

SIGNIFICANCE OF SCIENTIFIC RESEARCH: FROM LAB TO LAND

BY

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TO
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HOST: Prof. Lingaraj Sahoo
IIT, GUWAHATI.

➤ State of scientific research

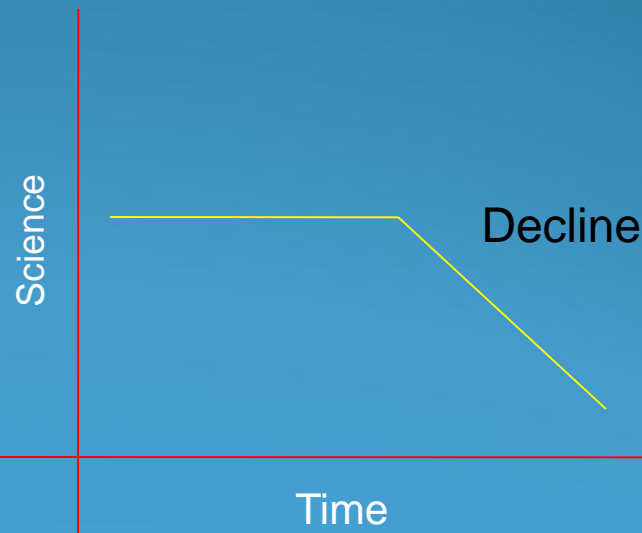
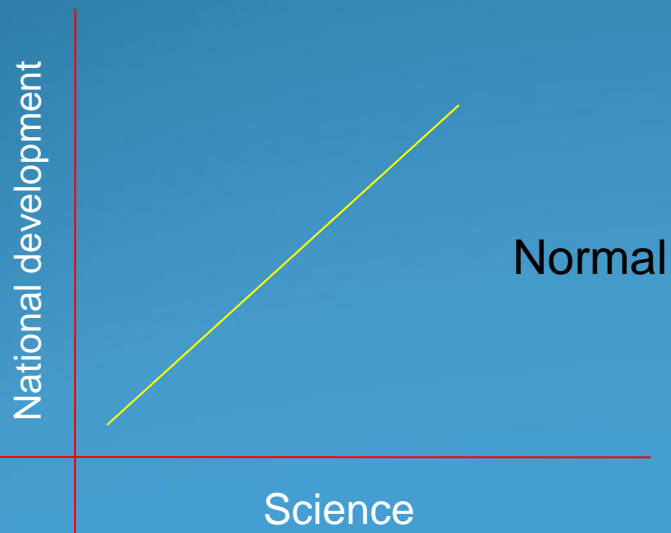
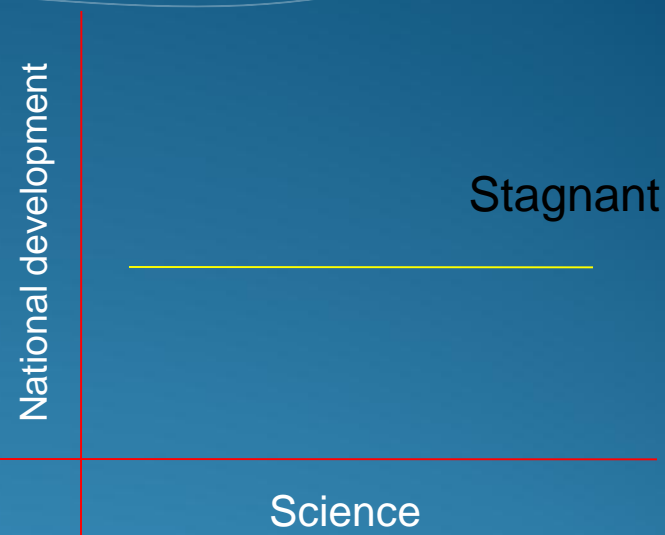
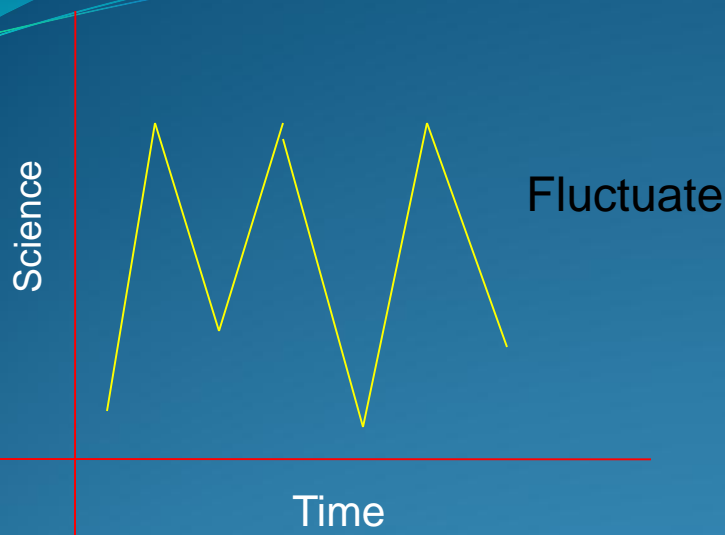
- Past
- Present
- Future
 - ❖ Implications on upcoming generations
 - ❖ Threat to sustainability of life

Scientific and Technological Capacities of Developed and Developing Countries

Parameter	Developed	Developing	Africa
Scientists and Technology	3.8	0.4	0.4
Percentage of GDP spent on Research and development	2	0.5	0.1-0.7
Scientific Publications (Per capita)	84	16	0.8
Patents and Inventions (Per capita)	97	3	Negligible

Source: Cameroon Ministry of External Relations, 2001S

Effects of Scientific research challenges in WA Universities on National Development



Current Scientific Research

- Protecting
 - Our environments and



Current Scientific Research.....Cntd



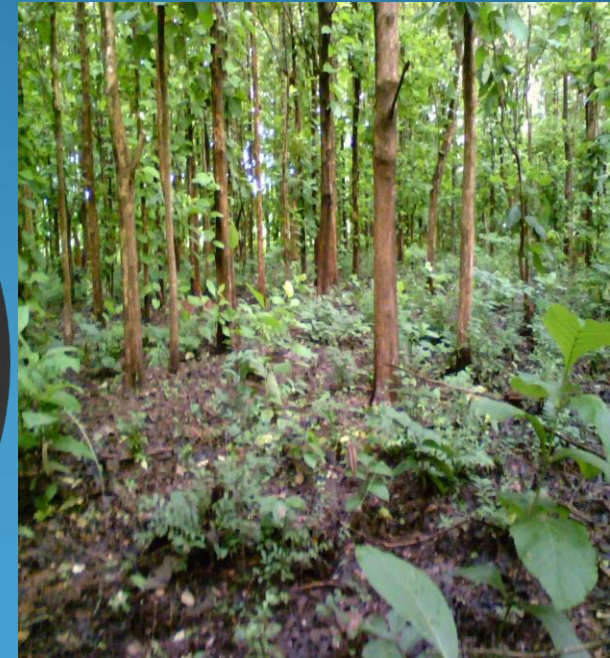
West Africa River (Source: New England Aquarium, 1998).

➤ Conservation of natural resources

- Forest
- Aquatic
- Animals

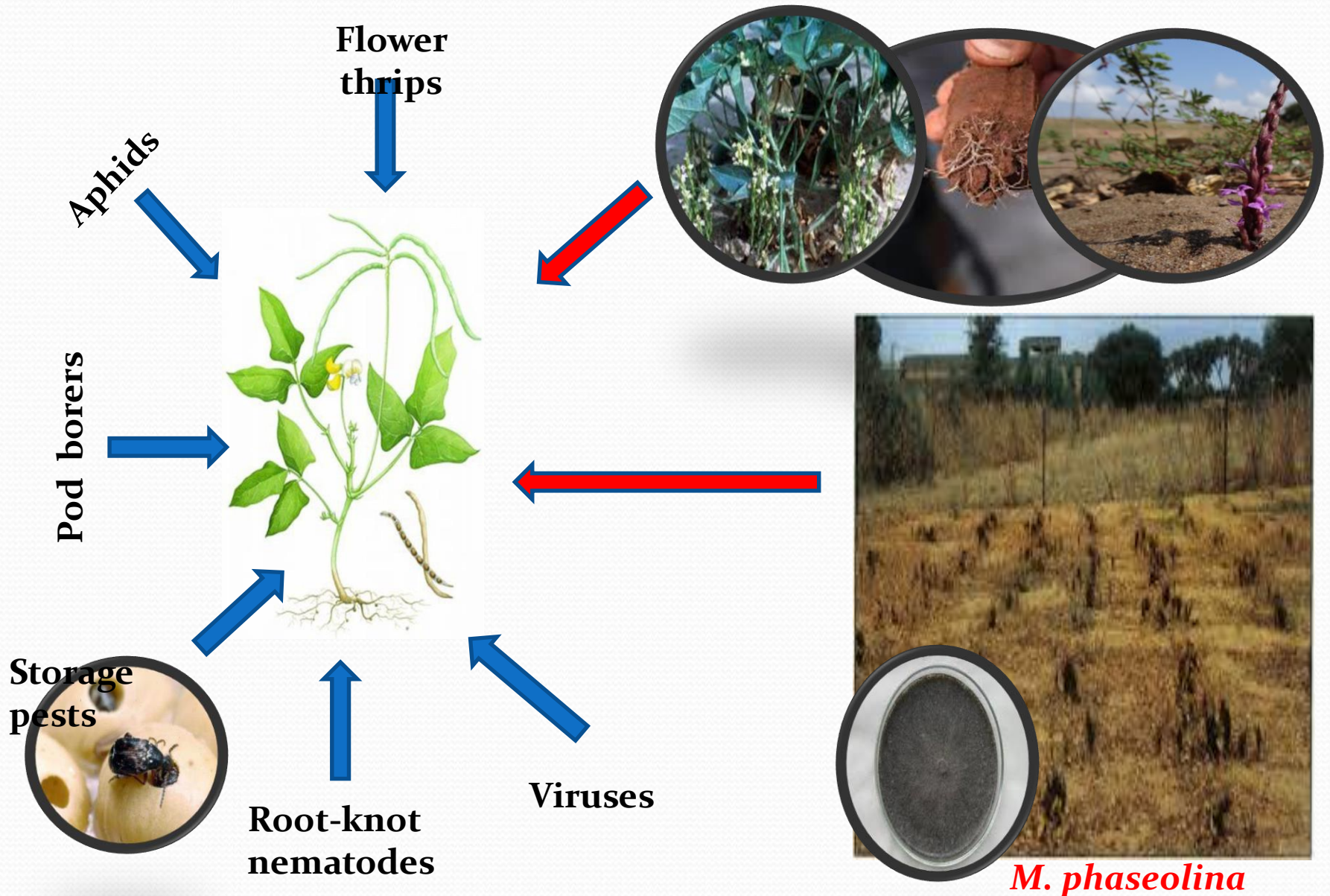
▪ **Food Security**

- ✓ Biotic
- ✓ Abiotic stress

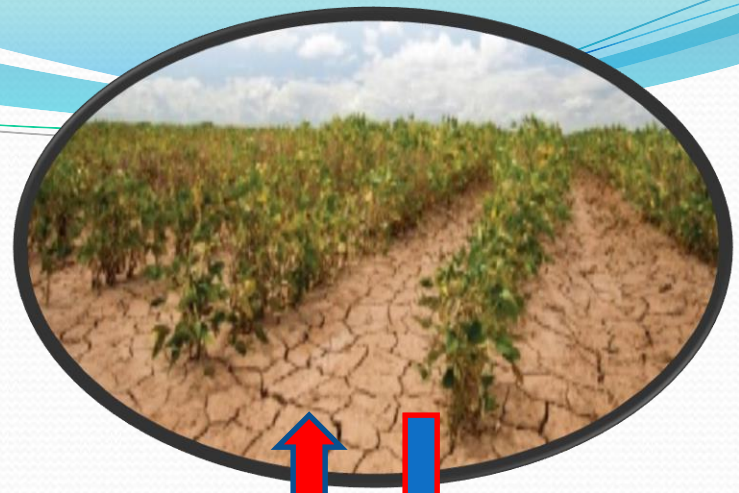


Source: African Conservation Foundation.

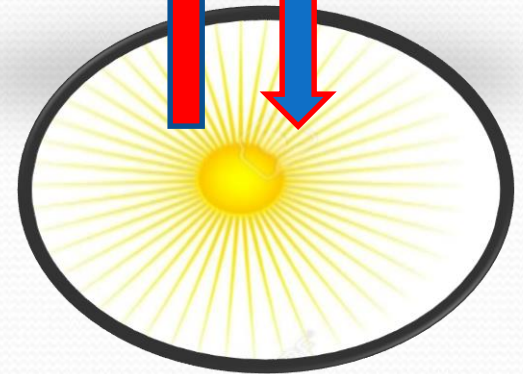
Why I am in India?: From Lab to Land



❖ Drought***



❖ Heat**



❖ Salinity*

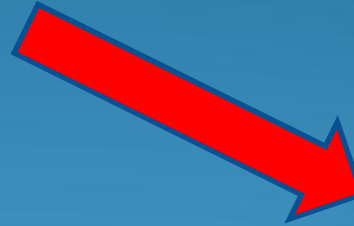


- Who will help us?.....farmers
- This is our **CRY.....FARMERS**
- University of Ibadan
- Inter. Inst. Trop. Agric
- Kent State University
- University of Goettingen
- IIT, Guwahati
- Manipur University
- Tezpur University
- **You or Me**

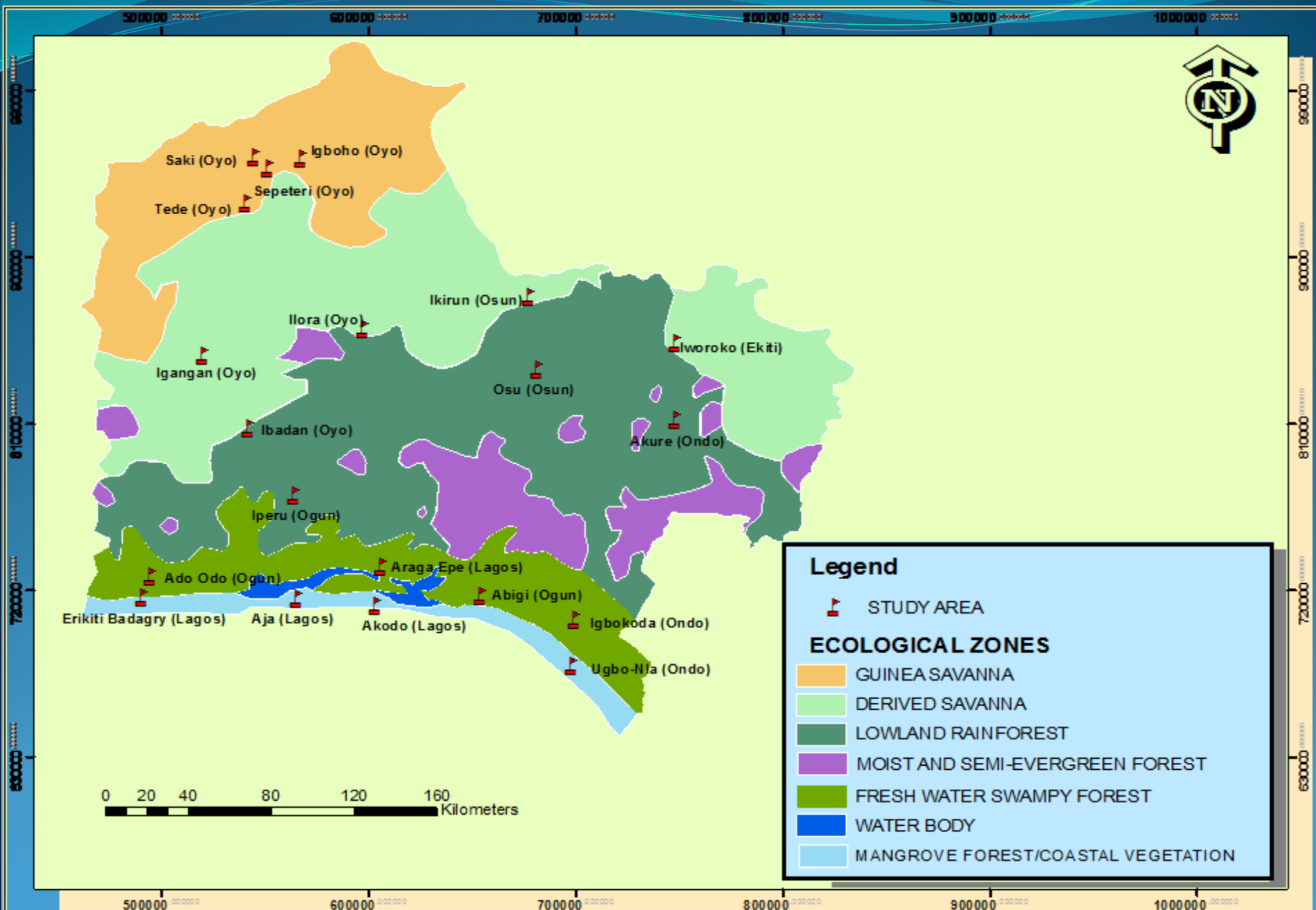


From Lab to Land

Dr. Abiala at IITA, Nigeria



Map of Southwestern Nigeria showing Ecological zones and Study areas.



From the field to the Laboratory

Dr. Abiala Moses at IITA, Ibadan, Nigeria

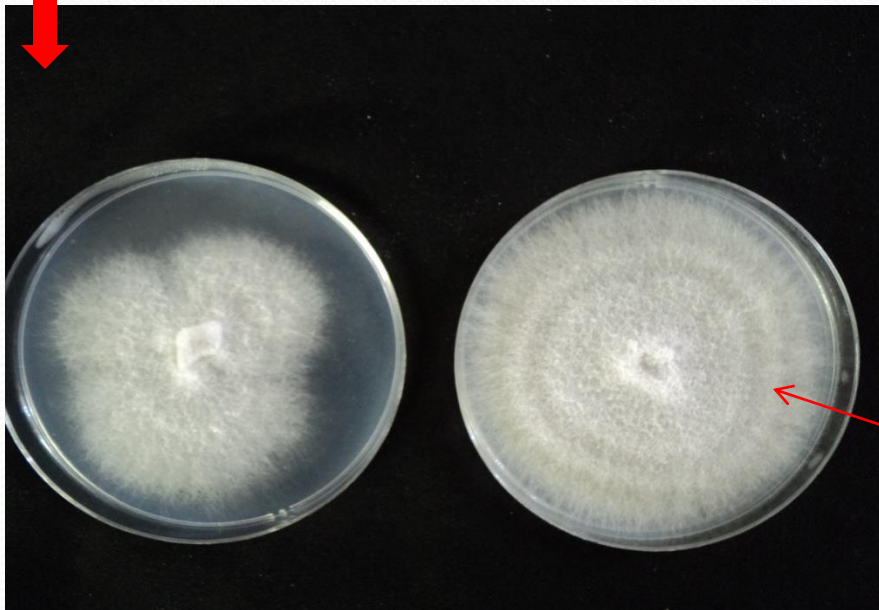
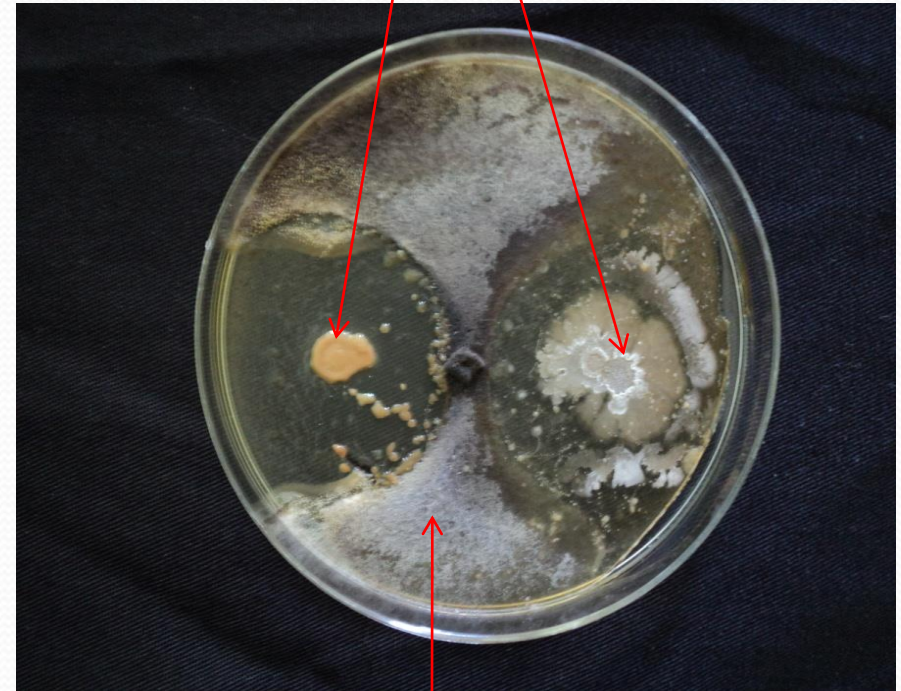


Field and Research Security

Research on food security in progress.....

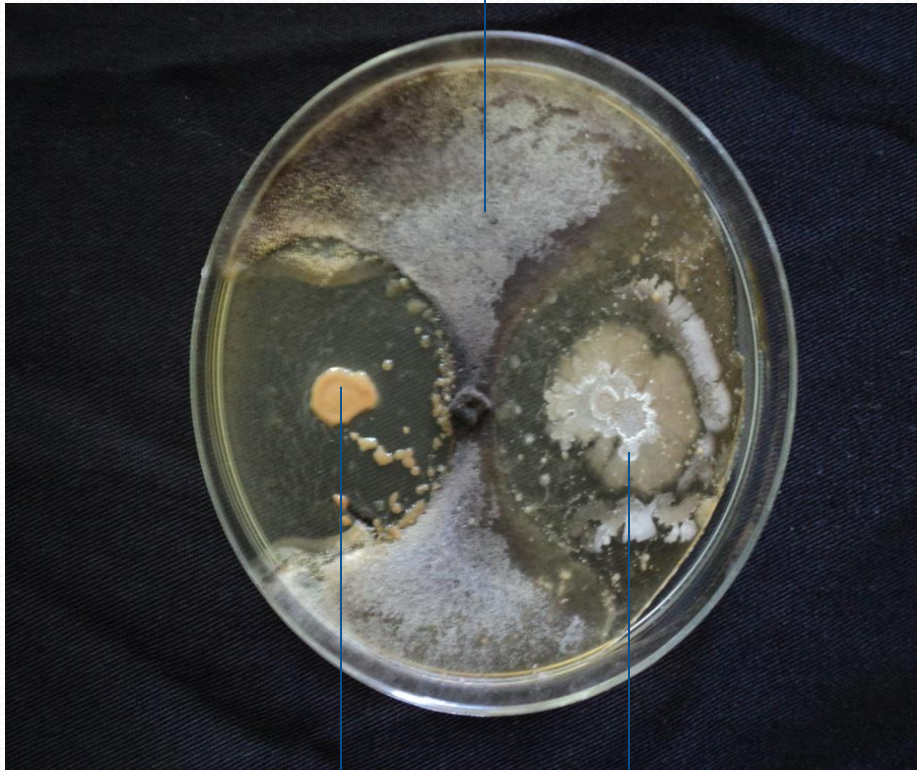


Useful soil bacteria



Deadly plant pathogen to majority of WA food crops

→ *Fusarium verticillioides*



→ Antagonistic bacteria (EPR2)

→ Antagonistic bacteria (AT-IKS)

Research in progress.....

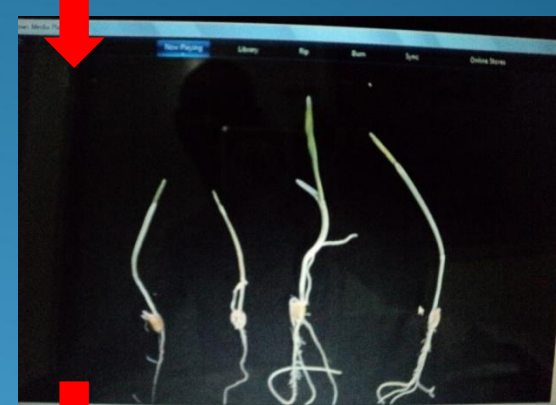
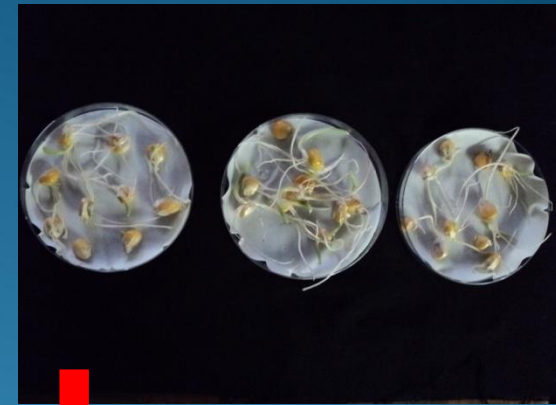


West Africa Universities Scientific Research Impacts

- Food security
- Nutrients Uptake (82% Carbohydrate, 18% Protein)
- Environments

PLANT/SOIL NUTRIENT INTERACTION

Treatment	% Nitrogen	%Phos	% Potassium
MZ	9.27	0.87	10.05
MZ + PF	0.00	0.00	0.00
MZ + NPK	19.19	1.52	23.28
MZ+NPK+PF	0.00	0.00	0.00
MZ+PF+ACT	16.06	1.39	18.00
MZ+PF+ATA	16.5	1.24	18.18
MZ+PF+NPK+ACT	9.39	0.74	9.14
MZ+PF+NPK+ATA	18.46	2.04	26.42
MZ+ACT	19.8	1.8	23.5
MZ+ATA	18.5	2.31	28.5



➤ Application of biotechnology to food security

✓ ???

■ Challenges

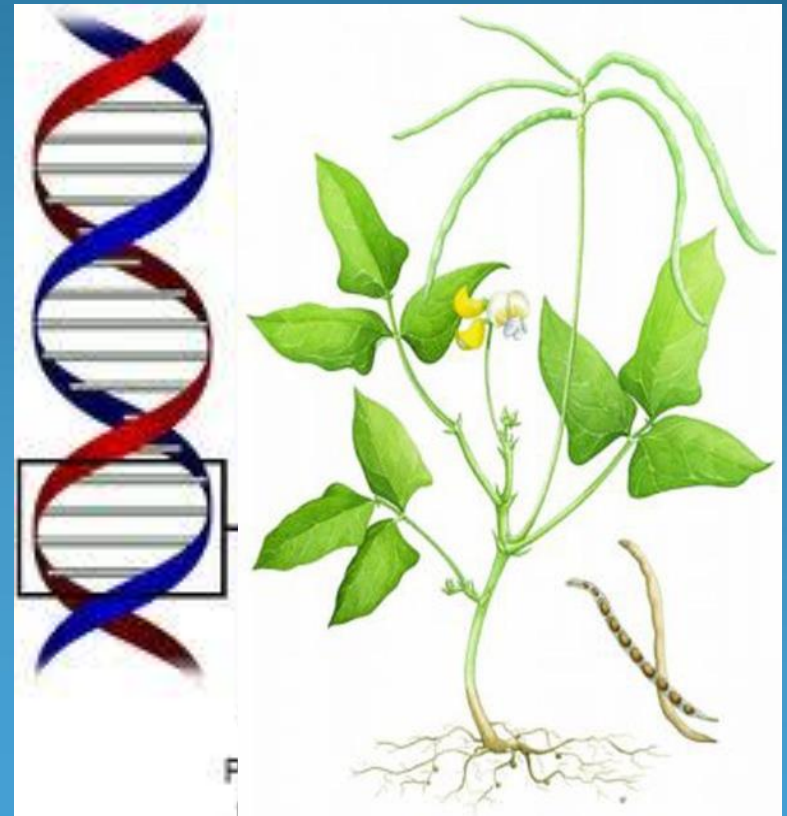
- Research facilities/Equipments
- Funding
- Capacity building
- Supervision capability

➤ Collaborative Research

- Professor Lingaraj Sahoo and Dr. Abiala Moses
- **Laboratory of Professor L. Sahoo, IIT, Guwahati**
 - ✓ Application of molecular techniques to legumes, cereals and vegetables

➤ Advantages

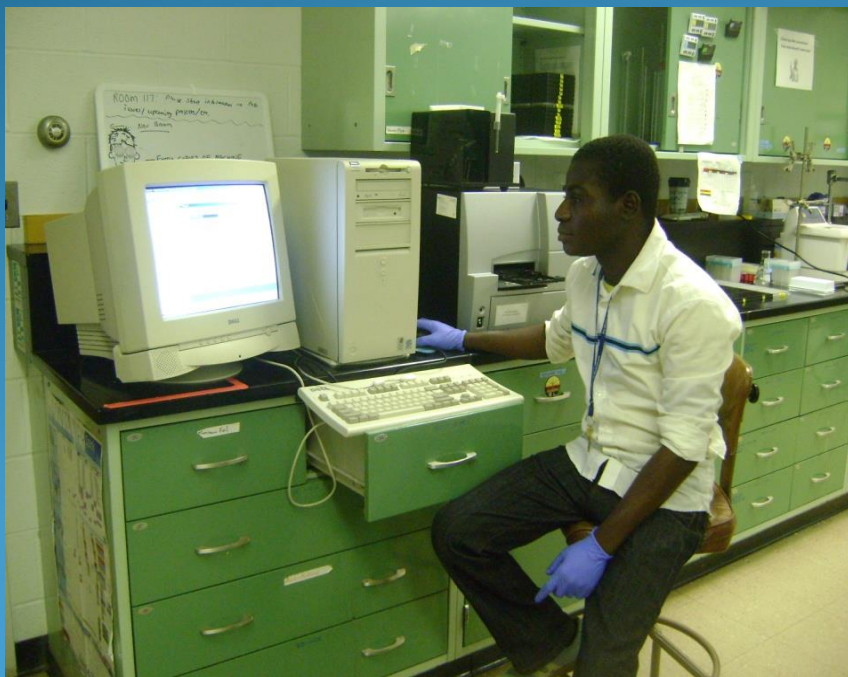
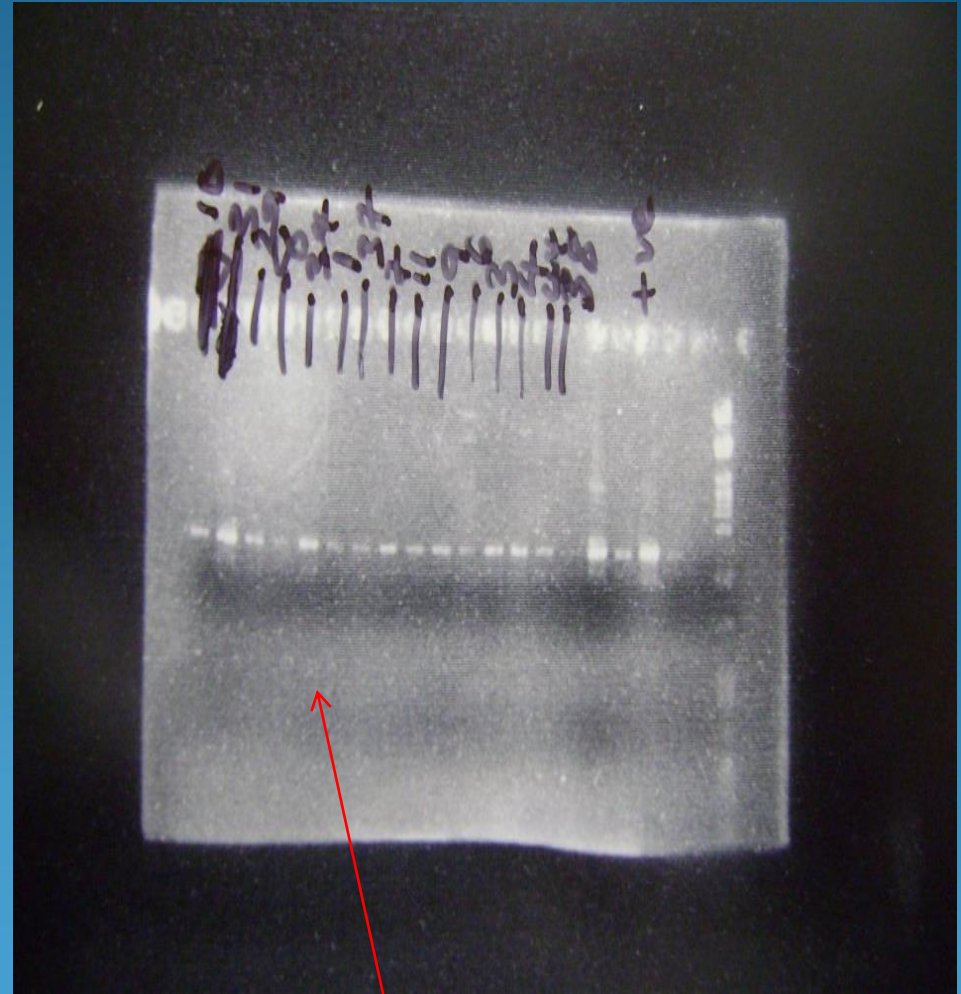
- Sustainability of life
- Biodiversity
- Improve nutrition
- Conservation
- Support MDG in



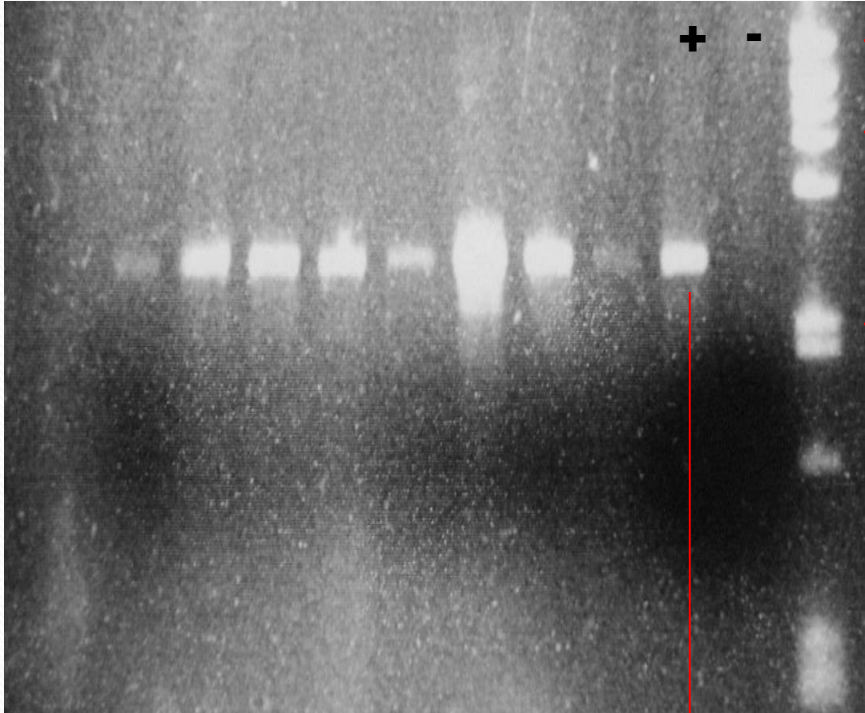
Collaborative research in progress.....



➤ When I was rounding up my PhD in United States of America (USA)



Molecular bands of WA soil Bacteria DNA



Positive control

Negative control

DNA ladder

1986 bp

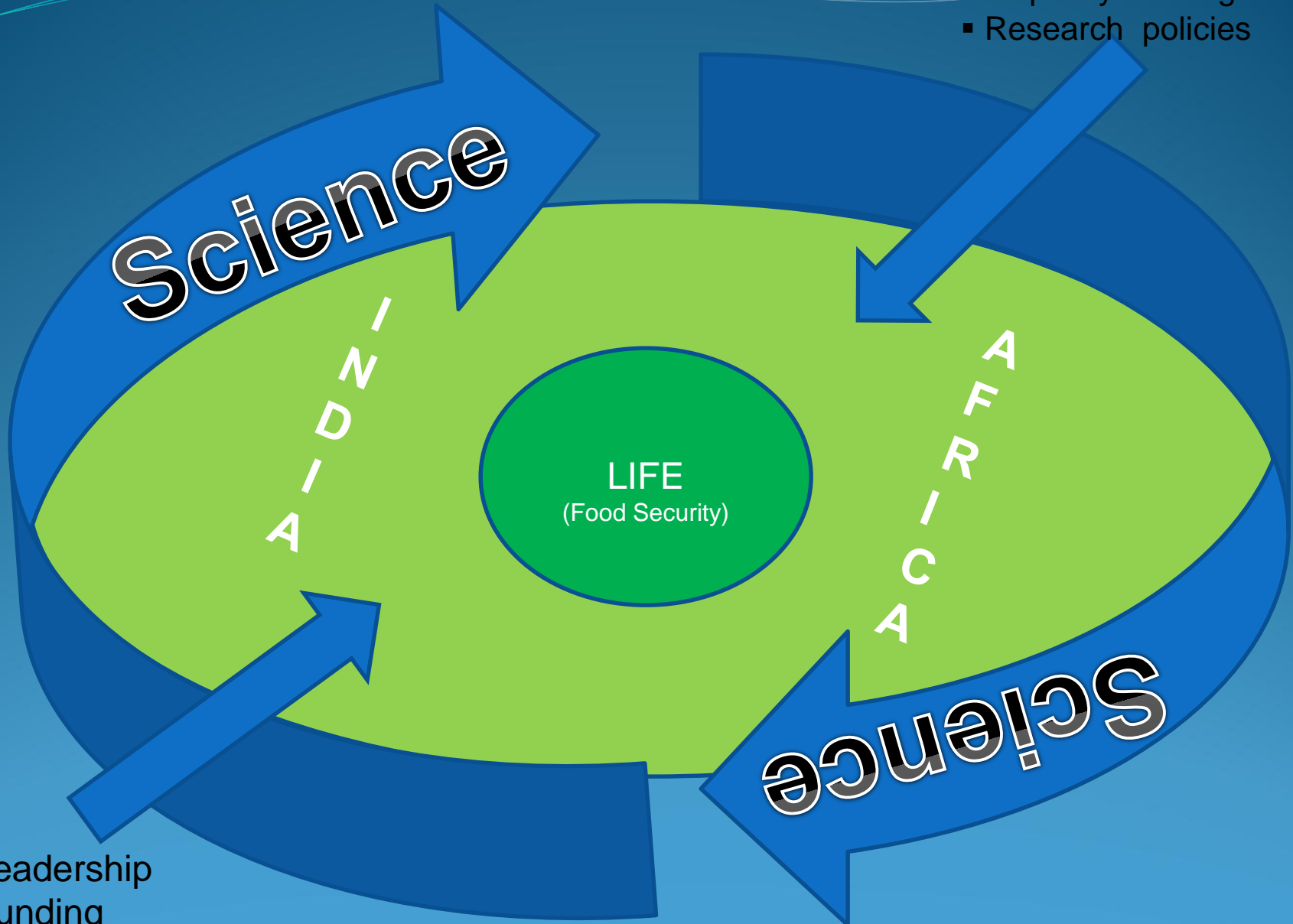
1700bp

1159bp

DNA band

Overcoming scientific research challenges

- Capacity building
- Research policies



- Leadership
- Funding
- Collaborative research

Acknowledgement

- Department of Biotechnology (DBT)
- The World Academic of Science (TWAS)
- Indian Institute of Technology (IIT), Guwahati
- Translation Crop Research Laboratory, Department of Bioscience and Bioengineering, IIT, Guwahati
- PROFESSOR LINGARAJ SAHOO

**Lovely
Lab
Members**



INDIA (My Second Home)

MY SOCIO-CULTURAL

&

RESEARCH EXPERIENCE

I LOVE INDIA.....Courtesy of Prof. L. Sahoo

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