AmbujaNeotia
THE NEOTIA UNIVERSITY
ज्ञानम् आत्म प्रदीपाय UGC Enlisted & Recognised

Krishi Parasar

Department, School of Agriculture and Allied Sciences

Issued: **April, 2022**

Forewords

It is great pleasure to learn that the School of Agriculture and Allied Sciences of our University in going to publish its 2nd edition of school's activities and achievements through the e-magazine, 'Krishi Parasar' on the eve of the 'DNA Day', 25th April-2022. This School is pioneer in publishing e-magazine in the University to express the feelings and thoughts of the students, faculty members and the University community.

The School Agriculture and Allied Sciences of our University is playing a crucial role in building up human resources to serve the nation in bringing food security. The first batch of graduate will complete their studies in the coming July and hopefully all of them will be engage either in higher studies or in job or in exploring the possibility in developing themselves as the job creator rather than job seeker.

The National Education Policy-2020 (NEP-20) is going to implement and the student have the possibilities to have accesses in obtaining dual degree that can have better possibilities in addressing their time management skill. The 2nd edition of e-magazine will illuminate some areas where students can venture their expertise not only in agriculture but also integrate the knowledge power to reduce the load on muscle power.

In this context the e-magazine will play a big role in bridging the emerging ideas in between our university communities with local and regional farmers in enhancing the products and services in agricultural sectors by using / applying artificial intelligence and machine learning.

Our final year agriculture students have completed their internship as well as rural agricultural working experiences so they can share their views with their juniors to have and they will share them through this e-magazine.

The publication of such a e-magazine will not the possible without the strong support from the entire academic community of our University in general and the Dean, School of Agriculture and Allied Sciences in particular. Thus, I would like to express my gratefulness to all the team members for their untiring efforts in publishing this 2nd edition.

I personally hope that this e-magazine will be publish regularly containing new ideas and thoughts. It will emerge as a useful media towards the pursuits of knowledge in bringing food security of the nation.

Dr. Biswajit Ghosh

Vice Chancellor

The Neotia University

Dean's Message

Department of Agriculture, School of Agriculture & Allied Sciences, The Neotia University started offering B.Sc.Ag degree in 2018 and is known for its academic excellence and dedicated approach towards dissemination of knowledge. The School acknowledges the role of research in education and is committed to developing an inclination towards research in both faculty and students. In this pursuit, the School has taken the initiative to regularly publish "Krishi Parasar", an e-magazine to encourage faculty and students to publish research papers, art & creativity, interviews, important agriculture news, etc. besides communicating and expressing their opinion. The publication of the e-magazine is a very prudent and conscious decision on the part of the TNU management.

I am extremely happy to note that the school is coming out with the publication and release of second issue of on the eve of DNA day celebration on 25th April 2022. I wish to acknowledge the Agriculture faculty members, students and digital initiative team for their wholehearted support and efforts in bringing out the publication. Further, I wish to congratulate all the faculty members and students whose research papers, articles, interviews, poems, photograph, etc. is published in this issue of the e-magazine and express my sincere thanks to the mentors of the students.

Celebration of the "World DNA Day" on 25th April is highly significant as it gives us opportunity to look back and acknowledge the good work done by the renowned scientists and review the progress made since the discovery of double stranded DNA was made. The year 2022 being the 100th birth anniversary of India-born Scientist and Noble Laureate Har Gobind Khorana, this issue of e-magazine is dedicated to him and Dr. Lalji Singh, Director, CCMB, Hyderabad and "Father of Indian DNA fingerprinting". Dr. Khorana, chemically synthesized oligonucleotides and developed world's first synthetic gene. The Noble prize was given to him with others for their interpretation of the genetic code and its function in protein synthesis.

I am sure, reader in general and students in particular will be highly benefitted with the publication of this magazine and it meets desired goal. Finally, I wish complete success of this e-magazine.

"Success is not final. Failure is not fatal. It is the courage that counts."

Prof. (Dr.) Sushil Kumar Kothari
Dean
School of Agriculture and Allied Sciences
The Neotia University

Departmental Message

The history and evolution of agriculture is intricately tied to human civilization itself. What began as a means of survival, has today emerged as a significant economic activity around the world. Agriculture has transformed in various ways from subsistence to affluence, from traditional to technological, from unrefined shifting cultivation to precision farming, and the pace has rapidly accelerated in the past few decades with globalization and technological advancements. In this journey of transformation media has played critical roles. Still there is a long way to go in making the planet free from hunger and malnutrition.Increasing population, changing climate, diminishing resources and increasing disposable incomes have put agriculture worldwide under tremendous pressure. While the developed countries have moved up in food, nutrition and health chain through technological advancements, second and third world countries are grappling with challenges in farming and food production.

In a country like India, which pulled out millions of people from the jaws of hunger and malnutrition through Green Revolution and is currently in the process of rapid industrialisation, agriculture is still the primary source of livelihood for about 70 per cent of the rural households. The agriculture gross value added (GVA) growth stood at 4% in FY20 and is likely to be 3% in the second quarter of FY21.The Indian food industry is poised for huge growth as well, increasing its contribution to world food trade every year due to its immense potential for value addition, particularly within the food processing industry. Indian food and grocery market is the world's sixth largest, with retail contributing 70% of the sales. India is among the 15 leading exporters of agricultural products in the world. Agricultural export from India reached US$ 38.54 billion in FY19 and US$ 35.09 billion in FY20. The total agricultural export was US$ 10.40 billion between April and October 2020. India is expected to achieve the ambitious goal of doubling farm income by 2022.

The agriculture sector in India is expected to generate better momentum in the next few years due to increased investment in agricultural infrastructure such as irrigation facilities, warehousing and cold storage. Furthermore, the growing use of genetically modified crops will likely improve the yield for Indian farmers. Going forward, the adoption of food safety and quality assurance mechanisms such as Total Quality Management (TQM) including ISO 9000, ISO 22000, Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP) by the food processing industry will offer several benefits. The agri-export from India is likely to reach the target of US$ 60 billion by the year 2022.

In light of these rapid changes and new developments happening all over the country, it is imperative that we focus on creating a conducive environment for our brilliant young minds to come forward, generate and share new ideas and creative new approaches to ensure the future potential of Indian agriculture is fully realised and the benefits reach all the stakeholders at grass root level. On the occasion of **World DNA Day**, April 25th 2021, we are extremely glad to launch our first ever agriculture e-magazine **"Krishi Parasar"** on behalf of the Faculty of Agriculture. This initiative of ours aims to create a dynamic platform for experts, students and enthusiasts to share their knowledge, experiences, information and creative ideas on latest developments, policy issues, scientific advancements and technological breakthroughs in the field of agriculture. I and my fellow board members sincerely hope that this small undertaking of ours, blossom into a vibrant creative space for our dear students, without whose active participation such an endeavour would not have been possible.

Dr. Abhishek Ghosh
Assistant Professor & Editorial Board member

Department School of Agriculture and Allied Sciences
The Neotia University

25th April is celebrated every year as World DNA Day

Content

1.	Scientific Articles	7
2.	Agri Vision	27
3.	Animation / Drawing Division	36
4.	Students Corner	37
5.	Image Gallery	41
6.	RAWE and Internship	50
7.	Outreach Programme	56
8.	Students Enrichment	62

Editorial Board

Convenor and Chief Editor:

Prof. (Dr.) Sushil Kumar Kothari

Associate Editors:

Dr. Sruba Saha
Assistant Professor,

School of Agriculture and Allied Science

The Neotia University

The **"Krishi Parasar"** is a content rich bi-annual E-Magazine initiated for the purpose of providing information about recent innovations and technologies in agriculture and allied sectors also revealing the creative mind of our young brilliant students. It was started by The Neotia University agriculture students and faculties who wanted to benefit the society in agriculture and related fields. This E-Magazine gives a platform to dignitaries like scientists, researchers, scholars, students and innovative farmers to share their views and vivid ideas about agriculture. A multitude of people find their livelihood in agro-food sector. Population detonation, ever increasing consumer demand, use of sustainable resources and climate change are the prime issues encountered by the world. Addressing the upcoming needs in the field agriculture the second issue of the E-magazine **"Krishi Parasar"** will be dedicated to cover a wide spectrum of themes related to agriculture and allied sciences. This would be very useful to get an insight into the strew information of science based researches from all over the world. the second issue of the E-magazine will be published on the eve of **"International DNA Day", 25th April, 2022.**

April 25th marks **"International DNA Day"**, a chance to celebrate the initial discovery of the DNA double helix structure in 1953 and the completion of the Human Genome Project in 2003. On this day in 1953, James Watson and Francis Crick formally announced their discovery of deoxyribonucleic acid (DNA) in a short letter published in the science journal, Nature.

Finally, I would like to thanks our all collaborators, specially our students, who are the backbone of this magazine.

Dr. Shraddha Bhattacharjee
Assistant Professor

Agricultural Extension
School of Agriculture and Allied Science
The Neotia University, Sarisa, Diamond Harbour,West Bengal

Agriculture is the main source of national income for most developing countries like India Agriculture plays vital role in generating employment. Due to the excessive pressure of population labour surplus economies like India and rapid increase in the demand for food, food production increases at a fast rate. Agricultural extension plays a crucial role in boosting agricultural productivity, increasing food security, improving rural livelihoods, and promoting agriculture as an engine of pro-poor economic growth. Agricultural extension officers are intermediaries between research and farmers. They operate as facilitators and communicators, helping farmers in their decision-making and ensuring that appropriate knowledge is implemented to obtain the best results with regard to sustainable production and general rural development. "Krishi Parasara" helpful for both students, agricultural scientist, Farmers for up gradation of knowledge and also helpful for agricultural development. Let us all wish and hope that our magazine strives to permeate all important value in our society to create a better world for all of us .

Editorial Board

Convenor and Chief Editor:

Prof. (Dr.) Sushil Kumar Kothari

Dr. Madhurima Banik
Assistant Professor

School of Agriculture and
Allied Sciences

The Neotia University

Dr Shankha Koley
Assistant Professor

School of Agriculture and Allied Sciences

The Neotia University

Dr. Abhishek Ghosh
Assistant Professor

School of Agriculture and Allied Sciences

The Neotia University

Dr. Shraddha Bhattacharjee
Assistant Professor

Agricultural Extension
School of Agriculture and Allied Sciences

The Neotia University

Dr. Tanuj Kumar Mandal
Assistant Professor

School of Agriculture and Allied Sciences

The Neotia University

Mr. Subhadip Pal
Teaching Associate

School of Agriculture and Allied Sciences

The Neotia University

Editorial Board

Convenor and Chief Editor:

Prof. (Dr.) Sushil Kumar Kothari

Associate Editors:

Students Co-ordinator

Tanmay Chakraborty
Subir Rana
Souvik Roy

1. Scientific Articles

ParamitaKarmakar
Ayan Deb
Ishita Chatterjee
Swagata Ghosh

2. Agri Vision

3. Animation / Drawing Division

Subhayan Dutta
Saikat Subhra Mainder
Sakshi
Bidyabhusan Bera
Anwesa Charan

5. Students Corner

Arindam Jana
Abir Halder
Subhro Mondal
Partha Sarathi Samanta
Smartha Mukherjee
Anindita Mondal
Sritama Choudhury
Rhea Pradhan

6. Image Gallery

Samrat Roy
Souryadipta Ghosh
Sakshar Mandal
Subhrajyoti Roy
Koutik Roy

7. Photo Courtesy

Souradeep Ghosh
Sourav Goldar
Tamishrasham Uddalak Ghosh
Subhadeep Mahato

Scientific Articles

AGRIVOLTAIC TOWARDS NEW AGRICULTURAL APPROACH FOR INDIAN FARMERS

Mr. Aminul Islam
Assistant Professor, School of Agriculture & Allied Sciences,
The Neotia University

Abstract:

Water, energy, and agriculture are the bedrock of modern civilization. This new technology promises to improve food production and reduce water use, while also creating energy and additional revenue. Essentially, the solar panels placed on the same land where crops are grown allow growers to harvest the power of the sun. The solar panels also help plants grow more efficiently by needing less water. Agrivoltaics (APV) combine crops with solar photovoltaics (PV) on the same land area to provide sustainability benefits across land, energy and water systems. The objective of this study is to present and summarize the recent studies on agrovoltaic and impact of solar panel on microclimate.

Introduction:

Energy Production and growing crops are essentially linked, as energy is required to grow, transport, process and store food. With an expanding population and growing industry, there is increasing need for alternative and innovative methods of food and energy production. The non-renewable nature and negative side-effects, such as gaseous carbon emissions, of using fossil fuels for energy has prompted a change in this direction. Solar energy does have a substantial land requirement that can compete with agricultural land especially because solar panels need near flat and clear land. A traditional solar farm produces about 1 MW of energy per every two hectares of land. There is competition for land availability revolves mainly around land for biomass (energy crops) versus land for food production; however, potential conflicts with solar PV siting and wind power also exist. In particular, the possible performance of shade crops, which are expected to grow poorly in low light environments, has not yet been fully explored for agrivoltaic systems.

What Is Agrivoltaic Energy

The technique was originally perceived by Adolf Goetzberger and Armin Zastrow in 1981, and agrivoltaic was coined in 2011. The term agrivoltaics is dual-use solar array mounted five metres above the soil surface with a suitable spacing and inclination to get maximum solar energy and allow the land to cultivate by using farm machinery, or a system where solar arrays is installed on the roofs of greenhouses. Agrivoltaics or agrophotovoltaics uses the same land for both solar power generation and agricultureal crop production. In Agrivoltaics crop yield increased due to the shade of the solar panels mitigating some of the stress on plants caused by high temperatures and UV damage. In some cases, it has resulted that Due to shade of solar panel crop production reduces but such loses may be offset by solar energy production.

Methodology:

There are three basic types of agrivoltaics that are being actively researched: solar arrays with space between for crops, stilted solar arrays above crops, and greenhouse solar arrays. All three systems have several variables used to maximize solar energy absorbed in both the panels and the crops. The main variable taken into account for agrivoltaic systems is the tilt angle of the solar panels. Other variables taken into account for choosing the location of the agrivoltaic system are the crops chosen, panel heights, solar irradiance and climate of the area.

- orientation of solar panels in the south for fixed or east–west panels for panels rotating on an axis,

- *spacing between solar panels for sufficient light transmission to ground crops,*

elevation of the supporting structure of the solar panels to homogenize the amounts of radiation on the ground. The most conventional systems install fixed solar panels on agricultural greenhouses, above open fields crops or between open fields crops. It is possible to optimize the installation by modifying the density of solar panels or the inclination of the panels.

Figure 1: Plant at Amity University (Credit: NSEFI)

Figure 2: Mahindra Susten plant at Tandur with lemon grass (Credit: Mahindra Susten)

Figure 3: Agrivoltaics with tracking and drip irrigation (Credit: Jain Irrigation)

SOLAR FARMING POTENTIAL IN INDIA: The Government of India (GOI) is serious about its power sector growth which is evident from the fact that India's rank improved from 137 in the year 2014 to 115 in the year 2019 due to an improvement in electricity reliability (Bank 2019). According to the research (Hyvärinen 2019), around 83.4% and 81.33% of the total landmass in India is suitable for solar- and wind-based energy generation, respectively. The installation of wind-based power generation is challenging because of issues such as the need for open space, wake effect, topographic impact, and annual wind intensity (Saraswat et al. 2021). For India to achieve higher electricity production through solar energy requires the deployment of solar systems throughout the country. Different types of first pilot plants in India: a. Cultivation of crops between the space of two rows of ground-mounted photovoltaic panels (interspace farming). b. Farming between and below ground-mounted panels installed at fixed tilt angle allowing for manual cultivation only. c. Farming below panels mounted on an elevated structure. Given sufficient elevation, the use of agricultural machinery is possible.

Table. 1. Overview of operational Agrivoltaic Projects in India (Pulipaka 2021)

Project Name	Power Production	Year of Commission
GSECL Harsha Abakus plant near Sikka, Gujarat	1MW	2016
GSECL Harsha Abakus plant near Panandharo, Gujarat	1MW	2016
GIPCL plant near Amrol, Gujarat	1MW	2016
CAZRI plants in Jodhpur, Rajasthan	100KW	2017
Amity University plant in Noida, Uttar Pradesh	10KW	2017
Dayalbagh Agriculture University plant in Agra, Uttar Pradesh	200KW	2020
Junagadh Agriculture University plant in Junagadh, Gujarat	7kW	2017
Abellon Energy plant in Aravalli District, Gujarat	3MW	2012
Mahindra Susten plant at Tandur, Telangana -	1MW	2016
Jain Irrigation plants at Jalgaon, Maharashtra -	14.4kW	2014
NISE plant near Gurgaon, Haryana	100kW	2019
Cochin Airport plant in Kerala	40MW	2015

Effects of Agrovoltaic System:

The solar panels of agrivoltaics remove light and space from the crops, but they also affect crops and land they cover in more ways. Agrivoltaics are expected to change the microclimate for crops in both positive and negative manners with no net benefit, reducing quality by increasing humidity and disease, and requiring a higher expenditure on pesticides, but mitigating temperature fluctuations and thus increasing yields. Agrivoltaic system also influences on air temperature, air humidity and wind speed at standard height, Soil temperature, Crop temperature, Incident radiation. Overall, an alteration in microclimatic conditions and crop production under AV was confirmed.

Advantages Agrivoltaic System:

- Photovoltaic arrays in general produce much less carbon dioxide and pollutant emissions than traditional forms of power generation.
- Dual use in land for agriculture and energy production could improve competition for land resources and allow for less pressure to convert natural areas into more farmland.
- Dupraz et al. in 2011, calculated that the land use efficiency may increase by 60-70%
- Dinesh et al. in 2016, model claims that the value of solar generated electricity coupled to shade-tolerant crop production created an over 30% increase in economic value from farms deploying agrivoltaic systems instead of conventional agriculture.

Disadvantages Agrivoltaic System:

- The main disadvantages of this energy source stem from the shade cast by the panels, as this can affect crop productivity to varying degrees, forcing more resistant plants to be chosen and restricting those that are more dependent on sunlight.
- Some land needed to be sacrificed for mounting structures and systems equipment
- Photovoltaic systems are technologically complex, meaning farmers will be unable to fix some things that may break down or be damaged, and requiring a sufficient pool of professionals
- Requires a massive investment, not only for the solar arrays, but in different farming machinery and electrical infrastructure.

Conclusion:

Energy and food demand is increased dramatically due to the population expansion. This issue led researchers to move towards a more rational use of energy and the development of renewable energies. Agrivoltaics is an emerging approach to allow the co-location of power generation from photovoltaic (PV) technologies and crops production.

References:

1. Marrou H, Guilioni L, Dufour L, Dupraz C, We´ry J (2013) Microclimate under agrivoltaic systems: Is crop growth rate affected in the partial shade of solar panels? Agric For Meteorol 177:117-132
2. Dupraz C, Marrou H, Talbot G, Dufour L, Nogier A, Ferard Y (2011). Combining solar photovoltaic panels and food crops for optimising land use: towards new agrivoltaic schemes. Renew. Energy 36 (10), 2725-2732.
3. Bank W (2019). Doing Business 2019: Getting Electricity; The World Bank: Washington, DC, USA, 2019.
4. Saraswat S K, Digalwar A K, Yadav S S, Kumar G (2021). MCDM and GIS Based Modelling Technique for Assessment of Solar and Wind Farm Locations in India. Renew. Energy, 169, 865-884
5. Hyvärinen A (2019). Wind Turbines over a Hilly Terrain: Performance and Wake Evolution. Ph.D. Thesis, KTH Royal Institute of Technology, Stockholm, Sweden
6. Pulipaka S (2021). Agrivoltaics in India Overview of operational Projects and relevant Policies, National Solar Energy Federation of India, 10-33.
7. Dinesh H and Pearce J M (2016) .The potential of agrivoltaic systems, Renewable and Sustainable Energy Reviews, 54, 299-308
8. https://en.wikipedia.org/wiki/Agrivoltaic
9. https://www.iberdrola.com/innovation/agrovoltaics
10. https://agsci.oregonstate.edu/newsroom/sustainable-farm-agrivoltaic

EFFECT OF COVID-19 ON AGRICULTURE IN INDIA

Anuska Chaterjee
2nd Year, B.Sc. Agriculture

COVID-19, originating from Wuhan, China - the epicentre - has eventually spread through the whole world and emerged into a pandemic. India has already become a hotspot for the virus, next to the USA, infecting 9.6 million (14.6% of global infection) as of December 6th, 2020 which has resulted in a decline of 23.9% gross domestic product in quarter 1, FY 2020-21.

Major Problems in Agriculture Sector

The non-availability of migrant labour is interrupting some harvesting activities, particularly in northwest India where wheat and pulses are being harvested.

- There are disruptions in supply chains because of transportation problems and other issues. Prices have declined for wheat, vegetables, and other crops, yet consumers are often paying more.
- India's $14 billion (or Rs 1 trillion) poultry market has begun a culling exercise as consumers have started keeping off chicken products for fear of catching corona virus.
- Weak demand from the poultry sector has resulted in a sharp decline in feed prices too, with both soybean and maize prices falling by nearly 25 per cent in the past two months. The poultry market consumes around half of soybean and maize production in India. Industry estimates peg the loss to the market at Rs 1,000 crore.
- With the mango season just starting and nearly 40 per cent produce is sent to foreign countries. Due to closure of exports farmers will suffer huge losses.

A survey was conducted by NABARD to find out the impact of COVID. The results yielded-

i. **Impact on Production** - At All-India level, agriculture production in almost half (47%) of sample districts was adversely affected by the impact of COVID-19. Magnitude wise, agriculture production (-2.7%) had not been adversely impacted significantly, mainly due to the fact that harvesting of rabi crops like wheat was almost complete by the end of April 2020. However, production in allied sector had declined significantly, especially in poultry sector (-19.5%), followed by fisheries sector (-13.6%) and Sheep/Goat/Pig (S/G/P) sector (-8.5%), primarily due to drastic decline in demand for these products possibly due to the widespread fear circulating in the wake of COVID 19 regarding safety of non-vegetarian food, particularly poultry 2 meat, for health related concerns. Similarly, production in dairy (-6.6%) and horticulture (-5.7%) sub-sector also reduced, owing to reduced demand for these products and disruption in their supply chain.

ii. **Impact on Farm Gate Prices** - Farm gate prices have not declined significantly in crop sector (-2.2%). However, prices in allied sectors had declined in the range of 2% to 18%. This decline was highest in poultry sector (-17.8%), followed by horticulture (- 7.6%), dairy (-5.6%), fisheries (-4.8%) and S/G/P (-2.9%) sectors respectively, mainly due to supply disruption caused by restriction on movement of vehicles. On the whole, 54% of sample districts witnessed adverse impact on farm gate prices of agricultural produce.

iii. **Impact on Availability of Agri Inputs** - Due to restrictions imposed on movement of men/material and closure of shops, availability of agri inputs viz. seeds (-9.2%), fertilisers (-11.2%), pesticides (-9.8%), fodder (-10.8%), etc. declined in the range of 9 to 11 per cent. At all-India level, 58% of sample districts were adversely affected in terms of availability of inputs.

iv. **Impact on Prices of Agri Inputs** - Due to disruption in supply chain owing to restrictions on movement of vehicles and closure of shops and markets, prices of agri inputs viz. seeds (8.8%), fertilisers (10.0%), pesticides (9.0%), fodder (11.6%), increased in the range of 9 to 12 per cent. At all-India level, 54% of sample districts witnessed an increase in prices of agri inputs, possibly due to its non-availability.

v. **Impact on Agriculture Marketing** - Even though local procurement centres were opened by various State Governments under their jurisdiction, yet restrictions on movement of vehicles had adversely impacted about 74 per cent of sample districts in smooth operation of agriculture marketing though mandis. The impact on operation of rural haats was more severe, with 87 per cent of sample districts being adversely affected. This was mainly due to a complete ban on opening of rural haats by the local authorities in majority of the districts in the country.

vi. Impact on Banking Services - As far as banking services are concerned, access to credit through term lending and KCC was adversely impacted in about 89 per cent and 59 per cent of districts, respectively. As regards to recovery, 94 per cent of sample districts were reported to have been adversely affected by the pandemic and consequent lockdown. However, a positive feature that emerged was that 63 per cent of sample districts reported an increase in digital transactions by the customers during the lockdown period.

vii. Impact on Microfinance Activities and FPO/FC - At an all-India level, microfinance activities were adversely impacted in 95 per cent of the sample districts and the business activities of NBFC-MFIs was adversely affected in 88 per cent of the 3 sample districts. Similarly, adverse impact was reported in activities of FPOs and Farmers Clubs promoted by NABARD. However, many SHGs and FPOs seized upon the opportunity of making face mask and sanitizers as also direct selling of vegetables/fruits to the customers, thereby helping the local community and administration as also increasing their business.

viii. Impact on MSME Sector - MSME sector was the worst hit sector by the COVID pandemic in terms of impact on price level of raw materials, employment, production level, consumer demand and disruptions in supply chains. Decline in production level and employment was reported in 97 per cent and 96 per cent of the sample districts, respectively. Similarly, adverse impact was reported on consumer demand (85% districts) and cash flow (80% districts) of MSME sector thereby increasing hardship of the people at large.

Things that should be done to reduce the impact-

There should be an immediate expansion (Tenant farmers should be included) of the Pradhan Mantri Fasal Bima Yojana (PMFBY) to ensure compensation payments to farmers affected by the Covid-19 pandemic.

- MSPs for farmers in the 2020-21 seasons should be substantially raised to 1.5 times the cost of production. Procurement should also be significantly expanded.
- Encourage better functioning food markets through improved regional political and economic integration and better functioning for trade in food.
- Temporarily reduce VAT and other taxes.
- Reduce post harvest crop losses and improve food stocks along the value chain
- Remove artificial constraints to domestic trades throughout the food supply chain in order to link smallholders farmers to markets
- Ensure that local purchases of food and food components for humanitarian purposes are exempt from restrictions
- Hold down core inflation and inflation expectations
- Assess and comprehensively cost all fiscal measures taken in response to the rise in food prices
- Protect basic consumption needs of vulnerable populations
- Scale up nutritional support and support management and prevention of under nutrition.

Conclusion:

The COVID-19 pandemic has evolved into a global challenge. As a result of the lockdown, tens of thousands of people left the major cities because of unemployment and returned to their rural villages to avoid the pressures of maintaining a family in cities with high living costs. They have returned to their village unemployed, in some places to compete for local jobs with other would-be migrant workers who have been unable to travel to seek employment in other communities that are now suffering from a shortage of labourers. Rural markets have been wholly or partially closed due to the lockdown, preventing farmers and harvesters earning an income. As a result, farmers urgently required money to sustain farming systems, particularly in April, since it is the season of the Rabi (spring) harvest. Immediately after the outbreak of COVID-19, therefore, the government launched a number of relief packages aimed in particular at helping the poor and farmers, which, however, has proved inadequate and is not fulfilling farmers' requirements. Some experts fear that a full-blown economic collapse of the sector could be imminent, even after the return to normal conditions, and so far the government does not appear to have a plan-B to deal with such a situation. "Having life, hoping for the future" seems to be the general message being conveyed. As result, the mental health, livelihoods and well-being of farmers all over India could be jeopardized.

While farmers generally would be expected to recover even from an economic collapse, those below the poverty line in India are mostly likely to be the last to overcome the impact of the lockdown. In 2020, wages within both the agricultural and non-agricultural sectors have been declining due in no small part to the current situation, though the decline related to non-agricultural work has been the steepest. This seems to indicate that the relief packages and other initiatives launched by the government and local administrations aimed at sustaining farming systems have enjoyed some success, although the expected major impact on farmers' wages has not yet been observed.

Anushka Chatterjee
TNU2020032200122
2nd Year

5G SMART AGRICULTURE

Aritra Mondal
2nd Year, B.Sc. Agriculture

5G is the 5th generation of communications systems, a major expansion of today's 4G LTE networks. 5G has been designed to accommodate the extremely broad increase in data and mobility in today's digital world, the Internet of Things with billions of connected devices, and tomorrow's technologies.

By 2050 The World Population Will Explode To 9.5 Billion. We'll Need a 70% Increase in Food Production

5G and edge computing can empower rapid data-to-cloud transmissions for real-time analytics and machine-to- machine communications that optimize and automate precision farming.

Deploy:

- Drill, Seed, Spray, or till with autonomous tractors
- Achieve site - specific crop application with variable rate technology
- Maximum use of water with smart irrigation

Manage:

- Obtain vast field information with agriculture drones
- Adjust for climate condition with a smart greenhouse
- Analyze production, risk, and finances with farm management system

Monitor:

- Promotes livestock wealfare with GPS and biomedical data
- Avoid soil degradation with monitoring system
- Track total harvest quantities with yield monitoring

5G Smart Agriculture Applications Are:

5G on Farm Machinery:

For precision agriculture to really take off requires 5G-connected farm machinery. A massive increase in compute power and data collection are the driving forces behind the rise in artificial intelligence (AI) 5G on farm machinery and sensors will increase massively the amount of data available.

Precision Agriculture:

Also called „smart farming, precision agriculture is all about applying precise treatments to crops, so instead of treating an entire field the same, farmers can give each row exactly what it needs. It s all about reducing inputs, from water and food to fertiliser and herbicides.

Drone Spraying:

Autonomous drone sprayers are coming; equipped

with a weed scanner and crop sprayer, they scan crops using AI to identify weeds - precision agriculture defined - then apply pesticide only where needed. After 30 minutes they return to a field boundary station, refill their tank and top-up their battery.

Livestock Tracking:

5G will enable connectivity and geolocation services, which could reduce the cost and increase the performance of livestock monitoring solutions that currently depend on proprietary radio solutions," says Jordan. "However, this will depend on 5G coverage being available and early deployments are focused on urban centres.are focused on urban centres.

Weed and Crop Monitoring:

Now that drone cameras can detect differences between crops and weeds, farmers can spray appropriate areas rather than overuse pesticide. John Deere agricultural firm Blue River now uses 5G along with high-resolution cameras that generate 20 images per second. The technology includes AI software that identifies weeds, so it helps farmers apply weedkiller exactly where it's needed instead of blanketing a field with chemicals

Conclusion:

In the next decade, 5G will become more common in agriculture, and particularly for agriculture businesses with large output. The use of IoT-powered sensors and 5G together will provide affordable and environmentally conscious solutions for farmers to run more efficient farming operations. This combination will save energy, which will reduce costs and improve the quality of produce.

Beside many usage of 5G network, it has lots of adverse effects.

Aritra Mondal
TNU2020032200181
2nd Year, 3rd Semester

COVID -19 AND INDIAN AGRICULTURE

Eshika Bera
2nd Year, B.Sc. Agriculture

Introduction:

A severe highly contagious and infectious respiratory disease, COVID-19, emerged in December 2019, with the first incidence reported in Wuhan city, Hubei province of China . The COVID-19 pandemic ravaged humanity and brought the world economy to a standstill as had been warned by WHO that the pandemic was going to touch every sector. COVID-19 knows no race or boundaries, all religions the country over are affected.

Covid 19 & Indian Agriculture:

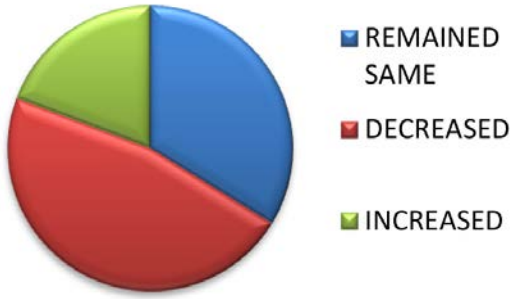
As the world comes to a standstill and public life shuts down across the globe, all have their eyes on the healthcare systems which are buckled under the strain of the COVID-19 pandemic. With the lockdown anticipated to extend for some more time, there are now concerns rising over food supply and people are now scared. The potential negative impacts of Corona on agricultural production, market stability, food supply may now be seen from the surface but it is still difficult to predict quantify the exact damage accurate.

Impact on Agriculture Production:

The impact of lockdown imposed in the entire country sowing to COVID-19 on the overall production levels in the agricultural and allied sector has been significant with overall production levels in the agriculture and allied sector declining in 47% of the sample districts. However, 19% of the districts have also reported an increase in the overall level of production in the sector and 34% of the districts have shown no change in the levels of production in the agriculture and the allied sector.

Magnitude of Change of AGRICULTURAL Production at the State level :

In the agriculture subsector, most of the states have witnessed a decline in production. States like Chhattisgarh (13%) and Himachal Pradesh (15%) have witnessed a sharp decline in agriculture production. However, some large agricultural states like Telangana (23 % increase), Punjab (5%), Rajasthan (4.4%) and Gujarat (6.7%) have actually shown an increase in agricultural production which may be attributed to the fact that rabi season had witnessed a bumper crop production and harvesting of the crops had been completed in many of the states before the onset of the pandemic and the lockdown.



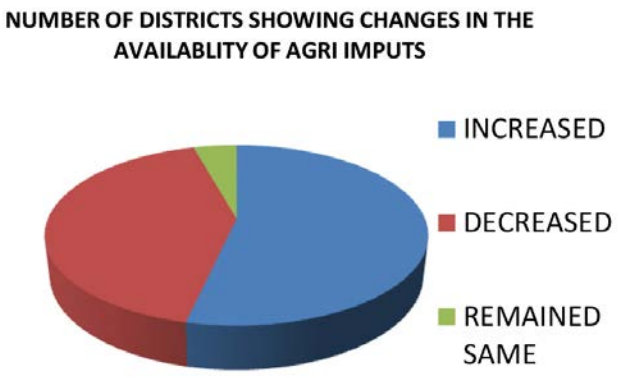
Distrcits showing in overall agricultural

Impact on Farm-gate Prices in Agriculture & Allied sector:

The spread of the pandemic and the subsequent lockdown that was imposed by the government had a significant impact on the farm gate prices of commodities in agriculture and the allied sector. This was mainly due to the fact that with the shutting down of major sectors of the economy, the demand for these commodities also dried up due to lack of transport, shutting down of rural haats/markets and shops which led to a decrease in prices across many districts of the country. A total of 54% districts reported a decline in overall prices of commodities in agriculture and allied sector and 23% districts witnessed an increase in prices which can be attributed to the supply chain disruptions in some parts of the country. The prices remained same in 23% of the districts.

Impact of COVID-19 on availability of Agri-inputs:

The overall availability of agriinputs was reported to have declined in 58% of the sample districts and 38% of the total districts surveyed reported no change in the availability of agri-inputs, whereas only 4% districts reported an increase in the availability of Agri-inputs (Fig 3.5). The feedback on availability and prices of various agri-inputs viz. seeds, fertilizers, pesticides, rentals agricultural machinery, fodder/cattle feed, etc. were obtained to gain greater insights into the agriculture sector during the lockdown period.



Impact on the Prices of Agri-inputs:

As evident from the previous section, the availability of agri-inputs had declined both at the all-India level and across the States. Theoretically, lower availability is expected to result in higher prices. The survey results also reflected a similar picture. The overall prices of agri-inputs showed an increase in 300 sample districts (54%) while 236 districts (42%) reported no impact of COVID-19 on the price levels of agri inputs and 24 (4%) districts reported a decline in the overall price levels of Agri-inputs.

Impact on small farmers:

Nearly 90% of India's agricultural sector is made up of small and marginal farmers. These farmers are particularly vulnerable to economic shocks, include those sparked by COVID-19 lockdowns. In August 2020, IGC collaborated with the Asian Development Research Institute (ADRI) to convene a panel to discuss three key influences that COVID-19 has had on India's agricultural markets: Differential impacts on staple versus perishable foods,Disrupting labour supply chains, Ongoing consequences of ineffective social safety nets.

Advantages of Agriculture after lock down:

The News 2020-21 saw the Indian economy register its worst-ever contraction since Independence and also the first since 1979-80. The National Statistical Office has, in its Provisional Estimates released on May 31, pegged the growth in real gross value added at basic prices (previously known as GDP at factor cost) for 2020-21 at minus 6.2%. ! Although the GDP growth has been pegged at -6% but the farm sector (agriculture, forestry & fishing) has grown by 3.6%.Agriculture being exempted from the nationwide lockdown in 2020 · The GoI largely spared PDS ration shops and other stores selling food, groceries, fruits & vegetables, milk, meat and fish, animal fodder, seeds and pesticides from strict lockdown. The Gof parly address the demand-side problem through Enhanced state crop procurement, Rise in minimum support price (MSP), PM KISAN.

Conclusions:

On the whole, at the national level the impact of COVID-19 and the resultant lockdown had been quite harsh on agriculture and allied sector in majority of districts. Among various subsectors, rabi crops were least affected as its harvesting was on the verge of completion but allied sectors such as poultry, fisheries and pig/goat/sheep sector witnessed a drastic fall in demand due to misplaced rumours leading to declining production as well as declining farm gate prices. However, prices of agriculture inputs were estimated to be rising mainly due to disruption in supply chain and closure of shops and markets.

AGRICULTURE IS THE SAVIOUR !!

Eshika Bera
TNU2020032200229
2nd Year, 3rd Semester

Mushroom Cultivation

Ishita Chatterjee
B.Sc. (Agriculture), 4th Year

In the past few years there has been a huge shift towards commercial mushroom cultivation, as many working professionals and youngsters alike have gravitated towards mushroom farming as a viable alternative source of income. As a source of income mushroom farming has proven to be quite profitable to the cultivators and agripreneurs. Mushroom farming has seen an increase in the number of first-time agripreneurs starting a commercial mushroom cultivation venture, as well as growing consumer demand.

While the most obvious use of mushrooms is seen in the culinary industry, processed foods, FMCG, and households, mushrooms are also gaining popularity in the pharmaceutical industry. Thus expanding the scope of sales for the people who are cultivating mushrooms on a commercial level. Some mushrooms are fortified with rare minerals and the medicinal qualities of certain mushroom varieties can be sold at high prices.

We have chosen two varieties- oyster mushroom and paddy straw mushroom.

The first step of the mushroom growing process is spawn production. Spawn is used as a carrier to efficiently get mushroom mycelium into a bulk substrate where you can eventually grow mushrooms. As a substrate we have used paddy straw and we sterilized them to avoid any kind of mould or fungal contamination. For oyster mushrooms we have added the spawns to straw in the poly bags to make like a hanging log culture. The mushroom will eventually grow out of these bags, as the mycelium will continue to grow until they are fully colonized or fully consolidated by job in all the nutrients from the substrate. As the mushrooms like to have high humidity and generally cooler temperature, we have kept the mushroom bags in an air-conditioned room with a reasonable amount of fresh air. And for paddy straw mushroom we prepared the bed by placing four to five bundles side by side in the first layer and putting spawn on it leaving the margins. And then we put another bundle of straw over it from the opposite side at a perpendicular angle and similarly inoculated it with spawn. States of 3 to 4 layers are made and an ideal temperature around 30 degrees Celsius is maintained. Once the mushroom got its ideal size, we are expecting to harvest them in total of two flashings.

Value addition isone of the most important aspects of any industry. A variety of products can be made from mushrooms which will help the farmers to earn more profit. Mushrooms are also known for their medicinal potential. They have anti-fungal, antiviral and antibacterial properties. Moreover, it contains antioxidants. Mushroom cultivation is a multitasking enterprise which requires variable exporters and logistics support. Hence it can generate numerous intermediate businesses like spawn production, supply of raw materials, enterprise of mushroom dehydration and creating a cold storage for mushroom with other crops. Dried mushrooms are used in value added products like mushroom pickle mushroom tablets and so on. In our laboratory we have made mushroom chocolate and mushroom pickle by ourselves. Moreover, this technology can be integrated with the National Rural Employment Guarantee Scheme by providing nutritional foods to the rural poor and creating employment for many who will take up the responsibility for making mushrooms available in the villages. Especially oyster mushroom cultivation is a very idol technology which can be used as a therapy for physical and mentally challenged people. It will definitely create a positive impact to the unemployed farmers by acquiring new scales which will help them to earn, gain self-reliance and self-confidence in terms of doing things independently. We hope to Sun brain mushrooms to the cart of windows like any other vegetable.

Finally, I would like to show my gratitude towards School of Agriculture & Allied Sciences, The Neotia University, our honorable Dean, Prof. Dr. Sushil Kumar Kothari sir, and guide Dr. Solanki Sarkar ma'am and Mr. Arijit Purkayastha sir for arranging such a great opportunity and continuous support throughout this course.

5 Hacks to Water Indoor Plants when you're on Vacation

Maityree Gol
B.Sc. (Agriculture), 3rd Year

You have nurtured your plants with love and it's sad for you to see them wilting when you are back from vacation. We know you are a responsible plant parent. But, you can enjoy your vacation without worrying about your plant babies, even in the summers.

Indoor Plants don't need direct sunlight but they can't compromise on water, except succulents. So, here are 5 scientific methods to water indoor plants when you're away from home. These methods are really simple to install. Also, you hardly have to spend a few pennies, plus most of the required materials are available at home. So, let's check them out.

1. The Mini Greenhouse

Greenhouses are used to cultivate crops under controlled conditions. You can also create a mini-greenhouse with a plastic bag to control the moisture of your soil.

Required materials

- A large and clear plastic bag
- 3-4 wooden stakes
- A rope or sellotape

Feeling happy that all the materials are easily available? Well, the other good news is, this hack will maintain the soil moisture for months. You can literally enjoy your world tour without worrying about your plants.

To build this mini greenhouse follow the procedure given below.

Procedure

Step 1. Water your plants optimally. Be careful over-watering is a big NO for this time.

Step 2. Insert some wooden stakes into the soil. Try to place it at the peripheries, so that the roots of the plant don't get hurt.

Step 3. Now take a clear plastic bag, large enough to fully cover your plant. Blow some air into the bag to prevent it from collapsing. Cover your plant carefully. It is advisable that the plastic shouldn't touch the leaves, try your best to follow this. But don't stress much if it's too hard for you, a little touch will cause no harm.

Step 4. Tie the plastic with a rope to fix it with the planter. You can also use sellotape for the same.

Your mini greenhouse is ready.

Wondering how it works?

Let's understand the science behind it.videos on this application.

As you water your plant optimally, some portion of water will be absorbed by the roots and excess will try to evaporate. But don't worry, you have created a mini atmosphere through the polythene and all the water vapour will be captured into this. Water droplets can be observed on the plastic firm. Once this mini atmosphere gets saturated with water vapour, vapour will convert into water (condensation) and drip down to the soil. This way water will keep reusing and moisture will be under control.

Hope the concept is clear to you now. Let's explore the other methods of watering.

2. Glass Bottle Watering

Do you have glass bottles at your home? It could be empty ketchup, oil or wine bottles. If yes, then instead of throwing them away you can make a self-watering system for plants through these glass bottles. In case you don't have any, don't be disappointed. Hack No. 5 is the alternate option for you.

Required materials and tools

- Empty narrow neck glass bottles with cap (aluminium/plastic)
- (Nail + Hammer) Or (Incense stick + matchbox)
- Small piece of cotton cloth
- Scissor
- Rubber band

One time installation of this system will save your time and effort in watering plants. The installation process is very simple, just follow the procedure given below.

Procedure

Step 1. Give lots of water to your plant. The soil needs to be wet enough, otherwise, it soaks all the water from the bottle within a day.

Step 2. Choose a narrow neck glass bottle. Take the cap of your bottle.

If you have a plastic cap, then you need an incense stick and matchstick. Lit the incense stick and shake it a little to extinguish the flame. Place the ignited part of the incense stick at the centre of the cap, until it forms a hole.

For the aluminium lid, you need a hammer and nail. Keep the bottle cap upside down. Place the nail at the centre of the cap and hammer to form a hole.

Step 3. Fill the bottle with water.

Step 4. The soil might choke the bottle at its opening and fail your self-watering system. To prevent this, cut a small piece of cotton cloth. Tightly fix it, at the mouth of the bottle, with the help of a rubber band.

Step 5. Hold the bottle and place your thumb at the hole. Turn the bottle upside down and place it in your planter. Insert the neck of the bottle deep into the soil and make sure the bottle is in a stable position.

You can observe the changing water level within a few hours.

Your self-watering system is installed successfully.

You must have understood how this works by the steps only. So, we don't bore you with

science. Let's jump to the next method.

3. Water Wicking

If you have multiple plants, then water wicking is the best for you. It will keep your plants hydrated through a single installation.

The duration of this system depends on the volume of the water reservoir and the number of plants you want to water.

Required materials

- Cotton rope or cotton shoelaces
- Bucket (Water reservoir)
- Nuts/bolts for weight

If you can't purchase cotton rope or cotton shoelaces then you can use any old cotton t-shirt. Cut your t-shirts into strips according to the required size. Also if you don't have nuts/bolts you can still go for this. Read the procedure and you will get the alternate way at step 3.

Procedure

Step 1. Take a large bucket and fill it with water. Place all your planters around the bucket.

Step 2. Cut out the cotton rope according to the required size. The size of the rope depends upon the distance between the bucket and plants.

Step 3. Tie up a nut/bolt to add weight at one end of the rope and soak the rope in the water. If you don't have nuts/bolts then make 2-3 knots at the end of the rope to add weight.

Step 4. Insert the other end of the rope 2-3 inches deep into the soil.

Your plant is ready to take water through capillary action.

Confused about what capillary action is and how it is related to water wicking? Or how does this hack even work?

Read below to know the logic behind water wicking.

The science behind water wicking

Wick means absorbing water through capillary action. Capillary action is caused by many forces resulting in the spontaneous flow of liquid through a porous material or a narrow tube. This movement of water even works against gravity. The movement of water from roots to the leaves of plants is because of capillary action. We used the same concept in water wicking. Since cotton is a good absorber and porous material, water in the reservoir will be absorbed and transferred to the soil through capillary action.

Hope the concept is clear to you. Check out the next method.

4. Houseplants Bath

Do you know when you are away from home, your plants would enjoy a bath in your sink or bathtub. This way they will feel fresh for a week. But this bath suits well-drainage planters.

Required materials

- Towel
- Bathtub or sink

It's better to choose a lightweight planter for this and make sure your sink is strong enough to hold the weight of your planter. Then follow the mentioned below.

Procedure

Step 1. Give sufficient water to your plant, precisely saturate the soil.

Step 2. Place a towel at the drainer of your sink or bathtub to choke water.

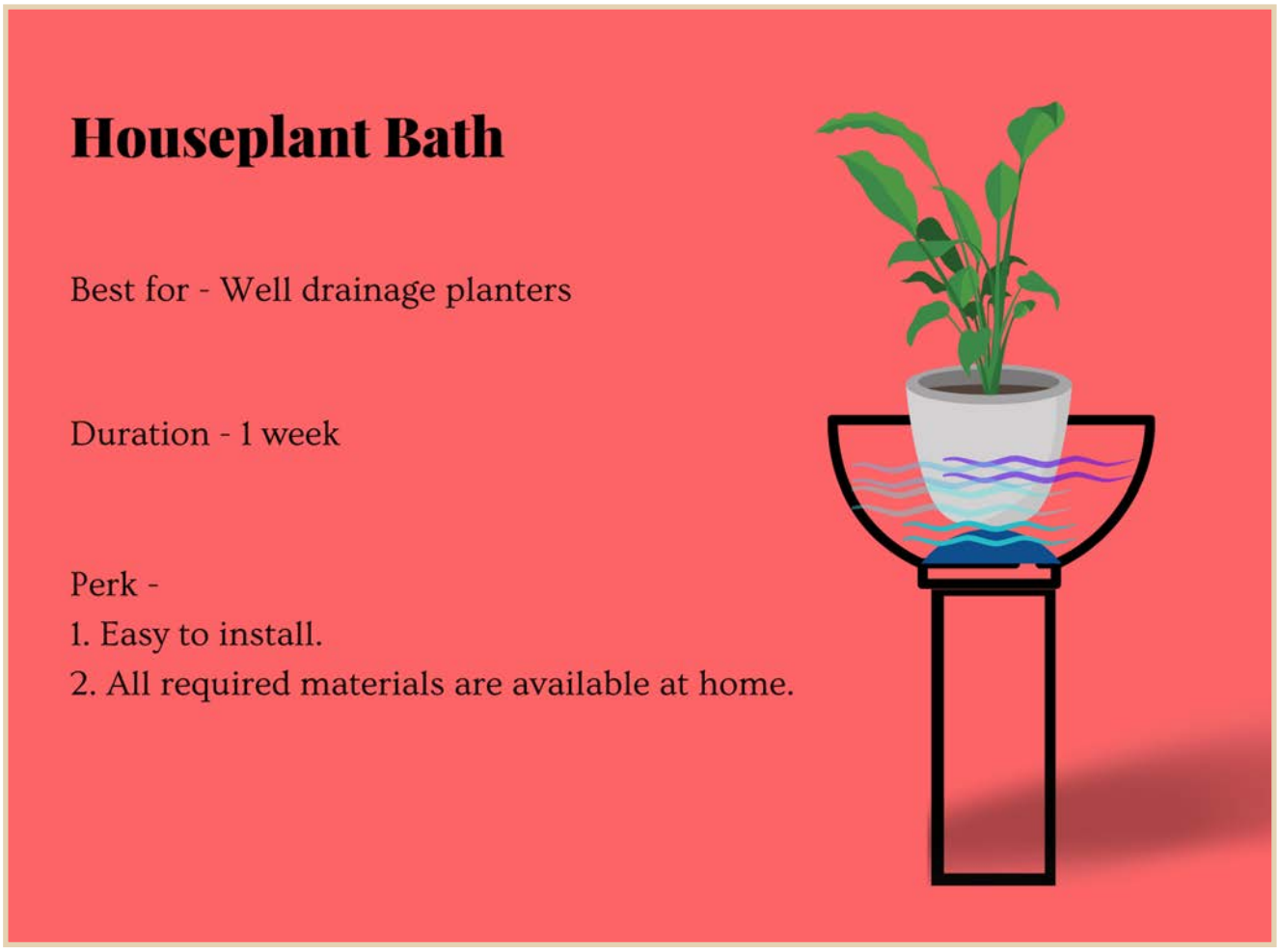
Step 3. Half fill your bathtub or sink with water.

Step 4. Place your planter above the towel very carefully, otherwise, you may get scratches on your sink/bathtub.

Your plant is ready to enjoy the bath.

Since it's a good drainage planter the soil will absorb water. The self-watering pots are available

in the market, works similarly. Check out the last method.



5. Bottle Drip System

Drip irrigation is a widely accepted method when it comes to saving water. Here water drips slowly to the roots of plants and maintains the soil moisture. You can also install it at home. The drip irrigation kits are available in the market but you can create a D.I.Y drip irrigation system by reusing your plastic bottles.

Required materials

- Plastic bottle
- Incense stick

You have to select the size of the plastic bottle based on the water requirement of your plant and the number of days you are on vacation. Try to reuse any mineral water/fruit juice or cold drink bottle. After that, you just need to follow the steps mentioned below.

Procedure

Step 1. Lit an incense stick and shake it a little to extinguish the flame.

Step 2. Take the selected plastic bottle and poke the ignited part of the stick for a few seconds to make 2 holes into the bottom and 3-5 holes in the sides of the bottle.

Step 3. Dig a hole into the soil to insert the bottle up to its neck without hurting the roots.

Step 4. Place the bottle into the hole Make sure the punctured side of the bottle should face your plant.

Step 5. Fill the bottle with water, then tightly screw the bottle cap.

Your self made drip irrigation system is ready to hydrate your plant.

Wrapping up!

Your indoor plants are beyond adding aesthetics to the interior. It fades your Monday blues and helps you in living green. In return, you have some responsibility towards them. You can make your responsibilities somewhat easier through the above 5 hacks. Choose any one of the methods according to your plant's water requirement, your vacation duration and your convenience.

Betel leaf oil

Rohan Mondal
B.Sc. Agriculture, 1st Year

The betel (Piper betel) is a vine of the family Piperaceae, which includes pepper and kava. Betel leaf is mostly consumed in Asia. The Piperaceae, also known as the pepper family, are a large family of flowering plants. The betel leaf is cultivated mostly in South and Southeast Asia, Major betel leaves growing countries are Sri Lanka, India, Thailand and Bangladesh. In our state West Bengal , South 24 Pargana , Purba Medinipur district are leading in betle leaf cultivation . In South 24 Pargana of our state the betel leaf cultivated through a proper process. Suppose from 8000 Square feet area we will get around 40 gocha (gocha is local measurement unit of betel leaf) betel leaf in a month . In 1 gocha there are around 200-220 piece of betel leaf . So In 1 month we will get 8000 to 10000 betel leaf from 8000 sq.feet area . In normal time we will get around 60000 per month from this quantity of betel leaf . But this quantity and everything is in normal conditions without any natural disaster. At first time when we will start this business we have to plant atleast 1000 of betel leaf plant . The price of one betel leaf plant is about Rs. 100 /- so the price of 100 leaf plant is Rs 10000 /- . And normally after three month we will collect the leaf . Per month for pampering the plants we will have to provide some vitamins , pesticides , soil etc. So approximately in a year we have to spend around Rs 50000 /- in pesticides , labour and other pampering ingredients .

Betel leaf is a great source of antioxidant that fights oxidative stress by scavenging free radicals. Thus, betel leaf helps in lowering high blood glucose levels and aids in the management of diabetes mellitus. Many types of medicine cosmetics are made with betel leaf and also the research work is going on it . In our state the South 24 Pargana dist area is Very stormy and ful of nature disaster . So every year the betel leaf farmers are to be damaged . Many betel leaves are totally being wasted for sale . So the farmers economical situation become worst . So now with some modern techniques we can utilise the 15 days old dry betel leaf . From 1 kg betel leaf we can extract about 1.8 to 2 ml betel leaf oil .Now a days the price of 100 ml betel leaf oil is 6 to 10 thousands rupees depends on the quality . There is a very simple and effective way to extract the oil . Even the whole setup is Very cheap of cost. IIT Kharagpur developed a process which helps the farmers to extract the oil at home .For 10 litre setup the cost is around 10000 and 20 litre setup the cost is around 20000.In this process according to Prof Guha “It is a distillation unit with special modifications for recycling evaporated water which carries the vapors of essential oil from the distillation flask to the condensation unit. It has also a special device to minimize the formation of emulsion for increasing the recovery of essential oil.” Also for industrial purpose we can use autoclave . So as an agriculture student we have to aware farmers about this oil extraction process . Thus they reduce the wastage of dried betel leaves and earn some profits. We have to tell them about the marketing of betel leaf oil . Betel leaf oil is very essential elements of verious medicine so the research on it is going on .

References

https://en.wikipedia.org/wiki/Integrated_farming

https://agritech.tnau.ac.in

https://www.youtube.com/watch?v=zRitfpln-g9U&t=252s

Integrated farming the shine of self employment

Surajit Das
B.Sc Agriculture, 2nd Year

India is still not out of the words in unemployment is concerned after a year when the lockdown was imposed to contain the spread of deadly COVID-19 on March 25 last year as pandemic-induced job loss has not tapered off consistently .The government had imposed a lockdown to curb the spread of the pandemic but this impacted economic and commercial activities and resulted in job loss and later on the exodus of migrant workers which rocked the entire nation.

In this situation integrated farming is a way to recover their economic condition .unemployed youth showing their interest in integrated farming.

Integrated farming:

Integrated farming (also known as mixed farming) is a farming system with simultaneous activities involving crop and animal. The main purpose of integrated farming is so that the farming components support one another; hence, reducing external inputs.

A judicious mix of agricultural enterprises like dairy, poultry, piggery, fishery, sericulture etc. suited to the given agro-climatic conditions and socio-economic status of the farmers can bring prosperity to the farming operations.

Advantages

1. Productivity: IFS provides an opportunity to increase economic yield per unit area per unit time by virtue of intensification of crop and allied enterprises.

2. Profitability: Use waste material of one component at the least cost.

3. Recycling: Effective recycling of waste material in IFS.

4. Eco friendly: In IFS waste materials are effectively recycled by linking appropriate components, thus minimize environment pollution.

5. Income Rounds the year: Due to interaction of enterprises with crops, eggs, milk, mushroom, honey, cocoons silkworm. Provides flow of money to the farmer round the year.

The main advantages is if for any reason we suffer a loss on one side ,we can offset that loss by the profit of the other side

Following models are suitable for Indian region:-

- Agriculture + livestock
- Agriculture + livestock + poultry
- Horticulture + fish culture + poultry
- Sericulture + fish culture
- fish culture + sericulture
- Agricultural(rice) + fish+ mushroom cultivation
- Agricultural + duckery + poultry
- Poultry + fish culture

How we can start thinking about it:-

1. Talk 1-on-1 with as many farmers as possible.
2. Learn the science.
3. Start taking action where you are with what you have.
4. Read and listen
5. Be Patient.
6. Enjoy the Operations and Keep your day job as long as you can.
7. Visit local integrated farm

Training program

For this integrated farming krishi vigyan Kendra(KVK) ,ADO office, local farmers club ,NGOs are organizinig various training program. they are teaching enthusiastic people through this program and also they are arranging loans for starting integrated farming.

Those people are interested,they can contact with local ADO officer,KVK, farmers club and also they will know about startup, advantages and disadvantages of integrated farming. After knowing all information they can start their activity on integrated farming.

SURAJIT DAS
TNU2020032100095
2nd Year, 3rd Semester

Agri Vision

Finance in Agriculture

Dr. Pranay Kumar Roy Barman
M.Sc. (Ag.), CAIIB, MBA, Ph.D.
Professor (Visiting), The Neotia University

In reality finance is applied economics. An account is the language of any type of business and finance provides a conceptual frame work for analysis. Financial implications are at the heart of every business decision, strategy and transaction. There is no exception to business relating to agriculture starting from production to marketing . Finance is a tool used to monitor, communicate and evaluate the results of farm business decision. Improvement of financial programmes is the responsibility of every member of the agri- organization either directly or indirectly . While large agri corporates have specific staff to handle financial analysis and help managers make business decisions , in small organisations diverse , cross functional project teams are formed to tackle specific objectives. It is desirable for each functional area to understand the role of finance and the finance personnel to understand the role of the other functional areas as well as finance model and its strategic decisions. The non financial professionals should also be able to understand and clearly communicate financial results. A number of specific topics have to be commonly understood by everyone in agro- business. Whether one is in farm engineering, marketing, sales, logistics, human resources, research, legal, general management or any other areas should have basic knowledge of fund management.

It is an established fact that agri-business is a series of managed conflicts. The conflict can be managed through financial information and valuation impact. In agri-business a systematic and common approach can resolve the tensions with a pragmatic approach by the application of knowledge of applied finance. Finance provides a common focus on goal attainment and value enhancement. The entrepreneurs have to know the important spheres of fundraising, finance decisions, investment decisions, capital budgeting , liquidity decision and dividend decisions. .More to say, the decision makers have to understand the specific techniques of appraisal, decision rules, financial strategies and policies that are the tools for maximization of value of the farms.

Having relevance to what has been discussed, very briefly we will talk about agro-projects. The major approach of every treatise on project and project appraisal is to realize the alternative choice of investment proposals. When the choice is finally made , a particular proposal out of the alternatives proposal is presented to the financial institution or bank for consideration. In selecting a proposal , the entrepreneur has to strike a balance between high profitability and high risk and select a proposal where there is quick return of owners' fund at a minimum risks. . This is not an easy task. In order to help the management in resolving this perennial contradiction of business, a number of techniques have been developed. Credit – appraiser's approach is different. He has to assess the creditability of the project and also bankability. Here the question of credit risk comes. Credit risk is not the same as financial risk. A project may be financially viable but not credit worthy.

Project appraisal takes an important role in capital investment decision making or in capital expenditure decision. The main objective of project appraisal is to maximize the organization's profit and optimizing the return on investment. Techniques of appraisal of capital investment decisions are very important and relevant for proper appraisal of performance of a project. Among some other techniques discounted cash flow technique which considers both the aspect of project i.e. volume of cash in and the time pattern of their occurrence . Discounted cash flow technique can be explained with the help of " time value of money". It is often said " a bird in hand is better than two in bush.". In other words , if one is given the option of getting Re. 1 today and getting it one year hence ; everybody will decide in favour of getting it to day. It means same amount of money " to day" is more variable than " to morrow ". In order to evaluate capital investment three methods of using discounted cash flow are practiced-- these are NPV (Net Present Value,) IRR (Internal Rate of Return), B/C (Benefit Cost ratio --- Profitability Index).

In course of undertaking a venture for any agro-project the investor must be equipped with the knowledge and application of whole gamut of financial practices to harvest the desired outcome.

PERFECT IMPLIMENTATION OF PROJECT PLAN ASSURE THE BALANCE OF DEMAND AND SUPPLY OF SEED POTATO IN THE STATE

Dr. Nirmalendu Samanta
Visiting Professor, School of Agriculture and Allied Sciences, The Neotia University

Seed is the prime input in agriculture. Use of improved seed is capable to produce satisfactory yield. So, farmers can achieve maximum yield, if quality seed can be provided in time at affordable price at their door steps of farmers by adopting perfect package of practice. The potato is one of the main commercial crops in the state. Generally, potato is used mostly in all types of vegetable in everyday diet of the people of Bengal. Breakfast, lunch and dinner every where its presence are dominantly shown. Potato requirement is 125 grams per day per capita for an adult in his daily diet. The population in the state is nine cores as per last census; 2011.The population will reach around ten cores at the end of the terms of next census; 2021. Considering the ever increasing population in the state, forty six lakhs tonnes of potato annually is required. As per statistical data published in Agricultural Statistics at a Glance 2017 by Government of India the area was four lakhs seven thousand hectare under cultivation and production was one core twelve lakhs tonnes of potato. The productivity was 27.60 tonnes per hectare. The rank was second after Uttar Pradesh in the country for potato production. The potato growing area was 18.92 % of the total cultivated area of the country and production was 23.29 %. Highest productivity was 31.58 tonnes per hectare in Gujarat state and lowest productivity was 10.03 tonnes in Assam state.

So, surplus quantum of potato after fulfil the demand of the state is required to be preserved in cold store. The state having 470 numbers of cold storage and its content capacity about 70 lakhs tonnes. So, the potato growers are compelled to distress sale of balance 42 lakhs tonnes of potato at lower price. Inspite of that, surplus stored quantity of 24 lakhs tonnes after meeting states' demand. Therefore, surplus 66 lakhs tonnes of potato is required to be sold outside the state. No marketing setup in the state for selling of potato is being organised till today. Although, potato produced in the state is exported in different neighbouring countries but confirmed policy in regard to export is not framed in regular process. Therefore, no scope to export the surplus quantum of potato by the farmers is possible in the state. Indian shops of retail sale of potato are established about 65-70 numbers in Singapore city the World Trade Centre of commerce for selling Indian potato. But, demand is less due to the cooking quality of Indian potatoes is not similar with the other countries. Generally surplus potatoes are sold in different states of the country. But, the volume of sale depends on the demand of consuming states. The sale of potatoes decreases in some states as they have started production in their areas. Inspite of that, the farmers of the state are very much interested to grow potato during Rabi season due to lack of short duration profitable diversified alternative crops. The Government of India has taken steps with a view to export for which ear marked production zones are created in different locations of the state as well as country. We are very much hopeful that may be find solutions regarding export in future. In that case, potato shall be cultivated as per choice of quality by the consumers of the importing country and / or the Indian cultivator may be introduced new cultivars for export.

Considering all the deficiencies in marketing, the farmers are still interested to grow potato in the state and required high yielding, good cooking quality and standard size seed potato for increasing productivity. In absence of quality seed potato the farmers are not receiving satisfactory yield rather the cost of production is static. Sometimes, the farmers are facing problem by using of inferior quality seed potato procuring from dishonest dealers or distributors at highest price. The dealers are keeping the price of seed potato quite higher in comparison to the price fixed by the public sector organization and earning huge profit.

The dealers are selling untreated and untested seed potato to the farmers by procuring from other states. Occasionally, farmer receives seed potato as DADAN (Advance in kind without price) on condition they have to sale produced potato with field price and deduct the seed cost of DADAN. The poor farmers have no alternative except receiving of DADAN.

There were mainly two public sector organizations like WBSSCL and WBCADC who produced certified seed potato around 4000 tonnes and 8000 tonnes respectively. Now, both the organization has cartel down certified seed potato production drastically. But, Government Farms scattered in the state are producing certified seed potato to the tune of 500-700 tonnes still now. Besides this, some Agricultural co-operative societies are producing seed potato every year in small quantum each in the state. Earlier, seed potato of certified class were produced about 40-50 thousand tonnes in the state as a whole and now producing at diminishing rate gradually. Production in the state contributed only 0.06 - 0.10 % share to the requirement of the state. The total requirement of seed potato is 8 lakhs 15 thousand tonnes @ 2 tonnes per hector to cover up the entire potato cropped area of the state. About 60% potato is used as seed from their own availability for the next cropping season by the farmers in the state. Rest 40% quantity is sold up through the potato seed dealer and distributors by procuring from different potato growing states of small size tubers of about 20-30 grams weight. The seed stock has no authentic test report from accredited laboratory which is used as seed potato by the farmers.

Approximately, 10-12 lakhs farmers comprising small, marginal and large are engaged in potato cultivation in the state. Some of them are very much poor farmer and compelled to receive DADAN from middleman. Sometimes, they are also compelled to sale out their produce with the field price on pre-condition of that middleman. No scope to get fare price by the farmer for selling their produced potato.

The farmers of the state are very much reluctant to use seed potato of certified class produced by the public sector organization of the state. Reason behind it, the size of seed potato tubers are large in comparison to the potato used by the farmer collecting from the dealer who procured from outside state. The size of the seed potato is 25-125 grams weight as prescribed by the Indian Minimum Seed Certification Standard. But, the requirement of farmers is 25-30 grams in average weight. Otherwise, they compelled to use large size tuber, it means they required 2000 kg per hectare instead of 1200-1250 kg per hectare of small size tuber. The productivity of both the category seed potato is parallel approximately. About 1600-1700 numbers of seed tubers of small size are to be kept in 50 kg capacity jute containers. Whereas, around 625-650 numbers of average 80 grams size tuber contain in same size of container. Due to reduction of quantity at least an

amount of rupees 25 thousand per hectare will be saved by using of small size tuber. The farmer can meet up the initial expenditure of cultivation from the saved money.

Presently, research works on potato from different angle is going on at different stations in the state. However, the scientists are working mainly for evolving new breed, varietal evaluation, improve package of practice, increase of productivity etc. But, no attempt yet been taken for improvement of seed quality and scientific storing. Though, the Department of Agriculture, Government of West Bengal is working on quality seed tuber (disinfected small tuber) by tissue culture method through hydro-phonic process. They are producing and multiplying of small potato tuber and distributing G3 tuber of 20-30 grams weight for commercial potato production in the farmers' field from Anandapur Vegetable Farm, Midnapur (West). In the year 2017, they have started quality seed potato production by procuring of 10,000 numbers of mini-tuber average in weight 1 gm size @ rupees 10.00 each from Central Potato Research Institute, Shimla and distributed tuber of market standard of 20-30 grams weight each about 20,000 numbers mini-tuber among the cultivators for commercial production during the year 2019. But, it is very meagre quantity in comparison to the demand of the state. So, self sufficiency in seed potato production within the period in the state is under question mark. Some private entrepreneurs are producing seed potato (Tuber to Tuber) under seed certification system at their own interest but they have no confirm selling destination for assured marketing. So, Providing of good quality, high yielding, affordable size are very much important to the farmers and its assured marketing. In this context, we are in needing perfect implementation of unique plan and infrastructure for achieving the goal. Is it feasible to supply quality seed tuber as per demand of the farmer of affordable size? Feasible, when the unique project will be implemented perfectly with modern infrastructure. In that case, Government as well as multinational company need to step forward for establishment of potato base industry individually or Public Private Partnership approach. The project should be included of technology for production of quality seed potato of appropriate size, Selection of producing zone, research and development on export quality, scientific storing, grading and product mechanization, specialised cold store construction, processing unit, market research etc. for developing seed industries. Entire project should be run under the strict governance of a good administrator and experienced technologist. Inclusion of contract farmer as seed potato producer is prime factor for the project with attractive monetary package. So all round effort is required with strict vigilance.

The project will generate employment and create huge man day. The project must be prepared under the guidance of specialized expert in collaboration with Agri-engineer and legal person of industrial law. The normal function will be started after a period of five years of project implementation start. There is no specialized seed potato cold store for safe preservation in the state. The mechanism to prevent the internal hammerage of seed potato in storage due to fluctuation of temperature and relative humidity till the next season approaches. No deviation should be occurred in temperature and humidity while in operation. Due to miss management, electricity problem, mechanical disorder etc. is correlated with the deterioration of tuber quality. Considering the above factors, increase of temperature in cold storage decrease the seed quality through physiological and bio-chemical activities of tuber. Sudden hike of temperature with corresponding humidity and occurrence of such event repeatedly reduces the vigour, viability as well as productivity. So, seed potato tuber should be preserve in cold store at 0-1 degree centigrade temperature along with 90-92 percent relative humidity to be maintained till the next cropping season approach. Planting of high vigour seed potato can be expected to give good return (potential yield). Therefore, specialised cold storage is must for good storing.

Grading of seed tuber is the foremost requirement of the potato producer in the state. So, three tire screening method has to be adopted where the under size tuber from the bottom screen and over size tuber from upper screen would be eliminated for commercial use and the graded tuber from the middle screen should be collected for seed purpose. For this reason, the project shall have self processing mechanism to utilize the entire eliminated stocks. Biscuits, flour, chips etc. making provision shall be included under this project. Motivation is required from the consumers for utilization of potato as by-product parallel to the main object in large scale.

Presently, about 3 lakhs 26 thousand tonnes of potato are sold as seed procuring from different potato growing states by the dealers and distributors of this state. Out flow of about 1350 corers of rupees would be stopped to those states for purchasing of potato from West Bengal. If we think about it, then the appropriate authority or who are interested may be established this type of agro-base project for the interest of farming community, industrialist and the state of West Bengal. In this case, the requirement of seed potato will reduce to about 40 % of the requirement of the state. Simultaneously, more area coverage will come under potato seed production by utilization of certified seed potato to be produced from the project and automatically increase the productivity as well as reduce the cost of cultivation. The production will increase for the farmers as well as the state. It must bring the stability economically to the farmers.

The accidental discovery of penicillin-an antibiotic

Dr. Bharat Chandra Saha
Professor, School of Agriculture & Allied Sciences
The Neotia University, Sarisha, Diamond Harbour, West Bengal

It was the year of 1914, the First World War broke out and Sir Alexander Fleming a Scottish born physician-scientist was only 33 years old. He was then a captain in the Royal Army Medical Corps and was working in field hospitals in France. There, he found that the antiseptics such as, carbolic acid, boric acid and hydrogen peroxide, that were administered to treat wounds and prevent infection, were actually killing more soldiers than curing the wounds. He established that those antiseptic agents were useful only to cure superficial wounds, but when applied to deep wounds, they were very harmful .He noted those antiseptic agents when applied deep inside the wounds were actually killing the white blood cells of the body and were lowering the natural resistance of the wounded soldiers leading to their death.

Nearly after 14 years of this observation, Fleming was working as Professor of Bacteriology at St. Mary's Hospital in London.. He was working on various aspects of bacteria, Staphylococcus that cause boils, sore throats and abscesses

Once he was on a tour for fourteen days in 1928 and after his return he went to his laboratory where the colonies of Staphylococcus was growing on Petri dishes. He noticed something unusual on one of the Petri dishes. He noticed that a mold had developed on an accidentally contaminated staphylococcus culture plate. Upon examination of the mold, he noticed that the culture prevented the growth of staphylococci It was dotted with colonies, save for one area where a blob of mold was growing. That was quite an interesting phenomenon for him. He found that, the "mold juice" was capable of killing a wide range of other harmful bacteria, such as Streptococcus, Meningococcus and the Diphtheria bacillus. He thought that the mold had secreted something that inhibited the growth of other bacteria .Later, the mold was identified as a rare strain of the fungus penicillin i.e. the Penicillium notatum (Fig.1). That mould was determined to be a rare variant of Penicillium notatum (now Penicillium rubens), a laboratory contaminant in his laboratory.

Fig.1

Next, he wanted to isolate pure penicillin from the mold juice and for the next 16 years, he pursued for better methods of production of penicillin, medicinal uses and clinical trial. His successful treatment was that on Harry Lambert who had otherwise fatal streptococcal meningitis Thus, 1942 proved to be a critical moment in the medical usage of penicillin.

Despite of several attempts, the isolation of penicillin proved to be very unstable, and Fleming and his group were, only able to prepare solutions of crude material to work with. Fleming published the results of his findings in the British Journal of Experimental Pathology in June 1929, with only a passing reference to penicillin's potential therapeutic benefits. At that stage it looked as if its main application would be in isolating penicillin-insensitive bacteria from penicillin-sensitive bacteria in a mixed culture. Harold Raistrick, Professor of Biochemistry at the London School of Hygiene and Tropical Medicine, tried to purify penicillin but failed.

Later, many scientists were involved in the stabilization and mass production of penicillin and in the search for more productive strains of Penicillium. Important contributors include Ernst Boris Chain and

Sir Howard Walter Florey. In 1945 Fleming won the Nobel Prize in Physiology or Medicine for the discovery and development of penicillin with Chain and Florey. Dorothy Hodgkin received the Nobel Prize in Chemistry in 1964determining the structures of important biochemical substances including penicillin($C_{16}H_{18}N_2O_4S$).

The introduction of penicillin in the 1940s was the era of antibiotics. Penicillin has now been recognized as one of the greatest advances in therapeutic medicine. The discovery of penicillin and the initial recognition of its therapeutic potential occurred in the United Kingdom, but, due to World War II, the United States could play the major role in developing large-scale production of the drug, thus making a life-saving substance .Thus, the discovery of Penicillin heralded the dawn of the antibiotic age. Before its introduction there was no effective treatment for infections such as pneumonia, gonorrhoea or rheumatic fever. Hospitals were full of people with blood poisoning contracted from a cut or a scratch, and doctors could do to cure those diseases.

Business Ideas on Seed Production and Technologies

Dr. Samir Kumar Samanta
Professor (Visiting), School of Agriculture & Allied Sciences
The Neotia University, Sarisha, Diamond Harbour, West Bengal

Agriculture plays major role in every sphere of our life and equivalently in the world of business. Out of so many items SEED is most important in this segment to undertake by the young entrepreneurs, particularly who are fresh agriculture graduates having basic knowledge of cultivation, strength of carrying hard work, innovative mind and definitely business aptitude. Interesting as in other business, seed business has many segments. At individual level one can do production, sale directly to the farmers and control own capacity within his capability limit. However in Small Scale Commercial production and processing, an entrepreneur may undertake several activities related to seed business, namely farm unit for production, hybridization or to use any other breeding technology, distribution of own produce, promotion in markets through packaging etc. In my opinion seed plays a significant role in corporatization of agribusiness with the adoption of latest seed improvement technologies which are mostly impractical for small or individual entrepreneur.

As of now most demanded one is Hybrid Varity seeds followed by high yielding varieties in case of major cereal, oilseed, as well as vegetable crops. Production of hybrid seed for cereals like rice, maize, sorghum and oil seeds namely sunflower, mustard and others.

To know technological part involved one should know how hybrid variety seed production is undertaken.

“The development of hybrid varieties differs from hybridization in that no attempt is made to produce a pure-breeding population; only the F1 hybrid plants are sought. The F1 hybrid of crosses between different genotypes is often much more vigorous than its parents. This hybrid vigour, or heterosis, can be manifested in many ways, including increased rate of growth, greater uniformity, earlier flowering, and increased yield, the last being of greatest importance in agriculture.

By far the greatest development of hybrid varieties has been in corn (maize), primarily because its male flowers (tassels) and female flowers (incipient ears) are separate and easy to handle, thus proving economical for the production of hybrid seed. The production of hand-produced F1 hybrid seed of other plants, including ornamental flowers, has been economical only because greenhouse growers and home gardeners have been willing to pay high prices for hybrid seed.” **(https://www.britannica.com/science/plant-breeding/Hybrid-varieties).**

“The production of F1 hybrid seed between two strains is accomplished by interplanting a sterile version of one strain (say A) in an isolated field with a fertile version of another strain (B). Since strain A produces no viable pollen, it will be pollinated by strain B, and all seeds produced on strain A plants must therefore be F1 hybrids between the strains. The F1 hybrid seeds are then planted to produce the commercial crop. Much of the breeder’s work in this process is in developing the pure-breeding sterile and fertile strains to begin the hybrid seed production. Pollination in corn (maize) is by wind, which blows pollen from the tassels to the styles (silks) that protrude from the tops of the ears. Thus controlled cross-pollination on a field scale can be accomplished economically by interplanting two or three rows of the seed parent inbred with one row of the pollinator inbred and detasselling the former before it sheds pollen. In practice most hybrid corn is produced from “double crosses,” in which four inbred lines are first crossed in pairs (A × B and C × D) and then the two F1 hybrids are crossed again (A × B) × (C × D). The double-cross procedure has the advantage that the commercial F1 seed is produced on the highly productive single cross A × B rather than on a poor-yielding inbred, thus reducing seed costs. In recent years cytoplasmic male sterility has been used to eliminate detasselling Pollination in corn (maize) is by wind, which blows pollen from the tassels to the styles (silks) that protrude from the tops of the ears. Thus controlled cross-pollination on a field scale can be accomplished economically by interplanting two or three rows of the seed parent inbred with one row of the pollinator inbred and detasselling the former before it sheds pollen.” **(https://www.britannica.com/science/plant-breeding/Hybrid-varieties).**

So with this simple background information what can be done:

1. Hybrid seed production
2. Production of A line, B line and R line for different corporate seed sectors
3. Production of inbred lines wherever necessary
4. Production of pollen and supply to the system
5. Development of new A, B and R lines
6. Development of germplasm resources for the breeders or breeding companies
7. Many more

Vegetable seed industry has enormous employment generation potential. Hybrid seed production of vegetable requires lot of manual labour for emasculation and pollination. There is a need to diversify the vegetable seed production hubs to non-tradition high productive regions.

The Global Vegetable Seeds Market is estimated to be valued at USD 8.77 billion in 2018 and is projected to reach USD 14.00 billion by 2025, at a CAGR of +8.10% from 2019. Asian vegetable seed market is the largest where China and India are the major players in the region occupying 48 per cent of the global vegetable seed market share. The Indian market for vegetable seed is projected to grow at a CAGR of 9.8% for the forecast period between 2020-2025. Indian seed industry is the 5th largest in the world and is worth 2.7 billion US $ (Dubey, 2016). Out of this, total vegetable seed market including OPV's is 4000 crores (US $ 580 m). India is the tenth largest importer of vegetable seeds by value and seventh largest importer by volume, in the world. It accounted for about 1% of the total vegetable seed imports by volume during 2018. Europe stands next with 26 per cent share and France being major vegetable seed exporting hub to rest of the world. During 2015-16 India exported 18.7 million tonnes of vegetables worth 4866.91crores. Export of Vegetable Seeds from India was 11.99 thousand MT, valuing Rs. Crores 745.95 / US$ Mill 107.76 during 2018-19. India exports vegetable seeds majorly to Netherlands (25.42 Mill USD), followed by USA (22.25 Mill USD), and Pakistan (17.1 Mill USD).

So what can be possible for vegetable seed production in India , particularly in West Bengal.

1. Simply to produce seeds of different vegetable crops have markets in India and other countries. To name mainly solanaceous and cucurbitaceous crops.
2. Tomato is the world's largest vegetable crop after potato and sweet potato. Asia alone produces 60 percent of total world's Tomato with China and India leading the global Tomato production. In 2017, world's Tomato production was 182 Mill MT. China ranks first in the list with annual production of 59.51 Mill MT followed by India – 20.71 Mill MT, Turkey – 12.75 Mill MT and USA – 10.91 Mill MT. (Source: FAO) .India's climatic conditions are very congenial for the growth of wide variety of Tomato.
3. In 2018, India exported Mill USD 25.22 worth Tomato seeds which consists of 61 percent of total vegetable seed export. Netherland was the largest importer with import value of Mill USD 11.19 followed by USA – Mill USD 4.36, Israel – Mill USD 1.14 and Pakistan Ir– Mill USD 0.98. (Source: DGCIS) The pricerealized per unit of Tomato seeds is much higher in the regions like Europe, America and Africa than APAC region. Kenya, Nigeria, Egypt, and Ethiopia are the countries from Africa importing Tomato seeds from India. Egypt and Nigeria are the largest producers of Tomatoes in Africa, together producing more than 10 Mill tons of Tomato annually.
4. In 2018, India exported Mill USD 1.76 worth of Cabbage seeds accounting for 0.99 percent of total vegetable seed export. Bangladesh was the largest importer with import value of Mill USD 0.43 followed by Pakistan –Mill USD 0.26 , USA –Mill USD 0.21 and Kenya –Mill USD 0.2 .
5. India has the potential to be a breeding center for other tropical/ sub-tropical vegetable crops such as Peas, Cauliflower, Radish, Onion, Hot Pepper (Capsicum) Okra, Egg Plant etc. India is also exporting these vegetable seeds to the various international destinations
6. Radish Seed find place in the markets like Bangladesh (35.71 per cent), Pakistan (22.86 per cent), Vietnam (14.29 per cent), Korea (5.71 per cent) and Hong Kong (4.29 per cent). The total export during 2018-19 was 414.72 metric tons, valued at USD 0.7 million. Of the total exports, USD 0.25 Mill was to Bangladesh and USD 0.16 Mill to Pakistan. (Source: DGCIS)
7. Indian seed industry has been growing awfully in quantity and value over the past fifty years. Both public and private sector corporations/ companies are actively involving in quality seed production. The public sector component comprises National Seeds Corporation (NSC), State Farm Corporation of India (SFCI) and 15 State Seeds Corporations (SSCs) ,Indian Council of Agricultural Research (ICAR) institutions and State Agricultural Universities. ICAR launched an All India Coordinated Research Improvement project (AICRP) on seed production called National Seed Project in 1979 with 14 centres in different Agricultural Universities. AICRP on production of breeder seed in vegetable crops is started under National Seed Project in 1994. Twenty two State Seed Certification Agencies and 104 State Seed Testing Laboratories are involving in quality control and certification (Poonia, 2013). The private sector comprises around 150 seed companies of national and foreign origin but only few companies like M/S Rasi seeds M/S Bejo Sheetal, Indo-American Hybrid Seeds and Namdhari Seeds are working exclusively on vegetable.

My suggestion to new entrepreneurs would be to undertake seed production of any vegetables which are very common in West Bengal. As for example

1. Tomato
2. Brinjal
3. Cabbage
4. Spinach
5. Radish
6. Cucumbers
7. Melons
8. Amaranthus
9. Gourds
10. Chilli & sweet peppers
10. Others

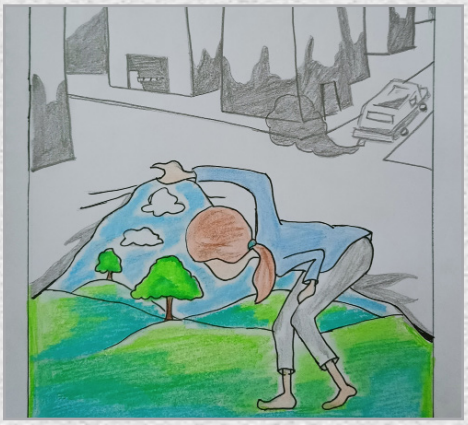
In most of the vegetables hybrid seed production is most fascinating even for a single person having minimum one acre land. There are so many fund supports for the start ups and can be utilised effectively. A small packaging unit costing less than Rs, 20000/ would be most helpful for individual breeder. Seed production of heirloom varieties now has tremendous market demand. Similarly organic seed production plays a new dimension.

It is challenging job, no doubt but may ago a long way if undertaken by young graduates. The known as well unknown technologies are available in internet for any such work and one can easily enhance his/ her skill by going through these resources available.

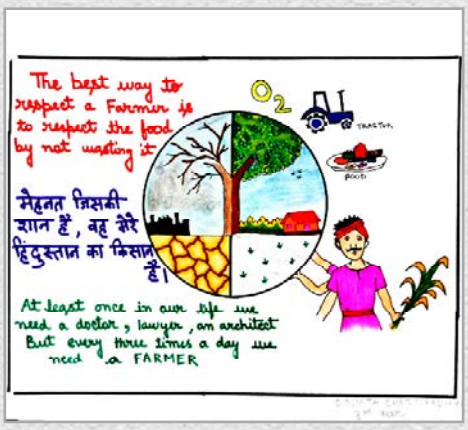
To strengthen further author may be contacted for advice.

(most of data collected from internet and the text copied duly acknowledged)

Animation / Drawing Division



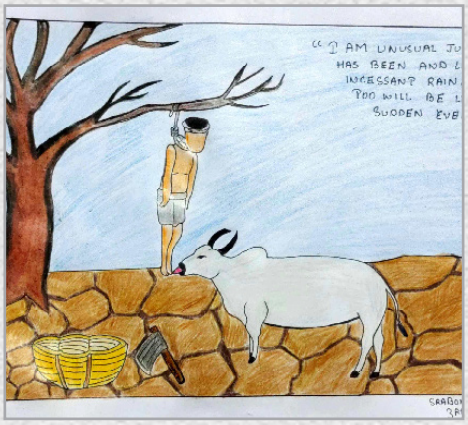
Anushka Chatterjee
B.Sc. (Agriculture), 3rd Year



Dipsmita Chattopadhyay
B.Sc. (Agriculture), 3rd Year

Keya Ghosh
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year



Sraboni Bhunyia
B.Sc. (Agriculture), 3rd Year

Tiyasa Mukherjee
B.Sc. (Agriculture), 4th Year

TRISHITA BERA
B.Sc. (Agriculture), 2nd Year

Students Corner

"CHAOS TURNED INTO PEACE"

A big thanks to corona miss

It's all cause of you this chaos has turned into peace,

The daily accelerating murders and rapes in our country,

At least, has put a brake and that is worthy.

Hey humans!

Did you even provide a chance for this innocent?

Animals to breathe?

We are living organisms! Right? So, they are!

We are not avatar,

To carve a scar and to decide an abattoir.

This is a lesson for all of us,

To end the rush and gross,

Without blaming any countries,

We will learn what actually, it is being hungry.

How happy are the animals and birds!

Not by seeing the world dead and blurred.

But seems once again they conquered,

Like their descendants and ancestors.

Humans are falling into their places,

All living organisms need their spaces, and this is all

'Cause of God's grace!

It is finally over! Say what? "A chase and a race"

For us to earn, fight, destruct, and face!

Keeping quiet is helping us create silence,

Knowing ourselves more to stop violence,

Realising such outbreak is and important phase,

Where your pride, arrogance, hatred, envy would not

Cease any case.

See how beautifully the ecosystem is balanced!

Before it turned into a challenge,

How silence and peaceful it is!

All because of corona miss!

Aditi Poudyal
TNU2019032200247
B.Sc. (Agriculture), 3rd Year
The Neotia University

Students Corner

চাষার ফসল

আকাশ পানে চেয়ে চাষি বলছে দুচোখ দিয়ে!
বাদল ওগো..... বন্ধু আমার
দিনের শেষে এসো এবার একটু বৃষ্টি নিয়ে।
এ কেমন খেলা তোমার? খেলছো মোদের সাথে?
সোনার ফসল নষ্ট হবে, ভেবে ঘুম আসে না রাতে।
সারাদিনের মাঠ ফাটা রোদ মাথার উপর নিয়ে,
খালি পেটে খেটেও , মোরা তুলেদি অন্ন সবার পাতে।
সারা বছর খাটনির পরেও অশ্রু ধারা ঝরে,
এত্তো কিছুর পরেও তোমার মন তবু না ভরে,
হীরক রাজা ছিল যে সেই, কথা সত্যি হল তাহার
সোনার ফসল ফলায় যে জন, জোটে না তার দুবেলা আহার,
বিশাল তুমি আকাশ ওগো, শেষ নাইকো তোমার,
একটু খানি বৃষ্টি দিয়ে , কাটাও দুঃখ আমার।
মিটবে মোদের জলের অভাব, পাবো দেহে বল,
মাঠে মাঠে ফলবে আবার , সোনার ফসল।।

Moumita Bag
TNU2019032200065
B.Sc. (Agriculture), 3rd Year

Students Corner

অবাস্তব স্বপ্ন

আজকের ওই ধারের আল টা বাঁধতে হবে .. আচ্ছা আমর নাম তো ভাগ্য,আমি নাকি সাবর সাথে থাকলে তাদের ভাগ্যে লক্ষ্মী ফেরে, তা আমর ভাগ্যে কি লক্ষ্মী মরে গেছে?কিজানি বাপু.....দালানে বসে দেওয়ালে হেলান দিয়ে মুখ টা হা করে এইসব কথা ভাবছিল ভাগ্য।মনে ভাগ্যচরণ দাস,বাড়ি মেছেদা। ও বাবা...বাবা...ঘরের ভিতর ফুলী চিৎকার করতে করতে আসলো,কি হয়েছে?চিৎকার করছিস কেনো?বলল ভাগ্য।আজ ক্ষেতে যাবে না? হমম যাবো,তোর মারে বল পান্তা বাঁধতে,ফুলি আচ্ছা বলে ঘরের ভিতর দৌড় দিল।ভাগ্য আলটা বেঁধে একটা দীর্ঘ নিঃশ্বাস ফেলল,তারপর গামছা দিয়ে কপালের ঘোমটা মুছতে মুছতে আকাশের দিকে তাকালো,মন টা ভালো নেই আজ ভাগ্যের, বৃষ্টি টা আসার অপেক্ষা করতে করতে আজ প্রায় ৪মাস হয়ে গেলো,বাড়ি আসার সাথে সাথেই ফুলির মা বললো, ও গো,তুমি এবার বড় বাজার যাবেনা নাকি? ভাগ্য,যাবো টা কি নিয়ে?এক্ষণ ও আগের বারের ৭৫০টাকা পায় রফিকুল,জানি না কি হবে,ভগবান এর উপর ভরসা এর কি। ফুলি পিছন থেকে বাবাকে জড়িয়ে ধরে বলল, হ্যা বাবা সব ঠিক হয়ে যাবে।শুধু তুমি চিন্তা করো না।সেদিন ভাগ্য সবাই মাঠ থেকে এসে মাঠের ধারে বসে গামছা টা খুলছিল,দূরে নজর পড়লো ফুলি তাকে দেখছে ,গাছের আড়ালে দাড়িয়ে।জোরে হাক দিয়ে ডাকলো ,ফুলি...এই ফুলি....ফুলি একটু ভয় পেয়ে চমকে গেলো,তারপর এদিক ওদিক ভেবে ছুটে আসল,ভাগ্য জিজ্ঞেস করলো কি রে ফুলি,ওখান দাড়িয়ে দাড়িয়ে কি করছিলি?স্কুল যাবি না? ফুলি ভয় কেঁদে ফেললো,আর ভাগ্য কে জড়িয়ে ধরলো।কি হয়েছে মা? কাদছিস কেনো? এ ফুলি মা..আমার খুব ভয় লাগে বাবা,ভাগ্য অবাক হয়ে জিজ্ঞেস করলো কেনো মা,কি হয়েছে?রাজু কাকা,বিমল মামা,এই বৃষ্টির জন্য মারা গেছে,তাই আমার ভয় লাগে ,যদি তুমি আমাকে ছেড়ে চলে যাও ওই বৃষ্টির জন্য,ভাগ্য মেয়ে কে বুকে টেনে বললো না রে মা,আমি কোথাও যাবো না।

হটাৎ করেই যেনো ঘুমটা ভেঙে গেলো নির্মাল্য র, কালরাতে agronomy র অ্যাসাইনমেন্টের সাইড এফেক্ট পুরো মাথাটা খেয়ে নিয়েছে আমার, উইফফ..আধো ঘুমের চোখে পাশের আলার্ম ক্লক টা বন্ধ করে সামনের ঘরে আসলো,বাবার পাশে ধব করে সোফায় বসে পড়লো,টিভি তে ABP NOTUN চলছে, দিল্লির রাজপথে জমায়েত... পাশ থেকে বাবা বলে উঠলো,uncultured bloody fellows....

Samrat Roy
B.Sc. (Agriculture), 4th Year

Students Corner

।। কৃষি ।।

' কৃষি ' শব্দটি ছোট্ট অতি , দুটি অক্ষর জোটে ,
ছোট শব্দ হলেও তার গভীর অর্থ বটে ।
কারোর কাছে কৃষি হলো জীবনযাপনের ধারা ,
কেউ বা আবার কৃষি নিয়ে করছে লেখাপড়া ।
ফল-ফুলের বাগানে কেউ দৃষ্টি আকর্ষণ করে ,
কিছুজন আবার indore plants সাজিয়ে রাখছে ঘরে ।
কৃষি নিয়ে গবেষণা করে কারোর এপথে চলা ,
এইভাবেই কৃষির মাধ্যমে এগোচ্ছে বাংলা ।

***

গ্রীষ্মে যখন ফ্যান চালিয়ে বসে আমরা ঘরে ,
অনেক মানুষ আছে তখন ক্ষেতে পরিশ্রম করে ।
বর্ষাতে আবার বাইরে গেলেই ছাতা রেনকোটের পালা ,
বৃষ্টি মাথায় নিয়েই কেউ কাজ করেন দুবেলা ।
ভালোমন্দ খাচ্ছি পড়ছি পাচ্ছি যোলোআনা ,
যাদের দ্বারা এসব হচ্ছে তারাই অচেনা ।
যেসব মানুষের পরিশ্রমে আমরা পেটভরছি সুখে ,
তারাই হলেন আমাদের ' সমাজবন্ধু কৃষক ' ।
কৃষকদের আত্মহনন লেগেই আছে দেশে ,
কারণ তারা আশানুরূপ মূল্য পায়না শেষে ।

***

কেউ করবে না আত্মহত্যা , কেউ মানবে না হার ,
যতরকম সুযোগ সুবিধা সবাই পাবে এবার ।
কোনোরকম জোড়ে জুলুম চলবে না কো আর ,
হাতে হাত রেখে সবাই করছি অঙ্গীকার ।
চাষের ক্ষতি করবে যারা কেউ পাবে না ছাড় ,
কৃষকদের পাশে থাকবে ' এগ্রিকালচার ' ।
দিনের শেষে কষ্ট নয় , ফুটবে মুখে হাসি ,
কৃষিজগতে পরিবর্তন আনবে বঙ্গভূমির কৃষি ।।

Taniya Pal
B.Sc. (Agriculture), 2nd Year

Image Gallery

Aktarul Golder
B.Sc. (Agriculture), 3rd Year

Avinandan Jana
B.Sc. (Agriculture), 2nd Year

Avinandan Jana
B.Sc. (Agriculture), 2nd Year

Avinandan Jana
B.Sc. (Agriculture), 2nd Year

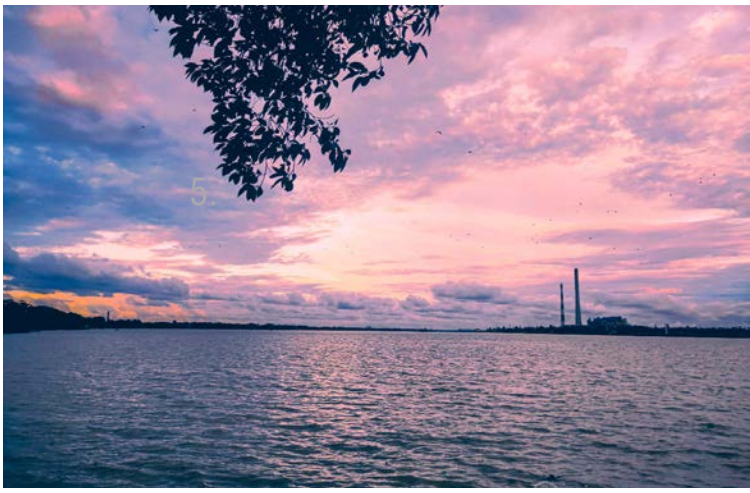
Image Gallery

Aenika Mandal
B.Sc. (Agriculture), 3rd Year

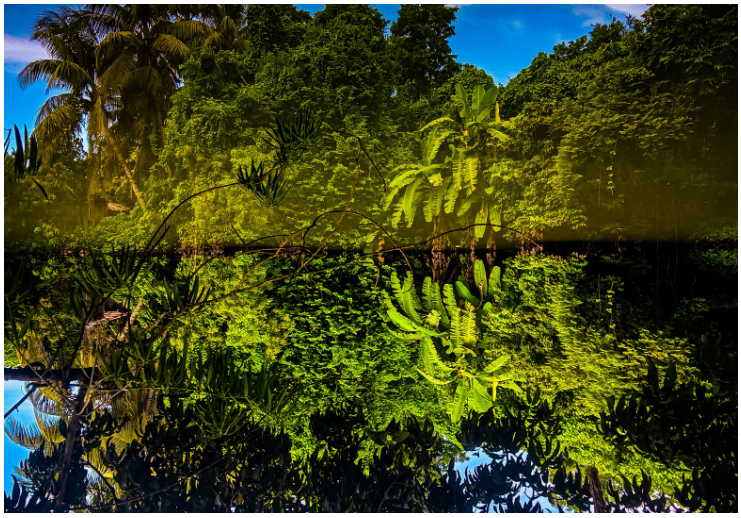
Eshika Bera
B.Sc. (Agriculture), 2nd Year

Eshika Bera
B.Sc. (Agriculture), 2nd Year

Mehul Kumaar Das
B.Sc. (Agriculture), 1st Year



Eshika Bera
B.Sc. (Agriculture), 2nd Year



Eshika Bera
B.Sc. (Agriculture), 2nd Year

Eshika Bera
B. Sc. (Agriculture), 2nd Year

Mehul kumar Das
B.Sc. (Agriculture), 1st Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Mehul Kumar Das
B.Sc. (Agriculture), 1st Year

Mehul Kumar Das
B.Sc. (Agriculture), 1st Year

Mehul Kumar Das
B.Sc. (Agriculture), 1st Year

Mehul Kumar Das
B.Sc. (Agriculture), 1st Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Payel Jana
B.Sc. (Agriculture), 2nd Year

Samrat Roy
B.Sc. (Agriculture), 4th Year

Samrat Roy
B.Sc. (Agriculture), 4th Year

Samrat Roy
B.Sc. (Agriculture), 4th Year

Santanu Mondal
B.Sc. (Agriculture), 3rd Year

Santanu Mondal
B.Sc. (Agriculture), 3rd Year

Shrabanti Paul
B.Sc. (Agriculture), 1st Year

Sreetama Giri
B.Sc. (Agriculture), 2nd Year

Sreetama Giri
B.Sc. (Agriculture), 2nd Year

Shrabanti Paul
B.Sc. (Agriculture), 1st Year

Shrabanti Paul
B.Sc. (Agriculture), 1st Year

Suman Nandi
B.Sc. (Agriculture), 2nd Year

Suhana Alam
B.Sc. (Agriculture), 3rd Year

Suhana Alam
B.Sc. (Agriculture), 3rd Year

Suhana Alam
B.Sc. (Agriculture), 3rd Year

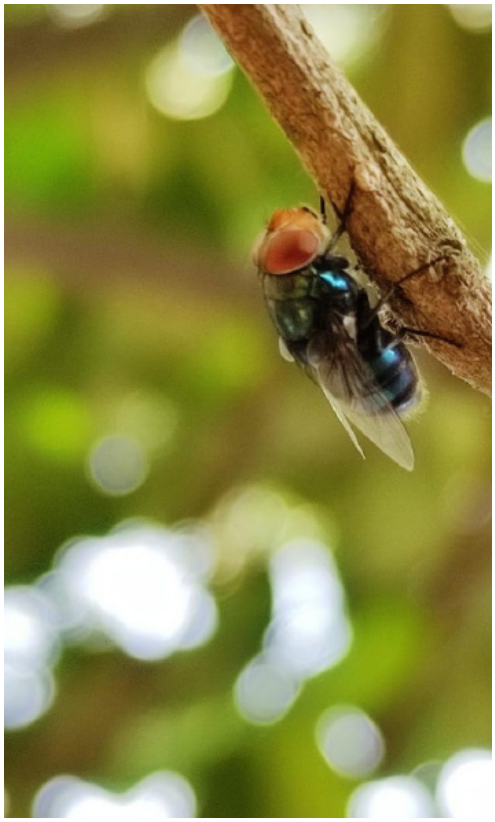
Sumit Biswas
B.Sc. (Agriculture), 3rd Year

Sumit Biswas
B.Sc. (Agriculture), 3rd Year

Suman Nandi
B.Sc. (Agriculture), 2nd Year

Surajit Das
B.Sc. (Agriculture), 2nd Year

Surajit Das
B.Sc. (Agriculture), 2nd Year

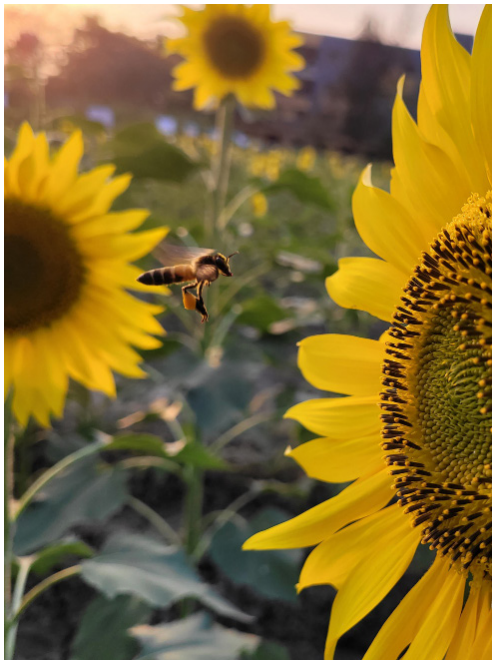


Trisha Banerjee
B.Sc. (Agriculture), 2nd Year

Swarnendu Bhowmick
B.Sc. (Agriculture), 2nd Year

Swarnendu Bhowmick
B.Sc. (Agriculture), 2nd Year

Swarnendu Bhowmick
B.Sc. (Agriculture), 2nd Year



Tiyasa Mukherjee
B.Sc. (Agriculture), 4th Year

Swarnendu Bhowmick
B.Sc. (Agriculture), 2nd Year

Swarnendu Bhowmick
B.Sc. (Agriculture), 2nd Year

RAWE and Internship

Two months of significant novel learnings and sublime experiences! I have completed the internship program (RAWE & AIA Programme) successfully from 20th September 2021 to 24th November 2021 in Rallis India Limited under our Amtala territory head Debasish Das, South 24 Pargana, Gangasagar block.

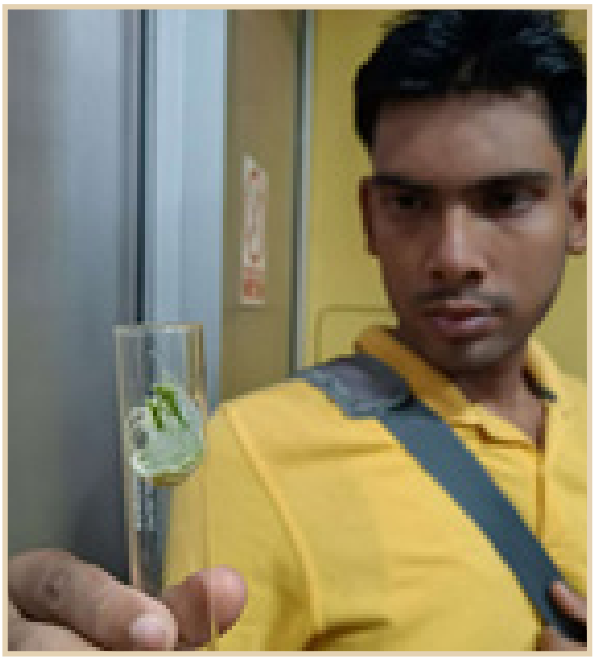
I am very thankful to Rallis India Limited for giving us this wonderful opportunity .This Internship help to improve my experience. I have gained knowledge about various insect pest and pesticide. I was able to talk directly to the farmer and able to know about their problem .I learned about different pesticide and their chemical composition. I have come to know which pesticide will be better for which diseases. I was knowledgeable about different pest and insect.

I have visited at least 20 farmers regularly & interacted with them. I got know about their landholdings, whether it is their own land or not, which crop they are growing & what's the method of their Cultivation, What is their cultivation problems etc. I tried to give them solution according to my knowledge & helped them out with Tata Rallis product. It was great experience for me.

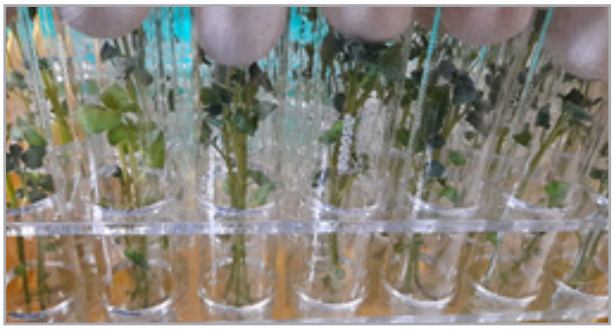
I would like to show my gratitude towards our honourable Dean, Prof. Dr. Sushil Kumar Kothari of our university for arranging such a great opportunity and continuous support throughout this Agricultural Industrial Attachments Program.

Smarandip Das
TNU2018032100120
Final Year, B.Sc. (Hons.) Agriculture,
School of Agriculture & Allied Science,
The Neotia University

RAWE and Internship



Two months of significant novel learnings and sublime experiences! I have completed the internship program (RAWE & AIA Programme) successfully from 20th September 2021 to 4th December 2021 in the Potato and Maize research station under O/o The Economic Botanist III WB, West Medinipore as per the order of the Director of Agriculture and Ex- officio Secretary, WB.



I have worked on hi-tech potato seed tuber production (through Aeroponics) technology in the research station and gained knowledge on handling hi-tech instruments and laboratories. It makes me very much comfortable and confident enough to handle hi-tech plant tissue culture laboratory, Micro-plants, ARC technology, hardening of Micro-plants, production of virus-free potato plants, molecular techniques, and serological techniques for potato virus detection, Net house operation, and overall, scientifically potato & maize cultivation.

I would like to show my gratitude towards The Neotia University, our honorable Dean, Prof. Dr. Sushil Kumar Kothari sir, and guide MS. Indrani Khoso ma'am for arranging such a great opportunity and continuous support throughout this Agricultural Industrial Attachments Program.

Souvik Roy
TNU2018032100188
Final Year, B.Sc. (Hons.) Agriculture,
School of Agriculture & Allied Science,
The Neotia University

RAWE Under Krishi Vigyan Kendra, Kalimpong

Darjeeling Krishi Vigyan Kendra situated in Kalimpong was sanctioned in the year1992 and is one of the oldest among the total number of 22 KVK's in West Bengal. The Host Organization happens to be Uttar Banga Krishi Viswa Vidyalala (UBKV) Pundibari, Coochbehar. The Kendra has been working since 1993 on the assessment, refinement and transfer of agricultural and allied technologies and transfer of skill through training in agriculture and allied sectors for the farmers/ farmwomen of the district.

As an agriculture student from the Neotia University, I was fortunate to get an opportunity to be a part of KVK Kalimpong during my RAWE internship programme. A total of five students including me were appointed to KVK Kalimpong,

where we gathered much practical knowledge and experience on the local agricultural system, crops, cropping pattern, weather phenomena, soil quality and much more. We also conducted numerous soil tests in the KVK soil lab under the guidance of Dr. Ranajit Panda (Subject Matter Specialist in Soil Science). The RAWE internship was a ten weeks programme which gave us ample time to enrich ourselves with useful experience and diverse knowledge by being a part of the Kendra. We had joined the KVK on 20th September 2021 thereafter we were assigned different survey programmes in various local villages, mostly in those which were the major agriculture and farming hubs. Some of the most important village were Dungra Busty, Loley Gaon, Chibo Busty, Bong Busty and Khawas gaon.

As a matter of fact more than 80% of people depend upon farming in Kalimpong and the major agro-products include paddy, maize, millet, pulse, oilseed and potato. Kalimpong is also widely known as a hub of cash crops like ginger, cardamom, betel-nut and mandarin oranges. A variety of vegetables and fruits are also cultivated as inter-crops during suitable seasons. Conducting surveys in these agricultural villages and farms made us familiar with the major varieties grown, constraints faced by the farmers, indigenous techniques used, land use pattern and so forth. All these surveys were done under the guidance of Mrs.Snehlata Lama (Subject Matter Specialist in Horticulture). Most of the crops grown were of local variety with their unique significant characteristics. They have also been given local names mostly based on their distinct characteristics like appearance and their belonging places. Performing these surveys provided us information about the type of constraints the farmers undergo. Some of the major problems were the lack of skill and knowledge of dealing with pest and diseases, middle-man problems, lack of fund etc. All these problems have been significantly discouraging the farmers who were undergoing major losses and some of them were at the verge of giving up on farming and taking up some other mode of living. There were also some very knowledgeable farmers with good theoretical and practical knowledge who

had been peculiar about their crops and one such notable person was Mr.Yogendra Kharga who had a massive Orange Orchard and his produces were being distributed and sold vastly over significantly far areas of Kalimpong and Darjeeling , Siliguri and even in some parts of Sikkim. He was a very encouraging and knowledgeable man and provided us great knowledge on the variety of his crop, the insects he had identified and also preserved for his further study. All these experiences were possible only under the constant guidance of the faculties of the KVK.

Another significant experience we had in the KVK was working in the Soil lab where more than 20 samples were tested for their N,P,K content and also other micronutrients like B, Zn, Cu, Mn, Fe, Mo and Cl. A good knowledge about the local soil could be gathered and found out that the soil was mostly acidic in nature with low pH and with sandy loam to sandy clay loam texture. Carrying out these tests was a great approach in adding our practical experience as we were a part of all the procedures carried out like soil sampling, water distillation, preparation of the buffer solution, testing the samples etc. Dr.Ranajit Panda guided and supported us throughout these tests and gradually we also prepared the soil health cards for various villages and farms from where the samples had been collected. Overall it was a substantial and notable experience to be a part of KVK Kalimpong which added great value to our Bachelor studies in Agriculture.

We are thankful to Dr.Mendel Wangchuk Moktan (Head of the Department) and all the faculty and staff without whom this experience would not have been possible.

Work experience at Rathinda Krishi Vigyan Kendra

We have successfully complected our 8 weeks internship program (RAWE and AIA Programme) from 09.09.2021 to 01.12.2021 at the Rathindra Krishi Vigyan Kendra, Palli Siksha Bhavana (Institute of Agriculture), Visva-Bharati, Sriniketan, Birbhum, West Bengal under the supervision of our course co-ordinator(RAWE course) Mr.Sayak Mahato, Subject Matter Specialist(Agricultural Meteorology), Rathindra KVK.

Work Done:- We have tested the percentage of Fe, Organic carbon, Nitrogen at the given soil samples in the soil laboratory, we have cultivated some crops like broccoli, tomato, chilli. We have prepared vermicompost pit and cultivated azolla and also completed an 'Bee keeping' training. We have also worked at Bio floc unit and participated in two plant clinic organized by Rathindra KVK. We have visited different agricultural industries. We have participated in a special swacchata campaign and a tree plantation programme.

We would like to show my gratitude towords The Neotia University, Our honourable Dean,Prof. Dr. Sushil Kumar Kothari Sir and our guide Prof. Pragun Paul for arranging such a great opportunity for us.

I bow with reverence and profound sense of gratitude in expressing my sincere appreciation and regards to Dr. Subrata Mondal , Senior Scientist and Head , Rathndra Krishi Vigyan Kendra for his constant help during the entire course of Rural Agricultural Work Experience and AIA programme.

Sritama Choudhury (TNU2018032200101) | **Tiyasa Mukherjee (**TNU2018032200110)
Asmita Halder (TNU2018032200143) | **Anwesha Charan** (TNU2018032200016)
Deepanwita Sadhukhan (TNU2018032200116) | **Shuvam Mukherjee** (TNU2018032100213)
Shruti Haldar (TNU2018032200092) | **Puja Dutta** (TNU2018032200072)
Soyeta Das (TNU2018032200100) | **Soheli Pal** (TNU2018032200201)
Srijanee PaL (TNU2018032200177)

Final Year, B.Sc. (Hons.) Agriculture, School of Agriculture & Allied Science, The Neotia University

Internship at Uttar Banga Krishi Viswavidyalaya, Krishi Vigyan Kendra

We have completed the internship program (RAWE & AIA programme) successfully from 20th september to 30th November in uttar Banga krishi Vishwavidyalaya, Krishi vigyan Kendra, Pundibari, Coochbehar

Work done - we have worked at Soil testing laboratory and tested different soil samples , azolla production , vermicompost production , nutritional garden preparation, fodder maize growing under hydroponics , paddy straw mushroom production . We were choosen for giving training to Krishak bandhu group at KVK

we have gained a very good experience from that kvk and gained a good knowledge about these activities which will help us in our future.

We would like to show my gratitude towards, The Neotia University, Our honorable Dean, Prof. Dr. Sushil Kumar Kothari Sir, and Mr. Pragun Paul Sir for arranging such a great opportunity for us.

Interns are done by-

1. **Binita Dey** (TNU2018032200027)
2. **Arijit Chowdhury** (TNU20180321237)
3. **Pratiti Debnath** (TNU2018032200224)
4. **Koutik Roy** (TNU2018032100051)
5. **Al Amin Siddik** (TNU2018032100137)
6. **Debojyoti Sarkar** (TNU2018032100035)
7. **Debojit Mitra** (TNU2018032100225)
8. **Shubhayan Dutta** (TNU2018032100238)
9. **Sankhasubhra Dutta** (TNU2018032100085)

Outreach Programme

OUTREACH PROGRAMME CUM FARMER-SCIENTIST INTERACTION MEET

Organized by CSIR-CIMAP and School of Agriculture and Allied Sciences, at The Neotia University, Diamond Harbour Campus, South 24 Parganas, West Bengal, on 11th February, 2022

The Agriculture Unit of School of Agriculture & Allied Sciences has conducted the first **Outreach Programme and Farmer-Scientist Interactive Meet** on 30.03.2022, where the agriculture experts of the school visited Sagar Island to examine, interact, knowledge sharing with the betel-leaf and brahmi farmers of the island. The two cash crops betel leaf (Piper betle L) propagation along with brahmi cultivation are conducted in the Sagar Island of South 24 Parganas, West Bengal. A team of researcher headed by Prof. Sushil Kumar Kothari, Dean, School of Agriculture & Allied Sciences and team members including Dr. Bidisha Mondal, HOD, Agriculture Unit and Principal Investigator of Betel Leaf Essential Oil Extraction project (TNU/R&D/F6), Dr. Riman Saha Chowdhury, Horticulture Expert and final year B.Sc AgicultureAgriculture (Hons.honors) student Mr. Swarandip Das visited the place.

The early morning vessel ride to pristine Sagar Island was unique. The team first visited the Chakphuldubi village to interact with the betel farmers. The region harbors around 500 betel-vines producing finest quality betel leaves. The farmers gave a detailed account of the cultivation practices adopted by them as well as shared their problems with the team. The betel-leaf cash crop of Sagar Island is directly related to the economy of the region. The 'Meetha' cultivar of betel-leaf is widely cultivated along with 'Bangla' in most of the villages. The abundance of betel- baroj in that particular area and excellent aroma of the crop is fascinating and fetches good amount of money from domestic and international market. The experts and researchers from the university gave advice to the farmers to adopt some accurate farming technologies and suggested some disease and pest control measures. They were also given a preliminary idea about betel leaf oil extraction (BLEO) to the betel farmers and idea about the utilization of waste for wealth generation. The baroj approximately produce 30kg-50kg waste leaf per month or more that could be utilized for BLEO extraction. The waste leaf from the baroj and water from baroj adjoining pond was collected for oil extraction under intra-mural project of the university and testing of soil in Soil-Science laboratory of SAAS respectively.

Outreach Programme

In the next phase the team met Mr. Debashis Patra, Brahmi (Bacopa monnieri) grower-cum-exporter and agri-entrepreneur who assisted the university team to visit brahmi field and processing unit. The brahmi is grown under contract farming involving 250 farmers and the dried plants were supplied to pharmaceutical company. The farmers could sell fresh or dried plants to the company at different price. The university team suggested some farming information for the betterment of brahmi production. Prof. Kothari, Dean SAAS suggested the growers about thinning of the plants and to increase the spacing for getting better produce. Plant material, soil and water sample was collected from the field for propagation and testing in TNU Soil testing lab. The team then visited the processing unit. The plant materials were sun-dried and packed and the store-house has a future resolution to bring a machine for solar drying costing 40 lakhs that will ensure uniform drying and finer produce for better industrial utilization. Additionally the tour was useful for generating knowledge on local plants that are useful for coastal saline region as well as full of prospect for domestic food market and medicinal industry. The outreach programme was a complete success both from farmers and scientists perspective with idea about several new avenues. The expert team of SAAS had successfully completed of first farmers outreach programme of the school. During dusk the team bade a goodbye to the island with a promise to return.

Visit to Betel-Vine boroj and farmers Interaction

Outreach Programme

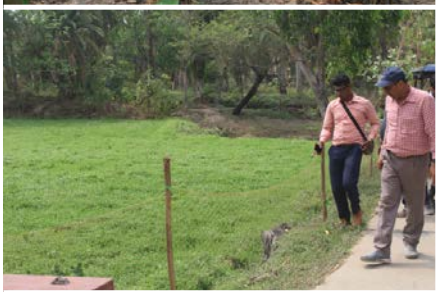
Interaction with Brahmi Cultivators & Processing farmers

Serial No.	Farmers	Voice
1.	Alokesh Das	9800450599
2.	Anirban Pradhan	9800756627
3.	Asish Bhuia	8584097017
4.	Bholaram Jana	8145385924
5.	Rabindra Nath Shit	8967275131

Outreach Programme

SAGAR ISLAND







Outreach Programme

CSIR-CIMAP Programme

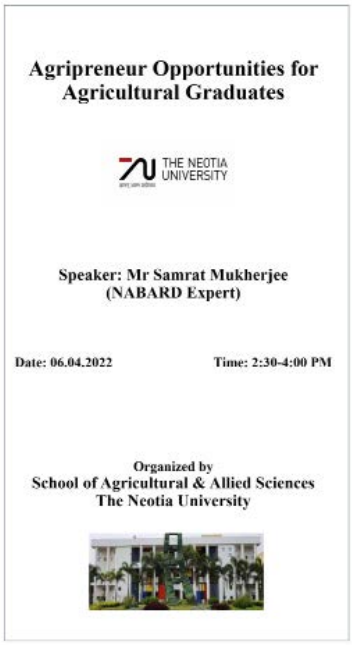
Report of CSIR-CIMAP

Mission Aroma is an initiative by CSIR, CIMAP (Central Institute of Medicinal and Aromatic Plants) to disseminate aromatic plants production technology throughout the country. The Seminar was held on 11/3/2022 in collaboration with The Neotia University (TNU) and CIMAP. Around 50 farmers were invited to the campus of TNU to take part in the project Mission Aroma with the objective of redirecting the farmers from conventional cultivation towards medicinal and aromatic crop cultivation that will potentially give a better economic return to the farming community.

Dr. Rakesh Kumar, Scientist introduced various medicinal crops like Citronella, Vetiver, Mentha, Lemongrass, Tulsi, etc. crops with a detailed presentation on the cultivation, intercultural operations, and processing methods to the farmers. He further discussed the process of distillation and extraction of essential oil from the harvest. The farmers were not only encouraged to consider the adoption of medicinal and aromatic crops suited to this particular agro-climatic condition, but they were also assured of linkage with the target buyer of the products as well by the concerned.

Students Enrichment Programme

NABARD



Report of NABARD

Agripreneurship refers to entrepreneurship in agriculture. Entrepreneurship is a concept that encompasses transforming an idea or vision into a “new business or new venture creation, or the expansion of an existing business, by an individual, a team of individuals, or an established business”. But entrepreneurship, as opposed to self-employment, is also defined by the spirit of the entrepreneurs. Entrepreneurs are usually creative, take opportunities and accept risks, and can quickly change business strategies to adapt to changing environments. They are often innovators (Kahan, 2012). While usually being innovative and creative, farmers often lack experiences, access to services, people, or markets, and skills to have realistic chances to succeed as entrepreneurs (Wongtschowski et al. 2013). In addition, agripreneurs are influenced by external, systemic factors, such as economic and social barriers, policies, and regulations (Kahan 2012). While these constraints affect all farmers and especially all smallholders, women and youth are particularly affected. Mr. Samrat Mukherjee – DGM, NABARD was our resource person for this programme. Mr. Samrat Mukherjee introduced students to some economic terms like dividend, inventory, demand of agricultural commodities, cooperative banks, regional rural banks etc. He gave a detailed knowledge about Farmer Producer Organizations, Agri-clinics; how these organizations can help the students to generate income. He described about supply chain management and its importance in Agriculture. As a resource person Mr. Mukherjee enlightened our students about NABARD functioning, its Board of management, how NABARD is helping the agriculture sector to achieve self-sufficiency in food production.

Students Enrichment Programme

Mushroom Unit Inauguration Program

organized by School of Agriculture and Allied Sciences, at The Neotia University, Diamond Harbour Campus, South 24 Parganas, West Bengal, on 13th April, 2022.

Report of Mushroom Unit Inauguration Program

The mushroom cultivation unit was inaugurated at The Neotia University campus to facilitate the experiential learning program for our final year students. This mushroom cultivation unit will facilitate the learning process of spawn production and mushroom cultivation for our students in an appropriate manner. As we all know mushroom is an economic crop with enormous health benefits, so proper understanding of the cultivation and production process along with hands on training will encourage the students to come up with eye catching entrepreneurship ideas which will help them in building up their own ventures for their sustainable livelihood and create jobs for the others. The students will be submitting a detailed project report on the theme as part of their course curriculum.

Students Enrichment Programme

Fertilizer Orientation Course

jointly organized by The Fertiliser Association of India and School of Agriculture and Allied Sciences, at The Neotia University, Diamond Harbour Campus, South 24 Parganas, West Bengal, on 21st March, 2022.

Report of Fertiliser Orientation Course

The programme was organized on 21st March, 2022 in The Neotia University, Sarisha, South 24 Parganas, West Bengal. The Fertiliser Orientation Course programme in coordination with the Fertiliser Association of India, Eastern Region was mainly organized for the fourth-year BSc. (Ag) students to make them aware regarding various fertiliser companies as well as enrich them with the knowledge regarding production, transportation and marketing of the fertilisers. Numerous guests were invited in the programme who delivered their beautiful presentation regarding the production, utilization, shipment as well as marketing of the fertilisers.

The list of the guest members who attended the programme and delivered their valuable talk and presentations are mentioned below:

1. Dr. D.P. Patra

Regional head,
FAI-Eastern Region, Kolkata

2. Prof. Dr. Biswajit Ghosh

Vice Chancellor, The Neotia University,
South 24 Parganas, West Bengal

3. Prof. Sushil Kumar Kothari

Dean, School of Agriculture and Allied Science,
The Neotia University, South 24 Parganas, West Bengal

4. Shri. U.C. Dixit

Assistant Vice President,
Indorama India Pvt. Ltd., Kolkata

5. Shri. Swapan Roy

State Marketing Manager, Indian Farmer Fertiliser Cooperative limited (IFFCO), Kolkata

6. Shri. Sutanu Shanko Ghosh

Senior Manager (Marketing),
Coromandel International Limited (CIL), Kolkata

7. Dr. Soumitra Das

Director South Asia -Zinc Nutrient Initiative,
International Zinc Association (IZA), New Delhi

8. Shri. Sanjay Bhowmick

Assistant Director of Agriculture, Department of Agriculture, Government of West Bengal

9. Shri. Ashis Kumar Halder

Zonal Co-ordinator, Nagarjuna Fertilisers and Chemicals Ltd. (NFCL), Kolkata

10. Shri. Sajal Kumar Mukherjee

General Manager- Supply Chain,
Indorama India Pvt. Ltd., Haldia, West Bengal

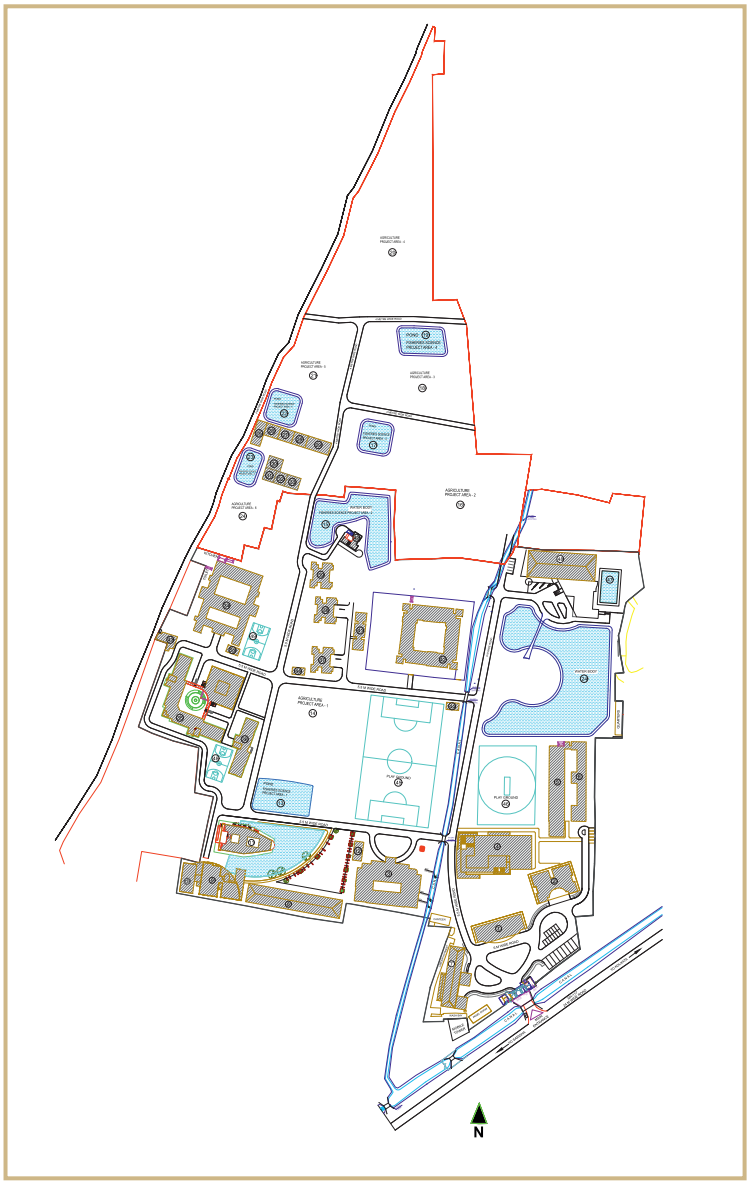
11. Dr. Madhurima Banik

Assistant Professor,
School of Agriculture and Allied Science,
The Neotia University, South 24 Parganas,
West Bengal

Students Enrichment Programme

Agronomy, Horticulture Field and Agro-Meteorology Observatory

maintained by School of Agriculture and Allied Sciences



LEGEND- BUILDING

A. ADMINISTRATIVE BLOCK
1. ADMINISTRATIVE BUILDING (G + V)

B. ACADEMICS BLOCK
2. SCHOLASTIC BUILDING - 1 (G + III)
3. SCHOLASTIC BUILDING - 2 (G + II)
4. SCHOLASTIC BUILDING - 3 (G + III)
5. SCHOLASTIC BUILDING - 4 (G + III)
6. SCHOLASTIC BUILDING - 5 (G + III)
7. WORKSHOP BUILDING
8. NEW WORKSHOP BUILDING
9. NEW PHARMACY BUILDING (G + III)
10. PHARMACY BUILDING (G + III)
11. SHIP IN CAMPUS (G + III)

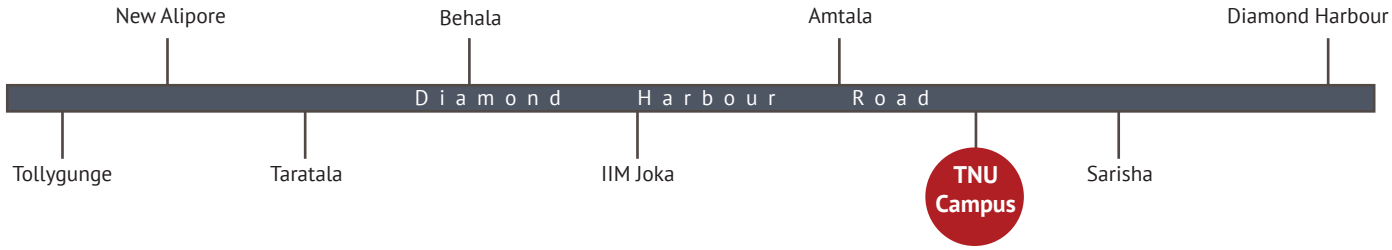
C. AGRICULTURE & FISHERY SCIENCE BLOCK
12. POLY HOUSE & NET HOUSE
13. FISHERY SCIENCE PROJECT AREA - 1
14. AGRICULTURE PROJECT AREA - 1
15. FISHERY SCIENCE PROJECT AREA - 2
16. AGRICULTURE PROJECT AREA - 2
17. FISHERY SCIENCE PROJECT AREA - 3
18. AGRICULTURE PROJECT AREA - 3
19. FISHERY SCIENCE PROJECT AREA - 4
20. AGRICULTURE PROJECT AREA - 4
21. AGRICULTURE PROJECT AREA - 5
22. FISHERY SCIENCE PROJECT AREA - 5
23. FISHERY SCIENCE PROJECT AREA - 6
24. AGRICULTURE PROJECT AREA - 6
25. MUSHROOM UNIT
26. FIELD LAB
27. STORE HOUSE
28. SERICULTURE UNIT
29. THRESHING FLOOR
30. BIO GAS PLANT
31. CATTLE SHED
32. VERMI COMPOST PIT
33. BIO FERTILIZER PLANT

D. RESIDENTIAL BLOCK
34. BOY'S HOSTEL - 1 & 2 (G + III)
35. BOY'S HOSTEL - 1 & 2 (G + III)
36. BOY'S HOSTEL - 1 & 2 (G + III)
37. OLD STAFF QUARTERS (G + III)
38. NEW STAFF QUARTERS (G + III)
39. NEW STAFF QUARTERS (G + III)
40. DIRECTOR'S RESIDENCE (G + I)
41. OLD STAFF QUARTERS (G + III)
42. GIRL'S HOSTEL - 3 (G + II)

E. UTILITY & SERVICES BLOCK
43. ELECTRICAL ROOM
44. PUMP ROOM

F. RECREATIONAL BLOCK
45. FOOTBALL GROUND
46. CRICKET GROUND
47. SWIMMING POOL
48. MULTI PURPOSE HALL
49. BASKETBALL COURT (3 NOS.)

G. HEALTH BLOCK
50. MEDICAL UNIT



AmbujaNeotia

THE NEOTIA UNIVERSITY
ज्ञानम् आत्म प्रदीपाय
UGC Enlisted & Recognised

NEOTIA INSTITUTE OF TECHNOLOGY MANAGEMENT AND SCIENCE
(Formerly ITME. Since 2002.)

Campus: Sarisha, Diamond Harbour Road, 24 Parganas (S), West Bengal - 743 368
Head Office: Vishwakarma, 86C Topsia Road (S), Kolkata - 700 046
Campus: +91 70444 46888 / **Head Office:** +91 70444 46999 | **Email:** contact@tnu.in