TECHNISCHE UNIVERSITÄT DRESDEN

GLOBAL SDG CAMPUS

KU KASETSART UNIVERSITY

INTERNATIONAL FORESTRY FIELD SCHOOL

Sustainable Forestry in the Tropics: Unlocking the Bioeconomic Potential of Thailand's Teak Plantations

HANDBOOK

Thailand 2024

Bangkok - Uttaradit - Chiang Mai

sponsored by:

SACHSEN

Federal Ministry of Education and Research

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01. Learning objectives

The primary challenge this course addresses is the utilization of the full range of potential products and ecosystem services from teak plantations. The overarching goal is to guide students in developing and evaluating silvicultural strategies to optimize ecosystem services, including timber production.

By the end of the course, students should be able to:

- Understand and explain the ecological characteristics of teak (Tectona grandis), including its growth cycle and the environmental factors influencing its development
- Assess and critique various management practices and their implications on teak plantation sustainability
- Assess the socio-economic context of teak plantation management strategies and propose socially feasible management approaches
- Integrate ecological, economic, and social data to formulate a balanced forest management strategies
- Demonstrate stakeholder engagement skills through conducting interviews and
- Facilitating discussions

02. Background

Teak Forestry in Thailand

Teak (Tectona grandis) is a highly valued tropical hardwood species native to South and Southeast Asia, including Thailand. It is renowned for its durability, workability, and resistance to pests and diseases. In Thailand, teak plays a significant role both ecologically and economically, contributing to forest conservation and the timber industry. Understanding the ecological aspects of teak in Thailand involves examining its natural habitat, growth conditions, biodiversity impacts, and its role in sustainable forestry practices.

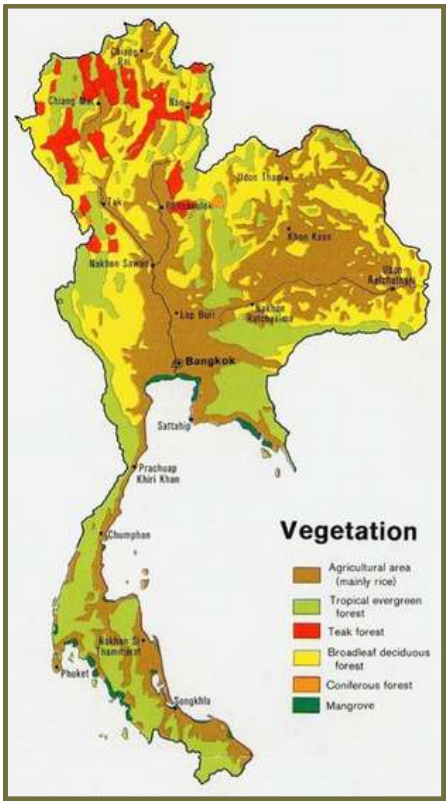
Teak thrives in a tropical climate with a distinct dry season, which is essential for its growth cycle. In Thailand, teak forests are predominantly found in the northern and western regions, where the climate provides the ideal conditions. The optimal temperature range for teak growth is between 22°C and 35°C, and it requires an annual rainfall of 1,200 to 2,500 millimeters.

Teak is naturally associated with mixed deciduous forests, which are characterized by a mix of deciduous tree species. Mixed deciduous forests are dominated by a variety of deciduous trees. In addition to teak, common species include Lagerstroemia spp. (Lagerstroemia), Pterocarpus macrocarpus (Burma padauk), Xylia xylocarpa (Ironwood), and Shorea siamensis (Siamese sal). The understory consists of smaller trees, shrubs, and herbs. Bamboo species such as Dendrocalamus strictus are often prevalent. These forests undergo significant seasonal changes, with most trees shedding their leaves during the dry season (November to April) and regrowing them during the rainy season (May to October).

Teak is a calciphile, meaning it prefers soils that are rich in calcium. It thrives in deep, welldrained, fertile soils with a neutral to slightly alkaline pH (6.5 to 7.5). It grows well in alluvial soils found in valleys and riverbanks, as well as in limestone-rich soils on hillsides. In Thailand, teak plantations are often established in areas with such soil conditions to maximize growth and yield. Teak can reach heights of 30 to 40 meters, with a trunk diameter of up to 1.5 meters. It has a straight, cylindrical bole and high-quality timber that is yellow-brown and darkens with age. Teak trees shed their leaves during the dry season to conserve water, a typical adaptation to the climate.

Teak management has a long history in Northern Thailand, dating back to the late 19th and early 20th centuries when it was first identified as a valuable resource for export. The British were instrumental in setting up the first teak plantations and sawmills in the region. Over the years, the management of teak plantations shifted from foreign companies to the Thai government.

In the latter half of the 20th century, concerns over deforestation and diminishing yields led to the establishment of teak plantations, including the implementation of 30-year rotation cycles. Teak remains a significant part of Thailand's economy and ecology. Further developing and improving silvicultural practices is critical for realizing the potential significant contribution of teak to a forest bioeconomy



Map of Teak forest areas in Thailand

Key Policies and Legislation

The Forest Act of 1941 defines what constitutes a forest and sets the framework for forest conservation and management. It classifies teak as a protected species, requiring permits for harvesting.

The National Reserved Forests Act of 1964 designates certain areas as Reserved Forests, where logging and forest product collection are strictly regulated. It aims to prevent illegal occupation and unsustainable use of forest lands.

The Community Forest Act of 2019 allows communities to manage and utilize forest resources within Reserved Forests, recognizing the role of local communities in sustainable forest management. However, it limits the commercial use of forest products, focusing instead on subsistence and conservation.

The Forest Plantation Act of 1992 aims to facilitates the establishment of commercial forest plantations, including teak, on private and permitted lands. It encourages private investment in forestry.

The Logging Ban of 1989 was implemented to curb deforestation, this ban prohibits logging of native species in public forests, including teak. It has significantly impacted forest management practices, pushing for more sources of timber through plantations.

Organizational Responsibilities

The Royal Forest Department (RFD) manages Reserved Forests and oversees private commercial plantations. It is responsible for designing management plans, issuing permits, and enforcing forest laws.

The Forest Industry Organization (FIO) is a state-owned enterprise under the Ministry of Natural Resources and Environment. The FIO manages the majority of teak plantations, seeks to promote sustainable forestry practices, and wishes to produce FSC-certified timber.

The Department of National Parks, Wildlife and Plant Conservation (DNP) manages National Parks and Wildlife Sanctuaries, with the aim of ensuring the protection of biodiversity and natural resources within these areas.

Silviculture and Plantation Management

FIO is Thailand's largest manager of teak plantations (80,000 ha). Smallholder farmers in Thailand have also ventured into establishing teak plantations, yet they often grapple with attaining high-quality timber and face challenges due to the lengthy gestation periods associated with teak growth.

FIO currently manages teak monoculture plantations with a distinctive approach that balances extensive practices with aspects of intensive management. FIO's teak plantations are established at a density of 625 trees/ha at a 4 m × 4 m spacing. This is less dense than the 1000–1100 trees per hectare recommended by intensive management protocols. The rationale behind the lower density may be to reduce initial competition, yet it has implications for final timber volume and quality. The practice of intercropping is advantageous for maximizing land use efficiency and suppressing weeds, which can otherwise compete with teak saplings for resources. Unlike intensive management systems that advocate for regular pruning to enhance timber quality, the majority of FIO forest managers do not practice regular pruning. This cost-saving measure may lead to wood with more knots, potentially decreasing its market value. FIO conducts thinning operations later in the stand's development, typically after 15 and 20 years. This contrasts with intensive management recommendations, which suggest early thinning to manage competition and improve growth rates. The harvest rotation age is set at 30 years, which is shorter than the 50 or more years seen in extensive teak management, but not as aggressive as the 15–25 years rotations.

The FIO's strategy reflects a compromise between cost-efficiency and the maximization of timber output. FIO managers tend to reduce short-term costs by avoiding early intensive management practices such as frequent pruning and thinning.

However, these practices are pivotal in cultivating high-quality timber, suggesting that the FIO's approach may lead to tradeoffs in timber value. Late thinning practices adopted by the FIO might not alleviate inter-tree competition adequately in the early growth stages, potentially resulting in diminished growth rates and overall yield. Furthermore, the absence of pruning likely affects the structural quality of the timber, making it less desirable for premium markets.

The FIO's rotation period, which seeks to balance between traditional long rotations and intensive short rotations, aims to offer a compromise between quick returns and the cultivation of mature, valuable timber. However, this may result in timber that has not reached its optimal size or quality, impacting the economic viability of the plantations.

03. Field Activities

Course Schedule

Time	Activity	Location
Day 1 **29.09.2024**	**Welcome Session and Campus Tour**	KU Home, Bangkok
09.00	Guided campus tour	
10.00	Sightseeing organized by Thai students	
Day 2 **30.09.2024**	**Opening session and preparation of fieldwork**	KU Home, Bangkok
09.00	Welcome session introducing students and faculty	
09.30	Students share personal backgrounds and interests in short presentations	
10.15	Student presentations (cont.)	
	Lunch at KUFF	
12.30	Lecture on teak management in Thailand: past, present, and future (Dr. Michael Jenke)	
	Break	
13:45	Lecture on plantation management incl. relative spacing thinning (Dr. Carsten Schusser)	
15:15	Outline work plan and prepare equipment	
	Dinner at KUFF	
Day 3 **01.10.2024**	**TS Teak - Private Teak Plantation and Sawmill**	Seeharaj Hotel, Uttaradit
07.45	Leave KU Home	
09.05	Train from Bangkok (Krung Thep Aphiwat) to Uttaradit	
15.30	Meet with TS Teak managing director (Mr. Kraisorn Swangdecharux), visit log yard and plantation next to sawmill	

03. Field Activities

Course Schedule

Time	Activity	Location
Day 4 **02.10.2024**	**Private Teak Plantation - Thinning exercise**	
08.00	Drive to Den Dan plantation	
08.30	Inventory and exercise in relative density thinning at Den Dan plantation owned by TS Teak • Planted: 2005 (19 years) • Spacing: 8 ha – 4 m × 4 m; 8 ha – 2 m × 2 m • Site index class: 25-26 • First thinning: 2011 (low thinning) Lunch at local restaurant	Seeharaj Hotel, Uttaradit
12.30	Data analysis	
15.30	Discuss results of thinning exercise with forest owner at Den Dan plantation	
Day 5 **03.10.2024**	**Private Teak Plantation - Timber Quality**	
08.30	Visit smallholder teak woodlot to discuss teak growing by smallholders	
10.00	Visit TS Teak plantation at Nam Ang plantation (2nd rotation coppice) Lunch Seeharaj Hotel, Uttaradit	Seeharaj Hotel, Uttaradit
13.00	1Tour of TS Teak which integrates timber production, sawmilling, and wood processing	
16.00	Conclusion at TS Teak office Dinner Party	
Day 6 **04.10.2024**	**History of Teak Utilization**	Baan Sri Dha, Chiang Mai
08.00	Uttaradit to Lampang city	

03. Field Activities

Course Schedule

Time	Activity	Location
10.30	Visit 'old forest village' in Lampang city	
13.00	Lampang city to Thung Kwian	Baan Sri Dha, Chiang Mai
14.00	Station of state forest enterprise at Thung Kwian (elephant logging)	
17.00	Drive from Thung Kwian to Chiang Mai	
Day 7 05.10.2024	**Chiang Mai City**	Baan Sri Dha, Chiang Mai
	Independently explore the old town of Chiang Mai	
Day 8 06.10.2024	**Ecology of Teak and Associated Forests**	
09.00	Drive from Chiang Mai City to Mae Ho Phra	
10.30	Visit station of state forest enterprise FIO	Rabeang Pasak Treehouse, Mae Ho Phra
	Lunch at treehouse	
13.00	Visit surrounding forest to learn its ecology and characteristics (dry evergreen forest, dry dipterocarp forest, mixed deciduous forest, and teak plantation)	
17.00	Prepare interview questions for next day	
Day 9 07.10.2024	**Understanding Stakeholders of Public Teak Plantations**	
08.00	Prepare interview questions	
10.30	Groups (4-5 students) meet and interview different local stakeholders (FIO, CF, DNP, Tourism)	Rabeang Pasak Treehouse, Mae Ho Phra
13.00	Reflect on interviews within groups	
15.00	Discuss management options for public forestland considering stakeholder opinions	

03. Field Activities

Course Schedule

Time	Activity	Location
Day 10 **08.10.2024**	**Crop Tree Management in Public Teak Plantations**	
09.00	Inventory of 50 m × 50 m plot	Rabeang Pasak Treehouse, Mae Ho Phra
11.00	Selection of future trees and competitors by 4 groups according to stakeholder demand	
14.00	Discuss management options and silvicultural treatments	
	Exam preparation	
Day 11 **09.10.2024**	**Exams**	Baan Sri Dha, Chiang Mai
09.00	Oral exams (German students)	
13.00	Visit National Park Buatong Waterfall	
17.00	Drive to Chiang Mai City	
Day 12 **10.10.2024**	**Closing Session and Return Trip**	
08.00	Reflections on field activities and learning outcomes; Feedback and closing remarks	
	Students return by bus or train to Bangkok	

Route from Bangkok to Uttaradit, Lampang, and Chiang Mai

Kasetsart University, Faculty of Forestry (Bangkok)

The Faculty of Forestry was established in 1938, well before Kasetsart University itself was founded in 1943, and later became an integral part of the university. The faculty offers a comprehensive curriculum designed to provide students with a strong foundation in both the theoretical and practical aspects of forestry. This curriculum includes undergraduate and graduate programs in Forestry, emphasizing fieldwork, research, and internships. The Faculty of Forestry comprises several departments, including Forest Biology, Forest Management, Silviculture, and Forest Engineering, and serves approximately 800 students annually.

To support practical training and research, the faculty operates five training stations located in various ecological regions across Thailand providing students with diverse environments to apply their learning and conduct research.

TS Teak (Uttaradit)

Located in Uttaradit Province, a prime region for teak forests, TS Teak began its journey in 1970 with a forest concession in Uttaradit. Recognizing the business potential, TS Teak established its sawmill in 1979, marking the first step in its long-term commitment to teak forestry. Initially focusing on processing teak from natural forests, TS Teak launched a reforestation program in 1984. Uttaradit's favorable conditions for teak cultivation made it an ideal location for forestry. This initiative aimed to ensure the long-term viability of teak resources by creating managed teak plantations.

During the early years, TS Teak utilized natural teak from both domestic and international sources. Recognizing the unsustainable nature of this approach and the global shift towards sustainable practices, TS Teak began reducing reliance on natural forest teak in 1988. The company focused on using teak from its own plantations, promoting long-term business sustainability and environmental responsibility. In 2002, TS Teak transitioned from a simple sawmill to a comprehensive teak processing industry. The company upgraded its production systems to meet higher standards of efficiency and quality- TS Teak's design team partnered with German engineers to refine the process of creating finished teak products that meet European standards.

Louis T. Leonowens Mansion (Lampang)

The Louis T. Leonowens House, located in Lampang, is a significant landmark in the history of Thailand's teak trade. Lampang was a major center for the teak industry before World War Two, attracting many foreign companies, including those from British Burma, which brought with them Shan and Burmese workers. These workers built houses and temples in their traditional styles, many of which still stand today.

Louis T. Leonowens, the son of Anna Leonowens (famous from "The King and I"), was a prominent figure in the teak trade. He established the Louis T. Leonowens Company in 1905, which became one of the major companies in the teak industry. His residence, known locally as "Baan Louis," served as both his home and the company's office.

The house symbolizes the era when Lampang was at the heart of Thailand's forest industry, exporting teak and other valuable woods to Europe. The wealth generated from this trade significantly influenced the development of the city. Louis T. Leonowens himself was known for his deep integration into Thai society, speaking fluent Thai and growing up with King Chulalongkorn (Rama V).
Today, the Louis T. Leonowens House stands as a testament to the historical significance of the teak trade in Thailand. It reflects the economic and cultural impacts of the industry and serves as a reminder of the city's rich heritage in forestry.

FIO Station Thung Kwian (Lampang)

Thung Kwian Teak Plantation in Lampang Province is managed by the Forestry Industry Organization (FIO) of Thailand. The FIO was established in 1947 under the Royal Forest Department (RFD) and became an independent agency under the Ministry of Agriculture and Cooperatives in 1956. It is currently under the Ministry of Environment and Natural Resources. FIO oversees 245 forest plantations covering approximately 190,000 hectares across Thailand, with dominant species including teak, eucalyptus, and rubber.

As of now, 32 plantation stations, including Thung Kwian Teak Plantation, have achieved FSC certification. Thung Kwian Teak Plantation, covering around 2,560 hectares, is recognized as one of the best under FIO management, primarily planting teak. FIO's goal is to lead in sustainable economic forest plantations to support the wood industry. The rotation period for planted teak is less than 50 years, with thinning practices conducted when the trees are 6-10 years old and again at 20-30 years. The average annual growth rate of teak at Thung Kwian is 0.4 cubic meters per year, which is lower than the growth rates observed in experimental plots planted with high-quality seeds.

Thai Elephant Conservation Center (Lampang)

The Thai Elephant Conservation Center, located in Ban Thung Kwian, Wiang Tan Sub-district, operates under the supervision of the Northern Region Forest Industry Department. Originally established as an elephant training center by the Forest Industry Organization (FIO) in 1969, it holds the distinction of being the first and only one of its kind in the world.

Initially, the center's primary function was to raise and train young elephants to develop obedience and expertise in logging, while their mother elephants worked in the forests. However, due to a policy to close the forests, many elephants found themselves without employment. Consequently, the training center was transformed into a sanctuary for old and sick elephants and became home to the world's first Elephant Hospital.

In January 1992, the Forest Industry Organization officially established the Thai Elephant Conservation Center. It now also serves as a tourist attraction, offering activities such as elephant shows. These shows preserve the traditional art of using elephants for logging, demonstrating how these magnificent animals have historically been an essential labor force in hauling wood. These exhibitions are enjoyed by both Thai and international tourists, providing insight into the important role of elephants in forestry.

Chiang Mai - Old Town

Chiang Mai, the cultural capital of Northern Thailand, boasts a rich architectural heritage that prominently features wooden structures and significant trees. The old town, surrounded by ancient walls and a moat, is a treasure trove of historical landmarks, especially temples, that reflect the city's deep connection to timber.

Wat Phra Singh is one of the most revered temples in Chiang Mai and a prime example of Lanna architecture. The temple complex, dating back to the 14th century, features several wooden structures that exemplify the intricate craftsmanship of the period. The Viharn Lai Kham, a wooden assembly hall, is adorned with exquisite teakwood carvings and houses the revered Phra Singh Buddha image. The elegant woodwork and detailed gables showcase the skill of traditional Lanna artisans.

Wat Chedi Luang, another iconic temple, was constructed in the 14th and 15th centuries. While its massive brick and stucco chedi (pagoda) is the most prominent feature, the temple complex also includes notable wooden elements. The temple grounds house a beautiful wooden assembly hall with intricate carvings and expansive teak pillars. This hall is a testament to the historical importance of timber in religious and communal structures.

Wat Pan Tao is renowned for its all-teak wooden viharn (prayer hall), which was originally part of a royal palace. This stunning structure is made entirely from teak wood and features elaborate carvings and a beautiful facade. The viharn's interior is equally impressive, with large teak columns and a serene atmosphere that reflects the temple's historical and spiritual significance.

While not a religious site, the Lanna Folklife Museum is housed in a beautifully preserved wooden building. The museum provides insights into the traditional ways of life in Northern Thailand, including the use of timber in construction, tools, and everyday items. Exhibits often showcase the significance of teak and other woods in the region's cultural and economic history.

In addition to architectural landmarks, Chiang Mai's old town is home to several significant trees that hold cultural and historical importance. The city's temples often feature ancient Bodhi trees (Ficus religiosa), which are revered in Buddhism. These trees provide a serene environment and are often surrounded by wooden structures that enhance their spiritual ambiance.

Mae Ho Phra District (Chiang Mai Province)

Mae Ho Phra, located in Chiang Mai Province, Northern Thailand, serves as a prime example of the complex dynamics involved in modern forestry management. The area features a diverse mix of forest types, including mixed teak forests and pure teak plantations, managed under different frameworks such as Forest Industry Organization (FIO) plantations, community forests, and national forest reserves/national parks. This blend of forest management strategies and stakeholder interests makes Mae Ho Phra an ideal setting for practical forestry education and research.

In 1985, the Forest Industry Organization (FIO) was granted a 30-year concession to manage 1,480 hectares of teak plantations in Mae Ho Phra. Despite local opposition to logging operations, which led to a cessation order in the southernmost area (now designated as a community forest), forest operations continue in most other compartments. The FIO's teak plantation estate covers 1,400 hectares, providing a significant case study in sustainable forestry practices. This area is adjacent to

the Namtok Bua Tong-Nam Phu Chet Si National Park, enhancing its ecological significance and potential for ecotourism.

Mae Ho Phra's forestry landscape includes:

- **FIO Plantations:** State-owned teak plantations managed by the FIO, emphasizing sustainable timber production.
- **Community Forests:** Areas managed by local community organizations, focusing on conservation and sustainable use by local residents.
- **National Forest Reserves/National Parks:** Protected areas under the Department of National Parks (DNP) and the Royal Forest Department (RFD), aimed at conserving biodiversity and promoting ecotourism.

The forestry management in Mae Ho Phra involves multiple stakeholders, each with distinct roles and interests:

- **Forest Industry Organization (FIO)**: A state enterprise under the Ministry of Natural Resources and Environment responsible for managing teak plantations and promoting sustainable forestry practices. The FIO plays a crucial role in balancing economic objectives with environmental conservation.
- **Community Forest Organization:** Local groups that manage community forests. These organizations are pivotal in representing the interests of local residents and fostering community engagement in forest management.
- **Tourism Operators:** Businesses that capitalize on the natural beauty and recreational potential of the forests, contributing to the local economy through ecotourism. They work closely with other stakeholders to promote sustainable tourism practices that do not compromise forest health.
- **Department of National Parks (DNP):** The government body responsible for overseeing national parks and protected areas, ensuring the conservation of biodiversity and the promotion of ecotourism.

The complex interplay of different forest types and management practices, coupled with the involvement of diverse stakeholders, offers real-world examples of the challenges and practices in forest management, including multiple objectives, stakeholder engagement, and ecological conservation.

04. Assignments

International Student Seminar

Prepare a concise and engaging 3-minute presentation about your personal background, focusing on your experiences and aspirations in forestry. Begin with a brief introduction of yourself, including your name, where you are from, and your educational background. Highlight any relevant experiences you have in forestry, such as internships or projects you have conducted. Conclude your presentation by discussing your future aspirations in forestry, explaining what areas you are passionate about and what you hope to achieve in your career. Aim to make your presentation clear, structured, and engaging.

Video Production

Student teams will produce material for a short documentary-style video that captures the essence of the field activities, local environment, and cultural aspects of the International Forestry Field School in Northern Thailand. The goal is to document the learning experiences and interactions with the local environment and communities, emphasizing both the scientific and cultural dimensions of the field school. Each team will be assigned two specific days to conduct their filming during the field school program. Upload the raw footage on a Google Drive for final editing.

Consultation of Private Forest Company

Imagine you are a forestry consultant hired to assist a sawmill owner. Your goal is to gather detailed information that will allow you to provide practical recommendations for improving their forestry operations. To prepare a set of interview questions aimed at understanding the operations and challenges of a teak plantation and sawmill.

This assignment will help students adopt the role of forestry consultants seeking to provide support to a sawmill owner with limited professional forestry knowledge, particularly in improving silvicultural practices and forest management.

- **Silvicultural Practices:** Develop questions that explore the current methods used in planting, maintaining, and harvesting teak. Consider asking about planting density, thinning practices, pest and disease management, and fertilization techniques.

- **Forest Management:** Formulate questions to understand the overall management strategies, including rotation periods, forest inventory practices, and reforestation efforts. Inquire about how they monitor and manage forest health and productivity.

- **Operational Challenges:** Create questions that identify the key challenges the plantation and sawmill face. This could include issues related to labor, equipment, market access, regulatory compliance, and environmental concerns.

- **Economic Aspects:** Develop questions to learn about the financial side of the operations, such as costs of production, revenue streams, and profitability. Understanding their economic challenges will help you suggest cost-effective management practices.

- **Certification:** Prepare questions about their efforts towards sustainable forestry practices. Ask about their long-term sustainability goals and the steps they are taking to reach them.

Focus on open-ended questions that encourage detailed responses and provide deeper insights. Avoid yes/no questions unless they are followed by a request for elaboration.

Ensure your questions are clear and specific to avoid misunderstandings. Be precise about what you want to learn, whether about a particular silvicultural technique or a specific management challenge.

By completing this assignment, you will develop the skills necessary to gather critical information as a forestry consultant, enabling you to provide informed recommendations for improving silvicultural practices and forest management in a real-world setting. This exercise will also enhance your ability to communicate effectively with forestry professionals and understand the practical challenges they face.

Understanding Stakeholders of Public Teak Plantation

The objective of this assignment is to understand the different perspectives on forest management by conducting and documenting interviews with key stakeholders, including community leaders, tourism operators, and state administration.

Form small groups of 4-5 students with each group focusing on one of the following stakeholder categories:

- Community leaders and members of Ban Sak Ngam village
- Local Tourism operators
- State administration officials of the National Parks authority DNP
- State administration officials of the Plantation Enterprise FIO

Approach potential interviewees and explain the purpose of the interview. Ensure that they understand how the information will be used. Create a comfortable environment to encourage open and honest dialogue.

For community leaders and members, focus on their experiences and views on forest management practices, the impact of these practices on their lives, and their involvement in decision-making processes. Explore their perceptions of the benefits and challenges associated with current forest management strategies.

When interviewing tourism operators, inquire about how forest management affects tourism activities, their views on sustainable tourism, and the economic and environmental impacts of tourism on the forests. Understand their interactions with other stakeholders and their role in promoting sustainable forest use.

For state administration officials, delve into the policies and regulations governing forest management, the challenges in implementing these policies, and their perspective on balancing conservation with economic development. Discuss their collaboration with local communities and other stakeholders.

While conducting the interviews, take detailed notes and, if permitted, record the conversations to ensure accuracy. Focus on capturing key points, notable quotes, and any recurring themes or unique insights. Pay attention to both verbal and non-verbal cues that might provide additional context

Management of Public Teak Plantation

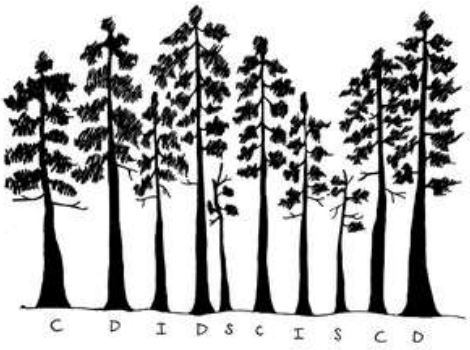
This exercise is designed to deepen your understanding of forest management by focusing on tree selection and strategic planning based on specific management objectives and stakeholder needs. Consider the goals of the state enterprise FIO, acting as the forest owner, along with insights gathered from other stakeholders you've interviewed.

Begin by identifying a plot measuring 50m x 50m. This will be your working area for the tree marking exercise. Observe and record details about the soil type, topography, and water availability.

Select 25 potential future/crop trees that show promise for future growth and development. These trees should have the potential to thrive and eventually dominate the canopy. Identify trees that could impede the growth of your selected crop trees. These are usually in direct competition. Assess each tree's crown class, vitality (check for signs of disease or damage), and other physical characteristics that align with the objectives of timber quality and biodiversity conservation. For example, look for straight trunks and favorable branching patterns for timber production, and diverse species and microhabitats for conservation goals.

Ensure that the spacing between selected crop trees is optimal to prevent overcrowding and promote healthy growth. Use marking ribbons to clearly identify both crop trees and competitor trees.

Discuss the rationale behind your selection of crop trees and identification of competitors. Consider factors such as tree spacing, species composition, and overarching management objectives. Propose future management actions based on your findings from the tree marking exercise. These might include recommendations for thinning, pruning, or other silvicultural practices aimed at enhancing the growth and quality of the crop trees.



Crown classes

Source: openoregon.pressbooks.pub/forestmeasurements

05. Organizational and Logistic Issues for TUD Students

Travel Expenses and Reimbursement

TUD students participating in the Teak Field School are subject to TU Dresden's business travel regulations and must submit their travel expenses to TUD at the end of the trip in order to be reimbursed for accommodation, transportation, visa fees and other reimbursable expenses.

Students are responsible for obtaining receipts for their accommodation and transportation during the trip. Reimbursement of costs can only be made on presentation of original receipts.

The receipts/invoices must include the following information:

- First and last name
- Type of expense and amount
- Date and place
- Signature of the recipient

Invoices paid in Thai Baht must be converted into Euro. The exchange rate of the respective month of the European Commission must be used for this:
https://commission.europa.eu/funding-tenders/procedures-guidelines-tenders/informationcontractors-and-beneficiaries/exchange-rate-inforeuro_en

In addition to the original receipts and the exchange rate, the boarding pass for the flight from Germany to Thailand must be enclosed with the business trip claim.

To submit your reimbursement claim, please make an appointment with Dr. Simon Benedikter after your return to Dresden: **simon.benedikter@tu-dresden.de**

The reimbursement claim must be submitted by October 31, 2024 at the late

Contacts :

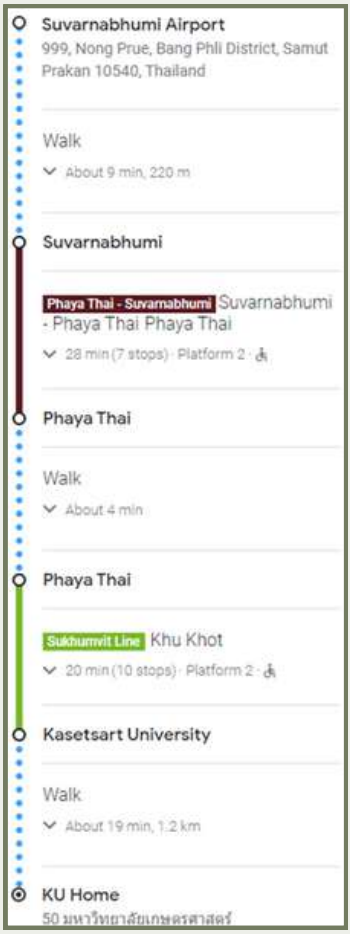
Dr. Carsten Schusser (TUD)
Carsten.Schusser@tu-dresden.de

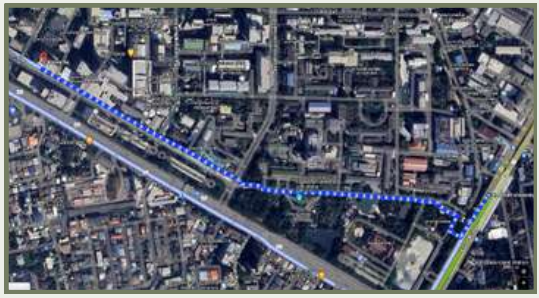
Dr. Aor Pranchai (KU)
fforaor@ku.ac.th

Dr. Michael Jenke (KU)
fformaj@ku.ac.th

Arrival in Bangkok

The best way to get to the Kasetsart University campus and your accommodation on campus (KU Home) is to take the sky train (MRT). Kasetsart has its own station. From Suvarnabhumi Airport take the Sky Train to Phara Thai and change to Sukhumvit Line (direction Khu Khot). Get off at Kasetart University and walk across the university campus to KU Home.





At KU home, double rooms will be reserved for you from the 28th during your stay in Bangkok. Please note that KU home does not provide breakfast.

On September 29th, the first day of the field school, you will be picked up at KU home by your fellow Thai students. Make sure you are downstairs in the lobby at 9am.

Notes

Notes

SEMINAR ADDRESS

English	Thai
KU Home **Kasetsart University** 50 Ngamwongwan Road, Khwaeng Lat Yao, Khet Chatuchak, Bangkok 10900	**เคยู โฮม** **มหาวิทยาลัยเกษตรศาสตร์** 50 ถนนงามวงศ์วาน แขวงลาดยาว เขตจตุจักร กรุงเทพฯ 10900