PRR & VS GOVT.COLLEGE

VIDAVALUR, SPSR NELLORE DT.

DEPARTMENT OF BOTANY

CERTIFICATE COURSE IN CULTIVATION OF AZOLLA AS BIOFERTILIZER

2022-23

CIRCULAR

This is to inform to all the students that the department of Botany is organizing a CERTIFICATE COURSE IN "CULTIVATION OF AZOLLA AS BIOFERTILIZERR" from 10-10-2022 to 04-11- 2022 a 4week programme. Those who are interested can enroll their names in the Botany department.

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VIDAVALUR - 524316.
SPSR NELLORE DT.

1. B.A —
2. B.com —
3. B.Sc (MPCs) —
4. B.Sc (BZC) —

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DEPARTMENT OF BOTANY

CERTIFICATE COURSE IN CULTIVATION OF AZOLLA AS BIOFERTILIZER:

Our college has large number of students entering for graduation in Science after their Intermediate i,e 10+2 classes. In spite of their good academic record students have virtually stopped studying after the month of April. during course of time students if complete the certificate course, they will be benefited by getting good jobs in life science sector.

AIMS AND OBJECTIVES OF CERTIFICATE COURSE:

The certificate course is aimed to act as a buffer for the life sciences students who were unknown to Zoology subject, with objective to provide adequate time and basic knowledge about cultivation of Azolla as Biofertilizer. This gives them knowledge about cultivation of Azolla as Biofertilizer.

During this interaction with the faculty and their classmates, the students will equipped with the knowledge and the confidence needed to take on bigger challenges of carrier.

Many farmers, due to limited resources, often struggle to produce sufficient feed for those animals. But Azolla is the right option in front of them.

Azolla is an ideal sustainable feed for cattle, fish, pigs, and poultry. Apart from this, it's also used as a biofertilizer on the farm. Hence many farmers attract to the Azolla cultivation.

Azolla cultivation is popular in countries like China, Vietnam, and the Philippines, etc.

Azolla fixes nitrogen; it is an excellent source of nitrogen and a high nutrient value.

For Azolla, cultivation required less investment; hence it is a low-cost alternative for a good feed and good biofertilizer.

CERTIFICATE COURSE

Course title: C U L T I V A T I O N O F A Z O L L A

Course outcomes

On successful completion of the course, the learners should be able to **CO1:** describe about the importance of biofertilizers.

CO2: identify bacterial, algal and fungal biofertilizer.

CO3: assess the quality control of biofertilizers.

CO4: describe the morphology and ecology of Azolla.

CO5: Describe the procedure of cultivation of Azolla.

CO6: Identify the uses of Azolla as biofertiliuzer.

UNIT – I

Introduction, Bacterial bio fertilizer: *Rhizobium, Azotobacter*, *Azopirillum* and *Frankia*.

UNIT –II

Algal biofertilizer - Blue green alga-Nostoc, Anabaena; Fungal biofertilizers - Mycorrhizae – ecto and endomycorrhiza.

UNIT-III

Morphology, Anatomy, Reproduction and Ecology of Azolla. Chemical composition of Azolla.

UNIT – IV

Mass production and inoculation Procedure of cultivation of Azolla, methods of application, pests and weed control, quality control, agronomic importance. Uses of Azolla as cattle feed.

References

1. Subba Rao N.S. 1995, Soil microorganisms and plant growth, Oxford and IBH publishingCo. Pvt. Ltd, NewDelhi.
2. Mahendra K. Rai. 2005, Hand book of Microbial biofertilizers, The Haworth Press, Inc.New York.
3. Azollo as Livestock Feed. Directorate of Animal Husbandry and Veterinary Services, Cuttack, India.

Syllabus

Week 1

1. Introduction.
2. Bacterial bio fertilizer: *Rhizobium, Azotobacter*.
3. Bacterial bio fertilizer: *Azopirillum* and *Frankia*.

Week 2

1. Algal biofertilizer - Blue green alga-Nostoc, Anabaena;
2. Fungal biofertilizers - Mycorrhizae – ecto and endomycorrhiza.

Week 3

1. AZOLLA-Morphology, Anatomy.
2. Reproduction and Ecology of Azolla.
3. Chemical composition of Azolla.

Week 4

1. Mass production and inoculation.
2. Procedure of cultivation of Azolla, methods of application.
3. Pests and weed control- quality control.
4. Agronomic importance, Uses of Azolla as cattle feed.

Time Table

Every Day 1 PM TO 1.45 PM

DAY	NAME OF THE FACULTY
MONDAY	SRI. K. RAVICHANDRA REDDY
TUESDAY	SRI. P. SUDHAKAR
WEDNESDAY	SRI. K. RAVICHANDRA REDDY
THURSDAY	SRI. P. SUDHAKAR
FRIDAY	SRI. K. RAVICHANDRA REDDY
SATURDAY	SRI. P. SUDHAKAR

CULTIVATION PROCEDURE

1. Create an artificial pond for growing Azolla.

2. For creating the Azolla cultivation pond, select a partially shaded area because Azolla needs 30% sunlight; too much sunlight will destroy the plant. The area under the tree is preferable.

3. If you decide to grow an Azolla on a large scale, you can make small concrete tanks. Otherwise, you can make the pond any size you want.

4. Dig out the soil for the pond and level the soil; after that, spread the plastic sheet around the ground to prevent water loss. Make sure the pond is at least 20 CM Deep.

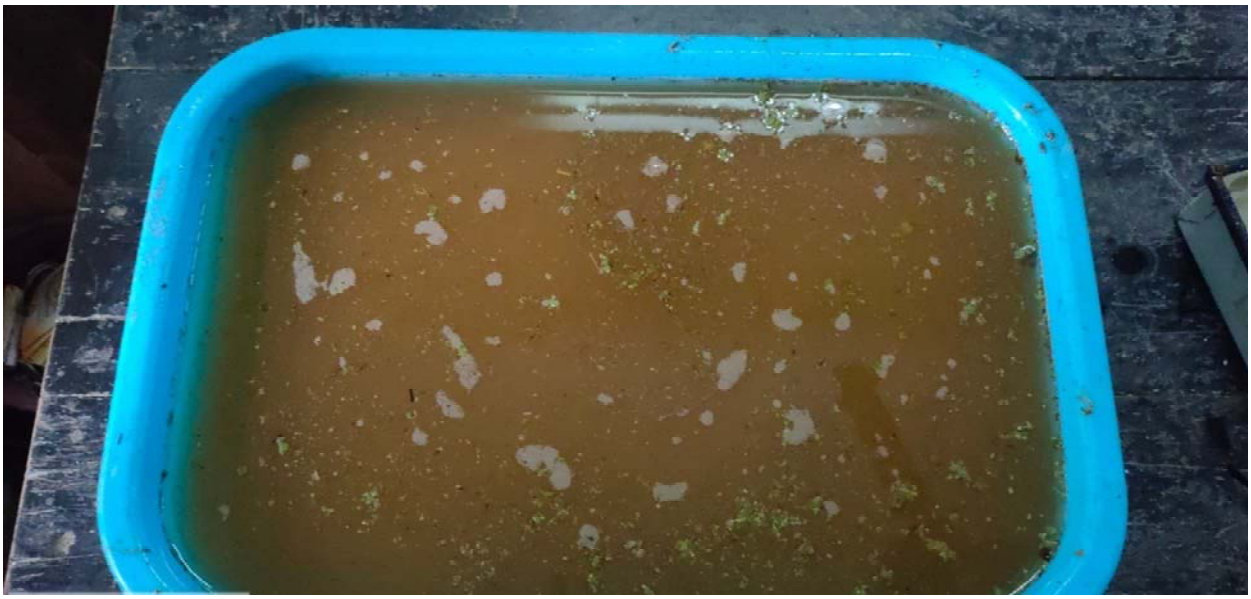
5. Add some soil uniformly on the plastic sheet in the pond. For 2M X 2M size pond, add 10-15 kg soil.

6. Azolla needs Phosphorus to grow well you can use Super Phosphate along with cow dung slurry. Cow dung increases the available nutrients. Use cow dung 4-5 days old.

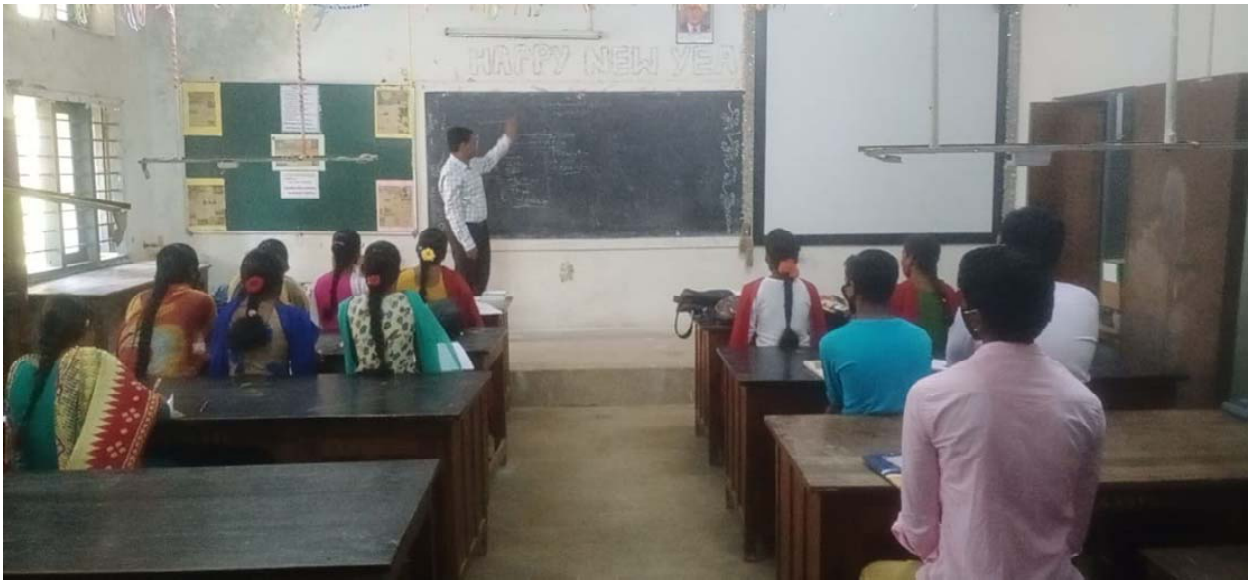
7. Next, fill the pond with water to a level of about 10 cm; this will allow the Azolla Plant's short route to float freely, then leave the pond for 2 to 3 days so the ingredients can settle.

8. After 2-3 days, add Azolla culture in the pond by gently rubbing Azolla in your hands. It helps break Azolla into smaller pieces for faster multiplication.

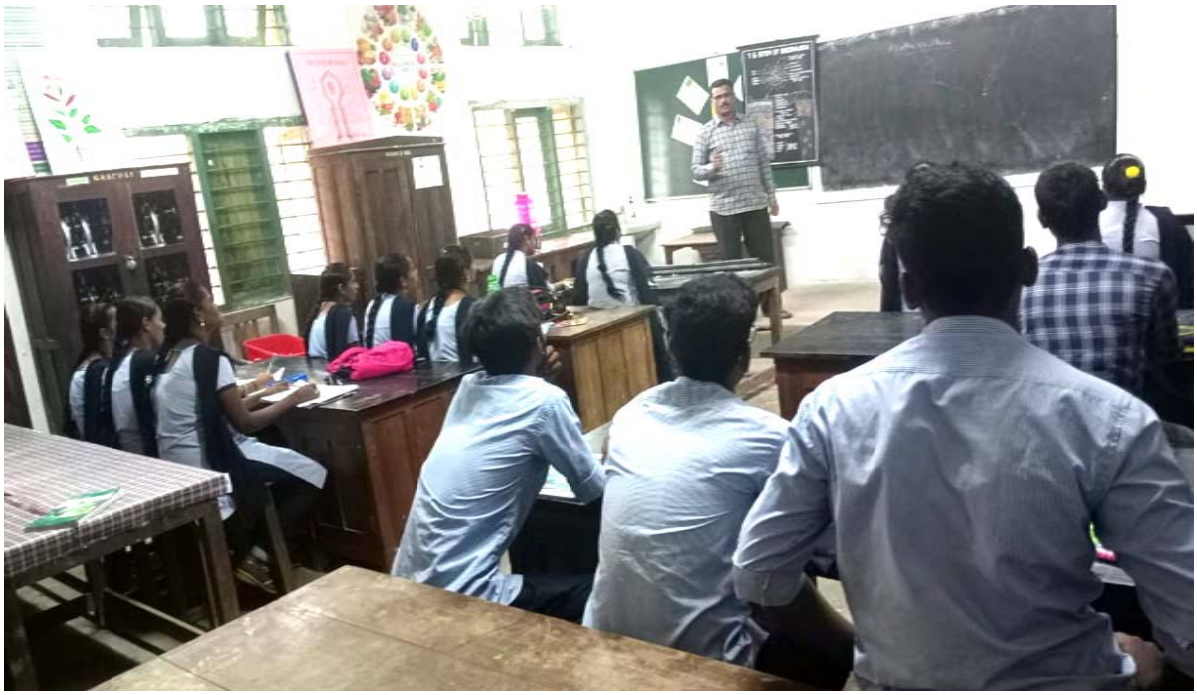
9. After two-week start of harvesting, form a pond of 2M X 2M size, you can harvest 1kg Azolla each day.



DAY-1 INOCULATION OF AZOLLA



CLASS BY P. SUDHAKAR, LECTURER IN BOTANY



Class by K.Ravichandra Reddy Lecturer in Botany

S.No	Name of the student	10-10-22	11-10	12-10	13-10	14-10	15-10
1	E.Mallika	P	A	P	P	P	P
2	D.Yaswanth	P	P	P	A	P	P
3	T. Jeevitha	P	P	P	P	P	P
4	B. Sowmya	A	P	P	P	P	P
5	A. Lahari	P	P	A	P	P	P
6	S. Vindhya	P	A	P	P	P	P
7	P. Kavya	P	P	P	P	P	P
8	G. Meghana	P	P	P	P	P	P
9	Anand Kumar	P	P	P	A	P	P
10	Vinutha Sree	P	P	P	P	P	P
11	Esha Pervez	P	P	P	A	P	P
12	Vijay Kumar	P	P	P	P	P	P
13	B. Yanswanth	P	A	P	P	P	P
14	B.Swapna	P	P	P	P	P	P
15	B.LT Meghana	P	P	P	A	P	P

S.No	Name of the student	17-10	18-10	19-10	20-10	21-10	22-10
1	E.Mallika	P	A	P	P	P	P
2	D.Yaswanth	P	P	P	A	P	P
3	T.Jeevitha	P	P	P	P	P	P
4	B. Sowmya	A	P	P	P	P	P
5	A. Lahari	P	P	A	P	P	P
6	S. Vindhya	P	A	P	P	P	P
7	P. Kavya	P	P	P	P	P	P
8	G. Meghana	P	P	P	P	P	P
9	Anand Kumar	P	P	P	A	P	P
10	Vinutha Sree	P	P	P	P	P	P
11	Esha Pervez	P	P	P	A	P	P
12	Vijay Kumar	P	P	P	P	P	P
13	B. Yanswanth	P	A	P	P	P	P
14	B.Swapna	P	P	P	P	P	P
15	B.LT Meghana	P	P	P	A	P	P

S.No	Name of the student	25-10	26-10	27-10	28-10	29-10	31-10
1	E.Mallika	P	A	P	P	P	P
2	D.Yaswanth	P	P	P	A	P	P
3	T.Jeevitha	P	P	P	P	P	P
4	B. Sowmya	A	P	P	P	P	P
5	A. Lahari	P	P	A	P	P	P
6	S. Vindhya	P	A	P	P	P	P
7	P. Kavya	P	P	P	P	P	P
8	G. Meghana	P	P	P	P	P	P
9	Anand Kumar	P	P	P	A	P	P
10	Vinutha Sree	P	P	P	P	P	P
11	Esha Pervez	P	P	P	A	P	P
12	Vijay Kumar	P	P	P	P	P	P
13	B. Yanswanth	P	A	P	P	P	P
14	B.Swapna	P	P	P	P	P	P
15	B.LT Meghana	P	P	P	A	P	P

S.No	Name of the student	01-11	02-11	03-11	04-11
1	E.Mallika	P	A	P	P
2	D.Yaswanth	P	P	P	A
3	T.Jeevitha	P	P	P	P
4	B. Sowmya	A	P	P	P
5	A. Lahari	P	P	A	P
6	S. Vindhya	P	A	P	P
7	P. Kavya	P	P	P	P
8	G. Meghana	P	P	P	P
9	Anand Kumar	P	P	P	A
10	Vinutha Sree	P	P	P	P
11	Esha Pervez	P	P	P	A
12	Vijay Kumar	P	P	P	P
13	B. Yanswanth	P	A	P	P
14	B.Swapna	P	P	P	P
15	B.LT Meghana	P	P	P	A
		P	P	P	A

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DEPARTMENT OF BOTANY

QUESTION PAPER FOR CERTIFICATE COURSE in

CULTIVATION OF AZOLLA AS BIOFERTILIZER

TIME :2hrs Max. Marks: 50

SECTION –A

Answer all **1×10 = 10**

1. Name of the bacterium present in legume root nodules

A. Xanthomonas

B. Rhizobium

C. Pseudomonas

D. Bacillus thuringiencis

2. Which of the following is NOT an example of a prokaryotic cell?

A) Nostoc

B) Frankia

C) Chlamydomonas

D) Actinomycetes

3. The association of fungi with roots of higher plants is called

A) Mycorrhiza

B) Lichens

C) Root nodules

D) Epiphytes

. 4. AZOLLA is belongs to

a) Thallophyta
b) Bryophyta
c) Pteridophyta
d) Gymnosperms

5. Mycorrhiza enhances the absorption ---------- by plants

6. The symbiotic Cyanobacterium present AZOLLA is ……..

7. Biofertilizers reduces the use of

A) Chemical fertilizers B) cost of crop cultivation C) labor D) all the above

8. Azolla is a ---------- hydrophytes.

9. AZOLLA can fix nitrogen due to presence of ----------

10 What is symbiosis?

SECTION –B

Write any Four questions **5 ×4 = 40**

11. Write short notes on various organisms act as biofertilizers.

12. Write short notes on morphology of AZOLLA.

13. Write the uses of AZOLLA

14. What are requirements for cultivation of AZOLLA?

15. Write about procedure of AZOLLA cultivation in brief.

Department of Botany

PRR & VS Govt. College

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Vidavalur, SPSR Nellore Dist

Course Completion Certificate

This is to certify that Mr./Ms. _____, ____ group has successfully completed the certificate course ***'Cultivation of Azolla as Biofertilizer'*** conducted by the Department of Botany from 10th Oct. 2022 to 4th Nov.2022 (4 Weeks)

Incharge

Course-coordinator

IQAC Coordinator

Principal
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PRR. & VS Govt. Degree College
VIDAVALUR- 524 318.
Sri Potti Sriramulu Nellore (D)

Department of Botany

PRR & VS Govt. College

(Accredited with B Grade by NAAC)
Vidavalur, SPSR Nellore Dist

Course Completion Certificate

This is to certify that Mr./Ms. B. Sowmya, III Bzc. group has successfully completed the certificate course ***'Cultivation of Azolla as Biofertilizer'*** conducted by the Department of Botany from 10th Oct. 2022 to 4th Nov.2022 (4 Weeks)

Incharge | Course-coordinator | IQAC Coordinator | Principal

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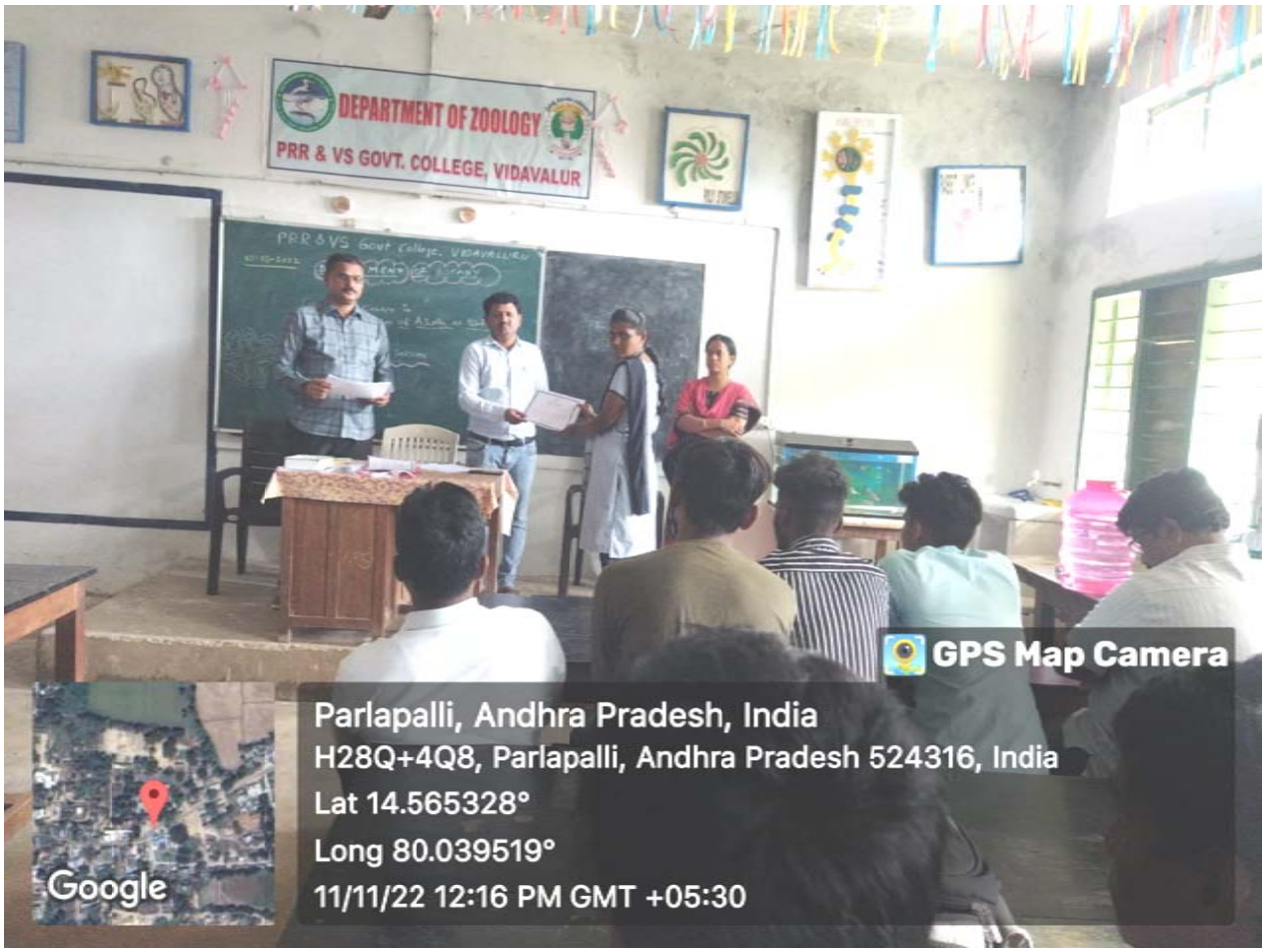
Sri Potti Sriramulu Nellore Dt.


DEPARTMENT OF ZOOLOGY
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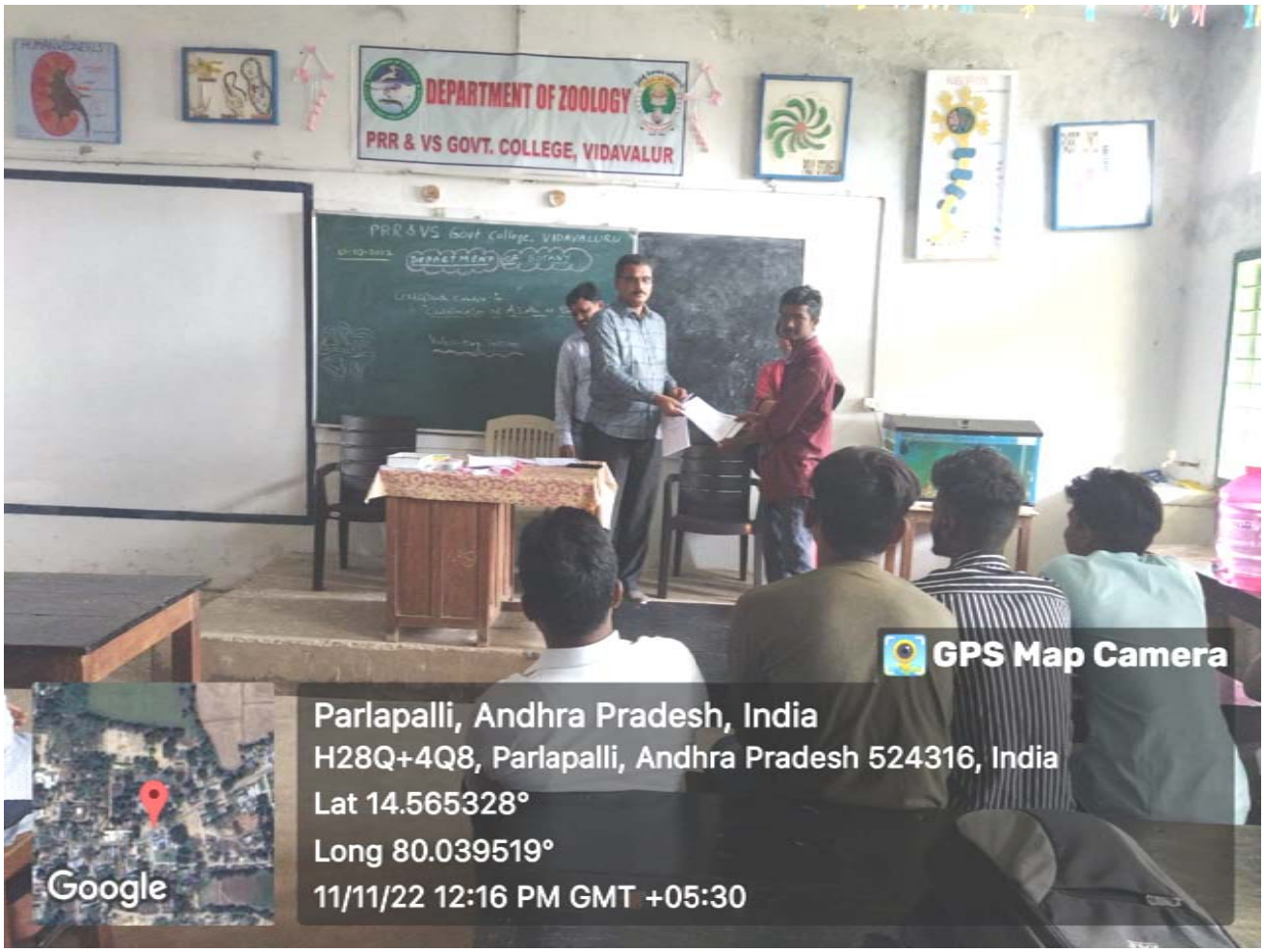

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