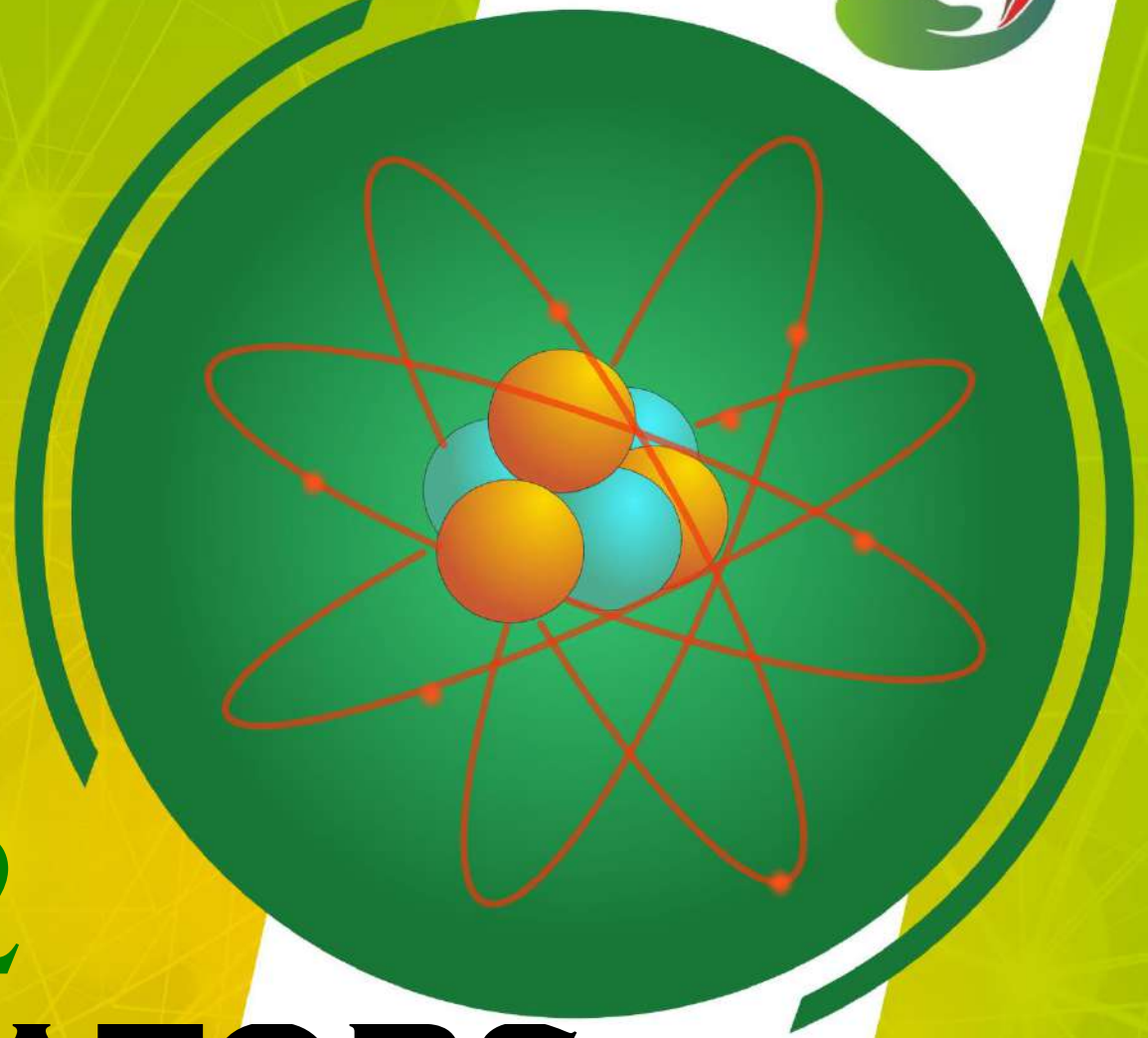


**November Issue**

**Volume 12**



**2022**

# **CREATORS**

**Newsletter of Bionest-IASST  
(In Association with ISVEC)**

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# EVENTS AND WORKSHOPS

MAY TO NOVEMBER 2022

## **National Technology Day 2022**

On the occasion of National Technology Day 2022 and as a part of Swatchata Pakhwada celebrations, Bio-NEST IASST organized a webinar on 11th May 2022 from 10:30 am onward. The topic for the webinar was "E-Waste: The tech garbage Issues and opportunities." which was addressed by Mr. Achitra Borgohain, Founder & CEO – Binbag Recycling. A total of 46 participants attended the session.

## **International Day of Light at IASST, Guwahati, on 16th May 2022**

The International day of light was celebrated at IASST in online mode wherein A talk was delivered by invited speaker Prof. Bosanta Ranjan Baruah, Department of Physics, IIT- Guwahati on the topic- "High Resolution Imaging Using Laser Beam Scanning Microscopes."

## **Awarded in North East Research Conclave 2022**

Incubatee of Bio-NEST IASST -Dr. Ananya Barman has received the "Best Young Women Innovative Research and Entrepreneur Award from Hon'ble Union Minister Shri Dharmendra Pradhan, Minister of Education and Minister of Skill Development & Entrepreneurship, GoI and Hon'ble Chief Minister of Assam Dr. Himanta Biswa Sarma at NERC at IIT Guwahati and Assam Biotech Conclave on 20th-23rd May at Guwahati Biotech Park.

## **Workshop on scientific story writing in social media and newspaper on 27th May 2022**

A day long workshop was organized for students and faculties on scientific story writing in social media and newspaper. Welcome address was given by Director, IASST, followed by talk given by Dr. Dinesh Ch. Goswami, Former Advisor to Director NEIST; Prof. Abhijit Bora, Tezpur University; Prof. Abani Kumar Bhagabati, Gauhati University and Mr. P.J. Baruah, Executive editor, Assam Tribune.

## **Celebration of World Environment day on 6th June 2022**

IASST celebrated World Environment Day on 6th June 2022 at 9:30 am onwards. The theme of world environment was "Only one earth". The event started by plantation of sapling followed by inaugural speech by Prof. Ashis K. Mukherjee, Director, IASST. The invited guest speakers were Mr. Arup K Misra, Chairman of Pollution Control Board, Assam and Prof. Debendra C Baruah, HOD, Energy Dept, Tezpur University.

## **Observation of 8th International Yoga Day on 21st June 2022**

A week long Yoga Session from 13th-20th June 2022 was organized by IASST at Mini Sports Complex. The session co-ordinator was Yogabid Debajit Nath, Founder and Yoga Teacher at Durlav Yoga Centre. The students, Staff and Faculties participated and practised Yoga with full zeal and spirit.

## **International MSME Day 2022**

On the occasion International MSME Day 2022, Bio-NEST IASST team is organizing a webinar on 27th June 2022 from 3 PM onward. The topic for the webinar was "Creation of Biotech MSMEs for Atmanirbhar Bharat" which was addressed by Mr. Anijit Bhattacharya, Consultant- Grant Thornton Bharat LLP.

## **Webinar on Nutraceuticals and Functional Foods**

Bio-NEST IASST in collaboration with AAU NEATEHUB organized a webinar on the topic : "Know-how of commercializing Nutraceuticals and Functional Foods "on 5th July from 2022 from 11 am onward. The webinar topic was addressed by Dr. Madhumita Barooah Professor - Dept. of Biotechnology, Assam Agricultural University.

## **Awareness Workshop on "R&D Funding Opportunities by SERB-DST held on 14-15 July 2022**

Two-days Brainstorming Workshop was organized by IASST and sponsored by Science and Engineering Board, DST, GoI at Radisson Blu, Guwahati for researchers from North-East Institutions. The workshop aimed to raise awareness of the researchers working in different colleges, universities and institutions about various research schemes and funding opportunities provided by SERB for research. More than 60 participants participated along with 15 resource persons from different reputed institutes from all over India.

## **Celebration of World Snake Day 2022 at IASST**

IASST observed World Snake Day on 16th July 2022 by conducting a One-day National Symposium on “Snake and Scorpion Envenomation and Therapy: National and International Perspectives.” Prof. Ashis K. Mukherjee, Director, IASST, emphasized the importance of snake and scorpion venom research in India. Dr. Joy Kumar Chakma, Scientist E, (ICMR) delivered a talk on “A talk on ICMR initiative on the research of snakebite.” His speech was followed by exciting lectures by Prof. Choo Hock Tan from the University of Malaya, Malaysia, Prof. Shakti Vaiyapuri from the University of Reading, UK, Prof. Jose M. Gutierrez from Instituto Clodomiro Picado, Costa Rica, Prof. Robin Doley, Department of Molecular Biology and Biotechnology, Tezpur University, Dr. Surajit Giri from the Demow Community Health Centre, Assam, Dr. Jaideep Menon from Amrita Hospital (Kochi), and Dr. M. V. Khadilkar, the Technical Director of Premium Serums And Vaccines Pvt. Ltd. (Pune).

## **IASST celebrated 76th Year of India’s Independence 2022**

IASST has celebrated Independence Day 2022 under the banner of 75th Year of India’s Independence-“Azadi Ke Amrit Mahotsava” with great enthusiasm and patriotic fervour. The program started with a tricolor flag hoisting by Prof. Ashis K. Mukherjee, Director, IASST, followed by the national anthem. This year, IASST has started a program of felicitating wards of the employees of IASST who have cleared class 10th & 12th examinations in the year 2022.

## **Inauguration of The Maharishi Charaka Medicinal Plant Garden at IASST, Guwahati**

Dr. Srivari Chandrasekhar, Secretary, DST, on 17th August 2022, inaugurated the Maharishi Charaka Medicinal Plant Garden at IASST, Guwahati in the presence of Director, faculty members, staff and research scholars of IASST. The park is a rich repository of fifty-three different medicinal plant species based on Indian Systems of Medicine (ISM).

## **International Day for Universal Access to Information Technology**

IASST also organized a talk on the topic Artificial Intelligence, e-Governance and Access to Information on the International Day for Universal Access to Information Technology (AI) on 28th September 2022 at 10.30 AM. The keynote speaker was Mr. Deepak Goswami, Retired Deputy Director General NIC –India.

## **World Heart Day celebrated at IASST**

IASST celebrated World Heart Day on 29th September 2022. Prof. Ashis K. Mukherjee, Director, IASST inaugurated the programme. Dr. Debanga Borah, a cardiologist from Apollo Excelcare Hospital, Guwahati delivered a lecture on “Heart and Its Problems”. On this occasion, a health check-up camp for the IASST fraternity was also organized.

## **44th Foundation Day 2022**

The Institute of Advanced Study in Science and Technology (IASST) has celebrated its 44th Foundation Day with a day long program on 3rd November 2022. Several dignitaries took part in the event including Dr. Srivari Chandrasekhar, honourable secretary of DST, GOI and Prof. Ashutosh Sharma, former secretary of DST, GOI. Several eminent researchers delivered lectures in the event.

## **Celebration of World Diabetes Day 2022**

IASST celebrated World Diabetes Day 2022 on 14th November 2022 with the theme “Access to Diabetes Education.” The renowned clinician, Dr. Manas P Baruah, Director and Head, Department of Diabetes, Endocrine & Metabolic Disease, Apollo Excelcare Hospital, Guwahati, Assam, delivered the invited talk. Also, Dr. Suman Dasgupta, Assistant Professor, Department of Molecular Biology and Biotechnology, Tezpur University, Assam, delivered an invited scientific research-oriented talk on “Type 2 Diabetes: An Immune-Metabolic Disorder”

## **Janjatiya Gaurav Diwas**

On 15th November, Bhagawan Birsa Munda’s birth anniversary is celebrated across the country as ‘Janjatiya Gaurav Diwas’. IASST, Guwahati takes pleasure in showcasing its scientific interventions to empower the tribal communities, such as (i) the adoption of three tribal villages and augmenting their income by various means, (ii) the promotion of tribal foods as functional foods by nutritional and safety assessment, optimizing the production process, and value addition., (iii) formation of tribal self-help groups for production of ethnic food, cultivation of soybean, making of soymilk and tofu (iv) revival of Eri silk culture for both silk and edible insects, (v) lab experience based science education programme to impart scientific temperament among tribal children.

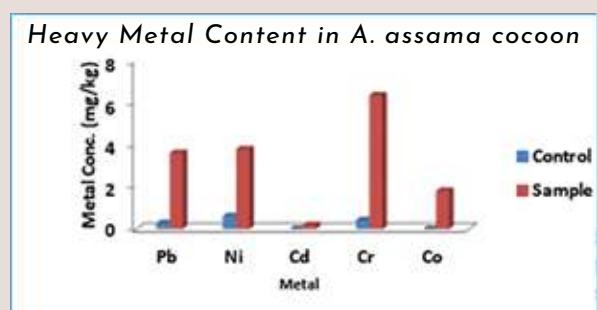
# Is Black gold exploration alarming for Golden Silk of Assam? An evidence based study with facts and figures.

-Dr. Arundhuti Devi, LSD, IASST, Ghy -35

The atmospheric pollutants play an important role in determining the quality and quantity of natural silk production, and it is necessary to know the sources and concentrations of the pollutants having direct impact on silk production for a quantitative assessment of the impacts. Silk production depends on healthy cocoons, and if these are produced in an area located close to an oil field, the emissions arising from exploration, production, and transport of crude oil including controlled flaring and venting of the associated natural gas are most likely to have adverse impacts on the cocoons. Crude oil contains both aliphatic (mainly n-alkanes from C20–C37) and aromatic hydrocarbons and spills from the oil field can introduce these hydrocarbons to soil, water, and air. Accidental discharges from wells can also pollute the atmosphere with large amounts of SO<sub>2</sub>, CO, H<sub>2</sub>S, and N-oxides along with particulates containing partially burnt hydrocarbons and metals. Fine particulates (PM 2.5) have been a major health hazard particularly in close proximity of a big industry. Rearing the worm in an appropriate environment for production of a large number of cocoons of high quality has been a major economic activity of the people living adjacent to the upper Assam oil fields of India. A gradually declining trend in Muga production in the oil field area has been reported for quite some time showing the Muga worm to be very sensitive to changing environmental conditions.

The Muga silk is made up of natural proteins, sericin, in the outer coating and fibroin, in the inner core; both are biopolymers known for their use as biomedical sutures and having potential applications in cosmetic, medical, and polymer materials. Although a few studies on aerosol characterization have been reported from India, studies on oil field aerosol (particularly PM 2.5) and correlating the same to natural silk production are scarce. The present study has been designed to evaluate and compare the concentrations of PM 2.5 along with the associated higher hydrocarbons and heavy metals (Cd, Co, Cr, Cu, Ni, Pb, and Zn), in order to ascertain their impact on Muga cultivation with reference to the Lakhmoni oil field, India. Methodology Study area. The study area lies in the Lakhmoni oil field of Oil and Natural Gas Corporation Limited (ONGCL) in north-eastern India close to a Group Gathering Station (GGS 5; 27° 0' 33" N, 94° 48' 30" E) where the corporation collects, treats (e.g., separation of water and gas, etc.), and stores crude oil from different wells in the area for dispatch to oil refineries through a pipeline network.

The site is surrounded by *Machilus bombycina* (locally known as the Som tree) plantation for rearing the Muga (*A. assama*) worms for silk production. The present study has investigated the contamination levels of air with respect to PM 2.5 and its hydrocarbon and heavy metal content (Cd, Cu, Co, Cr, Ni, Pb, and Zn) in a petroleum production site.

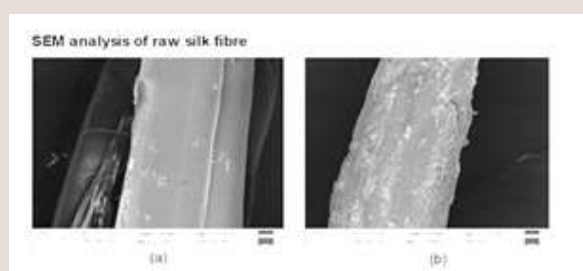


Since *A. assama* are highly sensitive to toxic chemicals, presence of even small amount of these metals will cause serious health affect to *A. assama* larvae and finally lead to deterioration of *A. assama* silk fibre.

In addition, the possible effects of such contamination on the production of the natural and exotic Muga silk from cocoons of *A. assama* were also studied. *A. assama* feeds on *M. bombycina* plants grown in the upper Assam oil fields of India.

India is the second largest producer of silk in the world after China. The Muga silk worm (*Antheraea assama*) is an economically important insect, unique, and endemic to the North Eastern region of India, particularly Assam. The golden yellow yarn produced by this insect is lustrous, highly durable, strongest, and toughest of all natural silk fibers, having a huge demand in the national and the international market.

During its growth cycle, the silk worms come in contact with various pathogenic and toxic agents in the surrounding environment. The effects are also extended to the *M. bombycina* leaves on which the worms feed. The combined effects of the contaminated environment of air and soil might have been appreciable affecting the larvae and, therefore, the production of the golden threads of the Muga silk. Scanning electron microscopy analysis of cocoon samples from the study area showed smooth as well as rough fibers.



A) Normal Fibre B) Damaged Raw Fibre

The damage to the fibers might have occurred through interactions with the harmful chemicals in air, the plant leaves, and the soil. This will definitely have effects on luster, tensile strength, and other properties of the silk fibers and will make the silk worms vulnerable in the unfriendly atmosphere. This is the first report from India on hydrocarbons and

associated metals in PM 2.5 collected from an oil field and on their possible effects on production of silk by *A. assama*.

Epidemiological studies show that pollutants in air can act as a confounder, an effect modifier, or both and that climatic factors like dispersion, transformation, and removal of the pollutants from the ambient atmosphere might play an important role. Large surface area of the fine particles makes them good carriers of toxins such as hydrocarbons and heavy metals on their surface held by adsorption.

The presence of hydrocarbons was suspected in the TGA and FTIR measurements and was confirmed by GC-MS analysis, which identified n-alkanes from C22 to C35 in the fine particulates in air, which could have been the most harmful chemicals for Muga larvae. Aromatic hydrocarbons in the form of derivatives of polyaromatic hydrocarbons such as quinoline, naphthalene-6,7-diol, phthalic acid, 9-ethyl-anthracene, 1-penthrene carboxylic acid, and 7-ethenyl-phenanthrene were also present. This study shows that aliphatic hydrocarbons lower than C22 were not associated with PM2.5 in accordance with similar observations by other workers.

The variations of hydrocarbons at site A (closest to the ONGCL station) and at site B (away from the ONGCL station) indicated natural dilution of the pollutants with increasing distance from the oil field station.

Hence, crude oil exploration is indeed impacting the quality of Muga and remediation steps should be taken to preserve 'The Golden Silk of Assam.'

**Acknowledgement:** The author and researchers are thankful to Institute of Advanced Study in Science and Technology, DST, GoI for the support provided to conduct the experiment.

# HOW TO EVALUATE A STARTUP IDEA...?

Sagar Kumar,  
Manager - Incubation & Outreach,  
BioNEST IASST

Every once in a while, we all come across (awesome) ideas that might have the potential to change the world. Many of these ideas might sound interesting on paper but may not be viable in practice.

A few of these ideas might be interesting and viable but not feasible without a large sum of money. On the other hand, a few other ideas might be interesting, viable, and also feasible with a little bit of funding and hard work.

Wanna-be entrepreneurs have ideas but might not know which one to pursue or which one to quit their jobs over. An entrepreneur needs to understand that pursuing good ideas instead of mediocre ones isn't a foolproof recipe for success. However, it puts an entrepreneur on the right track and helps save time and money.



So, before we dive in to evaluate these ideas, let's first understand what a **Startup** is –

**A startup is a company/enterprise that is designed or created to try to grow very quickly.** So, if a business idea is not aiming to build a company that grows very fast, then it's just a small business. After all,

***Startup = Growth***

We often see founders become heavily fixated on their idea(s), leading to blind spots around other success factors. They assume that a good idea (turned into a product or service) will be adopted by the market and that's enough to get the investors as well as the customers.

Every business idea we come across has different viability, feasibility, and capital requirement. Therefore, there are numerous reasons why entrepreneurs need frameworks to evaluate their ideas. An entrepreneur must evaluate his/her ideas against those characteristics, vision, and goals before taking the first step forward. Failure to do so, in the beginning, might have major consequences later in the venture. More specifically, it may lead to a waste of resources or failure of the Startup.

Now, the question is how “you” (as an entrepreneur) can effectively evaluate your idea and everything that sits around it....?

Building a new product or service from scratch requires a lot of effort. Sometimes it might be difficult to define whether the idea is realizable. Since the aim is to build a profitable and successful product or service, you should realize the importance of evaluating your idea. The right way will be to do some research and analysis to dig into the potential of your business concept. You’d also like to frame the **Business Canvas Model (BCM)** for evaluating your business ideas.

Nevertheless, you must pay attention to the **3 steps** that will help you to evaluate your startup idea -

### 1. Problem:

Any startup idea should be about solving a specific problem. Framing the problem statement is always the starting point for a startup. This is to be noted that the success of the startup depends on how well it helps end users solve their problems. As an entrepreneur, you must understand what kind of problem you want to solve with your startup. You need to be clear and specific in your thoughts in that regard and while doing so, you may ask the following questions:

- What is the relevant challenge of your niche market?
- What are the crucial issues faced by the customers?
- What is the setting for this startup that allows it to be able to grow quickly?

Answering these questions will give you a clear vision of what problems should be solved with the help of your product or service.

### 2. Solution:

Until this point, we focused on the relevant problem to solve and now it’s time to think about how exactly the startup is going to resolve your customers’ problems. The vision of the solution is an important one since it will contribute to the overall project estimation when it comes to the development process. Here, the predominant questions you may ask are:

- What are your solutions to your customer’s problems?
- What is your unique approach to solving the problem?



**It is always crucial for an entrepreneur to understand that solution(s) come ONLY after framing the problem statement.** It is a **HUGE** mistake to start working on a solution first and then look for the problem statement. The right approach is to find out the challenges experienced by the target audience and then think of various solutions to solve the problems.

### 3. Reason:

Finally, the reason is like a cherry on top of the whole process of the startup idea evaluation. This explains why your solution to the problem will work. It is a reason why customers will choose your product or service over anyone else. You may the following questions:

- What are your startup advantages?
- Why is your product or service going to win versus your competitors?
- Why is your startup to be the fastest one to grow and expand?



As an entrepreneur, you need to have a clear vision of how your startup will create and deliver value to its customers. The reason is what should distinguish you from your competitors and what should attract more users to try and buy your product or service.

In addition to the above steps, it is also essential to have a well-thought business plan/proposal in place. This should outline the goals and objectives, as well as the strategies you will use to achieve them.

An entrepreneur must understand that without doing preliminary market research and competitor analysis it would be impossible to shape the competitive advantage of his/her startup, which will thereby help the brand stand out from the wide majority and also deliver a top-notch product or service.

