala has a total population of 1,634 peoples, out of which male population is 820 while female population is 814. Literacy rate of Waghala village is 76.74% out of which 82.20% males and 71.25% females are literate. There are about 406 houses in Waghala village.

About Waghala

1.	**Name of study area**	***Waghala***
2.	Date of collection of samples	27/11/2021
3.	Date of completion of analysis	27/11/2021
4.	Name of village	Waghala
5	Name of Gram panchayat	Waghala
6.	Pin code of study area	441208
7.	Tehsil	Armori
8.	District	Gadchiroli
9.	State	Maharashtra

METHODOLOGY

The complete PBR project consists of three parts.

1. Survey of Waghala village using questionnaires and people's approach about water quality they used, misused, water recharging, shortage of water, and their role in conservation of water and agriculture related information.
2. Study and comparison various parameters of water by using water sampling kit and titration method.
3. Study and comparison of various parameters of soil by using standard literature procedure and reference.

Questionnaire on water management (Sample Survey Form)

Q.1 -What are various sources of water in Waghala area (village)?

Ans.:- Dug well, Gram panchayat tap water, Bore well.

Q.2 - In rainy season, whether chlorination of drinking water is carried out by Gram Panchayat or not?

Ans.:- Yes, Chlorination is done by Gram Panchayat in drinking water.

Q.3 -What is difference between pure water & impure water in your sense?

Ans.:- pure water is clean, Impure water is more dirty and turbid.

Q.4 - Generally well water quality is good in comparison with Bore well water. What is You're Experience?

Ans.:- As per my opinion Dug well water is good in comparison with bore well.

Q.5 - Do you know, we get important minerals like calcium and fluoride from water?

Ans. :- Yes

Q.6 -Do you feel water scarcity in summer season?

Ans.:- No, drinking water is sufficient in our village.

Q.7 -Do you think we the people are responsible for the water scarcity?

Ans.:- Yes

Q.8 -Water scarcity arises due to improper management and improper recharging of water.

What is your opinion?

Ans.:- No, we don't have any idea

Q.9 -Whether water resources in your area is sufficient for irrigation point of view?

Ans.:- Yes, canal water is available.

Q.10 -We can differentiate between soft water & hard water due to chemical activity. Water

Which gives more scum (salt) it is called hard water if less scum (salt) is formed it is called soft water. Do you aware about it?

Ans.:- Yes

Q.11 – What is effect of hard water on Agriculture produce?

Ans.:- we don't have any idea about it

12 -Due to washing of cloth, pollution of lake takes place. Do you aware about it?

Ans.:- Yes

Q.13 -In rainy season, do you drink water after chlorination or boiling?

Ans.:- No

Q.14 -Which method you applying for cold water in summer season.

Ans.:- Water store in matka made from soil.

Q.15 -What type of method you are applying for water purification?

Ans.:- by Bleaching powder.

Q.16 -What type of Ayurveda medicine (Jadibuti) you were practicing earlier?

Ans.:- Extract of Kadunimb use as insecticide as well as pesticide.

Q.17 -What are the solution for water scarcity in summer season.

Ans.:- No Scarcity of water.

Q.18 -What is the method for the removal of salt from water?

Ans.:- Alum is used for the removal of dirt.

Survey on Agriculture Information

Q.1- what type of fertilizer you are using in your farming whether chemical or organic?

Ans.:- Chemical fertilizers

Q.2- Which type of chemical composition you preferred for chemical fertilizers?

Ans.:- 20:20:0

Q.3 -Which Company Brand is more useful as per your opinion?

Ans.:- Krushi udhog

Q.4- How many Kg or bag of chemical fertilizer your required per acre?

Ans.:- 3 Bags per Acre

Q.5 - From how many Years you are using chemical fertilizers?

Ans.:- from 10 Years

Q.6 - During use of chemical fertilizer what was the percentage of crop production? Whether increased or decreased.

Ans.:- Crop production increases

Q. 7- During the use of organic fertilizer what was the percentage of crop production? Whether increased or decreased.

Ans.:- percentage of crop production was average.

Q.8- compare to chemical fertilizer and organic fertilizer which is best?

Ans.:- Chemical is good, but it decreased soil fertility.

Q.9- During use of chemical fertilizer what was the percentage of insect or paste attack on Crops whether increased or decreased?

Ans.: - The average percentage of insect or paste attack was increased

Q.10 - During use of organic fertilizers what was the percentage of insect or pest attack on Crops? Whether increased or decreased.

Ans.:- Insect or pest attack was decreased in use of organic fertilizers.

Q.11 - What type of pesticide and insecticide you were using before 20 years? Chemical or self-Made from plant extract.

Ans.:-Self-made insecticide was used before 20 years.

Q.12 - Please tell names of some self-made pesticide or insecticide if you know?

Ans.:- Panchamrut, Saptaparni.

Q. 13 - How much amount you spend on insecticide and pesticide per acre?

Ans.:- 1900 Rs. per Acre.

Q. 14- Are you ready to do the organic farming as before if you get some scheme or facilities from the government?

Ans.:- Yes

Q.15- Do the soil fertility of your land increased or decreased using chemical fertilizer?

Ans.:- The soil fertility was decreased using chemical fertilizer.

Q.16 - Compare production rate and selling rate of crop, profit or loss?

Ans.:- The production rate was 1600 and selling rate was 27,000, overall profit.

Q. 17 - Have you ever done the Agriculture Audit?

Ans.:- No

Q.18 - Did you ever compare the production rate and amount you spend for paddy crop?

Ans.:- Yes

Q.19- Are you aware about soil analysis of your farmland conducted by the government? Did You participate there?

Ans.:- No

Q.20 - Are you ready to do the soil analysis in current year?

Ans.:- Yes

Q.21- Do you have any experience of Bagayati Agriculture?

Ans.:- Yes

Q.22- if so is it more useful than traditional Agriculture?

Ans.:- Yes, it is more profitable

Q.23- Do you have proper facility of Irrigation?

Ans.:- yes, Irrigation is of sprinter type

Q.24- Is it useful to take the production of oil Seeds

Ans.:- No

Q.25- Do you take the production of cereals

Ans.:- Yes

Water Sample Collection and Physicochemical Analysis

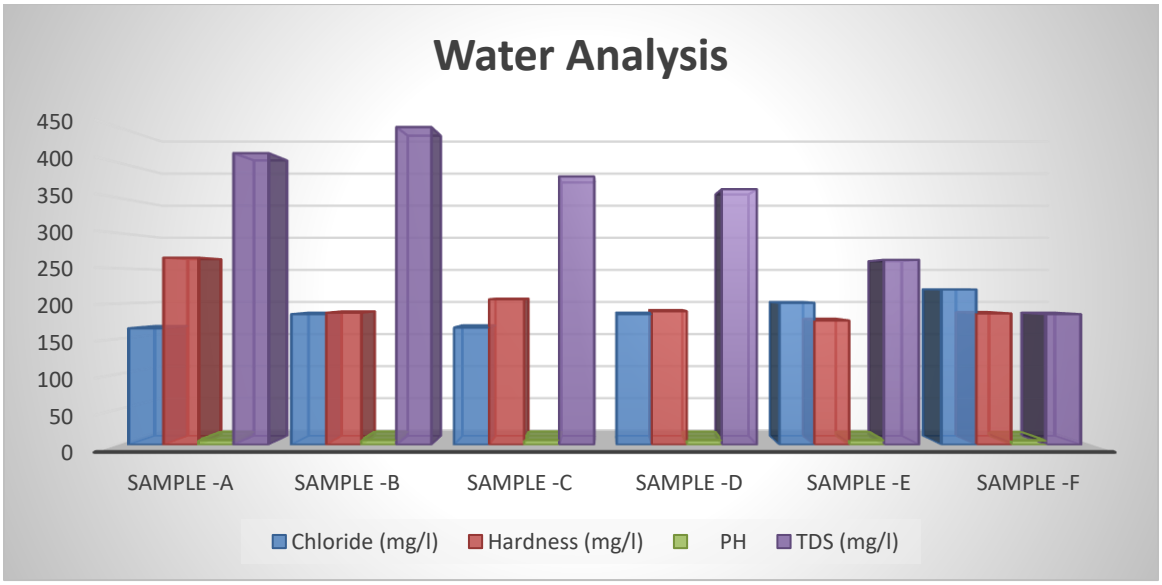
Total 06 water samples were collected from the various locations of Waghala village and Wainganga river by the group of students and different parameters like: - Chloride, Hardness, pH, TDS, Fluoride, were investigated by using standard procedure of literature Result were depicted in **table1.**

Collection of water sample from Wainganga River

Group No. 01

Table No.- 1: -Physico-chemical Analysis of Bore well and Dug Well Water of Waghala **Village**

Sample Name	**Chloride (mg/l)**	**Hardness (mg/l)**	**P^H**	**TDS (mg/l)**	**Fluoride (mg/l)**
Sample –1 DW	164	**269**	6.95	**420**	0.37
Sample -2 DW	191	197	6.99	**460**	0.28
Sample -3 DW	169	**204**	6.59	**379**	0.30
Sample -4 DW	194	191	6.65	**359**	0.20
Sample -5 BW	211	178	**5.67**	267	0.50
Sample –6 BW	218	190	**5.18**	186	0.42
Standard (IS10500) **(Excellent Acceptable range)**	**≤250**	**≤200**	**6.5-8.5**	**≤300**	**≤ 1**



Soil Sample Collection and Physicochemical Analysis:

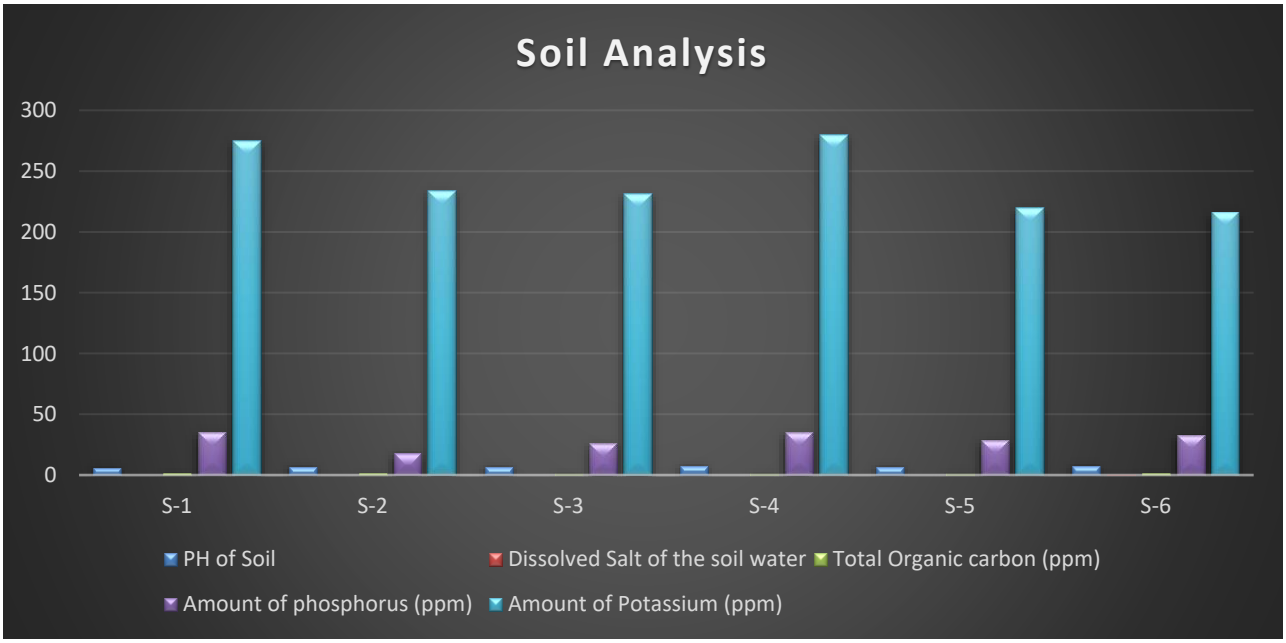
Department of chemistry, Peoples biodiversity register group (PBR) visited Waghala village on 27/11/2021 for the collection of soil samples. We collected the 06-soil sample from Waghala village from different area of agriculture. Remove plant residue from the surface and use a spade, soil auger or soil sampling tube as illustrated. Place the soil in a clean bucket or container, mix thoroughly.

Collection of Soil sample from the field of Waghala village by the students

Students of chemistry PBR group analyzed parameters like P^H of Soil, Dissolved salt in water, Total Organic carbon, Amount of phosphorus, Amount of Potassium, Nitrogen, Calcium and Magnesium in department of chemistry. The results obtained are depicted below in **Table No. 2**

Table No. 2: Observation Table (Students Group No. 02)

Sample No.	P^H of Soil	Dissolved Salt of the soil water	Total Organic carbon (ppm)	Amount of phosphorus (ppm)	Amount of Potassium (ppm)
S-1	6.21	0.52	1.92	35.23	275
S-2	6.94	0.52	1.82	18.2	234
S-3	6.91	0.56	1.73	26.23	231
S-4	7.7	0.56	1.66	35.2	280
S-5	6.6	0.64	1.62	28.78	220
S-6	7.6	1.1	1.87	32.94	216



Result & Discussion

We have collected various water samples from different region of Waghala village using standard procedure and carried out analysis as per location given in the table. We have selected four location of hand pump some are private and some are public bore well.

- The concentration of chloride found average in all the bore well and dug well sample of Waghala village.
- Hardness of entire hand pump and dug well water samples varies from 178 ppm to 269 ppm. Sample of Dug well **01** and **03** shows higher hardness while remaining sample is soft with respect to standard conventional Range of Indian standard.
- P^H analysis of water sample indicates that Bore well sample no.**5** & **6** Water is some of acidic nature in comparison with Dug well sample.
- TDS of drinking water should be less than 300 as Indian standard (IS-10500). Water analysis confirmed that DW-01, DW-02, DW-03 and DW-04 having more TDS while remaining water sample of Bore well are having very good TDS range.
- Concentration of fluoride was found be less than 1 and in the range of (0.2- 0.5) in all Sample Hand pumps and dug well which is good sign of drinking water. Excessive fluoride causes fluorosis-changes in tooth enamel that range from barely noticeable white spots to staining and pitting. Fluoride can also become concentrated in bone stimulating bone cell growth, altering the tissue's structure, and weakening the skeleton. Fluoride ion analysis confirmed that all collected water sample have concentration is in the range of **0.2- 0.5**mg/l which is considered as good water for drinking.

Soil Sample Report of Waghala Village

- Soil pH affects the amount of nutrients and chemicals that are soluble in soil water, and therefore the amount of nutrients available to plants. Some nutrients are more available under acidic conditions while others are more available under alkaline conditions. However, most mineral nutrients are readily available to plants when soil pH is near neutral. The development of strongly acidic soils (less than 5.5pH) can result in poor plant growth. Most of the soil sample of Waghala village with respect to P^H is close to 7 which are neutral range. Hence soil quality is good in accordance with P^H.

- Level of dissolved salt of soil water play vital role for the proper growth of plants more salt in soil result in dehydration of the plant, causing yield dropdown amount of dissolved salt in water found to be in range between **0.50-0.63**mg/l.
- Analysis of organic carbon content in the soil shows that it is in the standard reference range.

- Phosphorus is a vital component of ATP, the "energy unit" of plants. ATP forms during photosynthesis, has phosphorus in its structure, and processes from the beginning of seedling growth through to the formation of grain and maturity. Thus, phosphorus is essential for the general health and vigor of all plants. Investigation of Sample collected from Waghala village shows less amount of phosphorus than required according to standard specification. Nitrogen is so vital because it is a major component of chlorophyll, the compound by which plants use sunlight energy to produce sugars from water and carbon dioxide (i.e., photosynthesis).
- Analysis of total soil sample of Phosphorous content found in the range of **10-30** ppm. Except sample no. **1, 4** and **6.** Phosphorous, magnesium are essential plant nutrients. They are called “secondary” nutrients because plants require them in smaller quantities than nitrogen, phosphorus, and potassium.
- Examination of all-inclusive soil sample for Potassium found in the range of 216-280 ppm. Except sample no.6, 10 and 11. Calcium and magnesium both increase soil pH, but sulfur from some sources reduces soil P^H. Compounds containing one or more of these nutrients are often used as soil amendments rather than strictly as suppliers of plant nutrition.

Recommendation for Waghala village general public Water quality: -

1. Those hand pump and dug well water of Waghala village, which have high TDS and hardness value water of that source should be treated before drink water or if no such facility is available then banned for use.
2. Peoples are advice to chlorinate drinking water frequently.

3. Essential to arrange some more awareness program for Waghala village people on water and soil to know its importance and to increase its quality.

Soil Quality: -

1. Analysis of soil sample of Waghala village shows some of it samples contain excess of amount nitrogen, potassium and Phosphorous hence they are advice to use less chemical fertilizer.
2. By our survey we are promoting Farmers of Waghala village towards organic farming by different government projects and subsidy.
3. By different program farmers should know its major benefit like food obtained from organic farming is free from any contamination. The organically grown foods have better tastes no effects on health than those grown by harmful chemicals such as pesticides, fungicides and herbicides
4. People advice to use compost or manure to increase the percentage of microorganism in the Soil.
5. Vermicomposting is also alternative solution to increase the quality of soil.

Conclusion: -

In summary, we have carried out survey and analysis on water and soil sample of Waghala village by using questionnaire and analysis of entire sample of water was completed in M.G Arts, Science and late N.P Commerce college Armori chemistry laboratory and soil samples were analyzed in the district laboratory of soil Testing and Survey office Gadchiroli. Different parameter of water like chloride, Hardness, P^H, TDS, and Fluoride was studied and compared with standard (IS10500) Excellent Acceptable range. Parameters of soil like P^H, dissolved salt in soil water, amount carbon, phosphorous, potassium, nitrogen, calcium and magnesium were also studied and compared with standard value. From the result of investigation, we recommended some key advice to that corresponding village.

Acknowledgement: -

Department of Chemistry PBR team is thankful to Sarpanch and Villager of Waghala for their support and cooperation during survey and sample collection. We also show our deep gratitude to Principal of M.G arts Science and late N.P commerce college Armori, for continuous inspiration and guidance throughout survey.

People Biodiversity Register of Zoology

Department of Zoology

People Biodiversity Register (PBR) Report entitled

"Animal diversityof Waghala village of Armori tehsil, Gadchiroli district Maharashtra"

PBR submitted by: **B. Sc. II** (Department of Zoology) students' group **2021-2022**

Under the supervision of **Dr. Jayesh Papadkar,Prof. Sunanda Kumre and Prof.Nikhil Borode**

INTRODUCTION:

Peoples' Biodiversity Register is a document which contains comprehensive information on locally available Bio-resources including landscape and demography of a particular area or village. Bio-resources mean plants, animals and microorganisms or parts thereof, their genetic material and by-products (excluding value added products) with actual or potential use or value but do not include human genetic material. PBRs preparation is the new concept under the Biological Diversity Act, 2002.

The concept was defined in the BD Rules 2004 and State Specific Rule. So far about 5000 PBRs prepared in entire India. But few states like Kerala has been completed the documentation of PBRs for all the Biodiversity Management Committees. There is no proper methodology or approach maintained for documentation of information related to biodiversity and associated knowledge in the PBRs at BMC level.

To assess the people's knowledge on biodiversity and community protocols for biodiversity conservation in three ecosystems such as agriculture, forest and Wetlands. To identify the unique biodiversity of the area like sacred groves, Rare, Endangered and threatened species, biodiversity which are commercial use for Access and benefit sharing. PBR documentation helps, sustainable resource management in Restoration of Traditional fishes, Crops, Wildlife habitats and locally endangered wild species.

Study Objective:

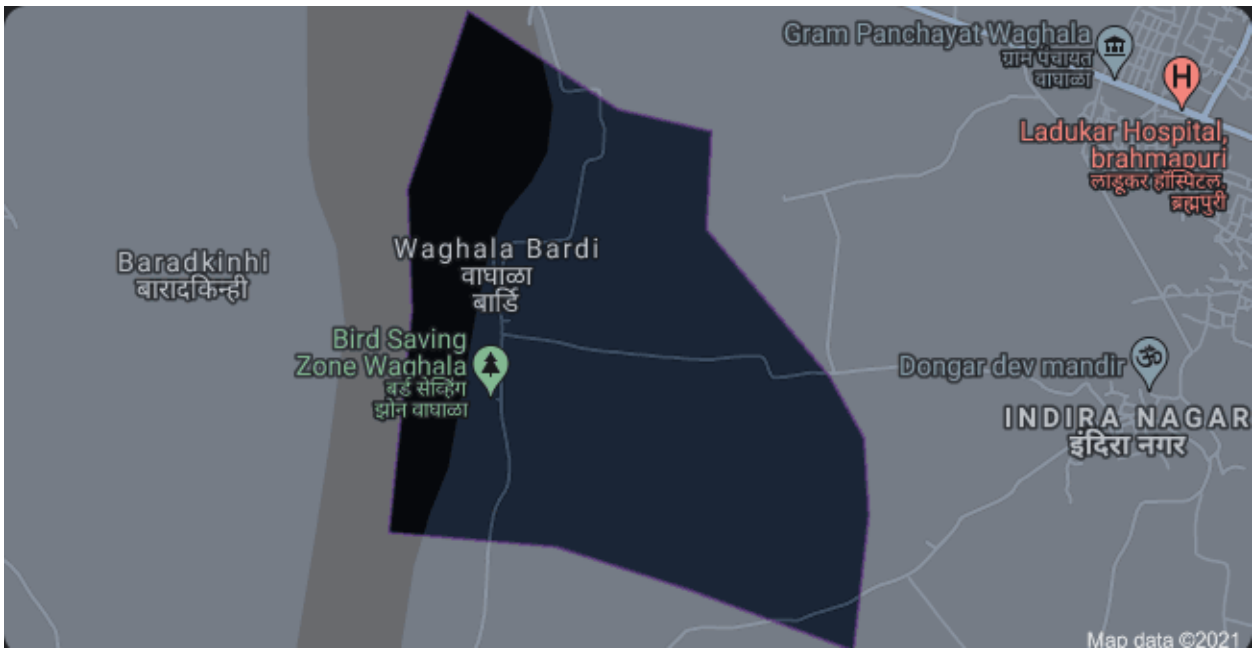
1. To regulate access to biological resources.
2. To conserve and sustainably use biological diversity.

3. To know the traditional knowledge of local people about the diversity.
4. To collect the photographic evidences related to faunal diversity.
5. To provide conservation measure to local authority.
6. To conduct advocacy between Gram Panchayat Member and institution.

MATERIAL AND METHOD

Study Area:

Vaghala is a Village in Armori Taluka in Gadchiroli District of Maharashtra State, India. It belongs to Vidarbh region. Vaghala Local Language is Marathi. Waghala Village Total population is 1634 and number of houses are 406. Female Population is 49.8%. Village literacy rate is 76.7% and the Female Literacy rate is 35.5%.It located on toposhet map at 20.4631° N, 79.9468° E. The area receives rain during June to September ranging from 300-400 mm. The temperature ranges from 20°C-45°C. It recognize as bird saving zone and one committee is established by the Gram Panchayat in collaboration with Forest Department, Wadsasa for conservation of birds named as Bird Protection and Conservation Committee.



Methodology:

i)Conduction of Interviews

To know the traditional knowledge of villagers about the founal diversity student conduct interviews of locals and information gain from the villagers is noted down

ii) Point Transect/ Belt transect method
To know the status and diversity of fauna we use line transect, point transect and belt transect method

iii) Observation:
Observation done using binocular and photographic documentation can be done using mobile camera with the help of Note cam application

iv) Awareness:
Awareness was created among the villagers by posters and through interviews

Identification of Species

S N	Animal Species	Identification key / Standard reference book
1.	Insect	Entomology by D. B. Tembhare
2.	Amphibian	Field guide to amphibian and reptiles by Joseph T**.** Collins
3.	Birds	Salim Ali and Ripley 1972
4.	Reptiles	Deorus (1969)
5.	Pices	Jyram
6.	Mammals	Prater (1971)

RESULT AND DISCUSSION

The study area has rich faunal diversity that include insect, amphibian, pices, birds, reptiles and mammals. The climatic conditions and geographic location provide ideal habitat to all species present at that area. During present study different species of birds, reptiles, mammals etc. was recorded as describe below. This all information is given by villagers in their local language and we turn the information in scientific term

ACKNOWLEDGEMENT

Department of Zoology is thankful to Principal L.H. Khalsa Sir for providing necessary facilities and encouragement to carry out the PBR Survey. Department of Zoology is thankful to Birds Protection and Conservation Committee, Waghala (Bardi) for providing cooperation for this PBR survey. Department of Zoology also thankful to all those people and student who are directly or indirectly provide support for this PBR survey.

Arthropods:

Arthropods include an incredibly diverse group of taxa such as insects, crustaceans, spiders, scorpions, and centipedes. There are far more species of arthropods than species in all other phyla combined, and the number of undescribed species in the largest assemblage of arthropods, the insects, probably numbers in the tens of millions. Members of the phylum have been responsible for the most devastating plagues and famines mankind has known. Yet other species of arthropods are essential for our existence, directly or indirectly providing us with food, clothing, medicines, and protection from harmful organisms.

Sr. No.	Generic Specific Name	Common Name	Classification	Characteristics	Image
1.	*Hypolimnas bolina*	Blue Moon Butterfly	Phylum: Arthropoda Class: Insecta Order: Lepidoptera Genus: *Hypolimnas* *Species: H.* bolina	*H. bolina* is a black-bodied butterfly with a wingspan of about 70–85 millimetres (2.8–3.3 in). The species has a high degree of sexual dimorphism. The female is mimetic with multiple morphs	
2.	*Junonia iphita*	Chocolate Pancy	Phylum: Arthropoda Class: Insecta Order: Lepidoptera Genus: *Junonia* *Species: J. iphita*	The wingspan is about 5–6 cm (2.0–2.4 in) and the female can be told apart from the male by white markings on the oblique line on the underside of the hindwing. The wavy lines on the underside of the wings vary from wet- to dry-season forms.	
3.	*Symphaedra nais*	Baronet butterfly	Phylum: Arthropoda Class: Insecta Order: Lepidoptera Genus: *Symphaedra* *Species: S. nais*	The male and the female both have tawny-yellow uppersides.	
4.	*Junonia almana*	Peacock Pancy	Phylum: Arthropoda Class: Insecta Order: Lepidoptera Genus: *Symphaedra* *Species: S. nais*	Upperside rich orange-yellow. Fore wing with a pale dusky and a much darker short transverse bar with lateral jet-black marginal lines	

5.	*Harmonia axyridis*	Asisan Lady Beetle	Phylum: Arthropoda Class: Insecta Order: Coleoptera Genus: *Harmonia* *Species: H.axyridis*	*Harmonia axyridis* is a typical coccinellid beetle in shape and structure, being domed and having a "smooth" transition between its elytra (wing coverings), pronotum, and head. It ranges from 5.5–8.5mm in size.	
6.	*Anthia sexguttata*	Six Spot Ground Beetle	Phylum: Arthropoda Class: Insecta Order: Coleoptera Genus: *Anthia* *Species:A.sexguttata*	Adults measure approximately 4 cm (1.5 inches), are black with six relatively large, white, dorsal spots (four over the elytra and two on the thorax). Other patterns are possible although the pattern is always symmetrical.	
7.	*Eurybrachys*		Phylum: Arthropoda Class: Insecta Order: Hemiptera Genus: *Eurybrachys*	***Eurybrachys*** is a genus of bugs in the family Eurybrachidae	
8.	*S. fonscolombii*	Red Veined Darter	Phylum: Arthropoda Class: Insecta Order: Odonata Genus: *Sympetrum* *Species:* *S. fonscolombii*	*Sympetrum fonscolombii* can reach a body length of 38–40 millimetres (1.5–1.6 in). This species is similar to other *Sympetrum* species but a good view with binoculars should give a positive identification, especially with a male.	
9.	*Diplacodes trivialis*	Ground Skimmer	Phylum: Arthropoda Class: Insecta Order: Odonata Genus: *Dilacodes* *Species:D.trivialis*	Diplacodes trivialis is small dragonfly with bluish eyes and greenish-yellow or olivaceous thorax and abdomen with black marks.	
10.	*Trithemis pallidinervis*	Long Tail Marsh Glider	Phylum: Arthropoda Class: Insecta Order: Odonata Genus:*Trithemis* *Species:T. pallidinervis*	A medium sized yellowish brown dragonfly with long spider like legs	

11.	*Crocothemis servilia*	Scarlet Skimmer	Phylum: Arthropoda Class: Insecta Order: Odonata Genus:*Crocothemis* *Species:C.servilia*	It is a medium sized blood-red dragonfly with a thin black line along the mid-dorsal abdomen. Its eyes are blood-red above, purple laterally.	
12.	*Argiope pulchella*		Phylum: Arthropoda Class: Arachnida Order: Araneae Genus:*Argiope* *Species:A.pilchella*	The female is larger than the male, being 8 to 10 mm (0.3 to 0.4 in) while the male is 4 to 6 mm (0.16 to 0.24 in).	
13.	*Hyllus semicupreus*	Heavy-bodied Jumper	Phylum: Arthropoda Class: Arachnida Order: Araneae Genus:*Hyllus* *Species:H.semicupreius*	As usual in spider morphology, the female is much larger than male the female is about 8-9 mm in length and the male is 7-9 mm length	

Mollusca

Mollusca is the second-largest phylum of invertebrate animals after the Arthropoda. The members are known as molluscs or mollusks. Around 85,000 extant species of molluscs are recognized. The number of fossil species is estimated between 60,000 and 100,000 additional species. Molluscs are the largest marine phylum, comprising about 23% of all the named marine organisms. Numerous molluscs also live in freshwater and terrestrial habitats.

Sr. No	Scientific Name	Common Name	Classification	Characteristics	Image
1.	*Bellamya crassa*	Pila	Phylum: Mollusca Class: Gastropoda Order:Architaenioglossa Genus: *Bellamya* Species:*B.crassa*	***Bellamya*** is a genus of freshwater snails with a gill and an operculum, aquatic gastropod molluscs in the family Viviparidae. *Bellamya* is the type genus of the subfamily	

				Bellamyinae	
2.	*Mainwaringia paludomoidea*		Phylum: Mollusca Class: Gastropoda Order:Littorinimorpha Genus:*Mainwaringia* Species:*M. paludomoidea*	Shell conically produced, suture distinct, bright yell owish brown, body whorl with three distinct, broad, dark brown bands	
3.	*Lamellidens marginalis*	Unio	Phylum: Mollusca Class: Bivalvia Order:Unionida Genus:*Lamellidens* Species:*L.marginalis*	Shell oblong ovate, valves covered by blackish brown periostracum.	

Amphibian:

Amphibians are small vertebrates that need water, or a moist environment, to survive. The species in this group include frogs, toads, salamanders, and newts. Amphibians are ectothermic, tetrapod vertebrates of the class Amphibia. All living amphibians belong to the group Lissamphibia. They inhabit a wide variety of habitats, with most species living within terrestrial, fossorial, arboreal or freshwater aquatic ecosystems.

Sr. No.	Scientific Name	Common Name	Classification	Characteristic	Image
1.	*Hoplobatrachus tigerinus*	Common Indian Bull Frog	Phylum:Chordata Class: Amphibia Order: Anura Genus: *Hoplobatrachus* *Species:H.tigerinus*	Indian Bullfrog is a ferocious predator and the largest frog found in India. It can grow up to 200 mm in size and can weigh up to 3 kilograms.	

2.	*Euphlyctis cyanophlyctis*	Common Skitterin g Frog	Phylum:Chordata Class: Amphibia Order: Anura Genus: *Euphlyctis* *Species:E.cyanophlyc tis*	Found on still water bodies such as ponds, reservoirs, and lakes, Common Skittering Frogs skitter on the water when they are disturbed or threatened.	
3.	*Polypedates maculates*	Indian Tree Frog	Phylum:Chordata Class: Amphibia Order: Anura Genus:*Polypedates* *Species:P.maculates*	These frogs measure about 7–8 cm in body length. They are mostly brownish, yellowish,rarely with an hourglass-shaped figure on the back of the head and the front of the back.	
4.	*Fejervarya sp.*	Cricket Frogs	Phylum:Chordata Class: Amphibia Order: Anura Genus:*Polypedates* *Species:P.maculates*	In spite of their small size, Cricket Frogs have very strong vocalization.	
5.	*Uperodon montanus*	Ramallel a Narow Mouthed Frog	Phylum:Chordata Class: Amphibia Order: Anura Genus:*Uperodon* *Species:U. montanus*	The frogs of the (former) genus *Ramanella* are small and characteristically have discs on their fingers but lack them on the toes.	

Pisces/ Fishes

Pisces, a class of vertebrates comprising the true fishes, have the jaws supported by a skeleton derived from primitive gill arches. Typically, they have two sets of paired fins, pectoral and pelvic, as well as dorsal, caudal, and anal fins in the midline. They are found in fresh marine and blackish water. Body is usually streamlined. They swim with the help of their tail.

Sr. No	Scientific Name	Common Name	Classification	Characteristics	Image
1.	*Catla catla*	Catla	Phylum: Chordata Class: Actinopterygii Order:Crypriniformes Genus: *Lobeo* Species: *L. Catla*	Catla is a fish with large and broad head, a large protruding lower jaw, and upturned mouth. It has large, greyish scales on its dorsal side and whitish on its belly. It reaches up to 182 cm (6.0 ft) in length and	

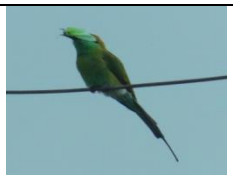
				38.6 kg (85 lb) in weight	
2.	*Cirrhinu mrigala*	Mrigal	Phylum: Chordata Class: Actinopterygii Order:Cypriniformes Genus: *Cirrhinu* Species: *C. Mrigala*	Mrigal is popular as a food fish and an important aquacultured freshwater species throughout South Asia. Mrigal is the benthopelagic and potamodromous plankton feeder.	
3.	*Mystus seenghala*	Seenghala	Phylum: Chordata Class: Actinopterygii Order:Siluriformes Genus: *Mystus* Species: *M. seenghala*	It grows to a length of 40 cm. The pectoral spine of the species may give painful wounds and sometimes can be venomous	
4.	*Channa Punctatus*	Spotted Snakehead	Phylum: Chordata Class: Actinopterygii Order:Anabantiformes Genus: *Channa* Species: *C. Punctatus*	Channa punctatus normally grows to around 15.0 cm (5.9 in) in length, but males up to 31.0 cm (12.2 in) have also been captured	
5.	*Clarias batrachus*	Mugur	Phylum: Chordata Class: Actinopterygii Order:Siluriformes Genus: *Clarias* Species: *C. batrachus*	The walking catfish has an elongated body shape and reaches almost 0.5 m (1.6 ft) in length and 1.2 kg (2.6 lb) in weight	
6.	*Labeo rohita*	Rohu	Phylum: Chordata Class: Actinopterygii Order:Cypriniformes Genus: *Labeo* Species: *L. rohita*	The rohu is a large, silver-colored fish of typical cyprinid shape, with a conspicuously arched head. Adults can reach a maximum weight of 45 kg (99 lb) and maximum length of 2 m (6.6 ft),	

				but average around ½ m (1.6 ft)	

Aves:

Birds are a group of warm-blooded vertebrates constituting the class Aves, characterised by feathers, toothless beaked jaws, the laying of hard-shelled eggs, a high metabolic rate, a four-chambered heart, and a strong yet lightweight skeleton.

Sr. No	Scientific Name	Common Name	Classification	Characteristics	Image
1.	*Anastomus ocitans*	Asian Open Bill Stork	Phylum:Chordata Class: Aves Order: Ciconiiformes Genus:Anastomus *Species:A. ocitans*	The Asian openbill stork is predominantly greyish (non-breeding season) or white (breeding season) with glossy black wings and tail that have a green or purple sheen.	
2.	*Mycteria leucocephala*	Painted Stork	Phylum:Chordata Class: Aves Order: Ciconiiformes Genus: *Mycteria* *Species:M.leucocephala*	This large stork has a heavy yellow beak with a down-curved tip that gives it a resemblance to an ibis. The head of the adult is bare and orange or reddish in colour.	
3.	*Ardea alba*	Great Egret	Phylum:Chordata Class: Aves Order: Pelecaniformes Genus: *Ardea* *Species:A.alba*	The great egret is a large heron with all-white plumage. Standing up to 1 m (3.3 ft) tall, this species can measure 80 to 104 cm (31 to 41 in) in length and have a wingspan of 131 to 170 cm	

4.	*Ploceus philippinus*	Baya Weaver	Phylum:Chordata Class: Aves Order: Passeriformes Genus: *Ploceus* *Species:P.philippinus*	These are sparrow-sized(15 cm [5.9 in]) and in their non-breeding plumage, both males and females resemble female house sparrows.	
5.	*Egretta garzetta*	Little Egret	Phylum:Chordata Class: Aves Order: Pelecaniformes Genus: *Ploceus* *Species:P.philippinus*	The adult little egret is 55–65 cm (22–26 in) long with an 88–106 cm (35–42 in) wingspan, and weighs 350–550 g (12–19 oz).	
6.	*Merops orientalis*	Green Bee Eater	Phylum:Chordata Class: Aves Order: Coraciiformes Genus: *Merops* *Species:M.orientalis*	Like other bee-eaters, this species is a richly coloured, slender bird. It is about 9 inches (16–18 cm) long with about 2 inches made up by the elongated central tail-feathers.	
7.	*Euodice malabarica*	Silver Billed Munia	Phylum:Chordata Class: Aves Order: Passeriformes Genus: *Euodice* *Species:E.malabarica*	The adult Indian silverbill is 11–11.5 cm long and has a conical silver-grey bill, buff-brown upperparts, white underparts, buffy flanks and dark wings.	
8.	*Coracias beghalansis*	Indian Roller	Phylum:Chordata Class: Aves Order: Coraciiformes Genus: *Coracias* *Species:C.benghalansis*	The Indian roller is a bulky and broad-winged bird with a large head and short neck and legs. It has a body length of 30–34 cm (12–13 in) with a wingspan of 65–74 cm (26–29 in) and weighs 166–176 g (5.9–6.2 oz)	

9.	*Passer domesticus*	House Sparrow	Phylum:Chordata Class: Aves Order: Passeriformes Genus: *Passer* *Species:P.domesticus*	The house sparrow is typically about 16 cm (6.3 in) long, ranging from 14 to 18 cm (5.5 to 7.1 in). The house sparrow body shape is full chest and rounded head	

Reptiles:

Reptiles are air-breathing vertebrates covered in special skin made up of scales, bony plates, or a combination of both. They include crocodiles, snakes, lizards, turtles, and tor- toises. Unlike birds and mammals, reptiles do not maintain a constant internal body temperature.

Sr. No.	Scientific Name	Common Name	Classification	Characteristics	Image
1.	*Calotes versicolor*	Oriental Garden Lizard	Phylum:Chordata Class: Reptilia Order: Squamata Genus: *Calotes* *Species:C.versicolor*	It is an insectivore and the male gets a bright red throat in the breeding season.	
2.	*Agama agama*	Rainbow Lizard	Phylum:Chordata Class: Reptilia Order: Squamata Genus: *Agama* *Species:A. agama*	Its size varies from 13 to 30 cm (5.1 to 11.8 in) in total length.Males are typically 7.5 to 12 cm (3.0 to 4.7 in) longer than the average female.	
3.	*Hemidactylus frenatus*	Common House Gecko	Phylum:Chordata Class: Reptilia Order: Squamata Genus:*Hemidactylus* *SpeciesH. frenatus*	They grow to a length of between 7.5–15 cm (3–6 in), and live for about 5 years.	

				These small geckos are non-venomous and not harmful to humans.	

Mammals:

Mammal,(class Mammalia), any member of the group of vertebrate animals in which the young are nourished with milk from special mammary glands of the mother. In addition to these characteristic milk glands, mammals are distinguished by several other unique features. Hair is a typical mammalian feature, although in many whales it has disappeared except in the fetal stage. The mammalian lower jaw is hinged directly to the skull, instead of through a separate bone (the quadrate) as in all other vertebrates. A chain of three tiny bones transmits sound waves across the middle ear. A muscular diaphragm separates the heart and the lungs from the abdominal cavity.

Sr. No.	Scientific Name	Common Name	Classification	Characteristics	Image
1.	*Bos taurus indicus*	Lohani Cattle	Phylum:Chordata Class: Mammalia Order: Artiodactyla Genus:*Bos SpeciesB.taurus indicus*	They are draft type of cattle and are smaller than many other types of cattle, with the average bull weighing 300–350 kg. Their coat is normally red with white spots.	
2.		Banni	Phylum:Chordata Class: Mammalia Order: Artiodactyla Genus: *Species:*	Body colour mainly blck, Horned is curved with 24 to 30 cm diameter	
3.	*Capra aegagrus hircus*	Black Bengal Goat	Phylum:Chordata Class: Mammalia Order: Artiodactyla Genus:Capra *Species:C. aegagrus hircus*	This breed is usually colored black but it is also found in brown, white or gray. The Black Bengal goat is small in size but its body structure is	

				tight.	
4.	*Canis lupus familiaris*	Indian Parihah Dog	Phylum:Chordata Class: Mammalia Order: Carnivora Genus:*Canis* *Species:C.lupus familaris*	It is a medium-sized dog of square to slightly rectangular build and short coat. The dog has a double coat, a coarse upper coat, and a soft undercoat	
5.		Krishna Valley	Phylum:Chordata Class: Mammalia Order: Artiodactyla Genus:*Bos* *Species:*	Common color of their body is grey-white with a darker shade on fore and hindquarters in bulls. And the mature cows are more whitish in appearance than the bulls.	
6.	*Felis catus*	Indian Street Cat	Phylum:Chordata Class: Mammalia Order: Carnivora Genus: *Felis* *Species:F. catus*	The cat is similar in anatomy to the other felid species: it has a strong flexible body, quick reflexes, sharp teeth and retractable claws adapted to killing small prey. Its night vision and sense of smell are well developed	

Conclusion:

Waghala is considered to be one of the biodiversity rich areas of storks in Gadchiroli district. It possesses great diversity of flora and fauna. In the present observation, birds were identified and recorded for community structure and diversity. But the conservation efforts are limited due to lack of documentation and studies on this area. This study was designed not only to document species richness of this small area but also to find out distribution patterns of these

birds along various microhabitats along the *Waghala*. The variation in species richness and relative abundance of avifauna is associated with crop stages.

It is observed that there is a lot of bird's species which are founds in river zone and bank. This entire stork they excrete their excreta in the waste of birds there is presence of nitrogenous waste act as bio fertilizer and it helps in increasing the yield which is very effective for farming. This fecal matter does not affect by any means to villagers. Peoples of the village on the contrary protecting these guests every year and conserve the site which is example of awareness. Pollution, pesticide and wetland drainage have severely reduced suitable foraging habitat across the breeding range. Conservation efforts that focus on the preservation of ecosystems and biodiversity seems to hold the most promise for halting the decline of this and other bird's species.

WAGHALA VILLAGE AT GLANCE

Dr. Jayesh Papadkar, Head Of Department Addressing the Students


Latitude: 20.465114
Longitude: 79.946669
Elevation: 234.97±29 m
Accuracy: 13.6 m
Time: 27-11-2021 10:10
Note: pbr


Latitude: 20.464729
Longitude: 79.946703
Elevation: 199.61±10 m
Accuracy: 12.4 m
Time: 11-27-2021 10:55
Note: PBR
Powered by NoteCam


Latitude: 20.465325
Longitude: 79.946685
Elevation: 217.89±21 m
Accuracy: 9.6 m
Time: 27-11-2021 10:23
Note: pbr


GPS Map Camera
Waghala Bardi, Maharashtra, India
FW7W+7MG, Waghala Bardi, Maharashtra 441208, India
Lat 20.464572°
Long 79.946799°
27/11/21 10:04 AM
Waghala Bardi
Google


Latitude: 20.464718
Longitude: 79.946746
Elevation: 206.94±6 m
Accuracy: 4.8 m
Time: 11-27-2021 10:06
Note: PBR
Powered by NoteCam


Latitude: 20.458638
Longitude: 79.945819
Elevation: 206.71±8 m
Accuracy: 7.3 m
Time: 27-11-2021 11:47
Note: 10

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People Biodiversity Register of Geology

Department of Geology

PBR Study Report on

A Study of Shallow Water Aquifer and Geology in Waghala Village of Armori Taluka, Dist. Gadchiroli.

*PBR submitted by: -**B. Sc. II** (Department of Geology) student's gp. **2021-22***

*Under the supervision of **Prof. Dr. C. P. Dorlikar, Prof. P. S. Ganvir and Prof. D. W. Wanmali***

1. INTRODUCTION

The groundwater is the freshwater resource available in the rock strata named as aquifer. There are multiple types of aquifers available in the usual geological setup. The most common and frequently encountered category is the aquifer in sedimentary terrain. The study of the aquifer has always been a center of curiosity since the dawn of the cultured mankind. These aquifers are of great importance, when the groundwater quality and quantity is concerned. As the groundwater resources are gradually turning into a crucial feature for the human settlement, it has been studied with more intensity.

There are in common two kinds of general aquifers viz., deep aquifers where the bore has to be done and the shallow aquifers where digging is sufficient. In common scenario, the dug wells are much common since ancient times than the bore wells which are originated and evolved in recent times. Hence, it would not be intensified to declare the exploitation of shallow is much higher than the deep ones. The overlying soil or weathered layer or the first layer of bed rock usually performs as a shallow water aquifer. The geology is actually a controller of the aquifer system and hence, the groundwater potential also depends on the same.

A region where the geological setup is rich with non-porous and impervious rocks creates terrible groundwater difficulties. In usual groundwater studies, the strata underneath is the chief factor of study. Once, the geology is understood, the aquifer mapping is much easier task than before. The researchers usually probe for the fresh groundwater resources by studying the geology; hence, the aquifer study is nothing but a part and parcel of the geological studies.

The considerable burden of demographic expansions puts direct influence over the groundwater resources and hence, its study is important. The present study is an attempt has been made to prepare a draft over shallow aquifer of Waghala village of Armori Taluka for the fulfillment of Peoples' Biodiversity Register by second year graduate students of Geology with following objectives;

1.1 Objectives

- To study the shallow water aquifer of the Waghala village.
- To evaluate the groundwater obtainability in the Waghala village.
- To chalk out the water consumption outline in the Waghala village.
- To measure the static water level of the groundwater in the village.
- To understand the geomorphic implications over the groundwater conditions in the village.

1.2 Study Area

- The Waghala village is located in the Armori taluka of district Gadchiroli, Maharashtra.
- The Waghala village is aligned along the bank of Wainganga River.
- The Waghala village can be classified as a rural area with very sparse population.
- The major crop around the Waghala village is the paddy.

1.3 Methodology

- The Waghala village was visited to understand the geology, geomorphology, groundwater setups, agricultural practices, etc.
- After overviewing the geology through few outcrops and geomorphology with reference to the banks and terraces of the Waingangā River, 04 dug wells (as samples points) were decided.
- The dug wells were then measured by the standard format and the generated data thereafter analyzed in the laboratory.
- Simultaneously, the locals were also questioned regarding the groundwater usage pattern for domestic and agricultural purpose.

Figure 1 - Overview of the Waghada village indicating sample points

2. FUNDAMETAL CONCEPTS

2.1 Hydrological properties

2.1.1 Porosity

It is a percentage of pore spaces present in the rock stratum and is denoted by N. Following are some porosity range for some common material.

Unconsolidated Material	N (%)	Consolidated Material	N (%)
Clay	45 - 60	Sandstone	5 - 20
Silt	35 -50	Limestone	4 - 20
Sand and gravel	25 - 40	Shale	0 - 10
Glacial till	10 - 25	Igneous and metamorphic rock	0 - 10
Vesicular basalt			5 - 40

Table 1 – Classification of rocks based on porosity.

Porosity can be of primary (formed during the origin of rock) and secondary porosity (formed after the origin of rock)

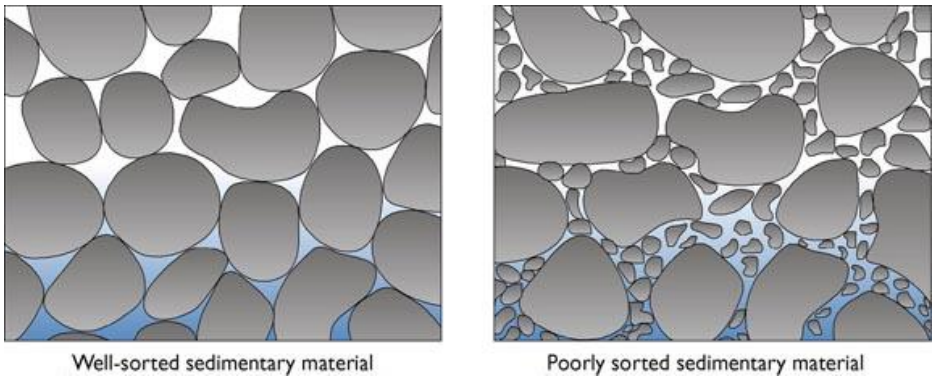


Figure 2 – Primary porosity of the rock.

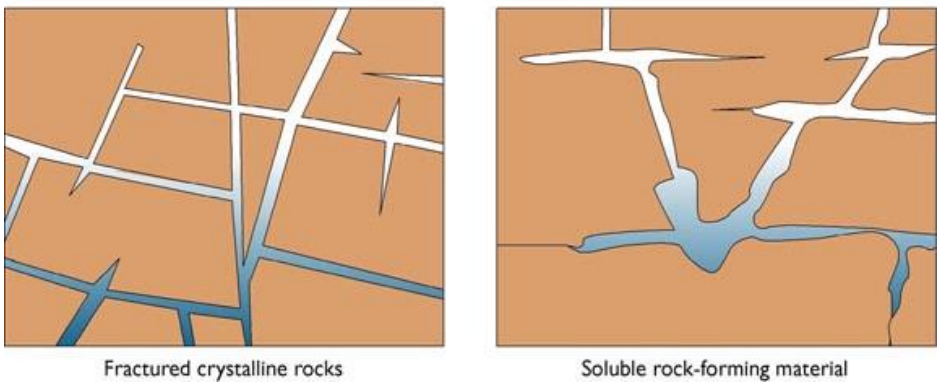


Figure 3 – Secondary porosity of the rock.

2.1.2 Permeability

It is capability of the rock to allow the water to flow with within. Following are some common examples.

Class	Hydraulic Conductivity K (M/D)	Example
Extremely Permeable	>10	Coarse sandstone, limestone and fissured crystalline rocks, pebbles, gravels.
Semi-Permeable	10 – 0.1	Fined grained sands, loams, slightly jointed crystalline rocks.
Impermeable	< 0.1	Clays, marls, compact igneous rocks.

Table 2 – Classification of rocks based on permeability.

2.1.3 Hydraulic Conductivity

In hydro-geology, the hydraulic conductivity K, may be defined as the flow velocity per unit hydraulic gradient. It is expressed as cm/second

Soil type	Hydraulic conductivity (cm/sec)
Clean gravel	$100 \sim 1$
Coarse sand	$1 \sim 0.01$
Fine sand	$0.01 \sim 0.001$
Silty sand	$10^{-3} \sim 10^{-5}$
Clay	$< 10^{-6}$

Table 3 – Hydraulic conductivity of the common rock materials.

2.2 Wells

The wells are the artificial digs or bores in the earth surface to withdraw the water beneath the surface.

2.2.1 Dug

These are traditional wells dig up with means of picks and shovels with a diameter ranging up to one meter and of 20 meters as maximum depth.

2.2.2 Driven

It is constructed on unconsolidated materials by driving a pipe with the maximum diameter of 7.0 centimeters.

2.2.3 Bored

The bored wells are constructed in the unconsolidated materials by means of hand or power augers.

2.2.4 Jetted

These wells are excavated in the loose earth materials by the force of the jet of water which is produced by pumping water through hollow drill rods.

2.2.5 Drilled

The water from consolidated aquifers is extracted by drilling deep wells. These wells are generally constructed by hydraulic rotary drill methods. The drilled wells may attain a depth of 70 meters or more.

2.3 Types of the Groundwater Reserves

The rock unit abled to store and transmit water is called as aquifer, where ‘aqua’ stands for water and ‘fer’ stands for yield. The rock units like sandstone, limestone, gravel beds, etc. are good aquifers. Following are its type;

2.3.1 Unconfined Aquifer

An unconfined aquifer is the rock unit where water table is under atmospheric pressure and is not confined by any impermeable rock strata.

2.3.2 Confined Aquifer

It is also called as artesian or pressure aquifers where groundwater is under the pressure of overlying relatively impermeable strata.

2.3.3 Aquiclude

It is a rock unit with enough pore spaces but lack of transmissibility. The best example is Shale.

2.3.4 Aquifuge

It is a totally impermeable rock unit neither store nor transmits water. The best example is Granite.

2.3.5 Aquitard

It is a flooded permeable stratum allowing groundwater movement but does not yield water freely to well.

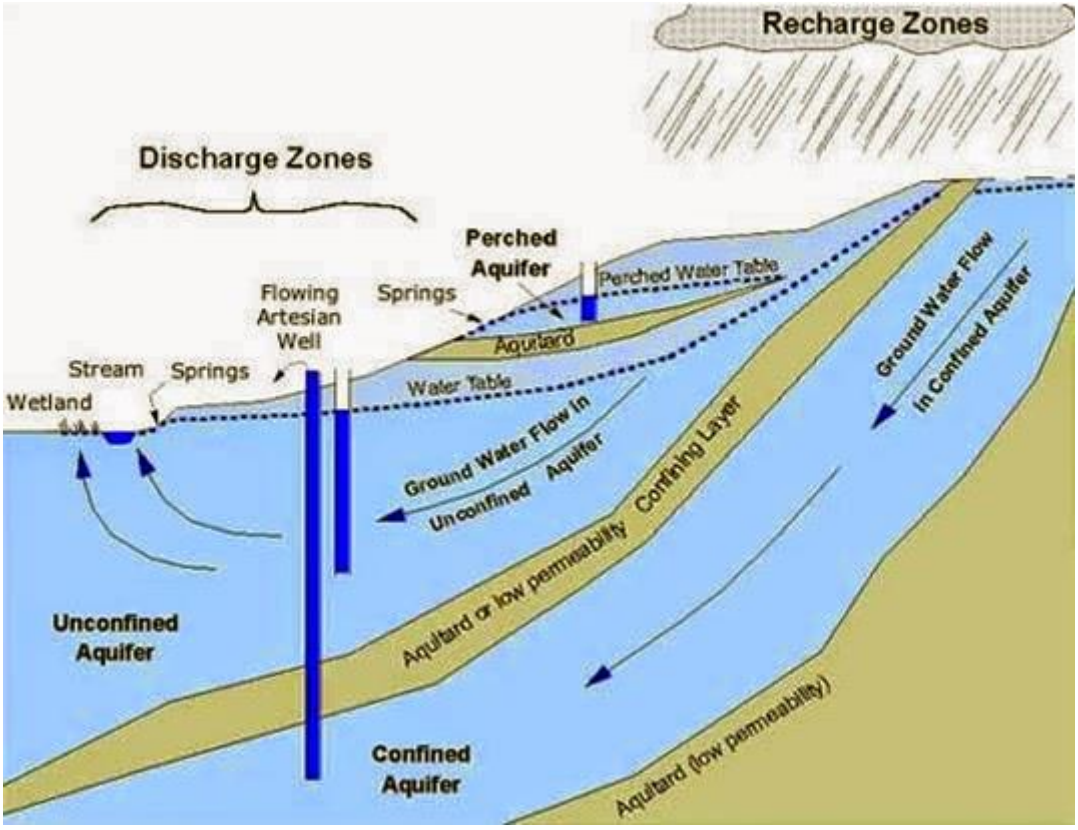


Figure 4 – General aquifer system.

3. GENERAL WATER USAGE PATTERN OF WAGHALA VILLAGE

The survey of Waghala village was done with respect to the water usage pattern and on the behalf of the responses following comments can be made;

- In and around the Waghala village the numbers of dug wells were relatively lower than the bore wells.
- The occupants of the Waghala village mostly depend on the bore wells, but the use of the dug wells for domestic purpose cannot be denied.
- The common concise of the locals over the groundwater quality with respect to domestic usage was on the positive flank.
- The farmers mostly use the bore wells in the fields but few dug wells were also reported.
- The Waghala village is on the bank of the Wainganga River, which actually provides them a huge source for fresh water. This ultimately lowers the dependency over the groundwater to certain extent.
- An irrigation canal is also been allotted to the east ward agricultural lands of the Waghala village, where the water from the river Wainganga is supplied in a fixed interval.
- As such, no groundwater related problem was raised by the locals.

Figure 5 - Student-resident interaction over questionnaire in Waghala village.

4. GEOLOGY AROUND WAGHALA VILLAGE

To reveal the geology of the Waghala village, disclosures in and around the village were outlined. In the attempt of outcrops outlining, very few prominent disclosures of rocks were observed in the western side of the village along the Wainganga River. Following observations were made in the preliminary attempt;

- The major portion of the Waghala village is covered by the alluvium deposited by the Wainganga River.
- A systematic sequence of the river transgression has been observed along the banks of the river.
- The majority of the sedimentary zone observed is of quaternary age.
- Apart from that, very few insignificant exposures of the sandstones were also observed.
- In general observation the quaternary sedimentation includes alluvium and gravel beds.
- It is quite dark possibility,that the most of the aquifer of shallow depth is in the quaternary beds.

Figure 6 - Dr. C. P. Dorlikar interacting with students over local geology.

5. WELL INVENTORY SURVEY OF STUDY AREA

5.1 WELL INVENTORY DATA SHEET OF DW01

1. Village: **Waghala**
2. Taluka: **Armori**
3. District : **Gadchiroli**

4. Toposheet No: Quadrant:

6. Altitude: **211.68 metres** (M.S.L.) 7. Date: **27 – 11 – 21** 8.Time: **11.03 am**

9. Location: **20^0 27' 51" N & 79^0 56' 50" E**

10. Owner's Name (In full): **Gram Panchayat**

11. Address: **Waghala**

12. Type of well: **Dug Well** 13. Height of Parapet: **1 m.**

14. Diameter of well top: **3.6 m.** 15. Bottom: _____

16. Depth of well: **15.3 m.** 17. Dimension of the Bore: _____

18. Dug cum bore well: _____ 19.Depth of lining: _____m

20. Nature of lining: _____ 21. Condition of lining: _____

22. S W L Summer /winter: **12.4 m** 23. Draw Down Summer/Winter:

24. Use of water: **Domestic** 25. Quality of water: **Good**

26. Geological Formation: **Quaternary sediments and Sandstone**

27. Trajectory: _____

28. Rate: _____

29. Duration of pumping summer/ winter:

30. Quality pumped Summer/Winter: _____ 30-A. Kilt/day: _____

31. Prime mover: _____ Make: _____

32. H.P _____ 32-A R.P.M _____ 32-B Drive _____32-C pump-Type_____

33. Section of the well/lithology: **Quaternary sediments and Sandstone**

34. Log of bore-hole: _____

35. Fluctuation of water table? Post Monsoon (Oct): _____

Late Monsoon (June): _____

36. Any other remark: _____

37. Temperature: _____ 38. Conductivity: _____ 39. PH: _____

40. Date: **27 – 11 – 21** 41. Reporter:

42. Name of the student: **B.Sc. II year Students.**

Figure 7 - Measurement of DW01

5.2 WELL INVENTORY DATA SHEET OF DW02

4. Village: **Waghala**

5. Taluka: **Armori**

6. District : **Gadchiroli**

4. Toposheet No: Quadrant:

6. Altitude: **227.35 metres** (M.S.L.) 7. Date: **27 – 11 – 21** 8.Time: **11.09 am**

9. Location: **20^0 27' 50" N & 79^0 56' 50" E**

10. Owner's Name (In full): **Gram Panchayat**

11. Address: **Waghala**

12. Type of well: **Dug Well** 13. Height of Parapet: **0.7 m.**

14. Diameter of well top: **1.4 m.** 15. Bottom: _____

16. Depth of well: **17 m.** 17. Dimension of the Bore: _____

18. Dug cum bore well: _____ 19.Depth of lining: _____m

20. Nature of lining: _____ 21. Condition of lining: _____

22. S W L Summer /winter: **10.1 m** 23. Draw Down Summer/Winter:

24. Use of water: **Domestic** 25. Quality of water: **Good**

26. Geological Formation: **Quaternary sediments and Sandstone**

27. Trajectory: _____

28. Rate: _____

29. Duration of pumping summer/ winter:

30. Quality pumped Summer/Winter: _____ 30-A. Kilt/day: _____

31. Prime mover: _____ Make: _____

32. H.P _____ 32-A R.P.M _____ 32-B Drive _____32-C pump-Type_____

33. Section of the well/lithology: **Quaternary sediments and Sandstone**

34. Log of bore-hole: _____

35. Fluctuation of water table? Post Monsoon (Oct): _____

Late Monsoon (June): _____

36. Any other remark: _____

37. Temperature: _____ 38. Conductivity: _____ 39. PH: _____

40. Date: **27 – 11 – 21** 41. Reporter:

42. Name of the student: **B.Sc. II year Students.**

Figure 8 - Measurement of DW02

5.3 WELL INVENTORY DATA SHEET OF DW03

7. Village: **Waghala**

8. Taluka: **Armori**

9. District : **Gadchiroli**

4. Toposheet No: Quadrant:

6. Altitude: **205.5 metres** (M.S.L.) 7. Date: **27 – 11 – 21** 8.Time: **11.17 am**

9. Location: **20^0 27' 45" N & 79^0 56' 50" E**

10. Owner's Name (In full): **Smt. Manda Hari Kharkade**

11. Address: **Waghala**

12. Type of well: **Dug Well** 13. Height of Parapet: **0.9 m.**

14. Diameter of well top: **1.6 m.** 15. Bottom: _____

16. Depth of well: **19.4 m.** 17. Dimension of the Bore: _____

18. Dug cum bore well: _____ 19.Depth of lining: _____m

20. Nature of lining: _____ 21. Condition of lining: _____

22. S W L Summer /winter: **11.8 m** 23. Draw Down Summer/Winter:

24. Use of water: **Domestic** 25. Quality of water: **Good**

26. Geological Formation: **Quaternary sediments and Sandstone**

27. Trajectory: _____

28. Rate: _____

29. Duration of pumping summer/ winter:

30. Quality pumped Summer/Winter: _____ 30-A. Kilt/day: _____

31. Prime mover: _____ Make: _____

32. H.P _____ 32-A R.P.M _____ 32-B Drive _____32-C pump-Type_____

33. Section of the well/lithology: **Quaternary sediments and Sandstone**

34. Log of bore-hole: _____

35. Fluctuation of water table? Post Monsoon (Oct): _____

Late Monsoon (June): _____

36. Any other remark: _____

37. Temperature: _____ 38. Conductivity: _____ 39. PH: _____

40. Date: **27 – 11 – 21** 41. Reporter:

42. Name of the student: **B.Sc. II year Students.**

Figure 9 - Measurement of DW03

5.4 WELL INVENTORY DATA SHEET OF DW04

10. Village: **Waghala**

11. Taluka: **Armori**

12. District : **Gadchiroli**

4. Toposheet No: Quadrant:

6. Altitude: **205.5 metres** (M.S.L.) 7. Date: **27 – 11 – 21** 8.Time: **11.13 am**

9. Location: **20^0 27' 46" N & 79^0 56' 49" E**

10. Owner's Name (In full): **Gram Panchayat**

11. Address: **Waghala**

12. Type of well: **Dug Well** 13. Height of Parapet: **0.8 m.**

14. Diameter of well top: **1.8 m.** 15. Bottom: _____

16. Depth of well: **17 m.** 17. Dimension of the Bore: _____

18. Dug cum bore well: _____ 19.Depth of lining: _____m

20. Nature of lining: _____ 21. Condition of lining: _____

22. S W L Summer /winter: **13 m** 23. Draw Down Summer/Winter:

24. Use of water: **NA** 25. Quality of water: **NA**

26. Geological Formation: **Quaternary sediments and Sandstone**

27. Trajectory: _____

28. Rate: _____

29. Duration of pumping summer/ winter:

30. Quality pumped Summer/Winter: _____ 30-A. Kilt/day: _____

31. Prime mover: _____ Make: _____

32. H.P _____ 32-A R.P.M _____ 32-B Drive _____32-C pump-Type_____

33. Section of the well/lithology: **Quaternary sediments and Sandstone**

34. Log of bore-hole: _____

35. Fluctuation of water table? Post Monsoon (Oct): _____

Late Monsoon (June): _____

36. Any other remark: _____

37. Temperature: _____ 38. Conductivity: _____ 39. PH: _____

40. Date: **27 – 11 – 21** 41. Reporter:

42. Name of the student: **B.Sc. II year Students.**

Figure 10 - Measurement of DW04

6. CONCLUSION

The observation and analysis of the surveyed data gives following conclusions;

- The Waghala village is a settlement along the river bank of the Wainganga River.
- Accordingly, most of the sedimentary strata is of quaternary age and brought by the series of floods of Wainganga River.
- The shallow water aquifer is mostly composed of the sedimentary beds including alluvium and gravel beds and a hard rock probably of sandstone.
- As the alluvium and gravel beds are of high porosity and permeability, the shallow aquifer is of great potential.
- The Wainganga River towards west is the major recharger of this shallow aquifer.
- Majority of the groundwater resource is mostly exploited through bore well followed by dug wells.
- The dug wells are also in use for the domestic purpose and the water quality is of no concern. Hence, suggestible for domestic and drinking purpose (in absence of alternating source).
- The average mean static level from well inventory data is 11.82 m.
- As the Waghala village is a paddy field, the groundwater resources are also widely used for the agricultural purpose.

7. RECOMMENDATION

Following recommendations can be made for optimizing water resource in Waghala village;

- Though the groundwater resources are plenty, the utilization should be kept economical so that the recharged water in the aquifer can support to the rest of the area where aquifer is connected.
- The inhabitants should take care of the water quantity and quality by depending on canal irrigation and minimizing the use of chemical based farming.

FIELD PICTURES

Figure 11 - Dr. C. P. Dorlikar with the B.Sc. II year students at Waghala village.

Figure 12 - Dr. C. P. Dorlikar and students in the Wainganga River near Waghala village.

Mahatma Gandhi Arts, Science & Late N. P. Commerce College,
Armori, Dist. Gadchiroli

Department of Geology

People Biodeversity Register of Waghala Village, Tah. Armori

Academic Session 2021-22

Sr. No.	Name	Mobile No.	Signature
1	ADITYA ARVIND ZODAGE	9011539256	
2	AISHWARYA RAJENDRA SHENDE	9529950507	
3	AKANKSHA BHARAT WARKE		
4	ANIKET KISHOR KUTHE	9309592059	
5	BHARGHAV SADANAND KUTHE	7219864083 2	
6	DIKSHA DADAJI SARVE	8275459781	
7	DIMPAL DRUKSING GHATGHUMAR		
8	DIPA DEVIDAS DUMANE	9309843480	
9	DURGA SUDHAKAR KALSAR	7350711543	
10	GAURI VIJAY HEMKE		
11	HARSHADA MURLIDHAR BUDDHE	9405392613	
12	HARSHWARDHAN DILIP BHOYAR	8010299744	
13	HIMANSHU SANJAY GURU	7774830231	
14	KAMLESH PANDHARI MISAR	7620224774	
15	KUNAL DNYANESHWAR HAJARE		
16	LINASHRI SADANAND JANBANDHU	9022609134	
17	MAITHILI UMAKANT MHASHAKHETRI	8208542668	
18	MEGHA PRADIP SAHARE	7588200645	
19	NIKITA DIPAK NIMBEKAR		
20	NIKITA KESHAV HEDAU	8855064431	
21	PAYAL VINOD SORTE	9145523773	
22	PRACHI GANGADHAR KIRNAPURE	8669766382	
23	PRAJWAL NARENDRA DHAIT		
24	PRANALI TANAJI KUTHE	9307224655	
25	PRANJALI VIJAY GAJPURE	7058814484	

1. Prof. Dr. C. P. Dorlikar - HOD -

List of B.Sc. II year students who attended the field visit of PBR - 2021-22

Lokmat 10.12.2021

वघाळा परिसरात भूजल सर्वेक्षण

एमजी महाविद्यालयाच्या भूगर्भशास्त्र विभागाचा उपक्रम

लोकमत न्यूज नेटवर्क

आरमोरी : येथील महात्मा गांधी कला, विज्ञान व स्व.न.पं. वाणिज्य महाविद्यालयात भूगर्भशास्त्र विभागातर्फे लोकांचे जैवविविधता नोंदवही अंतर्गत कार्य करण्यासाठी वघाळा येथे खडक, विहिरीची पातळी तसेच दिशादर्शक नकाशा तयार करण्यात आला.

या अभ्यास दौऱ्यात एकूण २५ विद्यार्थी व भूगर्भशास्त्र विभागाचे प्रमुख प्रा. डॉ. चंद्रकांत डोर्लीकर, प्रा. प्रियदर्शन गणवीर यांनी माहिती संकलन व परीक्षण केले. यात गावातील शासकीय व खासगी विहिरींचे अध्ययन करण्यात आले. याप्रसंगी वघाळा येथील नागरिक वामन प्रधान, हरिहर खरकाटे, नवले यांच्याशी विहिरीची पातळी व खोली, पाण्याचा दर्जाविषयी संवाद साधला. वघाळा परिसरातील विविध खडकांचे नमुने गोळा करण्यात आले. वरील नमुन्यांचे परीक्षण करून नोंदी करण्यात आल्या, पाण्याची पातळी व खडकांचा संबंध शोधण्याचा प्रयत्न केला. अभ्यास दौऱ्यादरम्यान वैनगंगा नदीपात्रातील भूरूपशास्त्रीय दृष्टिकोनातून वैशिष्ट्यपूर्ण अभ्यास करण्यात आला. प्राचार्य डॉ. लालसिंग खालसा यांच्या मार्गदर्शनात अभ्यास दौरा आयोजित करण्यात आला होता. अभ्यास दौऱ्यासाठी जितेंद्र बोदेले, प्रांजली गजपुरे, मेघा सहारे, निकिता निंबेकार, निकिता हेडाऊ, पायल सोरते, प्राची किरणापुरे, प्रज्वल धाईत, प्रणाली कुथे यांनी परिश्रम घेतले.

सर्वेक्षण करताना महात्मा गांधी महाविद्यालयाचे विद्यार्थी.

New of PBR visit (Lokmat 10.12.2021)

People Biodiversity Register of Physics

Department of Physics

PBR Survey Report on

Use of Electrical Appliances in Household at *Waghala Village of Armori tehsil dist. Gadchiroli (M.S.)*

*PBR submitted by: -**B. Sc. II** (Department of Physics) student's group **2021-22***

Under the supervision of Dr. R.M. Thombre, Prof. S. B. Gedam and Dr. C. D. Mungmode

Introduction:

Electricity and Electrical Appliances has played an important role in the development of human civilization. Numerous electrical appliances have made human life easy. Currently, lighting accounts for approximately 30 % of total residential electricity used followed by refrigerators, fans, electric water heaters, and TVs. Approximately 4 % of total residential electricity used is for standby power the apparently small amount of power that many modern appliances consume when they are not actively turned on. Modern electrical appliances consume less electricity as compare to old ones which ultimately results into low carbon emission helping the environment conservation. The Department of Physics conducted survey at adopted village *Waghala*

The objective of this project was to carry out a survey on use of electrical appliances in household at adopted village *Waghala*. Eleven (11) students participated in this survey. Information of 55 families was collected. The survey was carried out using questionnaire based personal interviews in households.

Observations and Analysis:

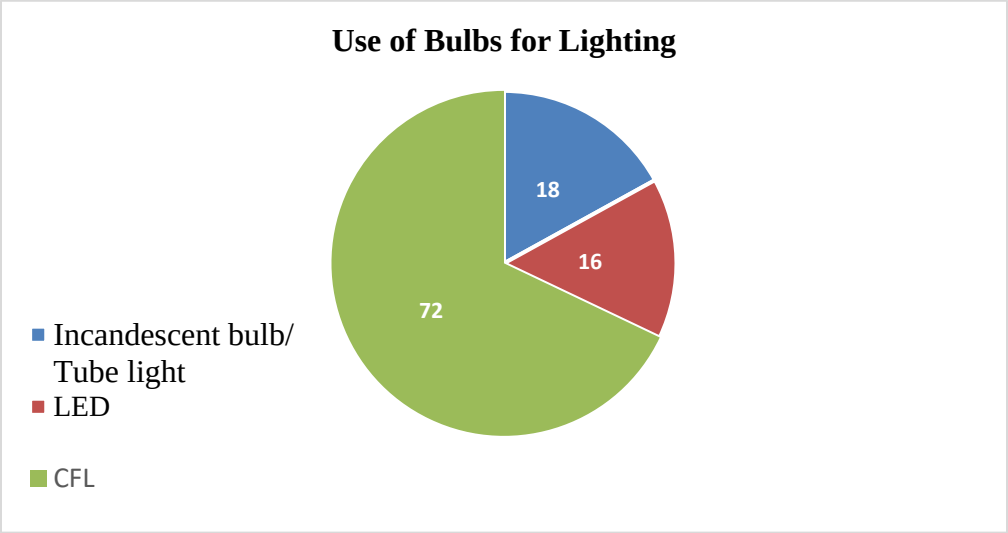
The brief analysis of the major results is presented in the following report. The tables with detailed results are included in appendices.

1. Number of Families without Electricity:

All the houses have electricity connection.

2. Use of Conventional Bulbs and LED Bulbs:

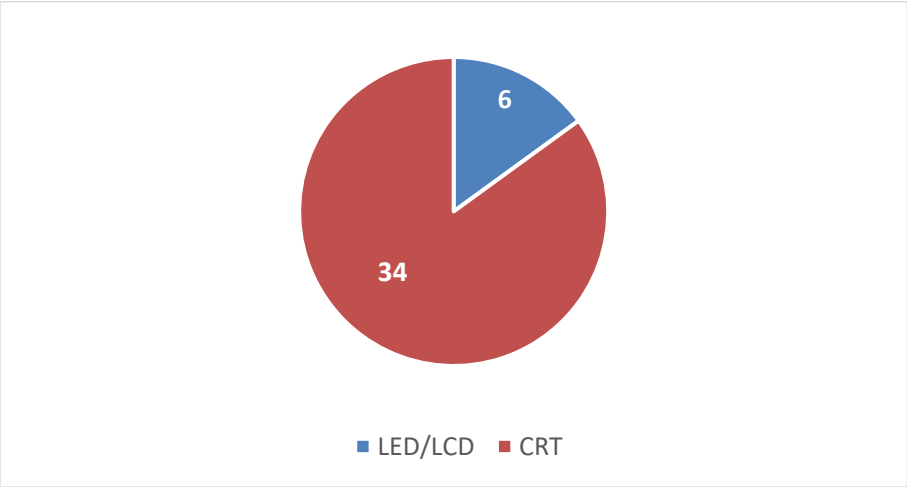
The data on lighting was collected on the type of light bulbs per household. The number of conventional bulbs/ tube light and LED/CFL bulbs used in these families are as bellow:



It is observed that 68 % household use CFL bulb, 15 % use LED whereas 17 % household still use conventional bulbs for lighting purpose.

3. Use of Television:

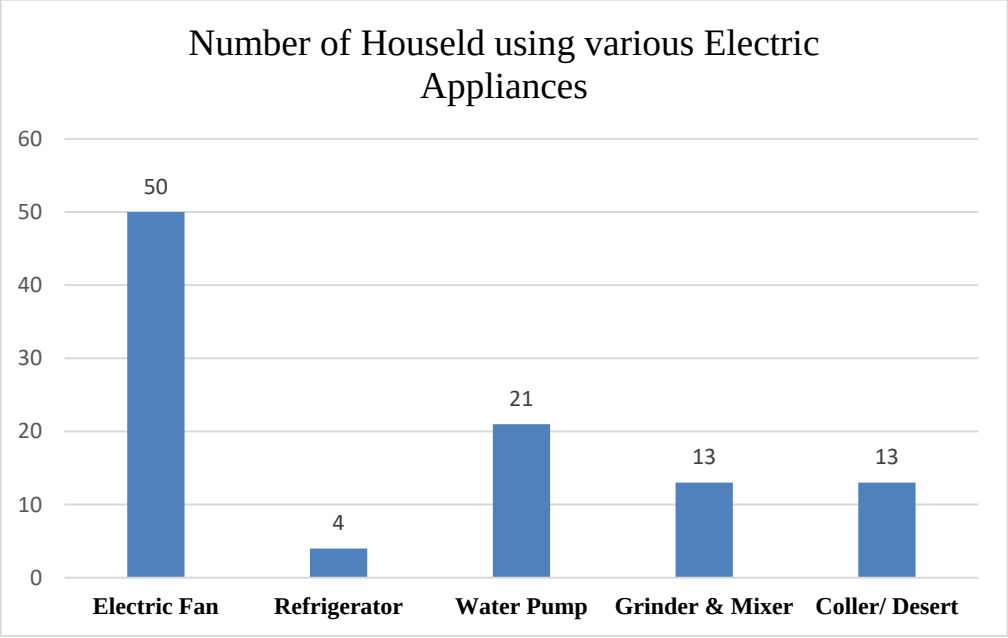
Out of 55 families 40 families has television set. The distribution of CRT and LED/LCD TV sets is as bellow:



Most of the families i.e. 85 % families use CRT TV sets which consumes more electricity whereas very few families i.e. 15 % families use LED/LCD TV sets.

4. Electric Fan, Refrigerator, Electrical Water Pump, Other Appliances:

Data on use of other electric appliances was also collected. It is found that 05 families i.e. 9.09 % do not have electric fans; many families (78 %) are using old table and celling fans. Only 04 families (07.81 %) have refrigerator. Twenty one (21) families have electric water pump. Thirteen (13) household have Grinder and Mixer whereas 16 household have Cooler/ Desert.



Other than electric appliances some questions were asked about electric consumption and monthly electric bill. Since many families are using few electric appliances, their monthly electric consumption is less but few families complained about more electric bill. The cause of more electric consumption in these families is found to be inappropriate earthling and old electric appliances.

Conclusion:

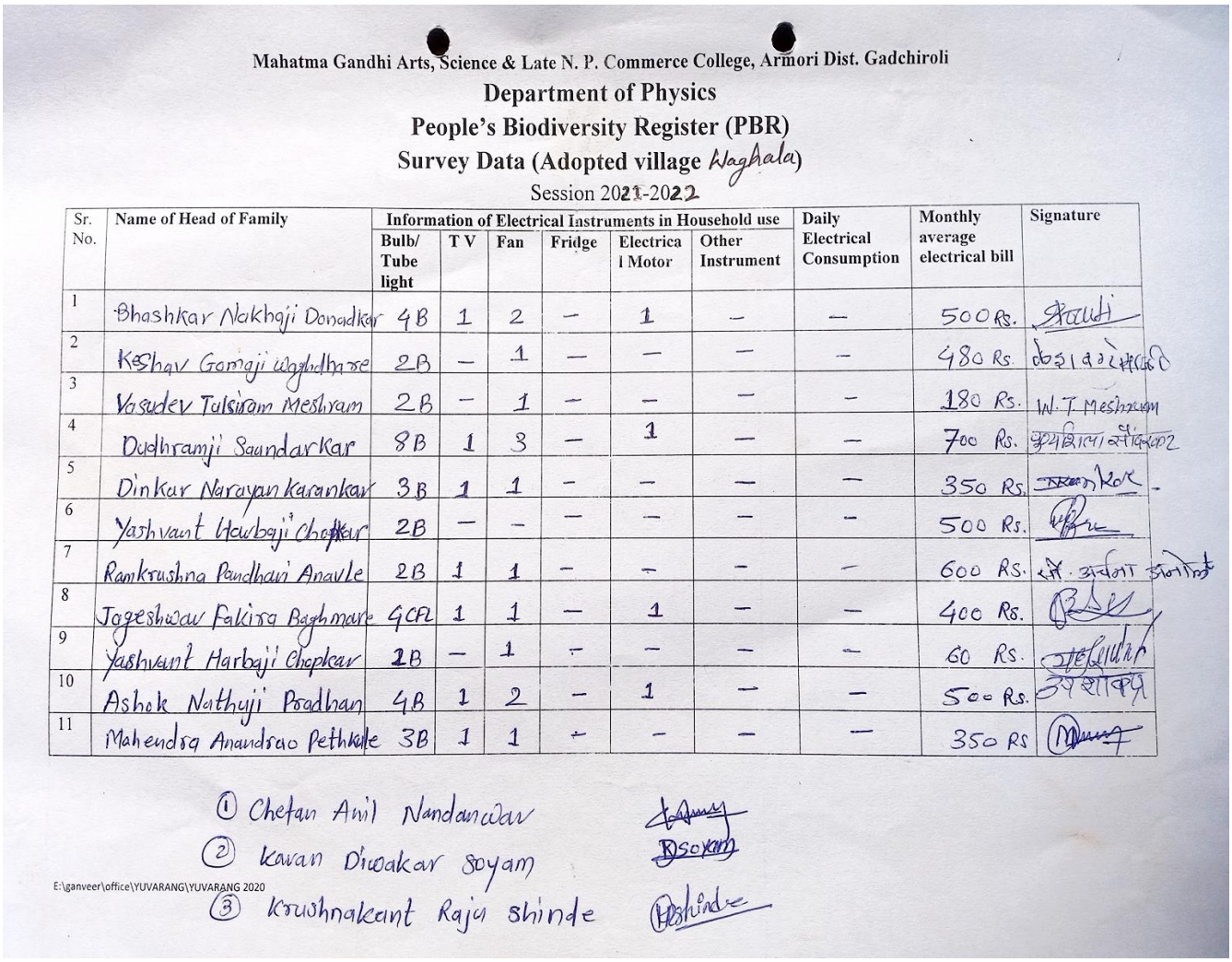
In this era where electricity and electrical appliances are very important for the survival of human being and government putting its efforts to make every household electrified, as a result all the households are electrified in village *Waghala.* Moreover, since 30% of electricity in household is use for lighting purpose, modern lighting technologies are being adopted. It is found that only 17 % household are using conventional lighting sources (Incandescent bulbs) and 68 % are using CFL resulting into more consumption of electricity. Very few other electrical appliances are being used in household and some of these are made up of old technologies. In some household, inappropriate earthlings are found.

Recommendations:

1. Use of LED bulbs should be promoted.
2. Use of five star rating electrical appliances are recommended.
3. Awareness camp on proper use of electric appliances and proper earthlings should be conducted.

Students collecting the data

Students involved in Survey



Mahatma Gandhi Arts, Science & Late N. P. Commerce College, Armori Dist. Gadchiroli

Department of Physics

People's Biodiversity Register (PBR)

Survey Data (Adopted village Waghala)

Session 2021-2022

Sr. No.	Name of Head of Family	Information of Electrical Instruments in Household use						Daily Electrical Consumption	Monthly average electrical bill	Signature
		Bulb/ Tube light	T V	Fan	Fridge	Electrical Motor	Other Instrument			
1	Bhashkar Nakhaji Donadkar	4B	1	2	–	1	–	–	500 Rs.	
2	Keshav Gomaji Waghdhare	2B	–	1	–	–	–	–	480 Rs.	
3	Vasudev Tulsiram Meshram	2B	–	1	–	–	–	–	180 Rs.	W. T. Meshram
4	Dudhramji Saundarkar	8B	1	3	–	1	–	–	700 Rs.	
5	Dinkar Narayan Karankar	3B	1	1	–	–	–	–	350 Rs.	
6	Yashvant Harbaji Chopkar	2B	–	–	–	–	–	–	500 Rs.	
7	Ramkrushna Pandhari Anavle	2B	1	1	–	–	–	–	600 Rs.	
8	Jageshwar Fakira Baghmare	4CFL	1	1	–	1	–	–	400 Rs.	
9	Yashvant Harbaji Chopkar	2B	–	1	–	–	–	–	60 Rs.	
10	Ashok Nathuji Poadhan	4B	1	2	–	1	–	–	500 Rs.	
11	Mahendra Anandrao Pethkile	3B	1	1	–	–	–	–	350 Rs	

① Chetan Anil Nandanwar

② Karan Diwakar Soyam

③ Krushnakant Raju Shinde

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Data Collection by students at adopted village *Waghala*

Mahatma Gandhi Arts, Science & Late N. P. Commerce College,
Armori, Dist. Gadchiroli

Department of Physics

People Biodeversity Register of Waghala Village, Tah. Armori

Academic Session 2021-22

Sr. No.	Name	Mobile No.	Signature
1	ACHAL RAJESH ATHAWALE		
2	AKANKSHA BHARAT WARKE	9834187829	Awarke.
3	ATHARVA PRAKASH KELZARKAR		
4	BHARATI SUDHURAM KOWACHI	9421953218	Bkowachi
5	BHUSHAN RAMESH GONNADE		—
6	BISHAL CHANDRASHEKHAR MANDAL		—
7	DEVANAND MAROTI GEDAM		—
8	DINESH ASHINATH ISHTAM	8767885791	DIshtam
9	FARNAJ SHAKIR SHEIKH		—
10	GUNJAN DHANRAJ THAKARE		—
11	NACHIKET ARUN NAGOSE	9545799446	—
12	NIKESH TAMDEO WAGHARE		—
13	NIKHITA RAVINDRA BHUTE	8010641953	Bhute
14	ONAM GHIGU GAWALE		—
15	PANKAJ RAMU USENDI		—
16	PRACHI GOPAL RAUT		—
17	PRACHI VILAS NANDARDHANE	9529467673	P.V.Nandardhane
18	PRANJALI RAJESH KUMBHALWAR		—
19	PUJA ASHOK CHAUDHARI		—
20	RAJESHWARI RAJKUMAR GANVIR	9356891820	Ganvir
21	RITU DHANPAL BANKAR		—
22	ROHIT RAMU MESHRAM		—
23	RUTUJA RAJESH KIRME	8551828760	Rkirme.
24	SAHIL DEVRAO MADAVI		—
25	SAKSHI KRUSHNA WALDE	9307674916	S.K.Walde
26	SAKSHI VIJAY RAUT		—
27	SALEHA ASHPAQUELLA PATHAN		—
28	SEJAL MANOHAR BONDRE		—
29	SHREYA PRAKASH KELZARKAR		—
30	SHRUTI DILIP CHAPLE	9765767594 27	Chaple
31	SHUBHANGI ANIL NIMJE	8329630903	Snimje

1. Prof. Dr. R. M. Thombre - HOD
2. Prof. S. B. Gedam
3. Prof. Dr. C. D. Mungmode

People Biodiversity Register of Computer Science

Department of Computer Science

People Biodiversity Register Report entitled

"Use of Internet Banking & Android Mobile Application Survey of Waghala Village"

PBR submitted by **B. Sc. II** (Department of CS) students group **2021-22**

Under the supervision of Prof. Sunil Chute, Head of Computer Science

Introduction:-

Agriculture drives Waghala's economy. Agriculture remains every village's economic backbone despite economic advancement. Only a small percentage of the village's inhabitants works in agriculture. In today's world, you need an Android phone, PC, or laptop. Indian villages lack these resources. After the Indian government launched Startup India, Standup India, and Digital India, we decided to conduct a poll.

India's villages and farmers should be smart about internet banking and Android banking apps. In a changing economy, banks are diversifying their involvement in agriculture to create revenue. Banks have taken on marketing, managerial services, insurance, and infrastructure finance via private-public partnerships. Information technology has made payment alternatives and financial services more flexible and user-friendly. Internet users can monitor bank accounts and undertake mobile banking from home.

Objective of the study:-

Banking has always been a time-consuming business that relies on IT to collect and distribute data. IT is important for analyzing data and differentiating bank products and services. Mobile phones, cellphones, and smartphones can be utilized for land information like 7/12 assessments and government farmer programs.

Waghala Tah-Armori, Gadchiroli (M.S.)

Waghala hamlet is part of our college's People Biodiversity Register study programme, thus we surveyed online banking and an Android app there. Waghala is in India's Gadchiroli district, Armori Tehsil.

Materials and Methods: -

B.Sc. II Computer Science students surveyed Waghala's use of internet banking and android mobile apps, and the department produced a questionnaire. PBR Computer Science groups studied 42 of 338 village families. Families with PBR students were photographed with a camera phone.

Waghala 2011 Census Details

Vaghala Local Language is Marathi. Waghala Village Total population is 1634 and number of houses are 406. Female Population is 49.8%. Village literacy rate is 76.7% and the Female Literacy rate is 35.5%.

Population

Census Parameter	Census Data
Total Population	1634
Total No of Houses	406
Female Population %	49.8 % (814)
Total Literacy rate %	76.7 % (1254)
Female Literacy rate	35.5 % (580)
Scheduled Tribes Population %	8.9 % (145)
Scheduled Caste Population %	7.5 % (122)
Working Population %	55.6 %
Child(0 -6) Population by 2011	157
Girl Child(0 -6) Population % by 2011	49.0 % (77)

Results and Discussion:-

Total No Of Home	Bank Account	Nationalized Bank Account	State Level Bank	Private Bank	No. of Android Mobile	Simple Mobile	Mobile Bank Application	Total No of Used Social Site	Total No Of Used Internet Banking (UPI)
42	42	42	42	0	42	02	00	42	31

In Waghala, 42 house surveys are conducted on bank holders, including nationalized, state-level, cooperative, and private banks. Waghala village residents use Internet Banking, an Android mobile banking app. In the survey, every household in the sample had a bank account with a national bank and a co-operative bank, and roughly 100% of people have an Android phone. 90% of people utilized UPI apps like Phone Pay, Google Pay, etc., whereas 10% used internet banking and 90% used Facebook or WhatsApp. Due of illiteracy, rural farmers confront many obstacles. They can't obtain agricultural information online. Icons help farmers make important decisions. Farmers would benefit from speech-based interaction with Indian symbols.

Conclusion: -

Even if they don't own an Android phone, some Waghala households use Android apps and internet banking. Krishi-Mitra offers Marathi and English crop, weather, and expert advice. The Krishi-Mitra app is a sophisticated, user-friendly system. A user can access current meteorological statistics, crop, seed, and fertiliser information with a single click. Specialists may be consulted if needed. This application is useful even without native-language support.

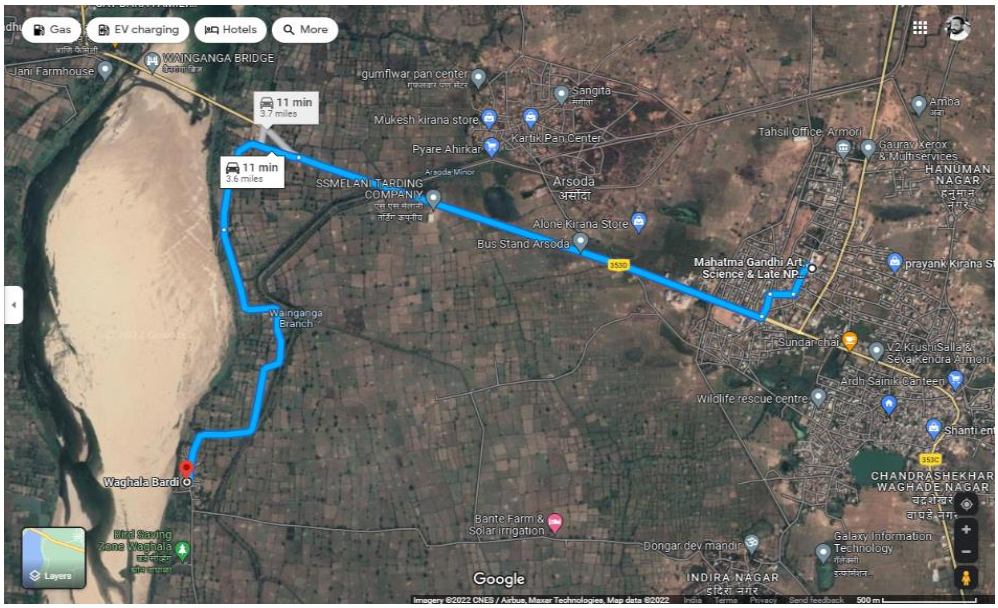
This model improves current methods. This helps implement Krishi-Mitra for farmers. Farmers' problems are solved. Future updates will bring native language support and dynamic query resolution. The app will also provide professional statistics and information.

The Indian government emphasizes new technology, but it's ineffective without public participation.

Recommendation: -

Farmers should use internet banking and the Android mobile app in agriculture. They should know how active the agro-based industry is, which makes consumer goods.

Web location of Waghala Village



Field Photography

Students of B.Sc. Computer science taking interview with villager

List of Student Participate in PBR Survey

Student Name	
RAUT RIYA PRADIP	
DESHMUKH NIKHIL DADAJI	
BHOYAR SURAJ BHASKAR	
BOGAMI DINESH PANDU	
SAYAM SHUBHAM SHAMRAO	
BHOYAR ANIKET VILAS	
BELWATI DILLESHWAR LEKHURAM	
SARWA TAMENDRA PANNALAL	
PATRANGE NAKSHATRA PRAKASH	
WANMALI JANHVI SATISH	
UNDIRWADE SWETA DAULAT	
BANSOD PRATIK YASHWANT	
UKE SUDIPT DILIP	
DUMANE SURAJ BAJIRAO	
SHENDE NAMRATA NARENDRA	
DUNEDAR ANIKET MADHUKAR	
DORLIKAR PRAGATI PRAKASH	
ROY CHANDRAKANT RANJAN	
GHATURKAR DOLTAN RAJU	
CHUDHARI ATHARV DIPAK	
RAMTEKE KUNAL ASHOK	