



2022 GLOBE Asia-Pacific Virtual Student Presentation

January 24, 2022
via ZOOM VDO Conference

“We Learn
We Do
with
GLOBE”



Contents

	Page
Agenda for 2022 GLOBE Asia-Pacific Virtual Regional Meeting	2
Student Research Abstract	
1. The Effect of Different Soil Characteristics between Burned Soil and Plowed Soil on Growth of Rice <i>Winfield High School, India</i>	5
2. Mosquito Larva Studies <i>Amity Public School, Nepal</i>	6
3. Impact of Chemical waste on environment <i>Pushpanjali Secondary School, Nepal</i>	7
4. Assessing the Correlation of the Air Pollution and Meteorological Conditions of San Mateo in a COVID-19 Setting <i>Batasan Hills National High School, Philippines</i>	8
5. Finding Microplastics In Campus <i>New Taipei Municipal Hsin Tien Senior High School, Taiwan Partnership</i>	9
6. Microplastics Monitoring in two main river of central Taiwan. <i>Feng Yuan Senior High School, Taiwan Partnership</i>	10
7. The Study of How the Amount of Clouds in the sky Affect the Difference of Temperatures during Daytime and Nighttime <i>Varee Chiangmai School, Thailand</i>	11
8. The study of physical factors of dung beetles for the development of an automated artificial nest system <i>Sawang Daen Din School, Thailand</i>	12
9. Technique to increase yield of Pan Phichit lime (<i>Citrus aurantifolia</i> Swingle) by applying soil properties data together with automation system <i>Donchanwittayakom School, Thailand</i>	13
10. 3-year-Navigating Environmental Indices around Jungil High School, Daejeon, South Korea <i>Jungil High School, Republic of Korea</i>	14



Agenda for
2022 GLOBE Asia-Pacific Virtual Regional Meeting
“We Learn We Do with GLOBE”
January 24 – 26, 2022 via ZOOM VDO Conference

Hosted by:

GLOBE Thailand, The Institute for the promotion of teaching science and technology (IPST)
and GLOBE Asia-Pacific Regional Office

Sponsor by: GLOBE implementation office

****All times are in Manila Time Zone****

Date & Time	Description	Remark
Day 1: January 24, 2022	GLOBE Student Presentation	
10:30 am – 11:00 am	Register	
11:00 am – 11:30 am	Opening Session Introduction and Welcome Remarks By Prof.Dr. Sukit Limpijumnong, President of IPST and Country Coordinator, GLOBE Thailand Welcome Remarks Dr.Desh Bandhu, Coordinator /GLOBE Regional Coordination Office for Asia-Pacific Welcome Remarks By Dr. Tony Murphy, Director/GLOBE Implementation Office, USA Opening speech By Dr. Khunying Kalaya Sophonpanich, Deputy Minister of Education (VDO Presentation)	MC: Dr.Alongkot Maiduang, IPST
11:30 am – 12:15 pm	Plenary Talk#1 “Space Science and Technology for All” By Dr. Saran Poshychinda, Executive Director, National Astronomical Research Institute of Thailand (Public Organization)	
12:15 pm – 1:00 pm	Plenary Talk#2 “Sensor and Smart Farming Implementation for Student Project” By Assoc. Prof. Dr.Krisanadej Jaroensutasinee Walailak University, and GLOBE Technology Working Group	
1:00 pm – 2:00 pm	Break (Lunch)	
2:00 pm – 4:00 pm	Student Presentation 1. Winfield High School, India 2. Amity Public School, Nepal 3. Pushpanjali Secondary School, Nepal 4. Batasan Hills National High School, Philippines 5. New Taipei Municipal Hsin Tien Senior High School, Taiwan Partnership	- 7 mins for each presentation



Date & Time	Description	Remark
	6. Feng Yuan Senior High School, Taiwan Partnership 7. Varee Chiangmai School, Thailand 8. Sawang Daen Din School, Thailand 9. Donchanwittayakom School, Thailand 10. Jungil High School, Republic of Korea	
Day 2: January 25, 2022	GLOBE Asia-Pacific Regional Meeting	
10:45 am – 11:00 am	Register	
11:00 am – 11:15 am	Opening Session Welcome Remarks & Opening Remarks by Prof.Dr. Sukit Limpijumnong, President of IPST	MC: Miss Samornsri Kanphai, IPST
11:15 am - 11:45 am	Opening Remarks & GLOBE Program Update By Dr. Tony Murphy, Director/GLOBE Implementation Office, USA	
11:45 am – 12:30 pm	Opening Remarks & The GLOBE Program status in the region By Dr.Desh Bandhu, Coordinator /GLOBE Regional Coordination Office for Asia-Pacific	
12:30 pm – 1:00 pm	GLOBE Country Coordinators Report	- Conduct by Dr.Desh - Alphabetical order by country name
1:00 pm – 2:00 pm	Break (Lunch)	
2:00 pm – 4:00 pm	GLOBE Country Coordinators Report (cont.)	
Day 3: January 26, 2022		
10:45 am – 11:00 am	Register	
11:00 am – 12:00 pm	GLOBE Working Group Report	- MC: Miss Samornsri Kanphai, IPST - Conduct by Mr. Yogenda, Nepal
12:00 pm - 1:00 pm	GLOBE Website Update & GLOBE's new Data Entry System By Mr. David Overoye, Manager, SSAI Web Solutions	
1:00 pm – 2:00 pm	Break (Lunch)	
2:00 pm – 3:00 pm	Student Exchange & Regional Campaigns (Presentation and Discussion) By Dr.Desh Bandhu, Coordinator /GLOBE Regional Coordination Office for Asia-Pacific	
3:00 pm – 3:50 pm	GLOBE Strategic Plan & Its Implementation (Presentation and Discussion) By Dr. Tony Murphy, Director/GLOBE Implementation Office, USA	
3:50 pm – 4:00 pm	Closing Session	



GLOBE Asia-Pacific Student Research Abstract





The Effect of Different Soil Characteristics between Burned Soil and Plowed Soil on Growth of Rice

Student (s): B. Tanush Reddy, Y. Dhanush, G. Nihanth Sai, X CLASS

Teacher: Gadde Pulla Rao M.Sc., B.Ed.

School: Winfield High School – Khammam, India

Country: India

Abstract

Soil management strategies influence soil nutrients, which directly affect the growth of rice. This study compared soil nutrients resulting from three different soil management strategies and their effects on rice growth. After interpreting the results of the nutrient studies, plowed soil was shown to have the lowest pH level and nitrogen content, but the highest phosphorus and potassium contents. Similarly, rice plants showed the most productive growth, as measured by plant height and density, in plowed soil. Thus, plowing the soil up and over remaining rice straw and hay was identified as the most appropriate system for sustaining agricultural rice production.

Keywords: *soil, rice plant, rice growth, burned soil, plowed soil*



Mosquito Larva Studies for Mosquito Born Diseases

Student (s): Jenish Bhattarai, Ujjwal Bhujel, Ankesh Kaduwal, Parina Phuyal, Purnata Karki, Pabita Ramtel

Teacher: Subarna Bhattarai

School: Amity Public School

Country: Nepal

Abstract:

Mosquito Larva Studies has turned vital for our area as our municipality, Mechinagar Municipality, Jhapa, Nepal, also falls in risk zone for dengue, malaria and encephalitis.

Hypothesis:

The high fever was the main symptom among the patients and the people who died. So, it might be due to one among above indicated diseases. Malaria, Dengue and Encephalitis.

Procedure:

- i. Collection of larvae from different locations.
- ii. Observation of Larva's location in water.
- iii. Observation of Electrical Conductivity, pH and Temperature of water.
- iv. Larva observation on larva tray. Using lens on mobile using GLOBE Protocol sheet among team mates.
- v. Photos taken to process on GLOBE Application.

Principal Result:

- i. Identified different mosquitoes' larva *Culex* and *Aedes*.

Conclusion:

- i. The prone diseases classified to aware the mates within the school.
- ii. The awareness information on Facebook and social media.
- iii. Volunteered the location to generate awareness against the related diseases.
- iv. Helped cleaning the area possible.
- v. Inform the concerned authority as well.



Impact of Chemical waste on environment

Student (s): Miss Nasala Lakhey, Miss Dristi Maharjan, Mr. Aashutosh Karki,
Miss Kristina Maharjan, Mr. Alex Maharjan, Miss Sujita Maharjan

School: Pushpanjali Secondary School

Country: Nepal

ABSTRACT

The Godavari is one of the places where we have researched based on our investigation and research on it; this experiment investigated the water quality and soil quality. We collected the water and soil of Godavari and tested its acidity and alkalinity of it. We formed different groups and went to collect different samples on different days and got different results.

We noticed that in rainy weather sewages from different canals and drains and dumping sites get mixed into the Godavari River. We use different materials for a sample and collected the water and soil in different bottles. Then we visited various farms and industries in that area and interviewed them. Through that, we found that they all used chemical fertilizers as it was easy to use and was profitable in comparison to organic fertilizers. They used chemicals like urea, ammonium phosphate, ammonium sulfate, and ammonium chloride. Not only that, synthetics like detergents, facewash, handwash, etc. got mixed in the river traveling through drains and canals.

After collecting the samples and completing our field visits, we tested those samples of soil and water and tested them in the chemistry lab of our school with our assigned teacher. We found that the pH value of clean water was 6.9 and the water affected by the sewage was 8.0 and that made caused water pollution where people go far from home to fetch a bucket of water. Also, cause the impossibility to grow crops easily as many local people are using chemical fertilizer that results in decreasing the fertility of the soil.



Assessing the Correlation of the Air Pollution and Meteorological Conditions of San Mateo in a COVID-19 Setting

Student: Mr. Josiah Myron A. Diosanta

Teacher: Mrs. Maria Teresa Brioso

School: Batasan Hills National High School

Country: IBP Road, Batasan Hills, Quezon City, NCR, Philippines

Abstract

According to the World Health Organization (2020), the air quality in the Philippines is considered moderately unsafe which can bring detrimental effects to Filipinos living in the perimeter. This issue caused 45.3 deaths for every 100,000 people in the said country. The objective of this study is to produce an air quality data at San Mateo, Rizal as well as to be more cognizant about the factors of meteorological conditions as vehicle. The researcher gathered the air quality (particulate matter and carbon dioxide) and meteorological conditions (surface temperature and humidity) in three areas of San Mateo, Rizal; namely, Ampid Public Market, SM San Mateo, and Barangay Banaba for 28 days. After the experimentation, average and correlational values were assessed. For the relationship between Particulate Matter and Surface Temperature, the Banaba (0.64) is more moderate. A moderate degree of relationship exists between Particulate Matter and Relative Humidity in Ampid (0.47) and Banaba (0.34) than SM San Mateo. The correlation between the Carbon Dioxide and Surface Temperature appeared to have strong relationship with each other in each site (0.83, 0.73, and 0.69 for SM San Mateo, Banaba, and Ampid, respectively). For the correlation between the Relative Humidity and Carbon Dioxide, Banaba (0.75) has the highest degree of correlation. Overall, these Air Pollutants and meteorological conditions which are the Surface Temperature and Humidity have a significant relationship with each other. It is concluded that an increase in Carbon Dioxide concentration in the atmosphere may increase the amount of Relative Humidity in the area. According to Comunian et.al (2020), states that Particulate Matter had a mechanism for the COVID-19 virus to proliferate. Due to the limited source of materials, time and to the pandemic happening around, the researcher recommends utilizing standard devices and spends more time in gathering data correlating the present medical condition.

Keywords: *Air Pollution, Meteorological Conditions, Particulate Matter, Carbon Dioxide, Humidity, Surface Temperature*



Finding The Microplastic In Campus

Student (s): Chia-En Tsai, Wan-Hsuan Yang

Teacher: Cheng-Chang Chen

School: New Taipei Municipal Hsin Tien Senior High School

Country: Taiwan Partnership

Abstract

We are curious about the number of microplastics from the water in our lives, such as tap water, drinking water, and so on. We speculated that there won't be too many microplastics in tap water because it has been processed. The number of microplastics in the water dispenser should be almost zero. We used special paper to filter the experimental water, observe the microplastics remaining on the filter paper, and record its number. The number of microplastics in the tap water is not as much as we guessed, usually lower than in untreated river water, which means that the treatment and filtration are effective. But some water that from water dispensers is exceeding expectations. More than we thought, some are even as same as the amount of tap water. Therefore, how to decrease the microplastics from water dispensers is the issue we care about.

Keyword: *Microplastics, Campus, Water, Drinking fountain*



Microplastics Monitoring in two main river of central Taiwan

Student (s): Cheng-Hua Wu, Cyuan-You Syu, Ying-Shan Tu, Yue-Lin Jiang

Teacher: Ke-Hsuan Zheng

School: Feng Yuan Senior High School

Country: Taiwan Partnership

Abstract

In this study, we used the developing GLOBE Microplastics Monitoring Protocol to quantitatively analyze plastic debris in Dajia river and Wu River located in central Taiwan. We collected water samples along the river from November to December, 2021. In the 10 samples we examined, there were 100% plastic debris, even the water in the upper reaches of the river. Fibers were the most common item in our sample, they can divided into two category. First were colored natural fibers, they can become transporters of microplastics. Secondly were man-made fibers, some of them have fluorescent when they are exposed to UV light. We found that the quantity of microplastics in the lower reaches of the river (115 items/L) was more than upper reaches (35 items/L).

We also found lots of plastic materials(2~5mm) in central west beach of Taiwan. However, there were just a few microplastics founded in one water sample collected nearby Wu River estuary, fishing port and oysters culture area. We speculated it is may be caused by oysters. It might infer that oysters will be more vulnerable to microplastics pollution.

Keyword: *microplastics, gridded membrane filter, fiber, Dajia river, Wu River*



The Study of How the Amount of Clouds in the sky Affect the Difference of Temperatures during Daytime and Nighttime

Student (s): Bhira Tayarangsee, Wareerat Nuntasukkasem, Khanasiri Intakosum

Teacher (s): Sangmanee Mingsrisuk, Rattanaorn Waenphet

School: Varee Chiangmai School

Country: Thailand

Abstract

Weather has a very important role in our daily lives. The weather in an area is affected by particular weather components pertaining to the area. These components can change all the time and the change of one may or may not affect the others. The cloud is one such component. They reflect solar radiation back to space while also absorbing the shortwave during the day and emitting the energy as infrared radiation at night. This process helps balance the temperature during the day and at night. Thus, the purpose of this study was to investigate how the amount of clouds affect the difference of the daytime and nighttime temperatures. The amount of clouds on each day was observed and recorded. The data was then compared to the difference of the average temperatures recorded daily using a device made from Arduino board and temperature sensor to find a relationship. The findings showed that the amount of clouds did affect the difference of the daytime and nighttime temperatures. On cloudy days, the temperature differences were low while it was high on days with few clouds. However, it was also found that apart from the amount of clouds, other factors also affect these differences for example, the amount of dust particles in the air or the types of clouds.

Keywords: *Weather, Cloud quantity, results of cloud quantities causing air temperature*



The study of physical factors of dung beetles for the development of an automated artificial nest system

Student: Ngamthip Fongchon, Chayakorn Sanusit and Sasipim Janporn

Teacher: Jassada Ritsreeboon and Surasak Sangchan

School: Sawang Daendin School, Sakon Nakhon Province

Country: Thailand

Abstract

This research examines the physical factors of life for the dung beetles, dung pat size, depth of nest from soil surface, soil pH, soil moisture, soil color, soil texture, soil temperature, air temperature, size and number of dung ball found in the study area of Sawang Daen Din District, Sakon Nakhon Province. In February, 2021, to develop an automated artificial nest system using the Node MCU ESP8266 to control physical factors in the soil to optimize the development of dung beetle larvae for conservation and economic cultivation.

The results showed that Dung beetles live in the dung and nest under the dung pat. Depth from the average soil surface 3.16 cm in sandy loam (SL) with average soil pH of 7, average soil moisture 33%, soil color 7.5YR4/3, 7.5YR4/5, 7.5YR4/6, average soil temperature 30.7 °C, average air temperature 33.1 °C. From the survey, 11 dung ball were found with an average diameter of 2.45 cm and an average size of dung pat 188.60 cm². When designing and developing artificial nests for cultivating babies with automatic control system, it was found that the artificial nests were able to control the physical factors, humidity in the life of the larva. The soil properties were suitable for the growth of dung beetle larvae similar to those found in nature.

Keywords: *physical factors, dung beetles, automated artificial nest*



Technique to increase yield of Pan Phichit lime (*Citrus aurantifolia* Swingle) by applying soil properties data together with automation system.

Students: Mr.Anuphong Khunkhang, Mr.Amarin Nantain, Ms.Paphadsara Buttawong

Teacher: Mrs.Saranya Panpradab

School: Donchanwittayakom school, Don Chan District, Kalasin Province

Country: Thailand

Abstract

Because during the dry season in the area of Don Chan District, Kalasin Province There was a decrease in the yield of lemons but has a higher price. In addition, most of the soil in the area is sandy loam keep less moisture, low nutrients and limited water use. The research team is therefore interested in solving such problems. Therefore, the technique of increasing the yield of Pan Phichit lime was studied by applying soil properties data together with an automated system. 1) To study soil properties suitable for flowering and fruiting of lime 2) To compare the amount of watering of lime trees affecting flowering and fruiting of lime 3) To study the efficiency of the automatic irrigation system affecting flowering and fruiting of lemons 4) To study and compare the efficiency of ground cover from legume leaves V2. 5) To study the yield enhancement technique affecting flowering and fruiting of lime. By studying the soil properties of the lime orchards of the farmers, it was found that the soil properties in the lemon gardens of the farmers in both areas had pH, NPK nutrients, and soil temperatures that were similar, and were in the appropriate criteria for planting. However, soil moisture lemon garden planted by a cement pond has a more suitable soil moisture content for planting than a garden planted with a normal plant. When studying the relationship between soil moisture and the number of fruiting of limes, it was found that watering the lime trees in the amount of 1000 and 1500 cm³/day resulted in the highest fruit fruiting effect. (Soil moisture is between 44.67-54.67%) From the study of the ground cover from legume leaves, it was found that each ratio of the ground cover from legume leaves had different effects on the soil properties. By using ground cover from legume leaves mixed with chemical fertilizers and ground cover from legume leaves mixed with chemical fertilizers and Trichoderma affects the soil properties that are most suitable for growing plants. Therefore, the ground cover from legume leaves mixed with chemical fertilizers and Trichoderma is the ground cover from legume leaves V2. Because there is a mixture of Trichoderma that helps with digestion and preventing plant diseases from soil. When growing limes by using automatic irrigation system together with ground cover from legume leaves V2, it was found that the soil moisture control was in a range suitable for growing limes, the humidity was at 45-55% and resulted in more flowering and fruiting of the lemon tree than the farmer's cultivation. The study on the control of the number of inflorescences of inflorescences which was transmitted to the increase in yield of limes revealed that the reduction of 2 inflorescences of the limes resulted in the best fruiting of the limes. When comparing the diameters of the limes from different experiments, it was found that the values were not significantly different. And when the battle of hormones from banana stalks affecting to increase the yield of limes, it was found that planting lemons and spraying hormones from banana stalks resulted in more flowering and fruiting from limen trees than growing limes by conventional farmers without injections hormone spray.

Keyword: *Automatic watering system, Cover sheet from legume leaves, Techniques to increase productivity.*



3-year-Navigating Environmental Indices around Jungil High School, Daejeon, South Korea

Student (s): Hee Sung JUNG *et al.*

Teacher: Duck Gon KIM

School: Jungil High School

Country: Republic of Korea

Abstract

Our SOJU science club at Jungil High School is formed for students who are interested in earth environment. We have highly interested in how climate change affects nature. So we decided to study on surrounding water and air environments including river and mountains around our school. We used various measuring devices such as water quality multi-parameter analyzer, laser thermometer and weathercock. After collecting data, we saved all the data and analyzed them. First, we measured key parameters including Dissolved Oxygen (DO), Electrical Conductivity (EC), pH, Total Dissolved Solids (TDS) as a water quality indices and observed various aquatic organisms. Second, we have regularly monitored fine particulate matter (PM 10) and ultra-fine particulate matter (PM 2.5) ratio in the atmosphere around the school for 3 years, from 2019 to 2021. Our results show that there have been no significant changes in both PM 10 and PM 2.5 level in atmosphere around the Jungil High School, Daejeon, South Korea. As a result, we conclude that no significant climate changes could keep maintaining lives of various living organisms.

Keyword: *Particulate Matter(PM), PM 10, PM 2.5, 3-year, South Korea*



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