Department : Department of Forestry, Wildlife and Environmental Sciences		
Academic Year : 2021-22		
Sr. No.	**Programme Code**	**Name of the Programme**
01.	319	M. Sc. (Forestry and Environmental Sciences)

Following students have carried out their Project work/ Internship/ Field Project/Industrial Training for the academic session 2021-22

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

"A STUDY OF FOREST FIRE BY USING REMOTE SENSING AND GIS TECHNIQUES IN BILASPUR CIRCLE (C.G.)"

Session: 2021-22

SUBMITTED FOR PARTIAL FULFILMENT
FOR THE REQUIREMENT OF MASTER DEGREE IN FORESTRY & ENVIORONMENTAL SCIENCES

SUBMITTED TO :-

PROFESSOR SC TIWARI
Dept. of Forestry, Wildlife &
Environmental Sciences
Guru Ghasidas Vishwavidyalaya,
Bilaspur – 495009

SUBMITTED BY :-

ABHAY RAI
M.Sc. (Forestry & Env.Sci.)
IV Semester
Roll. No.20412002
Enroll no. GGV/16/6203

DEPARTMENT OF FORESTRY WILDLIFE & ENVIRONMENTAL SCIENCES GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University established by the central University, Act. 2009 No. 25 of 2009)

Department of Forestry Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) 495009 INDIA

(A Central University established by the central University, Act. 2009 No. 25 of 2009)

CERTIFICATE

This is to certify that **Mr. ABHAY RAI S/O Mr. SANJAY RAI** is a student of **Master of Science** (Forestry & Environmental Sciences) 4th semester in the Department of Forestry Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) and completed his Student project work entitled **"A study of forest fire by using Remote Sensing and GIS Techniques in Bilaspur Circle (C.G.)".** He has worked at **Regional Geomatic Centre, Bilaspur (C.G.),** from the period of **17/05/2022 to 10/06/2022** for his student project work. The Report is the partial fulfillment of the requirement to receive the degree in **Master of Science (Forestry & Environmental Sciences).**

Date 15/09/22

15/09/22

Professor SC TIWARI
Department of Forestry Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I, **ABHAY RAI**, hereby declare that this Student project entitled **"A study of forest fire by using Remote Sensing and GIS Techniques in Bilaspur Circle (C.G.)"** Submitted to Department of Forestry Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur for partial fulfillment of the requirements for the award of **Master of Science (M.Sc.)** in Forestry & Environmental Sciences. The Report has been composed by myself. It is my own work to the best of my knowledge and belief. The work contained in the report is original and has been done by me.

To the best of my knowledge the work has not been submitted to any other Institution for any other Degree/Diploma. I have followed the guidelines provided by the university in writing the report. The assistance and help received during the course of this investigation have been duly acknowledged.

SUBMITTED BY :- Abhay Rai

ABHAY RAI
M.Sc. (Forestry & Env.Sci)
IV Semester
Roll. No.20412002
Enroll no. GGV/16/6203

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4.2 Conclusion

REFERENCES

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER – 1

1.1 Introduction: -

The most common hazard in forests is forest fire. Forests fires are as old as the forests themselves. Fire has been a major influencing factor on the development and management of many of the world's forests. Some forest ecosystems have evolved in response to frequent fires from natural causes, but most others are susceptible to the effects of wild fire. Forest fire may be defined as an unclosed and freely spreading combustion that consumes the natural fuels. When a fire burns out of control it is known as **Wild Fire**. A forest fire is an unplanned, unwanted, uncontrolled fire in an area of combustible vegetation starting in rural areas and urban areas.

There have been forest fires throughout historic time ignited and burned naturally through the forest. Fire effects on forests however are not equal. Fire may be beneficial for one ecosystem and may be dreadful for the other, depending upon the climatic conditions and type of vegetation. Each year, millions of hectares of the world's forests are consumed by fire, which results in enormous economic losses because of burnt timber; degraded real estate; high costs of suppression; damage to environmental, recreational and amnesty values; and loss of life.

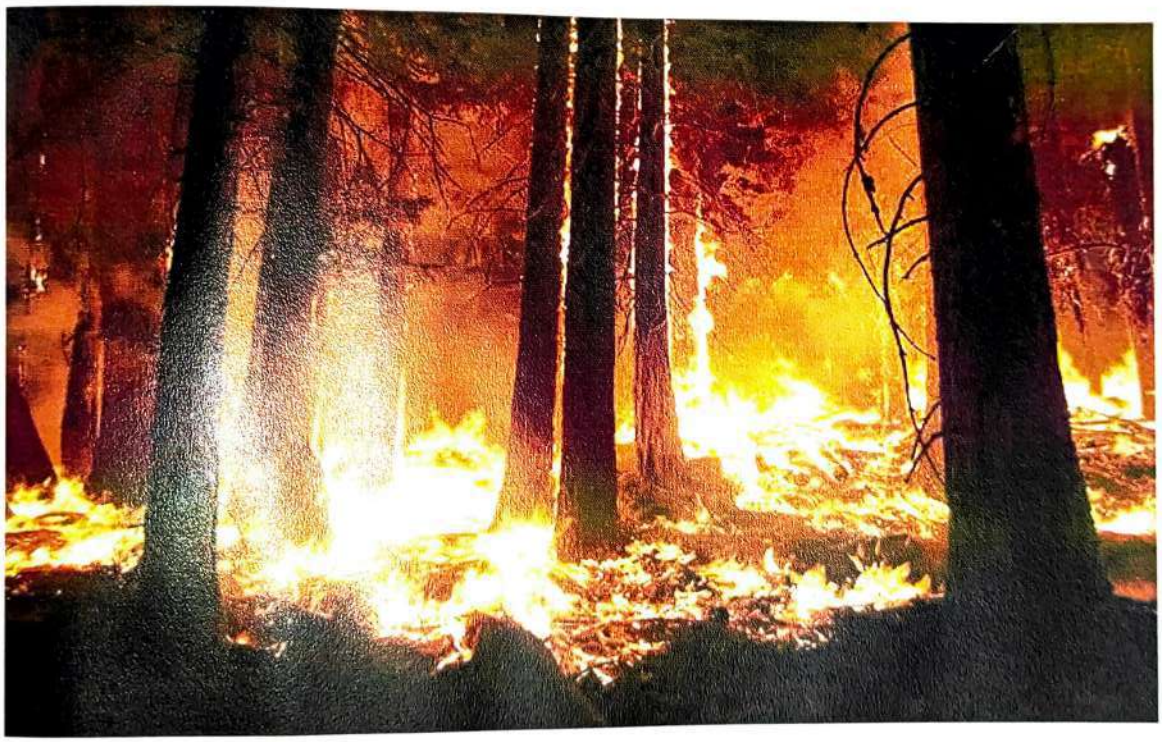


Fig - 1 Forest fire

A REPORT ON

COMPUTER TRAINING (QGIS)

BILASPUR, CHHATTISHGARH

SESSION: 2021-22

MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCES

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

SUBMITTED TO: -

PROFESSOR SC TIWARI
Dept. of Forestry, Wildlife & Environmental Sciences
Guru Ghasidas Vishwavidyalaya,
Bilaspur – 495009

SUBMITTED BY: -

ABHAY RAI
M.Sc.(Forestry & Environmental Sciences)
IV Semester
Roll. No.20412002
Enrollno.GGV/16/6203

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)
(A Central University)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

GURU GHASIDAS VISHWAVIDYALAYA

Bilaspur (C.G.)

(A Central University)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

I have great pleasure in certifying that ***Mr. Abhay Rai S/O Mr. Sanjay Rai*** *is a regular student of M.Sc. Forestry & Environmental Sciences* ***4th Semester*** *during the session of 2021-22 of Department of Forestry. He has completed* ***"training entitled, COMPUTER (QGIS) TRAINING PROGRAM."*** *during this semester under my guidance.*

I wish him all the success in his academics.

Date 5/09/22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Supervisor:
Dr. SC Tiwari 5/09/22
(Professor)
Dept. of Forestry, Wildlife and
Environmental Sciences

DECLARATION

I hereby declare that the field training entitled, ***— COMPUTER (QGIS) training program*** *submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with* ***Teacher of Guru Ghasidas Vishwavidyalaya*** *and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

DATE: -PLACE:

Abhay Rai

ABHAY RAI
M.Sc. Forestry
Semester 4th
Roll No: - 20412002
Enroll No.GGV/16/6203

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or" bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem solving tool

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A

REPORT

ON

"INSTITUTIONAL TRAINING"

Submitted for partial fulfillment of requirement of Masters of Science

In forestry

(SESSION: 2021-22)

Under the supervision of:

PROFESSOR SC TIWARI

Dept. of Forestry Wildlife

and Environmental Sciences

GGV,Bilaspur

Submitted by:

ABHAY RAI

M.Sc. Forestry 4th semester

Roll No-20412002

Enroll no. GGV/16/6203

Department of forestry , Wildlife & Environmental Sciences

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

Guru Ghasidas Vishwavidyalaya

Bilaspur (C.G.)

(A Central University)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

I have great pleasure in certifying that Mr. ABHAY RAI ***S/O Mr. SANJAY RAI*** *is a regular student of M.Sc. Forestry* ***4th Semester*** *during the session of 2021-22 of Department of Forestry. He has completed "field training entitled,* ***INSTITUTIONAL TRAINING PROGRAM.***" *during this semester under my guidance.*

I wish him all the success in his academics.

Date- 15/09/22

Supervisor:
15/09/22
Professor SC Tiwari

Dept. of Forestry Wildlife and Environmental Science

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

*I hereby declare that the field training entitled, —**Institutioal training program** submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with **IFP Ranchi** and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

ABHAY RAI

M.Sc. (Forestry & Environmental Sciences)

IV Semester
Roll. No.20412002

Enroll no. GGV/16/6203

DATE:-
PLACE:- Ranchi, Jharkhad

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3.	Role of Molecular Marker in Diversity studies of forest tree Spices	Shri Ayushman Malakar (Ph.D. Scholar, JRF)	
4.	Principles of plant Tissue Culture	Dr. Animesh Sinha (Scientist- E, Head, Genetics)	
5.	Lac Cultivation and its role for livelihood support	Shri S.N.Vidya (CTO) & Shri B.D. Pandit (T.O)	
6.	Identification of Medicinal Plants and its Uses.	Shri Ravi Shankar (CTO, Silvculture Dvision)	
7.	Classical Biological control of insect pest & Visit to Insectory	Mr. Subhash Chandra(Sci-D, Forest protection, Silviculture & forest mgnt.)	
8.	Carbon Sequestration in Soil & Terrestrial Vegetation	Dr. S.N.Mishra (CTO Ecology & Rehabilitation Division)	
9.	Concept about Mycorrhizae		
10.	Application of GIS & Remote sensing in Forestry Sector	Dr. Sharad Tiwari (Scientist -G, info. & Technology)	
11.	Visit to Mandar, Ranchi field	Shri B.D. Pandit (T.O)	
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER –1

INTRODUCTON :- INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

I.F.P is situated on National highway (N.H.-24), Lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern India. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agro-ecological zones and 6 main forest types.



Plate -1 IFP RANCHI

TOTAL AREA OF I.F.P

The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:-

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To undertake research and demonstration of agro-forestry models .
- To establish model nursery, germ plasm bank and identify suitable seed production areas for improving forest productivity.
- To steer, undertake and coordinate research, development and extension in forestry sector in the states of Bihar, Jharkhand, Sikkim and West Bengal.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.
- To carry out the related activities considered necessary to attain the above activities.

SECTIONS OF I.F.P LALGUTWA.

Institute of forest productivity is spread over 35 hectares of land. It has various section and out of them our visiting section was as follows:

- Medicinal garden.
- Bambusetum.
- Office building.
- Forest productivity unit.

@dailyrecruitment.in
Institute of Forest Productivity
(Indian Council of Forestry Research and Education)
IFP RANCHI RECRUITMENT

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON

FOREST ATTACHMENT

PALI, BILASPUR (C.G.)

SESSION: 2021-22

MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIORONMENTAL SCIENCES

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIORNMENTAL SCIENCES

SUBMITTED TO :-

PROFESSOR SC TIWARI
Dept. of Forestry,Wildlife &
Environmental Sciences
Guru Ghasidas Vishwavidyalaya,
Bilaspur – 495009

SUBMITTED BY :-

ABHAY RAI
M.Sc. (Forestry & Env. Sci.)
IV Semester
Roll. No.20412002
Enroll no. GGV/16/6203

Guru Ghasidas Vishwavidyalaya

Bilaspur (C.G.)

(A Central University)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

I have great pleasure in certifying that ***Mr. Abhay Rai S/O Mr. Sanjay Rai*** *is a regular student of M.Sc. Forestry & Environmental Sciencs* ***4th Semester*** *during the session of 2021-22 of Department of Forestry, Wildlife and Environmental Sciences. He has completed "field training entitled,* ***FOREST ATTACHMENT PROGRAM****." during this semester under my guidance.*

I wish him all the success in his academics.

Supervisor

15/09/22

Date- 15/09/22

PROFESSOR SC Tiwari
Department of Forestry Wildlife and
Environmental Sciences GGV, Bilaspur (Chhattisgarh)

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

*I hereby declare that the field training entitled, — **Training report on Field Training (Attachment with State Forest Department)** submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with Forest Department and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

Abhay Rai

ABHAY RAI
M.Sc. Forestry
Semester 4th.
Roll No:- 20412002
Enroll No. GGV/16/6203

DATE:-
PLACE:-Pali, Bilaspur.CG

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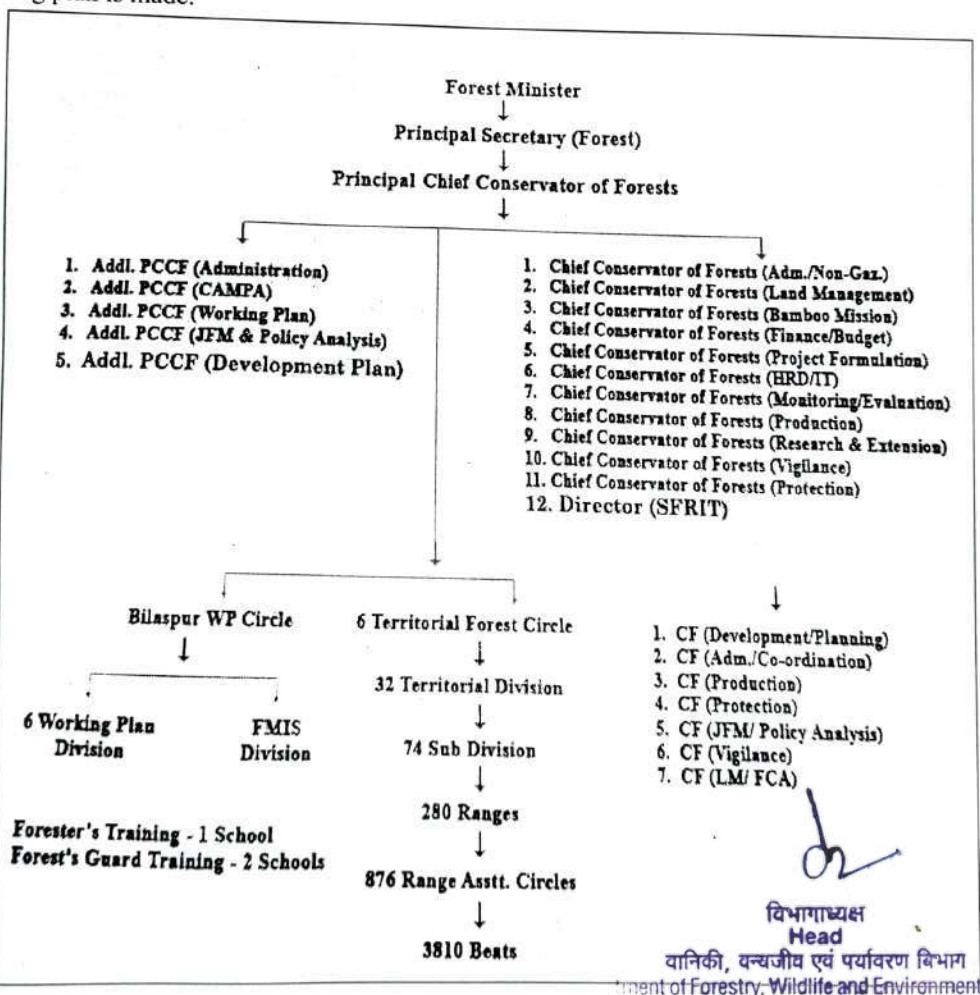
विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER - 1

CHHATTISGARH FOREST DEPARTMENT

❖ INTRODUCTION

The forest department in any state works to conserve, protect and manage the forest in sustainable manner. The whole Chhattisgarh forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest divisions and for every division 10 years working plan is made.



विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Figure 1- State forest administration structure flow chart

ATTACHMENT WITH CHHATTISGARH FOREST DEPARTMENT

GURU GHASIDAS VISHWAVIDYALAYA

A CENTERAL UNIVERSITY



DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

STUDENT REPORT
ON

"APPLICATION OF REMOTE SENSING AND GIS IN FORESTRY"

SUPERVISOR

Dr. S.C. TIWARI
PROFESSOR

SUBMITTED BY

ABHISHEK KUMAR THAKUR
M.Sc. FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCES
M.Sc. (4^{Th} SEMESTER)
(FOREST MANAGEMENT)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled **"Application of Remote Sensing and GIS in Forestry"** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Abhishek Kumar Thakur*** ***S/o Mr. Mukesh Thakur*** *under my supervision and guidance.*

I wish Abhishek Kumar Thakur all success in his academics.

Place: Bilaspur

Date: 14/Sept./2022.

Dr.S.C. Tiwari

Supervisor

Professor

Department of Forestry, wildlife & Environmental Science. **Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.**

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I here by declare that the student project work entitled "Application of Remote Sensing and GIS in Forestry" submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me under the guidance of *"Dr. S.C. Tiwari"* and this project work is a part of the award of of Master of Science degree in Forestry and Environmental Sciences.



Mr. ABHISHEK KUMAR THAKUR
M.Sc. Forestry 4th Semester
Enrolment No. GGV/20/06701

REMOTE SENSING

INTRODUCTION

The term remote sensing is often wrongly applied to satellite-borne imaging of the earth's surface only. Remote sensing is the common name for all methods used to collect data at a distance from the object under study by some kind of recording device. The use of remote sensing techniques is increasing rapidly, finding new fields of application as technology advances in developing the remote sensing systems.

- Remote sensing is the science and art of acquiring information (spectral, spatial, and temporal) about material objects, area, or phenomenon, without coming into physical contact with the objects, or phenomenon under investigation. Remote Sensing means sensing of the earth's surface from space by making use of the properties of electromagnetic wave emitted, reflected, or diffracted by the sensed objects for the purpose of improving natural resource management land and the protection of the environment. Without direct contact, some means of transferring information through space must be utilized. In remote sensing information transfer is accomplished by use of electromagnetic radiation (EMR).

- Remote sensing in the broad sense, the measurement or acquisition of information of some property of an object or phenomenon, by a recording device that is not in physical or intimate contact with the object or phenomenon under study; e.g., the utilization at a distance (as from aircraft, spacecraft, or ship) of any device and its attendant display for gathering information pertinent to the environment, such as measurements of force fields, electromagnetic radiation, or acoustic energy. The technique employs such devices as the camera, lasers, and radio frequency receivers, radar systems, sonar, seismographs, gravimeters, magnetometers, and scintillation counters.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYALAYA

A CENTERAL UNIVERSITY



DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

"A REPORT ON INDUSTRIAL TRAINING "

SUPERVISOR

Dr. S.C. TIWARI
PROFESSOR

SUBMITTED BY

ABHISHEK KUMAR THAKUR
M.Sc. FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCES
M.Sc. (4^{Th} SEMESTER)
(FOREST MANAGEMENT)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the ***"Industrial* Training Report "** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Abhishek Kumar Thakur S/o Mr. Mukesh Thakur*** *under my supervision and guidance.*

I wish Abhishek Kumar Thakur all the success in his academics.

Place: Bilaspur

Date: 14th/Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. S.C. Tiwari 14/09/22

Supervisor
Professor

Department of Forestry, wildlife & Environmental Science. **Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.**

DECLARATION

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Mr. ABHISHEK KUMAR THAKUR
M.Sc. Forestry 4th Semester
Enrolment No. GGV/20/06701

INSTITUTE OF FOREST PRODUCTIVITY
RANCHI
(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **ABHISHEK KUMAR THAKUR** of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(Dr. Nitin Kulkarni)
Director

CHAPTER -1

INTRODUCTION ABOUT THE INSTITUTE OF FOREST PRODUCTIVITY{IFP}

About the institute





Institute of Forest Productivity is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), situated on National highway (N.H.-24), lalgutwa, Ranchi. IFP catering to the forestry research needs in the states of Bihar, Jharkhand and West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country. In 1985 brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

- The total area of institute of forest productivity is 35 hectares.
- Since coming into existence in 1993, the institute has taken up a number of initiatives in the field of forestry and allied sciences through research projects and extension programmes, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry based institutes.
- The institute has specially established its technical expertise in Lac cultivation and

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYALAYA

A CENTERAL UNIVERSITY



DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

"COMPUTER TRAINING REPORT (QGIS)"

SUPERVISOR

Dr. S.C. TIWARI
PROFESSOR

SUBMITTED BY

ABHISHEK KUMAR THAKUR
M.Sc. FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCES
M.Sc. (4Th SEMESTER)
(FOREST MANAGEMENT)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

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I wish Abhishek Kumar Thakur all the success in his academics.

Place: Bilaspur
Date: 14th/Sept./2022.

Dr.S.C. Tiwari
Supervisor
Professor
***Department of Forestry, wildlife & Environmental Science*, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.**

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

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Mr. ABHISHEK KUMAR THAKUR
M.Sc. Forestry 4th Semester
Enrolment No. GGV/20/06701

CONTENT

1. INTRODUCTION TO GIS
2. DOWNLOADING DATA FOR GIS WORK
3. GEO- REFERENCING IN QGIS
4. PREPARATION OF VECTOR DATA AND ATTRIBUTE TABLE IN QGIS
5. MOBILE GNSS- GEO REFERENCING USING GCP AND CREATION OF POLYGONS

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
tment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY-1

INTRODUCTION

GIS- Geographic Information System When We Discussed About:

GIS it is necessary to remember two important person the first one is John snow (1813 –1858). It was believed that cholera was spread by a " bad air " or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells.

During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory.
His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as the father of GIS

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data. Additional data such as the school's name, level of education taught.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYALAYA

A CENTERAL UNIVERSITY



DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

"TRAINING REPORT ON FOREST ATTACHMENT"

SUPERVISOR

Dr. S.C. TIWARI
PROFESSOR

SUBMITTED BY

ABHISHEK KUMAR THAKUR
M.Sc. FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCES
M.Sc. (4Th SEMESTER)
(FOREST MANAGEMENT)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the **"Training Report on Forest Attachment "** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Abhishek Kumar Thakur S/o Mr. Mukesh Thakur*** *under my supervision and guidance.*

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr.S.C. Tiwari

Supervisor
Professor

Department of Forestry, wildlife & Environmental Science. **Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.**

DECLARATION

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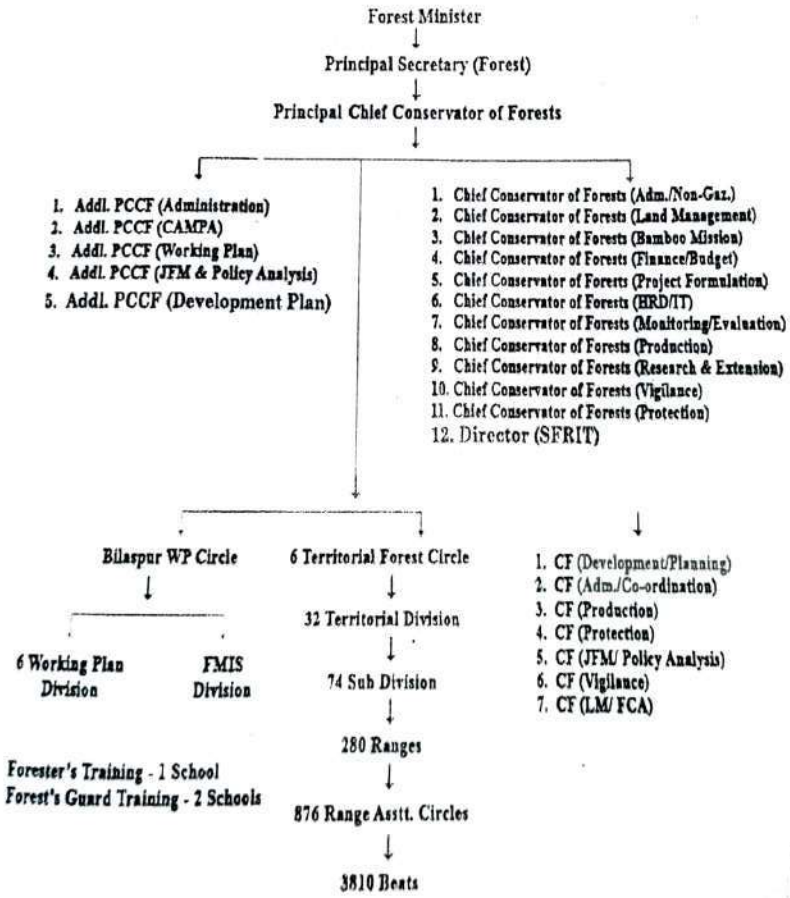
Mr. ABHISHEK KUMAR THAKUR
M.Sc. Forestry 4th Semester
Enrolment No. GGV/20/06701

CHAPTER-1

FOREST ATTACHMENT

1.1 CHHATTISGARH FOREST DEPARTMENT:INTRODUCTION

The forest department in any state works to conserve, protect and manage the forest in sustainable manner. The whole Chhattisgarh forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forestdivision and for every division 10 years working plan is made



विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON TREE SPECIES SUITABLE FOR ROADSIDE PLANTATION AND CARBON SEQUESTRATION IN KOTA – SAKRI BILASPUR, INDIA

(STUDENT PROJECT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. S. C. TIWARI

SUBMITTED BY

ADARSH JAISWAL

M.Sc. IV SEMESTER

ROLL NO. 20412003

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the Student Project Report entitled: ***"A REPORT ON TREE SPECIES SUITABLE FOR ROADSIDE PLANTATION AND CARBON SEQUESTRATION IN KOTA – SAKRI BILASPUR, CHHATTISGARH"*** submitted for the partial fulfillment of Degree of ***Master of Science in Forestry & Environmental Science from Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh has been carried out by Mr. ADARSH JAISWAL S/o BADRIN[illegible]AISWAL of M.Sc. Forestry, IV[th] Semester, and Enrollment No. (GGV/16/6207) unde[illegible] guidance and supervision.***

I wish him all the success in his future academic endeavors.

Date: …. / Sept / 2022
Place: Bilaspur

Supervisor 16/9/22
Prof. S. C. Tiwari
Department of Forestry, Wildlife and Environmental Sciences

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
[illegible]ment of Forestry, Wildlife and Environmental Science
[illegible]रु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
[illegible]uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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Date :....16 Sept / 2022
Place : Bilaspur

ADARSH JAISWAL
M.Sc. Forestry IVth Sem
Roll No. 20412003
Enrollment No. GGV/16/6207

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Introduction

Anthropogenic climate change is affecting organisms and ecosystems alike. The increasing atmospheric concentration of greenhouse gases is a major cause of global warming. CO_2 levels increasing from 300 to 400 ppm over the last century has caused an ambient temperature increase of 0.5^0C. The temperature is expected to increase by another $0.5–0.6^0$C over the next 100 years. The World Bank recently reported that the per capita CO_2 emissions of the United States have reached 17.5 t, while those of China and India are 7.5 and 1.64 t, respectively. However, China has the highest total CO_2 emissions, followed by the United States and India. From the present CO_2 emission trends, it is clear that concrete efforts must be taken to reduce the impact of global warming, such as improving carbon sink sources and increasing public awareness of carbon footprint reduction.

India has the second largest road network in the world after the United States. Recent reports revealed that India has a 5.5 million km road network, which is being used by 90% of total passenger traffic, and it is increasing by 26.93 km per day. Road networks across Indian cities are thus developing rapidly, and existing roads within cities are being widened to stimulate economic growth, employment and education services. Road connectivity is an important determinant of human well-being and the quality of life in urban areas. By the end of 2010, India's urban population had increased by 26% compared to 2001, and it is projected that, by 2030, six out of 10 Indians will be living in cities. This will cause traffic congestion, pollution and transportation issues, with negative effects on the health of urban residents. Urban residents are exposed to carcinogenic poly aromatic hydrocarbons and air pollutants, and are therefore at higher risk of developing atopic eczema, nasal discharge, blocked nose, sneezing and asthma. Trees absorb key pollutants, such as CO_2, emitted by automobiles and industries before they can escape to the upper atmosphere, trap heat and contribute to global warming. Absorbed CO_2 is processed via photosynthesis, and trees are considered efficient natural carbon sinks. The planting of trees is therefore a step toward climate change mitigation. Fast-growing and long-lived tree species are ideal carbon sinks, but these attributes are usually mutually exclusive, because fast-growing trees have short life spans, and long-lived trees typically grow slowly. Forests are major carbon sinks, but forest areas are shrinking because of deforestation for non-forestry purposes. Therefore, atmospheric pollutants and greenhouse gases are continually increasing. Although there are 422 trees for each person on Earth, this ratio has shrunk to 28:1 in India.

In India, tree cutting for road widening, infrastructure and drainage has increased aggressively over the past few years. vegetation and water bodies in major Indian cities has declined by 66% and by 74% over the past four decades. Urban authorities are planting exotic and fast-growing trees with small canopies, such as *Peltophorum pterocarpum* and *Delonix regia.*, on roadsides instead of large-canopy, indigenous trees, such as *Ficus spp.*, *Azadirachta indica (neem)*, *Tamarindus indica (tamarind)*. *Terminalia arjuna* or *Mangifera indica* (mango). In the early 1980, indigenous and long-lived tree species were used for roadside plantations to provide shade and support biodiversity over the long term. The spacing of roadside plantations varied in terms of species selection, as wide tree spacing is

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON COMPUTATIONAL SKILLS

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. S. C. TIWARI

SUBMITTED BY

ADARSH JAISWAL

M.Sc. IV SEMESTER

ROLL NO. 20412003

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)

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CERTIFICATE

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Place: Bilaspur

Supervisor
Prof. S. C. Tiwari
Department of Forestry, Wildlife and Environmental Sciences

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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ADARSH JAISWAL
M.Sc. Forestry IVth Sem
Roll No. 20412003
Enrollment No. GGV/16/6207

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS

Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

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The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool through spatial analysis.GIS is more than just software. People and methods are combined with geospatial software and tools, to enable spatial analysis, manage large datasets, and display information in a map/graphical form.

COMPONENTS OF GIS

GIS enables the user to input, manage, manipulate, analyze, and display geographically referenced data using a computerized system. To perform various operations with GIS, the components of GIS such as software, hardware, data, people and methods are essential.

SOFTWARE: –

In GIS Software are open-source software & commercial software GIS software provides the functions and tools needed to store, analyze, and display geographic information. Key software components are

(a) a database management system (DBMS)

(b) tools for the input and manipulation of geographic information

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Head
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ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON INSTITUTIONAL ATTACHMENT WITH IFP RANCHI, AND SERICULTURE BILASPUR

(INSTITUTIONAL ATTACHMENT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. S. C. TIWARI

SUBMITTED BY

ADARSH JAISWAL

M.Sc. IV SEMESTER

ROLL NO. 20412003

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

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I wish him all the success in his future academic endeavors.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date: …. / Sept / 2022
Place: Bilaspur

Supervisor
Prof. S. C. Tiwari
Department of Forestry, Wildlife and Environmental Sciences

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

DECLARATION

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Date : 16/ Sept / 2022
Place : Bilaspur

ADARSH JAISWAL
M.Sc. Forestry IVth Sem
Roll No. 20412003
Enrollment No. GGV/16/6207

INSTITUTE OF FOREST PRODUCTIVITY
RANCHI
(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **ADARSH JAISWAL** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavors in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(Dr. Nitin Kulkarni)
Director

बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. आदर्श जायसवाल पिता श्री बद्रीनाथ जायसवाल छात्र/छात्रा, एम. एस.सी/पी.एच.डी. वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर को कोनी में **मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता** विषय पर, प्रशिक्षण सत्र 2022– 2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर
दिनांकः- 04.07.2022

श्रीराम मीणा
संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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Chapter - 1
INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY

About the Institute

I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern india. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim,Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

TOTAL AREA OF I.F.P - The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery , germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.

SECTIONS OF I.F.P LALGUTWA - Institute of forest productivity is spread over 35 hectares of land. It has various section and out of them our visiting section was as follows:

- Medicinal garden.
- Bambusetum.
- Forest productivity unit.
- Office building.

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A REPORT ON FOREST ATTACHMENT AT MARWAHI FOREST DIVISION, BILASPUR CHHATTISGARH

(FOREST ATTACHMENT REPORT)

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SESSION: 2020-22

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Prof. S. C. TIWARI

SUBMITTED BY

ADARSH JAISWAL

M.Sc. IV SEMESTER

ROLL NO. 20412003

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

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I wish him all the success in his [illegible] demic endeavors.

Date: …. / Sept / 2022
Place: Bilaspur

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
[illegible]ment of Forestry, Wildlife and Environmental Science
[illegible]रु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
[illegible]uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Supervisor
Prof. S. C. Tiwari
Department of Forestry, Wildlife and Environmental Sciences

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

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Date : 16 ***Sept / 2022***
Place : Bilaspur

ADARSH JAISWAL
M.Sc. Forestry IVth Sem
Roll No. 20412003
Enrollment No. GGV/16/6207

CERTIFICATE

OF PARTICIPATION

Certified that Mr. **ADARSH JAISWAL** Student of M.Sc. Forestry & Environmental science, Department of Forestry, Wildlife & Environmental sciences , Guru Ghasidas University Bilaspur Chhattisgarh has Successfully Completed the Forest Attachment & Field Training Programme Organised By Forest Department Marwahi Division , Marwahi Chhattisgarh From 05/05/2022 to 15/05/2022. The Forest Department wishes Bright Future of His For Future endeavour in academic advancement.

Mr. Dinesh Patel (IFS)
DFO , Marwahi
Division

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. FOREST ADMINISTRATION

The forest administration is the body responsible for implementation of forest policy and forestry issues in a particular country through rules, legislation and financial that means information and forest programs, the forest policy aims to promote the sustainable management and use of forest land resources.

State Forestry Department: The State Forestry Department is responsible for the administration and regulation of forest harvesting, forest revenue collection and development of the state forest resources. The Department also plans and coordinates the development of wood based industries. The State Forestry Department is divided into Forest Operations and Forest Development Divisions and supported by District Forest Offices. Development Divisions and supported by District Forest Offices.

Forest Development Division: Responsible for planning, implementing and monitoring of forest management and development activities, including biodiversity conservation, ecotourism development and forest rehabilitation as well as the preparation and implementation of the State Forest Management Plan.

District Forest Office: Responsible for administration, controlling forest harvesting, forest revenue collection and forest law enforcement. The office is also responsible for implementing forest management and development activities including the management of forest eco-park and state forest park.

Forest administration management: Forest management is the process of planning and implementing practices for the stewardship and use of forests and other wooded land to meet specific environmental, economic, social and cultural objectives. It deals with the overall administrative, economic, legal, social, technical and scientific aspects related to natural and planted forests. It may involve varying degrees of deliberate human
intervention, ranging from actions aimed at safeguarding and maintaining forest ecosystems and their functions, to those favoring specific socially or economically valuable species or groups of species for the improved production of forest goods and services.

Aims of forest administration:

- ✓ To provide sustainable forest management.
- ✓ To provide well economical condition.
- ✓ To provide well environmental condition.
- ✓ To provide well biodiversity composition.
- ✓ To provide better land management.
- ✓ To provide better health for the earth.
- ✓ Natural resource monitoring and development

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT
ON
FOREST ATTACHMENT
(Session: 2021-22)



SUBMITTED FOR PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

SUBMITTED TO:

Dr.S.C. TIWARI
Professor
Department of Forestry Wildlife & Environmental Sciences

SUBMITTED BY:

ALOK GUPTA
M.Sc. Forestry Wildlife & Environmental Sciences
IV Semester {F.M.}
Roll No.:- 20412004
Enrolment No.- GGV/20/06702

Department of Forestry, Wildlife & Environmental Sciences

GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009, No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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I wish ALOK GUPTA all the success in his academics.

Place: Bilaspur
Date: 14/Sept./2022.

Prof. Dr. S.C. Tiwari
Supervisor
Department of Forestry, Wildlife and Environmental Science,
Guru Ghasidas Vishwavidyalaya,
Bilaspur C.G.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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Date:

Place: Bilaspur

ALOK GUPTA
M.Sc. Forestry Wildlife & Environmental Sciences
IV Semester {F.M.}
Roll No.:- 20412004
Enrolment No.- GGV/20/06702

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
tment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER 1

FOREST ATTACHMENT

1.1 CHHATTISGARH FOREST DEPARTMENT:INTRODUCTION

The forest department in any state works to conserve, protect and manage the forest in sustainable manner. The whole Chhattisgarh forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest division and for every division 10 years working plan is made.

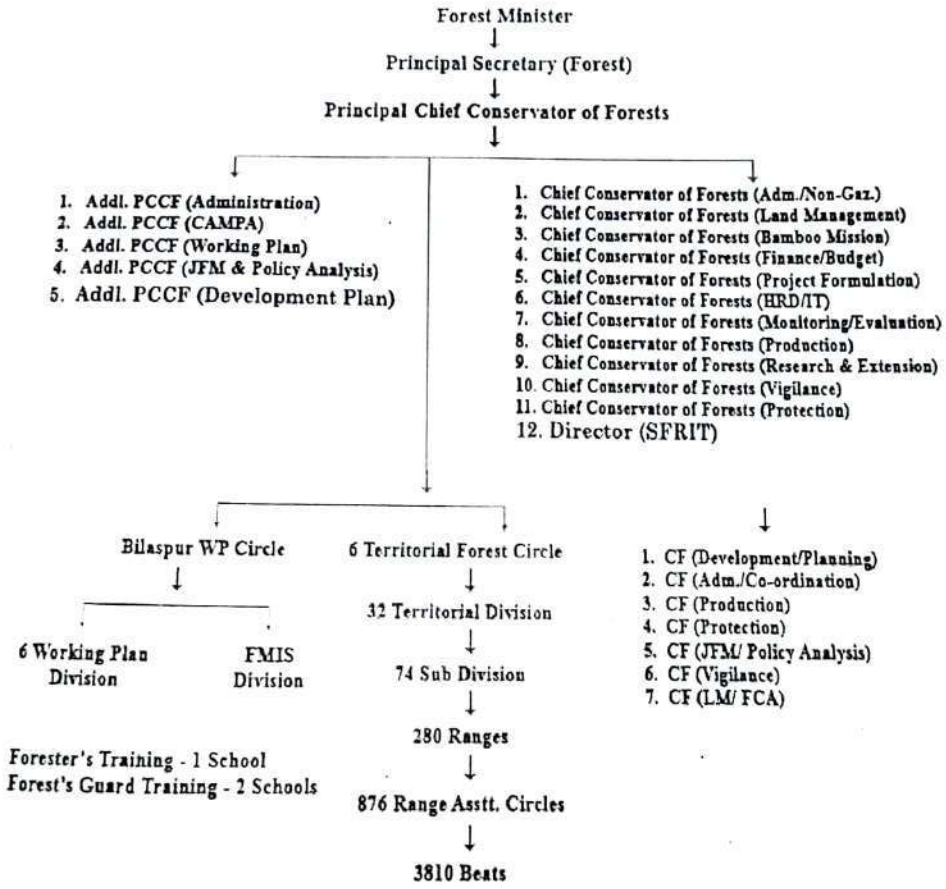


Plate no. 1 Administrative Setup Of Forest Department

1.2 ATTACHMENT WITH CHHATTISGARH FOREST DEPARTMENT

As a student of M.Sc. Forestry IV semester it is very essential to be aware of building up of all action plans of State Forest Department and their implementation on natural forest. To fulfill the practical knowledge, the Department of Forestry, GGV has organized a training program for one month

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT
ON
GIS TRAINING
(Session: 2021-22)



SUBMITTED FOR PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

SUBMITTED TO:

Dr.S.C. TIWARI
Professor
Department of Forestry
Wildlife & Environmental
Sciences

SUBMITTED BY:

ALOK GUPTA
M.Sc. Forestry Wildlife &
Environmental Sciences
IV Semester {F.M.}
Roll No.:- 20412004
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Department of Forestry, Wildlife & Environmental Sciences

GURU GHASIDAS VISHWAVIDYALAYA
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BILASPUR-495009, CHHATTISGARH

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I wish ALOK GUPTA all the success in his academics.

Place: Bilaspur
Date: 4th/Sept./2012.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Prof. Dr. S.C. Tiwari
Supervisor
Department of Forestry, Wildlife and Environmental Science,
Guru Ghasidas Vishwavidyalaya,
Bilaspur C.G.

DECLARATION

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ALOK GUPTA
M.Sc. Forestry Wildlife & Environmental Sciences
IV Semester {F.M.}
Roll No.:- 20412004
Enrolment No.- GGV/20/06702

Date:

Place: Bilaspur

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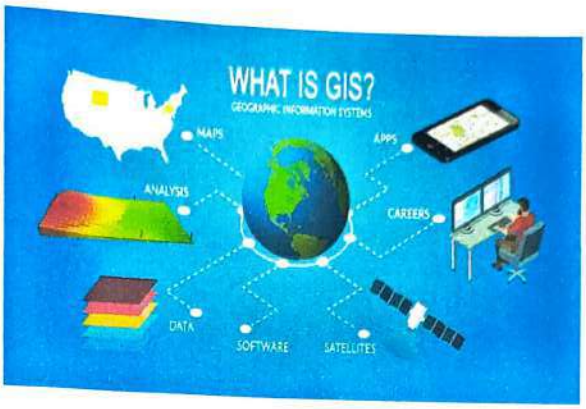
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
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guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

❖ INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a " bad air " or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate,analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth.Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem solving tool through spatial analysis.GIS is more than just software. People and methods are combined with geospatial software and tools, to enable spatial analysis, manage large datasets, and display information in a map/graphical form.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Research Paper
ON
"Carbon Sequestration Potential Of Bamboos and Trees"

(Session: 2021-22)

SUBMITTED FOR PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

SUBMITTED TO:

Dr.S.C. TIWARI
Professor
Department of Forestry Wildlife & Environmental Sciences

SUBMITTED BY:

ALOK GUPTA
M.Sc. Forestry Wildlife & Environmental Sciences
IV Semester {F.M.}
Roll No.:- 20412004
Enrolment No.- GGV/20/06702

Department of Forestry, Wildlife & Environmental Sciences

GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009, No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled ***"Carbon Sequestration Potential Of Bamboos and Trees"*** *submitted in partial fulfilment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. ALOK GUPTA S/o Mr. ASHOK KUMAR GUPTA*** *under my supervision and guidance.*

I wish ALOK GUPTA all the success in his academics.

Place: Bilaspur
Date: 14/Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Prof. Dr. S.C. Tiwari
Supervisor
14/9/22
Department of Forestry, Wildlife and Environmental Science,
Guru Ghasidas Vishwavidyalaya,
Bilaspur C.G.

DECLARATION

I hereby declare that the present ""***Carbon Sequestration Potential Of Bamboos and Trees***" has not been submitted for any degree or diploma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

ALOK GUPTA
M.Sc. Forestry Wildlife & Environmental Sciences
IV Semester {F.M.}
Roll No.:- 20412004
Enrolment No.- GGV/20/06702

Date:

Place: Bilaspur

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER-1

Carbon sequestration Potential of Bamboo And Trees

INTRODUCTION

The total forest area in the world is 4.06 billion hectares (ha), or 31% of the total land area. Although forests are not distributed equally among the world's peoples or geographically. The majority of the world's forests are found in the tropical domain which is around 45%, followed by the boreal, temperate, and subtropical domains. More than half of the world's forests (54%) are concentrated in just five countries: the Russian Federation, Brazil, Canada, the United States of America, and China. Additionally, they can also be found in the substantial portion of India, Northern Australia, Sri Lanka, Bangladesh, Myanmar, and Southwest Africa. Since they grow between the Tropics of Cancer and Capricorn, they are considered to be tropical. They can be differentiated from the Tropical Evergreen forest by the area of growth but majorly the vegetation.

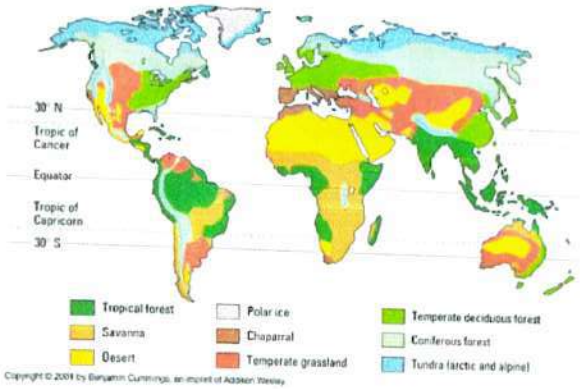


Plate no. 1 Distribution of different forest types in world

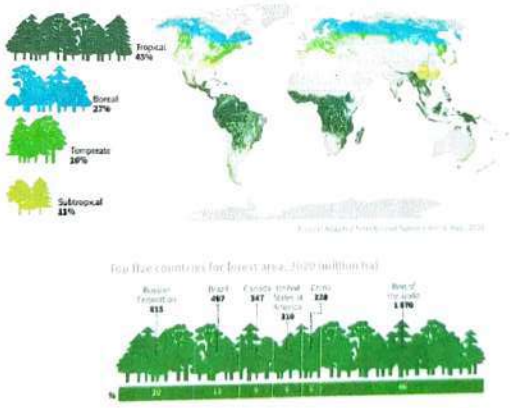


Plate no. 2 Proportion and distribution of global forest area by climatic domain,2020

Forest cover in India accounts for approximately 1.8% of global land area, or approximately 72 million hectars. In India, tropical deciduous forests cover nearly 65-66% of the total forest cover area. As a tropical nation, India is likely to have a large population of tropical deciduous forests. Tropical deciduous forests are more likely to be found in areas or regions that receive a significant amount of rainfall for a part of the year and the other half is

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT
ON
INSTITUTIONAL VISIT
(Session: 2021-22)

SUBMITTED FOR PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

SUBMITTED TO:

Dr.S.C. TIWARI
Professor
Department of Forestry
Wildlife & Environmental
Sciences

SUBMITTED BY:

ALOK GUPTA
M.Sc. Forestry Wildlife &
Environmental Sciences
IV Semester {F.M.}
Roll No.:- 20412004
Enrolment No.- GGV/20/06702

Department of Forestry, Wildlife & Environmental Sciences

GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009, No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

*This is to certify that the Project report entitled "**Report On Institutional Visit: IFP Ranchi and Sericulture Bilaspur**" submitted in partial fulfilment of the requirements for the Degree of **Master of Science in Forestry and Environmental Sciences** in **Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is the work carried out by **Mr. ALOK GUPTA S/o Mr. ASHOK KUMAR GUPTA** under my supervision and guidance.*

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Place: Bilaspur
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Prof. (Dr.) S.C. Tiwari
Supervisor
Department of Forestry, Wildlife and Environmental Science,
Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

INSTITUTE OF FOREST PRODUCT

RANCHI

(Indian Council of Forestry Research and Education, Del

CERTIFICATE

Certified that Mr./Mrs./Miss **ALOK GUPTA** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institution[illegible]chment training programme organized by Institute of Forest Productivity, Ranchi from 18[illegible]2 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

रेशम अनुसंधान विकास एवं प्रशिक्षण
बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. आलोक गुप्ता पिता श्री अशोक कुमार गुप्ता छात्र/छात्रा, एम.एस. सी/पी.एच.डी. वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर को कोनी में **मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा [illegible]न एवं उद्यमिता** विषय पर, प्रशिक्षण सत्र 2022– 2023 में दिनांक 30.06.2022 से 04.07.2022 प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर
दिनांकः- 04.07.2022

श्रीराम मीणा
संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

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Date:

Place: Bilaspur

ALOK GUPTA
M.Sc. Forestry Wildlife & Environmental Sciences
IV Semester {F.M.}
Roll No.:- 20412004
Enrolment No.- GGV/20/06702

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER -1

INTRODUCTION ABOUT THE INSTITUTE OF FOREST PRODUCTIVITY{IFP}

About the institute



Plate no. 1 Institute of Forest Productivity

Institute of Forest Productivity is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), situated on National highway (N.H.-24), lalgutwa, Ranchi. IFP catering to the forestry research needs in the states of Bihar, Jharkhand and West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country. In 1985 brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

- The total area of institute of forest productivity is 35 hectares.
- Since coming into existence in 1993, the institute has taken up a number of initiatives in the field of forestry and allied sciences through research projects and extension programmes, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry based institutes.
- The institute has specially established its technical expertise in Lac cultivation and over the years number of tribal farmers have been immensely benefited by the various extension activities run by the institute for the socio economic upliftment of the tribal.
- The Institute has well established soil testing lab, molecular biology lab, tree physiology and tissue culture lab, chemistry of forest produce lab and forest entomology lab. All these labs are well maintained and equipped with modern sophisticated equipments.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT PROJECT

Title: Estimation of Chlorophyll Content In Some Trees of Polluted Area, Bilaspur.

Submitted for partial fulfilment of requirement of the
Master of Science
In
Forestry

Session- 2021-22

Under The Supervision Of
Dr. Rashmi Agarwal
Professor
Department Of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur(C.G)

Submitted By
Annapurna Sudhakar
MSc. Forestry 4th Semester
Roll No. 20412005
Enroll No. GGV/16/6213

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled ***"Estimation of Chlorophyll Content in some trees of polluted area, Bilaspur.."*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by ..****Ms Annapurna Sudhakar… D/o.. Mr. Dhanush Ram Sudhakar..*** *under my supervision and guidance.*

I wish Annapurna Sudhakar all the success in her academics.

Place: Bilaspur
Date: ...../Sept./2022.

14.9.22

Dr. Rashmi Agarwal
(Professor)
Supervisor
Department of Forestry, Wildlife and Environmental Science,
Guru Ghasidas
Vishwavidyalaya, Bilaspur C.G.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date:

DECLARATION

I hereby declare that the present Student Project report entitled "***Estimation of Chlorophyll Content in some trees of polluted area, Bilaspur***" interpretation or part of it has not been submitted for an degree or diploma of any university the source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are authentic to my knowledge.

Annapurna Sudhakar 16/9/2022

M.Sc. Forestry4th Semester
Roll No. 20412005
Enrollment No.-GGV/16/6213

INTRODUCTION

Chlorophyll the green pigment is present in all the plants except fungi. Chlorophyll can be present in any green component of a plant, such leaves, stems, flowers and fruits. Chlorophyll transforms solar energy into chemical energy, which is then used to build vital carbohydrate molecules (glucose) that serve as the plant's primary food supply. Chlorophyll a and b are found abundantly in all autotrophic plant. The difference between these two chlorophylls is presence of methyl group in chlorophyll a which is replaced by a formyl group in chlorophyll b. The ratio of Chlorophyll a and b is approximately 3:1 in higher plants. Chlorophyll absorbs light of different wavelength mainly the red (650 – 700 nm) and the blue - violet (400 – 500 nm) regions of the visible spectrum. Green light (~550 nm) is not absorbed but reflected giving green colour. Chlorophyll a possesses a green-blue colour, and chlorophyll b possesses a green-yellow color (Arnon, 1849). The amount of solar radiation absorbed by a leaf is largely dependent on the concentrations of its photosynthetic pigments. Therefore, low Chlorophyll concentration can limit photosynthetic potential and primary production (Da Matta et al. 2008).

Increased Industrialization, urbanization, economic growth and other associated developmental activities have resulted in a profound deterioration of air quality in most of the developing countries like India. Air pollution is the contamination of air by any chemical, physical or biological agents that modifies the natural characteristics of the atmosphere. Complex mixture of pollutants like air borne particulate matter (PM), heavy metals, nitrogen dioxide (NO2), sulphur dioxide (SO2), carbon monoxide (CO), ozone (O3), benzene, uncombust hydrocarbons etc. contribute for the air pollution.

Trees are stationary and are continuously exposed to the air pollutants. Plants which are growing along roadsides are exposed to many pollutants emitted from motor vehicles such as suspended particulate matters, NO2, SO2, CO, heavy metals, benzene, smoke, dust and soot particles. These air pollutants may alter the physiological process of plants, thereby affecting the growth of plants (Jitin & Jain 2014).The exposure of these pollutants to the leaves cause a reduction in the concentration of their photosynthetic pigments viz., chlorophyll and carotenoids, which affects the plant productivity, germination of seeds, length of pedicles, and number of flowers. When plants are exposed to the environmental pollution above the normal physiologically acceptable range, photosynthesis gets inactivated .
Since, the plants leaf samples used for this experiment were constantly exposed to air pollutants (polluted area- industrial area and automobile area) they had absorbed, accumulated and integrated pollutants on their surface and showed specific response. Hence, plants can be used as bioindicators in various field of research

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT
ON
FIELD TRAINING (ATTACHMENT WITH STATE FOREST DEPARTMENT)

Submitted For Partial Fulfilment Of Requirement Of The Master Of Science In Forestry

Session: 2021-22

SUBMITTED TO

Dr. Rashmi Agarwal

Professor

Department of Forestry, Wildlife & Environmental Sciences,
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

Annapurna Sudhakar

M.Sc. forestry IV semester
Roll no. – 20412005
Enrolment no. – GGV/16/6213

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the Training report entitled " ***Field Training(Attachment with State Forest Department)..****" submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by ..****Ms. Annapurna Sudhakar… D/o Mr. Dhanush Ram Sudhakar..*** *under my supervision and guidance.*

I wish Annapurna Sudhakar all the success in her academics.

Place: Bilaspur

Date:...../Sept/2022

14.9.22

Dr. Rashmi Agarwal

Professor

Department of Forestry,

Wildlife & Environmental Sciences

GGV, Bilaspur (C.G)

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

*I hereby declare that the project work entitled "**Training report on Field Training (Attachment with State Forest Department)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Rashmi Agarwal, Professor** and this project work has been performed for the award of Master's degree in Forestry.*

Annapurna Sudhakar

M.Sc. forestry IV semester

Roll no. – 20412005

Enrollment no. – GGV/16/6213

Date: - 16/9/2022

Place: -

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER-1

CHHATTISGARH FOREST DEPARTMENT

INTRODUCTION

The forest department in any state works to conserve, protect, and manage the forest in sustainable manner. The whole Chhattisgarh Forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest divisions and for every division 10 years working plan is made

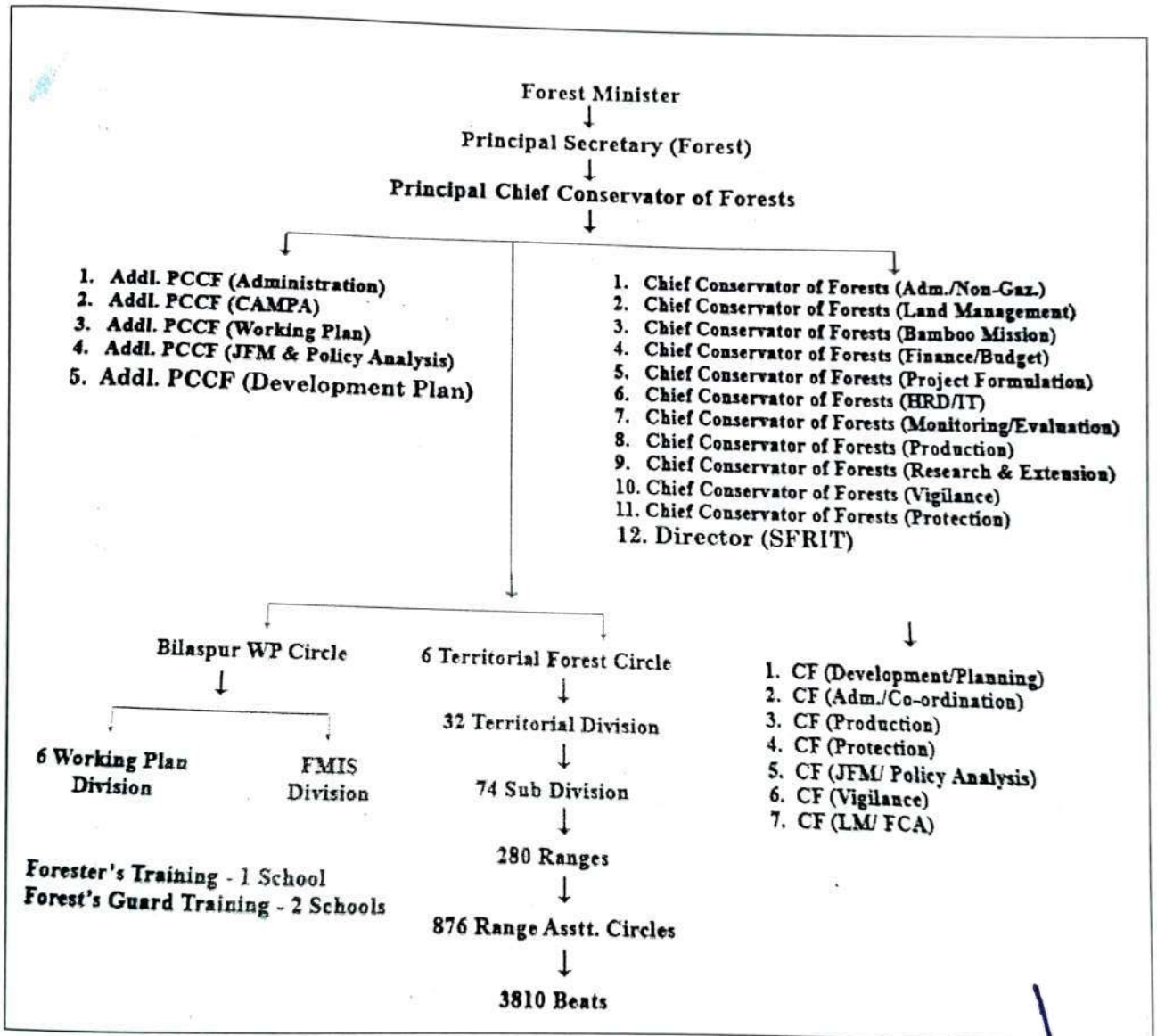


Figure 1- State Forest administration structure via flow chart

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON

COMPUTER TRAINING PROGRAM ON QGIS

Submitted For Partial Fulfillment Of Requirement Of The Master Of Science In Forestry

Session: 2021-22

SUBMITTED TO

Dr. Rashmi Agarwal

Professor

Department of Forestry, Wildlife & Environmental Sciences,

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

Annapurna Sudhakar

M.Sc. forestry IV semester

Roll no. – 20412005

Enrolment no. – GGV/16/6213

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR

(C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the Training report entitled " ***Computer Training Program On QGIS ..*** *" submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***..Ms. Annapurna Sudhakar… D/o Mr. Dhanush Ram Sudhakar..*** *under my supervision and guidance.*

I wish ***Annapurna Sudhakar*** *all the success in her academics.*

Place: Bilaspur

Date...../Sept/2022

14.9.22

Dr. Rashmi Agarwal

Professor

Department of Forestry,

Wildlife & Environmental Sciences

GGV, Bilaspur (C.G)

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

*I hereby declare that the project work entitled "**Computer Training Program on QGIS**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Rashmi Agarwal, Professor** and this project work has been performed for the award of Master's degree in Forestry.*

Annapurna Sudhakar

M.Sc. forestry IV semester

Roll no. – 20412005

Enrollment no. – GGV/16/6213

Date: - 16/a/2022

Place: -

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool

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Head
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ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT
ON
INSTITUTIONAL TRAINING (IFP, Ranchi & Sericulture Research, Development & Training Centre, Bilaspur)

Submitted For Partial Fulfillment Of Requirement Of The Master Of Science In Forestry

Session: 2021-22

SUBMITTED TO

Dr. Rashmi Agarwal

Professor

Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

Annapurna Sudhakar

M.Sc. forestry IV semester

Roll no. – 20412005

Enrolment no. – GGV/16/6213

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

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GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the Training report entitled ***" Institutional Training Report(IFP, Ranchi & Sericulture research, development& training centre, Bilaspur).."*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by ..**Ms Annapurna Sudhakar… D/o Mr. Dhanush Ram Sudhakar..** under my supervision and guidance.*
I wish Annapurna Sudhakar all the success in her academics.

Place: Bilaspur
Date: ...../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

14.9.22
Dr. Rashmi Agarwal

Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G)

DECLARATION

I hereby declare that the training report entitled ***"Institutional Training Report(IFP, Ranchi & Sericulture research, development& training centre, Bilaspur)"*** *submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of* ***Dr. Rashmi Agarwal, Associate Professor*** *and this project work has been performed for the award of Master's degree in Forestry.*

Annapurna Sudhakar

Date: - 16/9/2022
Place: -

M.Sc. forestry IV semester
Roll no. – 20412005
Enrolment no. – GGV/16/6213

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY 1

INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)



Figure 1- Research building of IFP Ranchi

Institute of Forest Productivity is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), catering to the forestry research needs in the states of Bihar, Jharkhand, and West Bengal. Since coming into existence in 1993, the institute has taken up several initiatives in the field of forestry and allied sciences through research projects and extension programmes, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry-based institutes. The institute has established itself as a major player for providing forestry-oriented solutions to different category of users in the region. The institute has specially established its technical expertise in Lac cultivation and over the years number of tribal farmers has been immensely benefited by the various extension activities run by the institute for the socio-economic upliftment of the tribal.

The Institute has well established soil testing lab, molecular biology lab, tree physiology and tissue culture lab, chemistry of forest produce lab and forest entomology lab. All these labs are well maintained and equipped with modern sophisticated equipment's.

In the past Institute has developed a botanical garden "Aus Upvan"- Regional Medicinal Garden for Chhota Nagpur and a Bambusetum with species. Ministry of Environment and Forests, New Delhi has recognized Institutes botanical garden as a Lead Garden in Jharkhand. The total area of institute of forest productivity is 35 hectares.

Objectives of the Institute-

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery, germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.

विभागाध्यक्ष
Head
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT PROJECT REPORT

on

(Clonal Propagation of Eucalyptus in High Tech Nursery)

Submitted for partial fulfilment of requirement

For the Degree of

Master of Science

In

Forestry and Environment Science

(Session: 2022)

Under the Supervision of:

Dr.Rashmi Agarwal

Professor

Department of Forestry, Wildlife

& Environmental Sciences

GGV, Bilaspur, CG

Submitted By:

Mr. Ashish Patle

M.Sc. Forestry 4th Semester

Enrl No: GGV/16/6218

Roll No. 20412006

DEPARTMENT OF FORESTRY, WILDLIFE

& ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University Established Under Central University Act 2009,No.25 of 2009)

BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled ***"Student Project Report."*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Ashish Patle S/o Mr. S.R. Patle*** *under my supervision and guidance.*

I wish Ashish Patle all the success in her academics.

Place: Bilaspur

Date: ...../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
tment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

15.9.22

Dr. Rashmi Agarwal

Professor & Supervisor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-..16/09/.....2022.

DECLARATION

I hereby declare that the report entitled " Clonal Propagation of Eucalyptus in High Tech Nursery" Student project report submitted to Department of Forestry, Wildlife &Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Prof. Rashmi Agarwal has been formed for the award of *Master of Science Degree in Forestry & Environment Sciences* and not submitted for any other degree.

Place: Bilaspur, .G

16/09/2022

Ashish Patle

M.Sc. Forestry IVth Sem.

Roll No. 20412006

Enrl. No.- GGV/16/6218

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
tment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. Introduction

Eucalypt culture, from its first introduction in Mysore in 1790 (Shyam Sundar, 1984) till date, has remained under discussions and debates for its ecological, social, silvicultural, biotechnological, industrial and economic aspects. Foresters, farmers and its wood users have been fascinated by its potential to adapt to varied soil conditions with fast growth, capability of generating economic returns to growers and multiple and varied uses. With its first organized plantation by the forest department on forest land in 1877 at Malabavi (Devarayanadurga), Tumkur district (Kadambi, 1944) to the present times, a lot has changed in its nursery and plantation culture, other technological innovations and their applications. Of these, its clonal culture is changing the landscape and fast occupying a space in agriculture and forest land-use in different states and regions of the country. Out of a total of over 600 species; some 170 species, varieties and provenances of eucalypts have been tried in India. *Eucalyptus camalulensis, E. citriodora* (*Corymbia* sp.), *E. globulus, E. grandis, E. pellita, E. tereticornis, E. torelliana* and *E. urophyla,* their hybrids and clones are now widely preferred for research and field plantations in the country.



Fig.01- Eucalyptus Plantation

2. Introduction in India

Eucalypt has long history in India. It was first planted around 1790 by Tipu Sultan, the ruler of Mysore, in his palace garden on Nandi Hills near Mysore. According to one version he received seeds from Australia and introduced about 16 species. Subsequent to the planting of Nandi Hills, the next significant introduction of eucalypts in India, was in 1843 when most extensive plantations were established on the Himalayan slopes in the vicinity of Shimla, and in the Nilgiri Hills at an altitude of 1,500 to 2,500 m. Plantations of *E. globulus* were raised to meet the demand for firewood from 1856. Between 1940 and 1950, due to politico-socioeconomic conditions, overgrowing population and increasing demand of industries, necessity arose to raise vast denuded tracts with indigenous forest trees and some fast growing short rotation tree crops which required less care after planting and were capable of growing over different sites. *Eucalyptus* was one such species meeting the desired qualities.

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT

ON FOREST ATTACHMENT

Submitted for partial fulfilment of requirement For the Degree of

Master of Science In Forestry and Environmental Sciences

(Session: 2022)

MASTER OF SCIENCE IN FORESTRY (2YDC)

Under the Supervision of:

Dr. Rashmi Agarwal

Professor

Department of Forestry, Wildlife

& Environmental Sciences

GGV, Bilaspur, CG

Submitted By:

Ashish Patle

M.Sc. Forestry 4th Semester

Enrl No: GGV/16/6218

Roll No. 20412006

DEPARTMENT OF FORESTRY, WILDLIFE

& ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA

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BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of2009)

CERTIFICATE

This is to certify that the report entitled ***" Forest Attachment "*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Ashish Patle S/o Mr.S.R. Patle*** *under my supervision and guidance.*

I wish Ashish Patle all the success in his academics.

Place: Bilaspur

Date: ...../Sept./2022.

15.9.22

Dr. Rashmi Agarwal

Professor & Supervisor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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I wish Ashish Patle all the success in his academics.

Place: Bilaspur

Date: ...../Sept./2022.

15.9.22

Dr. Rashmi Agarwal

Professor & Supervisor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-..16./.09../.....2022.

DECLARATION

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Place: Bilaspur, C.G

16/09/2022

Ashish Patle

M.Sc. Forestry

Roll No. 20412006

Enrl. No.- GGV/16/6218

FOREST & CLIMATE CHANGE DEPARTMENT

Raigarh Division Raigarh (C.G.)

CERTIFICATE

Certified that Mr. *Ashish Patle* of Guru Ghasidas University, Bilaspur Chhattisgarh has successfully completed the Institutinal Attachment Training Programme organized by Forest & Climate Change Department, Raigarh Division Raigarh (C.G.) from 09/05/2022 to 15/05/2022. The Institute wishes bright future of his/her for future endeavour in academic advancement.

(Stylo Mandavi)
"IFS"
Divisional Forest Officer
Raigarh Dn. Raigarh (C.G.)

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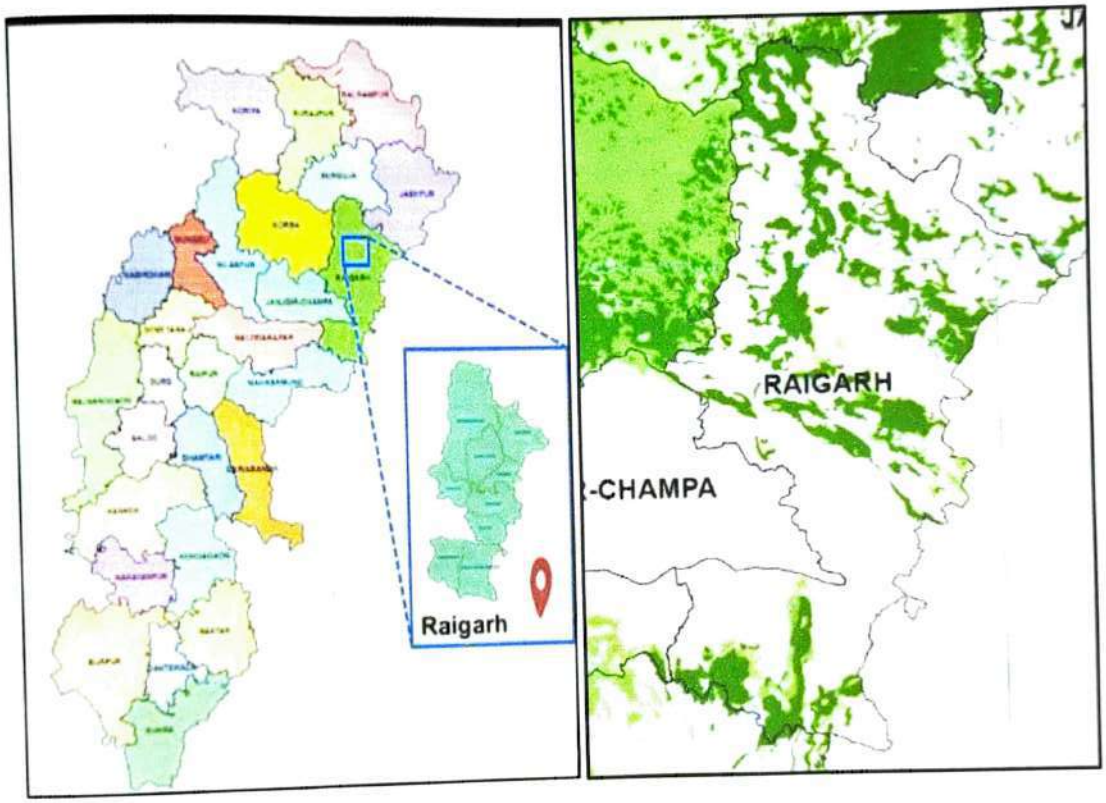
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Chapter-1

Introduction

Raigarh is a city in Eastern Chhattisgarh It is also known for its forest cover, coal reserves and power generation for the state as well as the country. It lies between 21° 20' and 23 .15' North latitude, 82° 56' and 84° 24' East longitude It is bounded on the north by Sarguja and Jashpur, on the west by Korba and Janjgir Champa, on the south by Mahasamund and on the east by Sambalpur district of Orissa. the Mahanadi and kelo river flows through the city which is one of its main water sources. This district extends over a geographical area of 7086 sq km. According to the publication of India state forest report 2019 total forest area of Raigarh district is 2620.33 sq.km. which is 36.97 % of total geographical area of district.



We have visited the nursery of bhelwa tikra (central nursery), bangursiya for demonstration working plan formulation, Badaljhiriya for conservation practices of watershed management & Urdana depot of Raigarh forest Division, Chhattisgarh.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT ON INSTITUTIONAL ATTACHMENT OF IFP RANCHI & SERICULTURE

Submitted for partial fulfilment of the requirementfor theDegree of Master of Science In Forestry and Environmental Sciences

(Session: 2022)

MASTER OF SCIENCE IN FORESTRY (2YDC)

Under the Supervision of:

Dr. Rashmi Agarwal

Professor

Department of Forestry, Wildlife

& Environmental Sciences

GGV, Bilaspur,CG

Submitted By:

Ashish Patle

M.Sc. Forestry 4th Semester

Enrl No: GGV/16/6218

Roll No. 20412006

DEPARTMENT OF FORESTRY, WILDLIFE

& ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University Established Under Central University Act 2009, No.25 of 2009)

BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of2009)

CERTIFICATE

This is to certify that thereport entitled ***"Institutional Attachment of IFP Ranchi & Sericulture"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Ashish Patle S/o Mr.S.R. Patle*** *under my supervision and guidance.*

I wish Ashish Patle all the success in his academics.

Place: Bilaspur

Date: ...../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

15.9.22

Dr. Rashmi Agarwal

Professor & Supervisor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-16/09/2022.

DECLARATION

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Place: Bilaspur, C.G

16/09/2022

Ashish Patle

M.Sc. Forestry

Roll No. 20412006

Enrl. No.- GGV/16/6218

INSTITUTE OF FOREST PRODUCTIVITY
RANCHI
(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **ASHISH PATLE** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

रेशम अनुसंधान विकास एवं प्रशिक्षण
बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. आशीष पाटले पिता श्री संतराम पाटले छात्र/छात्रा, एम.एस. सी/पी.एच.डी. वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर को कोनी में मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता विषय पर, प्रशिक्षण सत्र 2022–2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर
दिनांक:- 04.07.2022

श्रीराम मीणा
संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Chapter – 1

INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

About the institute

I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern india. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim,Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

TOTAL AREA OF I.F.P - The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery , germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT OF COMPUTATIONAL SKILL

Submitted for partial fulfilment of the requirementfor theDegree of Master of Science In Forestry and Environmental Sciences

(Session: 2022)

MASTER OF SCIENCE IN FORESTRY (2YDC)

Under the Supervision of:

Dr. Rashmi Agarwal
Professor
Department of Forestry, Wildlife & Environmental Sciences
GGV, Bilaspur, CG

Submitted By:

Ashish Patle
M.Sc. Forestry 4th Semester
Enrl No: GGV/16/6218
Roll No. 20412006

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009, No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of2009)

CERTIFICATE

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I wish Ashish Patle all the success in his academics.

Place: Bilaspur
Date: ...../Sept./2022.

15.9.22

Dr. Rashmi Agarwal

Professor & Supervisor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-..16/09/.....2022.

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Place: Bilaspur, C.G

16/09/2022

Ashish Patle

M.Sc. Forestry

Roll No. 20412006

Enrl. No.- GGV/16/6218

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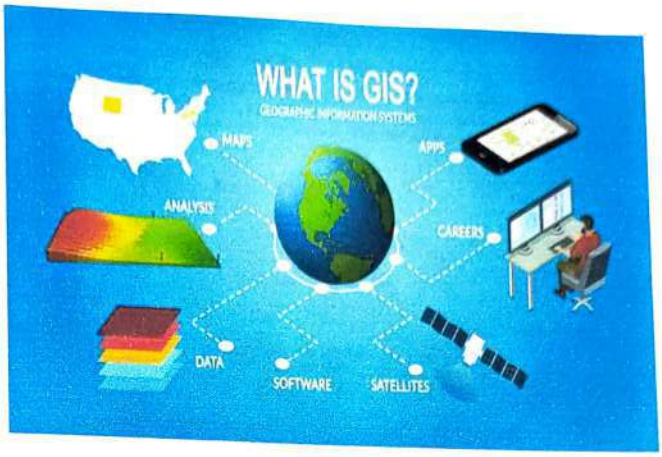
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT PROJECT
ON
IDENTIFICATION AND ENUMERATION OF TREES SPECIES OF URBAN RECREATIONAL AREA OF BILASPUR CITY

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY

(Session: 2021-22)

UNDER THE SUPERVISON OF

Dr. Rashmi Agarwal

Professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

Balbir Mehta

M.Sc. forestry IV semester
Roll no. – 20412008
Enrolment no. – GGV/16/6222

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

*I have great pleasure in certifying that Mr. Balbir Mehta s/o Mr. Dev Narayan Mehta is a regular student of M.Sc. Forestry IV Semester during the session of 2021-22 of Department of Forestry, Wildlife and Environmental Sciences, GGU, Bilaspur. He has completed this Student project entitled "**Identification and enumeration of trees species of urban recreational area of bilaspur city**" during this semester under my guidance.*

I wish him all the success in his future academic endeavours.

22.9.22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Rashmi Agarwal
Professor
Department of Forestry,
Wildlife & Environmental
Sciences
GGV, Bilaspur (C.G)

DECLARATION

*I hereby declare that the project work entitled "**Identification and enumeration of trees species of urban recreational area of bilaspur city**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Rashmi Agarwal, (Professor)** and this project work has been performed for the award of Master's degree in Forestry.*

Balbir Mehta

M.Sc. forestry IV semester

Roll no. – 20412008

Enrolment no. – GGV/16/6222

Date: - /09/2022

Place: - Bilaspur

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M.Sc. forestry IV semester

Roll no. – 20412008

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Date: - /09/2022

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IDENTIFICATION AND ENUMERATION OF TREES FAMILY AND SPECIES OF RECREATIONAL AREA OF BILASPUR URBAN CITY

Introduction

The flora of central province of India is very rich and diverse. The northern southern and central parts of the Chhattisgarh state are forested naturally. Variability in climatic and edaphic conditions brings about significant difference in the forest types and flora of the state. There are four important forest types viz. tropical moist, tropical dry, tropical thorn, subtropical broadleaved hill forests. Based on composition, there are three important forest formations namely teak forest, Sal Forest and miscellaneous forests. Bamboo bearing areas are widely distributed in the state.

Bilaspur district is situated between 21.47° to 23.8° north latitudes and 81.14° to 83.15° east longitude. The total area of bilaspur is 3508.48 Sq km and it comes under the area of dry deciduous tropical forest. The climate of Bilaspur district is sub-tropical, semi-arid, continental and monsoon type & annual rainfall of the district is about 58 centimetres. District has rural area as well as city area where there is total 6 recreational area around the Bilaspur city undertaken by Bilaspur Municipal Corporation. these recreational area acts as lungs of city Park helps in fighting the pollution, encourage biodiversity in city centres and help to control temperatures and humidity. Green zones in city centres are also crucial to social cohesion. Prior to developing an effective pollution and greenery management strategy it is essential to increase our understanding of the urban parks tree population and diversity.

Importance of Recreational area in Urban city

- Strom water collection area - Unpaved ground absorbs water. Trees and grass are a far more efficient and less expensive method of managing storm water than sewers and drainage ditches made of concrete.
- Reduction of the urban heat island effect - The urban heat island effect is caused by the prevalence of flat, dark surfaces consisting of asphalt and concrete in metropolitan areas. This is one of the main causes of pollution and makes urban neighbourhoods notably warmer than other neighbouring locations.
- Provide clean air - Numerous air contaminants are eliminated by trees.
- Protect natural ecosystem - It's not only about us that our cities need more and better parks. The environment in each park is unique. For a wide variety of wildlife, they provide as natural habitats. As cities expand, a greater number of these creatures lose their homes. For many people who have been displaced by urban growth, parks offer a safe refuge.
- Improve aesthetic value of city – it increases the greeneries as well as economical value of surrounding area

Objective

The objective of present investigation was to contribute useful information about the tree resources available in our recreational area by Bilaspur Municipal Corporation

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT
ON
FIELD TRAINING (ATTACHMENT WITH STATE FOREST DEPARTMENT)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY

(Session: 2021-22)

UNDER THE SUPERVISION OF

Dr. Rashmi Agarwal

Professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

Balbir Mehta

M.Sc. forestry IV semester
Roll no. – 20412008
Enrolment no. – GGV/16/6222

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

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14/9/22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Rashmi Agarwal
Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G)

DECLARATION

*I hereby declare that the project work entitled "**Training report on Field Training (Attachment with State Forest Department)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Rashmi Agarwal (Professor)** and this project work has been performed for the award of Master's degree in Forestry.*

Balbir Mehta
M.Sc. forestry IV semester
Roll no. – 20412008
Enrolment no. – GGV/16/6222

Date: -

Place: -

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER-1

CHHATTISGARH FOREST DEPARTMENT

INTRODUCTION

The forest department in any state works to conserve, protect, and manage the forest in sustainable manner. The whole Chhattisgarh Forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest divisions and for every division 10 years working plan is made

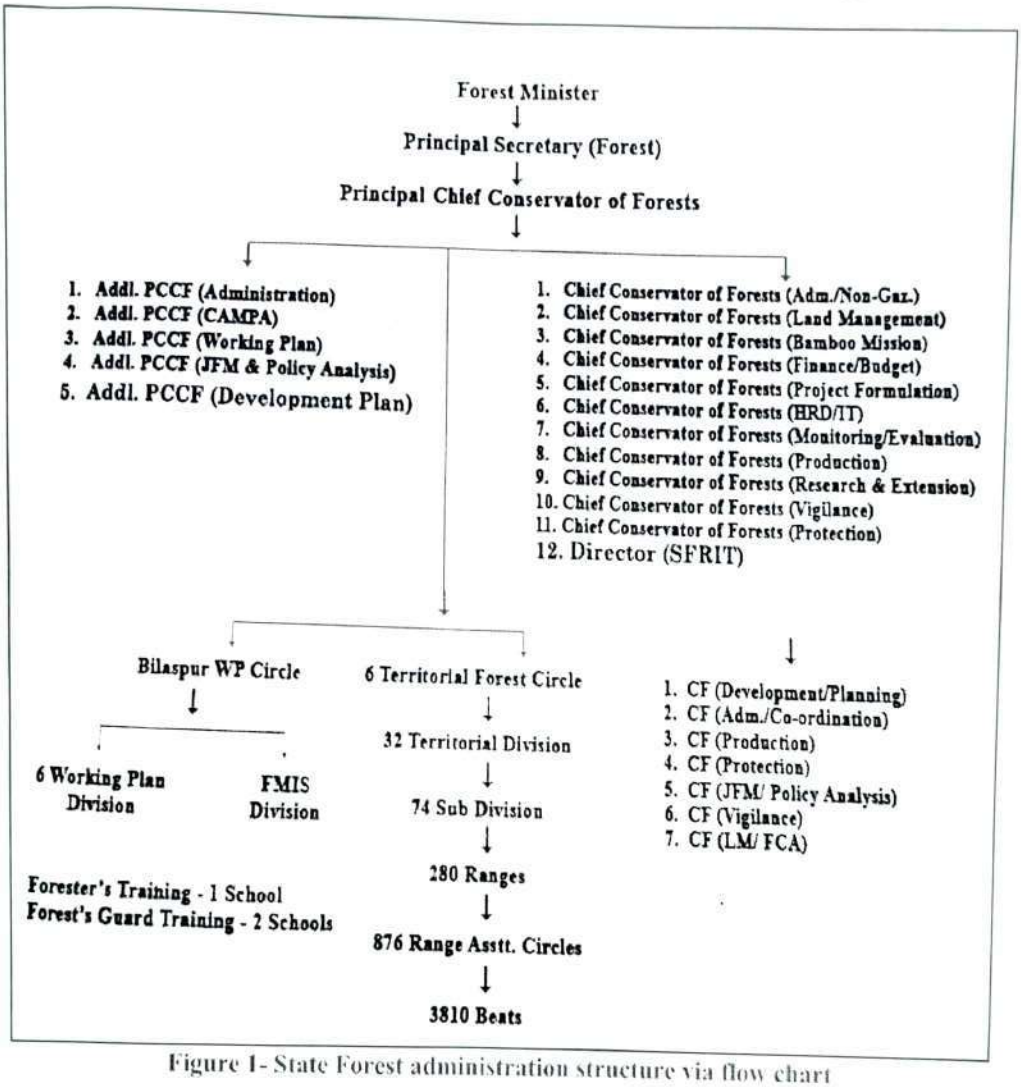


Figure 1- State Forest administration structure via flow chart

ATTACHMENT WITH CHHATTISGARH FOREST DEPARTMENT

As a student of M.Sc. Forestry IV semester, it is very essential to be aware of building up of all action plans of State Forest Department and their implementation on natural forest. To fulfill the practical knowledge, the Department of Forestry, GGV has organized a training program for one month

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT ON COMPUTER TRAINING PROGRAM ON QGIS

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY

(Session: 2021-22)

UNDER THE SUPERVISION OF

Dr. Rashmi Agarwal

Professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

Balbir Mehta

M.Sc. forestry IV semester
Roll no. – 20412008
Enrolment no. – GGV/16/6222

DEPARTMENT OF FORESTRY, WILDLIFE &

ENVIRONMENTALSCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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CERTIFICATE

I have great pleasure in certifying that Mr. Balbir Mehta s/o Mr. Dev Narayan Mehta is a regular student of M.Sc. Forestry IV Semester during the session of 2021-22 of Department of Forestry, Wildlife and Environmental Sciences, GGU, Bilaspur. He has completed this training entitled "Training report on Computer Training Program on QGIS)" during this semester under my guidance.

I wish him all the success in his future academic endeavours.

14/9/22

Dr. Rashmi Agarwal
Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G)

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

*I hereby declare that the project work entitled "**Training report on Computer Training Program on QGIS)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Rashmi Agarwal(Professor)** and this project work has been performed for the award of Master's degree in Forestry.*

Balbir Mehta
M.Sc. forestry IV semester
Roll no. – 20412008
Enrolment no. – GGV/16/6222

Date: - /09/2022

Place: - Bilaspur

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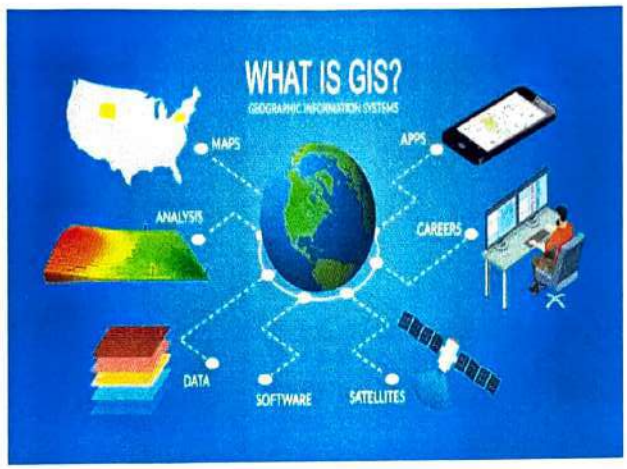
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or"bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT
ON
INDUSTRIAL TRAINING (ATTACHMENT WITH INSTITUTE OF FOREST PRODUCTIVITY, RANCHI)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY

(Session: 2021-22)

UNDER THE SUPERVISION OF

Dr. Rashmi Agarwal

Professor
Department of Forestry, Wildlife &
Environmental Sciences, Guru Ghasidas
Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

Balbir Mehta

M.Sc. forestry IV semester
Roll no. – 20412008
Enrolment no. – GGV/16/6222

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

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CERTIFICATE

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I wish him all the success in his future academic endeavours.

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
tment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Rashmi Agarwal
Professor
Department of Forestry,
Wildlife & Environmental
Sciences
GGV, Bilaspur (C.G)

DECLARATION

*I hereby declare that the project work entitled "**Training Report on Industrial Training (Attachment with Institute of Forest Productivity, Ranchi)**" submitted to Department of Forestry Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Rashmi Agarwal (Professor)**, and this project work has been performed for the award of Master's degree in Forestry.*

Balbir Mehta
M.Sc. forestry IV semester
Roll no. – 20412008
Enrolment no. – GGV/16/6222

Date: - /09/2022
Place: - Bilaspur

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY 1

INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)



Figure 1- Research building of IFP Ranchi

Institute of Forest Productivity is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), catering to the forestry research needs in the states of Bihar, Jharkhand, and West Bengal. Since coming into existence in 1993, the institute has taken up several initiatives in the field of forestry and allied sciences through research projects and extension programmes, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry-based institutes. The institute has established itself as a major player for providing forestry-oriented solutions to different category of users in the region. The institute has specially established its technical expertise in Lac cultivation and over the years number of tribal farmers has been immensely benefited by the various extension activities run by the institute for the socio-economic upliftment of the tribal.

The Institute has well established soil testing lab, molecular biology lab, tree physiology and tissue culture lab, chemistry of forest produce lab and forest entomology lab. All these labs are well maintained and equipped with modern sophisticated equipment's.

In the past Institute has developed a botanical garden "Aus Upvan"- Regional Medicinal Garden for Chhota Nagpur and a Bambusetum with species. Ministry of Environment and Forests, New Delhi has recognized Institutes botanical garden as a Lead Garden in Jharkhand. The total area of institute of forest productivity is 35 hectares.

Objectives of the Institute-

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery, germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON FOREST AREA OF MARWAHI

Submitted for partial fulfilment of requirement of the

Masters of Science in Forestry (2 Years)



(Session-2021-22)

Under the Supervision of:

Dr. Rashmi Agrawal
Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Dinesh Kumar
M.Sc. Forestry VIII Semester
Roll No. 20412009
Enroll No. GGV/16/6263

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

I have great pleasure in certifying that Mr. Dinesh Kumar S/O Mr. Mahesh Ram is a regular student of M.Sc. Forestry VIII Semester during the session of 2021-22 of Department of Forestry, Wildlife and Environmental Science. He has completed this Student project entitled "A Report on forest area of Marwahi Report- Marwahi Forest Division, Chhattisgarh" during thi semester under my guidance. I wish him all the success in his acade s.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

15.9.22
Supervisor

Dr. Rashmi Agrwal
Professor
Department of Forestry, Wildlife and Environmental Science

DECLARATION

I hereby declare that the project work entitled "*A Report on forest area of Marwahi* **report"** submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Prof. Rashmi Agrwal and this project work has been formed for the award of Master of Science Degree in Forestry.

Date: 16/09/22

Place: Bilaspur

Submitted By:-

Dinesh Kumar

M.Sc. Forestry IV Sem

Roll No. 20412009

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

FOREST ADMINISTRATION

The forest administration is the body responsible for implementation of forest policy and forestry issues in a particular country through rules, legislation and financial that means information and forest programs, the forest policy aims to promote the sustainable management and use of forest land resources.

State Forestry Department:

The State Forestry Department is responsible for the administration and regulation of forest harvesting, forest revenue collection and development of the state forest resources. The Department also plans and coordinates the development of wood-based industries. The State Forestry Department is divided into Forest Operations and Forest Development Divisions and supported by District Forest Offices.

Development Divisions and supported by District Forest Offices.

Forest Development Division:

Responsible for planning, implementing and monitoring of forest management and development activities, including biodiversity conservation, ecotourism development and forest rehabilitation as well as the preparation and implementation of the State Forest Management Plan.

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Forest management is the process of planning and implementing practices for the stewardship and use of forests and other wooded land to meet specific environmental, economic, social and cultural objectives. It deals with the overall administrative, economic, legal, social, technical and scientific aspects related to natural and planted forests. It may involve varying degrees of deliberate human

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON FOREST ATTACHMENT AT MARWAHI FOREST DIVISION, BILASPUR CHHATTISGARH

(FOREST ATTACHMENT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. RASHMI AGRAWAL

SUBMITTED BY

DINESH KUMAR

M.Sc. IV SEMESTER

ROLL NO. 20412009

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the Forest Attachment Report entitled: ***"A REPORT ON FOREST ATTACHMENT AT MARWAHI FOREST DIVISION, BILASPUR CHHATTISGARH"*** submitted for the partial fulfillment of Degree of ***Master of Science in Forestry & Environmental Science from Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh has been carried out by Mr. DINESH KUMAR S/o MAHESH RAM of M.Sc. Forestry, IVth Semester, and Enrollment No. (GGV/16/6263) under my guidance and supervision.***

I wish him all the success in his future academic endeavors.

Date: 16 ***/ Sept / 2022***
Place: Bilaspur

15.9.22

Supervisor
Prof. RASHMI AGRAWAL
Department of Forestry, Wildlife and Environmental Sciences

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

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Date : 16./ Sept / 2022
Place : Bilaspur

DINESH KUMAR
M.Sc. Forestry IVth Sem
Roll No. 20412009
Enrollment No. GGV/16/6263

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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intervention, ranging from actions aimed at safeguarding and maintaining forest ecosystems and their functions, to those favoring specific socially or economically valuable species or groups of species for the improved production of forest goods and services.

Aims of forest administration:

- ✓ To provide sustainable forest management.
- ✓ To provide well economical condition.
- ✓ To provide well environmental condition.
- ✓ To provide well biodiversity composition.
- ✓ To provide better land management.
- ✓ To provide better health for the earth.
- ✓ Natural resource monitoring and development

विभागाध्यक्ष
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वानिकी, वन्यजीव एवं पर्यावरण विभाग
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गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT ON INSTITUTIONAL ATTACHMENT OF IFP RANCHI AND SERICULTURE BILASPUR

(INSTITUTIONAL ATTACHMENT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. RASHMI AGRAWAL

SUBMITTED BY

DINESH KUMAR

M.Sc. IV SEMESTER

ROLL NO. 20412009

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Date: 16 ***/ Sept / 2022***
Place: Bilaspur

15.9.22

Supervisor
Prof. RASHMI AGRAWAL
Department of Forestry, Wildlife and Environmental Sciences

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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Date : 16 / Sept / 2022
Place : Bilaspur

Dinesh Kumar
M.Sc. Forestry IVth Sem
Roll No. 20412009
Enrollment No. GGV/16/6263

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Chapter - 1
INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY

About the Institute

I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern india. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim,Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

TOTAL AREA OF I.F.P - The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery , germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.

SECTIONS OF I.F.P LALGUTWA - Institute of forest productivity is spread over 35 hectares of land. It has various section and out of them our visiting section was as follows:

- Medicinal garden.
- Bambusetum.
- Forest productivity unit.
- Office building.

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rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT ON COMPUTATIONAL SKILLS

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. RASHMI AGRAWAL

SUBMITTED BY

DINESH KUMAR

M.Sc. IV SEMESTER

ROLL NO. 20412009

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the Forest Attachment Report entitled: ***"A REPORT ON COMPUTATIONAL SKILLS"*** submitted for the partial fulfillment of Degree of ***Master of Science in Forestry & Environmental Science from Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh has been carried out by M[illegible]ESH KUMAR S/o MAHESH RAM of M.Sc. Forestry, IVth Semester, and Enrollment No. (GGV/16/6263) under my guidance and supervision.***

I wish him all the success in his future academic endeavors.

15.9.22

Date: 16 / Sep / 2022
Place: Bilaspur

Supervisor
Prof. RASHMI AGRAWAL
Department of Forestry, Wildlife and Environmental Sciences

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the present Report entitled: ***"A REPORT ON COMPUTATIONAL SKILLS"*** interpretation or part has not been submitted for any degree or dipoma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Date : 16 ***/ Sept / 2022***
Place : Bilaspur

Dinesh Kumar
M.Sc. Forestry IVth Sem
Roll No. 20412009
Enrollment No. GGV/16/6263

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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS

Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool through spatial analysis.GIS is more than just software. People and methods are combined with geospatial software and tools, to enable spatial analysis, manage large datasets, and display information in a map/graphical form.

COMPONENTS OF GIS

GIS enables the user to input, manage, manipulate, analyze, and display geographically referenced data using a computerized system. To perform various operations with GIS, the components of GIS such as software, hardware, data, people and methods are essential.

SOFTWARE: –

In GIS Software are open-source software & commercial software
GIS software provides the functions and tools needed to store, analyze, and display geographic information. Key software components are

(a) a database management system (DBMS)
(b) tools for the input and manipulation of geographic information

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tment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

FOREST ATTACHMENT REPORT

Submitted for partial fulfilment of requirement of the Master of Science in Forestry & Environmental sciences

(Session-2021-22)

(FOREST MANAGEMENT)

Under the Supervision of:

Dr. K.K Chandra

Head of Department

Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Gautam Kumar

M.Sc. IV Semester
Roll No. 20412011
Enroll No. GGV/20/06703

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

*This is to certify that the project work entitled "**Forest Attachment Report-Central Nursery (Bhaisajhar),Teak forest & Wood depot (Kota) & Marwahi Forest Division Marwahi, Chhattisgarh**" submitted in partial fulfillment of the requirements for the Degree of **Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is the work carried out by **Mr. Gautam Kumar S/o Mr. Vijay Kumar Agrawal** under my supervision and guidance.*

I wish Gautam Kumar all the success in his academics.

Place: Bilaspur
Date : 07/Sept./2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

07/9/2022

Prof. K.K.Chandra

Supervisor

(Head of Department)

Professor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

DECLARATION

*I hereby declare that the project work entitled "**Forest Attachment Report-Central Nursery (Bhaisajhar),Teak forest & Wood depot (Kota) & Marwahi Forest Division Marwahi, Chhattisgarh**" submitted to **Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)**is record of an original work done by me under the guidance of **Dr. K.K.Chandra (Professor)** and this project work has been formed for the award of Degree of **Master of Science in Forestry and Environmental Sciences** and not submitted anywhere else.*

Place: Bilaspur

Date :07/Sept./2022

Gautam Kr.
07/09/22

Gautam Kumar
M.Sc. Forestry & Environmental Sciences
Roll No. 20412011
Enroll No. GGV/20/06703

Forest Department

CERTIFICATE

OF PARTICIPATION

Certified that Mr. **GAUTAM KUMAR** Student of M.Sc. Forestry & Environmental science, Department of Forestry, Wildlife & Environmental sciences , Guru Ghasidas University Bilaspur Chhattisgarh has Successfully Completed the Forest Attachment & Field Training Programme Organised By Forest Department Marwahi Division , Marwahi Chhattisgarh From 05/05/2022 to 15/05/2022. The Forest Department wishes Bright Future of His For Future endeavour in academic advancement.

Mr. Dinesh Patel (IFS)

DFO , Marwahi Division

ACKNOWLEDGEMENT

I would also like to take the opportunity and thank our ***Head of Department & supervisor Dr. K.K Chandra (Associate Professor)*** *for providing us good facilities for successful completion of our project. I also thank all the Faculty Members for their valuable suggestion.*

I would like to thank ***Dr. S.S.Singh (Dean), Mr. Dinesh Kumar Patel (DFO), Mr.Sanjay Tripathi (SDO), Mr. Sattu Jaiswal (Forest Ranger), Mr. Man Singh (Dpt. Ranger) Forester, Forest guard ,every staffs, friends and my dear Batchmates*** *for their invaluable time and knowledge and experience & also greatly thankful to* ***Forest Department of ATR, Kota Region, Mr.Abhinandan Goshwami (Range Forest Officer) & Bhaisajhar central nursery, Miss Yogeshwari Rajput (Forester)*** *for their kind support and cooperation throughout the day and providing useful guidelines and rules for exploring the Forest and timber marketing.*

I want to express my gratitude towards my ***Parents*** *for their encouragement which helped me in the completion of this project.*

This list is never ending, so I thank all those who directly or indirectly helped me to achieve my success.

Gautam Kr.

Gautam Kumar

M.Sc. Forestry & Environmental Sciences

Roll No. 20412011

Enroll No. GGV/20/06703

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER –1

FUNCTIONING OF FOREST DEPARTMENT & FOREST ADMINISTRATION

1.1 Introduction-

The forest administration is the body responsible for implementation of forest policy and forestry issues in a particular country through rules, legislation and financial that means information and forest programs, the forest policy aims to promote the sustainable management and use of forest land resources.

1.2 State Forestry Department:

The State Forestry Department is responsible for the administration and regulation of forest harvesting, forest revenue collection and development of the state forest resources. The Department also plans and coordinates the development of wood-based industries. The State Forestry Department is divided into Forest Operations and Forest Development Divisions and supported by District Forest Offices.

1.3 Forest Development Division:

Responsible for planning, implementing and monitoring of forest management and development activities, including biodiversity conservation, ecotourism development and forest rehabilitation as well as the preparation and implementation of the State Forest Management Plan.

1.4 District Forest Office:

Responsible for administration, controlling forest harvesting, forest revenue collection and forest law enforcement. The office is also responsible for implementing forest management and development activities including the management of forest eco-park and state forest park.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

INDUSTRIAL TRAINING REPORT

Submitted for partial fulfilment of requirement of the Master of Science in Forestry & Environmental Sciences

(Session-2021-22)

(FOREST MANAGEMENT)

Under the Supervision of:

Dr. K.K Chandra

Head of Department

Professor

Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Gautam Kumar

M.Sc. IV Semester
Roll No. 20412011
Enroll No. GGV/20/06703

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

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CERTIFICATE

This is to certify that the Industrial training report work entitled ***"Institute of Forest Productivity, Ranchi & Sericulture Training Koni, Bilaspur (C.G.)"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Gautam Kumar S/o Mr. Vijay Kumar Agrawal*** *under my supervision and guidance.*

I wish Gautam Kumar all the success in his academics.

Place: Bilaspur
Date : 07 /Sept./2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

7/9/2022

Prof. K.K.Chandra

Supervisor

(Head of Department)

Professor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

DECLARATION

I hereby declare that the Industrial training report work ***"Institute of Forest Productivity, Ranchi & Sericulture Training Koni, Bilaspur (C.G.)"*** *submitted to* ***Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)****is record of an original work done by me under the guidance of* ***Dr. K.K.Chandra (Professor), Head of Department*** *and this project work has been formed for the award of Degree of* ***Master of Science in Forestry and Environmental Sciences*** *and not submitted anywhere else.*

Place: **Bilaspur**

Date : 07/Sept./2022

Gautamkr. 07/09/22

Gautam Kumar
M.Sc. Forestry & Environmental Sciences
Roll No. 20412011
Enroll No. GGV/20/06703

INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **GAUTAM KUMAR** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

रेशम अनुसंधान विकास एवं प्रशिक्षण

बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. गौतम कुमार पिता श्री विजय कुमार अग्रवाल छात्र/छात्रा, एम.एस. सी/पी.एच.डी. वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर को कोनी में **मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता** विषय पर, प्रशिक्षण सत्र 2022–2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर
दिनांकः- 04.07.2022

श्रीराम मीणा
संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

ACKNOWLEDGEMENT

I would like to take the opportunity and thank our ***Department Head, Professor & Supervisor, Dr. K.K Chandra*** *for providing the best facilities for successful completion of my Project work. I also thank all the Faculty Members for their valuable suggestion.*

I would like to thank you ***Dr. Brijendra Pratap Singh (Asst. Professor), Dr.N.Kulkarni (IFP Director), Dr.Yogeshwar Mishra (IFP Head of Silvicultural Division), Sri B. D. Pandit, Sri Suraj Kumar , Sri S.N.Vaidya , Sr Ravi Sankar, Dr.Aditya Kumar (Scientist-D), Dr.Sarad Tiwari , Sri Amarnath Mahato, Dr. Saumitro Sankar Das, every staffs of IFP(Ranchi) and*** *would also like to thank you* ***Mr. Ram Meena (Director of sericulture,koni) and his whole team as well as to my dear Batchmates*** *for their invaluable time and knowledge and experience which they shared with us during the webinars.*

I want to express my gratitude towards my ***Parents*** *for their encouragement which helped me in the completion of this project.*

This list is never ending, so I thank all those who directly or indirectly helped me to achieve my success.

Gautam Kr.

Gautam Kumar
M.Sc. Forestry
Roll No. 20410211

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER –1

INTRODUCTON ABOUT INSTITUTE

INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

About the institute-

I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi.



Fig:1.1: Institute of Forest Productivity, Ranchi.

The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern India. The institute came into existence in year 1993 with the objective to formulate, organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim,Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

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वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT

ON

COMPUTATIONAL SKILLS

Submitted for partial fulfilment of requirement of the Master of Science in Forestry & Environmental Sciences

(Session-2021-22)

(FOREST MANAGEMENT)

Under the Supervision of:

Dr. K.K Chandra

Head of Department

Professor

Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Gautam Kumar

M.Sc. IV Semester
Roll No. 20412011
Enroll No. GGV/20/06703

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Computer Application training report work entitled ***"Training report on Computational Skills"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Gautam Kumar S/o Mr. Vijay Kumar Agrawal under my supervision and guidance.***

I wish Gautam Kumar all the success in his academics.

Place: Bilaspur

Date : 13/Sept./2022

19/9/2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Prof. K.K.Chandra

Supervisor

(Head of Department)

Professor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G.

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

DECLARATION

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Place: **Bilaspur**

Date : 13/Sept./2022

Gautam Kr. 13/09/2022

Gautam Kumar
M.Sc. Forestry & Environmental Sciences
Roll No. 20412011
Enroll No. GGV/20/06703

ACKNOWLEDGEMENT

I would like to take the opportunity and thank our ***Department Head, Professor, Dr. K.K Chandra (Supervisor)*** *for providing the best facilities for successful completion of my project work* entitled *I also thank all the Faculty Members for their valuable suggestion.*

I express my deep regards to ***Prof. S. S. Singh, Dean,*** *Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh for his constant help and academic encouragement.*

I would also like to thank you ***Dr.A.K.Singh (Asst. professor) & GGV Professors for the Providing training & their support.***

I want to express my gratitude towards my ***Parents*** *for their encouragement which helped me in the completion of this project.*

At last I like thank you ***my friends, seniors & my dear batchmates****, those who gave me the internal strength to come out of all quandaries and supported during report, This list is never ending, So I thank all those who directly or indirectly helped me to achieve my success.*

Gautam Kr.

Gautam Kumar
M.Sc. Forestry
Roll No. 20412011
Registration No.- GGV/20/06703

13/Sept,2022

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER 1

COMPUTER FUNDAMENTALS

1.1 INTRODUCTION-

The term computer is derived from the word compute. The word compute means to calculate. A computer is an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desmyed output results. Computer performs both simple and complex operations, with speed and accuracy.

A computer is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use.

- A computer is a programmable device that can store, retrieve, and process data.
- A computer is a machine that can be programmed to carry out sequences of arithmetic or logical operations automatically.
- Modern computers can perform generic sets of operations known as programs. These programs enable computers to perform a wide range of tasks.
- Today's computers are electronic devices that accept data (input), process that data, produce output, and store (storage) the results.

1.2 DIGITAL, ANALOG AND HYBRID COMPUTER COMPUTERS

1.2.1 Analogue Computer-

An analogue computer is a form of computer that uses continuous physical phenomena such as electrical, mechanical, or hydraulic quantities to model theproblem being solved.

1.2.2 Digital Computer

A computer that performs calculations and logical operations with quantitiesrepresented as digits, usually in the binary number system.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT REPORT

STATUS OF REGENERATION IN *Shorea robusta Gaertn.* (SAL) AT PALI (CHHATTISGARH) & RAHRA (JHARKHAND) FORESTS.

IN PARTIAL FULFILMENT OF REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCES

BY

Gautam Kumar

(Forest Management)
Roll No. 20412011
Registration No.- GGV/20/06703

Under the Supervision of

Dr. K.K Chandra

Head of Department

Professor
Department of Forestry,
Wildlife & Environmental Sciences GGV, Bilaspur (C.G.)

2022

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled **"Status of Regeneration in *Shorea robusta Gaertn.* (Sal) at Pali (Chhattisgarh) & Rahra (Jharkhand) Forests"** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Gautam Kumar S/o Mr. Vijay Kumar Agrawal*** *under my supervision and guidance.*

I wish Gautam Kumar all the success in his academics.

Place: Bilaspur
Date : 07/Sept./2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

7/9/2022

Prof. K.K.Chandra
Supervisor
(Head of Department)
Professor
Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-07/09/2022.

DECLARATION

I hereby declare that the Student report entitled **"Status of Regeneration in *Shorea robusta Gaertn.* (Sal) at Pali (Chhattisgarh) & Rahra (Jharkhand) Forests"** *submitted to* ***Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)****is record of an original work done by me under the guidance of* ***Dr. K.K.Chandra (Professor)*** *and this project work has been formed for the award of Degree of* ***Master of Science in Forestry and Environmental Sciences*** *and not submitted anywhere else.*

Place: Bilaspur

Date : 07/Sept./2022

Gautam Kr. 07/09/2022

Gautam Kumar
M.Sc. Forestry & Environmental Sciences
Roll No. 20412011
Enroll No. GGV/20/06703

ACKNOWLEDGEMENT

I would like to take the opportunity and thank our ***Department Head, Associate Professor & Supervisor, Dr. K.K Chandra*** *for providing the best facilities for successful completion of my project work* entitled **"Status of Regeneration in *Shorea robusta Gaertn.* (Sal) at Pali (Chhattisgarh) & Rahra (Jharkhand) Forests"**. *I also thank all the Faculty Members for their valuable suggestion.*

I would also like to thank you ***GGV Professors and Officers of Chhattisgarh & Jharkhand for the field support & permission for data collection.***

I want to express my gratitude towards my ***Parents*** *for their encouragement which helped me in the completion of this project.*

At last I like thank you ***my friends, seniors & my dear batchmates****, those who gave me the internal strength to come out of all quandaries and supported during report, This list is never ending, So I thank all those who directly or indirectly helped me to achieve my success.*

Gautam Kr.

Gautam Kumar
M.Sc. Forestry
Roll No. 20412011
Registration No.- GGV/20/06703

Sept,2022

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER 1

INTRODUCTION

Shorea robusta (Sal) is a tall timber deciduous (shade leaves during February to April, leafing out again in April and May) tree belongs to fam. Dipterocarpaceae. It is native to southern Asia, ranging south of the Himalaya, from Myanmar in the east to India, Bangladesh, and Nepal. In India, It extends from Chhattisgarh, Jharkhand, Assam & West Bengal west to the Shivalik Hills in Haryana, east of the Yamuna. Sal tree is about 14% of the total forest area in India. The microclimate and edaphic factors are the major factors in which controls the distribution of Sal forest range between 20-32° North latitude and 75-95° East longitude (Gautam and Devoe,2006). It is state tree of two Indian states- Chhattisgarh & Jharkhand.

Sal is fire hardy but frost tender (in early stage), Sal grows with seldom leaf-less with shining foliage & crown spreading conical /spherical in shape or elongated in young often it bears epicormic branches and bole with clean, straight and cylindrical, On an average heights of Sal is 25-56 m and a diameter of 3.0-3.5 m.. Bark of Sal appears brown and smooth and about 2.5- 5.0 cm thick which depends on many factors. Young trees grow quickly, developing a long taproot at a very young age and attaining top height of up to 6 meters after 6 years. It is known by Sakhwa in northern India.

Sal tree with yellow-white coloured flowers blooms heavily arranged in terminal or axillary racemose panicles which facilitate pollination. At maturity size of fruits is 1.0 cm diameter and 1.2-1.5 cm length. The fruits are covered with the segments of calyx enlarged into five usually unequal wings of about 5.0 -7.6 cm long. These wings facilitate the seed for wind dispersal. Genus *Shorea* has about 198 species found in all over world.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON INSTITUTIONAL ATTACHMENT OF IFP RANCHI & SERICULTURE

Submitted for partial fulfilment of the requirementfor the Degree of Master of Science In Forestry and Environmental Sciences

(Session: 2022)

MASTER OF SCIENCE IN FORESTRY (2YDC)

Under the Supervision of:

Dr. Krishna Kumar Chandra
Professor
Department of Forestry, Wildlife & Environmental Sciences
GGV, Bilaspur, CG

Submitted By:

Himani Sahu
M.Sc. Forestry 4th Semester
Enrl No: GGV/16/6227
Roll No. 20412013

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University Established Under Central University Act 2009, No.25 of 2009)

BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled **"Student Report."** Submitted in partial fulfillment of the requirements for the Degree of **Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is the work carried out by **Ms. Himani sahu D/o Mr. B.L. Sahu** under my supervision and guidance.

I wish Himani Sahu all the success in her academics.

Place: Bilaspur

Date: ...../Sept./2022

13/9/2022

Prof. K.K.Chandra
Supervisor
Head of Department
Professor
Department of Forestry,
& Environmental Sciences
GGV, Bilaspur , CG

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-..16./.09./..2022.

DECLARATION

I hereby declare that the report entitled "*Institutional Attachment of IFP Ranchi & Sericulture*"submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

HimaniSahu

Himani Sahu

M.Sc. Forestry

Roll No. 20412013

Enrl. No.- GGV/16/6227

INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **HIMANI SAHU** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Niti Kulkarni)
Director

रेशम अनुसंधान विकास एवं प्रशिक्षण

बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. हिमानी साहू पिता श्री बी.एल.साहू छात्र/छात्रा, एम.एस.सी/पी. एच.डी. **वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर** को कोनी में **मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता** विषय पर, प्रशिक्षण सत्र 2022– 2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर
दिनांक:- 04.07.2022

श्रीराम मीणा
संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Chapter – 1

INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

About the institute

I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern india. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim,Jharkhand, West Bengal which encompasses approx. 46,581 sq. km, forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

TOTAL AREA OF I.F.P - The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery , germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.

SECTIONS OF I.F.P LALGUTWA - Institute of forest productivity is spread over 35 hectares of land. It has various section and out of them our visiting section was as follows:

- Medicinal garden.
- Bambusetum.
- Forest productivity unit.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT OF COMPUTATIONAL SKILL

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Dr. Krishna Kumar Chandra
Professor
Department of Forestry, Wildlife & Environmental Sciences
GV, Bilaspur, CG

Submitted By:

Himani Sahu
M.Sc. Forestry 4th Semester
Enrl No: GGV/16/6227
Roll No. 20412013

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the report entitled " ***Computational Skill*** *" submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Himani Sahu D/o Mr. B .L. Sahu*** *under my supervision and guidance.*

I wish Himani Sahu all the success in her academics.

Place: Bilaspur

Date: ...../Sept./2022.

28/9/2022

Prof. K.K.Chandra

Supervisor

Head of Department

Professor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date- 16/09/2022.

DECLARATION

I hereby declare that the report entitled " Computational Skill " submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Himani Sahu

Himani Sahu

M.Sc. Forestry

Roll No. 20412013

Enrl. No.- GGV/16/6227

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool

Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT

ON FOREST ATTACHMENT

Submitted for partial fulfilment of requirementFor the Degree of

Master of Science In Forestry and Environmental Sciences

(Session: 2020-22)

MASTER OF SCIENCE IN FORESTRY (2YDC)

Under the Supervision of:

Dr. Krishna Kumar Chandra
Professor
Department of Forestry, Wildlife
& Environmental Sciences GGV, Bilaspur

Submitted By:

Himani Sahu
M.Sc. Forestry 4th Semester
Enrl No: GGV/16/6227
Roll No. 20412013

DEPARTMENT OF FORESTRY, WILDLIFE
& ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009,No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of2009)

CERTIFICATE

This is to certify that the report entitled ***" Forest Attachment "*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Ms. Himani sahu D/o Mr. B.L. Sahu*** *under my supervision and* *idance.*

wish Himani Sahu all the success in his academics.

13/9/2022

Prof. K.K.Chandra

Supervisor

Professor

Department of Forestry,Wild life & Environmental Sciences GGU

Place: Bilaspur

Date: ...../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date- 15 / 09 / 2022

DECLARATION

I hereby declare that the report entitled " Forest Attachment "submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K. Chandra and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Himani Sahu

HIMANI SAHU

M.Sc. Forestry

Roll No. 20412023

Enrl. No.- GGV/16/6227

FOREST & CLIMATE CHANGE DEPARTMENT
Raigarh Division Raigarh (C.G.)

CERTIFICATE

Certified that Miss HIMANI SAHU of Guru Ghasidas University, Bilaspur Chhattisgarh has successfully completed the Institutinal Attachment Training Programme organized by Forest & Climate Change Department, Raigarh Division Raigarh (C.G.) from 09/05/2022 to 15/05/2022. The Institute wishes bright future of his/her for future endeavour in academic advancement.

(Stylo Mandavi)
"IFS"
Divisional Forest Officer
Raigarh Dn. Raigarh (C.G.)

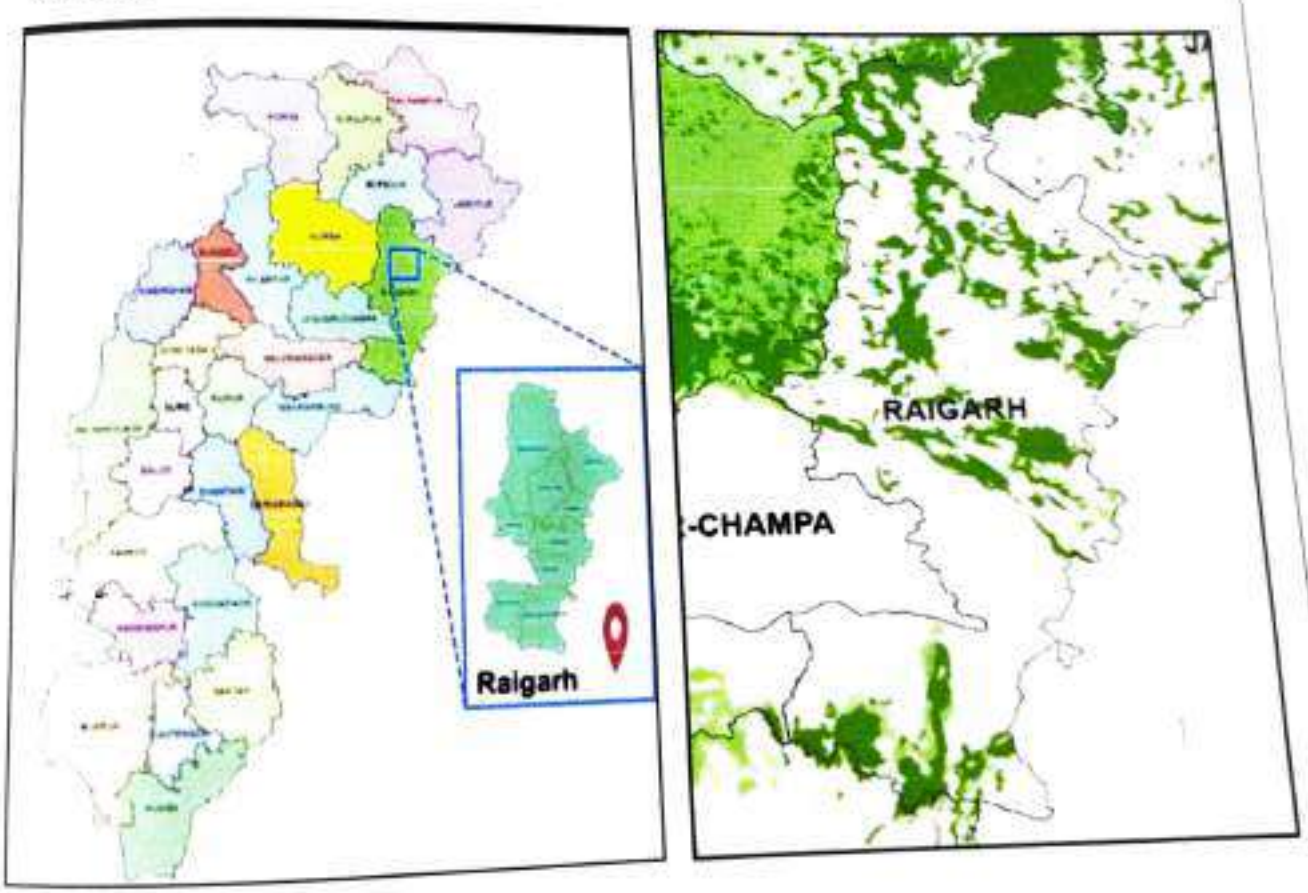
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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Chapter-I

Introduction

Raigarh is a city in Eastern Chhattisgarh It is also known for its forest cover, coal reserves and power generation for the state as well as the country. It lies between 21° 20' and 23 .15' North latitude, 82° 56' and 84° 24' East longitude It is bounded on the north by Sarguja and Jashpur, on the west by Korba and Janjgir Champa, on the south by Mahasamund and on the east by Sambalpur district of Orissa. the Mahanadi and kelo river flows through the city which is one of its main water sources. This district extends over a geographical area of 7086 sq km. According to the publication of India state forest report 2019 total forest area of Raigarh district is 2620.33 sq.km. which is 36.97 % of total geographical area of district.



We have visited the nursery of bhelwa tikra (central nursery), bangursiya for demonstration working plan formulation, Badaljhiriya for conservation practices of watershed management & Urdana depot of Raigarh forest Division, Chhattisgarh.

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT REPORT

On

(Biomass and Carbon Stocks of Different Tree Species Along Bank Of Arpa River Bilaspur Chhattisgarh)

Submitted for partial fulfilment of requirement For the Degree of Master of Science

In

Forestry and Environmental Sciences

(Session: 2020-22)

Under the Supervision of:

Dr. Krishna kumar chandra

Professor

Department of Forestry, Wildlife

& Environmental Sciences GGV, Bilaspur

Submitted By:

Himani Sahu

M.Sc. Forestry 4th Semester

Enrl No: GGV/16/6227

Roll No. 20412013

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University Established Under Central University Act 2009,No.25 of 2009)

BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled **"Student Report."** submitted in partial fulfillment of the requirements for the Degree of **Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is the work carried out by **Ms. Himani sahu D/o Mr. B.L. Sahu** under my supervision and guidance.

I wish Himani Sahu all the success in her academics.

Place: Bilaspur

Date: ...../Sept./2022

13/9/2022

Prof. K.K.Chandra
Supervisor
Head of Department
Professor
Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date: 16..../Sept./2022.

DECLARATION

I hereby declare that the report entitled "Biomass and Carbon Stocks of Different Tree Species Along Bank Of Arpa River Bilaspur Chhattisgarh " Student report submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of Master of Science Degree in Forestry & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Himani Sahu

Himani Sahu

M.Sc. Forestry 4th Semester

Roll No. 20412013

Enrl. No.- GGV/16/6227

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Biomass and Carbon Stocks of Different Tree Species Along Side Arpa River Bilaspur Chhattisgarh

INTRODUCTION

Trees are critically important to the ecosystem generally, not least as oxygen-producers and carbon dioxide capturers, cleaning pollution from the air. However, they also provide a number of specific benefits in their role as riparian buffers. They slow runoff from rainwater, reducing erosion, flooding, and pollution. This also helps recharge aquifers, encouraging more water back into the ground.

Trees lining riverbanks are themselves habitats for birds and forest wildlife. However, they also protect fish habitats, keeping rivers cooler and preventing overgrowth of bacteria and algae that thrive in warmer waters. Additionally, trees along the river help ensure the river can be enjoyed by local communities, which rely upon the watershed for boating, fishing, swimming, and other recreational opportunities—one reason for the program's popularity.

IMPORTANCE

The area alongside a stream or river is referred to as a riparian zone. Plants growing along the banks are called riparian vegetation, which is primarily made up of water loving plants. Riparian zones are sometimes called buffers since they help filter pollutants out of water flowing across the landscape towards waterways. Riparian buffers areas may be natural or engineered for restoration or soil stabilization.

One of the most important functions of riparian vegetation is its ability to control erosion and prevent sediment pollution in the stream. Increased sediment and silt in stream water can clog fishes' gills, bury their eggs, cover their food sources on the stream bottom, and cloud the water, shading out the sun needed for aquatic life. Vegetation on the shoreline, combined with the meandering curves of the stream or river, helps dissipate stream energy, resulting in less soil erosion and flood damage.

Shoreline vegetation also provides a natural biofilter that helps reduce pollution in surface runoff and shallow groundwater. Plants take up nitrogen and phosphorous from fertilizers and animal waste. This helps prevent algal blooms, which consume oxygen in the water (when they naturally die off) that is essential for the health of fish and other aquatic organisms.

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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON COMPUTATIONAL SKILLS

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE



SESSION: 2021-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. . K. K. Chandra

SUBMITTED BY

Himani Suryawanshi

M.Sc. IV SEMESTER

ROLL NO. 20412012

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the report entitled " ***Computational Skill*** *" submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Himani Suryavanshi D/o Mr. G.P. Suryavanshi*** *under my supervision and guidance.*

I wish Himani Suryavanshi all the success in her academics.

Date: *.... / Sept / 2022*

Place: ***Bilaspur***

12/9/22

Prof. K.K.Chandra

Supervisor

Head of Department

Professor

Department of Forestry, Wildlife and Environmental Science, GGV,Bilaspur

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date- 16/ SEPT /2022.

DECLARATION

I hereby declare that the report entitled " Computational Skill " submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of Master of Science Degree in Forestry & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Himani Suryavanshi
M.Sc. Forestry IVSem
Roll No. 20412012
Enrl. No.- GGV/16/6226

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DAY – 1

troduction to GIS – Component Downloading and Installation of QGIS – Getting miliar with QGIS Interface

INTRODUCTION OF GIS

eographical Information System (GIS) is a technology that provides the means to collect and use geographic ata to assist in the development of Agriculture. A digital map is generally of much greater value than the same ap printed on a paper as the digital version can be combined with other sources of data for analyzing information nd graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, ombining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a owerful means for agricultural scientists to better service to the farmers and farming community in uncovering their eeds and helping in a better decision making to implement planning activities for the development of agriculture.

S GEOGRAPHIC INFORMATION SYSTEM WHICH WE DISCUSSED ABOUT GIS

t is necessary to remember two important person the first one is John snow (1813 – 1858) It was believed that holera was spread by a "bad air" or "bad smell" from decomposing organic matter in the nineteenth century. But ohn snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells y he 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number f cases and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's eographic information system.

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dditional data such as the school's name, level of education taught, student capacity would make up the attribute ata. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool. hough spatial analysis GIS is more than just software. People and methods are combined with geospatial software ools to enable spatial analysis, manage large datasets, and display information in a map/graphical form.

OMPONENTS OF GIS

IS enables the user to input, manage, manipulate, analyze, and display geographically referenced data using a omputerized system. To perform various operations with GIS, the components of GIS such as software, ardware, data, people and methods are essential.

OFTWARE: –

IS software are open-source software & commercial software. ll software provides the functions and tools needed to store, analyze, nd display geographic information. Key software components are atabase management system (DBMS)

ools for the input and manipulation of geographic information

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A REPORT ON INSTITUTIONAL ATTACHMNT OF IFP RANCHI AND SERICULTURE BILASPUR

(INSTITUTIONAL ATTACHMENT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. . K. K. Chandra

SUBMITTED BY

Himani Suryavanshi

M.Sc. IV SEMESTER

ROLL NO. 20412012

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Scanned with OKEN Scanner

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR 495009
(CHHATTISGARH)

CERTIFICATE

This is to certify that the report entitled ***"Institutional Attachment of IFP Ranchi & Sericulture"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences*** *in* ***Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Himani Suryavanshi D/o Mr. G.P. Suryavanshi*** *under my supervision and guidance.*

I wish Himani Suryavanshi all the success in her academics

13/9/2022

Date: *.... / Sept / 2022*

Place: *Bilaspur*

Prof. K.K.Chandra

Supervisor

Head of Department

Professor

Department of Forestry, Wildlife and Environmental Science, GGV Bilaspur

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-..16../ SEPT /2022.

DECLARATION

I hereby declare that the report entitled "*Institutional Attachment of IFP Ranchi & Sericulture*" submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Himani Suryavanshi

M.Sc. Forestry IVSem

Roll No. 20412012

Enrl. No.- GGV/16/6226

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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Chapter - 1
INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY

About the Institute

I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern india. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim,Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

TOTAL AREA OF I.F.P - The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery , germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.

SECTIONS OF I.F.P LALGUTWA - Institute of forest productivity is spread over 35 hectares of land. It has various section and out of them our visiting section was as follows:

- Medicinal garden.
- Bambusetum.
- Forest productivity unit.
- Office building.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A REPORT ON FOREST ATTACHMENT

(FOREST ATTACHMENT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. . K. K. Chandra

SUBMITTED BY

Himani Suryavanshi

M.Sc. IV SEMESTER

ROLL NO. 20412012

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the report entitled " Forest Attachment " submitted in partial fulfillment of the requirements for the Degree of Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh) is the work carried out by Himani Suryavanshi D/o Mr. G.P. Suryavanshi under my supervision and guidance.

I wish Himani Suryavanshi all the success in her academics.

02/12/9/2022

Date: .... / Sept / 2022

Place: Bilaspur

Prof. K.K.Chandra

Supervisor

Head of Department

Professor

Department of Forestry, Wildlife and Environmental Science, GGV,Bilaspur

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date- 16/ SEPT /2022.

DECLARATION

I hereby declare that the report entitled " Forest Attachment " submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Himani Suryavanshi
M.Sc. Forestry IVSem
Roll No. 20412012
Enrl. No.- GGV/16/6226

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Head
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rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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1. FOREST ADMINISTRATION

The forest administration is the body responsible for implementation of forest policy and forestry issues in a particular country through rules, legislation and financial that means information and forest programs. the forest policy aims to promote the sustainable management and use of forest land resources.

State Forestry Department: The State Forestry Department is responsible for the administration and regulation of forest harvesting, forest revenue collection and development of the state forest resources. The Department also plans and coordinates the development of wood based industries. The State Forestry Department is divided into Forest Operations and Forest Development Divisions and supported by District Forest Offices. Development Divisions and supported by District Forest Offices.

Forest Development Division: Responsible for planning, implementing and monitoring of forest management and development activities, including biodiversity conservation, ecotourism development and forest rehabilitation as well as the preparation and implementation of the State Forest Management Plan.

District Forest Office: Responsible for administration, controlling forest harvesting, forest revenue collection and forest law enforcement. The office is also responsible for implementing forest management and development activities including the management of forest eco-park and state forest park.

Forest administration management: Forest management is the process of planning and implementing practices for the stewardship and use of forests and other wooded land to meet specific environmental, economic, social and cultural objectives. It deals with the overall administrative, economic, legal, social, technical and scientific aspects related to natural and planted forests. It may involve varying degrees of deliberate human
intervention, ranging from actions aimed at safeguarding and maintaining forest ecosystems and their functions, to those favoring specific socially or economically valuable species or groups of species for the improved production of forest goods and services.

Aims of forest administration:

- ✓ To provide sustainable forest management.
- ✓ To provide well economical condition.
- ✓ To provide well environmental condition.
- ✓ To provide well biodiversity composition.
- ✓ To provide better land management.
- ✓ To provide better health for the earth.
- ✓ Natural resource monitoring and development

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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A REPORT ON

(Biomass & Carbon Stock of Different Govt. Offices & Colleges of Bilaspur)

(STUDENT PROJECT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. . K. K. Chandra

SUBMITTED BY

Himani Suryavanshi

M.Sc. IV SEMESTER

ROLL NO. 20412012

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

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(CHHATTISGARH)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the Student project report entitled **" Biomass & Carbon Stock of Different Government Offices & Colleges of Bilaspur"** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Ms. Himani Suryavanshi D/o Mr. G.P. Suryavanshi*** *under my supervision and guidance.*

I wish Himani Suryavanshi all the success in her academics.

18/9/2022

Date: *.... / Sept / 2022*

Place: ***Bilaspur***

Prof. K.K.Chandra

. Supervisor

Head of Department

Professor

Department of Forestry, Wildlife and Environmental Science, GGV, Bilaspur

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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Date-16./ SEPT /2022.

DECLARATION

I hereby declare that the report entitled "Biomass & Carbon Stock of Different Government Offices & Colleges of Bilaspur" Student project report submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Himani Suryavanshi
M.Sc. Forestry IVSem
Roll No. 20412012
Enrl. No.- GGV/16/6226

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ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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Biomass and Carbon Stocks of Different Government Offices and Colleges of Bilaspur

INTRODUCTION

Trees play a vital role in mitigating the diverse effects of environmental carbon degradation and on reducing global warming. Trees promote sequestration of carbon into soil and plant biomass. Therefore, tree based land use practices could be viable alternatives to store atmospheric carbon dioxide due to their cost effectiveness, high potential of carbon uptake and associated environmental as well as social benefits. But due to large scale deforestation of natural vegetation has reached 5.2 million hectares in the past ten years has impaired the carbon sequestration capacity of the biosphere. Moreover the release of inactive carbon from consumption and burning of fossil fuels through power industries has led to a considerable increase of C in the atmosphere. To prevent global warming, it is legally imperative to lowered C either by reducing emissions or by enabling the storage of carbon in the terrestrial ecosystems.

As forests maintain over 86% of the terrestrial carbon stock on earth during photosynthesis and storing excess carbon as biomass, an accurate estimate of forest carbon storage including natural forests, plantations, grass lands etc. separately for different forests of various locality, will be of great significance to the research on the productivity of terrestrial ecosystem, carbon cycle and global warming. Generally predictions of the sequestration rate of different tree species cannot be made, since growth and sequestration depends on local climate, soil factors and management. The rate of carbon sequestration depends on the growth characteristics of the tree species, the conditions for growth where the tree is planted, and the density of the tree's wood. Over last 20 years, plenty of researches focusing of the carbon storage, carbon density and carbon sink function of forest ecosystem have been made by many countries 5.

In an educational institution or government offices scattered trees are the prominent features which are planted to maintain the greenery and aesthetic view inside the campus. This contributes in improving vegetation outside forest area and achieves 33% of total tree cover i.e., 24.62% (FSI, 2021) in India as advocated by Forest Policy 1952. These trees are managed either by planting or retaining naturally growing seedlings. Mostly trees are planted for the aesthetic view in an institution, but it provides shelter , shade and food for the fauna of the area and in carbon sequestration. Carbon sequestration is a mechanism for the removal of carbon from the atmosphere by storing it in the biosphere. However, due to uncontrolled removal of trees the habitat for animal species is lost, which can harm ecosystems. This also has a negative impact on removal of carbon from the atmosphere as a result the temperature of earth increases.

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INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **HRICHA CHAUHAN** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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CHAPTER -1

INTRODUCTION ABOUT THE INSTITUTE OF FOREST PRODUCTIVITY (IFP)

bout the institute





Institute of Forest Productivity is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), situated on National highway (N.H.-24), Ialgutwa, Ranchi. IFP catering to the forestry research needs in the states of Bihar, Jharkhand and West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country. In 1985 brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types. '

- The total area of institute of forest prodnctivity is 35 hectares.
- Since coming into existence in 1993, the institute has taken up a number of initiatives in the field of forestry and allied sciences through research projects and extension programmes, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry based institutes.
- The institute has specially established its technical expertise in Lac cultivation and over the years number of tribal farmers have been immensely benefited by the various extension activities run by the institute for the socio econonic upliftment of the tribal.
- The Institute has well established soil testing lab, molecular biology lab, tree physiology and tissue culture lab, chemistry of forest produce lab and forest entomology lab. All these labs are well maintained and equipped with modern sophisticated equipments.

The major objectives of the Institute are as follows:

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.

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rtment of Forestry, Wildlife and Environmental Science
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Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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STUDENT PROJECT REPORT

Submitted for partial fulfilment of requirement of the Master of Science in Forestry & Environmental sciences (2 Years)

(Session-2021-22)

FOREST MANAGEMENT

Under the Supervision of:

Dr. Garima Tiwari

Assistant Professor

Department of Forestry,

Wildlife & Environmental Sciences

GGV, Bilaspur (C.G.)

Submitted By:

Hricha Chauhan

M.Sc. IV Semester

Roll No. 20412014

Enrol No. GGV/20/06704

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

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(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the student report entitled" ***Student project Report-On Medicinal plants for Covid-19 Care"*** *submitted in partial fulfilment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)is the work*** *carried out by* ***Miss Hricha Chauhan S/o Mr. Santosh Singh Chauhan*** *under my supervision and guidance.*

I wish **Hricha Chauhan** *all the success in her academics.*

Place: **Bilaspur**
Date: ..16../Sept./2022.

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Garima Tiwari
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya; Bilaspur C.G.

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GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

DECLARATION

I hereby declare that the project work entitled —**Student project report on Medicinal plants for Covid-19 Care"** submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of *Dr. Garima Tiwari* and this project work has been formed for the award of *Master of Science Degree in Forestry.*

Place Bilaspur

Date: 16/09/22

Submitted By: -
Hricha Chauhan
M.Sc. Forestry
Roll No. 20412014

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EDICINAL PLANTS FOR COVID-19 CARE



"THE LAND ABOUNDS IN THIS NATURALS REMEDIES AND TO CLASSIFY THE PLANTS,GIVE THEIR ANMES AND

DESCRIBE THEIR PROPERTIES,THE PRESENSE OF A BOTANIST WOULD BE REQUIRED.IT IS CERTAIN THAT MANY

ILLNESSES ARE CURED BY PEOPLE AND THEY HAVE THEIR REMEDIES FOR EVERYTHING, MANY QUITE EFFECTIVE

FOR THIS REASON,NOT A FEW PREFER THEIR HERBS AND ROOTS TO OUR UNGUENTS AND SALVES.

"---REPLY BY A MISSIONARY AT MISSION SAN ANTONIO AS TO WHAT KNOWLEDGE THE NATIVES HAD TO MEDICINES.

[GEIGER AND MEIGHAN,1976]

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A REPORT

ON

FOREST ATTACHMENT

Submitted for partial fulfilment of requirementFor the Degree of Master of Science
In
Forestry and Environmental Sciences

(Session: 2020-22)

Under the Supervision of:

Dr. Garima Tiwari
Assistant Professor
Department of Forestry, Wildlife
& Environmental Sciences GGV, Bilaspur

Submitted By:

Mary Juli Tirkey
M.Sc. Forestry 4th Semester
Enrl No: GGV/16/6234
Roll No. 20412017

DEPARTMENT OF FORESTRY, WILDLIFE
& ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009,No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of2009)

CERTIFICATE

This is to certify that the report entitled " ***Forest Attachment*** *" submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mary Juli Tirkey D/o Mr. V.B Tirkey*** *under my supervision and guidance.*

I wish Mary Juli Tirkey all the success in his academics.

Place: Bilaspur

Date: ...../Sept./2022.

Dr. Garima Tiwari
Supervisor
Assistant Professor

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date- 16/09/2022.

DECLARATION

I hereby declare that the report entitled " Forest Attachment "submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. Garima Tiwari and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Mary Juli

Mary Juli Tirkey

M.Sc. Forestry

Roll No. 2041202017

Enrl. No.- GGV/16/6234

FOREST & CLIMATE CHANGE DEPARTMENT

Raigarh Division Raigarh (C.G.)

CERTIFICATE

Certified that Miss MARY JULI TIRKEY of Guru Ghasidas University, Bilaspur Chhattisgarh has successfully completed the Institutinal Attachment Training Programme organized by Forest & Climate Change Department, Raigarh Division Raigarh (C.G.) from 09/05/2022 to 15/05/2022. The Institute wishes bright future of his/her for future endeavour in academic advancement.

(Stylo Mandavi)
"IFS"
Divisional Forest Officer
Raigarh Dn. Raigarh (C.G.)

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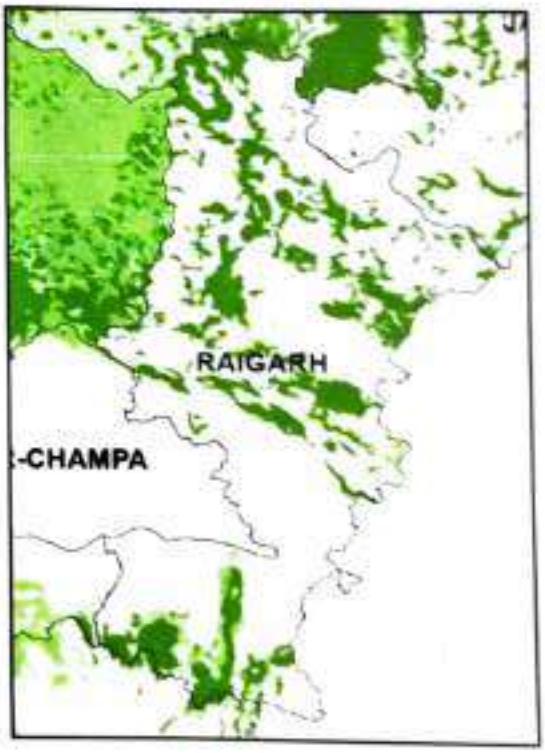
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Head
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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Chapter-1

Introduction

Raigarh is a city in Eastern Chhattisgarh It is also known for its forest cover, coal reserves and power generation for the state as well as the country. It lies between 21° 20' and 23 .15' North latitude, 82° 56' and 84° 24' East longitude It is bounded on the north by Sarguja and Jashpur, on the west by Korba and Janjgir Champa, on the south by Mahasamund and on the east by Sambalpur district of Orissa. the Mahanadi and kelo river flows through the city which is one of its main water sources. This district extends over a geographical area of 7086 sq km. According to the publication of India state forest report 2019 total forest area of Raigarh district is 2620.33 sq.km. which is 36.97 % of total geographical area of district.





We have visited the nursery of bhelwa tikra (central nursery), bangursiya for demonstration working plan formulation, Badaljhiriya for conservation practices of watershed management & Urdana depot of Raigarh forest Division, Chhattisgarh.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON INSTITUTIONAL ATTACHMENT OF IFP RANCHI & SERICULTURE

Submitted for partial fulfilment of the requirementfor theDegree of Master of Science In Forestry and Environmental Sciences

(Session: 2020-22)

MASTER OF SCIENCE IN FORESTRY (2YDC)

Under the Supervision of:

Dr. Garima Tiwari,
Assistant Professor
Department of Forestry, Wildlife
& Environmental Sciences
GGV, Bilaspur, CG

Submitted By:

Mary Juli Tirkey
M.Sc. Forestry 4th Semester
Enrl No: GGV/16/6234
Roll No. 20412017

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University Established Under Central University Act 2009, No.25 of 2009)

BILASPUR-495009, CHHATTISGARH

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of2009)

CERTIFICATE

This is to certify that thereport entitled ***"Institutional Attachment of IFP Ranchi & Sericulture"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* **Mary Juli Tirkey** ***D/o Mr.V.B Tirkey*** *my supervision and guidance.*

I wish **Mary Juli Tirkey** ***all the success in her academics.***

Place: Bilaspur
Date-.....2022.

Dr. Garima Tiwari,
Assistant Professor
Department of Forestry, Wildlife & Environmental Sciences
GGV, Bilaspur, CG

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date- 16/09/2022.

DECLARATION

I hereby declare that the report entitled "*Institutional Attachment of IFP Ranchi & Sericulture*"submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. Garima Tiwari and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Mary Juli

Mary Juli Tirkey

M.Sc. Forestry

Roll No. 20412017

Enrl. No.- GGV/16/6234

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Chapter - 1
INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

About the institute

I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern india. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim,Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

TOTAL AREA OF I.F.P - The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery , germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.

SECTIONS OF I.F.P LALGUTWA - Institute of forest productivity is spread over 35 hectares of land. It has various section and out of them our visiting section was as follows:

- Medicinal garden.
- Bambusetum.
- Forest productivity unit.
- Office building.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A STUDENT PROJECT

ON

MAJOR TREE SPP. SUGGESTED FOR PLANTATION IN URBAN SITES OF BILASPUR

Submitted for partial fulfilment of the requirement
for the Degree of
Master of Science
In
Forestry & Environmental Science

(Session: 2020-2022)

Under the Supervision of:
Dr. Garima Tiwari
Assistant Professor
Department of Forestry, Wildlife
& Environmental Sciences
GGV, Bilaspur , CG

Submitted By:
Ms. Mary Juli Tirkey
M.Sc. Forestry 1Vth Sem.
Enrol No: GGV/16/6234
Roll No. 20412017

DEPARTMENT OF FORESTRY, WILDLIFE
& ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009, No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009 (CG)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the ***Student Project is*** submitted for the partial fulfilment of Degree of ***Master of Science in Forestry to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh has been carried out by Ms. Mary Juli Tirkey, M.Sc. Forestry, IVth Semester, and Enrollment No. (GGV/16/6234) under my guidance and supervision.***

I wish her all the success in him future academic endeavours.

Place: Bilaspur

Date : 12/Sep/2022

(Dr. Garima Tiwari)
Assistant Professor
Supervisor

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the present **Student Project** has not been submitted for any degree or diploma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Mary Juli Tirkey
M.Sc. Forestry I Vth Semester
Roll. No.: 20412017
Enrollment No.: GGV/16/6234

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

INTRODUCTION

❖ What is Tree Plantation ?

- Tree plantation is the process of transferring of seedlings from one place to another for different purposes. Furthermore, there are various reasons behind tree plantation but the most important are forestry, land reclamation, and landscaping. Each process of tree plantation is important and unique in its own way.

- In simple words; Tree plantation is a biological practice where large amount of trees or plants have been planted in a given area.

❖ Aim & Objectives of Tree Plantation :-

- To create green belt and avenues for meeting aesthetic recreational needs to the people.
- To beautify the areas for scenic beauty.
- To reduce the surface run-off discharge and checking soil erosion along the embankments.
- To reduce temperature and increase humidity.
- To reduce noise pollution to the neighboring household population.
- To reduce the impacts of air pollution and dust as trees and shrubs are known to be natural sink for air pollutants.
- To provide much needed shade on glaring hot roads during summer.
- Moderating the effect of wind and incoming radiation.
- To define the ROW especially highlight sharp horizontal curves during night.
- To promote road development as eco friendly activity.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT OF COMPUTATIONAL SKILL

Submitted for partial fulfilment of the requirementfor the Degree of Master of Science In Forestry and Environmental Sciences

(Session: 2020-22)

MASTER OF SCIENCE IN FORESTRY (2YDC)

Under the Supervision of:

Dr. Garima Tiwari
A istant Professor
I artment of Forestry, Wildlife
& nvironmental Sciences
V, Bilaspur, CG

Submitted By:

Mary Juli Tirkey
M.Sc. Forestry 4th Semester
Enrl No: GGV/16/6234
Roll No. 20412017

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009, No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

(A central university established under Central Universities Act 2009, No. 25 of2009)

CERTIFICATE

This is to certify that the report entitled " ***Computational Skill*** *" submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mary Juli Tirkey D/o Mr. V.b Tirkey*** *under my supervision and guidance.*

I wish Mary Juli Tirkey all the success in her academics.

Place: Bilaspur

Date: ...../Sept./2022.

Dr. Garima Tiwari
Supervisor
Assistant Professor

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date- 16/09/2022.

DECLARATION

I hereby declare that the report entitled " Computational Skill " submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. Garima Tiwari and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Mary Juli Tirkey

M.Sc. Forestry

Roll No. 20412017

Enrl. No.- GGV/16/6234

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem solving tool.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON

"INSTITUTIONAL TRAINING"

(Session: 2021-22)

SUBMITTED FOR PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Under the supervision of:

Dr. Garima Tiwari

(Assistant Professor)
Department of Forestry, Wildlife

& Environmental Sciences

GGV, Bilaspur (C.G.)

Submitted By:

Monika Kranti

M.Sc. Forestry IV sem
Enroll. No. GGV/16/6235

Roll No. 20412018

Department Of Forestry, Wildlife And Environmental Sciences

Guru Ghasidas Vishwavidyalaya Koni, Bilaspur (CG)-495009.

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (CG)

(Central university established by the central university Act 2009.No 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled "Institutional Attachment Report " submitted in partial fulfillment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by Ms.* ***Monika Kranti D/o Mr. Kranti Ashok Kumar*** *under my supervision and guidance.*

I wish Monika Kranti all the success in her academic endeavour. Place:

Bilaspur

Date- 16/09/22

Dr. Garima Tiwari

Supervisor

Assistant Professor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the project work entitled "Training report on "Institutional Attachment" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an academic work performed by me for the award of Master's degree in Forestry and Environment Science.

Monika

Monika Kranti

M.Sc. IV Semester

Roll. No.: 20412018

Enrolment No.: GGV/16/6235

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER -1

INTRODUCTION

INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

Regarding the institution



The I.F.P. is located on National Highway (N.H.) 24, Lalgutwa, Ranchi-Gumla road, not far from Kathalmore, Ranchi, (Jharkhand).

A leading forestry research centre serving eastern India, the Institute of Forest Products conducts forestry research. The institute was established in 1993 with the goal of organizing, directing, managing, and carrying out forest research and education in the eastern region of the nation, which includes the states of Bihar, Sikkim, Jharkhand, and West Bengal and encompasses approximately 46,581 sq. km. of forested area, or 17% of the nation's total geographic area. 1985, Awarded under FRI, DEHRADUN, Sixagro-ecological zones and six different types of forests make up the operational area

AREA OVERALL OF IFP

The Institute of Forest Productivity occupies 35 hectares in total.

The Institute's main goals are listed below:

1. to create and keep up with forestry and related science information.
2. to serve as a central repository for regionally specialized studies and broad information about forests and wildlife.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A TRAINING REPORT

ON

FOREST ATTACHMENT

Submitted for partial fulfilment of the requirement for the Degree of Master of Science in Forestry

(Session: 2021-22)

Under the supervision of:

Dr. Garima Tiwari

Assistant Professor
Department of Forestry, Wi[illegible]e

& Environmental Sciences

GGV, Bilaspur (C.G.)

Submitted By:

Monika Kranti

M.Sc. Forestry IV sem
Enroll. No. GGV/16/6235

Roll No. 20412018

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University Established Under Central University Act 2009, No.25 of 2009)

BILASPUR-495009, CHHATTISGARH

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (CG)

(Central university established by the central university Act 2009.No 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled Forest Attachment Report submitted in partial fulfillment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by Miss* ***Monika Kranti D/O Kranti Ashok Kumar*** *runder my supervision and guidance.*

I wish Monika Kranti all the ... ess in her academics.

Place: Bilaspur

Date: 16..../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
...ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
...ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Garima Tiwari

Supervisor

ASSISTANT PROFESSOR

Department of Forestry, Wildlife and

Environmental Science

Guru Ghasidas

Vishwavidyalaya, Bilaspur C.G.

DECLARATION

I hereby declare that the project work entitled "Training report on Forest Attachment" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru GhasidasVishwavidyalaya,Bilaspur is a record of an academic work performed by me for the award of Master's degree in Forestry and Environment Science.

Monika

Monika Kranti

M.Sc. IV Semester

Roll. No.: **20412018**

Enrollment No.: GGV/16/6235

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER - 1

FOREST ADMINISTRATION

The forest administration is the body responsible for implementation of forestpolicy and forestry issues in a particular country through rules, legislation andfinancial that means information and forest programs, the forest policy aims topromote the sustainable management and use of forest land resources.

State Forestry Department

The State Forestry Department is responsible for the administration and regulationof forest harvesting, forest revenue collection and development of the state forestresources. The Department also plans and coordinates the development of woodbased industries. The State Forestry Department is divided into Forest Operations and Forest Development Divisions and supported by District Forest Office. Development Divisions and supported by District Forest Offices.

Forest Development Division

Responsible for planning, implementing and monitoring of forest management anddevelopment activities, including biodiversity conservation, ecotourismdevelopment and forest rehabilitation as well as the preparation andimplementation of the State Forest Management Plan.

District Forest Office

Responsible for administration, controlling forest harvesting, forest revenuecollection and forest law enforcement. The office is also responsible forimplementing forest management and development activities including themanagement of forest eco-park and state forest park.

Forest administration management

Forest management is the process of planning and implementing practices for thestewardship and use of forests and other wooded land to meet specificenvironmental, economic, social and cultural objectives. It deals with the overalladministrative, economic, legal, social, technical and scientific aspects related tonatural and planted forests. It may involve varying degrees of deliberate humanintervention, ranging from actions aimed at safeguarding and maintaining forestecosystems and their functions, to those favoring specific socially or economicallyvaluable species or groups of species for the improved production of forest goodsand services.

A

TRAINING REPORT

ON

Computational Skills & QGIS

Submitted for partial fulfilment of the requirement for the Degree of Master of Science in Forestry

(Session: 2021-22)

Under the supervision of:
Dr. Garima Tiwari
(Assistant Professor)
Department of Forestry, Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:
Monika Kranti
M.Sc. Forestry IV sem
Enroll. No. GGV/16/6235
Roll No. 20412018

DEPARTMENT OF FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA
(Central university established by the central university Act 2009 No 25 of 2009)
BILASPUR 495001, CHHATTISGARH

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled ***"Computational Skills & QGIS"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Ms. Monika Kranti D/o Mr. Kranti Ashok Kumar*** *under my supervision and guidance.*

I wish Monika Kranti all the success on her academics.

Place: Bilaspur

Date: ..16.../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr.Garima Tiwari
Supervisor
Asst.Professor
Department of Forestry, Wildlife
& Environmental Science
Guru Ghasidas Vishwavidyalaya,
Bilaspur (C.G.)

DECLARATION

I hereby declare that the project work entitled "***Training report on Computational skills***" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an academic work performed by me for the award of Master's degree in Forestry and Environment Science.

Monika

Monika Kranti

M.Sc. IV Semester

Roll. No.: 20412018

Enrolment No.: GGV/16/6235

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT PROJECT

ON

"EDIBLE LEAFY VEGETABLES USED BY PEOPLE OF CHHATTISGARH."

SUBMITTED FOR PARTIAL FULFILLMENT FOR THE REQUIREMENT OF MASTERS OF SCIENCE IN FORESTRY

UNDER THE GUIDANCE OF

DR. GARIMA TIWARI

(ASSISTANT PROFESSOR)

SUBMITTED BY

MONIKA KRANTI

MSC FORESTRY

IV TH SEMESTER

Roll no 20412018

Department of forestry, wildlife and Environmental Sciences

Guru Ghasidas Vishwavidyalaya Koni, Bilaspur (CG)-495009.

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR (CG)

(Central university established by the central university Act 2009.No 25 of 2009)

CERTIFICATE

This is to certify that, Student Project on Nutritional Analysis of Edible Leafy Vegetables used by People of Chhattisgarh is carried out by **Monika Kranti, D/O MR. Kranti Ashok Kumar** the student of M.SC forestry 4th Semester of Department of Forestry, Wildlife and Environmental Science during the Session of 2019-2020 .

She has successfully completed her report entitled "**Student Project on Edible Leafy Vegetables used by People of Chhattisgarh** "during this Semeter under my guidance.

I wish her all the success in her Academics

Supervisor

Dr.Garima Tiwari
(Assistant Professor)
Department of Forestry
Wildlife and Environmental sciences

Date- 16/09/22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the training entitled " **Edible Leafy Vegetables used by People of Chhattisgarh**" submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me under the guidance of Dr. Garima Tiwari (Assistant Professor) Department of Forestry .

This training has been completed for the award of Master's Degree of Science in Forestry

Monika

Monika Kranti
MS.C Forestry 4th Semester
Roll no. 20412018
Enrollment No. GGV/16/6235

CONTENT

SNO.	NAME	BOTANICAL NAME
1	MUNGA BHAJI	MORINGA OLEIFERA
2	PALAK BHAJI	SPINACIA OLERACEA
3	LAL BHAJI	AMARANTHUS TRICOLOR
4	BOHAR BHAJI	CORDIA DICTOMA
5	POI BHAJI	BASELLA ALBA L.
6	CHAULAI BHAJI	AMARANTHUS VIRIDIS
7	BATHUA BHAJI	CHENOPODIUM ALBUM
8	KANDA BHAJI	IPOMOEA BATATES
9	KUMDA BHAJI	CUCURBITA MOSCHATA
10	CHANA BHAJI	CICER ARIETINUM
11	KHEDA BHAJI	AMARANTHUS DUBIUS MART.
12	METHI BHAJI	TRIGONILLA FOENUMGRAEUM
13	GOBHI BHAJI	BRASSICA OLERACEA BOTRYTIS L.
14	MOOLI BHAJI	RAPHANUS SATIVUS L.
15	SARSOO BHAJI	BRASSICA COMPESTRIS L
16	PYAJ BHAJI	ALLIUM CEPA L.
17	KOCHAI BHAJI	COLOCASIA ANTIQUARUM
18	CHAROTA BHAJI	CASSIA TORA
19	BARBATTI BHAJI	PHASEALUS VULGARIS
20	KARELA BHAJI	MOMORDICA CHARANTIA
21	KARMOTA BHAJI	IPOMOEA AQUATICA FROSK
22	CHUCHUNIA BHAJI	MARSILEA VESTITA
23	ROPA BHAJI	AMARANTHUS HYBRIDUS L
24	PIPAL BHAJI	FICUS RELIGIOSA
25	TIWARA BHAJI	LATHYRUS SATIVUS L.
26	KENNA BHAJI	COMMELINA BENGHALENSIS
27	GOL BHAJI	PARTULACA OLERACEA L.
28	CHECH BHAJI	CHORCHORUS OLITORIUS
29	PATHARI BHAJI	BOERHAAVIA DIFFUSA L.
30	TINPANIA BHAJI	OXALIS CORNICULATA.
31	KUSUM BHAJI	CARTHAMUS OXYACANTHA
32	KOILARI BHAJI	BAUHINIA PURPUREA L
33	IMLI BHAJI	TAMARINDUS INDICA
34	AMARI BHAJI	HIBISCUS SABDARIFFA L
35	GUMEE BHAJI	LEUCAS CEPHALOTES
36	SILIYARI BHAJI	CELOSIA ARGENTEA L

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

ABSTRACT

The nation of Chhattisgarh has a rich culinary heritage and is referred to as the "rice bowl of India." Steamed rice and a variety of leaves are the major parts in most traditional and tribal dishes. These traditional leaves, which are abundant in bioactive chemicals, can serve as a source of natural remedies for a variety of human illnesses. The region that we know as Chhattisgarh is home to a vast range of unexpected, native green vegetables that are fighting to become important crops in the next years.

The current paper provides a summary of the health advantages and Traditional medicinal properties/uses of some leafy vegetables that are grown in different parts of the state.

A REPORT
ON
COMPUTER TRAINING PROGRAM ON QGIS

(SESSION: 2020-22)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY& ENVIRONMENTAL SCIENCE

SUBMITTED TO

Dr. Gunjan Patil
(Assistant Professor)
Dept. of Forestry, Wildlife & Environment sciences

SUBMITTED BY

Nidhi
M.Sc. Forestry & Environmental science
4th Semester
Roll no.- 20412020
Enroll. no. -GGV/20/06707

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIORNMENTAL SCIENCES

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G)
(A Central University)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the A report entitled "Computer Training Program on QGIS" submitted in partial fulfilment of the requirement for the Degree of ***Master of Science in Forestry and Environmental Science in Department of Forestry, Wildlife &Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss. Nidhi D/O Mr. Munindra Prasad Thakur*** *under my supervision and guidance.*

I wish Nidhi all the success in her academics.

Place: Bilaspur
Date: 14/09/2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Supervisor

Dr. Gunjan Patil
Assistant Professor
Department of Forestry, wildlife & Environmental Sciences

DECLARATION

I hereby declare that the field training entitled "Computer Training Program on QGIS" submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with ***Teacher of Guru Ghasidas Vishwavidyalaya*** *and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

Nidhi

DATE: 16.09.22
PLACE: Bilaspur

Nidhi
M.Sc. Forestry & Environmental Science
4th semester
Roll No: - 20412020
Enroll No.GGV/20/06707

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT PROJECT

ON

MUNICIPAL SOLID WASTE MANAGEMENT IN BILASPUR CITY (CG)

(SESSION 2020-2022)

SUBMITTED TO
Dr. GUNJAN PATIL
ASSISTANT PROFESSOR
DEPARTMENT OF FORESTRY,
WILDLIFE & ENVIRONMENTAL
SCIENCES

SUBMITTED BY
NIDHI
M.Sc. FORESTRY AND
ENVIRONMENTAL
SCIENCE
4TH SEMESTER
(FOREST MANAGEMENT)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA

A CENTERAL UNIVERSITY

Guru Ghasidas Vishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the student report entitled Municipal solid waste management submitted in partial fulfillment of the requirement for the Degree of ***Master of Science in Forestry and Environmental Science in Department of Forestry, Wildlife &Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss Nidhi D/O Mr. Munindra Prasad Thakur*** *under my supervision and guidance.*

I wish Nidhi all the success in her academics.

Place: Bilaspur
Date: 14/09/2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Supervisor

Dr. GUNJAN PATIL
Assistant Professor
Department of Forestry, wildlife & Environmental Sciences

DECLARATION

I hereby declare that the student project work entitled "*Student project report on Municipal solid waste management in Bilaspur (CG)*" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of *Dr. Gunjan Patil (Assistant Professor)* and this project work has been performed for the award of master of Science in Forestry.

Nidhi

Miss. NIDHI

MSc. Forestry 4th Semester

Roll No. 20412020

Enrolment No. GGV/20/06707

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER 1

INTRODUCTION

Human ceases to generate waste only when he or she is in a state to be disposed of a waste (Adygame, 2009). One of the inescapable facts of human survival is that the generation of waste. The process of nourishing the swiftly growing needs of the habitat, massive consumption and drainage of natural resources has resulted in the production of big amounts of waste (Aggarwal *et al.*, 2005). Municipal solid waste (MSW) may be a growing problem within the urban areas round the world that's increasing faster than the speed of urbanization. In 2002, 2.9 billion urban residents generated 0.64 kilograms (kg) of waste per capita per day, which increased to 3.45% and a whopping 87.5% while in 2012, 3 billion urban residents generated 1.2 kg of waste per capita per day. By 2025, it is projected that 4.3 billion urban residents will generate 1.42 kg of waste per capita per day.

India is the world's second highest populated country with a population exceeding a billion and one in every of the fastest urbanizing countries, due to land of physical, climatic, geographic, ecological, social, cultural and linguistic diversity. India currently is facing a municipal solid waste dilemma, that all elements of the society are responsible. The community sensitization and public awareness are low. There's no system of segregation of organic, inorganic and recyclable wastes at the household level.

Today over 45 million tonnes/year of solid waste is generated from the urban centres of India which is collected inefficiently, transported inadequately and disposed of unscientifically. Solid waste generation is predicted to lift 125 million tonnes/year by the year 2025. According to the Ministry of Urban Affairs, Govt. of India estimate, India is generating approximately 100,000 metric loads of solid waste on a daily basis of which 90% are dumped within the open place (Barjinder Bhalla *et al.* 2013).

A rapid increase in population and alteration in lifestyle has resulted in a drastic increase in Municipal Solid Waste (MSW). It includes both domestic waste and commercial waste which account for a comparatively small part of the entire solid waste stream in developed countries. Accumulation of an outsized amount of waste may create several problems for inhabiting populations (Gautam *et al.* 2010).

Now a day "Solid waste" term is used because the non-liquid waste matter also arises from domestic, commercial, industrial, agriculture, mining & public services activities (Tchobanoglous *et al.*, 2002). Solid waste comprises of various materials like papers, glasses,

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT

ON

INSTITUTIONAL TRAINING



SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

(SESSION: 2020-22)

SUBMITTED TO

Dr. Gunjan Patil

(Assistant Professor)

Department of Forestry, Wildlife & Environmental Sciences

SUBMITTED BY

Nidhi

M.Sc. Forestry & Environmental Science

4th Semester

Roll no.- 20412020

Enrolment no- GGV/20/06707

Department of Forestry, Wildlife &Environmental Sciences

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

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CERTIFICATE

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I wish Nidhi all the success in her academics.

Dr. Gunjan Patil

Assistant Professor

Department of Forestry and Environmental Science

Place: Bilaspur

Date: 14/09/2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the field training entitled, ***Institutional training program*** *submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with* ***IFP Ranchi*** *and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

Nidhi

DATE:- 16.09.22
PLACE:- Ranchi, Jharkhand

Nidhi
M.Sc. Forestry and Environmental Science 4th Semester
Roll no:- 20412020
Enroll no. GGV/20/06707

INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss NIDHI ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

रेशम अनुसंधान विकास एवं प्रशिक्षण

बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. निधी पिता श्री मुनीन्द्र कुमार ठाकुर छात्र/छात्रा, एम.एस.सी/पी. एच.डी. वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर को कोनी में **मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता** विषय पर, प्रशिक्षण सत्र 2022– 2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर

दिनांकः- 04.07.2022

श्रीराम मीणा

संयुक्त संचालक रेशम

अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

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S/No.	Title	Trainer
1.	Introduction about Institution I.F.P, RANCHI	Dr. Yogeshwar Mishra (GCR & Head, Silviculture division)
2.	Identification, Propagation& management of Bamboo species	Shri Ravi Shankar (CTO, Silvculture Dvision)
3.	Role of Molecular Marker in Diversity studies of forest tree Spices	Shri Ayushman Malakar (Ph.D. Scholar, JRF)
4.	Principles of plant Tissue Culture	Dr. Animesh Sinha (Scientist- E, Head, Genetics)
5.	Lac Cultivation and its role for livelihood support	Shri S.N.Vidya (CTO) & Shri B.D. Pandit (T.O)
6.	Identification of Medicinal Plants and its Uses.	Shri Ravi Shankar (CTO, Silvculture Dvision)
7.	Classical Biological control of insect pest & Visit to Insectory	Mr. Subhash Chandra (Sci-D, Forest protection, Silviculture & forest mgnt.)
8.	Carbon Sequestration in Soil & Terrestrial Vegetation	Dr. S.N.Mishra (CTO Ecology & Rehabilitation Division)
9.	Concept about Mycorrhizae	
10.	Identifcation of Honey Bee (Apiculture)	Shri B.D. Pandit (T.O)
11.	Application of GIS & Remote sensing in Forestry Sector	Dr. Sharad Tiwari (Scientist - G, info. & Technology)
12.	Visit to Mandar, Ranchi field	Shri B.D. Pandit (T.O)
13.	Training on Sericulture	
14.	Conclusion	-
15.	References	

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER-01

DAY-01 (18.04.2022)

INTRODUCTON :- INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

I.F.P is situated on National highway (N.H.-24), Lalgutwa, Ranchi- Gumla road, near kathal more Ranchi.

The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern India. The institute came into existence in year 1993 with the objective to formulate, organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agro-ecological zones and 6 main forest types.



Plate-01 IFP RANCHI

TOTAL AREA OF I.F.P

The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:-

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To undertake research and demonstration of agro-forestry models .
- To establish model nursery, germ plasm bank and identify suitable seed production areas for improving forest productivity.
- To steer, undertake and coordinate research, development and extension in forestry sector in the states of Bihar, Jharkhand, Sikkim and West Bengal.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT
ON

FIELD TRAINING (ATTACHMENT WITH STATE FOREST DEPARTMENT)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

(Session: 2020-22)

SUBMITTED TO

Dr. Gunjan Patil

Assistant Professor
Department of Forestry, Wildlife & Environmental Sciences

SUBMITTED BY

Nidhi

M.Sc. Forestry & Environmental Science
4th semester
Roll no. – 20412020
Enrolment no. – GGV/20/06707

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that A report on entitled "Forest Attachment" submitted in Partial fulfilment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)*** *is the work carried out by Miss. Nidhi D/O Mr. Munindra Prasad Thakur under my supervision and guidance.*

I wish Nidhi all the success in her academics.

Place-Bilaspur

Date- 14/09/2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Gunjan Patil

Assistant Professor

Department of Forestry,

Wildlife & Environmental Sciences

GGV, Bilaspur (C.G)

DECLARATION

*I hereby declare that the project work entitled "**Training report on Field Training (Attachment with State Forest Department)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Gunjan Patil (Assistant Professor)** and this project work has been performed for the award of Master's degree in Forestry.*

Nidhi

Nidhi

M.Sc. Forestry & Environmental science

4th Semester

Roll no.-20412020

Enroll.no. -GGV/20/06707

Date-

Place-

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3.	Seed Production area: Teak
4.	Establishment and management of coupes: Selection Cum Improvement Fellings
5.	Tendu Collection and its Marketing
6.	Wood Depot
7.	Vanausadhi Processing Centre Donganala
8.	Soil and Water Conservation in Slopy Forest Area
9.	Reforestation in Gevra Coal Mines
10.	Conclusion
11.	References

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER-1

This chapter describes about the Forest department of Bilaspur district its administarion divsion setup, types of Forest and aims and objective of forest administration.

FOREST DEPARTMENT

INTRODUCTION

The forest department in any state works to conserve, protect, and manage the forest in sustainable manner. The whole Chhattisgarh Forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest divisions and for every division 10 years working plan is made

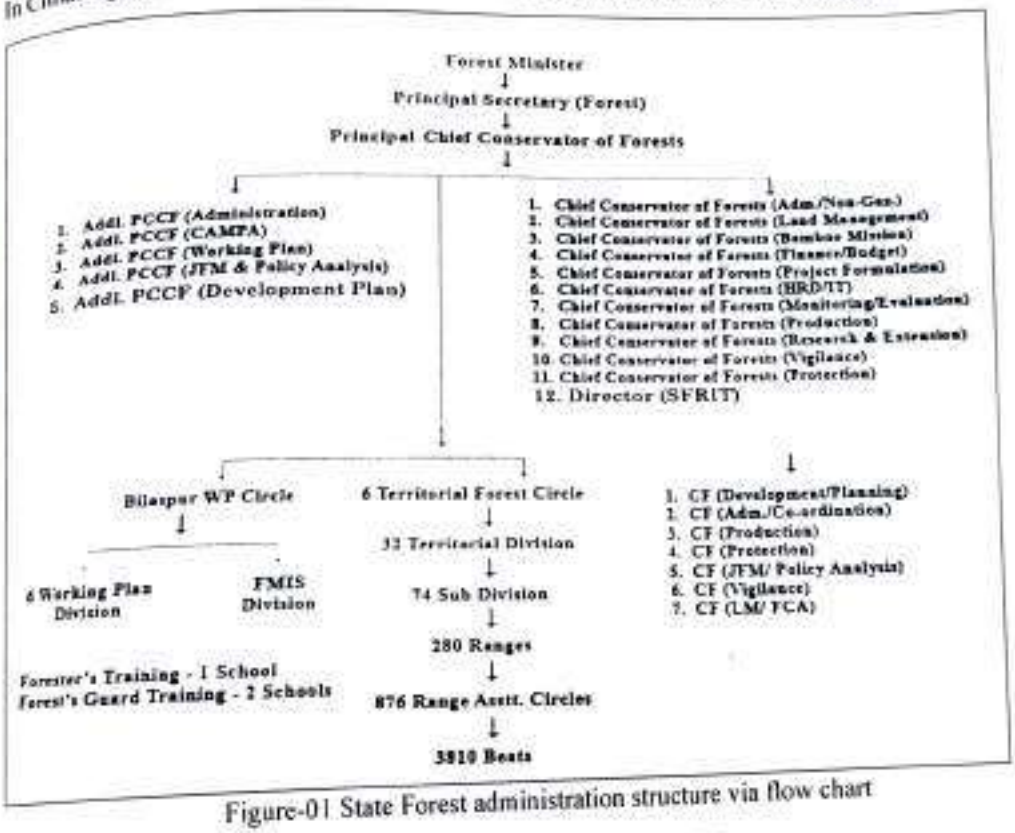


Figure-01 State Forest administration structure via flow chart

ATTACHMENT WITH BILASPUR FOREST DEPARTMENT

As a student of M.Sc. Forestry IV semester, it is very essential to be aware of building up of all action plans of State Forest Department and their implementation on natural forest. To fulfil the practical knowledge, the Department of Forestry, GGV has organized a training program for one month

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT PROJECT REPORT

(SESSION- 2021-22)

SUBMITTED FOR FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCES

UNDER THE SUPERVISION OF

Dr. Gunjan Patil
Assistant Professor

Department of Forestry, Wildlife & Environmental Sciences

SUBMITTED BY

Nisha Gaherwar
MSc. Forestry & Env. Sci.
IV Semester
Roll No.- 20412021
Enrolment No.- GGV/16/6242

Department of Forestry, Wildlife & Environmental Sciences
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

*This is to certify that the student report entitled "**Analysis of Ambient Air Quality using AQI- A case study of Bilaspur, (C.G.)** submitted in partial fulfilment of the requirement for the Degree of **Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is the work carried out by **Miss Nisha Gaherw** **Mr. Chandrakant Gaherwar** under my supervision and guidance.*

I wish Nisha Gaherwar all the success in her academics.

Place: Bilaspur

Date: 14/09/2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Gunjan Patil

Supervisor
Assistant professor
Department of Forestry, Wildlife and Environmental Sciences,
Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)

DECLARATION

I hereby declare that the student project work entitled ***"Student Project Report"*** *submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of* ***Dr. Gunjan Patil*** *and this project work has been performed for the award of Master's degree in Forestry, and Environmental Sciences.*

Date: 16/09/2022

Place: Bilaspur

Nisha Gaherwar
MSc. Forestry & Env. Sci.
IV semester
Roll No: 20412021
Enrolment No.- GGV/16/6242

"ANALYSIS OF AMBIENT AIR QUALITY USING AQI- A CASE STUDY OF BILASPUR, (C.G.)"

1 Introduction:

A healthy town is a city designed with the attention of an environmental area inhabited by using people who are dedicated to the minimization of waste output and pollutants, amongst other matters. The gaseous blanket above the earth floor presents the fundamental factors for survival of all lives on earth, inclusive of nitrogen, oxygen, and carbon dioxide, in conjunction with various gaseous substances together with inert gases helium, neon, and argon, and so on. However, due to diverse herbal (e.g., wooded area fires, volcano eruptions, wind) and anthropogenic (e.g., Industrial interest, transportation, deforestation) activities, many additives along with SPM, (pollen grains, aerosols, bacteria, viruses, and diverse tiny debris suspended inside the ecosystem), NO_2 (nitrogen oxides), SO_2 (sulphur oxides), carbon monoxide (CO; because of incomplete combustion of fuels) get launched to the surroundings. In due path of time, if no prevention measure is taken it'd attain a dangerous stage. Air pollution-associated problems have led to an elevated public awareness of the air first-class in both developing and evolved nations. The excessive concentration of the pollution can be existence threatening, causing breathing difficulties or different problems consisting of headaches and dizziness. The maximum permissible restriction in line with india's significant pollution manipulate board (CPCB) is given in **Table1.**

Table1. *Permissible Limit for Air Quality Parameters*

Parameter			USEPA		INDIAN	
			24 h	*Annual*	*24h*	*Annual*
SO_2	-		366µg/m^3	80µg/m^3	80µg/m^3	60µg/m^3
NO_2	-		80µg/m^3	80µg/m^3	80µg/m^3	60µg/m^3
SPM		$PM_{2.5}$	35µg/m^3	12µg/m^3	100µg/m^3	60µg/m^3
		PM_{10}	10µg/m^3	150µg/m^3	50µg/m^3	75µg/m^3

Source. Data from http://www3.epa.gov/ttn/naaqs/criteria.html; http://cpcb.nic.in/National_Ambient_Air_Quality_Standards.php

Air quality index (AQI) is a vital issue for the final public to simply perceive however unhealthy or smart the air quality is for his or her health and to help in information interpretation for decision-making processes associated with pollution mitigation measures and air quality management. Basically, the AQI is outlined as associate degree index or rating scale for reporting daily combined impact of close air pollutants recorded within the watching sites. Also, it helps to trace

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

FIELD TRAINING REPORT

(SESSION: 2021-22)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE BACHELOR OF SCIENCE IN FORESTRY

SUBMITTED TO

Dr. Gunjan Patil

Assistant Professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

Nisha Gaherwar

M.Sc. Forestry & Env. Sci.
IV semester
Roll no. – 20412021
Enrolment no. – GGV/16/6242

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Estabilished Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

*This is to certify that the student report entitled "**Field Training Report**" submitted in partial fulfilment of the requirements for **the Degree of Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is the work carried out by **Miss Nisha Gaherwar** d/o **Mr Chandrakant Gaherwar** under my supervision and guidance. I wish Nisha Gaherwar all the success in her academics.*

Place: Bilaspur

Date: 14../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Gunjan Patil

Assistant Professor

Department of Forestry,

Wildlife & Environmental Sciences

GGV, Bilaspur (C.G)

DECLARATION

*I hereby declare that the project work entitled "**Training report on Field Training (Attachment with State Forest Department)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Gunjan Patil, Assistant Professor** and this project work has been performed for the award of Master's degree in Forestry and Environmental Sciences.*

Gaherwar

Nisha Gaherwar

MSc. Forestry & Env. Sci. IV semester

Roll no. – 20412021

Enrolment no. – GGV/16/6242

Date: - 16/09/2022

Place: - Bilaspur

Forest Department

Certificate

Certified that Mr./Miss./Mrs NI[illegible] GAHERWAR Student of M.Sc. Forestry & Environmental science, Department of Forestry, Wildlife & Environmental sciences, Guru Ghasidas University Bilaspur Chhattisgarh has Successfully Completed the Forest Attachment & Field Training Programme Organised By Forest Department Katghora Division(Pali), Bilaspur Forest Circle Chhattisgarh From 05/05/2022 to 15/05/2022. The Forest Department wishes Bright Future of His/Her For Future endeavour in academic advancement.

Mr. Anand Tikariya
ACF, Pali
Training Nodal Officer

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REFRENCE ..... **Error! Bookmark not defined.**

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER-1

CHHATTISGARH FOREST DEPARTMENT

INTRODUCTION

The forest department in any state works to conserve, protect, and manage the forest in sustainable manner. The whole Chhattisgarh Forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest divisions and for every division 10 years working plan is made

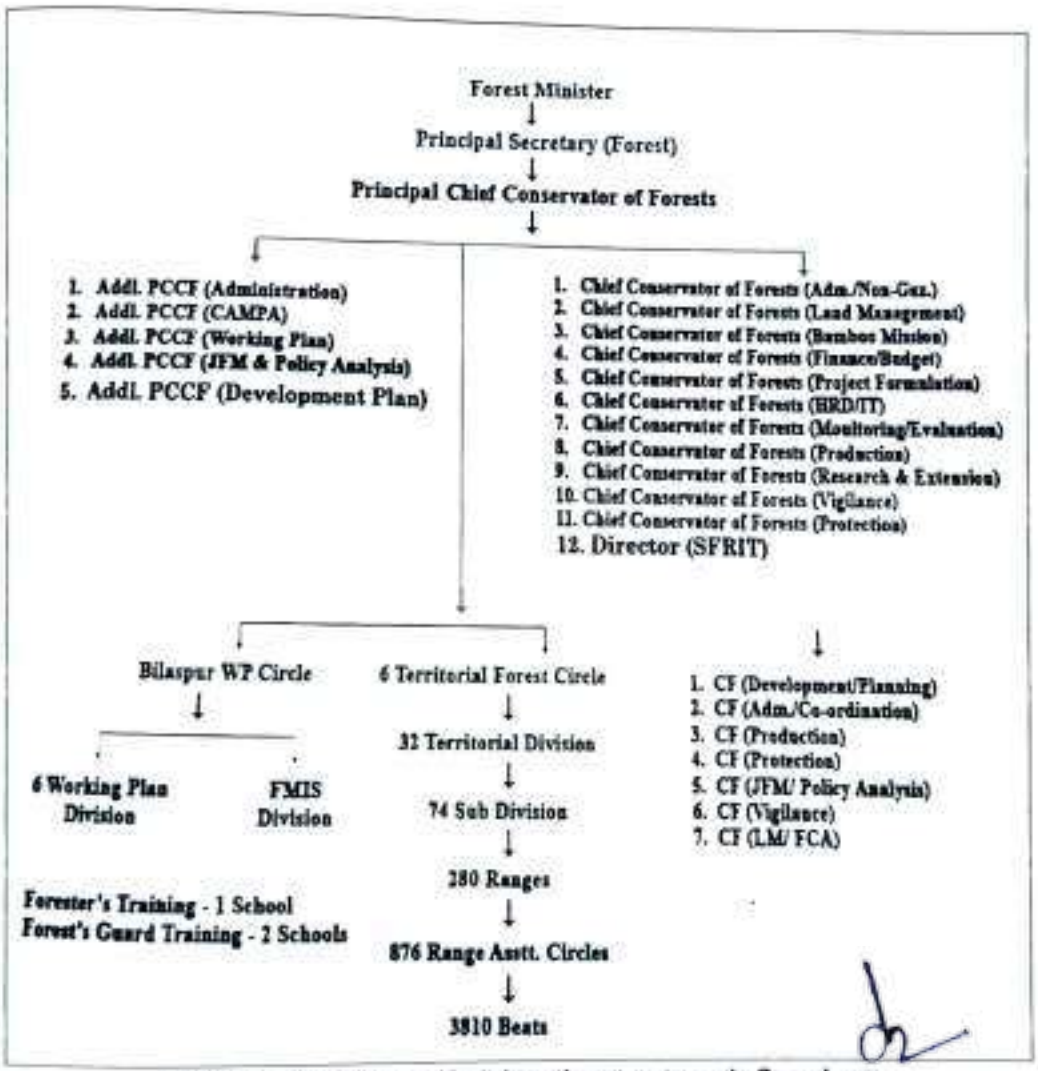


Figure 1- State Forest administration structure via flow chart

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

INDUSTRIAL TRAINING REPORT

(SESSION- 2021-22)

SUBMITTED FOR FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCES

UNDER THE SUPERVISION OF

Dr. Gunjan Patil
Assistant Professor
Department of Forestry, Wildlife & Environmental Sciences

SUBMITTED BY

Nisha Gaherwar
MSc. Forestry environmental sciences
IV Semester
Roll No.- 20412021
Enrolment no.- GGV/16/6242

Department of Forestry, Wildlife & Environmental Sciences
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

*This is to certify that the student report entitled "**Industrial Training Report**" submitted in partial fulfilment of the requirement for the Degree of **Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is the work carried out by **Miss Nisha Gaherwar d/o Mr. Chandrakant Gaherwar** under my supervision and guidance.*

I wish Nisha Gaherwar all the success in her academics.

Place: Bilaspur

Date: 17/09/2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Gunjan Patil
Supervisor
Assistant professor
Department of Forestry, Wildlife and Environmental Sciences,
Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)

DECLARATION

I hereby declare that the student project work entitled ***"Industrial Training Report"*** *submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of* ***Dr. Gunjan Patil*** *and this project work has been performed for the award of Master's degree in Forestry and Environmental Sciences.*

Nisha Gaherwar

M.Sc. Forestry &
Environmental Sciences IV semester
Roll No. 2041/2021
Enrolment No. GGV/16/6242

DATE: 16/09/2022
PLACE: Bilaspur

INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **NISHA GAHERWAR** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research cum Training Coordinator)

(Dr. Nitin Kulkarni)
Director

रेशम अनुसंधान विकास एवं प्रशिक्षण

बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. निशा गहेरवार पिता श्री चंद्रकांत छात्र/छात्रा, एम.एस.सी/पी.एच. डी. वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर को कोनी में मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता विषय पर, प्रशिक्षण सत्र 2022– 2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर
दिनांक:- 04.07.2022

श्रीराम मीणा
संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

LECTURE DAY 1

BY- Dr. Yogeshwar Mishra (GCR and HOD), Shri Ravi Shankar (CTO).

INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)



Figure 1- Research building of IFP Ranchi

Institute of Forest Productivity is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), catering to the forestry research needs in the states of Bihar, Jharkhand, and West Bengal. Since coming into existence in 1993, the institute has taken up several initiatives in the field of forestry and allied sciences through research projects and extension programs, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry-based institutes. The institute has established itself as a major player for providing forestry-oriented solutions to different category of users in the region. The institute has specially established its technical expertise in Lac cultivation and over the years number of tribal farmers has been immensely benefited by the various extension activities run by the institute for the socio-economic upliftment of the tribal.

The Institute has well established soil testing lab, molecular biology lab, tree physiology and tissue culture lab, chemistry of forest produce lab and forest entomology lab. All these labs are well maintained and equipped with modern sophisticated equipment's.

In the past Institute has developed a botanical garden "Aus Upvan"- Regional Medicinal Garden for Chhota Nagpur and a Bambusetum with species. Ministry of Environment and Forests, New Delhi has recognized Institutes botanical garden as a Lead Garden in Jharkhand. The total area of institute of forest productivity is 35 hectares.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT

ON

STUDENT PROJECT

Session – 2021-2022

SUBMITTED FOR PARTIAL FULFILLMENT FOR THE REQUIREMENT

OF MASTER DEGREE OF SCIENCE IN FORESTRY (2 Years)

GURU GHASIDASVISHWAVIDYALAYA, BILASPUR

UNDER SUPERVISION OF

Dr. Gunjan Patil
Assistant Professor Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

SUBMITTED BY

NISHTHA AWASTHI
Roll no. – 20412022
M.Sc. forestry
IV semester

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the student report entitled ***"Student Project"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss Nishtha Awasthi D/o Mr. N. K. Awasthi*** *under my supervision and guidance.*

I wish Nishtha Awasthi all the success in her academics.

Place: Bilaspur
Date: ..14./Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

14/09/2022

Dr. Gunjan Patil

Supervisor
Assistant Professor
Department of Forestry Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G

DECLARATION

I hereby declare that the project work entitled **"Student Project"** submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Faculty Members of Forest Department, Bilaspur and the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) and this project work has been formed for the award of Master of Science Degree in Forestry and Environmental Science.

NISHTHA AWASTHI

M.Sc. Forestry IV Semester
Roll No. – 20412022
Enrollment No. - GGV/16/6243

Date: 16-09-2022
Place: Bilaspur

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. INTRODUCTION

- The term "**medicinal plant**" include various types of plants used in herbalism ("herbology" or "herbal medicine"). It is the use of plants for medicinal purposes, and the study of such uses.
- Plant is an important source of medicine and plays a key role in world health . Medicinal herbs or plants have been known to be an important potential source of therapeutics or curative aids.
- The use of medicinal plants has attained a commanding role in health system all over the world. This involves the use of medicinal plants not only for the treatment of diseases but also as potential material for maintaining good health and conditions.
- Many countries in the world, that is, two-third of the world's population depends on herbal medicine for primary health care. The reasons for this is because of their better cultural acceptability, better compatibility and adaptability with the human body and pose lesser side effects. From records, most of the used drugs contain plant extracts.
- Some contain active ingredients (bioactive components or substances) obtained from plants. Through recent researches, plant-derived drugs were discovered from the study of curative, therapeutic, traditional cures and most especially the folk knowledge of indigenous people and some of these claims and believe of people are irreplaceable despite the recent advancement in science and technology.
- Some of the drugs believed to be obtained from plants are aspirin, atropine, artimesinin, colchicine, digoxin, ephedrine, morphine, physostigmine, pilocarpine, quinine, quinidine, reserpine, taxol, tubocurarine, vincristine and vinblastine.
- The word "**herb**" has been derived from the Latin word, *"herba"* and an old French word *"herbe"*. Now a days, herb refers to any part of the plant like fruit, seed, stem, bark, flower, leaf, stigma or a root, as well as a non-woody plant. Earlier, the term "herb" was only applied to non-woody plants, including those that come from trees and shrubs. These medicinal plants are also used as food, flavonoid, medicine or perfume and also in certain spiritual activities.
- Among ancient civilizations, India has been known to be rich repository of medicinal plants. The forest in India is the principal repository of large number of medicinal and aromatic plants, which are largely collected as raw materials for manufacture of drugs and perfumery products. About 8,000 herbal remedies have been codified in AYUSH systems in INDIA. Ayurveda, Unani, Siddha and Folk (tribal) medicines are the major systems of indigenous medicines. Among these systems, Ayurveda and Unani Medicine are most developed and widely practiced in India.
- Recently, WHO (World Health Organization) estimated that 80 percent of people worldwide rely on herbal medicines for some aspect of their primary health care needs. According to WHO, around

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A PROJECT

ON

INDUSTRIAL TRAINING

Session – 2021-2022

SUBMITTED FOR PARTIAL FULFILLMENT FOR THE REQUIREMENT

OF MASTER DEGREE OF SCIENCE IN FORESTRY (2 Years)

GURU GHASIDASVISHWAVIDYALAYA, BILASPUR

UNDER SUPERVISION OF

Dr. Gunjan Patil
Assistant Professor Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

SUBMITTED BY

NISHTHA AWASTHI
Roll no. – 20412022
M.Sc. forestry
IV semester

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the student report entitled ***"Industrial Training"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss Nishtha Awasthi D/o Mr. N. K. Awasthi*** *under my supervision and guidance.*

I wish Nishtha Awasthi all the success in her academics.

Place: Bilaspur
Date: ..14../Sept./2022.

14/09/2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Gunjan Patil

Supervisor
Assistant Professor
Department of Forestry Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G

DECLARATION

I hereby declare that the project work entitled "**Industrial Training**" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Faculty Members of Forest Department, Bilaspur and the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) and this project work has been formed for the award of Master of Science Degree in Forestry and Environmental Science.

Date: 16-09-2022
Place: Bilaspur

NISHTHA AWASTHI

M.Sc. Forestry IV Semester
Roll No. – 20412022
Enrollment No. - GGV/16/6243

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. INTRODUCTION

1.1.INSTITUTE OF FOREST PRODUCTIVITY

- **Institute of Forest Productivity** is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), catering to the forestry research needs in the states of Bihar, Jharkhand and West Bengal.
- It got Established in 1993.
- **Total area of I.F.P**
- The total area of institute of forest productivity is 35 hectares.
- Its parent institution is ICFRE.
- Since coming into existence in 1993, the institute has taken up a number of initiatives in the field of forestry and allied sciences through research projects and extension programs, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry-based institutes.
- Dr. Nitin Kulkarni, Scientist - G (Forest Entomology) is Director of the institute.
- It is located at NH 23, Lalgutwa, Ranchi, Jharkhand, India.
- Its campus is urban Institute acronym is IFP
- It provides research support to the problems of forest management in North East India. Theinstitute has not only steadily advanced in terms of infrastructure but also specialized itself as a major nucleus for research on forestry and ecology related problems of tropical forests of the central region comprising of the states of Bihar, Jharkhand, West Bengal.
- The institute has established itself as a major player for providing forestry-oriented solutions to different category of users in the region. The institute has specially established its technical expertise in Lac cultivation and over the years number of tribal farmers have been immensely benefited by the various extension activities run by the institute for the socio-economic upliftment of the tribal.
- The Institute has well established soil testing lab, molecular biology lab, tree physiology and tissue culture lab, chemistry of forest produce lab and forest entomology lab. All these labs are well maintained and equipped with modern sophisticated equipment.
- Its Official website is ifp.icfre.gov.in

1.2.OBJECTIVES OF IFP

- To undertake and promote forestry research, education and extension, leading to scientific and sustainable management of forest resources.
- To provide scientific advice to the central and state governments aiding informed decision making in matters of national and regional importance and international commitments and to address forestry research needs.
- To provide technical assistance and material support to states, forest dependent communities, forest based industries, tree & NTFP growers and other stakeholders in their forestry based programmes for conservation and sustainable use of forest resources.
- To undertake research in silviculture and forest management for development of natural and artificial regeneration practices, including nursery & plantation techniques.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT

ON

FOREST ATTACHMENT



Session – 2021-2022

SUBMITTED FOR PARTIAL FULFILLMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY (2 Years)

GURU GHASIDASVISHWAVIDYALAYA, BILASPUR

UNDER SUPERVISION OF

Dr. Gunjan Patil
Assistant Professor Department of Forestry, Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

SUBMITTED BY

NISHTHA AWASTHI
Roll no. – 20412022
M.Sc. forestry
IV semester

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the student report entitled ***"Forest Attachment"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss Nishtha Awasthi D/o Mr. N. K. Awasthi*** *under my supervision and guidance.*

I wish Nishtha Awasthi all the success in her academics.

Place: Bilaspur
Date: .14./Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Gunjan Patil

Supervisor
Assistant Professor
Department of Forestry Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G

DECLARATION

I hereby declare that the project work entitled "**Forest Attachment**" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Faculty Members of Forest Department, Bilaspur and the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) and this project work has been formed for the award of Master of Science Degree in Forestry and Environmental Science.

NISHTHA AWASTHI

M.Sc. Forestry IV Semester
Roll No. – 20412022
Enrollment No. - GGV/16/6243

Date: 16-09-2022
Place: Bilaspur

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. INTRODUCTION TO INDIAN FOREST

- Forests are the green lungs of the nation and provide various ecological services like clean air, water, maintenance of soil-moisture regime by checking soil erosion etc. Forests maintain environment stability and ecological balance. Natural forests with the vast variety of flora and fauna are hub of biodiversity. India is endowed with rich forest types like Tropical Wet Evergreen Forests, Tropical Moist Deciduous Forests, Tropical Dry Deciduous, Sub Tropical Dry Evergreen Forests, Himalayan Moist Temperate Forests, Sub-Alpine and Alpine Scrub Forests etc.

- National Forest Policy of India, 1988 envisages a goal of achieving 33% of geographical area of the country under forest and tree cover.

- The 'India State of Forest Report (ISFR)' for the year 2021 was released recently by the Forest Survey of India (FSI). The total forest cover & tree cover in India is about 24.62% of the geographical area, much less than the 33% target set to be achieved by 2022. Between 2011 & 2021, the total forest cover increased by about 21,762 sq. km, roughly the size of the state of Mizoram.

- In 2021, the total forest and tree cover in India is 80.9 million hectares, which is 24.62% of the geographical area of the country according to forest survey report. The tree cover is 2.91% 0f the geographical area of the country.

- The total mangrove cover in India is 4,992 sq km (included in total forest cover)

1.1 FORESTS IN CHHATTISGARH

As Chhattisgarh is rich in forest biodiversity so it is important to have a management body which implements and carries out various management programs.

According to Forest Survey of India [FSI], recorded forest area in the Chhattisgarh is 59,772 sq. Kilometres [44.21% of the geographical area] of which: -

- Reserved Forest – 25786 sq km [43.13%]
- Protected Forest – 24,034 sq km [40.21%]
- Unclassed Forest – 9,952 sqkm [16.65%]

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A PROJECT

ON

COMPUTATIONAL SKILL



Session – 2021-2022

SUBMITTED FOR PARTIAL FULFILLMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY (2 Years)

GURU GHASIDASVISHWAVIDYALAYA, BILASPUR

UNDER SUPERVISION OF

Dr. Gunjan Patil
Assistant Professor Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

SUBMITTED BY

Nishtha Awasthi
Roll no. – 20412022
M.Sc. forestry
IV semester

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the student report entitled ***"Computational Skill"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss Nishtha Awasthi D/o Mr. N. K. Awasthi*** *under my supervision and guidance.*

I wish Nishtha Awasthi all the success in her academics.

Place: Bilaspur
Date: 14../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

14/09/2022

Dr. Gunjan Patil

Supervisor
Assistant Professor
Department of Forestry Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G

DECLARATION

I hereby declare that the project work entitled "**Computational Skill**" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Faculty Members of Forest Department, Bilaspur and the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) and this project work has been formed for the award of Master of Science Degree in Forestry and Environmental Science.

Date: 16-09-2022
Place: Bilaspur

NISHTHA AWASTHI

M.Sc. Forestry IV Semester
Roll No. – 20412022
Enrollment No. - GGV/16/6243

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. COMPUTER FUNDAMENTALS

1.1. INTRODUCTION

- A **computer** is a programmable device that can store, retrieve, and process data.
- A computer is a machine that can be programmed to carry out sequences of arithmeticor logical operations automatically.
- Modern computers can perform generic sets of operations known as programs. These programs enable computers to perform a wide range of tasks.
- Today's computers are electronic devices that accept data (input), process that data, produce output, and store (storage) the results.

1.2. HISTORY OF THE COMPUTER

- The **first digital computer** and what most people think of as a computer was calledthe ENIAC. It was built during World War II (1943-1946) and was designed to helpautomate the calculations being done by human computers. By doing these calculations on a computer, they could achieve results much faster and with fewer errors.
- Early computers like the ENIAC used vacuum tubes and were large (sometimes roomsize) and only found in businesses, Universities, or governments.
- Later, computers began utilizing transistors as well as smaller and cheaper parts thatallowed the ordinary person to own a computer.

1.3. CLASSIFICATION OF COMPUTER

Computers differ based on their data processing abilities. They are classified according to purpose, data handling and functionality.

- **According to purpose, computers are either general purpose or specificpurpose**
- **General purpose computers are designed to perform a range of tasks.They have the ability to store numerous programs, but lack in speed and efficiency.**
- **Specific purpose computers are designed to handle a specific problem orto perform a specific task. A set of instructions is built into the machine.**

1.4. According to functionality, types of computers are classified as:

1.4.1. Analogue Computer

An analogue computer is a form of computer that uses continuous physical phenomena such as electrical, mechanical, or hydraulic quantities to model the problem being solved.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A

REPORT

ON

"INSTITUTIONAL TRANING"

Submitted for partial fulfillment of requirement of Masters of Science In

"forestry and Environmental Sciences".

(SESSION: 2021-22)

Under the supervision of:

DR. BHAVANA DIXIT

(Assistant Professor)

Dept. of Forestry Wildlife

And Environmental Sciences

GGV,Bilaspur

Submitted by:

PRACHI UJALA SAHU

M.Sc. Forestry 4th semester

Enroll No GGV/16/6246

Department of forestry, Wildlife &Environmental Sciences

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Institutional training report entitled "INSTITUTE OF FOREST PRODUCTIVITY (I.F.P) "*submitted in partial fulfillment of the requirements for the Degree of Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh) is the work carried out by* ***Miss. Prachi Ujala Sahu****, D/o* ***Mr.Hemchand Ujala Sahu,*** *under my supervision and guidance.*

I wish ***Prachi Ujala Sahu*** *all the success in her academics.*

Place: Bilaspur

Date: ...../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Bhawana Dixit

(supervisor)

Assistant Professor

Department of forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur C.g.

DECLARATION

I hereby declare that the student project work entitled "Institutional training report on Institutional of Forest Productivity (I.F.P)'' submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of ***Dr. Bhavana Dixit*** (Assistant Professor) and this project work has been, the formed for the award of master of Science in Forestry.

Prachi Ujala Sahu

Place : Bilaspur

Date - /Sept./2022

MSc. Forestry 4th Semester

Enrollment No. – GGV/16/6246

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER –1

INTRODUCTON :- INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

I.F.P is situated on National highway (N.H.-24), Lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern India. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agro-ecological zones and 6 main forest types.



Plate -1 IFP RANCHI

TOTAL AREA OF I.F.P

The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:-

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To undertake research and demonstration of agro-forestry models .
- To establish model nursery, germ plasm bank and identify suitable seed production areas for improving forest productivity.
- To steer, undertake and coordinate research, development and extension in forestry sector in the states of Bihar, Jharkhand, Sikkim and West Bengal.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.
- To carry out the related activities considered necessary to attain the above activities.

SECTIONS OF I.F.P LALGUTWA.

Institute of forest productivity is spread over 35 hectares of land. It has various section and out of them our visiting section was as follows:

- Medicinal garden.
- Bambusetum.
- Office building.
- Forest productivity unit.

@dailyrecruitment.in
Institute of Forest Productivity
(Indian Council of Forestry Research and Education)
IFP RANCHI RECRUITMENT

Medicinal garden of I.F.P

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
ru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A

REPORT

ON

QGIS TRANING

BILASPUR, CHHATTISHGARH

SESSION: 2021-22

MASTER DEGREE OF SCIENCE IN FORESTRY

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIORNMENTAL SCIENCE

SUBMITTED TO: -

Dr. A.K. Bhandari

Dr. [redacted]

(Assistant Professor)

Dept. of Forestry,Wildlife& environment science

Guru Ghasidas Vishwavidyalaya, Bilaspur – 495009

SUBMITTED BY: -

PRACHI UJALA SAHU

M.Sc.(Forestry & Evs)

IV Semester

Roll. No.20412023

Enrollno.GGV/16/6246

Guru Ghasidas VishwavidyalayaBilaspur (C.G.)

(A Central University)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

*This is to certify that the Institutional training report entitled "**QGIS traning program**" submitted in partial fulfillment of the requirements for the Degree of Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh) is the work carried out by Miss. Prachi ujala sahu, D/o Mr. Hemchand ujala sahu, under my supervision and guidance.*

I wish Prachi ujala sahu all the success in his academics.

Place: Bilaspur

Date: ...../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A.K. Bhardwaj

Dr. ~~Bhawana Dixit~~

supervisor

Assistant professor

Department of forestry, wildlife and environmental science,

Guru Ghasidas Vishwavidyalaya, Bilaspur C.g.

DECLARATION

*I hereby declare that the field training entitled, — **QGIS traning program** submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with **Teacher of Guru Ghasidas Vishwavidyalaya** and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

DATE: -
PLACE:

PRACHI UJALA SAHU
M.Sc. Forestry
Semester 4th
Roll No: - 20412023
Enroll No.GGV/16/6246

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or" bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem solving tool

Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT ON FIELD TRAINING (ATTACHMENT WITH STATE FOREST DEPARTMENT)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE BACHELOR OF SCIENCE IN FORESTRY

(Session: 2021-22)

SUBMITTED TO

Dr. BHUVANA DIXIT

Assistant Professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

PRACHI UJALA SAHU

M.Sc. forestry IV semester
Roll no. – 20412023
Enrolment no. – GGV/16/6246

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

I have great pleasure in certifying that ***Ms. Prachi ujala sahu*** *,D/o* ***Mr. Hemchand ujala sahu*** *is a regular student of M.Sc. Forestry IV Semester during the session of 2021-22 of* ***Department of Forestry, Wildlife and Environmental Sciences, GGU, Bilaspur.*** *He has completed this Computer Application training entitled "Training report on Field Training (Attachment with State Forest Department)" during this semester under my guidance.*

I wish her all the success in her future academic endeavours.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rtment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A.K. Bhardwaj

Dr .~~Bhavana Dixit~~

Assistant Professor

Department of Forestry,

Wildlife& Environmental Sciences

GGV,Bilaspur(C.G)

DECLARATION

I hereby declare that the project work entitled "**Training report on Field Training (Attachment with State Forest Department)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Bhavana Dixit, Associate Professor** and this project work has been performed for the award of Master's degree in Forestry.

Prachi ujala sahu

M.Sc. forestry IV semester

Roll no. – 20412023

Enrolment no. – GGV/16/6246

Date: -

Place: -

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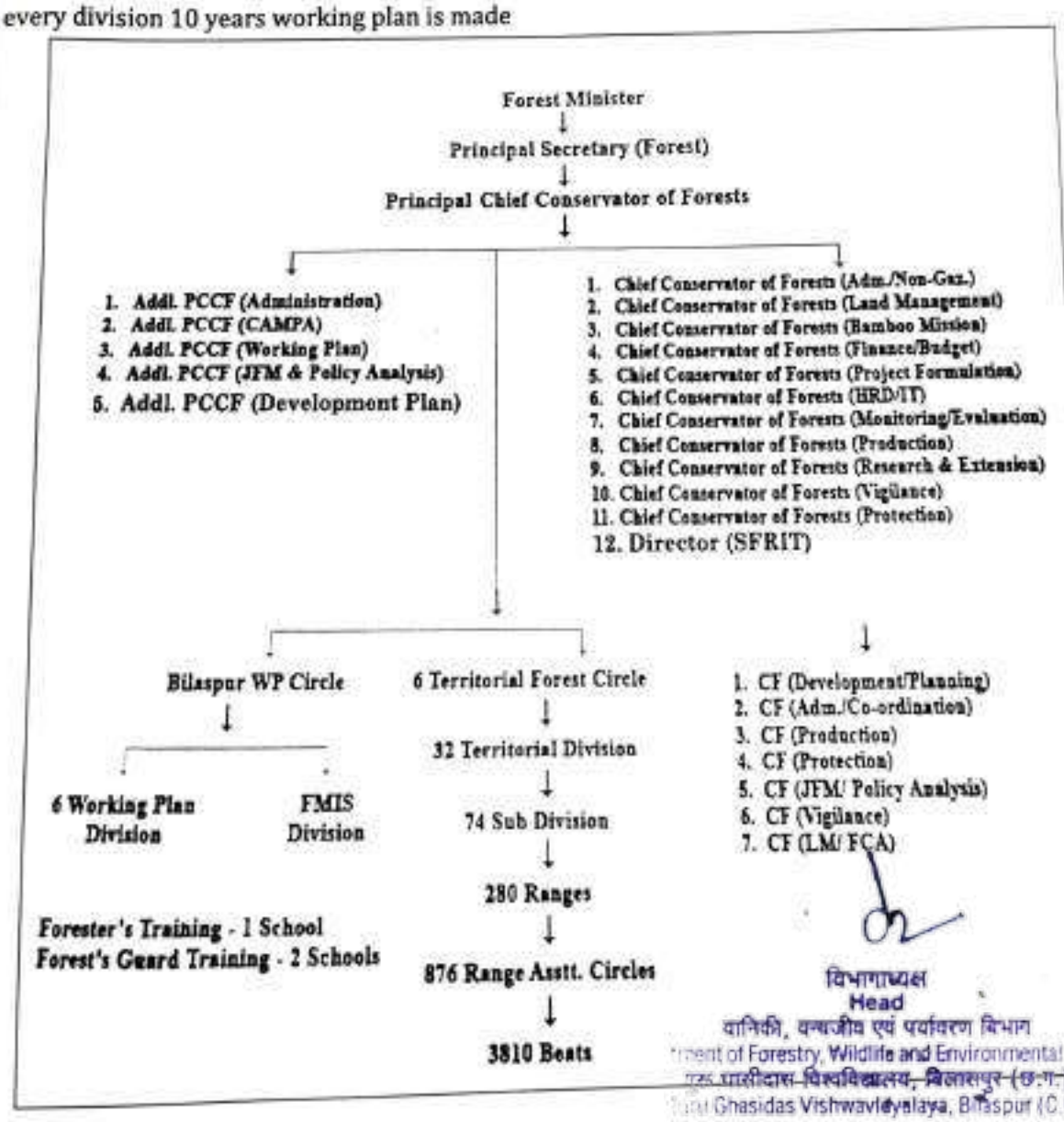
विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER - 1

CHHATTISGARH FOREST DEPARTMENT

❖ INTRODUCTION

The forest department in any state works to conserve, protect and manage the forest in sustainable manner. The whole Chhattisgarh forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest divisions and for every division 10 years working plan is made



विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Figure 1- State forest administration structure via flow chart

A

STUDENT PROJECT ON

A STUDY OF SOME COMMON WOOD ROTTING FUNGI FROM CHILPI WOOD DEPOT KABIRDHAM CHHATTISGARH.

(Session: 2021-22)

SUBMITTED TO,

DR. BHAVANA DIXIT

ASSISTANT PROFESSOR

SUBMITTED BY,

PRACHI UJALA SAHU

M.SC, FORESTRY & ENVIROMENTAL SCIENCE

4TH SEMESTAR

(FOREST MANAGEMENT)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled " A study of some common wood rotting fungi from chilpi wood depot kabirdham chhattisgarh "submitted in partial fulfillment of the requirements for the Degree of Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh) is the work carried out by Miss. Prachi ujala sahu, D/o Mr. Hemchand ujala sahu, under my supervision and guidance.

I wish Prachi ujala sahu all the success in his academics.

Place: Bilaspur

Date: ...../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. B[redacted]

supervisor

Assistant professor

Department of forestry, wildlife and environmental science,

Guru Ghasidas

Vishwavidyalaya, Bilaspur C.g.

DECLARATION

I hereby declare that the student project work entitled *"student project report on study of some common wood rotting fungi from chilpi wood depot kabirdham chhattisgarh"* submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Dr. bhavana dixit. Associate professor and this project work has been, the formed for the award of master of Science in Forestry.

Place : Bilaspur

Date - /Sept./2022

MISS. PRACHI UJALA SAHU

MSc. Forestry 4th Semester

Roll No. - 20412023

Enrolment No.- GGV/16/6246

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
tment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A STUDY OF SOME COMMON WOOD ROTTING FUNGI FROM CHILPI WOOD DEPOT KABIRDHAM CHHATTIGARH.

1) INTRODUCTION -

1.1 **WOOD** – The hard fibrous lignified substance that lies beneath the bark of trees is called wood. This fibrous material makes up the majority of the stems and branches of trees and shrubby plants, as well as a lesser extent of herbaceous stems. The main constituents of wood are cellulose, carbohydrates, and lignin, which are isomeric with starch.. (Bruce Hoadley, R. et al 1980).

1.2 **WOOD ROTTING FUNGI** - Wood is the important natural resources one of the few that are renewable wood is cover with a growth of trees or plant with trees, wood is exceptionally hard substrate to degrade, the cells of wood are surrounded by a wall that is composed mostly of cellulose and lignin, while cellulose is relative easy to degrade. the lignin present becomes a barrier of wood decay because lignin is a complex aromatic polymers that encrusts the cell walls preventing access of enzymes to the more easily degradable cellulose and hemi-cellulose, despite this formidable listing obstacles ,wood logs and timbers deg- readable by fungi , and these fungi are **wood rotting fungi**. The majority of the wood-degrading microorganisms are soft rot, white rot, or brown rot that can break down the lignified cell wall of woody. Wood rot causes structural deterioration of woody tissues as well as economic damage due to early ageing, decline, and significantly decreased crop productivity. When sufficient moisture is available, fungus only require a moderate amount of water to proliferate; for wood-rotting fungi to thrive, moisture levels of between 35% and 50% are needed.(Rahul Ravneel Prasad , anamika et al. 2021).

1.3 **WOOD DEPOT** - A wood depot is a location where wood logs are collected and sold for use in construction or carpentry before being disposed of. Felling, removal, and transportation are the three key stages of the wood production process (Acar 2016). Throughout the process of transforming them into the finished product, logs harvested from the forest can be stored at various times. In addition to planned cuts for regeneration work and thinning, industrial and firewood production are carried out in the woods or specific production areas in response to client demands. Throughout this process, numerous storage facilities are required between the point of production and the final consumer.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT PROJECT ON LAC CULTIVATION IN SURGUJA

(Session: 2021-22)



SUBMITTED FOR PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTER DEGREE IN FORESTRY

SUBMITTED TO:

Dr. ~~Bhavana Dixit~~ A.K. Bhardwaj

Assistant Professor

Dept. of Forestry,

Wildlife and Environmental

Sciences

SUBMITTED BY:

Purvi Jain M.Sc.

Forestry IV Semester

Roll no: 16007140

Enrolment no: GGV/16/6248

Department of Forestry, Wildlife and Environmental Sciences

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that student report entitled "LAC CULTIVATION IN SURGUJA" submitted in partial fulfilment of the requirements for the Degree of ***Master of science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chattisgarh)*** *is the work carried out by* ***Ms. Purvi Jain D/o Mr. Kishor Jain*** *under my supervision and guidance.*

I wish Purvi Jain all the success in her academics.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

for A. K. Bhardwaj

Dr. ~~Bhavana Dixit~~

Assistant Professor

Supervisor

Dept. of Forestry,
Wildlife and Environmental Sciences

GGU, Bilaspur

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DECLARATION

I hereby declare that the project work entitled ***"Student Project on LAC CULTIVATION IN SURGUJA"*** *submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of* ***Assi. Prof. Bhavana Dixit*** *and this project work has been performed for the award of Master's degree in Forestry.*



Purvi Jain

M.Sc Forestry 8th Semester

Roll no: 16007140

Enrolment no: GGV/16/6248

Date:

Place:- Bilaspur

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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LAC CULTIVATION

1. Lac -

Lac is one of the most valuable natural products secreted by lac insect and is the only natural resin of animal origin. In fact, it is the protective covering of female lac insect secreted all over its body by unicellular glands, distributed on specific areas of the body. Thus basically it is the cell (room) where mother lac insect develops.

2. Lac Insect –

The lac insect is soft body insect belongs to Coccids group of order **Homoptera**. The most common Indian lac insect of commercial importance is ***Kerria lacca*** (Kerr). ***Rangeeni*** and ***kusmi*** are two strains of this species. Each of these two strains produces two crops in a year (bi-voltine). *Kusmi* insect grows well mainly on *Schleichera oleosa* and also on a few other trees. The *rangeeni* strain grows well mainly on *Butea monosperma* and also on a few other trees but not on *S. oleosa*. Some basic differences between the two strains have been given in Table 1.

Table 1.Broad distinction between *kusmi* and *rangeeni* insect

Sl	Parameter	*Kusmi*	*Rangeeni*
1	Host Preference	*Schleichera oleosa* and others	*Butea monosperma* and others
2	Crop cycle	• June- July to December-February • December-February to June July	• June-July to October-November • October- November to June-July
3	Crop duration	Summer: 5-6 months Winter: 6-7 months	Summer: 8 months Rainy: 4 months
4	Productivity (Scraped lac)	Around 130 g per meter per crop	Around 33 g per meter per crop
5	Colour index	8-10 (light)	10-16 (dark)
6	Resin yield per insect	25-30 mg	7-14 mg
7	Settlement density	120-170 per sq cm	60-110 per sq cm

3. Life Cycle –

- ***Lac insect crawlers***:

The life cycle of lac insect starts with its first instar larval stage, the crawlers. The first instar larvae are soft bodied, oval shaped, tapering on posterior side of abdomen. It is 0.6 mm long from head to abdomen and 0.25 mm broad at thorax. There is no pronounced demarcation between head, thorax and abdomen. The head carries a pair of antennae, a pair of Ocilla (eye) and ventrally the piercing and sucking type of mouth-parts. The antenna is six segmented including basal one. Two pairs of spiracles are situated on the ventral side of the thorax. Abdomen is 8-9 segmented and last few are telescopic. The last segment of the abdomen forms the anal ring carrying a pair of greatly elongated setae, in addition to three shorter pairs arranged round the anal opening.

The first instar of lac insect is mobile stage and crawls over the shoot of host trees. It takes phloem sap by its proboscis, after piercing it into the phloem region of shoots. The lac crawlers start secreting resin

विभागाध्यक्ष
Head
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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
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TRAINING REPORT ON COMPUTER TRAINING PROGRAM ON QGIS

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY

(Session: 2021-22)

UNDER THE SUPERVISION OF

Dr. Bhuvana Dixit
Dr. A.K. Bhardwaj
Assistant professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

Purvi Jain
M.Sc. forestry IV semester
Enrolment no. – GGV/16/6248

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

I have great pleasure in certifying that Ms. Purvi Jain d/o Mr. Kishor Jain is a regular student of M.Sc. Forestry IV Semester during the session of 2021-22 of Department of Forestry, Wildlife and Environmental Sciences, GGU, Bilaspur. He has completed this training entitled "Training report on Computer Training Program on QGIS)" during this semester under my guidance.

I wish her all the success in her future academic endeavours.

for A.K. Bhardwaj

Dr. Bhavana Dixit

Assistant professor

Department of Forestry,

Wildlife & Environmental Sciences

GGV, Bilaspur (C.G)

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

*I hereby declare that the project work entitled "**Training report on Computer Training Program on QGIS**)" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. Bhavan Dixit(assi. Prof)** and this project work have been performed for the award of Master's degree in Forestry.*

Purvi Jain
M.Sc. forestry IV semester

Date: - 13 /09/2022

Place: - Bilaspur

Enrolment no. – GGV/16/6248

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REFRENCE .....

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858) It was believed that cholera was spread by a "bad air "or"bad smell "from decomposing organic matter in the nineteenth century But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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TRAINING REPORT

ON

FIELD TRAINING (ATTACHMENT WITH STATE FOREST DEPARTMENT)

(Session: 2021-22)

SUBMITTED FOR PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTER DEGREE IN FORESTRY

SUBMITTED TO:
Dr. ~~Bhavana Dixit~~ A.K. Khandwaj
Assistant Professor
Dept. of Forestry,
Wildlife and Environmental Sciences

SUBMITTED BY:
Purvi Jain
M.Sc. Forestry IV Semester
Roll no: 16007140
Enrolment no: GGV/16/6248

Department of Forestry, Wildlife and Environmental Sciences

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that report entitled "FIELD TRAINING ATTACHMENT WITH STATE FOREST DEPARTMENT)" submitted in partial fulfilment of the requirements for the Degree of ***Master of science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chattisgarh)*** *is the work carried out by* ***Ms. Purvi Jain D/o Mr. Kishor Jain*** *under my supervision and guidance.*

I wish Purvi Jain all the success in her academics.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A.K. Bhardwaj

Dr. Bhavana Dixit
Assistant Professor Supervisor
Dept. of Forestry, Wildlife and Environmental Sciences
GGU, Bilaspur

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DECLARATION

I hereby declare that the project work entitled ***"Training report on Field Training (Attachment with State Forest Department)"*** *submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of* ***Assi. Prof. Bhavana Dixit*** *and this project work has been performed for the award of Master's degree in Forestry.*

Date:

Place:

Purvi Jain
M.Sc. Forestry IV Semester
Roll no: 16007140
Enrolment no: GGV/16/6248

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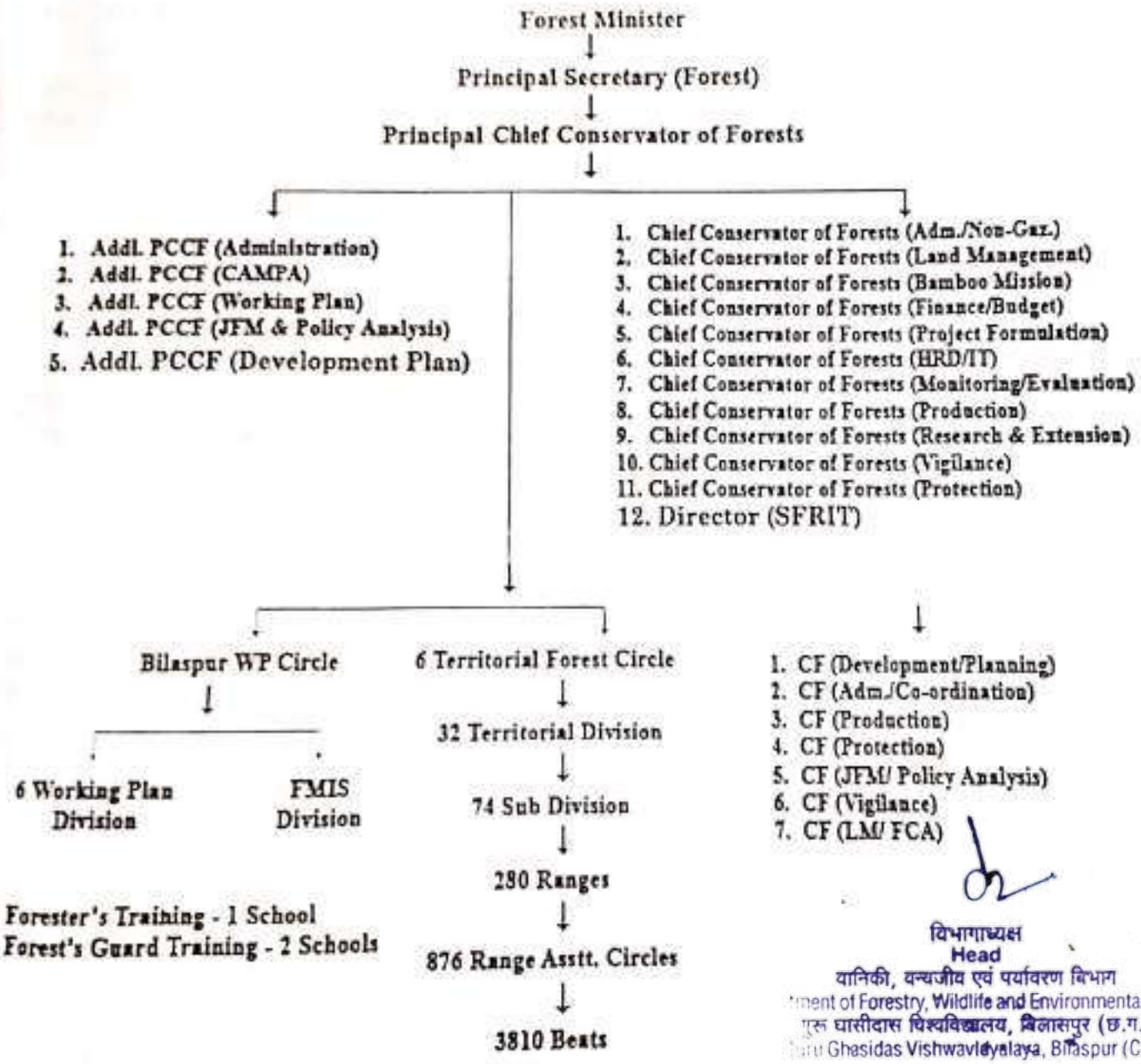
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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1. CHHATTISGARH FOREST DEPARTMENT: INTRODUCTION

The forest department in any state works to conserve, protect and manage the forest in sustainable manner. The whole Chhattisgarh forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest division and for every division 10 years working plan is made.



ADMINISTRATIVE SETUP OF FOREST DEPARTMENT

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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TRAINING REPORT ON

INSTITUTIONAL VISIT TO INSTITUTE OF FOREST PRODUCTIVITY, RANCHI & SERICULTURE DEPARTMENT, BILASPUR

(Session: 2021-22)

SUBMITTED FOR PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTER DEGREE IN FORESTRY

SUBMITTED TO:
Dr. [redacted]
Assistant Professor
Dept. of Forestry,
Wildlife and Environmental
Sciences

SUBMITTED BY:
Purvi Jain M.Sc.
Forestry IV Semester
Roll no: 16007140
Enrolment no: GGV/16/6248

Department of Forestry, Wildlife and Environmental Sciences

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that report entitled "institutional visit to IFP Ranchi and Sericulture Department Bilaspur" submitted in partial fulfilment of the requirements for the Degree of ***Master of science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chattisgarh)*** *is the work carried out by* ***Ms. Purvi Jain D/o Mr. Kishor Jain*** *under my supervision and guidance.*

I wish Purvi Jain all the success in her academics.

Dr. Bhavana Dixit
Assistant Professor Supervisor
Dept. of Forestry, Wildlife and Environmental Sciences
GGU, Bilaspur

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

I hereby declare that the project work entitled **"Training report on Institutional visit to IFP, Ranchi & Sericulture department, Bilaspur"** submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Assi. Prof. Bhavana Dixit** and this project work has been performed for the award of Master's degree in Forestry.

Purvi Jain M.Sc.
Forestry IV Semester
Roll no: 16007140
Enrolment no: GGV/16/6248

Date:

Place:

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DAY 1

INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)



Figure 1- Research building of IFP Ranchi

Institute of Forest Productivity is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), catering to the forestry research needs in the states of Bihar, Jharkhand, and West Bengal. Since coming into existence in 1993, the institute has taken up several initiatives in the field of forestry and allied sciences through research projects and extension programmes, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry-based institutes. The institute has established itself as a major player for providing forestry-oriented solutions to different category of users in the region. The institute has specially established its technical expertise in Lac cultivation and over the years number of tribal farmers has been immensely benefited by the various extension activities run by the institute for the socio-economic upliftment of the tribal.
The Institute has well established soil testing lab, molecular biology lab, tree physiology and tissue culture lab, chemistry of forest produce lab and forest entomology lab. All these labs are well maintained and equipped with modern sophisticated equipment's.

In the past Institute has developed a botanical garden "Aus Upvan"- Regional Medicinal Garden for Chhota Nagpur and a Bambusetum with species. Ministry of Environment and Forests, New Delhi has recognized Institutes botanical garden as a Lead Garden in Jharkhand. The total area of institute of forest productivity is 35 hectares.

Objectives of the Institute-

- To develop and maintain information on forestry and allied sciences.
- To act as a clearinghouse for region specific research and general information relating to forests and wildlife.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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STUDENT PROJECT ON

"STUDY OF PHENOLOGICAL VARIATION AND SOIL ANALYSIS OF JAMUN (*Syzygium cumini*) IN NATURAL FOREST OF BILASPUR FOREST DIVISION"

Session – 2021-2022

SUBMITTED FOR PARTIAL FULFILLMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY (2 Years)

GURU GHASIDASVISHWAVIDYALAYA, BILASPUR

UNDER SUPERVISION –

Dr. Bhawna Dixit
Assistant Professor Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

SUBMITTED BY

REETU SAHU
Roll no. – 20412025
M.Sc. forestry
IV semester (Final)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

I have great pleasure in certifying that ***MISS. REETU SAHU*** *D/O MR. GOPAL PRASAD SAHU is a regular student of M.Sc. Forestry IV Semester during the session of 2020-2022 of Department of Forestry, Wildlife and Environmental Science. She has completed this student project entitled* ***"Study of phenological variation and soil analysis of Jamun in natural forest of Bilaspur Forest division"*** *under the guidance and with the support of Faculty Members of Forest Department, Bilaspur and the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur*

I wish her all the success.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Supervisor

Dr. B[redacted]

Assistant Professor

Department of Forestry Wildlife and Environmental Science

DECLARATION

I hereby declare that the **student project work entitled "Study of phenological variation and soil analysis of Jamun in natural forest of Bilaspur Forest division"** submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Faculty Members of Forest Department, Bilaspur and the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) and this project work has been formed for the award of Master of Science Degree in Forestry.

Date: 16/09/22
Place: Bilaspur

REETU SAHU

M.Sc. Forestry IV Semester
Roll No. – 20412025
Enrollment No. - GGV/16/6250

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. INTRODUCTION

Jamun (*Syzygium cumini*) is an important indigenous minor fruit of commercial value. It is also known as black plum, Indian black cherry, ram jamun etc. in different parts of India.

It is very common, tall, beautiful, evergreen tree of the Indian subcontinent and has got very valuable place in ayurvedic medicines. Jamun has promising therapeutic value due to its various Phyto-constituents such as tannins, alkaloids, steroids, flavonoids, terpenoids, fatty acids, phenols, minerals, carbohydrates and vitamins.

Its pharmacological properties like hypoglycemic, diuretics, analgesic, anti-inflammatory, antiplaque, antimicrobial, antidiarrheal, antioxidant, gastro-protective and astringency have been proven on animal systems.

Jamun fruit has considerable nutritive value. It is a good source of iron apart from being the source of minerals, sugars and other phytochemicals

Origin: It has originated from Indonesia and India, now growing abundantly in Southern Asia.

Taxonomic characteristics

- Domain: Eukaryota
- Kingdom: Plantae
- Phylum: Spermatophyta
- Subphylum: Angiosperma
- Class: Dicotyledonae
- Order: Myrtales
- Family: Myrtaceae
- Genus: Syzygium
- Species: Syzygium cumini

Plant type

- Perennial
- Seed propagated
- Tree
- Woody

2. Habitat

Jamun *Syzygium cumini* prefers moist locations and will tolerate waterlogging thus is commonly found on riverbanks, but it can also survive, but less well, on drier sites once established.

In its native range it is commonly cultivated and thus found in and around homesteads and agricultural land. In the Pacific where it has proved most invasive, it is generally a more lowland species.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON
"COMPUTER TRAINING"
BILASPUR (C.G)

Session – 2021-2022

SUBMITTED FOR PARTIAL FULFILLMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY (2 Years)
GURU GHASIDASVISHWAVIDYALAYA, BILASPUR

UNDER SUPERVISION
Dr. Bhavana Bisht
Assistant Professor Department of Forestry,
Wildlife & Environmental SciencesGGV, Bilaspur (C.G.)

SUBMITTED BY
REETU SAHU
Roll no. – 20412025
M.Sc. forestry
IV semester (Final)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

I have great pleasure in certifying that ***MISS. REETU SAHU*** *D/O MR. GOPAL PRASAD SAHU is a regular student of M.Sc. Forestry IV Semester during the session of 2020-2022 of Department of Forestry, Wildlife and Environmental Science. She has completed Computer Training under the guidance and with the support of Faculty Members of Forest Department, Bilaspur and the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur*

I wish her all the success.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Supervisor
Dr. Bhawana Patel
Assistant Professor
Department of Forestry Wildlife and Environmental Science

DECLARATION

I hereby declare that the project work entitled "**Computer Training**" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) and this computer training work has been formed for the award of Master of Science Degree in Forestry.

Date: 16/09/22
Place: Bilaspur

REETU SAHU

M.Sc. Forestry IV Semester
Roll No. – 20412025
Enrollment No. –
GGV/16/6250

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विभागाध्यक्ष
Head
यानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

COMPUTER FUNDAMENTAL

1.1. INTRODUCTION

- A **computer** is a programmable device that can store, retrieve, and process data.
- A computer is a machine that can be programmed to carry out sequences of arithmeticor logical operations automatically.
- Modern computers can perform generic sets of operations known as programs. These programs enable computers to perform a wide range of tasks.
- Today's computers are electronic devices that accept data (input), process that data, produce output, and store (storage) the results.

1.2. HISTORY OF THE COMPUTER

- The **first digital computer** and what most people think of as a computer was calledthe ENIAC. It was built during World War II (1943-1946) and was designed to helpautomate the calculations being done by human computers. By doing these calculations on a computer, they could achieve results much faster and with fewer errors.
- Early computers like the ENIAC used vacuum tubes and were large (sometimes roomsize) and only found in businesses, Universities, or governments.
- Later, computers began utilizing transistors as well as smaller and cheaper parts thatallowed the ordinary person to own a computer.

1.3. CLASSIFICATION OF COMPUTER

Computers differ based on their data processing abilities. They are classified according to purpose, data handling and functionality.

- **According to purpose, computers are either general purpose or specificpurpose**
- **General purpose computers are designed to perform a range of tasks.They have the ability to store numerous programs, but lack in speed and efficiency.**
- **Specific purpose computers are designed to handle a specific problem orto perform a specific task. A set of instructions is built into the machine.**

1.4. According to functionality, types of computers are classified as:

1.4.1. Analogue Computer

An analogue computer is a form of computer that uses continuous physical phenomena such as electrical, mechanical, or hydraulic quantities to model the problem being solved.

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT

ON

FOREST ATTACHMENT



Session – 2021-2022

SUBMITTED FOR PARTIAL FULFILLMENT FOR THE REQUIREMENT

OF MASTER DEGREE OF SCIENCE IN FORESTRY (2 Years)

GURU GHASIDASVISHWAVIDYALAYA, BILASPUR

UNDER SUPERVISION OF

Dr. Bhavana Dixit
Assistant Professor Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

SUBMITTED BY

REETU SAHU
Roll no. – 20412025
M.Sc. forestry
IV semester

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)



CERTIFICATE

This is to certify that the report entitled ***"Forest Attachment"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss Reetu Sahu D/o Mr. Gopal Prasad Sahu*** *under my supervision and guidance.*

I wish Reetu Sahu all the success in her academics.

Place: Bilaspur
Date: ...../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Supervisor
Dr. Bhavana Dixit
Assistant Professor
Department of Forestry Wildlife and Environmental Science

DECLARATION

I hereby declare that the project work entitled "**Forest Attachment**" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Faculty Members of Forest Department, Bilaspur and the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) and this project work has been formed for the award of Master of Science Degree in Forestry and Environmental Science.

Date: 16/09/22
Place: Bilaspur

REETU SAHU

M.Sc. Forestry IV Semester
Roll No. – 20412025
Enrollment No. - GGV/16/6250

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. INTRODUCTION TO INDIAN FOREST

Forests are the green lungs of the nation and provide various ecological services like clean air, water, maintenance of soil-moisture regime by checking soil erosion etc. Forests maintain environment stability and ecological balance. Natural forests with the vast variety of flora and fauna are hub of biodiversity. India is endowed with rich forest types like Tropical Wet Evergreen Forests, Tropical Moist Deciduous Forests, Tropical Dry Deciduous, Sub Tropical Dry Evergreen Forests, Himalayan Moist Temperate Forests, Sub-Alpine and Alpine Scrub Forests etc.

National Forest Policy of India, 1988 envisages a goal of achieving 33% of geographical area of the country under forest and tree cover.

The 'India State of Forest Report (ISFR)' for the year 2021 was released recently by the Forest Survey of India (FSI). The total forest cover & tree cover in India is about 24.62% of the geographical area, much less than the 33% target set to be achieved by 2022. Between 2011 & 2021, the total forest cover increased by about 21,762 sq. km, roughly the size of the state of Mizoram.

In 2021, the total forest and tree cover in India is 80.9 million hectares, which is 24.62% of the geographical area of the country according to forest survey report. The tree cover is 2.91% 0f the geographical area of the country.

The total mangrove cover in India is 4,992 sq km (included in total forest cover)

1.1 FORESTS IN CHHATTISGARH

As Chhattisgarh is rich in forest biodiversity so it is important to have a management body which implements and carries out various management programs.

According to Forest Survey of India [FSI], recorded forest area in the Chhattisgarh is 59,772 sq. Kilometres [44.21% of the geographical area] of which: -

- Reserved Forest – 25786 sq km [43.13%]
- Protected Forest – 24,034 sq km [40.21%]
- Unclassed Forest – 9,952 sqkm [16.65%]

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT

ON

INDUSTRIAL TRAINING

Session – 2021-2022

SUBMITTED FOR PARTIAL FULFILLMENT FOR THE REQUIREMENT

OF MASTER DEGREE OF SCIENCE IN FORESTRY (2 Years)

GURU GHASIDASVISHWAVIDYALAYA, BILASPUR

UNDER SUPERVISION OF

Dr. Bhavani Dixit
Assistant Professor Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

SUBMITTED BY

REETU SAHU
Roll no. – 20412025
M.Sc. forestry
IV semester

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the institutional training report entitled ***"Industrial Training in Institute of Forest Productivity (IFP)"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss Reetu Sahu D/o Mr. Gopal Prasad Sahu*** *under my supervision and guidance.*

I wish Reetu Sahu all the success in her academics.

Place: Bilaspur
Date: ...../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A.C. Bhardwaj
Dr. Bhavana Dixit

Supervisor
Assistant Professor
Department of Forestry Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G

DECLARATION

I hereby declare that the project work entitled **"Industrial Training"** submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Faculty Members of Forest Department, Bilaspur and the Faculty Members of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) and this project work has been formed for the award of Master of Science Degree in Forestry and Environmental Science.

Date: 16/09/22
Place: Bilaspur

REETU SAHU

M.Sc. Forestry IV Semester
Roll No. – 20412025
Enrollment No. - GGV/16/6250

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. INTRODUCTION

1.1.INSTITUTE OF FOREST PRODUCTIVITY

- **Institute of Forest Productivity** is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), catering to the forestry research needs in the states of Bihar, Jharkhand and West Bengal.
- It got Established in 1993.
- **Total area of I.F.P**
- The total area of institute of forest productivity is 35 hectares.
- Its parent institution is ICFRE.
- Since coming into existence in 1993, the institute has taken up a number of initiatives in the field of forestry and allied sciences through research projects and extension programs, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry-based institutes.
- Dr. Nitin Kulkarni, Scientist - G (Forest Entomology) is Director of the institute.
- It is located at NH 23, Lalgutwa, Ranchi, Jharkhand, India.
- Its campus is urban Institute acronym is IFP
- It provides research support to the problems of forest management in North East India. Theinstitute has not only steadily advanced in terms of infrastructure but also specialized itself as a major nucleus for research on forestry and ecology related problems of tropical forests of the central region comprising of the states of Bihar, Jharkhand, West Bengal.
- The institute has established itself as a major player for providing forestry-oriented solutions to different category of users in the region. The institute has specially established its technical expertise in Lac cultivation and over the years number of tribal farmers have been immensely benefited by the various extension activities run by the institute for the socio-economic upliftment of the tribal.
- The Institute has well established soil testing lab, molecular biology lab, tree physiology and tissue culture lab, chemistry of forest produce lab and forest entomology lab. All these labs are well maintained and equipped with modern sophisticated equipment.
- Its Official website is ifp.icfre.gov.in

1.2.OBJECTIVES OF IFP

- To undertake and promote forestry research, education and extension, leading to scientific and sustainable management of forest resources.
- To provide scientific advice to the central and state governments aiding informed decision making in matters of national and regional importance and international commitments and to address forestry research needs.
- To provide technical assistance and material support to states, forest dependent communities, forest based industries, tree & NTFP growers and other stakeholders in their forestry based programs for conservation and sustainable use of forest resources.
- To undertake research in silviculture and forest management for development of natural and artificial regeneration practices, including nursery & plantation techniques.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

"Computational Skill Report"

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2020-22

Under the Supervision of –

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife &
Environmental Science, Guru Ghasidas
Vishwavidyalaya, Bilaspur (C.G.)

Submitted By -

Ruma
M.Sc. Forestry and
Environmental Science (4th semester)
Roll No. 20412026
Enrollment No. GGV/20/06708

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A Central University Established Under Central University Act 2009, No 25 of 2009)

Date- 09/ Sept /2022

CERTIFICATE

This is to certify that the Training Report entitled "**COMPUTATIONAL SKILL**" submitted for the partial fulfilment of Degree of **Master of Sciences in Forestry and Environmental Sciences to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Miss Ruma D/o Mr. Ratan lal** of **M.Sc. Forestry & Environmental Sciences (IVth Semester) & Enrollment No. (GGV/20/06708)** under my guidance and supervision.

I wish her all the success for her future academic endeavours.

Date- 14/09/22

Dr. Ajay Kumar Singh
Assistant Professor
of Forestry, Wildlife & Env. Sci
Guru Ghasidas Vishwavidyalaya
Central University) Bilaspur (C.G.)

Dr. Ajay Kumar Singh
Supervisor
Assistant Professor
Department of Forestry, Wildlife and
Environmental Science, GGU

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the present training Report entitled **Computational Skill** " interpretation or part has not been submitted for any degree or diploma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Date- 09/ Sept./2022.
Place: Bilaspur

RPatel

Submitted By:-
RUMA
M.Sc. Forestry
Roll No. 20412026
Enroll– GGV/20/06708

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER 1

COMPUTER FUNDAMENTALS

1.1 INTRODUCTION-

The term computer is derived from the word compute. The word compute means to calculate. A computer is an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desmyed output results. Computer performs both simple and complex operations, with speed and accuracy.

A computer is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use.

- A computer is a programmable device that can store, retrieve, and process data.
- A computer is a machine that can be programmed to carry out sequences of arithmetic or logical operations automatically.
- Modern computers can perform generic sets of operations known as programs. These programs enable computers to perform a wide range of tasks.
- Today's computers are electronic devices that accept data (input), process that data, produce output, and store (storage) the results.

1.2 DIGITAL, ANALOG AND HYBRID COMPUTER COMPUTERS

1.2.1 Analogue Computer-

An analogue computer is a form of computer that uses continuous physical phenomena such as electrical, mechanical, or hydraulic quantities to model theproblem being solved.

1.2.2 Digital Computer

A computer that performs calculations and logical operations with quantitiesrepresented as digits, usually in the binary number system.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Report on
"Forest Attachment"

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2020-22

Under the Supervision of –

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife &
Environmental Science, Guru Ghasidas
Vishwavidyalaya, Bilaspur (C.G.)

Submitted By -

Ruma
M.Sc. Forestry and
Environmental Science (4th semester)
Roll No. 20412026
Enrollment No. GGV/20/06708

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date- 09/ Sept /2022

CERTIFICATE

This is to certify that the Forest Attachment Training Report entitled "**FOREST ATTACHMENT OF RAIGARH, KOTA & BHAISAJHAR**" submitted for the partial fulfilment of Degree of **Master of Sciences in Forestry and Environmental Sciences to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Miss Ruma D/o Mr. Ratan lal** of **M.Sc. Forestry & Environmental Sciences (IVth Semester) & Enrollment No. (GGV/20/06708)** under my guidance and supervision.

I wish her all the success for her future academics endeavours.

Date- 14/09/22

Dr. Ajay Kumar Singh
Assistant Professor
Dept. of Forestry, Wildlife & Env. Sc.
Guru Ghasidas Vishwavidyalaya
(Central University) Bilaspur

Dr. Ajay Kumar Singh
Supervisor
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, GGU

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

FOREST & CLIMATE CHANGE DEPARTMENT
Raigarh Division Raigarh (C.G.)

CERTIFICATE

Certified that Miss RUMA of Guru Ghasidas University, Bilaspur Chhattisgarh has successfully completed the Institutinal Attachment Training Programme organized by Forest & Climate Change Department, Raigarh Division Raigarh (C.G.) from 09/05/2022 to 15/05/2022. The Institute wishes bright future of his/her for future endeavour in academic advancement.

(Stylo Mandavi)
"IFS"
Divisional Forest Officer
Raigarh Dn. Raigarh (C.G.)

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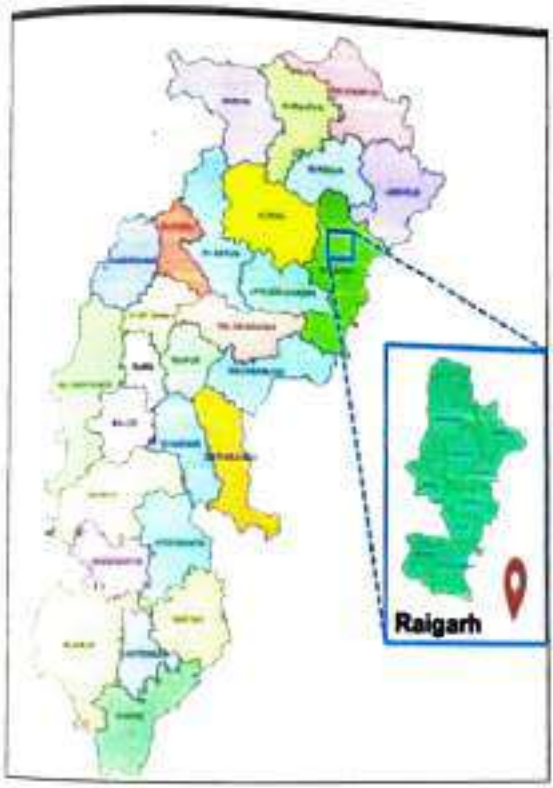
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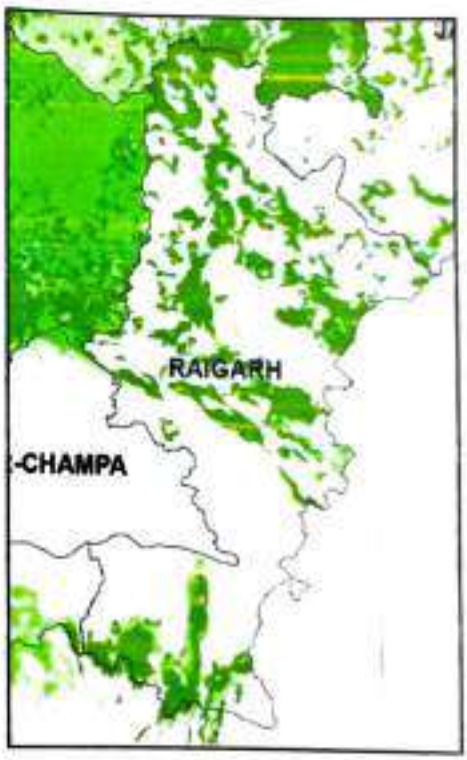
विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Chapter-1

Introduction

Raigarh is a city in Eastern Chhattisgarh It is also known for its forest cover, coal reserves and power generation for the state as well as the country. It lies between 21° 20' and 23 .15' North latitude, 82° 56' and 84° 24' East longitude It is bounded on the north by Sarguja and Jashpur, on the west by Korba and Janjgir Champa, on the south by Mahasamund and on the east by Sambalpur district of Orissa. the Mahanadi and kelo river flows through the city which is one of its main water sources. This district extends over a geographical area of 7086 sq km. According to the publication of India state forest report 2019 total forest area of Raigarh district is 2620.33 sq.km. which is 36.97 % of total geographical area of district.





We have visited the nursery of bhelwa tikra (central nursery), bangursiya for demonstration working plan formulation, Badaljhiriya for conservation practices of watershed management & Urdana depot of Raigarh forest Division, Chhattisgarh.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Report on "Assessment of Bamboo Diversity in Natural Forest of Bilaspur (C.G.)"

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2020-22

Under the Supervision of –

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife &
Environmental Science, Guru Ghasidas
Vishwavidyalaya, Bilaspur (C.G.)

Submitted By -

Ruma
M.Sc. Forestry and
Environmental Science (4th semester)
Roll No. 20412026
Enrollment No. GGV/20/06708

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

PARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A Central University Established Under Central University Act 2009, No 25 of 2009)

Date: 09/ Sept /2022

CERTIFICATE

This is to certify that the Student Report entitled "**ASSESSMENT OF BAMBOO DIVERSITY IN NATURAL FOREST OF BILASPUR (C.G.)**" submitted for the partial fulfilment of Degree of **Master of Sciences in Forestry and Environmental Sciences to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Miss Ruma D/o Mr. Ratan lal** of **M.Sc. Forestry & Environmental Sciences (IVth Semester) & Enrollment No. (GGV/20/06708)** under my guidance and supervision.

I wish her all the success for her future academics endeavours.

Date: 14/09/22

Dr. Ajay Kumar Singh
Assistant Professor
Dept. of Forestry, Wildlife & Env. Sc.
Guru Ghasidas Vishwavidyalaya
(A Central University) Bilaspur (C.G.)

Dr. Ajay Kumar Singh
Supervisor
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, GGU

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the present Student Report entitled " **Assessment of Bamboo Diversity in Natural Forest of Bilaspur (C.G.)**" interpretation or part has not been submitted for any degree or diploma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

R Patel

Ruma

Roll. No. 20412026

(Enrol. No. GGV/20/06708)

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date – 09/09/2022

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Chapter no.- 1

Introduction

For identification of Bamboo in Bilaspur, I have visited various Villages like Kota, Pendari, Sirgitti. In those area I have found many type of species like *Dendrocalamus strictus, Bambusa bambos, Bambusa nutans, Bambusa balcooa, Bambusa tulda, Bambusa vulgaris.*

These Bamboos grows in abundant across the District of Bilaspur ,Most of the species are very useful as they are providing livelihood to the locals ,maximum digree of Bamboo has been developed and initiated by tribal families I have selected randomly six species which are randomly found in those areas these species are found in other states of India like Arunachal Pradesh, Assam, Manipur, West Bengal, Jharkhand, Sikkim ,Madhya Pradesh, Nagaland, Mizoram, Bihar Etc.

These states contain more than 50%of Bamboo species in India. This species characteristics are lightweight, flexible, Tough, high tensile, cheap materials Etc. which are very Beneficial Characteristic for Bamboo for making it very important in day today life.

Objective of My Report

A. Identification and type of Bamboo which are present Bilaspur.

B. Soil and climatic condition of Bamboo species in Bilaspur.

C. Determinationof things ofvalue addition are made by Bamboo.

D. Determination of utilization of bamboo in our daily life.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Report on
"Institutional Training"

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2020-22

Under the Supervision of –

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife &
Environmental Science, Guru Ghasidas
Vishwavidyalaya, Bilaspur (C.G.)

Submitted By -

Ruma
M.Sc. Forestry and
Environmental Science (4th semester)
Roll No. 20412026
Enrollment No. GGV/20/06708

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A Central University Established Under Central University Act 2009, No 25 of 2009)

Date- 09/ Sept /2022

CERTIFICATE

This is to certify that the Institutional Attachment Report entitled **"INSTITUTIONAL ATTACHMENT REPORT ON INSTITUTE OF FOREST PRODUCTIVITY RANCHI, JHARKHAND & SERICULTURE RESEARCH, DEVELOPMENT AND TRAINING INSTITUTE BILASPUR (C.G.)"** submitted for the partial fulfilment of Degree of **Master of Sciences in Forestry and Environmental Sciences to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Miss Ruma D/o Mr. Ratan lal** of **M.Sc. Forestry & Environmental Sciences (IVth Semester) & Enrollment No. (GGV/20/06708)** under my guidance and supervision.

I wish her all the success for her future academics endeavours.

Date: 14/09/22

Dr. Ajay Kumar Singh
Assistant Professor
of Forestry, Wildlife & Env. Sc
Guru Ghasidas Vishwavidyalaya
(Central University) Bilaspur (C.G.)

Dr. Ajay Kumar Singh
Supervisor
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, GGU

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **RUMA** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

रेशम अनुसंधान विकास एवं प्रशिक्षण
बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. रूमा पिता श्री रतन लाल छात्र/छात्रा, एम.एस.सी/पी.एच.डी. वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर को कोनी में **मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता** विषय पर, प्रशिक्षण सत्र 2022– 2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर
दिनांकः- 04.07.2022

श्रीराम मीणा
संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER –1

INTRODUCTON ABOUT INSTITUTE

INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

About the institute-

I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near Kathal more Ranchi.

The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern India. The institute came into existence in year 1993 with the objective to formulate, organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim, Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985. Brought under FRI, DEHRADUN. The operational area comprises of 6 agroecological zones and 6 main forest types.

TOTAL AREA OF I.F.P

The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:

- ✓ To develop and maintain information on forestry and allied sciences.
- ✓ To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- ✓ To undertake research and demonstration of agro-forestry models.
- ✓ To establish model nursery, germplasm bank and identify suitable seed production areas for improving forest productivity.
- ✓ To steer, undertake and coordinate research, development and extension in forestry sector in the states of Bihar, Jharkhand, Sikkim and West Bengal.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

"FOREST ATTACHMENT REPORT"

Submitted for partial fulfilment of requirement of the Master of Science
In
Forestry and Environmental Sciences

(Session- 2020-22)

Under the Supervision of:

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife
& Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Satyendra Kumar
M.Sc. Forestry & Environmental
Sciences (4th Semester)
Roll No. - 20412027
Enroll. No. – GGV/16/6254

DEPARTMENT OF FORESTRY, WILDLIFE
& ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date: 09-09-2022

CERTIFICATE

This is to certify that the Forest Attachment Report entitled "**FOREST ATTACHMENT OF RAIGARH, KOTA & BHAINSAJHAR**" submitted for the partial fulfilment of Degree of **Master of Science in Forestry and Environmental Sciences to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Mr. Satyendra Kumar S/o Mr. Rakesh Kumar** of **M.Sc. Forestry & Environmental Sciences (IVth Semester)** and **Enrollment No. (GGV/16/6254)** under my guidance and supervision.

I wish him all the success for his future academic endeavours.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(Dr. Ajay Kumar Singh)
Supervisor
Dr. Ajay Kumar Singh
Assistant Professor
of Forestry, Wildlife & Env. Sci.
Guru Ghasidas Vishwavidyalaya
Central University, Bilaspur

DECLARATION

I hereby declare that the present **Forest Attachment Report** entitled **"Forest Attachment of Raigarh, Kota and Bhainsajhar"** interpretation or part has not been submitted for any degree or diploma of any university. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Date—09-09-2022

Place- Bilaspur (C.G.)

Satyendra Kumar
M.Sc. Forestry & Environmental Sciences IV th Semester
Roll. No.: 20412027
Enrollment No.: GGV/16/6254

FOREST & CLIMATE CHANGE DEPARTMENT

Raigarh Division Raigarh (C.G.)

CERTIFICATE

Certified that Mr. SATYENDRA KUMAR of Guru Ghasidas University, Bilaspur Chhattisgarh has successfully completed the Institutinal Attachment Training Programme organized by Forest & Climate Change Department, Raigarh Division Raigarh (C.G.) from 09/05/2022 to 15/05/2022. The Institute wishes bright future of his/her for future endeavour in academic advancement.

(Stylo Mandavi)
"IFS"
Divisional Forest Officer
Raigarh Dn. Raigarh (C.G.)

STUDY ON TASAR DIVERSITY AND ITS CULTIVATION IN CENTRAL TASAR RESEARCH & TRAINING INSTITUTE, RANCHI, JHARKHAND

(Student Project)

Submitted for partial fulfilment of requirement of the Master of Science
In
Forestry and Environmental Sciences

(Session- 2020-22)

Under the Supervision of:

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife
& Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Satyendra Kumar
M.Sc. Forestry & Environmental
Sciences (4th Semester)
Roll No. - 20412027
Enroll. No. – GGV/16/6254

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date: 09-09-2022

CERTIFICATE

This is to certify that the Student Project Report entitled "**STUDY ON TASAR DIVERSITY AND ITS CULTIVATION IN CENTRAL TASAR RESEARCH & TRAINING INSTITUTE, RANCHI, JHARKHAND**" submitted for the partial fulfilment of degree of **Master of Science in Forestry and Environmental Sciences to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Mr. Satyendra Kumar S/o Mr. Rakesh Kumar** of **M.Sc. Forestry & Environmental Sciences (IVth Semester)** and **Enrollment No. (GGV/16/6254)** under my guidance and supervision.

I wish him all the success for his future academic endeavours.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(Dr. Ajay Kumar Singh)
Supervisor
Dr. Ajay Kumar Singh
Assistant Professor
Dept. of Forestry, Wildlife & Env. Sci.
Guru Ghasidas Vishwavidyalaya
Bilaspur (C.G.)

DECLARATION

I hereby declare that the present **Student Project Report** entitled **"STUDY ON TASAR DIVERSITY AND ITS CULTIVATION IN CENTRAL TASAR RESEARCH & TRAINING INSTITUTE, RANCHI, JHARKHAND"** interpretation or part has not been submitted for any degree or diploma of any university. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Date-09--09-2022

Place- Bilaspur (C.G.)

Satyendra Kumar
M.Sc. Forestry & Environmental Sciences IV th Semester
Roll. No.: 20412027
Enrollment No.: GGV/16/6254

INSTITUTIONAL ATTACHMENT REPORT
ON
INSTITUTE OF FOREST PRODUCTIVITY RANCHI, JHARKHAND
&
SERICULTURE RESEARCH, DEVELOPMENT & TRAINING INSTITUTE, KONI, BILASPUR (C.G.)

Submitted for partial fulfilment of requirement of the Master of Science
In
Forestry and Environmental Sciences

(Session- 2020-22)

Under the Supervision of:

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife
& Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Satyendra Kumar
M.Sc. Forestry & Environmental Sciences (4th Semester)
Roll No. - 20412027
Enroll. No. – GGV/16/6254

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date: 09-09-2022

CERTIFICATE

This is to certify that the Institutional Attachment Report entitled **"INSTITUTIONAL ATTACHMENT REPORT ON INSTITUTE OF FOREST PRODUCTIVITY RANCHI, JHARKHAND AND SERICULTURE RESEARCH, DEVELOPMENT & TRANING INSTITUTE, KONI BILASPUR (C.G.)"** submitted for the partial fulfilment of Degree of **Master of Science in Forestry and Environmental Sciences to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Mr. Satyendra Kumar S/o Mr. Rakesh Kumar** of **M.Sc. Forestry & Environmental Sciences (IVth Semester)** and **Enrollment No. (GGV/16/6254)** under my guidance and supervision.

I wish him all the success for his future academic endeavours.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(Dr. Ajay Kumar Singh)
Supervisor

Dr. Ajay Kumar Singh
Assistant Professor
Dept. of Forestry, Wildlife & Env. Scien
Guru Ghasidas Vishwavidyalaya
(Central University) Bilaspur (C.G.)

DECLARATION

I hereby declare that the present **Institutional Attachment Report** entitled **"INSTITUTIONAL ATTACHMENT REPORT ON INSTITUTE OF FOREST PRODUCTIVITY RANCHI, JHARKHAND AND SERICULTURE RESEARCH, DEVELOPMENT & TRAINING INSTITUTE, KONI BILASPUR (C.G.)"** interpretation or part has not been submitted for any degree or diploma of any university. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Date—09-09-2022

Place- Bilaspur (C.G.)

Satyendra Kumar
M.Sc. Forestry & Environmental Sciences IV th Semester
Roll. No.: 20412027
Enrollment No.: GGV/16/6254

INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **SATYENDRA KUMAR** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

BRIEF (IFP,RANCHI)

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3.	Role of Molecular Marker in Diversity studies of forest tree Spices	Shri Ayushman Malakar (Ph.D. Scholar, JRF)	08-11
4.	Principles of plant Tissue Culture	Dr. Animesh Sinha (Scientist- E, Head, Genetics)	12-15
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7.	Classical Biological control of insect pest & Visit to Insectory	Mr. Subhash Chandra(Sci-D, Forest protection, Silviculture & forest mgnt.)	24-25
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विभागाध्यक्ष
Head
यानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

COMPUTATIONAL SKILLS REPORT

Submitted for Partial fulfilment of requirement of the Master of Science
In
Forestry and Environmental Sciences

(Session- 2020-22)

Under the Supervision of:

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife
& Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Satyendra Kumar
M.Sc. Forestry & Environmental
Sciences (4th Semester)
Roll No. - 20412027
Enroll. No. – GGV/16/6254

DEPARTMENT OF FORESTRY, WILDLIFE
& ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date: 09-09-2022

CERTIFICATE

This is to certify that the Report entitled **"COMPUTATIONAL SKILL REPORT"** submitted for the partial fulfilment of Degree of **Master of Science in Forestry and Environmental Sciences to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Mr. Satyendra Kumar S/o Mr. Rakesh Kumar** of **M.Sc. Forestry & Environmental Sciences (IVth Semester)** and **Enrollment No. (GGV/16/6254)** under my guidance and supervision.

I wish him all the success for his future academic endeavours.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(Dr. Ajay Kumar Singh)
Supervisor

Dr. Ajay Kumar Singh
Assistant Professor
Dept. of Forestry, Wildlife & Env. Sciences
Guru Ghasidas Vishwavidyalaya
A Central University

DECLARATION

I hereby declare that the entitled **"Computational Skill Report"** interpretation or part has not been submitted for any degree or diploma of any university. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Date—09-09-2022

Place- Bilaspur (C.G.)

Satyendra Kumar
M.Sc. Forestry & Environmental Sciences IV th Semester
Roll. No.: 20412027
Enrollment No.: GGV/16/6254

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Report on

"Studies On Morphological Characteristics and Utilization of Selected Tree Species of Institute of Forest Productivity (IFP) Ranchi, Jharkhand"

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2020-22

Under the Supervision of -

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife &
Environmental Science, Guru Ghasidas
Vishwavidyalaya, Bilaspur (C.G.)

Submitted By -

Shikha Singh Tanwar
M.Sc. Forestry and
Environmental Science (4th semester)
Roll No. 20412028
Enrollment No. GGV/20/06709

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date- 09/ Sept./2022.

CERTIFICATE

This is to certify that the Student Report entitled **"STUDIES ON MORPHOLOGICAL CHARACTERISTICS AND UTILIZATION OF SELECTED TREE SPECIES OF INSTITUTE OF FOREST PRODUCTIVITY (IFP) RANCHI, JHARKHAND"** submitted for the partial fulfilment of Degree of **Master of Science in Forestry and Environmental Science to Department of Forestry, Wildlife & Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Miss Shikha Singh Tanwar D/o Mr. Devendra Sharan Pal Singh Tanwar** of **M.Sc. Forestry & Environmental Science (IVth Semester) & Enrolment No. (GGV/20/06709)** under my guidance and supervision.

I wish her all the success for her future academics endeavours.

Date- 14/09/22

Dr. Ajay Kumar Singh
Assistant Professor
Dept. of Forestry, Wildlife & Env. Science
Guru Ghasidas Vishwavidyalaya
(Central University) Bilaspur (C.G.)

Dr. Ajay Kumar Singh
Supervisor
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, GGU

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the present Student Report entitled **" STUDIES ON MORPHOLOGICAL CHARACTERISTICS AND UTILIZATION OF SELECTED TREE SPECIES OF INSTITUTE OF FOREST PRODUCTIVITY (IFP) RANCHI, JHARKHAND"** interpretation or part has not been submitted for any degree or diploma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Shikha Singh Tanwar

Roll. No. 20412028

(Enrol. No. GGV/20/06709)

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date – 09/09/2022

Abstract

Total of 19 tree species belonging to 14 families were recorded from the study area (random sampling from total area of IFP). Fabaceae and Malvaceae was found to be the dominant family among tree species and is represented by 3 species each which was followed by Meliaceae with 2 species. Families like Mimosaceae, Sapotaceae , Phyllanthaceae , Callophyllaceae , Anacardiaceae , Bombaceae , Myrtaceae , Caesalpinaceae , Combretaceae , Bignoniaceae and Rubiaceae was represented by one species each.

It is observed that vegetation of Institute of Forest Productivity (IFP), Ranchi, Jharkhand has good species diversity.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

FOREST ATTACHMENT REPORT

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2020-22

Under the Supervision of -

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife &
Environmental Science, Guru Ghasidas
Vishwavidyalaya, Bilaspur (C.G.)

Submitted By -

Shikha Singh Tanwar
M.Sc. Forestry and
Environmental Science (4th semester)
Roll No. 20412028
Enrollment No. GGV/20/06709

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date- 09/ Sept./2022.

CERTIFICATE

This is to certify that the Forest Attachment Report entitled "**FOREST ATTACHMENT REPORT OF MARWAHI, KOTA & BHAINSAJHAR** " submitted for the partial fulfilment of Degree of **Master of Science in Forestry and Environmental Science to Department of Forestry, Wildlife & Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Miss Shikha Singh Tanwar D/o Mr. Devendra Sharan Pal Singh Tanwar** of **M.Sc. Forestry & Environmental Science (IVth Semester) & Enrolment No. (GGV/20/06709)** under my guidance and supervision.

I wish her all the success for her future academics endeavours.

Date- 14/09/22

Dr. Ajay Kumar Singh
Assistant Professor
Dept. of Forestry, Wildlife & Env. Sc
Guru Ghasidas Vishwavidyalaya
(A Central University) Bilaspur (C.G.)

Dr. Ajay Kumar Singh
Supervisor
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, GGU

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CERTIFICATE

OF PARTICIPATION

Certified that Miss. **SHIKHA SINGH TANWAR** Student of M.Sc. Forestry & Environmental science, Department of Forestry, Wildlife & Environmental sciences , Guru Ghasidas University Bilaspur Chhattisgarh has Successfully Completed the Forest Attachment & Field Training Programme Organised By Forest Department Marwahi Division , Marwahi Chhattisgarh From 05/05/2022 to 15/05/2022. The Forest Department wishes Bright Future of Her For Future endeavour in academic advancement.

Mr. Dinesh Patel (IFS)

DFO , Marwahi Division

DECLARATION

I hereby declare that the present Forest Attachment Report entitled " **FOREST ATTACHMENT REPORT**" interpretation or part has not been submitted for any degree or diploma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.



Shikha Singh Tanwar

Roll. No. 20412028

(Enrol. No. GGV/20/06709)

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date – 09/09/2022

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Institutional Attachment Report

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Academic Session – 2020-22

Under the Supervision of -

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife & Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Submitted By -

Shikha Singh Tanwar
M.Sc. Forestry and Environmental Science (4th semester)
Roll No. 20412028
Enrollment No. GGV/20/06709

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date- 09/ Sept./2022.

CERTIFICATE

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I wish her all the success for her future academics endeavours.

Date- 14/09/22

Dr. Ajay Kumar Singh
Assistant Professor
Dept. of Forestry, Wildlife & Env. Scie
Guru Ghasidas Vishwavidyalaya
Central University Bilaspur (C.G.)

Dr. Ajay Kumar Singh
Supervisor
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, GGU

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the present Institutional Attachment report entitled **"INSTITUTIONAL ATTACHMENT REPORT ON INSTITUTE OF FOREST PRODUCTIVITY RANCHI, JHARKHAND & SERICULTURE RESEARCH, DEVELOPMENT AND TRAINING INSTITUTE BILASPUR (C.G.)"** interpretation or part has not been submitted for any degree or diploma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Shikha Singh Tanwar

Roll. No. 20412028

(Enrol. No. GGV/20/06709)

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date – 09/09/2022

INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **SHIKHA SINGH TANWAR** of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

"Computational Skill Report"

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2021-22

Under the Supervision of -

Dr. Ajay Kumar Singh
Assistant Professor
Department of Forestry, Wildlife &
Environmental Science, Guru Ghasidas
Vishwavidyalaya, Bilaspur (C.G.)

Submitted By -

Shikha Singh Tanwar
M.Sc. Forestry and
Environmental Science (4th semester)
Roll No. 20412028
Enrollment No. GGV/20/06709

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date- 09/ Sept./2022.

CERTIFICATE

This is to certify that the Training Report entitled "**COMPUTATIONAL SKILL**" submitted for the partial fulfilment of Degree of **Master of Science in Forestry and Environmental Science to Department of Forestry, Wildlife & Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh** has been carried out by **Miss Shikha Singh Tanwar D/o Mr. Devendra Sharan Pal Singh Tanwar** of **M.Sc. Forestry & Environmental Science (IVth Semester) & Enrolment No. (GGV/20/06709)** under my guidance and supervision.

I wish her all the success for her future academics endeavours.

Date-10/09/22

Dr. Ajay Kumar Singh
Assistant Professor
Dept. of Forestry, Wildlife & Env. Scier
Guru Ghasidas Vishwavidyalaya
(Central University) Bilaspur (C.G.)

Dr. Ajay Kumar Singh
Supervisor
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, GGU

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the present Training Report entitled **"COMPUTATIONAL SKILL "** interpretation or part has not been submitted for any degree or diploma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

Shikha

Shikha Singh Tanwar

Roll. No. 20412028

(Enrol. No. GGV/20/06709)

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date – 09/09/2022

Abstract

To make better decision, to improve productivity, to save time, money and manpower in forest management activities, required are dynamic both locational and descriptive inventory data, rather geographic information. The evolution of GIS, the Global Positioning System (GPS), and Remote Sensing (RS) technologies has enabled the collection and analysis of field data in ways that were not possible before the arrival of computers. Including with studies on, Introduction to Computers and personal computers, about hardware, software, Input & Output Devices, Studies on open source and closed source operating system, DOS, Windows operating system, programming languages BASIC languages and programming concepts, MS Office – Word, Excel, Power Point, Access, Introduction to statical and Remote sensing software i.e. QGIS , Multimedia and Its Application and Internet uses.

The range of applications reviewed in this essay is clear evidence to the significant value of forests and the potential of GIS to aid in their management. Despite the diversity of applications, however, several broad conclusions can be reached about the role of GIS in forestry.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Studies on Air Pollution Tolerance Index of Trees Around Sirgitti Industrial Area in Bilaspur District of Chhattisgarh

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2021-22

(Forest Management)

Under the Supervision of:	Submitted By:
Dr. Brijendra Pratap Singh	**Shivam Dinkar**
Assistant Professor Department of Forestry, Wildlife & Environmental Science,Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)	M.Sc. Forestry and Environmental Science Roll No. **20412029** Enrollment No. **GGV/20/06710**

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that this report entitled " **Studies on Air Pollution Tolerance Index of Trees Around Sirgitti Industrial Area in Bilaspur District of Chhattisgarh**". submitted by **Mr. Shivam Dinkar** in partial fulfilment of the requirement for the award of the degree of Master of Science (Forestry and Environmental Science) under Guru Ghasidas Vishwavidyalaya Bilaspur Chhattisgarh, is the outcome of an original research work carried out by him under my supervision. The work has been carried out in the laboratory of P.G. Department of Forestry & Environmental Sciences and the results embodied in this report is original and have not been previously submitted either in part or full to any other institution, for the award of any degree or diploma.

I wish him all success in his future endeavours.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh

(Supervisor)

Assistant Professor

Department of Forestry Wildlife and Environmental Science

Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

DECLARATION

I, Shivam Dinkar (M.Sc. Forestry & Environmental Science Enrol. No. GGV/20/06710, Roll. No. 20412029), do hereby declare that this report entitled "**Studies on Air Pollution Tolerance Index of Trees Around Sirgitti Industrial Area in Bilaspur District of Chhattisgarh**" is a result of the original work carried out by me under the kind supervision of **Dr. Brijendra Pratap Singh**, Guru Ghasidas Vishwavidyalaya, Bilaspur Chhattisgarh, as a part of the award for the degree of **Master of Science in Forestry & Environmental Science**. To the best of my knowledge, it contains no materials previously published or written by another person and that which is presented in form of citations, have been duly acknowledged in the "Reference" section. I have acknowledged all the agencies and persons concerned who have directly or indirectly assisted me during the sampling, processing, analysis, and preparation of this report.

I am fully aware while I declare that this report has not been previously submitted to this university or any other institution for the award of any other degree or diploma.



Shivam Dinkar

Roll. No. 20412029

(Enrol. No. GGV/20/06710)

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date – 09/09/2022

Abstract

Air Pollution Tolerance Index (APTI) was calculated for various plant species around Sirgitti Industrial Area in Bilaspur District of Chhattisgarh. Studies were carried out to determine the physiological response of plant species, *Ficus religiosa, Ficus Benghalensis, Saraca asoca, Peltophorum petrocarpum, Neolamarckia cadamba, Moringa Olifera, Ziziphus Mauritian, Melia azedarach, Eculaptus alba, Millettia pinnata, Butea monosperma, Tectona grandis, Azadirachta indica, Acacia nilotica, Syzygium cumini* in Sirgitti Industrial Area in Bilaspur. The objective was to identify the air pollution tolerance plant species. The leaf samples collected from these plant species were used to determine their APTI by calculating the ascorbic acid, total chlorophyll, pH and relative water contents for sites. Response of plants towards air pollution assessed by APTI. Based on APTI , *Syzygium cumini* (21.48) > *Saraca asoca* (18.44) > *Neolamarckia cadamba* (15.20) > *Ficus Benghalensis* (15.02) > *Tectona grandis* (14.14) > *Peltophorum petrocarpum* (14.08) Were found high air pollution tolerant. *Azadirachta indica* (13.42) > *Ficus religiosa* (12.47) > *Acacia nilotica* (12.20) > *Melia azedarach* (11.97) > *Moringa olifera* (11.96) > *Ziziphus mauritian* (10.68) > *Millettia pinnata* (10.48) > *Eculaptus alba* (10.47) > *Butea monosperma* (10.08) can be considered to show intermediate response and there is no any species selected are found to be sensitive i.e. below (8.00) which can be considered to show sensitive response.

The APTI determination provides a reliable method for screening sensitive tolerant plants under field conditions where the air-shed is contaminated by a variety of pollutants. The susceptibility level of plants to air pollutions as indicated through their index values, compared well with the responses of plants observed under laboratory field experiments.



विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDIES ON AIR POLLUTION TOLERANCE INDEX OF TREES AROUND SIRGITTI INDUSTRIAL AREA IN BILASPUR DISTRICT OF CHHATTISGARH

STUDENT REPORT

SUBMITTED FOR THE AWARD OF DEGREE OF

MASTER OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

IN

THE SCHOOL OF STUDIES OF NATURAL RESOURCES

TO

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University established by the Central University Act 2009 No. 25 of 2009)

BY

SHIVAM DINKAR

UNDER THE SUPERVISION OF

Dr. Brijendra Pratap Singh

Assistant Professor

Department of Forestry, Wildlife and Environmental Science

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

RESEARCH CENTRE

DEPARTMENT OF FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University) BILASPUR (C.G.)

2022

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

FOREST ATTACHMENT REPORT

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2021-22

(Forest Management)

Under the Supervision of:	Submitted By:
Dr. Brijendra Pratap Singh	**Shivam Dinkar**
Assistant Professor Department of Forestry, Wildlife & Environmental Science Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)	M.Sc. Forestry and Environmental Science Roll No. **20412029** Enrollment No. **GGV/20/06710**

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date - 09/Sept./2022

CERTIFICATE

This is to certify that this report entitled " **Forest Attachment Report**". submitted by **Mr. Shivam Dinkar** in partial fulfilment of the requirement for the award of the degree of Master of Science (Forestry and Environmental Science) under Guru Ghasidas Vishwavidyalaya, is the outcome of an original research work carried out by him under my supervision.

I wish him all success in his future endeavor.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh
(Supervisor)
Assistant Professor
Department of Forestry Wildlife and
Environmental Science
Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

DECLARATION

I, Shivam Dinkar (M.Sc. Forestry & Environmental Science Enrol. GGV/20/06710 (Roll No. - 20412029), do hereby declare that this report entitled " **Forest Attachment Report** "is a result of the original work carried out by me under the kind supervision of **Dr. Brijendra Pratap Singh**, Guru Ghasidas Central University, as a part of the award for the degree of **Master of Science in Forestry & Environmental Science**. To the best of my knowledge, it contains no materials previously published or written by another person and that which is presented in form of citations, have been duly acknowledged in the "Reference" section. I have acknowledged all the agencies and persons concerned who have directly or indirectly assisted me during the sampling, processing, analysis and preparation of this report.

I am fully aware while I declare that this report has not been previously submitted to this university or any other institution for the award of any other degree or diploma.

Shivam Dinkar

(Enrol. No. GGV/20/06710)

(Roll. No. 20412029)

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date – 09/09//2022

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Institutional Attachment Report

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCES

Academic Session – 2021-22

(Forest Management)

Under the Supervision of:	Submitted By:
Dr. Brijendra Pratap Singh	**Shivam Dinkar**
Assistant Professor Department of Forestry, Wildlife & Environmental Science Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)	M.Sc. Forestry and Environmental Science Roll No. **20412029** Enrollment No. **GGV/20/06710**

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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Date - 09/Sept./2022

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This is to certify that this Report entitled "**Institutional Attachment Report**". submitted by **Mr. Shivam Dinkar** in partial fulfilment of the requirement for the award of the degree of Master of Science (Forestry and Environmental Science) under Guru Ghasidas Vishwavidyalaya, is the outcome of an original research work carried out by him under my supervision. The work has been carried out in the Institute of Forest Productivity, Ranchi and the results embodied in this report is original and have not been previously submitted either in part or full to any other institution, for the award of any degree or diploma.

I wish him all success in his future endeavours.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh

(Supervisor)

Assistant Professor

Department of Forestry Wildlife and Environmental Science

Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

DECLARATION

I, Shivam Dinkar (M.Sc. Forestry & Environmental Science Enrol. GGV/20/06710 (Roll No. - 20412029), do hereby declare that this report entitled "**Institutional Attachment Report**" is a result of the original work carried out by me under the kind supervision of **Dr. Brijendra Pratap Singh**, Guru Ghasidas Vishwavidyalaya, as a part of the award for the degree of **Master of Science in Forestry & Environmental Science**. To the best of my knowledge, it contains no materials previously published or written by another person and that which is presented in form of citations, have been duly acknowledged in the "Reference" section. I have acknowledged all the agencies and persons concerned who have directly or indirectly assisted me during the sampling, processing, analysis, and preparation of this report.

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Shivam Dinkar

Roll. No. 20412029

(Enrol. No. GGV/20/06710)

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date – 09/09//2022

A Report on
Sericulture Training

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCES

Academic Session – 2021-22

(Forest Management)

Under the Supervision of:	Submitted By:
Dr. Brijendra Pratap Singh	**Shivam Dinkar**
Assistant Professor Department of Forestry, Wildlife & Environmental Science Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)	M.Sc. Forestry and Environmental Science Roll No. 20412029 Enrollment No. GGV/20/06710

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR (C.G.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A Report on

"Computational Skills"

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Academic Session – 2021-22

(Forest Management)

Submitted To -	Submitted By:
Dr. Brijendra Pratap Singh	**Shivam Dinkar**
Assistant Professor Department of Forestry, Wildlife & Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)	M.Sc. Forestry and Environmental Science Roll No. 20412029 Enrollment No. GGV/20/06710

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

Date - 09/Sept./2022

CERTIFICATE

I have great pleasure in certifying that **Mr. Shivam Dinkar** S/o **Mr. T.R. Dinkar** is a regular student of M.Sc. Forestry IV Semester during the session of 2021-22 of Department of Forestry, Wildlife and Environmental Science Guru Ghasidas Vishwavidyalaya Bilaspur. He has Completed his report entitled **"A report on Computational skills"** during this Semester under my supervision and guidance.

I wish him all the success for his academics.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh
(Supervisor)
Assistant Professor
Department of Forestry, Wildlife and Environmental Science
Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

DECLARATION

I, Shivam Dinkar (M.Sc. Forestry & Environmental Science Enrol. GGV/20/06710 Roll. 20412029), do hereby declare that this Report entitled "**A Report on Computational Skills**" is a result of the original work carried out by me under the kind supervision of **Dr. Brijendra Pratap Singh**, Guru Ghasidas Vishwavidyalaya, as a part of the award for the degree of **Master of Science in Forestry & Environmental Science**. To the best of my knowledge, it contains no materials previously published or written by another person and that which is presented in form of citations, have been duly acknowledged in the "Reference" section. I have acknowledged all the agencies and persons concerned who have directly or indirectly assisted me during the sampling, processing, analysis, and preparation of this report.

I am fully aware while I declare that this report has not been previously submitted to this university or any other institution for the award of any other degree or diploma.

Shivam Dinkar

Roll. No. 20412029

(Enrol. No. GGV/20/06710)

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date – 09/09/2022

Abstract

To make better decision, to improve productivity, to save time, money and manpower in forest management activities, required are dynamic both locational and descriptive inventory data, rather geographic information. The evolution of GIS, the Global Positioning System (GPS), and Remote Sensing (RS) technologies has enabled the collection and analysis of field data in ways that were not possible before the arrival of computers. Including with studies on, Introduction to Computers and personal computers, Basic Concepts (H/W), S/W, Input & Output Devices, Studies on open source and closed source operating system, DOS, Windows operating system, programming languages BASIC languages and programming concepts, MS Office – Word, Excel, Power Point, Access, Introduction to statical and Remote sensing software i.e. QGIS , Multimedia and Its Application and Internet uses.

The range of applications reviewed in this essay is clear evidence to the significant value of forests and the potential of GIS to aid in their management. Despite the diversity of applications, however, several broad conclusions can be reached about the role of GIS in forestry.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A Report on
Computational Skills

SUBMITTED FOR THE AWARD OF DEGREE OF

MASTER OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

IN

THE SCHOOL OF STUDIES OF NATURAL RESOURCES

TO

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University established by the Central University Act 2009 No. 25 of 2009)

BY

SHIVAM DINKAR

UNDER THE SUPERVISION OF

DR. BRIJENDRA PRATAP SINGH

Assistant Professor

Department of Forestry, Wildlife and Environmental Science

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

RESEARCH CENTRE

DEPARTMENT OF FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCE

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University) BILASPUR (C.G.)

2022

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT PROJECT

ON

"Lichen population diversity with respect to air quality along road side of Achanakmar biosphere reserve and Chhattisgarh"

SESSION 2020-2022

MASTERS OF SCIENCE IN FORESTRY (2YEARS)

DEPARTMENT OF FORESTRY,WILD LIFE AND ENVIRONMENTAL SCIENCES GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

SUBMITTED TO :

Dr. Brijendra Pratap Singh

Assistant professor

Department of forestry, wildlife and Environmental sciences

SUBMITTED BY :

Shree Vatsh Singh

M.Sc. forestry 4th semester

Roll No. – 20412031

Enrollment No. GGV/20/06711

Guru Ghasidas Vishwavidyalaya,Bilaspur(C.G)

(A central university established under Central Universities Act 2009,No.25 of 2009)

CERTIFICATE

I have great pleasure in certifying that Mr. Shree Vatsh Singh S/O Mr. Vipnesh Singh is a regular student of M.Sc. Forestry 4th Semester during the session of 2020-22 of Department of Forestry, Wildlife and Environmental Sciences. He has completed this student project entitled **"Lichen population diversity with respect to air quality along road side of Achanakmar biosphere reserve and Chhattisgarh"** during this semester under my guidance. I wish him all the success in his academics.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

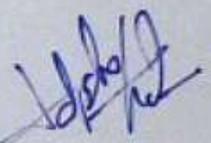
Dr. Brijendra Pratap Singh

Assistant Professor,

Department of Forestry, Wildlife and Environmental Sciences

DECLARATION

I here by declare that the project work entitled **"STUDENT PROJECT REPORT"** submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Dr. Brijendra Pratap Singh and this project work has been formed for the award of Masters of Science Degree in Forestry.



SUBMITTED BY :

Shree Vatsh Singh

M.Sc. forestry 4th semester

Roll No. – 20412031

Enrollment No. GGV/20/06711

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON

FOREST ATTACHMENT

PALI, BILASPUR (CG)

SESSION 2020-2022

MASTERS OF SCIENCE IN FORESTRY (2YEARS)

DEPARTMENT OF FORESTRY, WILD LIFE AND ENVIRONMENTAL SCIENCES GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

SUBMITTED TO :

Dr. Brijendra Pratap Singh

Assistant professor

Department of forestry, wildlife and Environmental sciences

SUBMITTED BY :

Shree Vatsh Singh

M.sc forestry 4th semester

Roll No. – 20412031

Enrollment No. GGV/20/06711

Guru Ghasidas Vishwavidyalaya, Bilaspur(C.G)

(A central university established under Central Universities Act 2009,No.25 of 2009)

CERTIFICATE

I have great pleasure in certifying that Mr. Shree Vatsh Singh S/O Mr. Vipnesh Singh is a regular student of M.Sc. Forestry 4th Semester during the session of 2020-22 of Department of Forestry, Wildlife and Environmental Sciences. He has completed this student project entitled **"A REPORT ON FOREST ATTACHMENT PALI, BILASPUR (CG)"** during this semester under my guidance. I wish him all the success in his academics.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh

Assistant Professor,

Department of Forestry, Wildlife and Environmental Sciences

DECLARATION

I here by declare that the project work entitled "**FOREST ATTACHMENT REPORT**" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Dr. Brijendra pratap singh and this project work has been formed for the award of Masters of Science Degree in Forestry.

SUBMITTED BY :

Shree Vatsh Singh

M.sc forestry 4th semester

Roll No. – 20412031

Enrollment No. GGV/20/06711

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A REPORT ON

"INSTITUTIONAL TRAINING AT INSTITUTE OF FOREST PRODUCTIVITY "

RANCHI, JHARKHAND

SESSION 2020-2022

MASTERS OF SCIENCE IN FORESTRY (2YEARS)

DEPARTMENT OF FORESTRY,WILD LIFE AND ENVIRONMENTAL SCIENCES GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

SUBMITTED TO :

Dr. Brijendra Pratap Singh

Assistant professor

Department of forestry, wildlife and Environmental sciences

SUBMITTED BY :

Shree Vatsh Singh

M.sc forestry 4th semester

Roll No. – 20412031

Enrollment No. GGV/20/06711

Guru Ghasidas Vishwavidyalaya, Bilaspur(C.G)

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CERTIFICATE

I have great pleasure in certifying that Mr. Shree Vatsh Singh S/O Mr. Vipnesh Singh is a regular student of M.Sc. Forestry 4th Semester during the session of 2020-22 of Department of Forestry, Wildlife and Environmental Sciences. He has completed this student project entitled **"A REPORT ON INSTITUTIONAL TRAINING AT INSTITUTE OF FOREST PRODUCTIVITY"** during this semester under my guidance. I wish him all the success in his academics.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh

Assistant Professor,

Department of Forestry, Wildlife and Environmental Sciences

DECLARATION

I here by declare that the project work entitled **"INSTITUTIONAL TRAINING PROGRAMME"** submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Dr. Brijendra Pratap Singh and this project work has been formed for the award of Masters of Science Degree in Forestry.

SUBMITTED BY :

Shree Vatsh Singh

M.sc forestry 4th semester

Roll No. – 20412031

Enrollment No. GGV/20/06711

Day	Time	Faculty	Subject
First Day -18.04.2022	10:00 am -1:00pm	Introductory lecture about institution	Dr. Yogeshwar Mishra, GCR and HOD, Silviculture Division
	2:00pm-03:30pm	Bamboo species cultivation and management practices(lecture)	Shri Ravi Shankar CTO, Silviculture Division
	3:30pm-05:30pm	Bamboo species identification(lecture)	Shri Ravi Shankar CTO, Silviculture Division and Shri Mahesh Kumar STA and PF working In Silviculture Division Field visit of Bamboosetum
Second Day-19.04.2022	10:00am-01:00pm	Role of Molecular markers in diversity assessment of Forestry species (lecture)	Dr. Aditya Kumar, Scientist-D Genetics Division
	02:30pm-05:30pm	Principles of Plant tissue culture (lecture) & Media preparation for culturing and visit to Molecular biology lab	Dr. Animesh Sinha, Scientist-E Head Genetics and Plant propagation Division
Third Day-20.04.2022	10:00am-11:00am	Visit to tissue culture lab for demonstration of techniques of inoculation/sub-culturing	Shri Atanu TA and other staff of Genetics division
	11:00pm-05:30pm	PSIP programme	Shri Sanjeev Kumar Scientist-E, Ecology, and rehabilitation
Fourth Day-21.04.2022	10:00am-01:00pm	Lac Cultivation and its role for livelihood	Shri S N Vaidya CTO & Shri B D Pandit TO
	2.30pm-5.30pm	Field exposure for Lac cultivation	
Fifth Day-22.04.2022	10:00am-05:30pm	NTPF identification and uses(lecture)&visit of lead garden	Shri Ravi Shankar CTO, Silviculture Division
Sixth Day-25.04.2022	10:00am-11:30am	Forest protection & Biological control of insect pest	Shri Subhash, Scientist-D Silviculture Division
	11:30am-01:30pm	Visit Insectory	
	02:30pm-05:30pm	Seed Production area Lecture	Dr. Yogeshwar Mishra, GCR and HOD, Silviculture Division
Seventh Day-26.04.2022	10:00am-11:30am	GIS based methodology for soil sampling from field	Dr. S.N Mishra, CTO Ecology and Rehabilitation Division
	11:30am-01:30pm	Demonstration of soil sample	Shri Satish TO and other staff
	02:30pm-05:30pm	Progeny testing (lecture)	Dr. Animesh Sinha, Scientist-E Head Genetics and Plant propagation Division
Eighth Day-27.04.2022	10:00am-02:30pm	Application of GIS and remote sensing in forestry sector (lecture)	Dr. Sharad Tiwari Scientist-G Information & Technology
	02:30pm-05:30pm	Visit of IT lab and IFP library	
Ninth Day-28.04.2022	10:00am-01:00pm	Visit to Mandar Research station abd demonstration of bamboo clonal trial Practical exposure to preparation of Vermicompost	Shri Rakesh Sinha, TO Mandar & Shri Pawan Kumar TA Research Station
	02:30pm-04:00pm	Closing Ceremony and valedictory	

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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PROGENY TESTING ..... **Error! Bookmark not defined.**

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

REPORT ON

QGIS TRAINING

BILASPUR, CHHATTISGARH

SESSION 2020-2022

MASTERS OF SCIENCE IN FORESTRY (2YEARS)

DEPARTMENT OF FORESTRY,WILD LIFE AND ENVIRONMENTAL SCIENCES GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

SUBMITTED TO :

Dr. Brijendra Pratap Singh

Assistant professor

Department of forestry, wildlife and Environmental sciences

SUBMITTED BY :

Shree Vatsh Singh

M.Sc. forestry 4th semester

Roll No. – 20412031

Enrollment No. GGV/20/06711

Guru Ghasidas Vishwavidyalaya,Bilaspur(C.G)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

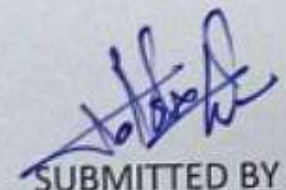
Dr. Brijendra Pratap Singh

Assistant Professor,

Department of Forestry, Wildlife and Environmental Sciences

DECLARATION

I here by declare that the project work entitled "**QGIS TRAINING PROGRAMME**" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Dr. Brijendra Pratap Singh and this project work has been formed for the award of Masters of Science Degree in Forestry.



SUBMITTED BY :

Shree Vatsh Singh

M.sc forestry 4th semester

Roll No. – 20412031

Enrollment No. GGV/20/06711

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

FOREST ATTACHMENT REPORT

Submitted for partial fulfilment of requirement of the Master of Science

In

Forestry and Environmental Science

Session- 2021-22

Under The Supervision of

Dr. Brijendra Pratap Singh

Assistant Professor

Department Of Forestry,

Wildlife & Environmental Sciences

GGV,Bilaspur(C.G)

Submitted By

Suhel Eraqui

MSc. Forestry 4th Semester

Roll No. 20412032

Enroll No. GGV/20/06712

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the forest attachment report entitled: ***"Forest Attachment Report"*** submitted for the partial fulfillment of *Degree of Master of Science in Forestry to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh* carried out by ***Suhel Eraqui M.Sc. Forestry 4th Semester*** *Student (Roll no. 20412032)* under my supervision, her work was appreciable and satisfactory

I wish her all the success in her future academic endeavors.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh
Assistant Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur(C.G)

Date: 12/09/2022

DECLARATION

I hereby declare that the present forest attachment report entitled "***Forest Attachment Report***" interpretation or part of it has not been submitted for an degree or diploma of any university the source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are authentic to my knowledge.



SUHEL ERAQUI

M.Sc. FORESTRY 4th SEMESTER (FM)

ROLL NO. 20412032

ENROLLMENT NO.-GGV/20/06712

ACKNOWLEDGEMENT

First of all I would like to thank god who bestowed me with patience and favorable condition and circumstances to achieve this feat.

I express my profound indebtness to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh for providing me all the necessary facility to complete my project work. I express my deep regards to Prof. S. S. Singh, Dean, School of Natural Resources, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh for his constant help and academic encouragement.

I express my deep regards to Dr. K. K. Chandra, Head, Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh for their valuable guidance and comments.

I express my deep sense of gratitude and thanks to my supervisor Dr. Brijendra Pratap Singh, Assistant Professor, Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh for his inspiring guidance, analytical powers and much needed critical comments during entire study period.

I pay my thanks to my teachers and staff members of the department for their constant encouragement, guidance and support for completion of this work.

I express my humble and sincere gratitude to all the attachment officers, that spared their valuable time for us and give more information and co-operate with us

I am highly obliged to my worthy parents, without their blessings and support this work would not have seen the light of the day. I also express my thanks to my all friends which have helped me during my field observations.

SUHEL ERAQUI

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1.2 ATTACHMENT WITH CHHATTISGARH FOREST DEPARTMENT

As a student of M.Sc. Forestry IV semester it is very essential to be aware of building up of all action plans of State Forest Department and their implementation on natural forest. To fulfill the practical knowledge, the Department of Forestry, GGV has organized a training program for one month

During this one month training program we went to various places connected with the forestry department and gained the actual practical knowledge about forest, nursery, plantation area, seed production area, felling coupes, processing units, non timber forest produces, propagation techniques, wildlife management, forest depot and its management etc.

Attachment officer – (SDO)

- **Range**

A forest range is a term used to define administrative regions containing one or more (usually) demarcated and (usually) protected or resource-managed forests.

- **Block**

It is the main territorial division of the forest, generally bounded by natural features and bearing a local name. Each block has a clear cut boundary, all rounded with numbers of pillar.

- **Compartment**

A block is divided into several compartment defined for purpose of administration and record. It is the smallest permanent working plan unit of management, location of work and record. The boundaries are formed either by natural features such as ridges, valley bottoms, streams or artificial lines such as fire lines.

1.3 TYPES OF FOREST

The major types of important forests in terms of forest department:

1. Reserved forest is a type of forest where forestry operations are not allowed and also human interference and NTFP collection is restricted. This type of forests are used for conservation purpose.

2. Protected forest is a type of forest where the forest is used in a sustainable way means a certain amount of human interference is allowed.

3. Revenue forest is a type of forest where all the forest products (like – wood, flowers, fruits, leaves, honey, etc) are used for commercial purpose to generate revenue.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A

REPORT ON INSTITUTIONAL ATTACHMENT TRAINING

SUBMITTED FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

SESSION 2021-22

UNDER THE SUPERVISION OF:

DR. BRIJENDRA PRATAP SINGH
ASSISTANT PROFESSOR
DEPARTMENT OF FORESTRY,
WILD LIFE AND ENVIRONMENTAL SCIENCE

SUBMITTED BY:

SUHEL ERAQUI
M.Sc. FORESTRY 4th Sem
ROLL NO-20412032
ENROLLMENT NO-GGV/20/06712

DEPARTMENT OF FORESTRY, WILD LIFE & ENVIRONMENTAL SCIENCES

GURU GHASI DAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No. 25 of 2009)

Guru GhasidasVishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)



CERTIFICATE

This is to certify that the Institutional Attachment Training Report and Sericulture training report submitted in partial fulfilment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru GhasidasVishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Suhel EraquiS/oMr. Najimuddin Eraqui*** *under my supervision and guidance.*

I wish Suhel Eraqui all the success in his academics.

Place: Bilaspur

Date: ..12.../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh
Supervisor
Assistant Professor
Department of Forestry, wildlife & Environmental Science. **Guru GhasidasVishwavidyalaya, Bilaspur C.G.**

DECLARATION

I here by declare that the Institutional Attachment Training Report and Sericulture training report submitted to Guru GhasidasVishwavidyalaya is record of ran original work done by me under the guidance "*Dr. Brijendra Pratap Singh*" and this project work has been formed for the award of master of Science Degree in Forestry.

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MSc. Forestry 4th Semester
Roll No. 20412032
Enrolment No.- GGV/20/06712

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Mr. SUHEL ERAQUI

MSc. Forestry 4th Semester
Roll No. 20412032

Enrolment No.- GGV/20/06712

CHHATTISGARH STATE MINOR FOREST PRODUCE (TRADING & DEVELOPMENT) CO-OP. FED. LTD.

SITAPUR, SURGUJA, (C.G.)

CERTIFICATE

Certified that Mr./Mrs./Miss **SUHEL ERAQUI** ..... of Guru Ghasidas University Bilaspur,Chhattisgarh has successfully completed the institutional attachment training programme organized by Chhattisgarh State Minor Forest Produce (Trading & Development) Co-op.fed.Ltd. Sitapur, Surguja, (C.G.) from 10.06.2022 to 14.06.2022. The Institute wishes bright future of his/her for future Endeavour in academic advancement.

गोदाम प्रभारी
बलराम गोदाम सीतापुर

(Mr. Chandrabhan Ram Bhagat)

Deputy Ranger/Training Coordinator

वन परिक्षेत्राधिकारी
सीतापुर

(Mr. Vijay Tiwari)

Forest Range Officer

Sitapur, Surguja (C.G.)

रेशम अनुसंधान विकास एवं प्रशिक्षण

बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. सुहेल इराकी पिता श्री नजीमुद्दीन इराकी छात्र/छात्रा, एम.एस. सी/पी.एच.डी. वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर को कोनी में **मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता** विषय पर, प्रशिक्षण सत्र 2022–2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर

दिनांकः- 04.07.2022

श्रीराम मीणा

संयुक्त संचालक रेशम

अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
tment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Introduction

Diospyros melanoxylon, the **Coromandel ebony** or **East Indian ebony**, is a species of flowering tree in the family Ebenaceae native to India and Sri Lanka; it has a hard, dry bark. Its common name derives from Coromandel, the coast of southeastern India. Locally it is known as *temburini* or by its Hindi name *tendu*. In Odisha, Jharkhand, and Assam, it is known as *kendu*. The leaves can be wrapped around tobacco to create the Indian *beedi*, which has outsold conventional cigarettes in India. The olive-green fruit of the tree is edible.

Leaves of tree species Diospyros melanoxyion are used as wrappers of tobacco to produce bidi. This tree is commonly known as "tendu," but also called "abnus" in Andhra Pradesh, "kendu" in Orissa and West Bengal, "tembru" in Gujarat, "kari" in Kerala, "tembhurni" in Maharahstra, and "bali tupra" in Tamil Nadu. Botanical name of the tree is Diospyros melanoxyion. Off-cuts of leaves are burned and the ash is used in tooth powder. Diospyros melanoxylon leaf is considered the most suitable wrapper on account of the ease with which it can be rolled and its wide availability. Leaves of many other plants like Butea monosperma, Shorea robusta etc. also find use as Bidi wrappers in different parts of the country but the texture, flavour and workability of diospyros leaves are unmatchable. The wide-scale use of Diospyros melanoxylon leaves in Bidi industry is mainly based on their enormous production, agreeable flavour, flexibility, resistance to decay and capacity to retain fires.



विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYALAYA

A CENTERAL UNIVERSITY



DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

STUDENT PROJECT
ON

"COMPARATIVE STUDY OF ENVIRONMENTAL AWARENESS AMONG THE RURAL AND URBAN PEOPLES UNDER IN BILASPUR REGION OF CHHATTISGARH"

SUBMITTED TO

Dr. BRIJENDRA PRATAP SINGH
ASSISTANT PROFESSOR

SUBMITTED BY

SUHEL ERAQUI
MSC, FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCE
4TH SEMESTAR
(FOREST MANAGEMENT)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled "Comparative study of environmental awareness among the rural and urban peoples under in Bilaspur region of Chhattisgarh" submitted in partial fulfillment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Suhel Eraqui S/o Mr. Najimuddin Eraqui*** *under my supervision and guidance.*

I wish Suhel Eraqui all the success in his academics.

Place: Bilaspur

Date: 12./Sept./2022.

विभागाध्यक्ष
Head
यानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh
Supervisor
Assistant Professor
Department of Forestry, wildlife & Environmental Science. **Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.**

DECLARATION

I here by declare that the student project work entitled *"Comparative study of environmental awareness among the rural and urban peoples under in Bilaspur region of Chhattisgarh"* submitted to Guru Ghasidas Vishwavidyalaya is record of ran original work done by me under the guidance *"Dr. Brijendra Pratap Singh"* and this project work has been formed for the award of master of Science Degree in Forestry.

Mr. SUHEL ERAQUI
MSc. Forestry 4th Semester
Roll No. 20412032
Enrolment No. GGV/20/06712

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Mr. SUHEL ERAQUI
MSc. Forestry 4th Semester
Roll No. 20412032
Enrolment No. GGV/20/06712

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER I

INTRODUCTION

Human being is a product of organic evolution and natural environment. His very existence, survival and progress on earth depend on the quality of the environment. The term environment comes from the Latin word 'environ' which is the combination of two words i.e., En (in) Viron (circle) which means to encircle or to surround. According to International Encyclopedia of Social Sciences, environment is the aggregate of all external conditions and influences affecting the life and development of an organism. Dictionary of Social Sciences defines environment as consists of all the external sources of factors to which a person or aggregate of persons are actually or potentially responsive (Dubey and Samal 1998). Thus, the word environment refers to the surroundings, the aggregate of circumstances of an organism or group of organisms specially the combination of external or extrinsic physical conditions that affect and influence the growth and development of organisms (Sandhu and Dhillon 2005).

In the present age the entire globe is facing severe environmental problems. The loss of forests, loss of soil productivity, decreasing reservoir of oil and natural gas, depletion of ozone layer, global warming are some of the problem of great concern for scientists and intellectuals all over the world. While over-exploitation of natural resources is responsible for some of these problems. The global problems relating to degradation of natural resources and pollution have increased dramatically. Natural resources are depleted by excessive use. Fresh water scarcity on a global scale, deforestation, degradation of coastal and marine areas, soil depletion and loss of biodiversity, are some of the problems that have become a major concern. Air and water pollution have reached such levels that have already resulted in serious health problems, as well as negative impact on the environment, and inevitably influencing prospects for long-term economic growth.

As the environment is a physical as well as biological concept, it encompasses both the non-living (abiotic) and living (biotic) components of the Earth .Thus ,based on

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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DEPARTMENT OF FORESTRY , WILDLIFE & ENVIRONMENTAL SCIENCE

REPORT ON QGIS TRAINING

SUBMITTED TO

Dr. BRIJENDRA PRATAP SINGH
ASSISTANT PROFESSOR

SUBMITTED BY

SUHEL ERAQUI
M.Sc. FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCE
4TH SEMESTER
(FOREST MANAGEMENT)

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Brijendra Pratap Singh

Supervisor

Assistant Professor

Department of Forestry, wildlife & Environmental Science.Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

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Mr. SUHEL ERAQUI
MSc. Forestry 4th Semester
Roll No. 20412032
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

❖ INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858) It was believed that cholera was spread by a " bad air " or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate,analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth.Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem solving tool through spatial analysis.GIS is more than just software. People and methods are combined with geospatial software and tools, to enable spatial analysis, manage large datasets, and display information in a map/graphical form.

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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT
ON
INDUSTRIAL TRAINING (ATTACHMENT WITH INSTITUTE OF FOREST PRODUCTIVITY, RANCHI)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY

(Session: 2021-22)

UNDER THE SUPERVISION OF

DR. ATUL KUMAR BHARDWAJ
Assistant professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

SUNAINA MINZ
M.Sc. forestry IV semester
Roll no. – 20412033
Enrollment no. – GGV/16/6258

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

I have great pleasure in certifying that ***Miss Sunainaminz D/O Mr. Sanatanminz*** *is a regular student of M.Sc. Forestry IV Semester during the session of 2021-22 of Department of Forestry, Wildlife and Environmental Sciences, G.G.V, Bilaspur. She has completed this training entitled "****Training Report on Industrial Training (Attachment with Institute of Forest Productivity, Ranchi)****" during this semester under my guidance.*
I wish him all the success in his future academic endeavours.

Date: 14/09/22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DR. ATUL KUMAR BHARDWAJ
Assistant professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G)

2

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DR. ATUL KUMAR BHARDWAJ
Assistant professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G)

2

DECLARATION

*I hereby declare that the project work entitled "**Training Report on Industrial Training (Attachment with Institute of Forest Productivity, Ranchi)**" submitted to Department of Forestry Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Prof. Atul Kumar Bhardwaj,** and this project work has been performed for the award of Master's degree in Forestry.*

SUNAINA MINZ
M.Sc. forestry IV semester
Roll no. – 20412033
Enrolment no. – GGV/16/6258

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING SCHEDULE

Day	Time	Faculty	Subject
First Day -18.04.2022	10:00 am.-1:00pm	Introductory lecture about institution	Dr. Yogeshwar Mishra, GCR and HOD, Silviculture Division
	2:00pm-03:30pm	Bamboo species cultivation and management practical(lecture)	Shri Ravi Shankar CTO, Silviculture Division
	3:30pm-05:30pm	Bamboo species identification(lecture)	Shri Ravi Shankar CTO, Silviculture Division and Shri Mahesh Kumar STA and FF working In Silviculture Division Field visit of Bambooseturn
Second Day-19.04.2022	10:00am-01:00pm	Role of Molecular markers in diversity assessment of Forestry species (lecture)	Dr. Aditya Kumar, Scientist-D Genetics Division
	02:30pm-05:30pm	Principles of Plant tissue culture (lecture) & Media preparation for culturing and visit to Molecular biology lab	Dr. Animesh Sinha, Scientist-E Head Genetics and Plant propagation Division
Third Day-20.04.2022	10:00am-11:00am	Visit to tissue culture lab for demonstration of techniques of inoculation/sub-culturing	Shri Atanu TA and other staff of Genetics division
	11:00pm-05:30pm	PSIP programme	Shri Sanjeev Kumar Scientist-E, Ecology, and rehabilitation
Fourth Day-21.04.2022	10:00am-01:00pm	Lac Cultivation and its role for livelihood	Shri S N Vaidya CTO & Shri B D Pandit TO
	2.30pm-5.30pm	Field exposure for Lac cultivation	
Fifth Day-22.04.2022	10:00am-05:30pm	NTPF identification and uses(lecture)&visit of lead garden	Shri Ravi Shankar CTO, Silviculture Division
Sixth Day-25.04.2022	10:00am-11:30am	Forest protection & Biological control of insect pest	Shri Subhash, Scientist-D Silviculture Division
	11:30am-01:30pm	Visit Insectory	
	02:30pm-05.30pm	Seed Production area Lecture	Dr. Yogeshwar Mishra, GCR and HOD, Silviculture Division
Seventh Day-26.04.2022	10:00am-11:30am	GIS based methodology for soil sampling from field	Dr. S.N Mishra, CTO Ecology and Rehabilitation Division
	11:30am-01:30pm	Demonstration of soil sample	Shri Satish TO and other staff
	02.30pm-05.30pm	Progeny testing (lecture)	Dr. Animesh Sinha, Scientist-E Head Genetics and Plant propagation Division
Eighth Day-27.04.2022	10:00am-02:30pm	Application of GIS and remote sensing in forestry sector (lecture)	Dr. Sharad Tiwari Scientist-G Information & Technology
	02.30pm-05.30pm	Visit of IT lab and IFP library	
Ninth Day-28.04.2022	10:00am-01:00pm	Visit to Mandar Research station abd demonstration of bamboo clonal trial Practical exposure to preparation of Vermicompost	Shri Rakesh Sinha, TO Mandar & Shri Pawan Kumar TA Research Station
	02:30pm-04:00pm	Closing Ceremony and valedictory	

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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3.	Role of Molecular Marker in Diversity studies of forest tree Spices	Shri Ayushman Malakar (Ph.D. Scholar, JRF)	
4.	Principles of plant Tissue Culture	Dr. Animesh Sinha (Scientist- E, Head, Genetics)	
5.	Lac Cultivation and its role for livelihood support	Shri S.N.Vidya (CTO) & Shri B.D. Pandit (T.O)	
6.	Identification of Medicinal Plants and its Uses.	Shri Ravi Shankar (CTO, Silvculture Dvision)	
7.	Classical Biological control of insect pest & Visit to Insectory	Mr. Subhash Chandra(Sci-D, Forest protection, Silviculture & forest mgnt.)	
8.	Carbon Sequestration in Soil & Terrestrial Vegetation	Dr. S.N.Mishra (CTO Ecology & Rehabilitation Division)	
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT
ON
FIELD TRAINING (ATTACHMENT WITH STATE FOREST DEPARTMENT)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY

(Session: 2021-22)

UNDER THE SUPERVISION OF

DR. ATUL KUMAR BHARDWAJ
Assistant Professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

SUNAINA MINZ
M.Sc. forestry IV semester
Roll no. – 20412033
Enrolment no. – GGV/16/6258

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

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I wish her all the success in his future academic endeavours.

Date: 14/03/22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DR. ATUL KUMAR BHARDWAJ

Assistant Professor

DepartmentofForestry,
Wildlife & Environmental
Sciences
GGV,Bilaspur(C.G)

DECLARATION

*I hereby declare that the project work entitled "**Training report on Field Training (Attachment with State Forest Department)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr DR. ATUL KUMAR BHARDWAJ (**Assistant Professor) and this project work has been performed for the award of Master's degree in Forestry & Environmental Science.*

SUNAINA MINZ
M.Sc. forestry IV semester
Roll no. – 20412033
Enrolment no. – GGV/16/6258

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT ON COMPUTER TRAINING PROGRAM ON QGIS

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY

(Session: 2021-22)

UNDER THE SUPERVISION OF

DR. ATUL KUMAR BHARDWAJ

Assistant professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

SUNAINA MINZ
M.Sc. forestry IV semester
Roll no. – 20412033
Enrolment no. – GGV/16/6258

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

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GURU GHASIDAS VISHWAVIDYLAYA BILASPUR
(C.G.)

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I wish her all the success in her future academic endeavours.

Date: 14/03/22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept. of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DR. ATUL KUMAR BHARDWAJ
Assistant professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G)

2

DECLARATION

*I hereby declare that the project work entitled "**Training report on Computer Training Program on QGIS)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr. ATUL KUMAR BHARDWAJ (assi. Prof)** and this project work have been performed for the award of Master's degree in Forestry.*

SUNAINA MINZ
M.Sc. forestry IV semester
Roll no. – 20412033
Enrolment no. – GGV/16/6258

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A

STUDENT PROJECT ON TENDU PATTA

SUBMITTED FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY

SESSION 2022

UNDER THE SUPERVISION OF

DR. ATUL KUMAR BHARDWAJ
Assistant Professor
Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

SUBMITTED BY

SUNAINA MINZ
M.Sc. forestry IV semester
Roll no. – 20412033
Enrolment no. – GGV/16/6258

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR
(C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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I wish her all the success in his future academic endeavours.

DR. ATUL KUMAR BHARDWAJ

Assistant Professor

DepartmentofForestry,

Wildlife & Environmental

Sciences

GGV,Bilaspur(C.G)

Date: 14/09/22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

*I hereby declare that the project work entitled "**Tendu patta** surajpur district **(Attachment with State Forest Department)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Dr DR. ATUL KUMAR BHARDWAJ** (Assistant Professor) and this project work has been performed for the award of Master's degree in Forestry & Environmental Science.*

SUBMITTED BY

SUNAINA MINZ
M.Sc. forestry IV semester
Roll no. – 20412033
Enrolment no. – GGV/16/6258

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYALAYA

A CENTERAL UNIVERSITY



DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

STUDENT REPORT
ON

"ISOLATION OF ARBUSCULAR MYCORRHIZAL FUNGI WITH PLANT ROOTS AND SPORAL DISTRIBUTION UNDER THE SELECTED PLANT SPECIES"

SUBMITTED TO

Dr. ATUL KUMAR BHARDWAJ
ASSISTANT PROFESSOR

SUBMITTED BY

VAIBHAV LAXMI TIWARI
M.Sc. FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCE
M.Sc. 4TH SEMESTAR
(FOREST MANAGEMENT)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled ***"Isolation of Arbuscular Mycorrhizal Fungi with Plant Roots and Sporal Distribution under the Selected Plant Species"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss. Vaibhav Laxmi Tiwari D/o Mr. Lakhan Tiwari*** *under my supervision and guidance.*

I wish Vaibhav Laxmi Tiwari all the success in her academics.

Place: Bilaspur

Date: ..12../Sept./2022.

Dr. Atul Kumar Bharadwaj

Supervisor

Assistant Professor

Department of Forestry, wildlife & Environmental Science.

Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

DECLARATION

I hereby declare that the student project work entitled "Isolation of Arbuscular Mycorrhizal Fungi with Plant Roots and Sporal Distribution under the Selected Plant Species" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance "Dr. Atul Kumar Bharadwaj" and this project work has been formed for the award of master of science degree in Forestry.

Miss. VAIBHAV LAXMI TIWARI
MSc. Forestry ,4th Semester
Enrolment No. GGV/20/06713

ACKNOWLEDGEMENT

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Miss. VAIBHAV LAXMI TIWARI
MSc. Forestry 4th Semester
Enrolment No. GGV/20/06713

CHAPTER I
INTRODUCTION

What is Mycorrhizae?

"Myco" – "rhiza" literally means "fungus" – "root" and describes the mutually beneficial relationship between the plant and root fungus.

In 1885, a German forest pathologist A. B. Frank discovered it.

Mycorrhiza is the mutual symbiotic relationship between green plants and fungi. The term "Mycorrhiza" is used to define the role of fungus in the plant's rhizosphere which is the root system. In this association, both are mutually beneficial - the plant through photosynthesis makes organic molecules.

These specialized fungi colonize plant roots in a symbiotic manner and extend far into the soil. Mycorrhizal fungal filaments in the soil are truly extensions of root systems and are more effective in nutrient and water absorption than the roots themselves.

More than 95 percent of terrestrial plant species form a symbiotic relationship with beneficial mycorrhizal fungi, and have evolved this symbiotic relationship over the past several hundred million years. These fungi predate the evolution of terrestrial plants, and it was the partnership with mycorrhizal fungi that allowed plants to begin to colonize dry land and create life on Earth as we know it.

Role of Mycorrhizae in Agriculture and Forestry:

ROLE IN AGRICULTURE:

1. The mycorrhizal association helps in the formation of dichotomous branching and profuse root growth, thus enhances plant growth.

2. Ectotrophic mycorrhiza helps in uptake of mineral ions and also acts as reservoir.

3. They also help in absorption of nutrients.

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ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYALAYA

A CENTERAL UNIVERSITY



DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

"TRAINING REPORT ON INDUSTRIAL TRAINING"

SUBMITTED TO

Dr. ATUL KUMAR BHARDWAJ
ASSISTANT PROFESSOR

SUBMITTED BY

VAIBHAV LAXMI TIWARI
MSC, FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCE
4TH SEMESTAR
(FOREST MANAGEMENT)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled "Training report on Industrial training"submitted in partial fulfillment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss. Vaibhav Laxmi Tiwari D/o Mr. Lakhan Tiwari*** *under my supervision and guidance.*

I wish Vaibhav Laxmi Tiwari all the success in her academics.

Place: Bilaspur

Date: ....12.../Sept./2022.

Dr. Atul Kumar Bharadwaj

Supervisor

Assistant Professor

Department of Forestry, wildlife & Environmental Science.

Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **VAIBHAV LAXMI TIWARI** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

रेशम अनुसंधान विकास एवं प्रशिक्षण
बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. वैभव लक्ष्मी तिवारी पिता श्री लखन तिवारी छात्र/छात्रा, एम.एस. सी/पी.एच.डी. वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर को कोनी में **मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता** विषय पर, प्रशिक्षण सत्र 2022–2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर
दिनांकः- 04.07.2022

श्रीराम मीणा
संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

DECLARATION

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Head
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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER -1

INTRODUCTION ABOUT THE INSTITUTE OF FOREST PRODUCTIVITY{IFP}

About the institute



Plate no. 1 Institute of Forest Productivity

Institute of Forest Productivity is a premier forestry research institute under Indian Council of Forestry Research & Education (ICFRE), situated on National highway (N.H.-24), lalgutwa, Ranchi. IFP catering to the forestry research needs in the states of Bihar, Jharkhand and West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country. In 1985 brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

- The total area of institute of forest productivity is 35 hectares.
- Since coming into existence in 1993, the institute has taken up a number of initiatives in the field of forestry and allied sciences through research projects and extension programmes, for the benefit of diverse category of stakeholders including tribal farmers, NGOs, State Forest Department, and forestry based institutes.
- The institute has specially established its technical expertise in Lac cultivation and over the years number of tribal farmers have been immensely benefited by the various extension activities run by the institute for the socio economic upliftment of the tribal.
- The Institute has well established soil testing lab, molecular biology lab, tree physiology and tissue culture lab, chemistry of forest produce lab and forest entomology lab. All these labs are well maintained and equipped with modern sophisticated equipments.

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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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GURU GHASIDAS VISHWAVIDYALAYA

A CENTERAL UNIVERSITY



DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCE

"TRAINING REPORT ON FOREST ATTACHMENT"

SUBMITTED TO

Dr. ATUL KUMAR BHARDWAJ
ASSISTANT PROFESSOR

SUBMITTED BY

VAIBHAV LAXMI TIWARI
MSC, FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCE
4TH SEMESTAR
(FOREST MANAGEMENT)

Guru Ghasidas Vishwavidyalaya, Bilaspur (C,G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled "Training Report on Forest Attachment" submitted in partial fulfillment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss. Vaibhav Laxmi Tiwari D/o Mr. Lakhan Tiwari*** *under my supervision and guidance.*

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Place: Bilaspur

Date: .12.../Sept./2022.

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Atul Kumar Bharadwaj

Supervisor

Assistant Professor

Department of Forestry, wildlife & Environmental Science.

Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

FOREST & CLIMATE CHANGE DEPARTMENT

Raigarh Division Raigarh (C.G.)

CERTIFICATE

Certified that Miss VAIBHAV LAXMI TIWARI of Guru Ghasidas University, Bilaspur Chhattisgarh has successfully completed the Institutinal Attachment Training Programme organized by Forest & Climate Change Department, Raigarh Division Raigarh (C.G.) from 09/05/2022 to 15/05/2022. The Institute wishes bright future of his/her for future endeavour in academic advancement.

(Stylo Mandavi)
"IFS"
Divisional Forest Officer
Raigarh Dn. Raigarh (C.G.)

DECLARATION

I here by declare that the student project work entitled *"Training Report on Forest Attachment"* submitted to Guru Ghasidas Vishwavidyalaya is record of ran original work done by me under the guidance *"Dr. Atul Kumar Bharadwaj"* and this project work has been formed for the award of master of Science Degree in Forestry.

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

STUDENT REPORT

Submitted for partial fulfilment of requirement of the Master of Science in Forestry & Environmental sciences (2 Years)

(Session-2021-22)

(Forest Management)

Under the Supervision of:

Dr. A.K. BHARDWAJ
Assistant Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Vivekanand Yadav
M.Sc. IV Semester
Roll No. 20412036
Enroll No. GGV/20/06715

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES
GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

Guru Ghasidas Vishwavidyalaya, Bilaspur(C.G.)

(A central university established under Central Universities Act 2009,No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled ***"Analysis Of different Soil Parameters Under Rhizospheric Zones Of Selected Tree Plantation"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences ,Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* **Mr. Vivekanand Yadav** ***S/o Mr. Tribhuwan Yadav*** *under my supervision and guidance.*

I wish **Vivekanand Yadav** ***all the success in his academics.***

Place: **Bilaspur**
Date: 12/Sept./2022

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr. Atul Kumar Bhardwaj

(Supervisor)

Assistant Professor
Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

DECLARATION

I hereby declare that the Student report work ***"Analysis Of Soil Parameters Under Rhizosphere Zones of Different Tree Species"*** submitted to **Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is record of an original work done by me under the guidance of ***Dr. Atul kumar Bhardwaj*** and this project work has been formed for the award of Degree of ***Master of Science in Forestry and Environmental Sciences*** *and not submitted anywhere else.*

Place:**Bilaspur**

Date: 12/.09../2022

Vivekanand Yadav
M.Sc. Forestry & Environmental Sciences
Roll No. 20412036
Enroll No. GGV/20/06715

ACKNOWLEDGEMENT

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I would like to take the opportunity and thank to Professor ***Dr. K.k.Chandra*** *for providing us good facilities for successful completion of our project on* ***Analysis Of different Soil Parameters Under Rhizospheric Zones Of Selected Tree Plantation****. I also thank all the Faculty Members for their valuable suggestion.*

I want to express my gratitude towards my ***Parents*** *for their encouragement which helped me in the completion of this project.*

This list is never ending, so I thank all those who directly or indirectly helped me to achieve my success.



Vivekanand Yadav
M.Sc. Forestry
Roll No. 20412036
Enroll– GGV/20/06715

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rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

1. Introduction

Forests cover 31 percent of the global land area. Approximately half the forest area is relatively intact, and more than one-third is primary forest (i.e. naturally regenerated forests of native species, where there are no visible indications of human activities and the ecological processes are not significantly disturbed).The total forest area is 4.06 billion hectares, or approximately 5000m^2 (or 50 x 100m) per person, but forests are not equally distributed around the globe. More than half of the world's forests are found in only five countries (the Russian Federation, Brazil, Canada, the United States of America and China) and two-thirds (66 percent) of forests are found in ten countries. Global distribution of forests showing the ten countries with the largest forest area, 2020 (million hectares and % of world's forest)

Since 1990, it is estimated that 420 million hectares of forest have been lost through conversion to other land uses, although the rate of deforestation has decreased over the past three decades. Between 2015 and 2020, the rate of deforestation was estimated at 10 million hectares per year, down from 16 million hectares per year in the 1990s. The area of primary forest worldwide has decreased by over 80 million hectares since 1990.Agricultural expansion continues to be the main driver of deforestation and forest degradation and the associated loss of forest biodiversity. Large-scale commercial agriculture (primarily cattle ranching and cultivation of soya bean and oil palm) accounted for 40 percent of tropical deforestation between 2000 and2010, and local subsistence agriculture for another 33 percent. It is not only the trees that make a forest, but the many different species of plants and animals that reside in the soil, under storey and canopy. Estimates of the total number of species on Earth range from 3 million to 100 million (May, 2010).

There are broadly five categories of forests in India. They are named as Tropical evergreen forests, Tropical deciduous forests, Tropical thorn forests, Montane forests, and Swamp forests. Although different geographers divide the forests into many other categories, these are supposed to remain uniform throughout the country. Let's take one by one in brief. These trees have broad leafs. India also has temperate deciduous forests but they are very less in number. These broad leaves are shed in the autumn season but it is in case of temperate deciduous mode. The tropical

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INDUSTRIAL TRAINING REPORT

Submitted for partial fulfilment of requirement of the Master of Science in Forestry & Environmental sciences (2 Years)

(Session-2021-22)

(Forest Management)

Under the Supervision of:

Dr. A.K. BHARDWAJ
Assistant Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

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M.Sc. IV Semester
Roll No. 20412036
Enroll No. GGV/20/06715

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(A Central University Established Under Central University Act 2009, No.25 of 2009)

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गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr.A.k.BHARDWAJ
(supervisor)
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
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DECLARATION

I hereby declare that the Industrial training report work "***Institute of Forest Productivity; Ranchi & Sericulture Training Koni; Bilaspur (C.G.)***" submitted to **Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is record of an original work done by me under the guidance of ***Dr. Atul kumar Bhardwaj*** and this project work has been formed for the award of Degree of ***Master of Science in Forestry and Environmental Sciences*** *and not submitted anywhere else.*

Place:Bilaspur

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INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss **VIVEKANAND YADAV** ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

रेशम अनुसंधान विकास एवं प्रशिक्षण

बिलासपुर

कार्यालय संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण, कोनी बिलासपुर (छ.ग.)

प्रमाण–पत्र

प्रमाणित किया जाता है कि श्री/कु. विवेकानंद यादव पिता श्री त्रिभूवन यादव छात्र/छात्रा, एम.एस. सी/पी.एच.डी. **वानिकी,वन्यजीव एवं पर्यावरण विज्ञान गुरू घासीदास के.वि.वि. बिलासपुर** को कोनी में **मलबरी/टसर नर्सरी, पौध रोपण, कृमिपालन बीजोत्पादन तकनीक तथा विपणन एवं उद्यमिता** विषय पर, प्रशिक्षण सत्र 2022–2023 में दिनांक 30.06.2022 से 04.07.2022 तक प्रशिक्षण प्रदान किया गया हैं ।

हम आपके उज्जवल भविष्य की कामना करते हैं ।

बिलासपुर
दिनांकः- 04.07.2022

श्रीराम मीणा
संयुक्त संचालक रेशम
अनुसंधान विकास एवं प्रशिक्षण बिलासपुर (छ.ग.)

ACKNOWLEDGEMENT

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I would like to thank our project supervisor for never ending support and motivation and also for helping nature towards the students.

I would also like to take the opportunity and thank our ***Department Head****, Professor,* ***Dr. K.K Chandra*** *for providing us good facilities for successful completion of our project in Industrial traning. I also thank all the Faculty Members for their valuable suggestion.*

I would like to thank ***Dr.Atul kumar bhardwaj(Asst. Professor,GGU), Dr.N.Kulkarni (IFP DIRECTOR), Dr.Yogeshwar Mishra (IFP Head of Silvicultural Division),Sri B. D. Pandit, Sri Suraj Kumar , Sri S.N.Vaidya , Sr Ravi Sankar, Dr. Aditya Kumar (Scientist-D), Dr.Sarad Tiwari, every staffs and my dear Batchmates*** *for their invaluable time and knowledge and experience which they shared with us during the webinars.*

I want to express my gratitude towards my ***Parents*** *for their encouragement which helped me in the completion of this project.*

This list is never ending, so I thank all those who directly or indirectly helped me to achieve my success in my endeavor.

Vivekanand Yadav
M.Sc. Forestry
Roll No. 20412036
Enrollment No.-GGV/20/06715

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER –1

INTRODUCTON ABOUT INSTITUTE

INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

About the institute-

I F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi.



Fig:1.1: Institute of Forest Productivity, Ranchi.

The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern India. The institute came into existence in year 1993 with the objective to formulate, organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim,Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

TRAINING REPORT
ON
COMPUTATIONAL SKILL

Submitted for partial fulfilment of requirement of the Master of Science in Forestry & Environmental sciences (2 Years)

(Session-2021-22)

(Forest Management)

Under the Supervision of:

Dr. A.K. BHARDWAJ

Assistant Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Vivekanand Yadav

M.Sc. IV Semester
Roll No. 20412036
Enroll No. GGV/20/06715

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

*is to certify that the Computer Application training report work entitled "**Training report on Computation Skills**" submitted in partial fulfillment of the requirements for the Degree of **Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)** is the work carried out by **Mr. Vivekanand Yadav** **S/o Mr. Tribhuwan Yadav** under my supervision and guidance.*

I wish* Vivekanand Yadav *all the success in his academics.

Place: **Bilaspur**
Date: 12/Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr.A.k.BHARDWAJ
(supervisor)
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

DECLARATION

I hereby declare that Computer Application training report work ***"Training report on Computation Skills"*** *submitted to* ***Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is record of an original work done by me under the guidance of* ***Dr. Atul kumar Bhardwaj*** *and this project work has been formed for the award of Degree of* ***Master of Science in Forestry and Environmental Sciences*** *and not submitted anywhere else.*

Place: **Bilaspur**

Date: 12./.09./2022

Vivekanand Yadav
M.Sc. Forestry & Environmental Sciences
Roll No. 20412036
Enroll No. GGV/20/06715

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V. Yadav

Vivekanand Yadav
M.Sc. IV Semester
Roll No. 20412036
Enroll No. GGV/20/06715

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

CHAPTER 1

COMPUTER FUNDAMENTALS

1.1 INTRODUCTION-

The term computer is derived from the word compute. The word compute means to calculate. A computer is an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desmyed output results. Computer performs both simple and complex operations, with speed and accuracy.

A computer is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use.

- A computer is a programmable device that can store, retrieve, and process data.
- A computer is a machine that can be programmed to carry out sequences of arithmetic or logical operations automatically.
- Modern computers can perform generic sets of operations known as programs. These programs enable computers to perform a wide range of tasks.
- Today's computers are electronic devices that accept data (input), process that data, produce output, and store (storage) the results.

1.2 DIGITAL, ANALOG AND HYBRID COMPUTER COMPUTERS

1.2.1 Analogue Computer-

An analogue computer is a form of computer that uses continuous physical phenomena such as electrical, mechanical, or hydraulic quantities to model theproblem being solved.

1.2.2 Digital Computer

A computer that performs calculations and logical operations with quantitiesrepresented as digits, usually in the binary number system.

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rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

FOREST ATTACHMENT REPORT

Submitted for partial fulfilment of requirement of the Master of Science in Forestry & Environmental sciences (2 Years)

(Session-2021-22)

(Forest Management)

Under the Supervision of:

Dr. A.K. BHARDWAJ

Assistant Professor
Department of Forestry,
Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Vivekanand Yadav

M.Sc. IV Semester
Roll No. 20412036
Enroll No. GGV/20/06715

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CERTIFICATE

This is to certify that the Project report entitled **"Central Nursery (Bhaisajhar), Teak Plantation & Wood depot (Kota), Raigarh Division, Raigarh, C.G."** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* **Mr. Vivekanand Yadav** ***S/o Mr. Tribhuwan Yadav*** *under my supervision and guidance.*

I wish* Vivekanand Yadav *all the success in his academics.

Place: **Bilaspur**
Date: /Sept./2022

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वानिकी, वन्यजीव एवं पर्यावरण विभाग
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गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Dr.A.k.BHARDWAJ
(supervisor)
Assistant Professor
Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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Place:Bilaspur

Date: 12/09/2022

V. Yadav

Vivekanand Yadav
M.Sc. Forestry & Environmental Sciences
Roll No. 20412036
Enroll No. GGV/20/06715

FOREST & CLIMATE CHANGE DEPARTMENT

Raigarh Division Raigarh (C.G.)

CERTIFICATE

Certified that Mr. VIVEKANAND YADAV of Guru Ghasidas University, Bilaspur Chhattisgarh has successfully completed the Institutinal Attachment Training Programme organized by Forest & Climate Change Department, Raigarh Division Raigarh (C.G.) from 09/05/2022 to 15/05/2022. The Institute wishes bright future of his/her for future endeavour in academic advancement.

(Stylo Mandavi)
"IFS"
Divisional Forest Officer
Raigarh Dn. Raigarh (C.G.)

ACKNOWLEDGEMENT

I would like to thank my project supervisor for never ending support and motivation and also for helping nature towards the students.

I would like to take the opportunity and thank to Assistant Professor ***Dr. Atul Kumar Bhardwaj*** *for providing us good facilities for successful completion of our project. I also thank all the Faculty Members for their valuable suggestion.*

I would like to thank ***Forest Rangeofficer , Dpt. Ranger Forester, Forest guard , every staffs and my dear Batchmates*** *for their invaluable time and knowledge and experience which they shared with us during the webinars.*

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M.Sc. IV Semester
Roll No. 20412036
Enroll No.
GGV/20/06715

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
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गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

FORESTS IN CHHATTISGARH

Chhattisgarh's total geographical area is 1,35,191 sq. km. Forest area of the state is 59,722 sq.km which accounts to 44.21% of the state's geographical area. As Chhattisgarh is rich in forest biodiversity so it is important to have a management body which implements and carries out various management programs. There are two major categories of forests in Chhattisgarh namely

- Tropical humid deciduous forest
- Tropical dry deciduous forest

TYPE OF FOREST PROPORTION (%)

- ✔ Reserved forest 43.41
- ✔ Protected forest 40.21
- ✔ Unclassified forest 16.65

Within 5 km radius of forest, numerous villages are there. Most of the population there belongs to tribal or backward community. They are mostly dependent on Forests for their livelihood.

There are 2 major species of trees in the state. Those are:-

1. Sal (*Shorearobusta*)

2. Teak (*Tectona grandis*)

Top Canopy species found in Chhattisgarh are:-

- ✔ Bija (*Pterocarpusmarsupium*)
- ✔ Saja (*Terminaliatomentosa*)
- ✔ Dhavdha (*Anogeissuslatifolia*)
- ✔ Mahua (*Madhucaindica*)
- ✔ Tendu (*Diospyrosmelanoxylon*)

There are various- vegetation found in state and which are so important in terms of environmental balance, as well as they are the principal means of livelihood of forest-dwellers.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

A

REPORT

ON

"INSTITUTIONAL TRANING"

Submitted for partial fulfillment of requirement of Masters of Science In

"forestry and Environmental Sciences".

(SESSION: 2021-22)

Under the supervision of:

DR. S.S DHURIA

(Professor)

Department of Forestry Wildlife and Environmental Sciences

GGV,Bilaspur

Submitted by:

ATUL KUMAR

M.Sc. Forestry 4th semester

Enroll No GGV/16/6219

Department of forestry, Wildlife &Environmental Sciences

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

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GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Institutional training report entitled "INSTITUTE OF FOREST PRODUCTIVITY (I.F.P) *''submitted in partial fulfillment of the requirements for the Degree of Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh) is the work carried out by* ***Mr. Atul Kumar****, S/o* ***Mr. Rajesh Kumar Kevat,*** *under my supervision and guidance.*

I wish ***Atul Kumar*** *all the success in his academics.*

Place: Bilaspur

Date: 14..../Sept./2022.

14/9/22

Dr. S.S DHURIA

(supervisor)

Professor

Department of forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur C.g.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

I hereby declare that the student project work entitled "Institutional training report on Institutional of Forest Productivity (I.F.P)'' submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of ***Dr. S.S Dhuria*** (Professor) and this project work has been, the formed for the award of master of Science in Forestry.

Mr. Atul Kumar

Place : Bilaspur

Date - /Sept./2022

MSc. Forestry 4th Semester

Enrollment No. – GGV/16/6219

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विभागाध्यक्ष
Head
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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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CHAPTER –1

INTRODUCTON :- INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

I.F.P is situated on National highway (N.H.-24), Lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern India. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agro-ecological zones and 6 main forest types.

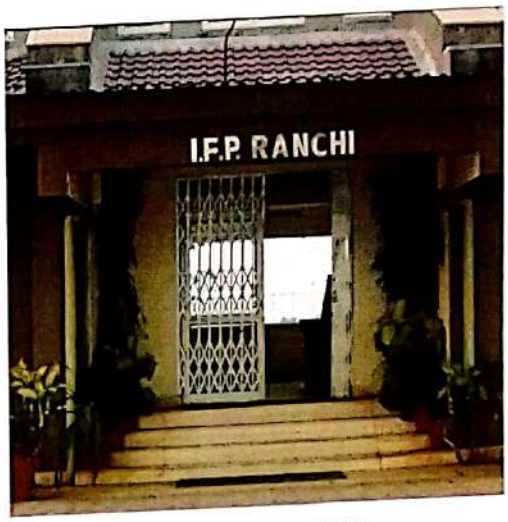


Plate -1 IFP RANCHI

TOTAL AREA OF I.F.P

The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:-

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To undertake research and demonstration of agro-forestry models .
- To establish model nursery, germ plasm bank and identify suitable seed production areas for improving forest productivity.
- To steer, undertake and coordinate research, development and extension in forestry sector in the states of Bihar, Jharkhand, Sikkim and West Bengal.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.
- To carry out the related activities considered necessary to attain the above activities.

SECTIONS OF I.F.P LALGUTWA.

Institute of forest productivity is spread over 35 hectares of land. It has various section and out of them our visiting section was as follows:

- Medicinal garden.
- Bambusetum.
- Office building.
- Forest productivity unit.

@dailyrecruitment.in
Institute of Forest Productivity
(Indian Council of Forestry Research and Education)
IFP RANCHI RECRUITMENT

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Medicinal garden of I.F.P

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A REPORT ON

QGIS TRANING

SUBMITTED FOR PARTIAL FULFILLMENT OF REQUIREMENT OF MASTERS OF SCIENCE IN

"FORESTRY AND ENVIRONMENTAL SCIENCES"

SESSION: 2021-22

MASTER DEGREE OF SCIENCE IN FORESTRY

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIORNMENTAL SCIENCE

SUBMITTED TO: -

Dr. S.S Dhuria
(Professor)
Dept. of Forestry,Wildlife& environment science
Guru Ghasidas Vishwavidyalaya,
Bilaspur – 495009

SUBMITTEDBY: -

Atul kumar
M.Sc.(Forestry & Evs)
IV Semester
Roll No: - 20412007
Enrollno.GGV/16/6219

Guru Ghasidas VishwavidyalayaBilaspur (C.G.)

(A Central University)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

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Bilaspur (C.G.)

(A Central University)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

I have great pleasure in certifying that ***Mr. Atul kumar, S/O Mr.Rajesh Kumar Kevat*** *is a regular student of M.Sc. Forestry* ***4th Semester*** *during the session of 2021-22 of Department of Forestry. He has completed "training entitled,* ***QGIS TRANING PROGRAM.****" during this semester under my guidance.*

I wish him all the success in his academics.

14/9/22

Supervisor:
Dr. S.S Dhuria
(Professor)
Dept. of Forestry, Wildlife and Environmental Sciences.

Date - 14/09/22

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

*I hereby declare that the field training entitled, — **Q-GIS Traning program** submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with **Teacher of Guru Ghasidas Vishwavidyalaya** and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

DATE: - 14/09/22
PLACE: Bilaspur

Atul kumar
M.Sc. Forestry
Semester 4th
Roll No: - 20412007
Enroll No.GGV/16/6219

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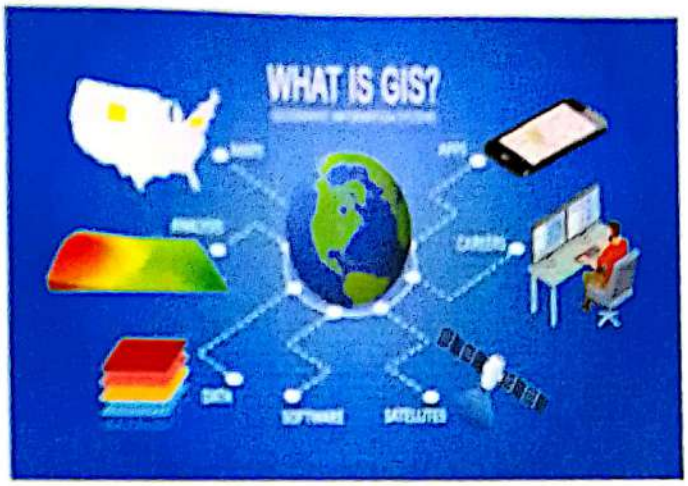
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ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or" bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem solving tool.

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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A

REPORT ON

FOREST ATTACHMENT

Submitted for partial fulfillment of requirement of Masters of Science in

"Forestry Wildlife And Environmental Sciences"

(SESSION: 2021-22)

Under the supervision of:

Dr . S.S Dhuria

(Associate Professor)

Dept. of Forestry Wildlife

and Environmental Sciences

GGV,Bilaspur

Submitted by:

Atul Kumar

M.Sc. Forestry 4th semester

Enroll No GGV/16/6219

Department of forestry , Wildlife &Environmental Sciences

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

Scanned with OKEN Scanner

CERTIFICATE

I have great pleasure in certifying that ***Mr. Atul kumar S/O Mr.Rajesh kumar kevat*** *is a regular student of M.Sc. Forestry* ***4th Semester*** *during the session of 2021-22 of Department of Forestry. He has completed "field training entitled,* ***FOREST ATTACHMENT PROGRAM****." during this semester under my guidance.*

I wish him all the success in his academics.

Date- 14/09/22

14/9/22

(Dr . S.S Dhuria)

supervisor

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

*I hereby declare that the field training entitled, —**Forest attachment program** submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with Forest Department and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

DATE:- 14/09/22
PLACE:- Bilaspur,Chhattisgarh

Atul Kumar
M.Sc. Forestry 4th Semester
Roll No:- 20412002
Enroll No. GGV/16/6219

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गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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CHAPTER - 1

CHHATTISGARH FOREST DEPARTMENT

❖ INTRODUCTION

The forest department in any state works to conserve, protect and manage the forest in sustainable manner. The whole Chhattisgarh forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest divisions and for every division 10 years working plan is made

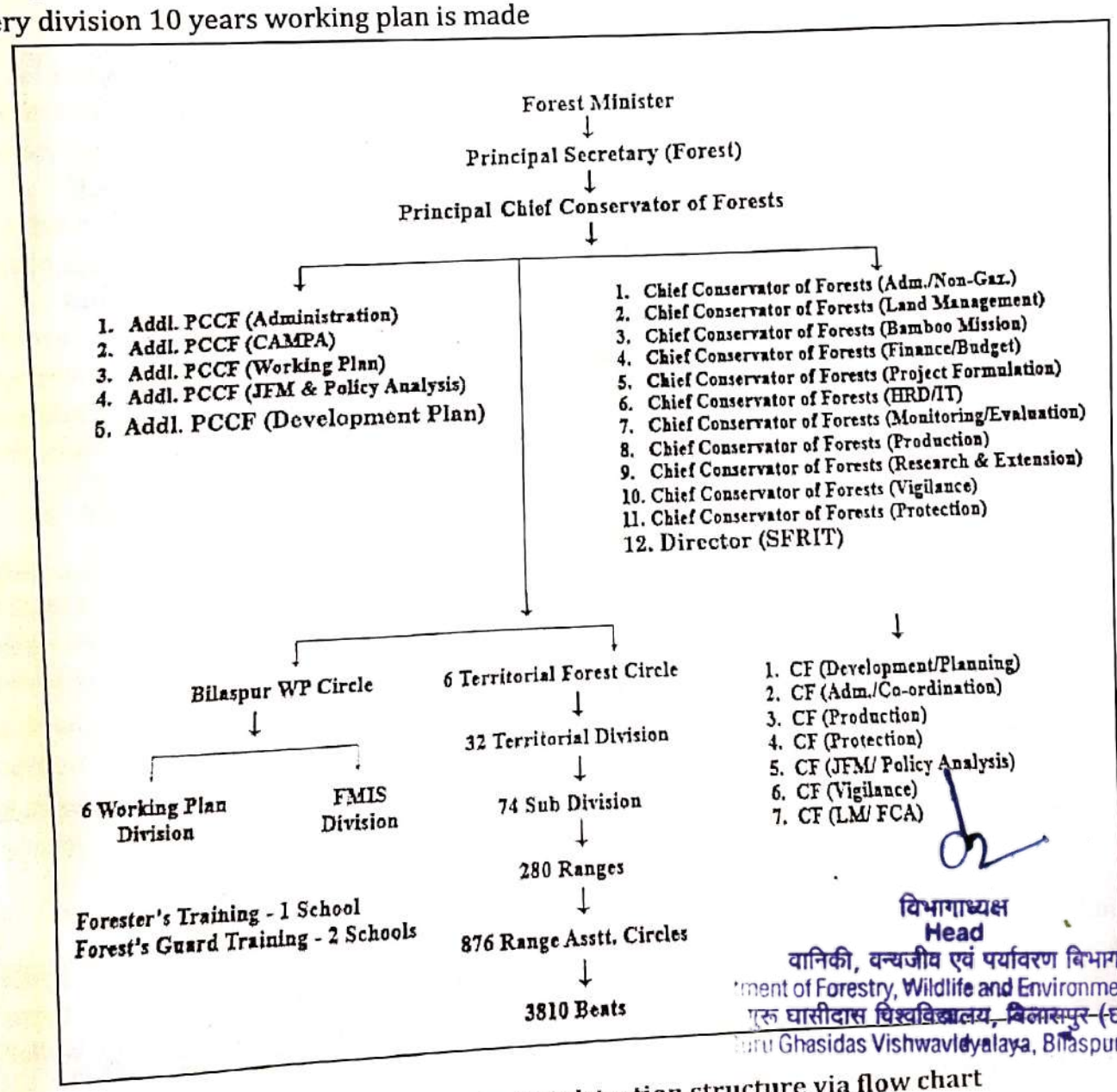


Figure 1- State forest administration structure via flow chart

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गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A

REPORT ON

STUDENT PROJECT

Submitted for partial fulfillment of requirement of Masters of Science

in forestry and Environmental Sciences.

(SESSION: 2021-22)

Under the supervision of:

Dr. S.S Dhuria

(Associate Professor)

Dept. of Forestry Wildlife

and Environmental Sciences

GGV,Bilaspur

Submitted by:

Atul kumar

M.Sc. Forestry 4th semester

Roll No

Enroll No GGV/16/6219

Department of forestry , Wildlife &Environmental Sciences

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

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Department of forestry , Wildlife &Environmental Sciences
Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

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I wish him all the success in his academics.

Date- 14/09/22

14/9/22
(Dr . S.S Dhuria)

supervisor

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DATE:- 14/09/22
PLACE:- Bilaspur,Chhattisgarh

Atul kumar
M.Sc. Forestry 4th Semester
Roll No:- 20412002
Enroll No. GGV/16/6219

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INTRODUCTION

Grasses are, the members of Gramineae Juss., nom. cons. (Poaceae Barnhart, nom. cons. et nom. alt.), are very distinctive from other flowering plant species owing to their unique vegetative and floral morphology, habitat diversity and moreover for their immense economic importance. Gramineae is the fourth largest among the angiosperm families in terms of species diversity (Watson & Dalwitz [1992]). According to Soreng et al. (2015), the family comprises of ±12074 species fewer than 771 genera belonging to 51 tribes and 12 subfamilies in the world. Members of the family exhibit great variations in their vegetative and reproductive morphology and are of paramount importance to human economy mainly for food grains (cereals and millets). Apart from this, the forest grasses are used as fodder, building materials, paper pulps, thatching materials and also used for making ropes, mats, brooms, musical instruments, agricultural and hunting materials, etc. (Rawat 2008). The family is monophyletic [Grass Phylogeny Working Group (GPWG) 2001; Soreng et al. 2015] and comprises mostly herbaceous species (grasses) to shrubs and tall trees (bamboos) with terete stem and paniculate inflorescence. They are easily recognizable morphologically by their spikelet inflorescence with two empty glumes and one to many lemmas; each lemma subtending a palea, presence of 2 – 3 lodicules, versatile anthers, feathery stigmas and caryopsis fruit type in most of the species. Grasses are cosmopolitan in distribution and they occupy various habitats like grassland, marshy and swampy areas of wetland ecosystems, savannas, deep and open forests, etc. They are mainly abundant in tropical to sub-tropical belt of the earth and extended up to Pleione 11(2): 440 - 454. 2017. ISSN: 0973-9467 © East Himalayan Society for Spermatophyte Taxonomy doi:10.26679/Pleione.11.2.2017.440-4546 warm-temperate regions (Clayton & Renvoize 1986).

Grasses may be annual or perennial herbs' generally with the following characteristics (the image gallery can be used for reference): The stems of grasses, called culms, are usually cylindrical (more rarely flattened, but not 3-angled) and are hollow, plugged at the nodes, where the leaves are attached.Grass leaves are nearly always alternate and distichous (in one plane), and have parallel veins. Each leaf is differentiated into a lower sheath hugging the stem and a blade with entire (i.e., smooth) margins. The leaf blades of many grasses are hardened with silica phytoliths, which discourage grazing animals; some, such as sword grass, are sharp enough to cut human skin. A membranous appendage or fringe of hairs called the ligules lies at the junction between sheath and blade, preventing water or insects from penetrating into the sheath.

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of Science in Forestry

(Session: 2021-22)

Under the supervision of:

Prof. S. S. Dhuria

Professor
Department of Forestry, Wildlife

& Environmental Sciences

GGV, Bilaspur (C.G.)

Submitted By:

Karnika Verma

M.Sc. Forestry IV sem
Enroll. No. GGV/16/6230

Roll No. 20412015

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BILASPUR-495009, CHHATTISGARH

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(Central university established by the central university Act 2009 No 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled Forest Attachment Report submitted in partial fulfillment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by Miss* ***Karnika Verma D/O Shyam Kumar Verma*** *runder my supervision and guidance.*

I wish Karnika Verma all the success in her academics.

Place: Bilaspur

Date: ..14.../Sept./2022.

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

14/9/22

Prof. S. S. Dhuria

Supervisor

PROFESSOR

Department of Forestry, Wildlife and Environmental Science

Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

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DECLARATION

I hereby declare that the project work entitled "Training report on Forest Attachment" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru GhasidasVishwavidyalaya,Bilaspur is a record of an academic work performed by me for the award of Master's degree in Forestry and Environment Science.

Karnika Verma

M.Sc. IV Semester

Roll. No.: **20412015**

Enrollment No.: GGV/16/6230

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7.	Timber Depot: Marwahi Forest Division Office Madna	Mr. Mohar Singh Markam	26-30
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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CHAPTER - 1

FOREST ADMINISTRATION

The forest administration is the body responsible for implementation of forestpolicy and forestry issues in a particular country through rules, legislation andfinancial that means information and forest programs, the forest policy aims topromote the sustainable management and use of forest land resources.

State Forestry Department

The State Forestry Department is responsible for the administration and regulationof forest harvesting, forest revenue collection and development of the state forestresources. The Department also plans and coordinates the development of woodbased industries. The State Forestry Department is divided into Forest Operations and Forest Development Divisions and supported by District Forest Office. Development Divisions and supported by District Forest Offices.

Forest Development Division

Responsible for planning, implementing and monitoring of forest management anddevelopment activities, including biodiversity conservation, ecotourismdevelopment and forest rehabilitation as well as the preparation andimplementation of the State Forest Management Plan.

District Forest Office

Responsible for administration, controlling forest harvesting, forest revenuecollection and forest law enforcement. The office is also responsible forimplementing forest management and development activities including themanagement of forest eco-park and state forest park.

Forest administration management

Forest management is the process of planning and implementing practices for thestewardship and use of forests and other wooded land to meet specificenvironmental, economic, social and cultural objectives. It deals with the overalladministrative, economic, legal, social, technical and scientific aspects related tonatural and planted forests. It may involve varying degrees of deliberate humanintervention, ranging from actions aimed at safeguarding and maintaining forestecosystems and their functions, to those favoring specific socially or economicallyvaluable species or groups of species for the improved production of forest goodsand services.

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Head
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A REPORT ON

"INSTITUTIONAL TRAINING"

(Session: 2021-22)

SUBMITTED FOR PARTIAL FULFILMENT FOR THE REQUIREMENT OF MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCE

Under the supervision of:

Prof. S. S. Dhuria

Professor
Department of Forestry, Wildlife

& Environmental Sciences

GGV, Bilaspur (C.G.)

Submitted By:

Karnika Verma

M.Sc. Forestry IV sem
Enroll. No. GGV/16/6230

Roll No. 20412015

Department of forestry, wildlife and Environmental Sciences

Guru Ghasidas Vishwavidyalaya Koni, Bilaspur (CG)-495009.

Scanned with OKEN Scanner

CERTIFICATE

This is to certify that the Student report entitled "Institutional Attachment Report " submitted in partial fulfillment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by Ms.* ***Karnika Verma D/o Mr. Shyam Kumar Verma*** *under my supervision and guidance.*

I wish Karnika Verma all the success in her academic endeavor.

Place: Bilaspur
Date: 14/03/22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
...ment of Forestry, Wildlife and Environmental Science
...गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
...uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

14/3/22

Prof. S. S. Dhuria

Supervisor

Professor

Department of Forestry, Wildlife and Environmental Science, Guru Ghasidas Vishwavidyalaya, Bilaspur C.G.

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DECLARATION

I hereby declare that the project work entitled "Training report on "Institutional Attachment" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an academic work performed by me for the award of Master's degree in Forestry and Environment Science.

Karnika Verma

M.Sc. IV Semester

Roll. No.: **20412015**

Enrolment No.: GGV/16/6230

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विभागाध्यक्ष
Head
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ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

INTRODUCTION

INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

Regarding the institution



The I.F.P. is located on National Highway (N.H.) 24, Lalgutwa, Ranchi-Gumla road, not far from Kathalmore, Ranchi, (Jharkhand).

A leading forestry research centre serving eastern India, the Institute of Forest Products conducts forestry research. The institute was established in 1993 with the goal of organizing, directing, managing, and carrying out forest research and education in the eastern region of the nation, which includes the states of Bihar, Sikkim, Jharkhand, and West Bengal and encompasses approximately 46,581 sq. km. of forested area, or 17% of the nation's total geographic area. 1985, Awarded under FRI, DEHRADUN, Sixagro-ecological zones and six different types of forests make up the operational area

AREA OVERALL OF IFP

The Institute of Forest Productivity occupies 35 hectares in total.

The Institute's main goals are listed below:

1. to create and keep up with forestry and related science information.
2. to serve as a central repository for regionally specialized studies and broad information about forests and wildlife.
3. For the purpose of increasing forest productivity, a model nursery, germplasm bank, and adequate seed production regions must be established.

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Head
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ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A

TRAINING REPORT

ON

"Computational Skills & QGIS"

ubmitted for partial fulfilment of the requirement for the Degree of Master of Science in Forestry

(Session: 2021-22)

Under the supervision of:
Prof. S. S. Dhuria
Professor
Department of Forestry, Wildlife
& Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:
Karnika Verma
M.Sc. Forestry IV sem
Enroll. No. GGV/16/6230
Roll No. 20412015

DEPARTMENT OF FORESTRY, WILDLIFE AND ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA
(Central university established by the central university Act 2009.No 25 of 2009)
BILASPUR 495001, CHHATTISGARH

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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled ***"Computational Skills & QGIS"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Ms. Karnika Verma D/o Mr. Shyam Kumar Verma*** *under my supervision and guidance.*

I wish Karnika Verma all the success on her academics.

Place: Bilaspur

Date: 14.../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

14/9/22

Prof. S. S. Dhuria
Supervisor
Professor
Department of Forestry, Wildlife
& Environmental Science
Guru Ghasidas Vishwavidyalaya,
Bilaspur (C.G.)

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DECLARATION

ıereby declare that the project work entitled "***Training report on ım utational Skills & QGIS***" submitted to Department of Forestry, ild fe and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, las ur is a record of an academic work performed by me for the ıar of Master's degree in Forestry and Environment Science.

Karnika Verma
M.Sc. IV Semester
Roll. No.: 20412015
Enrolment No.: GGV/16/6230

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

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rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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A

STUDENT PROJECT

ON

EFFECTS OF DIFFERENT SEEDLING GROWTH ATTRIBUTES OF PRE-TREATED SEEDS OF *Tectona grandis Linn.f.*

Submitted for partial fulfillment of the requirement for the Degree of Master of Science in Forestry

(Session : 2021-22)

Under the supervision of:

Prof. S. S. Dhuria
Professor
Department of Forestry, Wildlife & Environmental Sciences
GGV, Bilaspur (C.G.)

Submitted By:

Karnika Verma
M.Sc. Forestry IV SEM
Enroll. No. GGV/16/6230
Roll No. 20412015

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009, No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the Student report entitled ***"Effects of Different Seedling Growth Attributes of Pre-treated Seeds of Tectona grandis Linn.f."*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Ms. Karnika Verma D/o Mr. Shyam Kumar Verma*** *under my supervision and guidance.*

I wish Karnika Verma all the success on her academics.

Place: Bilaspur

Date: 14..../Sept./2022.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

14/9/22

Supervisor
Prof. S. S. Dhuria
Department of Forestry, Wildlife
& Environmental Science
Guru Ghasidas Vishwavidyalaya,
Bilaspur (C.G.)

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DECLARATION

I hereby declare that this Report entitled **"Effects of different seedling growth attributes of Pre-treated seeds of *Tectona grandis* Linn.f."** submitted to the **Department of Forestry, Wildlife & Environmental Science**, Guru Ghasidas Vishwavidyalaya, is a record or original work done by me under the guidance of Prof. S. S. Dhuria. The information and data given in the report is authentic to the best of my knowledge. This report is not submitted to any other university or institution for the award of any degree, diploma or fellowship or published any time before.

Kamika Verma
M.Sc. IV Semester
Roll. No.: 20412015
Enrollment No.: GGV/16/6230

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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CHAPTER- 1

INTRODUCTION

Large deciduous tree with a height of up to 30 meters and a diameter of at least 100 cm, **Teak (*Tectona grandis* Linn. f),** is a member of the **Lamiaceae family**. South East Asia is home to the natural distribution of teak. The most significant forests in India may be found in Madhya Pradesh, Tamil Nadu, Karnataka, Kerala, Uttar Pradesh, Gujarat, Odisha, Madhya Pradesh, and Rajasthan.

The distribution of teak is largely controlled by climate geology and soil (Balagopalan, 1995). Teak grows best in well drained fairly moist warm tropical climate with base-rich soils having high organic carbon and exchangeable calcium with pH 6.5 to 7.5 (Kulkarni, 1951). Generally, Teak grows well in areas receiving annual rainfall ranging from 800 to 2500 mm from sea level to an altitude of about 1200 m. It is distributed naturally over a wide range of rainfall from very dry area in which the annual rainfall is less than 800 mm to very moist areas mostly within the west coastal regions of India with an annual rainfall of over 3500 mm (Palanisamy *et. al*., 2009).

Teak is known as king of timber and it is one of the most beautiful and stable wood with excellent wood quality. Teak furniture is highly durable and the durability is accredited to the deposition of polyphenols in its heartwood. Because of its high dimensional stability and easy workability, it is considered as the best timber for making furniture, cabinet, tool handles, agriculture implements, ship and boat building, decorative flooring, wall paneling, carom board frames, mathematical instruments and wood packing etc (Luna, 1996). Apart from its use as a timber, other parts of the tree such as flowers, fruits, seeds, leaves and bark are also useful (Orwa *et. al*., 2009).

Although Teak has great economic value, people don't get interest in raising Teak seedling in nursery due to low germination percentage and the more average time required for the Teak germination (Luna, 1996). Naturally teak seeds germinate within a drupe. Each drupe is composed of a thin outer exocarp, surrounding a corky or thick spongy mesocarp, which in turn, surrounds the woody endocarp or the stone (Slator, 2013). The endocarp is four chambered containing zero seeds between zero to four in number, however, one seed is most

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Head
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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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A REPORT
ON

FIELD TRAINING (ATTACHMENT WITH STATE FOREST DEPARTMENT)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

(Session: 2020-22)

SUBMITTED TO

Prof. S. S. Dhuria

Professor
Department of Forestry, Wildlife &
Environmental Sciences

SUBMITTED BY

Laiba Aman Hamid

M.Sc. Forestry & Environmental Science
4th semester
Roll no. – 20412016
Enrolment no. – GGV/20/06705

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that A report on entitled "Forest Attachment" submitted in Partial fulfilment of the requirements for the Degree of ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)*** *is the work carried out by* ***Miss. Laiba Aman Hamid*** *D/O* ***Mr. Hamid Ulla*** *my supervision and guidance.*

I wish Laiba Aman Hamid all the success in her academics.

Place-Bilaspur

Date- 14.09.22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

14/9/22

Supervisor

Prof. S. S. Dhuria

Professor

Department of Forestry,

Wildlife & Environmental Sciences

GGV, Bilaspur (C.G)

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DECLARATION

*I hereby declare that the project work entitled "**Training report on Field Training (Attachment with State Forest Department)**" submitted to Department of Forestry, Wildlife and Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur is a record of an original work done by me under the guidance of **Prof. S. S. Dhuria (Professor)** and this project work has been performed for the award of Master's degree in Forestry.*

Date-

Place-

Laiba Aman Hamid

M.Sc. Forestry & Environmental science

4th Semester

Roll no.-20412016

Enroll.no. -GGV/20/06705

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Head
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ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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CHAPTER-1

This chapter describes about the Forest department of Bilaspur district its administarion divsion setup, types of Forest and aims and objective of forest administration.

FOREST DEPARTMENT

INTRODUCTION

The forest department in any state works to conserve, protect, and manage the forest in sustainable manner. The whole Chhattisgarh Forest is divided into 6 different working circle and circles are divided into coupes and compartments. All 6 working circle have their different management plans as per their requirement. In Chhattisgarh there are 34 forest divisions and for every division 10 years working plan is made

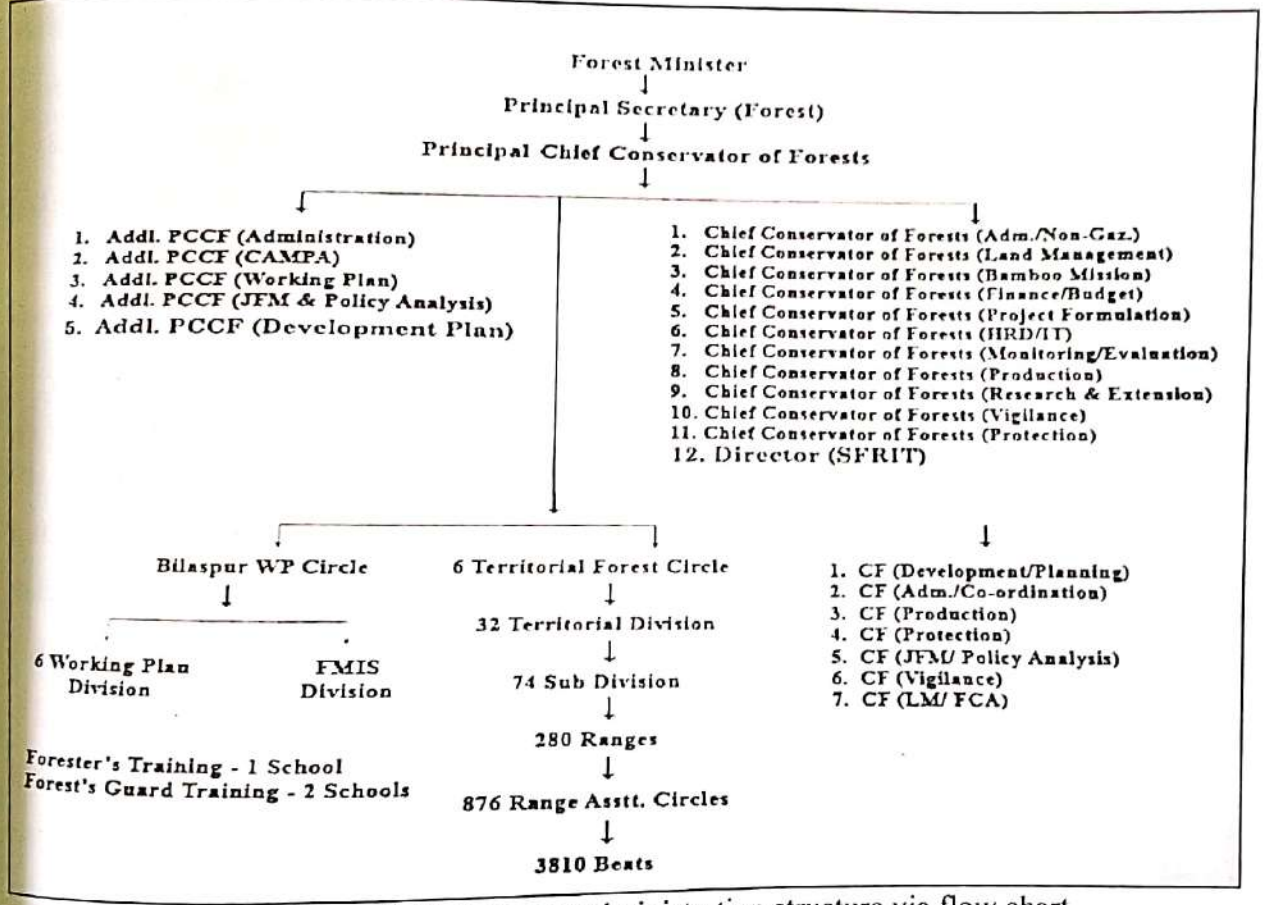


Figure-01 State Forest administration structure via flow chart

ATTACHMENT WITH BILASPUR FOREST DEPARTMENT

As a student of M.Sc. Forestry IV semester, it is very essential to be aware of building up of all action plans of State Forest Department and their implementation on natural forest. To fulfil the practical knowledge, the Department of Forestry, GGV has organized a training program for one month

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)
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A REPORT

ON

INSTITUTIONAL TRAINING

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

(SESSION: 2020-22)

SUBMITTED TO

Prof. S. S. Dhuria

(Professor)

Department of Forestry, Wildlife & Environmental Sciences

SUBMITTED BY

Laiba Aman Hamid

M.Sc. Forestry & Environmental Science

4th Semester

Roll no.- 20412016

Enrolment no- GGV/20/06705

Department of Forestry, Wildlife &Environmental Sciences

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the A report entitled "Institutional Training" submitted in partial fulfillment of the requirement for the Degree of ***Master of Science in Forestry and Environmental Science in Department of Forestry, Wildlife &Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss. Laiba Aman Hamid D/O Mr. Hamid Ulla*** *under my supervision and guidance.*

I wish Laiba Aman Hamid all the success in her academics.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Place: Bilaspur

Date: 14.09.2022

Supervisor 14/9/22

Prof. S. S. Dhuria

Professor

Department of Forestry and Environmental Science

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DECLARATION

I hereby declare that the field training entitled, ***Institutional training program*** *submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with* ***IFP Ranchi*** *and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

DATE:-
PLACE:- Ranchi, Jharkhand

Laiba Aman Hamid
M.Sc. Forestry and Environmental Science 4th Semester
Roll no:- 20412016
Enroll no. GGV/20/06705

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3.	Role of Molecular Marker in Diversity studies of forest tree Spices	Shri Ayushman Malakar (Ph.D. Scholar, JRF)
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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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CHAPTER-01

DAY-01 (18.04.2022)

INTRODUCTON :- INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

I.F.P is situated on National highway (N.H.-24), Lalgutwa, Ranchi- Gumla road, near kathal more Ranchi.

The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern India. The institute came into existence in year 1993 with the objective to formulate, organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agro-ecological zones and 6 main forest types.



Plate-01 IFP RANCHI

TOTAL AREA OF I.F.P

The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:-

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To undertake research and demonstration of agro-forestry models .
- To establish model nursery, germ plasm bank and identify suitable seed production areas for improving forest productivity.
- To steer, undertake and coordinate research, development and extension in forestry sector in the states of Bihar, Jharkhand, Sikkim and West Bengal.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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STUDENT PROJECT

ON

STUDY ON DAMAGING SYMPTOMS OF INSECT INFECTING IN KARANJ (*Milletia pinnata* L.) AT GGV CAMPUS, BILASPUR, CHHATTISGARH

(SESSION 2020-2022)

SUBMITTED TO

Prof. S. S. Dhuria

Professor

Department of Forestry, Wildlife & Environmental Sciences

SUBMITTED BY

Laiba Aman Hamid

M.Sc. Forestry & Environmental Science

4th Semester

(Forest Genetic Resources)

Department of Forestry, Wildlife & Environmental Sciences

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the student report entitled "Study on Damaging Symptoms of Insect Infecting in Karanj (Milletia pinnata L.) at Bilaspur, Chhattisgarh" submitted in partial fulfillment of the requirement for the Degree of ***Master of Science in Forestry and Environmental Science in Department of Forestry, Wildlife &Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss. Laiba Aman Hamid D/O Mr. Hamid Ulla*** *under my supervision and guidance.*

I wish Laiba Aman Hamid all the success in her academics.

Supervisor 14/9/22

Prof. S.S. Dhuria

Professor

Department of Forestry, Wildlife & Environmental Sciences

Place: Bilaspur

Date: 14.09.22

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Head
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rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

I hereby declare that the student project work entitled "Study on damaging symptoms of insect infecting in karanj (Milletia pinnata L.) at GGV campus, Bilaspur, Chhattisgarh" submitted to Guru Ghasidas Vishwavidyalaya is record of an original work done by me under the guidance of Prof. S. S. Dhuria (Professor) and this project work has been performed for the award of master of Science in Forestry.

Laiba Aman Hamid

MSc. Forestry 4th Semester

Roll No. 20412016

Enrolment No. GGV/20/06705

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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CHAPTER-1

INTRODUCTION

(*Milletia pinnata* L.) [Family-leguminoosae] is a medium sized glabrous tree popularly known as karanj in Hindi. It is adaptable tree for tropical and Sub-tropical regions which requires excellent drainage and a sunny location. It grows easily from seed (Savita Sangwan *et al.* 2010).

It is indigenous to Australia, the Pacific Islands, and eastern and tropical Asia. *Pongamia pinnata* is a common synonym for it. Common names for it include Pongame oiltree and Indian beech. This legume tree has a broad canopy that stretches out equally wide with a height that ranges from 15 to 25 metres (50 to 80 feet). For brief intervals, it might turn deciduous. It has a 50–80 cm (20–30 in) diameter, smooth or vertically fissured, grey-brown trunk that may be straight or crooked. Branches have pale stipulate scars and are glabrous. The tree's imparipinnate leaves are short-stalked, alternating, round or cuneate at the base, ovate or oblong along the length, obtuse-acuminate at the apex, and toothless on the edges. When they are young, they are a silky, glossy burgundy, and the edges are not toothed. When young, they are a delicate, velvety burgundy, and as the season goes on, they develop into a glossy, deep green with noticeable veins underneath.

Small clusters of white, purple, and pink flowers start to bloom after three to four years and continue to bloom all year. The two to four very fragrant, two to four flower, 15 to 18 mm (0.59 to 0.71 in) long, raceme-like inflorescences are produced. The flower's corolla is circular, ovate-shaped with basal auricles and frequently has a central patch of green colour, while the calyx is bell-shaped and truncated.

Indehiscent pods can be harvested in 4-6 years. Immediately following flowering and maturing in 10 to 11 months are the brown seed pods. The pods have thick walls, smooth surfaces, are elliptical in shape with a short, curving apex, and are smooth, flattened, and thick-walled. One or two bean-like, brownish-red seeds are contained within each pod, but because the seeds do not naturally break open, the pods must decay before the seeds may sprout. The seeds are unpleasant to herbivores in their natural state and range in length from 1.5 to 2.5 cm (0.59 to 0.98 in). They have a brittle, oily covering.

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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A REPORT
ON
COMPUTER TRAINING PROGRAM ON QGIS

(SESSION: 2020-22)

SUBMITTED FOR PARTIAL FULFILMENT OF REQUIREMENT OF THE MASTER OF SCIENCE IN FORESTRY& ENVIRONMENTAL SCIENCE

SUBMITTED TO

Prof. S. S. Dhuria
(Professor)
Dept. of Forestry, Wildlife &
Environment sciences

SUBMITTED BY

Laiba Aman Hamid
M.Sc. Forestry &
Environmental science
4th Semester
Roll no.- 20412016
Enroll. no. -GGV/20/06705

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIORNMENTAL SCIENCES

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G)
(A Central University)
(A central university established under Central Universities Act 2009, No. 25 of 2009)

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

(A central university established under Central Universities Act 2009, No. 25 of 2009)

CERTIFICATE

This is to certify that the A report entitled "Computer Training Program on QGIS" submitted in partial fulfilment of the requirement for the Degree of ***Master of Science in Forestry and Environmental Science in Department of Forestry, Wildlife &Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Miss. Laiba Aman Hamid D/O Mr. Hamid Ulla*** *under my supervision and guidance.*

I wish Laiba Aman Hamid all the success in her academics.

Place: Bilaspur
Date: 14.09.22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
Dept of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Supervisor

Prof. S. S. Dhuria
Professor
Department of Forestry, wildlife & Environmental Sciences

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DECLARATION

I hereby declare that the field training entitled "Computer Training Program on QGIS" submitted to Guru Ghasidas Vishwavidyalaya is a record of an original work done by me with ***Teacher of Guru Ghasidas Vishwavidyalaya*** *and has not been submitted elsewhere for the award of any other degree. The facilities, cooperation and the assistance received during the field training is duly acknowledged.*

DATE:
PLACE: Bilaspur

Laiba Aman Hamid
M.Sc. Forestry & Environmental Science
4th semester
Roll No: - 20412016
Enroll No.GGV/20/06705

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS



Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool

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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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बिलासपुर

GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR

(A Central University established by the Central University Act 2009 No. 25 of 2009)

INDUSTRIAL TRAINING REPORT

Submitted For Partial Fulfillment of Requirements of the Master of Science in Forestry & Environmental Science

Session – 2020-22

UndertheSupervisionof:

Dr. S.S.Dhuria

Professor

Department of Forestry, Wildlife &

Environmental Sciences GGV,Bilaspur (C.G.)

SubmittedBy:

Naveen Kumar Vaibhav

M.Sc.Forestry and Environmental Science

Roll No.- 20412019

Enrollment No. GGV/20/06707

DEPARTMENT OF FORESTRY,WILDLIFE & ENVIRONMENTAL SCIENCES

GURUGHASIDASVISHWAVIDYLAYABILASPUR(C.G.)

(ACentralUniversityEstablishedUnderCentralUniversityAct2009,No.25of2009)

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INSTITUTE OF FOREST PRODUCTIVITY

RANCHI

(Indian Council of Forestry Research and Education, Dehradun)

CERTIFICATE

Certified that Mr./Mrs./Miss NAVEEN KUMAR VAIBHAV ..... of Guru Ghasidas University, Bilaspur, Chhattisgarh has successfully completed the institutional attachment training programme organized by Institute of Forest Productivity, Ranchi from 18.04.2022 to 28.04.2022. The institute wishes bright future of his/her for future endeavour in academic advancement.

(Dr. Yogeshwar Mishra)
Group Coordinator (Research) cum
Training Coordinator

(Dr. Nitin Kulkarni)
Director

वानिकी, वन्यजीव एवं पर्यावरण विभाग
Department of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

I, Naveen Kumar Vaibhav (M.Sc. Forestry & Environmental Science Enrol. GGV/20/06710 (Roll No. - 20412029), do hereby declare that this dissertation entitled " **Industrial Training Report** "is a result of the original work carried out by me under the kind supervision of **Dr.S.S.Dhuria** , Guru Ghasidas Central University, as a part of the award for the degree of **Master of Science in Forestry & Environmental Science.** To the best of my knowledge, it contains no materials previously published or written by another person and that which is presented in form of citations, have been duly acknowledged in the "Reference" section. I have acknowledged all the agencies and persons concerned who have directly or indirectly assisted me during thesampling, processing, analysis and preparation of this report.

I am fully aware while I declare that this dissertation has not been previously submitted to this university or any other institution for the award of any other degree or diploma.

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date –

Naveen Kumar Vaibhav

(GGV/20/06707)

(20412019)

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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Chapter - 1

INTRODUCTON ABOUT INSTITUTE
INSTITUTE OF FOREST PRODUCTIVITY (I.F.P) RANCHI JHARKHAND

About the institute



I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi.

The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern india. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim,Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

TOTAL AREA OF I.F.P

The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery , germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.

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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
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A

REPORT

ON

FOREST ATTACHMENT

Submitted for partial fulfilment of requirement

For the Degree of

Master of Science

In

Forestry and Environmental

Science

(Session: 2020-22)

Supervisor

Dr. S.S.Dhuria
professor
Department of Forestry, Wildlife & Environmental Science
GGV, Bilaspur , CG

Submitted By:

NAVEEN KUMAR VAIBHAV
M.Sc. Forestry Final Semester
Enrl No: GGV/20/06707
Roll No. 20412019

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA
(A Central University Established Under Central University Act 2009,No.25 of 2009)
BILASPUR-495009, CHHATTISGARH

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CERTIFICATE

This is to certify that the ***Forest Attachment Report*** submitted for the partial ılfillment of Degree of ***Master of Science in Forestry to Department of Forestry, Vildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh has been carried out by Mr Naveen kumar vaibhav,M.Sc. Forestry, Final Semester, and Enrollment No. (GGV/20/06707) under my guidance and upervision.***

I wish his all the success in his future academic endeavors.

14/9/22

Dr. S.S. Dhuria
professor
Department of Forestry and Wildlife
& Environmental Science
GGV,Bilaspur,CG

Date- 14/09/22

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

I hereby declare that the present **Forest Attachment Report** has not been submitted for any degree or diploma of any University. The source of material and all assistance received during the course of investigation have been duly acknowledged. All the records and data given in the report are correct to my knowledge.

NAVEEN KUMAR VAIBHAV
M.Sc. Forestry VIII th Semester
Roll. No.: 20412019
Enrollment No.: GGV/20/06707

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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FOREST ADMINISTRATION

The forest administration is the body responsible for implementation of forest policy and forestry issues in a particular country through rules, legislation and financial that means information and forest programs, the forest policy aims to promote the sustainable management and use of forest land resources.

State Forestry Department:

The State Forestry Department is responsible for the administration and regulation of forest harvesting, forest revenue collection and development of the state forest resources. The Department also plans and coordinates the development of wood based industries. The State Forestry Department is divided into Forest Operation sand Forest Development Divisions and supported by District Forest Offices.Development Divisions and supported by District Forest Offices.

Forest Development Division:

Responsible for planning, implementing and monitoring of forest management and development activities, including biodiversity conservation, ecotourism development and forest rehabilitation as well as the preparation and implementation of the State Forest Management Plan.

District Forest Office:

Responsible for administration, controlling forest harvesting, forest revenue collection and forest law enforcement. The office is also responsible for implementing forest management and development activities including the management of forest eco-park and state forest park.

Forest administration management:

Forest management is the process of planning and implementing practices for the stewardship and use of forests and other wooded land to meet specific environmental, economic, social and cultural objectives. It deals with the overall administrative, economic, legal, social, technical and scientific aspects related to natural and planted forests. It may involve varying degrees of deliberate human

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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बिलासपुर

GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR

STUDENT PROJECT

Seed Viability On *Azadirachta indica*(Neem) &*Syzygium cumini*(Jamun) of Pali & Bilaspur Forests Region

Session – 2020-22

UndertheSupervisionof:

Dr. S.S.Dhuria

Professor

Department of Forestry,Wildlife & Environmental Sciences

C ,Bilaspur (C.G.)

SubmittedBy:

Naveen Kumar Vaibhav

M.Sc.Forestry and Environmental Science

Roll No.- 20412019

Enrollment No. GGV/20/06707

DEPARTMENT OF FORESTRY,WILDLIFE & ENVIRONMENTAL SCIENCES

GURUGHASIDASVISHWAVIDYLAYABILASPUR(C.G.)

(ACentralUniversityEstablishedUnderCentralUniversityAct 2009,No.25of2009)

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GuruGhasidas Vishwavidyalaya, Bilaspur (C.G)

(AcentraluniversityestablishedunderCentralUniversitiesAct 2009, No.25of 2009)

CERTIFICATE – I

This is to certify that the Student Project entitled "**Seed Viability Of *Azadirachta indica*(Neem) & *Syzygium cumini*(Jamun) Of Pali & Bilaspur Forest Region.**" submitted by **Naveen Kumar Vaibhav** to the partial fulfilment of the requirement for the award of the degree of *Master of Science(Forestry and Environmental Science)* from Guru Ghasidas Central University, is the outcome of an original research work carried out by him under my supervision. The results embodied in this report is original and have not been previously submitted either in part or full to any other institution, for the award of any degree or diploma.

I wish him all success in his future endeavours.

lace – Bilaspur

)ate –14/sept. / 2022

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
'rment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

14/9/22

Dr. S.S.Dhuria
(Supervisor)
Professor
Department of Forest
Environmental Scie
GGV, Bilaspur (C

Guru Ghasidas Vishwavidyalaya,Bilasp G.)

(AcentraluniversityestablishedunderCentralUniversitiesAct2009, No.25of 2009)

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DECLERATION

I hereby declare that the Student Project entitled. ***"Seed Viability Of Azadirachta indica(Neem) &Syzygium cumini(Jamun) Of Pali & Bilaspur Forests Region."****, submitted by me to Guru Ghasidas Central University Koni, Bilaspur (C.G.) in partial fulfilment of the requirements for the award of degree of MASTER OF SCIENCE (Forestry & Environmental Science) & not submitted anywhere else.*

Place. Bilaspur Chhattisgarh

Date-.....

NAVEEN KUMAR VAIBHAV
M.Sc. Forestry, Wildlife &
Environmental Science
GGV, Bilaspur (C.G.)

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Head
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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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INTRODUCTION

An embryonic plant wrapped in a protective shell with a food reserve is called a seed. In spermatophytes, which include gymnosperm and angiosperm plants, which are seed plants, the development of the seed is a step in the reproductive process.

Seeds are the product of the ripened ovule, after the embryo sac is fertilized by sperm from pollen, forming a zygote. The embryo within a seed develops from the zygote, and grows within the mother plant to a certain size before growth is halted. The seed coat arises from the integuments of the ovule.

Compared to more primitive plants like ferns, mosses, and liverworts, which lack seeds and rely on water-dependent methods of self-propagation, the development of seeds has been crucial to the reproduction and success of both gymnosperm and angiosperm plants. In both hot and cold climes, seed plants now predominate in biological niches on land, including forests and grasslands.

The word "seed" also has a broader definition that predates the above: anything that can be sowed, such as "seed" sunflowers, "seed" maize, or "seed" potatoes. While the potato is a tuber, the sunflower and maize "seeds" are actually the seeds that are enclosed in a husk or shell.

The ovary of flowering plants matures into a fruit that houses the seed and is used to disperse it. Many of the structures that are typically called "seeds" are actually dry fruits. The hard wall of the fruit, which must be cut open to get the seed, is sometimes marketed with sunflower seeds inside of it. The so-called stone fruits (like the peach) have a solid fruit layer (the endocarp) bonded to and around the actual seed. Different families of plants have distinct changes. Acorns and hazelnuts are examples of nuts, which are the single-seeded, hard-shelled fruits of some plants with an indehiscent seed.

It is the capability of plant structure (seed, cuttings etc.) to show living properties like germination and growth. Viability testing is one of the major aspects of seed technology.

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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A
Report
on

"Training Report on Computational Skill"

Organized by

Department of Sericulture Koni, Bilaspur C.G.

SUBMITTED FOR THE PARTIAL FULTILLMENT OF THE REQUIREMENT OF THE MASTER DEGREE OF SCIENCE IN FORESTRY AND ENVIRONMENTAL SCIENCES

Academic Session – 2021-22

Under the Supervision of:	Submitted By:
Dr. S.S. Dhuria Professor Department of Forestry, Wildlife & EnvironmentalSciencesGGV, Bilaspur (C.G.)	**Naveen Kumar Vaibhav** M.Sc. Forestry and Environmental ScienceRoll No. 20412019 Enrollment No. GGV/20/06707

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A central university established under Central Universities Act 2009 No. 25 of 2009)

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GURU GHASIDAS VISWAVIDYALAYA,BILASUR(C.G.)

(A ccnlrnlunlvcrsllycslulJllshctluntlcrCcnlrulU nlvcrslllcsAct 2009,No.25of 2009)

CERTIFICATE

This is to certify that the Computer Application training report work entitled"Training report on Computational Skills"submitted in parial fulfillment of the requirements for the Degree of Master of Science in Forestry and Environmental Sciences in Department of Forestry,Widlife & Environmental Sciences,Guru Ghasidas Vishwavidyalaya,Bilaspur (Chhattisgarh) is the work Carried out by Mr Naveen Kumar Vaibhav S/o Late Kalaram Vaibhav under my Supervision and guidance.

I wish Naveen Kumar Vaibhav all the success in his academics.

Place:Bilaspur

Date:14/Sept./2022

14/9/22

Dr.S.S. DHURIA

Professor

Department of Forestry,

Wildlife and Environmental Science

Guru Ghashidas

Vlshwavldyalaya,Bllaspur,CG.

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
uru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DECLARATION

I, Naveen Kumar Vaibhav (M.Sc. Forestry & Environmental Science Enrol. GGV/20/06710 (Roll No. - 20412029), do hereby declare that this dissertation entitled " **Training Report On Computational Skills** "is a result of the original work carried out by me under the kind supervision of **Dr.S.S.Dhuria** , Guru Ghasidas Central University, as a part of the award for the degree of **Master of Science in Forestry & Environmental Science**. To the best of my knowledge, it contains no materials previously published or written by another person and that which is presented in form of citations, have been duly acknowledged in the "Reference" section. I have acknowledged all the agencies and persons concerned who have directly or indirectly assisted me during thesampling, processing, analysis and preparation of this report.

I am fully aware while I declare that this dissertation has not been previously submitted to this university or any other institution for the award of any other degree or diploma.

Place. - Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Date –

Naveen Kumar Vaibhav

(GGV/20/06707)

(20412019)

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Chapter – 1

Introduction to Computer and Personal Computer

1.1. Introduction –

Computer

A computer is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use.

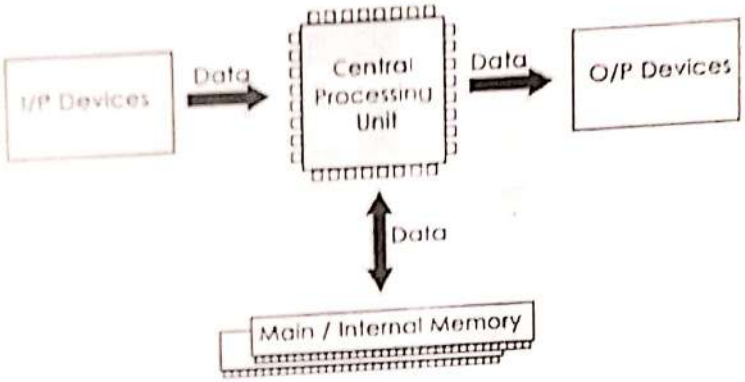


Figure 1 Computer CPU and linked devices

Central Processing Unit

The Central Processing Unit (CPU) is called "the brain of computer" as it controls operation of all parts of computer. It consists of two Components: Arithmetic Logic Unit (ALU), and Control Unit.

Arithmetic Logic Unit (ALU)

Data entered into computer is sent to RAM, from where it is then sent to ALU, where rest of data processing takes place. All types of processing, such as comparisons, decision-making and processing of non-numeric information takes place here and once again data is moved to RAM.

Control Unit

As name indicates, this part of CPU extracts instructions, performs execution, maintains and directs operations of entire system.

Functions of Control Unit

Control unit performs following functions –

1. It controls all activities of computer
2. Supervises flow of data within CPU
3. Directs flow of data within CPU
4. Transfers data to Arithmetic and Logic Unit
5. Transfers results to memory

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ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A REPORT ON COMPUTATIONAL SKILLS

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE



SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. K. K. Chandra

SUBMITTED BY

Divakar Singh Rajput

M.Sc. IV SEMESTER

ROLL NO. 20412010

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the report entitled ***" Computational Skill "*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Divakar Singh Rajput S/o Mr. Raju Singh*** *under my supervision and guidance.*

I wish him all the success in his academics.

Date: *.... / Sept / 2022*
Place: ***Bilaspur***

19/9/2022

Prof. K.K.Chandra

Supervisor
Head of Department
Professor
Department of Forestry, Wildlife and Environmental Science, GGV,Bilaspur

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GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date...../ SEPT /2022.

DECLARATION

I hereby declare that the report entitled " Computational Skill " submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of Master of Science Degree in Forestry & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Divakar Singh Rajput

M.Sc. Forestry IV Sem

Roll No. 20412010

Enrl. No.- GGV/16/6224

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विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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DAY – 1

Introduction to GIS – Component Downloading and Installation of QGIS – Getting Familiar with QGIS Interface

INTRODUCTION OF GIS

Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analyzing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture.

GIS- GEOGRAPHIC INFORMATION SYSTEM WHEN WE DISCUSSED ABOUT GIS

It is necessary to remember two important person the first one is John snow (1813 – 1858). It was believed that cholera was spread by a "bad air "or " bad smell "from decomposing organic matter in the nineteenth century. But john snow was evidence that, cholera was spread through contaminated drinking water not because of bad smells. During the 1854 broad street cholera outbreak he spatially correlated contaminated drinking water pipes and number of affected and deaths to prove his theory. His work of spatial analysis is considered as pioneer of today's geographic information system.

The second person is R.F. TOMLINSON (1933-2014) who is also consider as **The father of GIS** A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

The key word to this technology is Geography – this means that some portion of the data is spatial. In other words, data that in some way referenced to locations on the earth. Coupled with this data is usually tabular data known as attribute data. Attribute data can be generally defined as additional information about each of the spatial features. An example of this would be schools. The actual location of the schools is the spatial data.

Additional data such as the school's name, level of education taught, student capacity would make up the attribute data. It is the partnership of these two data types that enables GIS to be such an effective problem-solving tool through spatial analysis. GIS is more than just software. People and methods are combined with geospatial software and tools, to enable spatial analysis, manage large datasets, and display information in a map/graphical form.

COMPONENTS OF GIS

GIS enables the user to input, manage, manipulate, analyze, and display geographically referenced data using a computerized system. To perform various operations with GIS, the components of GIS such as software, hardware, data, people and methods are essential.

SOFTWARE: –

In GIS Software are open-source software & commercial software. GIS software provides the functions and tools needed to store, analyze, and display geographic information. Key software components are

(a) a database management system (DBMS)
(b) tools for the input and manipulation of geographic information

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A REPORT ON INSTITUTIONAL ATTACHMNT OF IFP RANCHI AND SERICULTURE BILASPUR

(INSTITUTIONAL ATTACHMENT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. K. K. Chandra

SUBMITTED BY

Divakar Singh Rajput

M.Sc. IV SEMESTER

ROLL NO. 20412010

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the report entitled ***"Institutional Attachment of IFP Ranchi & Sericulture"*** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Divakar Singh Rajput S/o Mr. Raju Singh*** *under my supervision and guidance.*

I wish him all the success in his academics.

Date: …. / Sept / 2022

Place: Bilaspur

4/9/2022

Prof. K.K.Chandra

Supervisor

Head of Department

Professor

Department of Forestry, Wildlife and Environmental Science, GGV,Bilaspur

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(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-...../ SEPT /2022.

DECLARATION

I hereby declare that the report entitled "*Institutional Attachment of IFP Ranchi & Sericulture*" submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Divakar Singh Rajput
M.Sc. Forestry IV Sem
Roll No. 20412010
Enrl. No.- GGV/16/6224

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Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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Chapter - 1
INTRODUCTON ABOUT INSTITUTE OF FOREST PRODUCTIVITY (I.F.P)

About the institute

I.F.P is situated on National highway (N.H.-24), lalgutwa, Ranchi- Gumla road, near kathal more Ranchi. The institute of Forest Products is a premier forestry research institute catering to the forestry research needs in eastern india. The institute came into existence in year 1993 with the objective to formulate ,organize, direct, manage, and carryout forest research and education in eastern region of the country, comprising the states of Bihar, Sikkim, Jharkhand, West Bengal which encompasses approx. 46,581 sq. km. forest area, which is 17% of total geographical area of the country.1985,Brought under FRI, DEHRADUN, The operational area comprises of 6 agroecological zones and 6 main forest types.

TOTAL AREA OF I.F.P - The total area of institute of forest productivity is 35 hectares.

The major objectives of the Institute are as follows:

- To develop and maintain information on forestry and allied sciences.
- To act as a clearing-house for region specific research and general information relating to forests and wildlife.
- To establish model nursery , germplasm bank and identify suitable seed production areas for improving forest productivity.
- To enhance the productivity of floral and faunal resources, conservation of biodiversity, eco-restoration of degraded lands and protection of fragile ecosystem unique to the region.
- To develop extension programmes and propagate the research results from lab to land.
- To provide consultancy services in the field of forestry research, training and in allied sciences.
- To develop and extend Lac cultivation and dissemination of market data on lac production in the country.

SECTIONS OF I.F.P LALGUTWA - Institute of forest productivity is spread over 35 hectares of land. It has various section and out of them our visiting section was as follows:

- Medicinal garden.
- Bambusetum.

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वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A REPORT ON SAL FOREST IN ATR BILASPUR

(STUDENT PROJECT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. K. K. Chandra

SUBMITTED BY

Divakar Singh Rajput

M.Sc. IV SEMESTER

ROLL NO. 20412010

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

(A Central University Established Under Central University Act 2009, No.25 of 2009)

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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR-495009
(CHHATTISGARH)

(A Central University Established Under Central University Act 2009, No.25 of 2009)

CERTIFICATE

This is to certify that the Student project report entitled **" SAL FOREST IN ATR Bilaspur"** *submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Divakar Singh Rajput S/o Mr. Raju Singh*** *under my supervision and guidance.*

I wish him all the success in his academics.

14/9/2022

Date: *.... / Sept / 2022*

Place: ***Bilaspur***

Prof. K.K.Chandra

Supervisor

Head of Department

Professor

Department of Forestry, Wildlife and Environmental Science, GGV,Bilaspur

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GURU GHASIDAS VISHWAVIDYLAYA BILASPUR (C.G.)
(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-...../ SEPT /2022.

DECLARATION

I hereby declare that the report entitled "SAL FOREST IN ATR BILASPUR " Student project report submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Divakar Singh Rajput
M.Sc. Forestry IV Sem
Roll No. 20412010
Enrl. No.- GGV/16/6224

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वानिकी, वन्यजीव एवं पर्यावरण विभाग
'rment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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INTRODUCTION :-

Sal Forest is a forest type dominated by a single plant species, commonly known as Sal tree (Shorea robusta). It belongs to the category 'Tropical Moist Deciduous Forest'. The distribution of Sal forests is controlled by the conditions of topography, geology, and soil.

DISTRIBUTION :-

This tree is native to the Indian subcontinent, ranging south of the Himalaya, from Myanmar in the east to Nepal, India and Bangladesh. In India, it extends from Chhattisgarh, Assam, Bengal, Odisha and Jharkhand west to the Shivalik Hills in Haryana, east of the Yamuna. The range also extends through the Eastern Ghats and to the eastern Vindhya and Satpura ranges of central India.[5] It is often the dominant tree in the forests where it occurs. In Nepal, it is found mostly in the Terai region from east to west, especially, in the Sivalik Hills (Churia Range) in the subtropical climate zone. There are many protected areas, such as Chitwan National Park, Bardia National Park and Shuklaphanta National Park, where there are dense forests of huge sal trees.

The sal tree is known also as sakhua in northern India, Including Madhya Pradesh, Odisha and Jharkhand. It is the state tree of two Indian states – Chhattisgarh and Jharkhand.

Sal is moderate to slow growing, and can attain heights of 30 to 35 m and a trunk diameter of up to 2–2.5 m. The leaves are 10–25 cm long and 5–15 cm broad. In wetter areas, sal is Evergreen in drier areas, it is dry-season deciduous. Shedding most of the leaves from February to April, leafing out again in April and May.

Sal is one of the most important sources of hardwood timber in India, with hard, coarse-grained wood that is light in colour when freshly cut, but becomes dark brown with exposure. The wood is resinous and durable, and is sought-after for construction, although not well suited to planing and polishing.

Species: S. robusta

Genus: Shorea

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वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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A REPORT ON FOREST ATTACHMENT

(FOREST ATTACHMENT REPORT)

SUBMITTED FOR THE PARTIAL FULLFILLMENT OF REQUIREMENT FOR MASTER DEGREE OF SCIENCE IN FORESTRY & ENVIRONMENTAL SCIENCE

SESSION: 2020-22

MASTER OF SCIENCE IN FORESTRY (2YDC)

UNDER SUPERVISION

Prof. K. K. Chandra

SUBMITTED BY

Divakar Singh Rajput

M.Sc. IV SEMESTER

ROLL NO. 20412010

DEPARTMENT OF FORESTRY, WILDLIFE & ENVIRONMENTAL SCIENCES

GURU GHASIDAS VISHWAVIDYALAYA BILASPUR, CHHATTISGARH

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CERTIFICATE

This is to certify that the report entitled " ***Forest Attachment*** *" submitted in partial fulfillment of the requirements for the Degree of* ***Master of Science in Forestry and Environmental Sciences in Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur (Chhattisgarh)*** *is the work carried out by* ***Mr. Divakar Singh Rajput S/o Mr. Raju Singh*** *under my supervision and guidance.*

I wish him all the success in his academics.

10/9/2022

Date: …. / Sept / 2022

Place: Bilaspur

Prof. K.K.Chandra

Supervisor

Head of Department

Professor

Department of Forestry, Wildlife and Environmental Science, GGV,Bilaspur

विभागाध्यक्ष
Head
वानिकी, वन्यजीव एवं पर्यावरण विभाग
ment of Forestry, Wildlife and Environmental Science
गुरू घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

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(A Central University Established Under Central University Act 2009, No.25 of 2009)

Date-...../ SEPT /2022.

DECLARATION

I hereby declare that the report entitled " Forest Attachment " submitted to Department of Forestry, Wildlife & Environmental Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G is record of an original work done by me under the guidance of Dr. K.K.Chandra and this work has been formed for the award of *Master of Science Degree in Forestry* & Environment Sciences and not submitted for any other degree.

Place: Bilaspur, C.G

Divakar Singh Rajput
M.Sc. Forestry IV Sem
Roll No. 20412010
Enrl. No.- GGV/16/6224

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FOREST ADMINISTRATION

The forest administration is the body responsible for implementation of forest policy and forestry issues in a particular country through rules, legislation and financial that means information and forest programs, the forest policy aims to promote the sustainable management and use of forest land resources.

State Forestry Department: The State Forestry Department is responsible for the administration and regulation of forest harvesting, forest revenue collection and development of the state forest resources. The Department also plans and coordinates the development of wood based industries. The State Forestry Department is divided into Forest Operations and Forest Development Divisions and supported by District Forest Offices. Development Divisions and supported by District Forest Offices.

Forest Development Division: Responsible for planning, implementing and monitoring of forest management and development activities, including biodiversity conservation, ecotourism development and forest rehabilitation as well as the preparation and implementation of the State Forest Management Plan.

District Forest Office: Responsible for administration, controlling forest harvesting, forest revenue collection and forest law enforcement. The office is also responsible for implementing forest management and development activities including the management of forest eco-park and state forest park.

Forest administration management: Forest management is the process of planning and implementing practices for the stewardship and use of forests and other wooded land to meet specific environmental, economic, social and cultural objectives. It deals with the overall administrative, economic, legal, social, technical and scientific aspects related to natural and planted forests. It may involve varying degrees of deliberate human
intervention, ranging from actions aimed at safeguarding and maintaining forest ecosystems and their functions, to those favoring specific socially or economically valuable species or groups of species for the improved production of forest goods and services.

Aims of forest administration:

- ✓ To provide sustainable forest management.
- ✓ To provide well economical condition.
- ✓ To provide well environmental condition.
- ✓ To provide well biodiversity composition.
- ✓ To provide better land management.
- ✓ To provide better health for the earth.
- ✓ Natural resource monitoring and development .

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