

THE
REGENERATIVE
FUTURE

DRONE AGAINST FOREST FIRE



JUANG
PATTANA
HOLDING

ChangeFusion

FabCafe
what do you fab?





Thai Summit Group is a Thai manufacturing company. It is a manufacturer of automotive and motorcycle parts, electrical appliances, and agricultural machinery. The company was founded in 1977.

ChangeFusion

A Bangkok-based organization that grows social entrepreneurs for creative and sustainable change.



A global network now serves and fosters creative technology communities in 14 locations around the world.



A service provider focusing on restoring forests with biological science knowledge.

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About the Regenerative Future

30 MARCH	<u>OPENHOUSE</u>
06-08 APRIL	<u>INSIGHT CAMP IN CHIANG MAI</u>
20 APRIL	<u>TRAINING SESSION: DRONE DJI</u>
07-4 MAY	<u>TRAINING SESSION: DIGITAL FABRICATION</u>
18 MAY	<u>TRAINING SESSION: PROTOTYPING</u>
25 MAY.	<u>FIELD TRIP: MANUFACTURING AND AUTOMATION</u>
02 JUNE	<u>EARTH SHOT</u>



Embark on a transformative journey with **THE REGENERATIVE FUTURE**, a groundbreaking program crafted through the collaborative efforts of Thai Summit, ChangeFusion, and FabCafe Bangkok. This pioneering initiative is dedicated to enlightening and empowering the next generation on the pressing issues of environmental vulnerability and climate change. It aims not only to foster comprehension of these challenges but also to actively engage participants in the pursuit of sustainable solutions.

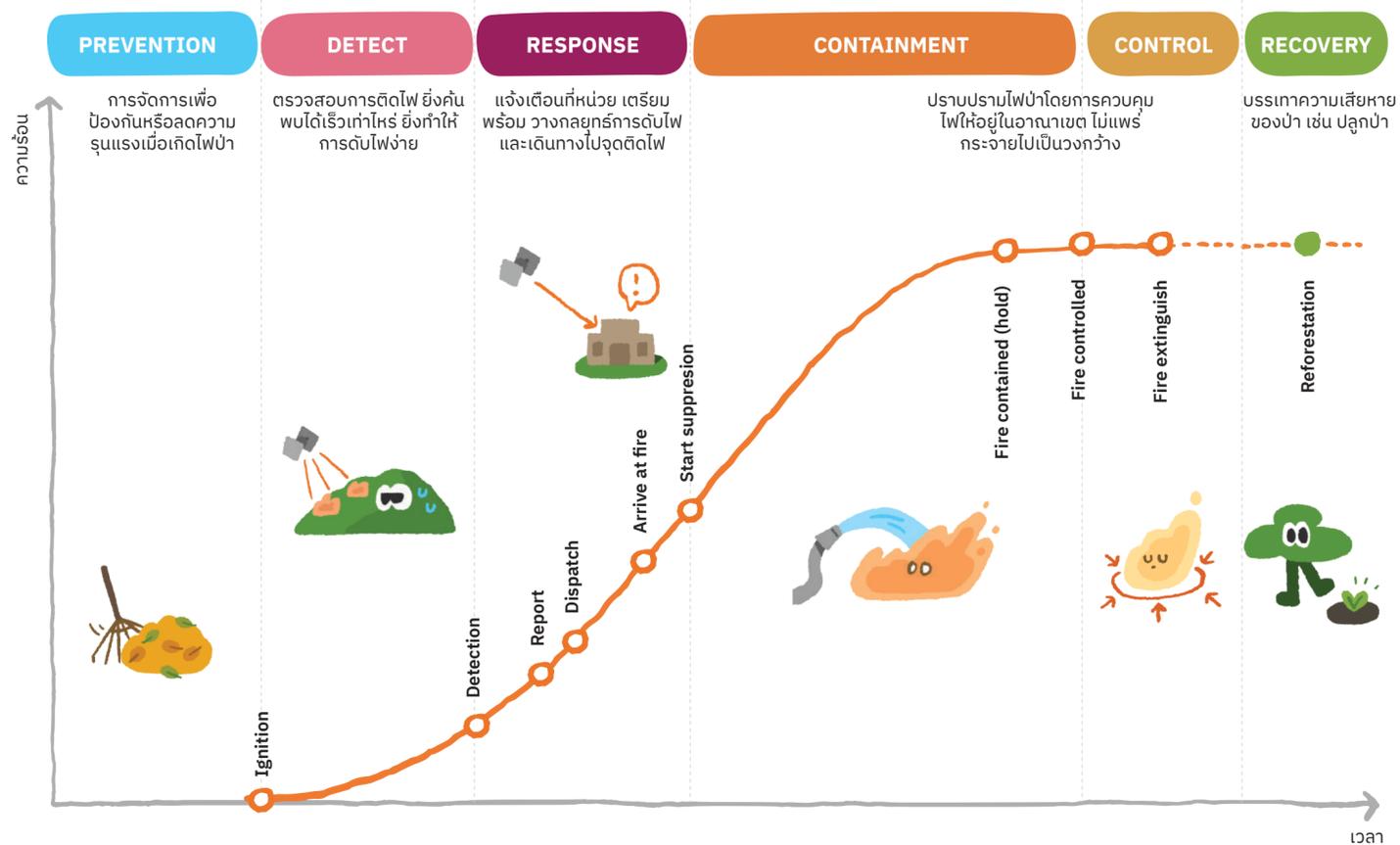
This year, the program zeroes in on the pervasive threat of wildfires in Northern Thailand. Participants will delve into the heart of this issue by engaging directly with key stakeholders dedicated to its mitigation. These stakeholders encompass a diverse array of perspectives, including the Chiang Mai city governor, National Park officials, tribal communities, and local dwellers in the Chiang Mai region.

Through firsthand experiences, participants will gather invaluable insights and data crucial for crafting effective solutions. Complementing this knowledge acquisition is specialized training in cutting-edge technologies. Participants will receive comprehensive instruction in drone technology with DJI. Additionally, they will gain proficiency in utilizing rapid prototyping machines, equipping them with the tools necessary to translate their ideas into tangible innovations.

Armed with newfound knowledge and technological prowess, participants will embark on a mission to devise actionable solutions to combat wildfires. These solutions will be rigorously tested and showcased to frontline responders, fostering collaboration and exchange of expertise. The ultimate objective of **THE REGENERATIVE FUTURE** is to catalyze the transformation of knowledge and technology into potent instruments for addressing urgent environmental challenges.

Join us as we embark on a journey of discovery, innovation, and regeneration, forging a path towards a brighter and more sustainable future.

Drone Against Forest Fire



Forest fire management often garners attention primarily for its dramatic and immediate stages of containment and control. However, to address the growing frequency and intensity of forest fires, a broader perspective is necessary. Prevention and detection are crucial elements that can significantly mitigate the impacts of fires before they grow uncontrollable. Early detection systems can dramatically reduce the spread and severity of fires, enabling more efficient resource allocation and response. Moreover, recovery processes are pivotal, often overlooked stages that ensure ecosystems and communities can rehabilitate after a fire. Effective recovery strategies not only restore these areas but also enhance their resilience against future fires.

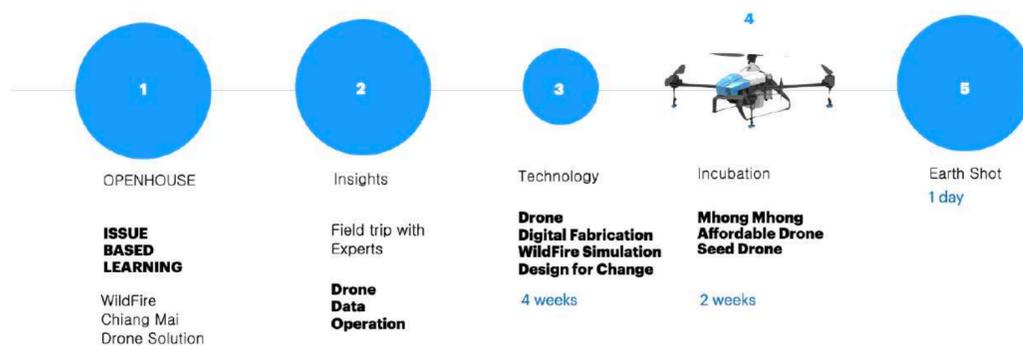
As forest fires become more frequent and devastating, the use of technology in managing these disasters has become crucial. Internet of Things (IoT) applications and remote sensing technologies have transformed how we detect and manage fires. IoT sensors can monitor forest conditions in real time, providing critical data on humidity, temperature, and other fire-inducing variables directly to firefighting teams. Remote sensing, utilizing satellites and aerial imagery, offers comprehensive landscape surveillance, enabling quicker responses to emerging threats. Among these technologies, drones have become particularly influential. Equipped with thermal imaging and high-resolution cameras, drones offer real-time, accessible, and detailed views of fires, allowing for strategic decision-making that has proven successful in numerous instances. Notably, drones have been effectively used to map fire progression, direct firefighting efforts, and assess damage post-fire.

THE REGENERATIVE FUTURE programs are increasingly incorporating drone technology, heralding a new era of forest fire management. These programs leverage drones not only for damage assessment but also for reforestation efforts. For frontline responders, the benefits are transformative. Drones provide a safer way to evaluate and combat fires, reducing the risk to human life and increasing the effectiveness of firefighting strategies. By integrating advanced technologies such as drones, forest fire management is not only becoming more sophisticated but also more proactive, ensuring that ecosystems and communities are better protected and prepared for future challenges.

Executive Summary

The Regenerative Future project is a focused two-month intensive initiative designed to equip 30 young individuals with the necessary skills and knowledge to address environmental challenges innovatively and sustainably. This year, the spotlight is on tackling the issue of forest fires in Chiang Mai. The program aims to empower students to collect data and develop empathy-driven insights before launching their projects, with a strong emphasis on using drone technology. It features a collaborative effort between academic institutions and environmental organizations, merging local expertise with advanced technological training.

The cohort consists of 30 students—19 males and 11 females—with two hailing from Chiang Mai itself. These students represent 15 different schools and have an average age of 15 years, with the oldest being 18 and the youngest 12. The program produced three projects.



The Regenerative Future: Implementing Constructivism in Learning

1. Insight Camp: The program begins with a three-day Insight Camp in Chiang Mai, initiating participants into the environmental, social, and economic dimensions of forest management. In collaboration with Chiang Mai University, FORRU, Breath Council, GEOSAC, local tribes, and the staff of Doi Suthep-Pui National Park, the camp offers an immersive learning experience. It emphasizes sustainable forest management practices and the crucial role of community engagement in conservation efforts. Lectures delivered by frontline experts elucidate the significance of forests, the causes and challenges of forest fires, and the current strategies to mitigate these issues. Subsequently, participants visit local sites to engage directly with the Hmong community and volunteers dedicated to forest conservation, gaining a comprehensive understanding of the dynamics influencing forest fires.

2. Technology Camp: The second segment, known as the Technology Camp, is held in Bangkok and concentrates on technological empowerment. Students are introduced to advanced technologies such as drones, the Internet of Things (IoT), and data visualization techniques. This phase includes hands-on sessions where these technologies are employed in real-time scenarios to improve forest surveillance and manage wildfires more effectively. Collaborations with companies like DJI enrich the curriculum, offering insights into digital fabrication and providing opportunities for students to prototype and familiarize themselves with drones at FabCafe Bangkok.

3. Incubation Phase: The concluding phase of the program is the Incubation Phase, where participants apply the insights and skills acquired from the previous camps to devise innovative solutions. This phase involves practical project work, focusing on real-world applications that contribute to sustainable forest management and conservation. Key projects developed by the participants include:

- **Hmong Hmong Kombucha:** This initiative leverages agricultural waste to create a kombucha product, the proceeds from which are used to fund wildfire prevention efforts. It exemplifies how agricultural byproducts can be repurposed to support environmental conservation.
- **Affordable Drone:** This project develops a cost-effective drone equipped with thermal imaging technology to enhance forest surveillance. The drone is designed to detect early signs of wildfires, potentially saving vast areas of forest by enabling timely interventions.
- **Floritech Drone Seeding:** Aimed at restoring post-disaster landscapes, this project uses drone technology to disperse seed capsules across devastated areas. The technology is tailored to boost the survival rates of native plant species, facilitating faster and more effective reforestation.

These projects underscore the program's commitment to blending innovative technology with practical conservation strategies, providing participants with the tools to make tangible contributions to environmental sustainability.

Executive Summary

Three innovative projects undertaken by students tackle different targets and goals in forest fire management, each bringing unique solutions to the forefront of ecological and technological integration.

First Project: Hmong Hmong - Kombucha for Sustainability

Funding The Hmong Hmong project targets the unsustainable nature of relying on donations for forest fire management in the expansive forest areas of Chiang Mai. Recognizing the limitations in budget and manpower, this initiative seeks to establish a self-sustaining income model by harnessing agricultural byproducts. The team uses leaf scraps from coffee and avocados, cultivated by the Hmong people of Mae Sa Mai, to produce kombucha. This approach not only generates funds for fire protection but also covers insurance and accident protection for the staff and volunteers involved. Innovatively, while kombucha is traditionally made with tea leaves, the Hmong Hmong project diversifies by using coffee leaves, which are rich in caffeine and antioxidants—agents that help detoxify the body. Recently, they have also begun utilizing avocado leaves, which are high in iron and calcium but previously unexplored for kombucha production, making them pioneers in this aspect.

Continue: The project benefits from low investment costs and utilizes locally available resources, making it easy to implement. However, it faces challenges in market acceptance and production flow. Kittikun Aornnim, a key team member and 2023's National Outstanding Youth in the Environment, leads this initiative, working closely with the local Hmong community to ensure its success.

Second Project: Affordable Drone Technology for Enhanced Detection

The Doi Suthep area, spanning over 160,000 rai, is monitored by just 120 park officials, with only 50 dedicated to patrolling high-risk areas. This translates to a staggering 3,200 rai per official, underscoring a critical need for technological assistance in forest management. The Affordable Drone project addresses this by developing a low-cost reconnaissance drone equipped with thermal imaging technology, designed to detect forest fires from a distance. This initiative aims to make such technology accessible, reducing costs from hundreds of thousands to just tens of thousands.

Developed using the iFlight TITAN XL5 framework, the drone integrates Raspberry PI and OpenMV Cam H7 Plus for its hardware, with software powered by OpenMV MicroPython and Machine Vision. This design mirrors the ingenuity and adaptability of a new generation that leverages online technological resources to create solutions for environmental and social challenges, regardless of age or educational level.

Pause: However, the project faces challenges with the high costs of thermal cameras, which are essential for the drone's functionality but lack a low-cost alternative in the market. A proposed solution is to develop an AI-enhanced thermal camera that might require more robust power and connectivity. Hiveground, a drone company, has shown interest in collaborating to overcome these hurdles and further develop this promising project.

Third Project: FloraTech - Drone Seeding for Forest Restoration

The FloraTech project leverages the growing accessibility of agricultural drones, which are no longer just tools for large-scale farming but are also enhancing the capabilities of smaller operations throughout Thailand. Developed by Udit Development Company to be cost-effective for small farmers, these drones are now being adapted for environmental restoration efforts.

FloraTech's initiative, known as the DRONE SEEDING project, utilizes Dronecoria's open-source technology adapted with a seed dispenser that precisely controls seed release over deforested areas. This method expedites the reforestation process, aiming to swiftly restore natural balances and lessen the impact on local communities' livelihoods post-disaster. In collaboration with the Forest Restoration Research Unit (FORRU) and The Next Forest, FloraTech has selected five native tree species—Climax and Pioneer varieties such as Black rosewood, Pod mahogany, Soap nut tree, Red sandalwood tree, Gamhar and Ficus hispida—tailored to promote ecological diversity and durability.

Continue: The seed capsules designed for this project are unique; they protect the seeds from being eaten by animals and provide essential nutrients to support early growth stages, enhancing survival rates. Moving forward, the project, in partnership with FabCafe Bangkok and a committed team of five students, plans to refine and scale this technology. They aim to customize the payload systems of DJI Agras drones to better match the specific needs of each seed type, with enhancements scheduled for implementation in October.

Section 1: Program

Insights

The program is structured into three main sections: Insights, Technology, and Incubation. Each part is designed to deepen students' understanding and engagement with forest fire management through a practical and immersive approach.

Insights Section This segment is a three-day camp in Chiang Mai, designed to introduce students to the complexities of forest fire situations in the region. The camp features seven key insights, each provided by different stakeholders to offer a comprehensive perspective:

- 1. FORRU Contribution:** Students learn about the significance and value of forests from the Forest Restoration Research Unit (FORRU), enhancing their understanding of ecological importance.
- 2. Community Forest Dynamics:** Breath Council imparts knowledge on the importance of community-managed forests and explores the human elements intertwined with these natural resources.
- 3. Biodiversity:** This session focuses on the biodiversity within forests and effective strategies for forest care and management, guided by experts from The Next Forest.
- 4. Hmong Tribe Visit:** A field trip to the Hmong tribe in Mae Sa Mai allows students to observe firsthand how local communities live, manage, and protect their forested areas.
- 5. Technological Insights:** An overview of current technologies used in forest management, such as smoke detection, remote sensing, data visualization, and AI, presented by experts from Chiang Mai University and Geosac.
- 6. Stakeholder Coordination:** Insight into the collaboration and coordination needed among various stakeholders like government agencies, media, and locals, facilitated by representatives from Doi Suthep-pui National Park.
- 7. Ideation Session:** This final insight involves students breaking into groups to discuss their learnings and brainstorm ideas to address the challenges discussed during the camp.

The camp successfully mapped out the intricacies of forest fires, providing students with a holistic understanding of the environmental, technological, and human factors that influence these natural events.

Successes of the Insights Camp

The program's structure, divided into seven distinct sessions, allowed students to engage with experts from various fields, including environmental scientists from the Forest Restoration Research Unit (FORRU), community leaders from Breath Council, and technology specialists from Chiang Mai University and Geosac. A particularly impactful experience was the visit to the Hmong tribe in Mae Sa Mai, where students observed firsthand how local communities manage and protect their forests. This practical exposure, coupled with theoretical knowledge, successfully created a comprehensive learning environment.

Students benefited significantly from the breadth of topics covered, gaining insights into everything from the ecological significance of forests and the role of community-managed forests to advanced technologies used in detecting and managing forest fires. This broad scope helped students connect the dots between different aspects of forest fire management, fostering a deeper understanding of the subject.



[Download the Handbook](#)



ประเภทของป่าแบ่งตามการจัดการ

ป่าอนุรักษ์ เขตอุทยาน



เขตรักษาพันธุ์สัตว์ป่า
วนอุทยาน

❌ ข้อห้าม

- ยึดถือ ครอบครองพื้นที่
- เก็บหา นำออกไปหรือกระทำการใดๆที่ส่งผลต่อระบบนิเวศ
- ล่อหรือนำสัตว์ป่าออกไป ทำให้เกิดอันตรายแก่สัตว์ป่า
- นำเครื่องมือล่าสัตว์จับสัตว์หรืออาวุธใดๆเข้าไปในพื้นที่
- เปลี่ยนแปลงทางน้ำหรือทำให้ น้ำเป็นพิษ เหือดแห้ง หรือนำเสีย
- กิ่งสิ่งเชื้อเพลิงที่ทำให้เกิดเพลิงไหม้

พ.ร.บ.อุทยานแห่งชาติ
พ.ร.บ.สงวนและคุ้มครองสัตว์ป่า

ป่าสงวนแห่งชาติ



ป่าสงวนและป่าคุ้มครอง

❌ ข้อห้าม

- ยึดถือ ครอบครอง บุกรุกพื้นที่ป่า
- ก่อสร้าง อยู่อาศัย
- ทำประโยชน์ในที่ดิน ทำให้ ไร่ของป่า
- ทำให้เกิดการเสื่อมเสียแก่สภาพป่า

✅ ทำได้ ต้องขออนุญาต

- ทำไม้หรือหาของป่าที่ไม่ใช่ไม้หรือของป่าหวงห้าม

✅ ทำได้ ไม่ต้องขออนุญาต

- ตัดไม้ไผ่ หวาย เถาว์ยี่ เก็บหาของป่าบางประเภทเพื่อบริโภคครัวเรือน
- เก็บเศษไม้ตายแห้ง ไม้พื้น

พ.ร.บ.ป่าสงวนแห่งชาติ

ป่าชุมชน



บ้านนอกเขตอนุรักษ์ที่ชุมชนร่วมกับรัฐในการดูแล จัดการอย่างยั่งยืน

❌ ข้อห้าม

- ยึดถือ ครอบครอง บุกรุกพื้นที่ป่า
- ใช้ประโยชน์ในเชิงการค้าที่คณะกรรมการไม่ได้อนุมัติ

✅ ชุมชนทำได้

- เก็บหาของป่า
- ใช้ประโยชน์จากไม้ ตามความจำเป็นที่ได้รับการอนุมัติตามแผนจัดการป่าชุมชน

✅ เจ้าหน้าที่ป่าชุมชน

- ตรวจสอบ ตรวจตรา ดูแลการดำเนินการใช้ประโยชน์จากผลผลิตให้สมดุล ยั่งยืน
- ป้องกันการเสียหายของป่า

พ.ร.บ.ป่าชุมชน พ.ศ. 2562

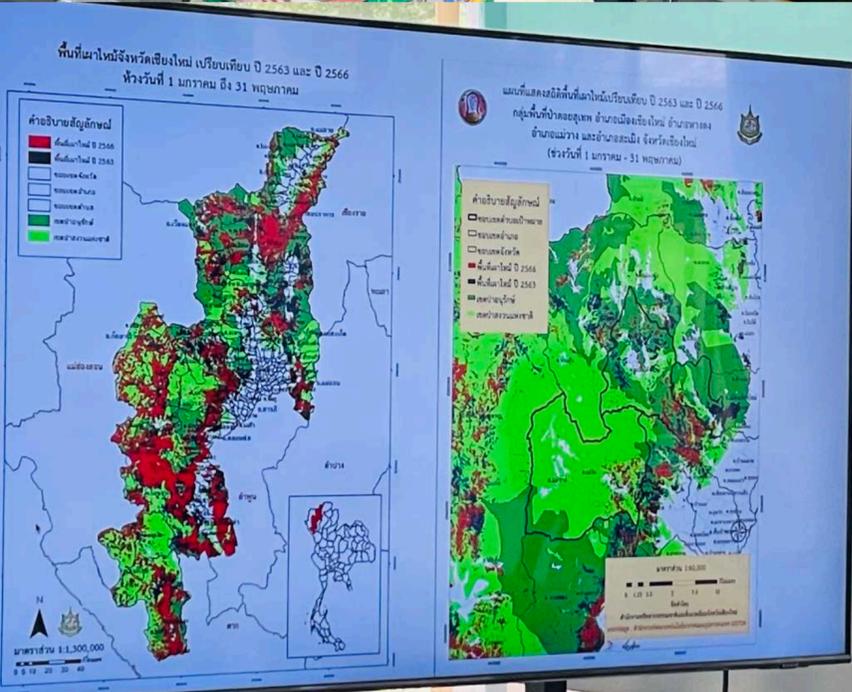
ป่ากรรมสิทธิ์

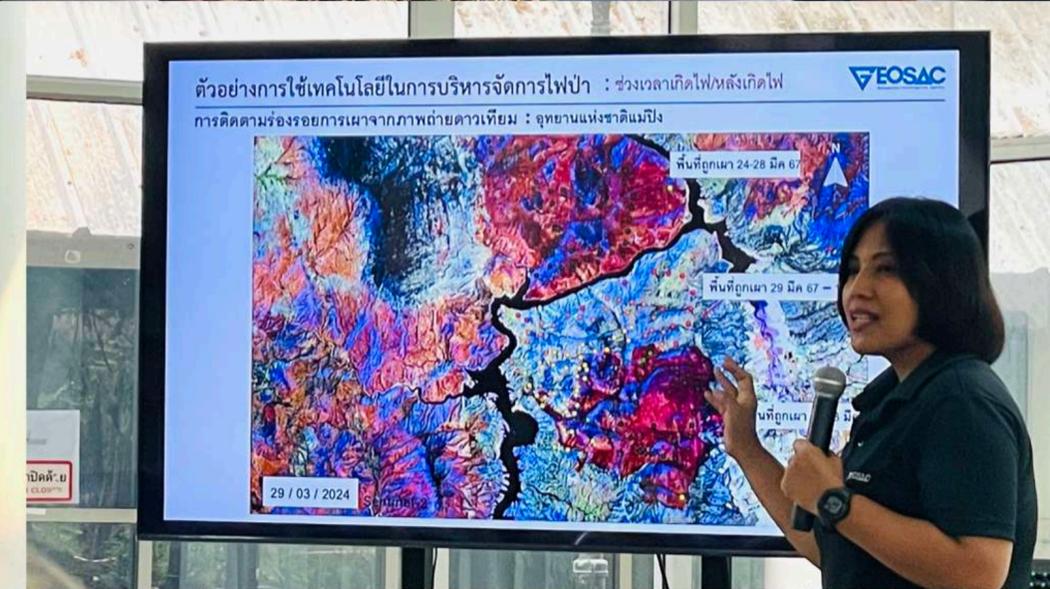


ป่าที่อยู่ในพื้นที่กรรมสิทธิ์

✅ เจ้าของกรรมสิทธิ์ทำได้

- ในปีพ.ศ.2561 ไม้ทุกชนิดในที่ดินกรรมสิทธิ์ไม่ถือเป็นไม้สงวนหวงห้าม การทำไม้ไม่ต้องขออนุญาตจากพนักงานเจ้าหน้าที่







Challenges and Feedback

Despite its successes, the camp faced challenges, primarily due to its condensed format and intensive schedule. Students expressed a need for more time to digest information and engage in discussions after each session. The packed agenda often left them overwhelmed, leading to lapses in concentration and a desire for a more relaxed pace to facilitate better learning and reflection.

Feedback from participants suggested that additional time for discussion would have been beneficial, allowing them to explore the subjects in greater depth and to form more thoughtful questions and ideas. This interaction is crucial for developing critical thinking skills and for applying theoretical knowledge to practical scenarios.

Moving Forward

In response to this feedback, future iterations of the Insights Camp could consider several adjustments:

- 1. Extended Duration:** Allocating more days to the camp or reducing the number of sessions per day could help manage the intensity of the program, giving students more time to absorb and reflect on the information presented.
- 2. Scheduled Reflections:** Incorporating structured reflection sessions after each insight presentation could help students process the information and engage more meaningfully with the content.
- 3. Interactive Formats:** Employing more interactive and participatory teaching methods during the sessions may help maintain student engagement and concentration throughout the camp.

By addressing these areas for improvement, the Insights Camp can enhance its effectiveness and continue to serve as a valuable educational platform for students passionate about environmental conservation and forest fire management. The goal is not only to educate but also to inspire and equip the next generation of environmental leaders with the tools they need to make a difference.

Section 1: Program

The Technology Camp, the second segment of our educational program, is hosted in Bangkok and focuses on empowering students with the latest in technological innovations. This camp primarily introduces students to the world of drone technologies and digital fabrication, providing a dynamic learning environment that bridges theoretical knowledge with practical application.

Throughout the camp, students participate in hands-on sessions designed to transform their innovative ideas into tangible solutions. Collaborations with industry leaders like DJI are a key component of the curriculum, where students learn about drone mechanics, flying techniques, and the applications of drones in various fields.

Further deepening their practical skills, participants are taught how to create 3D models using Rhino3D. They then learn how to prepare these models for digital fabrication, using tools such as laser cutters and 3D printers. These sessions not only enhance their technical skills but also encourage them to observe and analyze the physical dynamics involved in drone flight, such as the effects of momentum and gravity on carried objects.

After learning about small batch manufacturing, students have a chance to visit the Thaisummit factory TSESA, where students witness large-scale manufacturing processes firsthand. This visit exposes them to advanced robotic and automation technologies, showcasing real-world applications of the principles they learn at camp.

The program also includes assignments that allow students to apply their new skills in real-world scenarios, enhancing their understanding of digital fabrication. At FabCafe Bangkok, students get the opportunity to prototype and extensively familiarize themselves with drones, making the Technology Camp a cornerstone for budding technologists looking to make an impact in environmental management and beyond.

Technology



[Download the Drone Handbook](#)

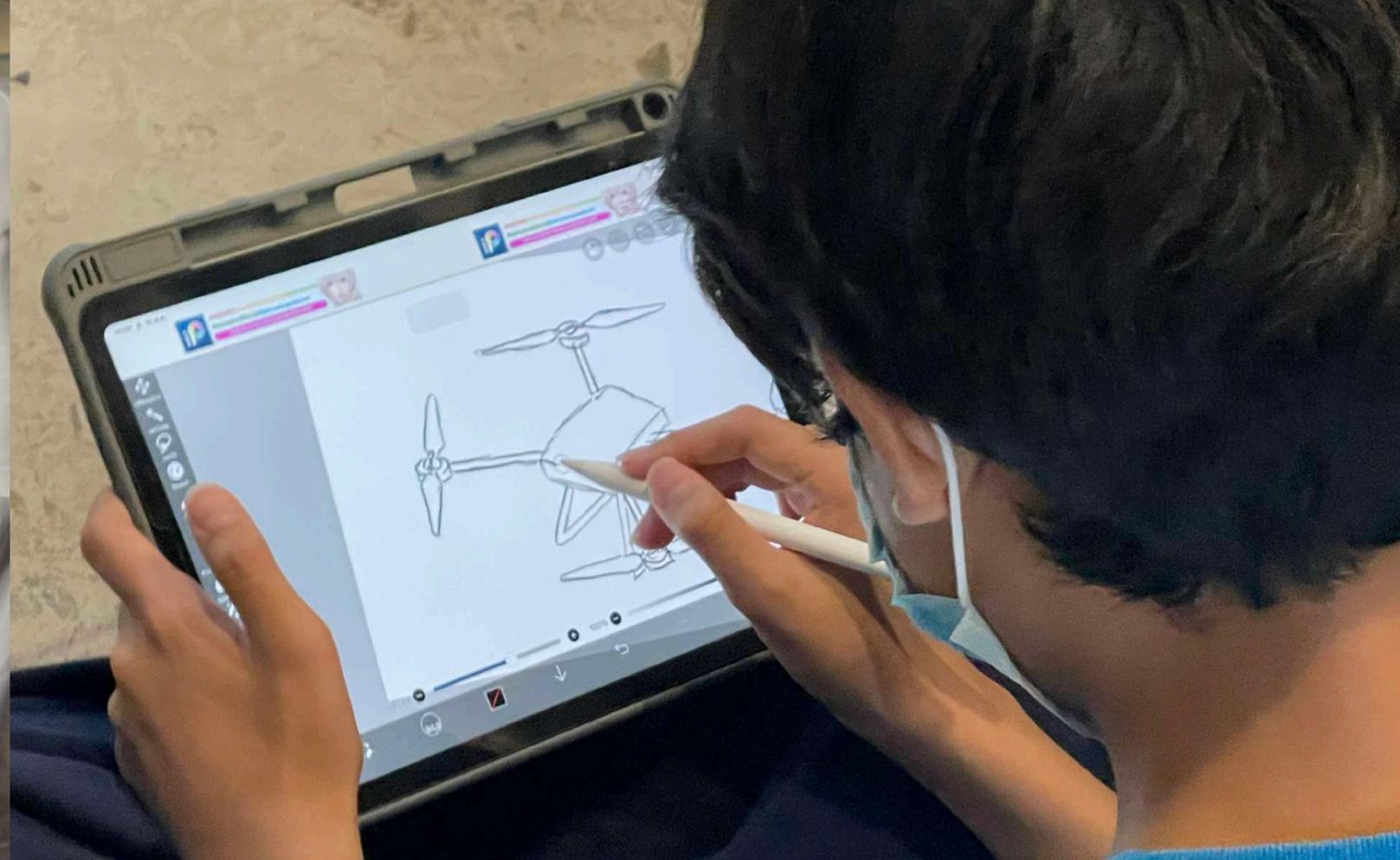


[Watch the Rhino for Drone Workshop](#)



[Download the Prototype Handbook](#)





Section 1: Program

Following the conclusion of the Insights Camp, the Incubation Camp begins, ushering students into the practical phase of their learning journey. The participants are divided into three groups based on their interests: the Funding Team, the Affordable Team, and the Seed Team, each tackling distinct challenges within the realm of forest management.

Funding Team This group embarked on a market research project to identify high-value products (excluding alcoholic beverages) that could be sourced from Hmong farms. They eventually settled on kombucha due to its market potential and health benefits. The team then explored how to cultivate SCOBY using coffee and avocado leaves, an innovative twist on traditional kombucha brewing. Alongside this, they developed branding strategies to effectively market their unique kombucha product.

Affordable Team Tasked with the goal of developing a drone that costs less than 150,000 THB, this team delved into the cost structures that typically drive up drone prices. They conducted thorough research on small, cost-effective drones, selecting the IFlight TITAN XL5 as their base model. Their major focus was developing an image processing detection system that uses sensors and software to identify fires from video footage, aiming to make forest surveillance both more affordable and effective.

Seed Team Starting with research on the most effective seeds to plant immediately after a forest fire to encourage ecological recovery, this group studied the advantages and disadvantages of climax and pioneer plants. They chose five species that would best promote the growth of other species and set out to develop a seed dispenser. Utilizing 3D printing technology and servos, they tailored the dispenser to match the size of the selected seeds. The team chose to use an open-source drone from Dronecoria as their main structure, ensuring adaptability and ease of modification.

Each team at the Incubation Camp demonstrates a commitment to using their newly acquired knowledge and skills to address real-world environmental challenges, paving the way for innovative solutions in forest fire management and ecological restoration.



Learn more about
Funding Team

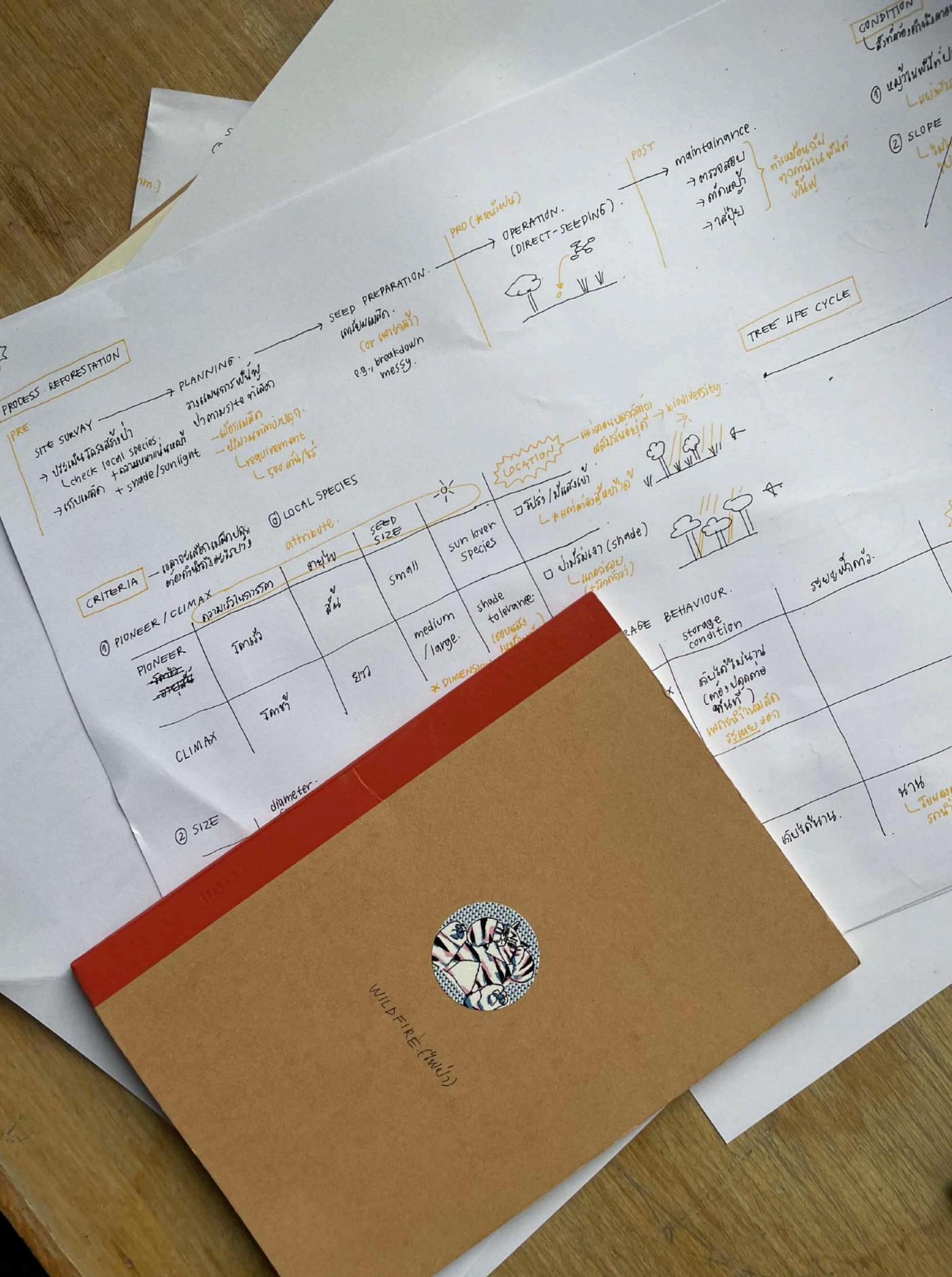


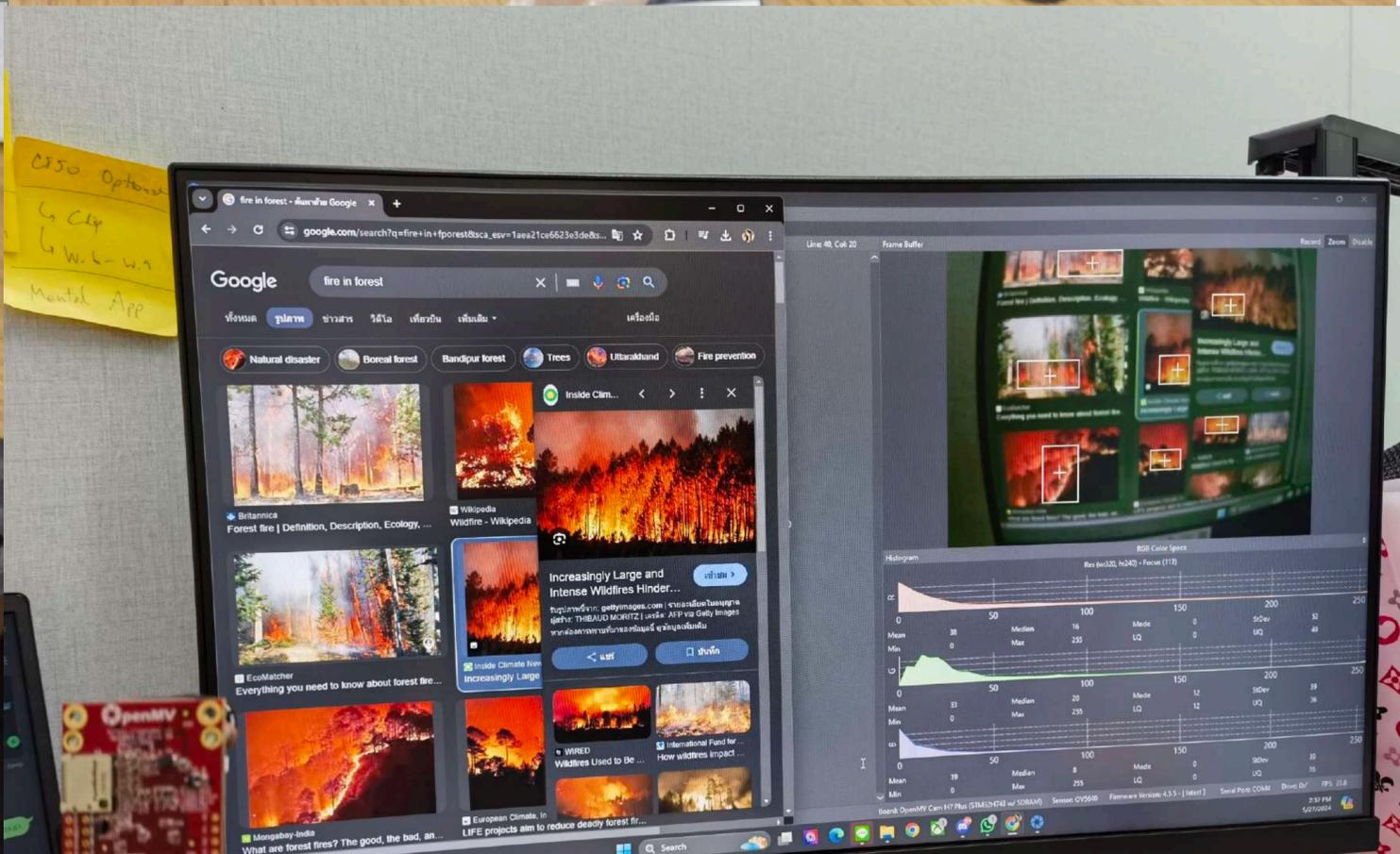
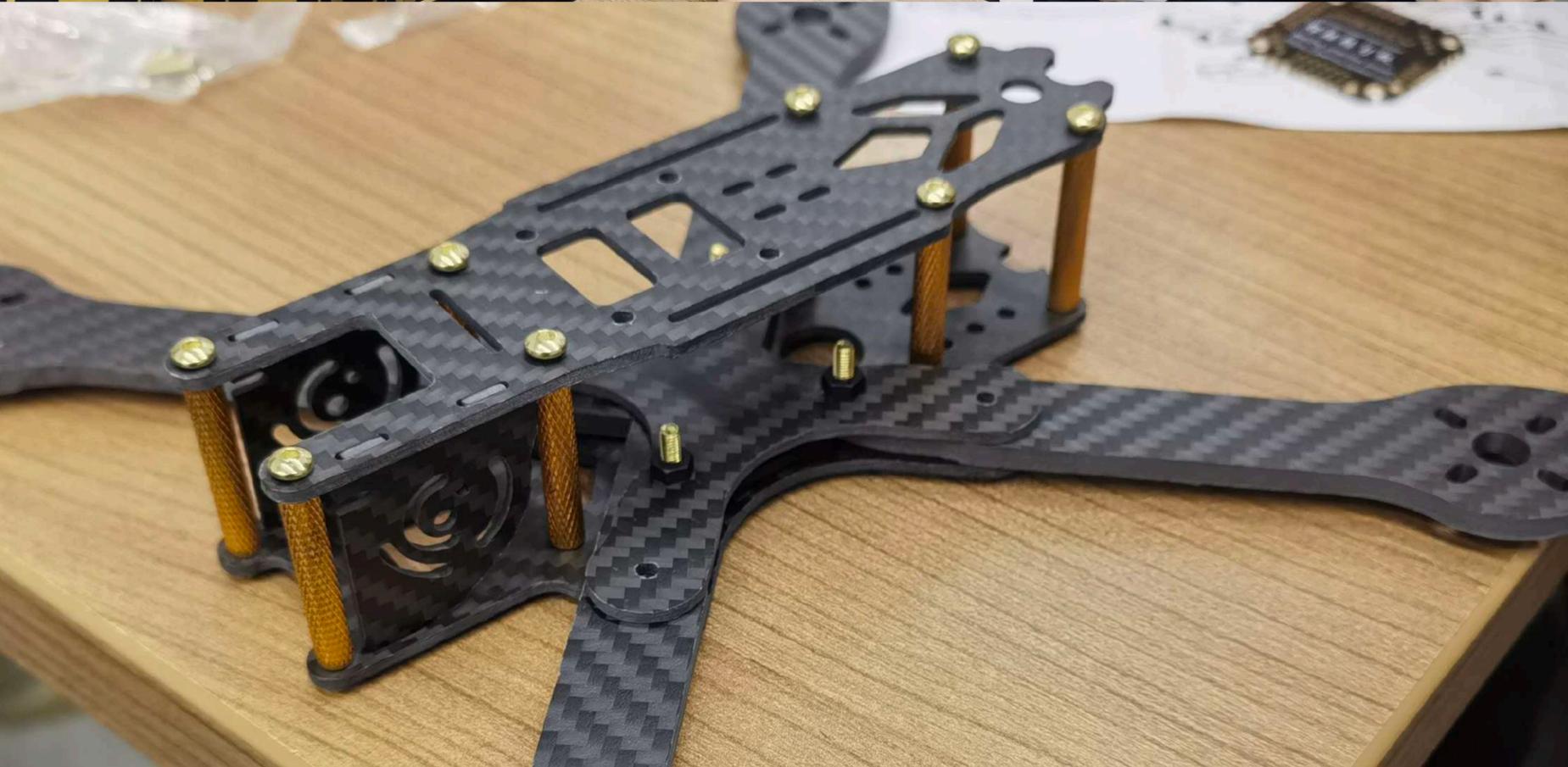
Learn more about
Affordable Team

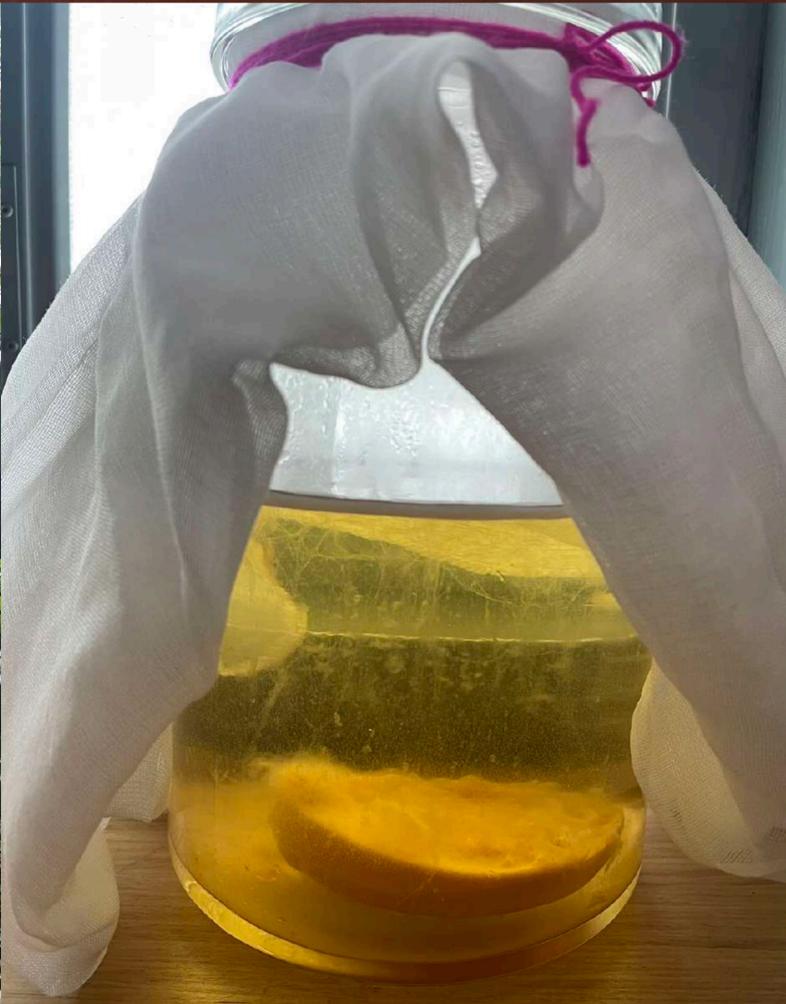


Learn more about
Seed Team

Incubation









AFFORDABLE DRONE



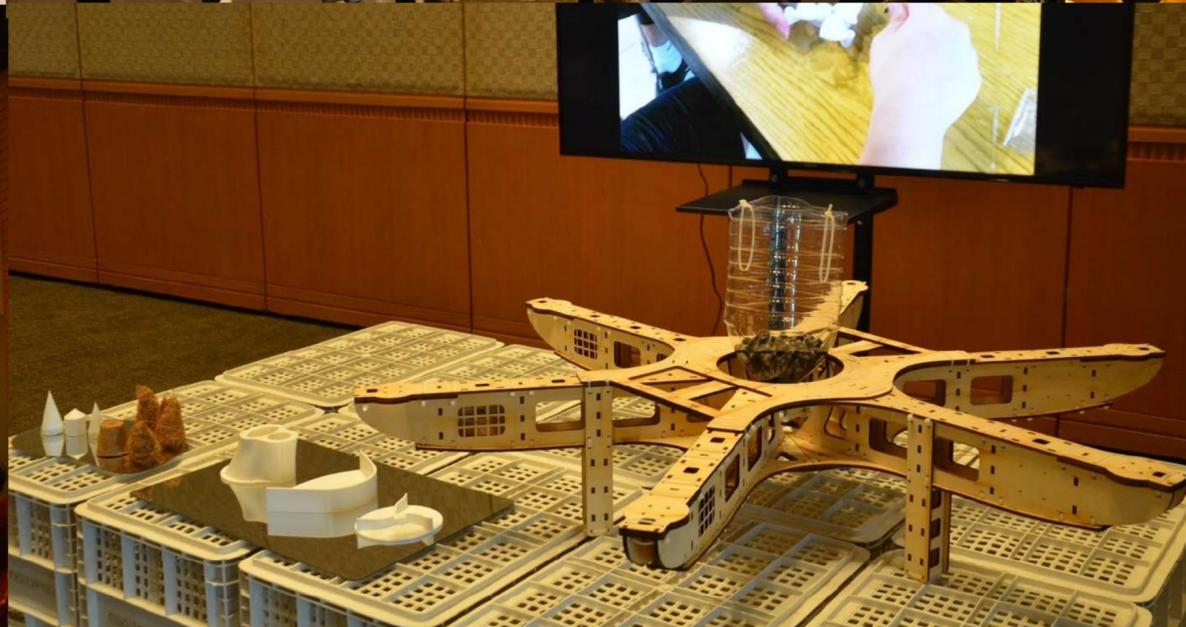
Learn more about **Hmong Hmong Team**



Learn more about **Affordable Drone Team**



Learn more about **FloraTech Team**



Section 2: People

Effective management of forest fires in Chiang Mai involves a diverse range of stakeholders, each playing crucial roles in prevention, mitigation, and recovery efforts. Understanding these stakeholders is vital for coordinated actions and effective communication during fire incidents. Here's an overview of the primary stakeholders involved in forest fire management in Chiang Mai;

1. Local Government Agencies

- **Chiang Mai Provincial Administration:** Manages overall governance and coordinates between various departments and sectors for fire prevention and control.
- **Department of Disaster Prevention and Mitigation (DDPM):** Responsible for planning and implementing measures to prevent and mitigate natural disasters, including forest fires.

2. Environmental and Forestry Departments

- **Royal Forest Department (RFD):** Oversees forest conservation, reforestation, and sustainable forest management, including the enforcement of fire management policies.
- **Department of National Parks, Wildlife and Plant Conservation (DNP):** Manages national parks and protected areas, implementing fire prevention and control strategies within these territories.
- **Doi Suthep-Pui National Park:** Directly involved in local fire management efforts, coordinating on-the-ground activities and public education initiatives to prevent and respond to forest fires in the park area.

3. Local Communities and Indigenous Peoples

- **Hmong and other hill tribes:** Often residing in or near forested areas, these communities are directly impacted by forest fires. They play a significant role in traditional and community-based fire management practices.

4. Academic and Research Institutions

- **Chiang Mai University:** Engages in research and development related to forest ecology, fire management, and climate change. Often collaborates with government agencies to develop fire management strategies.
- **Forest Restoration Research Unit (FORRU):** Focuses on research and implementation of forest restoration projects which can include fire resilience measures.

5. Non-Governmental Organizations (NGOs)

- **The Next Forest:** Focuses on sustainable forest management and restoration practices, providing expertise and resources for rehabilitating fire-affected areas.
- **Breath Council:** Works with community forests to promote sustainable practices and improve local responses to air quality.
- **Change Fusion:** A catalyst for social innovation, supporting initiatives that integrate community efforts with sustainable environmental solutions.

6. Private Sector

- **Tourism Operators:** Have a vested interest in maintaining the natural beauty and safety of forested areas to sustain tourism.
- **Agricultural Businesses:** Especially those that utilize or border forest lands, affected by the risk of fire damage to their crops and property.
- **Thaisummit:** Provides funding, support and insights into large-scale manufacturing processes, showcasing advanced technologies in robotics and automation that can be applied to enhance forest fire management and response strategies.

Section 2: People

7. Volunteer Firefighters and Community Fire Guards

- Local volunteers who receive training to assist in firefighting and preventive measures, crucial for initial fire response and community-level fire management.

8. Media

- Plays a critical role in disseminating information about fire risks, ongoing fires, and prevention strategies to the public.

9. Innovative Enterprises and Collaborative Spaces

- **FabCafe Bangkok:** Provides technological and creative support, facilitating prototype development for fire management tools like drones and other digital fabrication solutions.

10. Technology Providers

- Companies and startups that offer technological solutions like drones, satellite imagery, and remote sensing tools for forest surveillance and fire management such as DJI

By collaborating effectively, these stakeholders can enhance their response strategies and improve the overall management of forest fires in Chiang Mai, thereby protecting both the environment and the communities that depend on it

Section 3: Evaluation and Impact Assessment

Impact Goal

To promote integrated learning in technology and analytical thinking to enhance the potential of youth to create positive changes for the environment.



4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.



6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes



13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

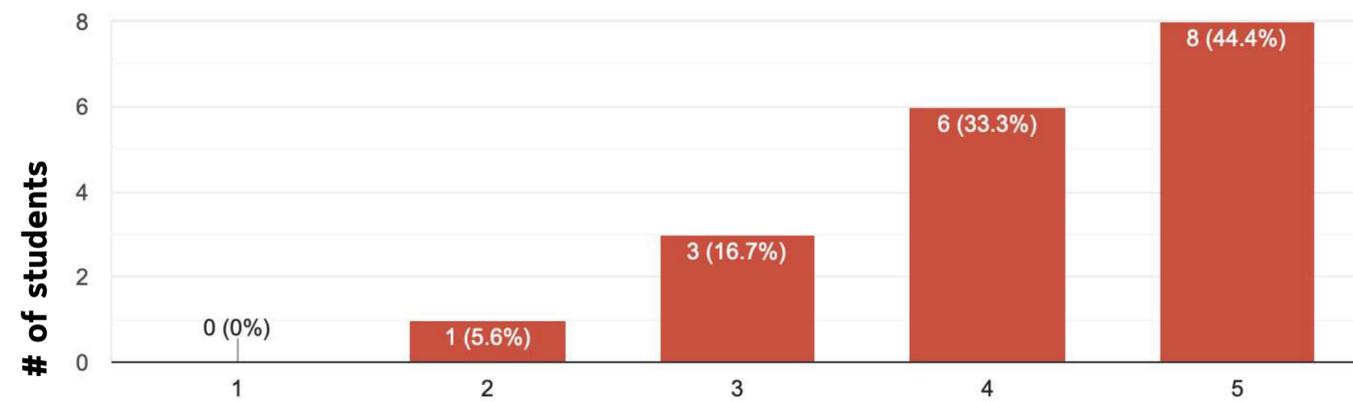


15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

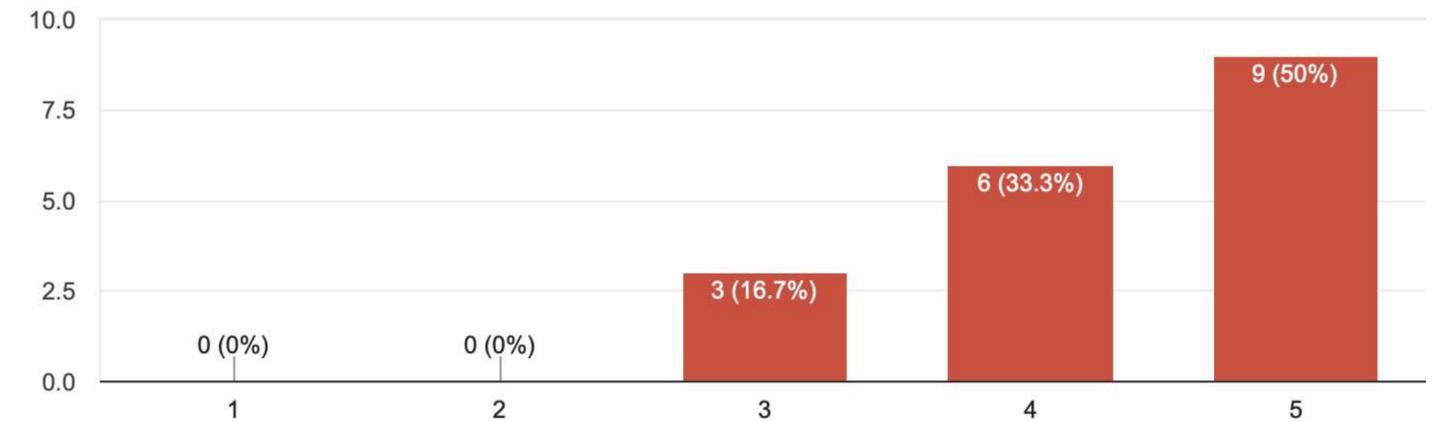
Stakeholder	Activities	Output	Outcome
Student	<p>Insight camp in Chiang Mai - Introduction to forest fire situations</p> <p>Technology camp - introduction to advanced technologies</p> <p>Incubation camp - applying insights to devise innovative solutions</p>	<p>Be able to integrate learning, data collection, and analytical thinking to create solutions through the use of technology that positively impact the environment</p> <p>Changes in perception led some students to seek fields of study that better match their interests, such as switching from a major in art to one in engineering.</p>	<p>Cultivate 21st-century learning skills, such as creativity, critical thinking, flexibility, and adaptability.</p> <p>A fulfilling career that suits one's interests.</p>
Local Community	<p>Visit the community to discuss the limitations of wildfire management and new technology</p>	<p>Shared situation with students and new tech for community use explored.</p>	<p>Exploration of using new yet relevant tech (drones, etc.) for new wildfire management planning.</p>
Academic/ Environmental department	<p>Exchange knowledge about wildfire situations, wildfire management, and the use of technology in wildfire management.</p>	<p>Shared insights with students and new tech for wildfire management explored</p>	<p>Opportunities to increase work effectiveness by using technology to address environmental issues, such as a plan for seeds restoration drones. .</p>
Corporate	<p>Share knowledge and provide a factory tour to help students learn about and become familiar with careers in engineering.</p>	<p>Executives and team members engage in learning about environmental issues and contribute to the development of youth in technology.</p>	<p>Long-term social responsibility by creating value for the environment and youth.</p>

Section 3: Evaluation and Impact Assessment

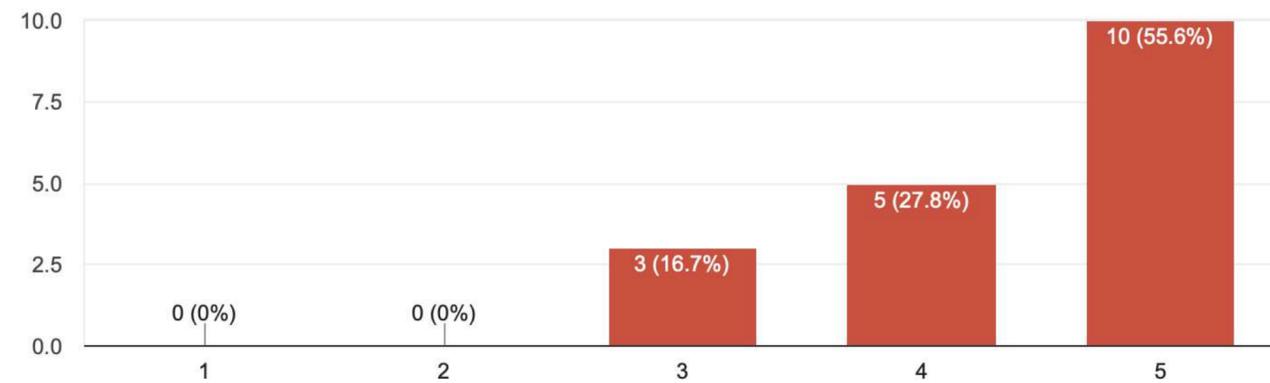
Chiang Mai Camp Evaluation
18 students



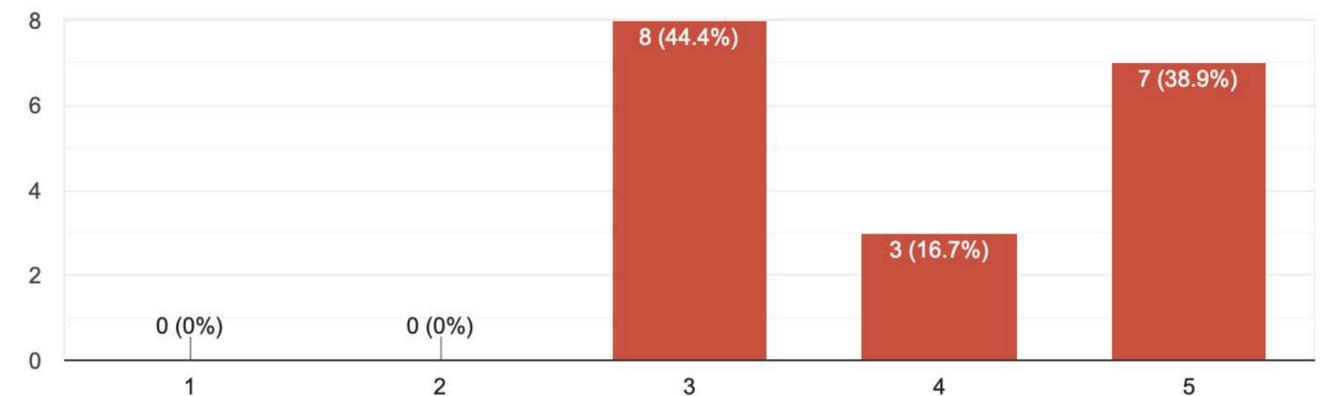
Level of understanding about wildfire issues and wildfire management strategies



Level of understanding about the application of technology in wildfire management



Level of understanding of wildfire issues after visiting the community

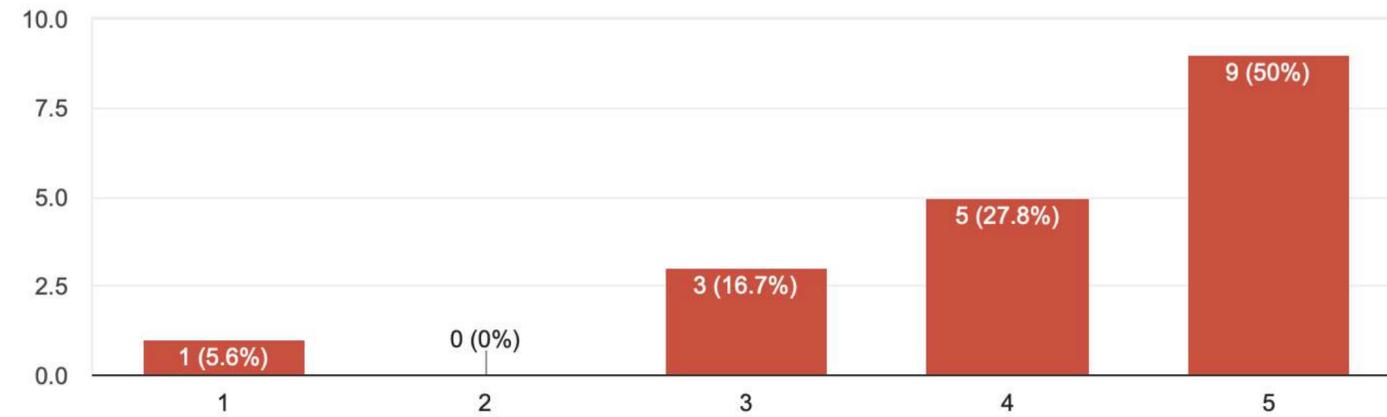


Level of convenience regarding travel

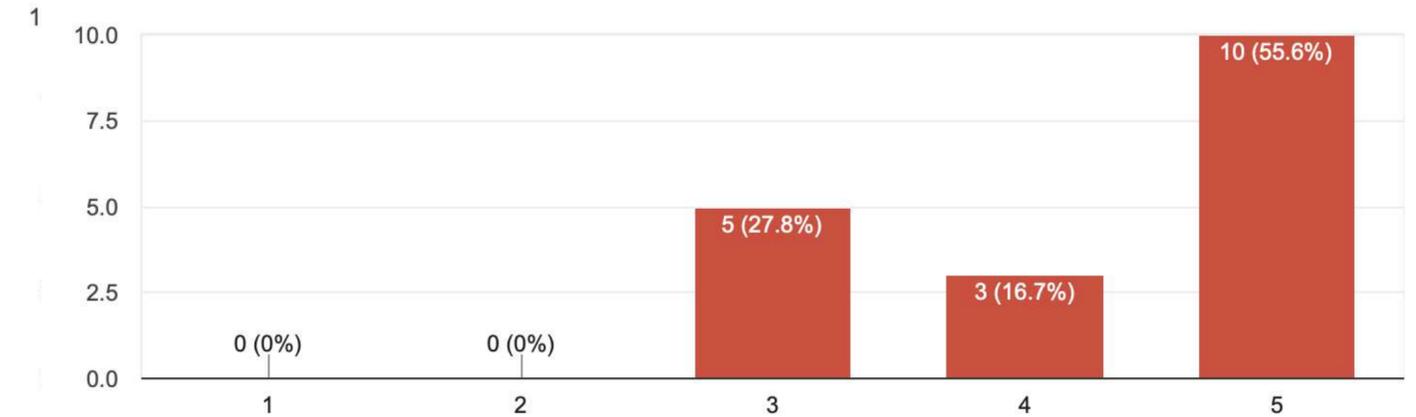
Score (1 = least, 5 = most)

Section 3: Evaluation and Impact Assessment

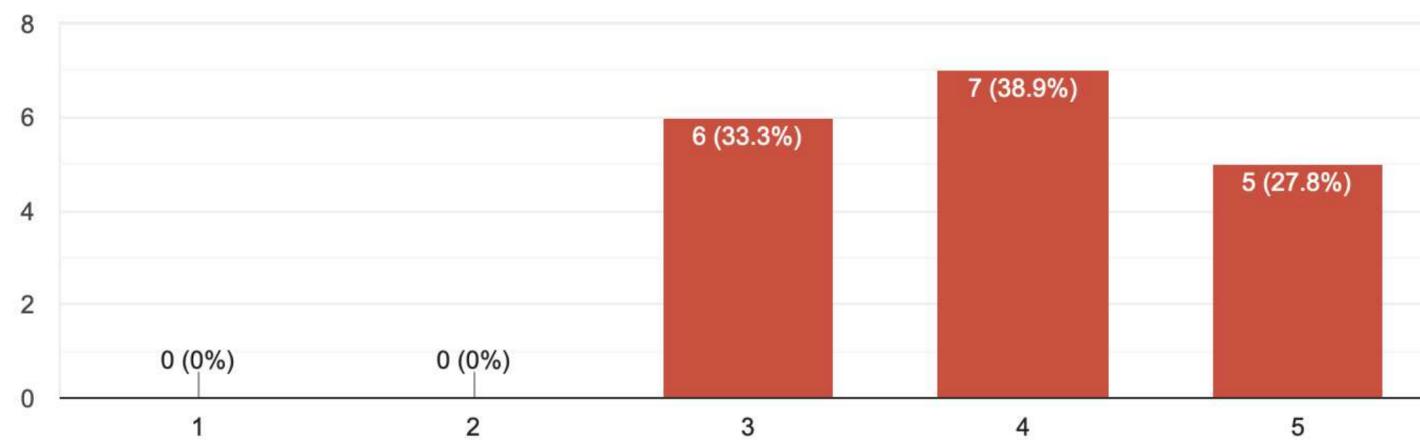
Technology Camp Evaluation
18 students



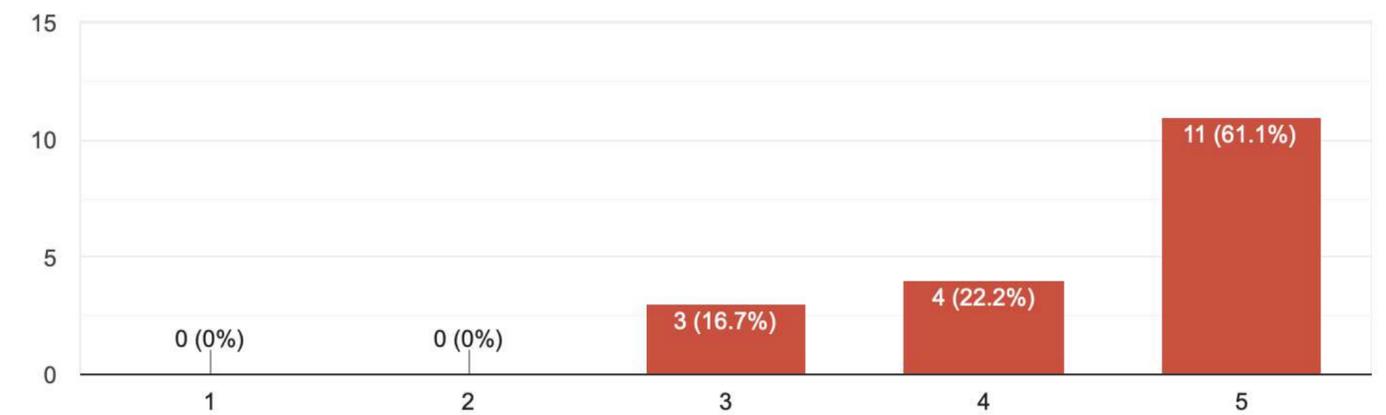
Level of understanding about the usage and limitations of drone technology



Level of understanding about the importance of drone technology in the application and resolution of wildfire issues



At what level can the training manual and instructors provide knowledge on using drone technology

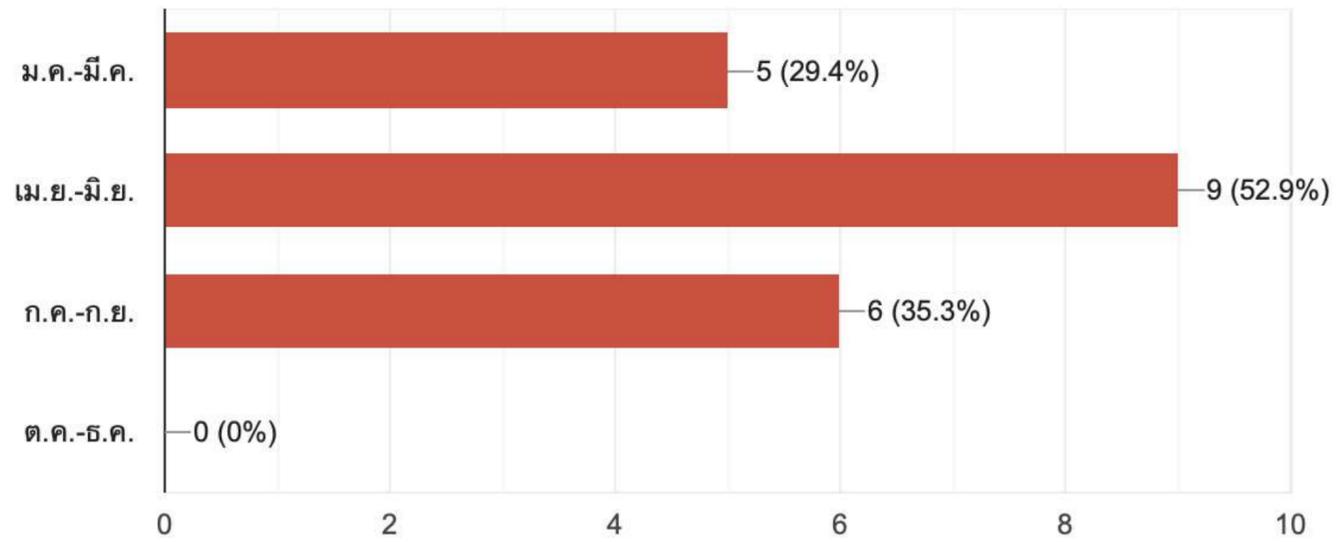


Suitability of the event venue

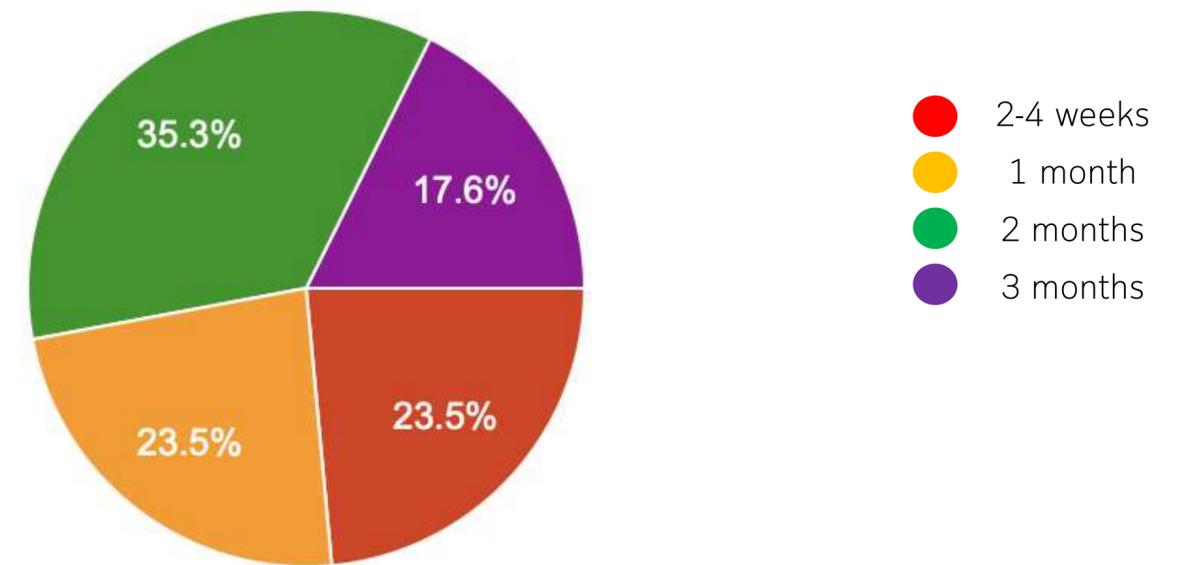
Score (1 = least, 5 = most)

Section 3: Evaluation and Impact Assessment

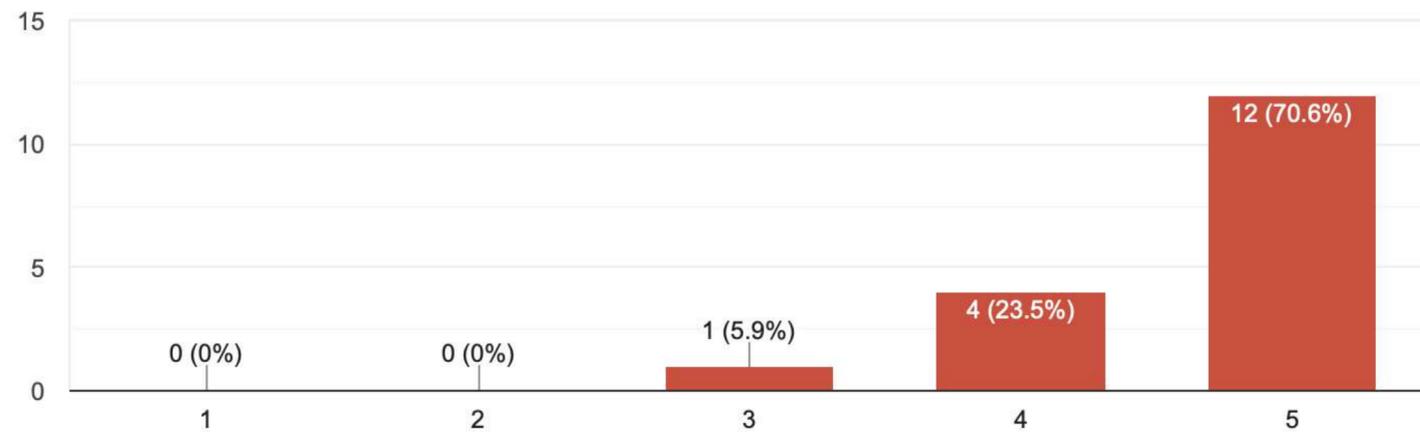
Overall Program Evaluation
18 students



Convenient times to participate in future projects



Convenient duration for participating in the project



Overall impression of the project

Score (1 = least, 5 = most)

Section 3: Evaluation and Impact Assessment

Overall Program Evaluation
18 students

ข้อเสนอแนะเกี่ยวกับ Chiang Mai Camp

11 responses

-

อยากให้มีค่ายแบบนี้อีก

เป็นค่ายที่ดี ทำให้รู้จักปัญหาไฟป่ามากขึ้น

อยากไปหลายวันกว่านี้💖

ดีมากๆเลยคะ อยากให้เด็กๆได้รู้จัก โปรเจคนี้อีกหลายๆคะ

ไม่มีคำบบบ

-

ทุกอย่างดีมากครับไม่มีข้อให้ติเลย

ความประทับใจหรือข้อเสนอแนะเกี่ยวกับ Training Session

11 responses

-

ได้ความรู้เรื่องเกี่ยวกับไฟป่ามากขึ้น

ประทับใจ โครงการที่ให้โอกาส เยาวชนได้เรียนรู้และเกิดการพัฒนา ข้อเสนอแนะ ขอให้มานับสนุนต่อๆไแ

ชอบมากคะอยากมีเวลามากกว่านี้

I'm proud of the detailed knowledge and interaction

ประทับใจมากกกกตต

ได้ทดลองอะไรหลายๆอย่าง

สนุกมากครับ

Section 3: Evaluation and Impact Assessment

Overall Program Evaluation
18 students

Insight Camp

Feedback : Students expressed that the Chiang Mai camp helped them better understand forest fires. They enjoyed the experience and would like to participate in similar camps in the future.

Technology Camp

Feedback : Students commented that the training session allowed them to try many different things. They enjoyed it a lot, had fun, and wished they had more time.

Incubation Phase

Students comment that working in a team helps them better understand solutions to forest fires by learning from each other's ideas. They discover that technology can address forest fires, express their opinions to find the best solution, and collaborate to resolve the issue. Additionally, they become more aware of the problem's conditions and work together to analyze and develop sustainable solutions.

For their recommendations, they suggest allowing more time for brainstorming in the project.

Impressions and Benefits of the Program

ผู้ทำกิจกรรมได้ร่วมสำรวจปัญหาที่เกิดขึ้นจริง ซึ่งทำให้การพัฒนาการแก้ปัญหา มีความเฉพาะเจาะจงมากขึ้น น้องๆ พี่ๆ ตั้งใจทำกิจกรรมและสร้างสรรค์ผลงานที่เกิดประโยชน์ต่อคนในชุมชน

เป็นโครงการที่เปิดโอกาสให้น้องๆ เข้ามาเรียนรู้การวิเคราะห์ แก้ไขปัญหา และได้ทดลองทำจริง แต่ละสัปดาห์มีการเรียนรู้ที่น่าสนใจ มีการลงพื้นที่จริง ทำให้ได้ insight ข้อมูลใหม่ๆ ที่หาจากที่อื่นได้ยาก

ในฐานะทีมงาน การเข้าไปยังสถานที่จริงและคุยกับคนที่เกี่ยวข้องจริงๆ ทำให้ได้รู้เรื่อง insight เกี่ยวกับไฟฟ้าเยอะมาก (และซับซ้อนกว่าที่คิดเยอะ) ค่ะ ก็เลยคิดว่าอย่างน้อยน้องๆ ที่ได้ไปแคมป์น่าจะจะได้เรียนรู้ เข้าใจปัญหามากขึ้นกว่าทราบจากสื่อในโซเชียล รวมถึงเรื่องการปลูกป่ามีประเด็นที่น่าสนใจหลายอย่างเช่นกัน ทำให้รู้สึกว่ายากศึกษามากขึ้น

Problems Encountered

น้องๆ มาร่วมโครงการไม่สม่ำเสมอ

ช่วงเวลาที่ว่างของนักเรียนแต่ละโรงเรียนไม่ตรงกัน ส่วนใหญ่นักเรียนอยู่ในช่วงเปิดเทอม ทำให้นักเรียนจัดการเวลาว่างทำได้ยากและมีข้อจำกัด

ตารางเวลาเรียนของเด็กกับตารางกิจกรรมทำให้รวมกลุ่มทำงานยาก กว่าที่จะได้เริ่มก็เหลือเวลาเพียงสองสัปดาห์ก่อนส่งงาน

Impressions and Benefits of the Program

The team highlights that the project, as a continuous and in-depth initiative addressing forest fire issues, provides a clear view of the real context and detailed information, helping students genuinely understand the problem. Participants can explore local issues directly, making problem-solving more specific. Additionally, everyone is dedicated to the activities and creating beneficial outcomes for the community. The project also offers students opportunities to learn how to analyze and solve problems and gain hands-on experience. Each week presents interesting learning opportunities and fieldwork, providing new insights that are hard to find elsewhere.

Problems Encountered

The team notes that the main issue lies in the differing free periods among students from various schools, posing challenges for group work with only two weeks left before submission. Additionally, coordinating with students and managing separate LINE groups results in communication overlaps. Activity announcements may require a more systematic approach or frequent updates due to frequent student inquiries. In terms of learning and work, the project format aims to extensively train students in critical thinking and research skills, which many currently lack.

Suggestions for Improving the Project

อาจเพิ่มระยะเวลาหรือวัน workshop สำหรับการทำงาน ระดมความคิด โดยเฉพาะของน้องๆมากขึ้น ในปัจจุบันมีวันที่จัด workshop/lecture แต่ระยะเวลาทำงานของน้องอาจจะน้อย และเมื่อคนเยอะการรวมตัวทำงานอาจเป็นไปได้ยาก ต้องนัดนอกเหนือเวลา

กำหนดช่วงเวลาให้สอดคล้องประสานกับนักเรียนผู้เข้าร่วม โครงการให้เหมาะสมยิ่งขึ้น

อยากให้มีการออกพื้นที่และคุยกับคนในชุมชน/ภาครัฐ/เอกชน ในมิติต่างๆ เพื่อให้มีการเชื่อมโยงนวัตกรรมกับปัญหาที่เกิดขึ้นได้ดียิ่งขึ้น

ถ้าเด็กเข้าใจบริบทและพยายามวิเคราะห์ปัญหามากกว่านี้ ก็อาจจะได้นวัตกรรมที่ตอบ โจทย์มากกว่านี้ ตรงนี้สามารถนำไปปรับปรุงกิจกรรมในครั้งถัดไป ก็คือ เน้นเรื่องการเก็บข้อมูล และวิเคราะห์ด้วยตัวเองอย่างลงลึก ก่อนเริ่ม ideation ค่ะ

ผลงานของนักเรียนมัธยมต้น-ปลาย ในเวลาเพียงแค่สองสัปดาห์ ไม่ควรกดดันในเรื่องของการสร้างนวัตกรรม เพราะขนาดนักศึกษามหาวิทยาลัย หรือผู้เชี่ยวชาญยังไม่สามารถสร้างภายในระยะเวลา และข้อจำกัดทางงบประมาณแบบนี้ได้

Suggestions for Improving the Project

- Consider extending the duration or adding more workshop days for project work to encourage greater student involvement .It would also be beneficial to schedule these periods to better fit the students' schedules.
- To encourage critical thinking among the students, it is suggested to include exercises or activities in each module. Perhaps additional challenges could be introduced during the camp sessions to further stimulate critical thinking.
- Students should have greater involvement in project development. Even if their skills are still developing, facilitators can guide them by assigning tasks and providing instructions on researching information, including readings and summarizing key points.
- Middle and high school students' work within just two weeks should not be pressured to innovate, as even university students or experts may find it challenging to create innovations within such a timeframe and budget constraints.
- If students understand the context and strive to analyze the problem more deeply, they may achieve innovations that better address the issue. This insight can be used to improve activities in future sessions by emphasizing data collection and thorough self-analysis before starting ideation.

Section 4: Finance

	Program Phrase 1 Preparation-Insight Camp	Program Phrase 2 Technology Camp	Program Phrase 3 Incubation-Earthshot	Program Phrase 4 Report-Prototype testing
Internal Expenses 37% TOTAL 462,000 THB	200,000.00 THB Field research Report Project Preparation		100,000 THB Evaluation and Impact Assessment	92,000 THB Field Testing Prototype Development 70,000 THB Report and Community Coordination
Program &Event Expenses 38% TOTAL 474,000 THB	25,000 THB Openhouse 80,000 THB Camp Expense	80,000 THB Instructor x3 60,000 THB StaffX2 50,000 THB Material 3D Print Testing 40,000 THB TSESA Transportation 10,000 THB Food 18,000 THB Break 70,000 THB Sensor and Circuit	41,000 THB Earthshot	
Prototype Expenses 25% TOTAL 304,000 THB			95,000 THB Affordable Drone Prototype 85,000 THB Seed Drone Prototype 24,000 THB Hmong Hmong Prototype	100,000 THB Seed Drone Development Infrared Camera Drone Attachment
GRAND TOTAL 1,240,000 THB	305,000 THB	328,000 THB	345,000 THB	262,000 THB

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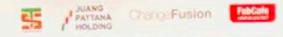
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ในการศึกษาเทคโนโลยีโดรนเพื่อแก้ปัญหาไฟป่า
The Regenerative Future:
Drones Against Forest Fire
มอบทุนโดย : บ. จิ่งพัฒนา โฮลดิ้ง จำกัด
1 มีนาคม - 31 ธันวาคม 2567



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