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Performance Assessment, Review, and Analysis of Knowledge for Holistic Development

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REPORT ON **STATE TALENT SEARCH** 2024

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STATE TALENT SEARCH
2024

Nagaland Board of School Education, Kohima

REPORT ON STATE TALENT SEARCH 2024

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FOREWORD

The State Level Promotion of STEM 2024, a collaborative initiative between PARAKH, NCERT, and the Nagaland Board of School Education (NBSE), exemplifies the transformative potential of education to ignite curiosity, foster innovation, and promote learning among young minds. This report documents the journey of the State Level Promotion of STEM 2024, its objectives, methodology, and outcomes, offering valuable insights into the program's execution and impact.

State Level Promotion of STEM 2024 was conceived to commemorate the golden jubilee of the Nagaland Board of School Education and align with the National Education Policy (NEP) 2020, which emphasises inquiry-driven and experiential learning. Focused on students of Class IX, the initiative sought to overcome prevalent challenges in STEM education, such as resource scarcity and a lack of engagement with science and mathematics. By nurturing interest in these critical areas, the program aimed to prepare students for future academic and career opportunities while addressing community-specific challenges through innovative project-based learning.

The two-stage structure of the examination highlights its comprehensiveness. Stage I involved a district-level written examination that tested students' foundational knowledge and analytical skills. Stage II transitioned into a state-level project presentation, where students worked in groups to develop solutions addressing local and global issues, from sustainable waste management to renewable energy and disaster mitigation. The detailed mentoring provided by experts from institutions of national importance, such as IIT Delhi, played a pivotal role in shaping the students' projects, empowering them to translate ideas into impactful solutions.

The report meticulously outlines the diversity of projects, ranging from biogas production and water conservation to advanced waste management techniques and climate change mitigation. These projects reflect the student's ability to identify community-centric challenges and propose feasible, innovative solutions. The evaluation criteria, designed by PARAKH, emphasized relevance to STEM education, community engagement, feasibility, and sustainability, ensuring that the projects were both impactful and practical. PARAKH remains committed to handholding initiatives like the State Level Promotion of STEM and supporting states in fostering STEM education through capacity building, resource

development, and strategic guidance. Beyond the State Level Promotion of STEM, PARAKH will continue to conduct workshops such as the "World of Work" aimed at equipping students with the skills and knowledge required to navigate future challenges and career landscapes.

This report not only celebrates the success of the State Level Promotion of STEM 2024 but also serves as a roadmap for similar initiatives across other states. It underscores the importance of collaboration among educational institutions, government bodies, and local communities to create a nurturing environment for holistic education. As we move forward, PARAKH is dedicated to sustaining these efforts and expanding their reach to ensure that every student has the opportunity to explore, innovate, and excel.

Prof. Indrani Bhaduri
CEO and Head, PARAKH, NCERT

PREFACE

I would like to express my sincere gratitude to PARAKH, NCERT, New Delhi, and the Department of School Education and Literacy, Government of India for the collaboration with the Nagaland Board of School Education and for the immense support provided to NBSE in shaping the State Talent Search Examination 2024, which was aimed at promoting STEM education for useful facilitation within the community in the state.

I would like to extend my special thanks and gratitude to Prof. Indrani Bhaduri, CEO & Head, PARAKH & ESD, NCERT, and the officers at NCERT for preparing the question paper for the Stage I (District Level) examination, and for providing intellectual resources, financial support and helpful guidance to NBSE from the conception stage of the STSE to its completion.

I am very grateful to the eminent professors from Institutions of National Importance namely Prof. Jasim Ahmed, IASE, JMI; Prof. Charu Monga, IIT Delhi; Prof. Jay Dhariwal, IIT Delhi; and Prof. Sumer Singh, IIT Delhi, for mentoring the students for the State Level project presentations. Your guidance and intellectual inputs enabled the students to identify and refine their projects and helped them present those projects in ways beyond our expectations.

I would also like to thank the Special Guest Prof. G.T.Thong, Pro-Vice Chancellor, Nagaland University; the esteemed judges Er. Lengminlal Singson, EE, Department of Power; Er. Onongoto Soleho, Chief Mentor, Department of Science & Technology; Er. Pelengulie Chucha, Scientist 'C', Department of Science & Technology; Dr. Visuzoto Valeo, Assistant Professor, Department of Physics, Kohima Science College; and Er. Watikumzuk Walling, SDO, PHED; and all the teacher-guides for extending their support.

Last but not least, I am grateful to everyone who has lent their support in one way or the other in making the STSE a success.

Asano Sekhose
Chairperson

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INTRODUCTION

The State Talent Search Examination (STSE) was conceived as one of the series of programmes to be organized throughout the year 2024 in commemoration of the golden jubilee of the Nagaland Board of School Education, which culminated with the jubilee celebration programme on 16th November 2024. The STSE was a thoughtful and purposeful programme aimed at promoting STEM education in the state. The objectives of this programme were:

- To create awareness and interest in STEM education among students;
- to encourage growth in enrolment in science subjects at the higher secondary level;
- to mass mobilize and involve students in this programme;
- to incentivize the effort with prizes and certificates of participation; and
- to align with the objectives of the National Education Policy (NEP) 2020 towards STEM education.

Nagaland like most other northeastern states in India faces unique educational challenges due to its geographical, socio-economic, and infrastructural conditions. There is also often phobia about subjects like mathematics and science, largely due to a lack of foundational understanding and the perception that these subjects are tedious or irrelevant to everyday life. This phobia and/or lack of interest is further compounded by limited resources, a shortage of trained teachers, and deficiencies in engaging teaching methods.

Against this backdrop, the STSE was organized in collaboration with PARAKH (Performance Assessment, Review and Analysis of Knowledge for Holistic Development), National Council of Research and Training (NCERT), New Delhi. The STSE was conducted for students of Class IX from all the registered Institutions under NBSE, who are at a critical stage for making their career choices.

PATTERN OF THE EXAMINATION

The STSE was held at two levels – District Level and State Level.

Stage I – District Level.

The first level of the examination, a written examination, consisted of one paper containing 100 Multiple Choice Questions. The duration of the examination was 2 hours. The questions were prepared by PARAKH and printed by NBSE. This District Level examination was held successfully in all 16 districts of the State on 10th September 2024 at **22 centres.** A total of **5265** students took the examination of which 66 students from the districts were selected for the second level.

Stage II – State Level

The second level consisted of a project presentation that was relevant to and beneficial to the local community. The selected 66 students from Level I were divided into 21 groups, taking into consideration the proximity of the schools in each town for ease of collaboration and teamwork amongst team members. Each school had 1 teacher-in-charge to guide and care for the selected students from that school. One group from Longleng district dropped out citing inconvenience in coming to Kohima for the final.

A few weeks before the date for the project presentation, PARAKH initiated online mentoring of the students for several days between 16th October and 1st November 2024 focusing on the identification and development of projects that are relevant and beneficial to the community. Mentors drawn from institutions of national importance were engaged for this purpose. The mentors were:

- Prof. Jasim Ahmed, Professor, IASE, JMI
- Prof. Charu Monga, Professor, IIT Delhi
- Prof. Jay Dhariwal, Professor, IIT Delhi
- Prof. Sumer Singh, Professor, IIT Delhi

The projects that were finally identified and chosen by the groups were:

Group 1 : Biogas through the anaerobic digestion process

Group 2 : Recycling glass waste to glassphalt for sustainable roads in Kohima City

Group 3 : Sustainable waste management in Mokokchung district

Group 4 : Pyrolysis, converting plastic waste into fuel

Group 5 : Integration of waste management & sustainable agriculture

Group 6 : Fog catcher

Group 7 : Plastic sand bricks

Group 8 : Elimination of single-use plastic bags

Group 9 : Scarcity of water in Wokha district

Group 10 : Methods to mitigate landslides& earthquake sensor detector

Group 11 : Vehicle accident control system

Group 12 : Rainwater harvesting system to control flood

Group 13 : Air pollution control

Group 14 : Power integrated road

Group 16 : Waste disposal management

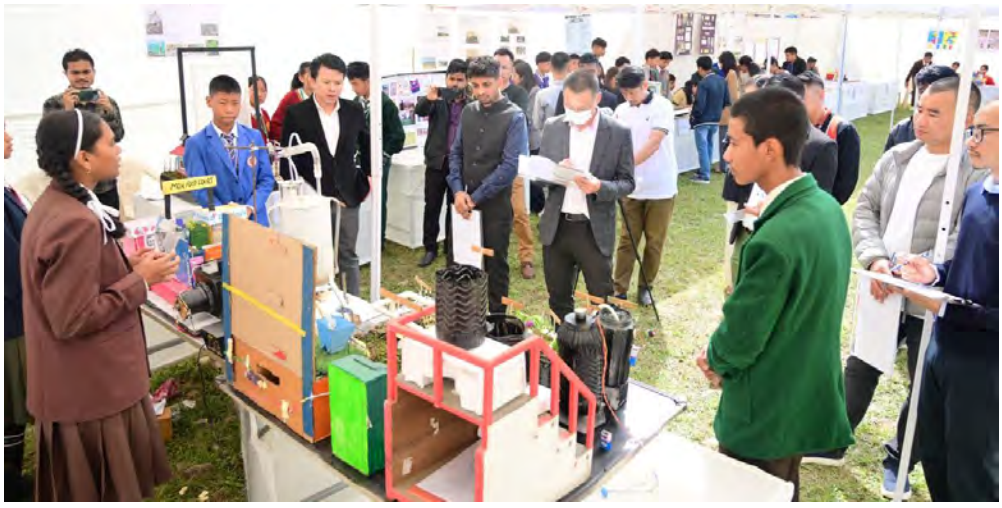
Group 17 : Automatic irrigation system

Group 19 : Global warming

Group 20 : Smart waste bin

The project selection highlighted the students' abilities to identify the needs and problems of their communities and to come up with innovative ideas to meet those needs or solve the problems.

Only eighteen of the twenty mentored groups could present themselves for the final competition. One group from the Peren district and another from the Chumoukedima district dropped out of the competition.



Project Presentation was held on 6th November 2024 at Mount Tabor Resort, Kohima. Rangumbuing Nsaranagbe, Secretary, NBSE, chaired the programme.

A panel of judges:

The judges were drawn from relevant organizations and government departments such as Science & Technology, Engineering Department, and science institutions. The following were called up to be the judges:

1. Mr. Madhusudan, State Liaisoning Officer, PARAKH, NCERT, New Delhi.
2. Er. Lengminlal Singson,Executive Engineer, Department of Power, Government of Nagaland, Kohima
3. Er. Onongoto Soleho, Chief Mentor, Directorate of Science & Technology, Nagaland, Kohima.
4. Er. Pelengulie Chucha, Scientist 'C', Directorate of Science & Technology, Nagaland, Kohima.
5. Dr. Visuzoto Valeo, Assistant Professor, Department of Physics, Kohima Science College, Jotsoma.
6. Er. Watikumzuk Walling, SDO, PHED, Office of the Chief Engineer, PHED, Nagaland, Kohima.
7. Shalini S Sharma, Assistant Secretary General, PHD Chamber of Commerce and Industry, New Delhi.

The projects were evaluated and adjudged against a set of criteria provided by PARAKH, New Delhi. These criteria focused on community-based projects that may be viewed as a product of STEM education or as ones that promote STEM education. These criteria ensure the selected projects are impactful, educational, and well-suited for community engagement, maximizing the potential to promote STEM education effectively.

Criteria for judging the projects:

- **Relevance to STEM Education Goals:** The project should align with STEM education goals and contribute to promoting scientific literacy, problem-solving, and critical thinking within the community. It should address real-world issues and demonstrate the value of STEM skills.
- **Community Engagement and Significance:** The project should include strategies for engaging the local community, such as interactive events, workshops, or hands-on demonstrations, and consider how the project can be presented in accessible formats, such as posters, to reach a broad audience.
- **Educational Impact:** The project should have measurable educational outcomes for both the students involved and the community participants, ideally improving awareness, knowledge, or skills related to STEM topics.
- **Creativity and Innovation in Presentation:** For poster presentations, the project should use creative visuals and layouts to effectively communicate STEM concepts. Innovation in design and presentation methods, such as interactive elements, is encouraged to engage the audience actively.
- **Clarity and Quality of Communication:** Information on the poster and other presentation formats should be clear, accurate, and well-organized. This includes presenting scientific concepts in an understandable way for a non-expert audience, especially children and families.
- **Practicality and Feasibility of Implementation:** The project should be feasible with the resources available and should demonstrate how it can be successfully implemented within the school or community with achievable goals.
- **Inclusivity and Accessibility:** The project should consider the diverse backgrounds of community members, ensuring that activities and materials are accessible to all ages, abilities, and socioeconomic backgrounds to maximize inclusivity.
- **Sustainability and Long-Term Impact:** The project should have a sustainable approach, meaning it could continue or be adapted beyond the initial presentation or event.
- **Collaboration and Teamwork:** Projects should promote teamwork among students and ideally involve collaboration with community members, local organizations, or educational institutions to leverage additional resources, perspectives, and expertise.
- **Assessment and Feedback Mechanism:** The project should have a built-in mechanism for gathering feedback from participants and evaluating the impact on both student presenters and community members. This may include surveys, interactive polls, or feedback forms to measure engagement and knowledge gained.

Presentation of the Projects:

The final presentations of projects by students were held on 6 November 2024. These presentations were more than just displays of knowledge; they were windows into the curiosity, creativity, and determination of the young minds eager to explore the mysteries of the scientific world. Across the whole state, these student-led projects will serve as a stage for innovation, where future scientists, engineers, and thinkers will emerge, sharing discoveries that could shape the future.

The judges went round the tables as a single team. Each group gave a presentation of their project and answered questions from the judges. The students showed impressive understanding of their projects and enough confidence in presenting them, thus indicating that they had been built up and mentored well. The judges demonstrated remarkable professionalism and lent their expertise to critically examine and evaluate the projects according to the criteria. Numerical values were assigned against each criterion for each of the projects to give the final ranking. The presentation of the projects and Evaluation went on for 3 hours.

WORLD OF WORK

Simultaneous with the Science Project Presentation, a workshop on "World of Work (WoW)" was conducted by PARAKH. Prof. Indrani Bhaduri, CEO & Head, PARAKH & ESD, NCERT addressed the students and talked about PARAKH's commitment to establishing a "World of Work" corner in select PM Shri schools of the country. Through the whole initiative, students will be equipped with the skills that they will need for their future careers and the 'World of Work'. Posters showcasing the 36 Sector Skill Councils and their various employment opportunities were put up by PARAKH for students to explore. Prof. Indrani also talked about the importance of AI in the 21st Century and encouraged the students to explore the basics of AI and its ethical use. She encouraged the students to be interactive during the workshop.

Ms. Asano Sekhose, Chairperson, NBSE in her address to the participants talked about NEP 2020 and its emphasis on holistic development of learners. She appreciated PARAKH's initiative of World of Work and encouraged the students to pursue skill development along with academic excellence to become successful and excel in their careers. She motivated the students to explore the new areas of employment being highlighted in the workshop and develop critical and analytical thinking. The workshop, the students were given kits that contained magnifying glass, compass, and other things that help students with critical thinking

DECLARATION OF WINNERS & CLOSING PROGRAMME

The results of STSE were eagerly anticipated, as participants showcased their innovative projects and solutions to community problems. After careful evaluation by the panel of expert judges, the winners were determined based on the criteria SET by PARAKH and the creativity, scientific accuracy, and presentation skills of the students. The competition provided a platform for young minds to demonstrate their talents, pushing the boundaries of knowledge and problem-solving.

The Result Declaration Programme of STSE saw Prof. G.T. Thong, Pro-Vice Chancellor, Nagaland University, Kohima Campus, Meriema as the Special Guest. The programme was led by Siduniu Rentta, Asst. Academic Officer, NBSE. Sr. Diana Munis, Animator of the Community (Superior) led the prayer for the program. Concept notes and a brief on STSE were given by Ekyimo Shitirie, Joint Secretary, NBSE.

Ms. Asano Sekhose, Chairperson, NBSE, delivered the welcome address. She said that as enshrined in the NEP 2020, the education we provide should give space to inquiry, discovery, and analysis-based learning to develop creativity and curiosity in the students. Students should be able to apply that learning in real-life situations. She said that the STSE has elevated student's understanding of science and that participation is of primary importance than winning or losing.

The judge's remark was given on behalf of all the judges by Er. Onongoto Soleho, Chief Mentor, Directorate of Science & Technology, Kohima, Nagaland. The judges remarked that deciding the winners for the projects had been difficult, as all the groups presented excellently.

Prof. Indrani Bhaduri, CEO & Head, PARAKH & ESD, NCERT addressed the audience on the significance of developing professional skills in order to prepare for future employment. She congratulated the participants for presenting exemplary models.

Prof. G.T. Thong, Pro-Vice Chancellor, Nagaland University, Kohima Campus, Meriema, the special guest of the programme, declared the winners of STSE and addressed the gathering. He dwelled on the significance of studying Science for society's overall advancement. He urged the students to be bold and self-assured enough to pursue Science and Technology as career options. He encouraged the students to always remember that there is no substitute for hard work.

The vote of thanks was delivered by Rüchünino Ziephrü, Assistant Academic Officer, NBSE.

WINNERS AND THEIR PROJECTS

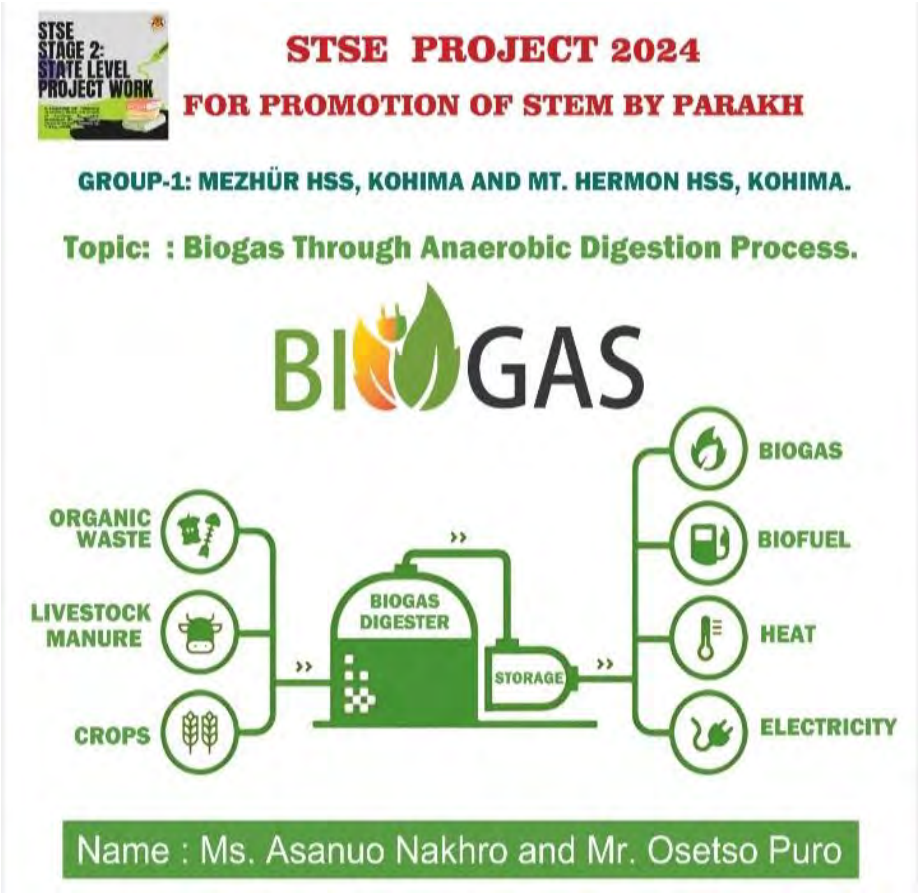
1st position – Group 1

Project Title:

Biogas through Anaerobic Digestion Process.

Participants:

- Ms. AsanuoNakhro, Mezhür Higher Secondary School, Kohima
- Mr. Osetso Puro, Mt. Hermon HigherSecondary School, Kohima



Introduction

Organic waste is any material that is biodegradable and comes from plants and animals. Biodegradable waste is organic matter that can be broken into carbon dioxide, methane or simple organic molecules. Most often, organic waste refers to waste food, but it also includes yardwaste, paper, wood, some fabrics, sewage, and manure. Organic waste makes up roughly three-quarters of the waste stream. Its accumulation in landfills and incineration leads to soil contamination, as well as the emission of greenhouse gasses. However, an efficient management of this organic waste by converting it into biogas and its reuse contributes to promoting the circular economy.

Anaerobic digestion is a process through which bacteria break down organic matter in the absence of oxygen. Anaerobic digestion (AD) is practiced extensively for the treatment of biodegradable waste for biomethane generation. This technology has the capability of managing organic waste such as food waste, lignocellulosic biomass and residues, energy crops, and organic fractions of municipal solid waste. The environmentally sound features of AD attracted research groups worldwide for improved biogas production. Biomethane has a high heating value ranging between 50 and 55 MJ/m^3 and a low heating value ranging between 30 and 35 MJ/m^3. The biomethane may be utilized as fuel by replacing the natural and liquid petroleum gas. Also, its application may help to curb the 80% of greenhouse gases (GHGs) emitted into the environment. Biodegradable waste may be handled by other technologies such as landfill and incineration, but AD is preferred as it helps in the reduction of waste sludge, kills pathogens, provides essential nutrients, and has less energy demand.

Steps involved in anaerobic digestion (AD) process

The anaerobic digestion (AD) process has four steps:

- **Hydrolysis**: Bacteria break down organic polymers into simple sugars.
- **Acidogenesis:** Bacteria convert simple sugars and amino acids into carbon dioxide, hydrogen, ammonia and organic acids.
- **Acetogenesis:** Bacteria convert organic acids into acetic acid, carbon dioxide and hydrogen.
- **Methanogenesis:** Single-celled organisms convert intermediate products into biogas.

Formation and Setting up of Biogas

- **Collection of kitchen waste**: Gather all kinds of kitchen waste, including vegetable peels, leftover food, and fruit scraps.
- **Pre-treatment**: Chop the waste into small pieces to facilitate faster digestion.
- **Anaerobic Digestion**: Place the pre-treated waste into the biogas digester. Here, microbes break down the waste, producing biogas.
- **Gas collection**: Capture the biogas produced for storage and use.
- **Choose a Biogas Digester**: Select a small-scale digester suitable for household use.
- **Install the system**: Place the digester in a well-ventilated area, preferably outdoors.
- **Feed the Digester**: Regularly add kitchen waste to the digester.
- **Monitor and Maintain**: Ensure the digester is functioning correctly by monitoring gas production and maintaining optimal conditions.

Project Objective

The objective of producing biogas from organic waste through anaerobic digestion (AD) is tocreate renewable energy and reduce greenhouse gas emissions.

- **Reduce greenhouse emissions**: Biogas is a renewable energy source that can reduce greenhouse gases. Methane is a powerful greenhouse gas that is produced when organic waste decomposes. Biogas can replace fossil fuels and reduce greenhouse gas emissions.
- **Reduce pollution**: Biogas production can reduce nitrogen and phosphorus pollution. Organic waste can contaminate surface and ground waters through runoff or leaching into soil.
- **Create organic fertilizer**: The process of producing biogas also creates digestate, which can be used as an organic fertilizer to improve soil properties.
- **Recycling nutrients**: Biogas systems can recycle nutrients in the food supply, reducing the need for fertilizers.
- **Create a sustainable energy source:** Biogas can be used to produce electricity, thermalenergy, and fuel, which can reduce the dependence on fossil fuels, etc.

Impact on Community

Anaerobic digestion (AD) of organic waste has many positive impacts on the community, including

- **Supporting economic growth**: AD can help rural communities manage agricultural waste more efficiently and profitably.
- **Creating Jobs:** The biogas industry can create construction and permanent jobs.
- **Reduce landfill waste**: AD reduces the amount of waste sent to the landfills, which extendsthe life of landfills and reduces environmental impact.
- **Improving agricultural productivity**: AD converts nutrients in manure into a form thatplants can use more easily, which can increase crop productivity.

- **Improve soil health**: AD produces fertilizers and soil amendments that can improve soilhealth.
- **Reducing pressure on natural resources**: AD reduces pressure on forest and agriculturallands by preventing deforestation for fuel wood, etc.

Conclusion

Biogas from organic waste is a sustainable and efficient solution to waste management and renewable production. By adapting biogas technology, we can significantly reduce our environmental footprints and move towards a green future. Implementing a biogas system can revolutionize how we can handle organic waste, turning it into a valuable resource.

2nd Position – Group 5

Project:

Integration of Waste Managementand Sustainable Agriculture

Participants:

- Ms. Angela Abhayansh, St. Mary's High School, Mon
- Mr. YanlongDilimth, Christ King High School, Mon
- Ms. Ngepngam J. Konyak, St. John's Higher Secondary School, Mon
- Mr. Manthak Konyak, Eklavya Model Residential School, Tizit

Concept of Project

Our project is to focus on the different types of waste generated in our locality and to overcome its impact on the environment in a sustainable way which is beneficial to the environment as well as it can be a benefit for small farmers and a way for people to grow economically too.

In our project, we have included one of the major issues which is waste management. We would like to implement our project in Mon Town.

The major problem is the disposal of household waste as well as lack of a proper drainage system makes it worse. The sewage tanks from most of the households are directly

connected to the municipality drain therefore during the rainy season the drains sometimes overflow it's a major concern that most of the disease-causing micro-organisms breed and there is a chance of an outbreak of water-borne epidemics I believe that in 2023 the outbreak of dengue is a possible reason because of this. Another concern is regarding waste disposal most of the household waste as well as plastic waste is thrown into the drains which clogs the drain water and therefore the water from various sources gathers there. So, through this project, we bring out a mitigation measure to dispose of the waste.

First of all, we will separate the different types of waste like plastic, metals, and organic waste. If the waste contains metals like iron and other types, these can be separated using magnetic separation and a metal detector. The plastic waste such as bottles, carry bags or any other types of plastics will be separated through bar screening. Then the water is allowed to pass through another type of treatment which is grit removal here small stones and pebbles are separated by passing the wastewater though a chamber then it is collected in a tank and allowed to rest for hours for sedimentation and where solid heavy materials such as sand or soil with waste food and human and animals excreta will sink to the bottom of the tank while scum (like oil grease) will float on the top this can be separated by clarification. After the removal of the scum further biological treatment will be done in an aeration tank in the absence of oxygen due to anaerobic respiration by certain anaerobic bacteria gases like methane will be produced or we can say biogas this gas can be stored in a tank and can be used as a fuel the sludge that remains can be decomposed further to form manure and then the wastewater if further treated with chemicals like chlorine tablets and alum to the water clear further UV (ultra violet) treatment is to be done to kill the harmful microbes and this treated water can be utilized for various purposes like agriculture or we can let it to water bodies also we can do groundwater recharging.

The second phase of our project is what to do with the waste that is separated so here the method of pyrolysis is heating of plastic in the absence of oxygen it is because in the absence of oxygen, the plastic would not produce carbon dioxide thus the smoke produced can be condensed to make diesel on the further distillation of the diesel we can get gasoline which can be utilized for running generators or producing electricity also this diesel can be sold further which can be an economic gain for the local people indulged in the work. Further, the metals can be melted together and alloys can be made which can be utilized for making various metal products. Now coming to sustainable agriculture, we look forward to such a type of farming technique that is more sustainable and low cost benefiting the environment and society. It is about Fukuoka Natural farming and Hydroponics. In Fukuoka Natural Farming there is no need to till the soil thus making it a sustainable practice by preventing soil erosion caused by tilling of the soil mostly in the hilly regions tilling is a major reason for soil erosion and degradation in food production therefore in this method we make seed

balls that is by mixing grain husk and clay dough is prepared and marble-sized balls are made by keeping a seed inside it then these balls are allowed to dry in the sun after that these seed balls are scattered around the field where on receiving moisture naturally the seeds germinate and sprout out and roots itself in the soil at the same time by the decomposition of husk present with the clay it gets nutrition for growth.

Also, if by chance the crops grown are affected by pests we can overcome this with a natural solution which is IPM integrated pest management here we can make some natural pesticides that are not harmful to the environment or do not cause any kind of pollution. On the other hand during the dry season if the field needs to be irrigated therefore here we can utilize the water that we have treated as well and the same water can be used for a hydroponics agriculture system this will help to overcome the problem of food production making the availability of organic food.

3rd Position – Group 3

Project Title:

Sustainable Waste Management in Mokokchung District: A Hypothetical Model

Participants:

- Mr. Rongpangnir Imchen, Eden Academy, Mokokchung
- Mr. Imtisosang Noel Longkumer, Town Higher Secondary School, Mokokchung
- Mr. Suroli Sangtam, Queen Mary Higher SecondarySchool, Mokokchung

Introduction

In response to the growing need for sustainable waste management, we propose an integrated approach for processing plastic and bio-waste at a community level. This model addresses two primary objectives:

- **Reducing Landfill** Dependency: By transforming waste into usable by-products.

- **Economic Gain:** Generating a revenue stream from processed waste products.

Our goal is to show how this model can work effectively and make a profit, using general estimates, to help decision-makers see the value in supporting this sustainable initiative.

This proposal outlines a forward-thinking waste management model focused on effective waste sorting, plastic recycling through pyrolysis, and composting of organic waste. Our model is designed to bring both environmental and economic benefits—like reducing waste, recovering valuable resources, and generating profits from the products we process. By providing estimated returns on investment and highlighting the long-term advantages, we hope to gain approval from leadership to make this plan a reality.

1. Proposed Waste Management Model

1.1 Household Waste Collection and Segregation

- Segregation **System:** Introducing a three-bin system where households separate waste into plastics, MLPs, and bio-waste. The collection is designated twice a week for ease and routine:

Waste Type	Collection Day
Plastic Waste	Wednesdays
Biodegradable Waste	Saturdays

- **Awareness Initiatives:** Educational programs will be conducted to encourage households to segregate waste accurately. This step aims to improve waste purity and lower contamination, increasing efficiency in downstream processes.

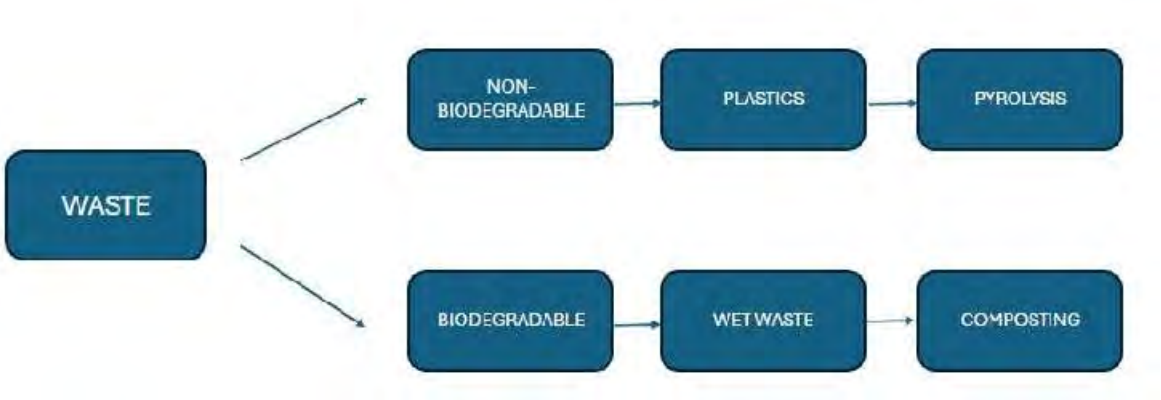


Figure 1: *Flow Diagram of Household Waste Collection and Segregation*

1.1.1. Hypothetical Process and Profitability Analysis

✓ Biodegradable Waste Processing Through Composting

Biodegradable waste is processed through aerobic composting in an optimal depth of 3 feet,which helps balance moisture and aeration.

Composting Procedure:

- Aeration and Turnover: Regularly turned to provide oxygen, vital for bacterial activity.
- l Bacteria Selection: Bacillus subtilis and Pseudomonas fluorescens are identified as effective aerobic bacteria that thrive in oxygenated environments, promoting faster composting.

Parameter	Value
Pit Depth	3 feet
Turnover Frequency	Every 1-2 weeks
Bacteria Type	Aerobic (e.g., Bacillus subtilis)
Composting Time	4-8 weeks (can vary)

Outcome: The composting process reduces biodegradable waste by approximately 40-60%, yielding nutrient-rich manure.

- Total number of households: 8,597
- Amount of wet waste produced per day per household: 1kg(approx.)
- Total Amount of wet waste generated per month: 2,40,716 kg.
- Post-composting **volume:** ~96,286 kg of organic manure

(Reduces the wet weight by 40-60% during composting)

Manure Yield: Expected to be approximately 40% of initial waste, resulting in ~96,286 kg oforganic manure.

Potential Revenue: The estimated selling price is ₹30 per kg of manure, projecting a monthlyrevenue of ₹28.9 lakhs if fully implemented.

Waste Type	Initial Volume (kg)	Manure Yield (kg)	Estimated Revenue (INR)
Bio-Waste (18 colonies)	2,40,716	~96,286	28.9 lakh

***Table 1**: Hypothetical Monthly Revenue from Bio-Waste Composting*

Revenue Potential: Selling compost at ₹30 per kg could generate ₹12,000 monthly from one compost pit (Assuming one compost pit decomposes 10,000 kg).

Some uses of compost manure in the community

- **Garden Soil Enrichment:** Mix compost into garden soil for nutrient-rich plant growth.
- **Lawn Fertilizer:** Spread a thin layer over the lawn to promote thick, green grass.
- **Mulch for Flower Beds and Shrubs:** Apply around plants to retain moisture and prevent weeds.
- Potted Plant Soil Amendment: Blend with potting soil for healthier container plants.
- **Compost Tea:** Soak compost in water for a nutrient-rich plant water or spray.
- **Vegetable Garden Fertilizer:** Use compost around vegetables for better growth and yield.
- **Soil Conditioner for Raised Beds:** Blend with soil in raised beds for improved structure and moisture.
- Improving Soil for New Lawns or Landscaping Projects: Use before planting for a strong foundation.
- **Composting Accelerator for Home Compost Bins:** Add finished compost to new compost piles to speed up decomposition.
- **Erosion Control in Sloped Areas:** Spread over slopes to help stabilize soil and prevent erosion.

1.2 Plastic Waste Processing through Pyrolysis

1.2.1. Hypothetical Process and Profitability Analysis

Pyrolysis is a process that breaks down plastic waste by heating it to high temperatures (300– 500°C) in an oxygen-free environment. This method converts the plastic into simpler hydrocarbon materials without burning it. Simplified mechanism of Pyrolysis:

- Shredding and Pre-Processing: Collected plastics are first shredded and pre-treated to remove impurities.
- Thermal Decomposition: The shredded plastic is then heated to ~500°C in a pyrolysis reactor, breaking down long-chain polymers into fuel oil and gas in an oxygen-free environment.
- Condensation and Gas Recycling: Vaporized hydrocarbons are condensed into pyrolysis oil, while syngas are recycled as a fuel source for the reactor.

Estimated data on plastic waste collection in Mokokchung:

Total number of households: 8597

Amount of plastic waste produced per day per house: ~20g Total amount of plastic waste produced per month: ~5160 kg

Waste Input (kg)	Pyrolysis Oil Yield (%)	Expected Oil Volume (liter)
~5,160	~50-60%	~2,580

Table 2: *Expected Output from Pyrolysis of Plastic Waste.*

(Note: The output will be used by the local authorities for their domestic uses)

By-Products and Their Applications

The pyrolysis process yields three main by-products, each with valuable applications:

- **Pyrolysis Oil**: A liquid fuel substitute similar to diesel that can be used in industrial applications. This oil offers an alternative energy source, potentially reducing reliance on conventional fossil fuels.
- **Synthetic Gas (Syngas):** This gas mixture can be recycled within the process to maintain reactor heat or be used in local industries for heat or power generation.
- **Char Residue:** Although minimal, the remaining char can be used as a filler material in road construction or as an additive in certain manufacturing processes.

Hypothetical Data Analysis: Potential Impact on Waste Reduction

- Biodegradable **Waste Reduction**: Composting reduces the bio-waste weight by 40-60%,producing valuable manure.
- **Plastic Waste Reduction**: Pyrolysis is estimated to decrease plastic waste volume by upto 70%, yielding useful oil and syngas.

The hypothesis predicts a 30-50% reduction in overall community waste volumes, significantly minimizing landfill loads.

2. Long-Term Environmental Significance of Proposed Waste Management Practices

2.1 Household Waste Segregation for Improved Recycling and Processing Efficiency

- **Reduced Landfill Waste**: Segregation enables specific processing for each type, significantly reducing the volume of waste sent to landfills. In the long term, this reduces methane emissions, groundwater contamination, and land-use impact.
- **Improved Recycling Efficiency:** Plastics can be diverted directly to recycling or pyrolysis processes, reducing plastic pollution.
- **Implementation Potential: Community-wide** education and engagement will foster habits of conscious waste disposal, creating a sustainable foundation for effective waste management.

Long-Term Goal: By establishing a habit of segregation, communities can move closer to a zero-waste culture, where recyclable and compostable materials are effectively diverted from landfills.

2.2 Bio-Waste Composting: Sustainable Fertilizer Production and Soil Health Enhancement.

- **Reduction in Chemical Fertilizers**: Organic manure from bio-waste composting reduces reliance on chemical fertilizers, which are energy-intensive to produce and can degrade soil health over time.
- **Carbon Sequestration:** Composting helps capture carbon in the soil, contributing to carbon sequestration and reducing greenhouse gases.

- **Enhanced Soil Health:** The use of compost improves soil structure, water retention, and nutrient content, promoting healthier ecosystems and supporting local agriculture.
- **Implementation Potential:** Regular collection and efficient composting systems provide a consistent supply of organic manure, which can be sold locally, supporting both the community's agricultural needs and providing economic returns.

Long-Term Goal: Transition to a sustainable, locally-produced fertilizer model that strengthens soil quality and decreases chemical dependency, supporting eco-friendly agricultural practices.

2.3 Plastic Waste Processing via Pyrolysis: A Resource-Recovery Solution

- **Resource Recovery**: Pyrolysis transforms waste into fuel oil and syngas, contributing to the circular economy by recovering resources from waste.
- **Lower Carbon Emissions**: Compared to incineration or landfilling, pyrolysis produces fewer greenhouse gases and can generate energy for further processing, making it a sustainable option for hard-to-recycle plastics.
- **Implementation Potential**: Setting up pyrolysis plants within the community creates a local processing point for plastics, decreasing transportation costs and making plastic waste disposal more manageable and economically beneficial.

Long-Term Goal: Establish a sustainable, energy-efficient system for handling plastic wastethat provides energy sources and reduces environmental impacts associated with conventional plastic disposal methods.

Conclusion

Our proposal aims to create jobs for local residents through the income generated from selling compost manure. A portion of these earnings can be directed towards hiring people for essential roles in waste management. For example, we need workers to oversee the compost pits located outside the town and others to operate the pyrolysis plant for processing plastic waste. These positions offer steady employment for community members while ensuring that our waste management system runs efficiently.

Measure	Environmental Impact	Long-Term Community Benefit
Household Segregation	Reduced landfill waste and improved recycling quality	Promotes waste-conscious behavior
Composting	Enhances soil health, reduces chemical fertilizer use	Provides local manure, supports agriculture
Pyrolysis	Reduces plastic pollution, recovers fuel from waste	Local energy resource, reduces waste transport
Employment Opportunities	Builds a green economy, enhances environmental Literacy	Creates jobs, fosters sustainable livelihoods
Financial Incentives	Decreases waste generation, fosters sustainable habits	Encourages community participation

Table 3: Proposal summary

Additionally, the revenue from this initiative can be reinvested into other community development projects, such as improving local infrastructure, funding educational programs, or supporting health services. This model not only promotes sustainable waste practices but also builds a self-sustaining cycle that benefits the entire community. By turning waste into valuable resources and reinvesting profits locally, we can create a cleaner environment and a stronger, more resilient community.

OTHER PARTICIPANTS AT THE STATE-LEVEL COMPETITION

Group 2:

Project Title: Recycling glass waste to glassphalt for sustainable roads in Kohima City

Participants:

- Nathan Kutuzo Sasu, Northfield, Khikha, Kohima
- Arenlong Longkumer, Northfield, Khikha, Kohima
- Longzao Shitirie, Don Bosco HSS, Kohima

Group 4:

Project Title: Pyrolysis, converting plastic waste into fuel

Participants:

- P Lamthiw P, St. John HSS, Tuensang
- Debraj Nath, Wela Foundation School, Tuensang
- Kohhi Sangtam, St. John HSS, Tuensang

Group 6

Project Title: Fog Catcher

Participants:

- Viprosie Nyuwi, Christian HSS, Meluri
- Atsürhe Nyuthe, St. Xavier HSS, Meluri
- Lorhevi Poji, St. Xavier HSS, Meluri

Group 7:

Project Title: Plastic sand bricks

Participants:

- Alex Santam, St. Xavier HSS, Meluri
- Ishmael Thurr, St. Xavier HSS, Meluri
- Ophilia Pfithu, St. Xavier HSS, Meluri
- Imsupenla Aier, St. Xavier HSS, Meluri

Group 8

Project Title: Elimination of single-use plastic bags

Participants:

- Eben L. Tsopoe, Fernbrook School, Wokha
- Khonzani T. Ovung, Fernbrook School, Wokha
- Randanbeni R. Ngullie, Fernbrook School,Wokha

Group 9

Project Title: Scarcity of water in wokha district

Participants:

- Tumben Y. Murry, Bethsaida school, Wokha
- Lansothung L. Murry, Perennial School, Wokha
- Lumchibeni T.Kikon, Perennial School, Wokha

Group 10

Project Title: Methods to Mitigate Landslides & earthquake Sensor Detector

Participants:

- Sudhanshu Kumar, Olympic HSS, Zunheboto
- Akivito B Awomi, Olympic HSS, Zunheboto
- Atou-u, Hillto Children Home School, Akuluto
- Veto Zhimo, Woodland HSS, Zunheboto

Group 11

Project Title: Vehicle accident control system

Participants:

- Sungtiben Jamir, St. John HS Res. School, Dimapur
- Aman Kumar, MGM HSS, Dimapur
- Taliakum Pongen, Don Bosco HSS, Dimapur

Group 12

Project Title: Rainwater harvesting system to control flood

Participants:

- Ishaan Singh Bardewa, Little Star HSS, Dimapur
- Ikehakpeule, St. Paul HSS, Dimapur

Group 13

Project Title: Air pollution control

Participants:

- Chumrise Ayonger, Loyola HSS, Kiphire
- Suveytsu Yimchunger, Little Flower HSS, Pungro
- Kokpila S, Loyola HSS, Kiphire

Group 14

Project Title: Power integrated road

Participants:

- Manlu Phom, Phom Lempong HSS, Longleng
- Ela O Phom, Christian School, Longleng
- Hunli Phom, Phom Lempong HSS, Longleng

Group 16

Project Title: Waste disposal management

Participants:

- Sheying, Christian High School, Noklak
- Tsumon, St Paul School Noklak
- Thingniu C, St Paul School Noklak

Group 17

Project Title: Automatic Irrigation System

Participants:

- Gaigongrei, Little Flower School Chümoukedima
- Gungun Kumari, Nagaland Police Central School, Chümoukedima
- Kelina R K, Saint Savio HS, Chümoukedima

Group 19

Project Title: Global warming

Participants:

- Like Zhimo, Shepherd High School Niuland
- Livino Awomi, Reginald Hughes Shaw Memorial, Niuland
- Atokali Chophy, Reginald Hughes Shaw Memorial, Niuland

Group 20

Project Title: Smart waste bin

Participants:

- Nuklasenla Jamir, Baptist HSS,Tseminyu
- Mercy Tep, Baptist HSS,Tseminyu
- Olivia Athari, Baptist HSS,Tseminyu

OBSERVATIONS AND CONCLUSION

The response of the students and the schools towards the call for participating in the STSE was very encouraging. The participating students showed keen interest in the STSE and also possessed knowledge and the skills for presenting the science projects. This showed that, giventhe opportunities and the facilities, the students will be able to achieve much more. It is hoped that the conduct of the STSE has ignited interest in STEM education among the students and that their interest will be sustained by moving toward innovative STEM teaching methods. The objectives of the STSE would be achieved if it had encouraged a shift towards inquiry-based and experiential learning at the school level.

Officials with the winners of the STSE

ANNEXURE –I

Abstract of statistics on Stage I (District Level) Examination

Sl. No	District	No. of Schools	No. of students	Examination centre
1	Kohima-I	27	600	Mezhür Hr. Sec. School, Kohima
	Kohima-II	9	390	Bethel Hr. Sec. School, Kohima
2	Mokokchung	16	212	Town Hr. Sec. School, Mokokchung
3	Tuensang	6	252	St. John Hr. Sec. School, Tuensang
4	Mon	19	417	Don Bosco Hr. Sec. School, Mon
5	Phek	6	127	Govt. Hr. Sec. School, Phek
6	Wokha	7	89	Libemo Memorial School, Wokha
7	Zunheboto	13	208	Olympic Hr. Sec. School, Zunheboto
8	Dimapur-I	12	423	Christian Hr. Sec. School, Dimapur
	Dimapur-II	22	525	Vidyabhawan Hr. Sec. School, Dimapur
	Dimapur-III	10	405	Holy Cross Hr. Sec. School, Dimapur
9	Kiphirte	5	171	Loyola Hr. Sec. School, Kiphire
10	Longleng	10	139	Bautüng Hr. Sec. School, Longleng
11	Peren	11	164	St. Xavier Hr. Sec. School, Jalukie
12	Noklak	4	152	Christian High School, Noklak
13	Shamator	4	30	St. Xavier Hr. Sec. School, Shamator
14	Medziphema	4	83	Govt. Hr. Sec. School, Medziphema
15	Chumukedima-I	13	363	St. Joseph Hr. Sec. School, Chumukedima
	Chumukedima-II	13	367	Unity Christian Hr. Sec. School, Diphupar
16	Niuland	6	80	Reginald Hughes Shaw Memorial School, Niuland
17	Tseminyu	5	68	Baptist Hr. Sec. School, Tseminyu
	Total	222	5265	

ANNEXURE – II

STUDENTS DETAIL AND GROUPING

Mentor 1: Prof. Jasim Ahmed, Professor, IASE, JMI

Kohima District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
1	1	Mezhür HSS, Kohima	24010043	Mr. Temjen	Asanuo Nakhro	Female	50
	2	Mt. Hermon HSS, Kohima	24010762	Mr. Angau Mbung	Osetso Puro	Male	53
2	1	Northfield, Khikha, Kohima	24010809	Ms. Ringhuila	Nathan Kutuzo Sasu	Male	50
	2	Northfield, Khikha, Kohima	24010823		Arenlong Longkumer	Male	50
	3	Don Bosco HSS, Kohima	24010639	Ms. Keneingunuo Phesao	Longzao Shitirie	Male	48

Tuensang District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
4	1	St. John HSS, Tuensang	24030014	Ms. Changkumnyu	P Lamthiw P	Male	56
	2	Wela Foundation School, Tuensang	24030170	Ms. Momola	Debraj Nath	Male	53
	3	St. John HSS, Tuensang	24030013		Kohhi Sangtam	Male	50

Mon District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
5	1	St. Mary's High School, Mon	24040346	Mr. Nirmal	Angela Abhayansh	Female	53
	2	Christ King High School, Mon	24040281	Mr. Shekhar Jyothi Karmakar	Yanlong Dilimth	Male	45
	3	Eklavya Model Resi School, Tizit	24040206	Mr. Souman Saha	Manthak Konyak	Male	44
	4	St. John's HSS, Mon	24040126	Mr. Jaunyi	Ngepngam J Konyak	Female	44

Noklak District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
16	1	Christian High School, Noklak	24120018	Shilim	Sheying	Male	46
	2	St Paul School Noklak	24120167	Chongkoi	Tsumon	Female	40
	3	St Paul School Noklak	24120179		Thingniu C	Female	40

Mentor 2: Prof. Charu Monga, Professor, IIT Delhi

Phek District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
6	1	Christian HSS, Meluri	24050017	Mr. Thazaba	Viprosie Nyuwi	Male	49
	2	St. Xavier HSS, Meluri	24050201		Atsürhe Nyuthe	Female	38
	3	St. Xavier HSS, Meluri	24050210		Lorhevi Poji	Female	35
7	1	St. Xavier HSS, Meluri	24050178	Mr. Heman Mukhiya	Alex Santam	Male	35
	2	St. Xavier HSS, Meluri	24050181		Ishmael Thurr	Male	35
	3	St. Xavier HSS, Meluri	24050220		Ophilia Pfithu	Female	35
	4	St. Xavier HSS, Meluri	24050225		Imsupenla Aier	Female	35

Longleng District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
14	1	Phom Lempong HSS, Longleng	24100135	Leom	Manlu Phom	Female	40
	2	Christian School, Longleng	24100035	Rajesh P.S.	Ela O Phom	Female	39
	3	Phom Lempong HSS, Longleng	24100108		Hunli Phom	Male	38

Niuland District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
19	1	Shepherd High School Niuland	24140038	Mr. Aviho	Like Zhimo	Female	43
	2	Reginald Hughes Shaw Memorial, Niuland	24140019	Mr. Niuto	Livino Awomi	Female	42
	3	Reginald Hughes Shaw Memorial, Niuland	24140014		Atokali Chophy	Female	40

Dimapur District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
11	1	St. John HS Res. School, Dimapur	24081170	Lipshi Deb	Sungtiben Jamir	Female	62
	2	MGM HSS, Dimapur	24081075	Kukku Marin Mathew	Aman Kumar	Male	54
	3	Don Bosco HSS, Dimapur	24081312	Ms. Shanta Dey	Taliakum Pongen	Male	50
12	1	Little Star HSS, Dimapur	24080982	Ms Rachael	Ishaan Singh Bardewa	Male	58
	2	St. Paul HSS, Dimapur	24081185	Mr. Tekatemjen	Ikehakpeule	Female	55

Mentor 3: Prof. Jay Dhariwal, Professor, IIT Delhi

Mokokchung District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
3	1	Eden Academy, Mokokchung	24020058	Ms. Akhemyinla	Rongpangnir Imchen	Male	58
	2	Town HSS, Mokokchung	24020228	Mr. Yimmere Jamir	Imtisosang Noel Longkumer	Male	58
	3	Queen Mary HSS, Mokokchung	24020172	Ms. Benjongrenla	Suroli Sangtam	Male	55

Kiphire District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
13	1	Loyola HSS, Kiphire	24090094	Vicky	Chumrise Ayonger	Male	43
	2	Little Flower HSS, Pungro	24090073	Catherine Mao	Suveytsu Yimchunger	Male	39
	3	Loyola HSS, Kiphire	24090133		Kokpila S	Female	39

Wokha District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
8	1	Fernbrook School, Wokha	24060006	Mrs. Swarnali Das Gupta	Eben L. Tsopoe	Male	45
	2	Fernbrook School, Wokha	24060019		Khonzani T. Ovun	Female	43
	3	Fernbrook School, Wokha	24060024		Randanbeni R. Ngullie	Female	45
9	1	Bethsaida school, Wokha	24060004	Ms. Lochumlo	Tumben Y. Murry	Male	43
	2	Perennial School, Wokha	24060068	W. Meribeni Kikon	Lansothung L. Murry	Male	43
	3	Perennial School, Wokha	24060086		Lumchibeni T. Kikon	Female	43

Peren District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
15	1	L.M. HSS, Mhainamtsi	24110171	P. G. Abraham	Poubina	Female	39
	2	Baptist High School Jalukie	24110002	Witalakbo	Tiameren	Male	38
	3	L.M. HSS, Mhainamtsi	24110163		Kibangdon Chalunmai	Female	38
	4	St. Xavier HSS, Jalukie	24110131	Jianchuilung	Keyinchunglung	Male	38

Mentor 4: Prof. Sumer Singh, Professor, IIT Delhi

Chümoukedima District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
17	1	Little Flower School, Chümoukedima	24130342	Mr. Deboprosad Bose	Gaigongrei	Male	46
	2	Nagaland Police Central School, Chümoukedima	24130290	Mr. Robert	Gungun Kumari	Female	46
	3	Saint Savio HS, Chümoukedima	24130377	Ms. Bethel	Kelina R K	Female	46
18	1	St. Joseph HSS, Chümoukedima	24130423	Ms. Rüüseno	Nito Jimomi	Male	46
	2	Cosmopolitan School, Chümoukedima	24130059	Ms. Medozenuo Angami	Kongbrailatpam Devshri Devi	Female	45
	3	St. Joseph HSS, Chümoukedima	24130422		Naonii Roger Shedu	Male	45
	4	Rincho Academy, Chümoukedima	24130724	Ms. Asha Kiso	Horzak Lungleng	Female	45

Zunheboto District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
10	1	Olympic HSS, Zunheboto	24070023	Ms. Toyekali Yeptho	Sudhanshu Kumar	Male	51
	2	Olympic HSS, Zunheboto	24070003		Akivito B Awomi	Male	42
	3	Hillto Children Home School, Akuluto	24070123	Semato Aye	Atou-u	Male	40
	4	Woodland HSS, Zunheboto	24070072	Tolito H Sumi	Veto Zhimo	Male	40

Tseminyu District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
20	1	Baptist HSS,Tseminyu	24150006	Mr. Philipson	Nuklasenla Jamir	Female	45
	2	Baptist HSS,Tseminyu	24150017		Mercy Tep	Female	40
	3	Baptist HSS,Tseminyu	24150018		Olivia Athari	Female	40

Shamator District

Group	Sl. No.	Name of the School	Roll No.	Teacher-guide	Student's Name	Gender	Marks
21	1	Christian High School, Shamator	24160001	Mr. Akhumba Y Yimchunger	Lunso Hopson	Male	41
	2	St. Xavier HSS, Shamator	24160032	Mr. Tothong	Wongshito	Male	37
	3	St. Xavier HSS, Shamator	24160040		Shongmou	Female	37