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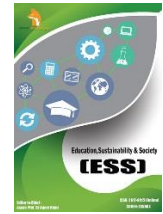
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RESEARCH ARTICLE

REFINING THE SUMMER SCHOOL CONCEPT FOR EDUCATION IN SUSTAINABLE AGRICULTURE AND THE ENVIRONMENT

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ABSTRACT

Agricultural activities are a major contributor to prosperity and a key player in the maintenance of productive and resilient landscapes. However, ageing farmers, yields gaps and climate change are hampering the development of agriculture, and Southeast Asia is no exception to this trend. In this worrying context, the revitalisation of the sector through agricultural education is a key issue: academic curricula in Agriculture and Environmental Sciences must regain their attractiveness among students and their capacity to meet the present and future needs of agricultural chains. Gathering a group of universities in the region, we explored several ways of diversifying the existing academic curricula through the design of original tools aimed at reconnecting scholars with field-based approaches to agricultural challenges and concepts. The aim of the TALENT programme (TrAining on LandscapE maNagementT) is to raise awareness among the present and future sustainability managers in charge of making informed decisions concerning tree-crop plantations, and of developing relevant policies on sustainable development issues. Here, we propose a renovated approach to analyse the landscape, assess ongoing agricultural practices, generate a simplified agrarian diagnostic tool and finally assess the sustainability of current agricultural practices.

KEYWORDS

Active learning, Multidisciplinary education, Off-campus, Pedagogical tools, Sustainability.

1. INTRODUCTION

Despite the high proportion of young people in the Asia-Pacific region, the average age of farmers remains high: 54 years old in Thailand, 57 years old in the Philippines. In Indonesia, almost 80 percent of the nation's 140 million farmers are now aged 45 or older. If this trend continues, future food supplies throughout the region will be seriously affected. Challenges facing perennial crop-based systems also include reducing the gaps between theoretical and measured yields. Yield gaps in plantations are large, and there is considerable scope for improving yields and environmental performance in commodity chains such as rubber, oil palm or timber. Concerning oil palm, a group researcher found that average current yields only represent 62% and 53% of the attainable yield in respectively, large-scale and smallholder plantations (Monzon et al., 2021). Narrowing yield gaps via improved agronomic management, together with limited expansion excluding in fragile ecosystems, would save 2.6 million hectares of forests and peatlands and avoid 732 MtCO₂e compared with following historical trends in yield and land use. Studying the adaptation options available in smallholder production systems, a group researchers noted that agricultural practices that help adapt to climate change are available in South Asia, but that the institutional setup to implement and disseminate those technical solutions needs to be strengthened (Aryal et

al., 2020).

Both initial education and vocational training are recognised by the UNFCCC, the Paris Climate Change Agreement, and the Sustainable Development Goals of the United Nations as viable solutions (Ledley et al., 2017; Sachs, 2015). Disseminating information about key international agreements on global sustainability among scholars proved to be a powerful educational tool while simultaneously providing a clearly understandable framework for students of any level. Universities and technical schools are engines of societal transformation as they can inspire and nurture future citizens, and navigate them towards sustainability through their educational programmes. Kioupi and Voulvoulis used multi-criteria analysis to compare and rank programmes according to how their learning outcomes aligned with the sustainability attributes as well as their contribution to sustainability (Kioupi and Voulvoulis, 2020).

These authors demonstrated that Master's programmes focusing on the environment and sustainability have some important gaps in their curricula and emphasised the need for all universities to understand and fine-tune the contribution of their programmes to sustainability. Using a more critical approach, Kopnina underlined the fact that embracing the SDGs often means assuming that economic growth can be conveniently decoupled from resource consumption (Kopnina, 2022). It is thus

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important to address the current hegemony of the sustainability-through-growth paradigm and to point out its impact on inequalities and the pressure it causes on natural resources, biodiversity loss, climate change and resulting social tensions.

Facing the complex challenge of preparing the present and future generations of students to become actors of change for a climate-smart and resilient agriculture involves revitalising and adapting educational strategies in key domains of agricultural and environmental sciences. Agricultural education is usually derived from interconnected components that hybridise classroom instruction and experiential learning. To better connect the students to the multiple facets of sustainability, we chose a multidisciplinary approach involving trainers/lecturers from a variety of complementary backgrounds. Similarly, we found that education for sustainable agriculture is far more efficient when students from different academic backgrounds (not only agriculture, ecology or food sciences, but also from social sciences, logistics or finance) are mixed. We even found that many benefits can be obtained from mixing students of different levels, from undergraduates to graduates with a PhD and even active professionals.

The importance of integrating transdisciplinary learning into higher education has been promoted because it offers those moving through the contemporary education system a learning culture not constrained by disciplinary silos (Flogie et al., 2015). This approach makes it possible to complement training provided in a limited time (one or two weeks) without interfering with the structure of the curriculum. Multidisciplinary is indeed the powerhouse of the educational project developed through the TALENT Programme.

2. THE PARTNERSHIP

The aim of the TALENT programme (TrAining on Landscape maNagement) is to raise awareness among the present and future sustainability managers in charge of making informed decisions concerning tree-crop plantations, and of developing relevant policies on sustainable development issues (<https://www.talent-programme.org/>). A group of six partner universities targets Masters Students, managers from large plantations, managers of smallholder cooperatives and bank executives). The partnership aims to design and implement targeted training activities that can contribute to the dissemination, over time, of best agricultural and forestry practices. The project involves four countries (Indonesia, Malaysia, Vietnam and Thailand), and four major commodity chains, palm oil, rubber, timber and pulp. The TALENT programme is creating a network of decision-makers trained in the principles of sustainability and supported by R&D experience in the field. In addition to face-to-face teaching activities, the e-TALENT platform (<https://www.talent-programme.org/resources/e-learning-platform>) provides online resources to all learners interested in the sustainability of plantations in Southeast Asia.

Launched in 1989, the Southeast Asian University Consortium for Graduate Education in Agriculture and Natural Resources - the University Consortium for short - is a commitment made among leading Southeast Asian higher education institutions to share academic expertise and resources (<https://uc.searca.org/>). Initiated by the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) in 1989, the University Consortium was seen by SEARCA and its five founding members as a viable approach to pursuing agricultural human resources development in Southeast Asia. It aims to link top agricultural universities in the region to facilitate the free exchange of information, facilities, and expertise. The objectives of the UC are to (i) provide highly trained personnel in agriculture, the environment, and natural resources for the development of the Southeast Asian region; (ii) promote mutually beneficial cooperation among UC members by optimising the use of resources and expertise and (iii) develop strong dynamic linkages among UC members through collaborative research projects as well as faculty and student exchange programmes. Today, the University Consortium is an effective network linking strong universities in Southeast Asia, Japan, Taiwan, Canada, and Germany.

3. BUILDING ON SUMMER SCHOOLS

Summer Schools are the backbone and the trademark of the TALENT-UC educational activities developed for sustainable agriculture and forestry. Summer Schools are very special times and places in which students and trainers of diverse nationalities and from a variety of academic backgrounds can share their experiences and build knowledge together, in one place and in a short time (one or two weeks). Summer Schools can come in very different shapes and colours: in the case of the TALENT Programme, the organising University or group of Universities gives a

different flavour to each vintage.

The original Summer Schools were intended as remedial courses to help students regain the academic level they had lost for different reasons (Lara-Cinisomo, et al., 2020). The courses were systematically organised during “summer” or “winter” breaks, meaning they were scheduled as a one- to two-week period between two academic semesters. Consequently, postgraduate and graduate students with different degrees, from different universities and different countries were able to join the Summer School and to address a selected sustainability challenge on the ground. Today, it is no longer a matter of ensuring a one-off educational or university upgrade, which would target a specific population identified as facing difficult learning situations, but rather of developing an original educational approach *de novo*. What the different types and sizes of Summer Schools have in common is offering, for a limited period of time, a different approach that questions learners by focusing on a renewal of codes, a de-compartmentalisation of learning and the enhancement of teaching that is no longer divided into disciplinary silos.

Education for sustainable development in agriculture and in environmental sciences is inherently multidisciplinary. It must embrace, without distorting them, different disciplines in their tools and objects, such as plant biology, agronomy, forestry, soil sciences or rural economy. Summer schools lend themselves particularly well to this integrative approach. Indeed, it is not a question of replacing or competing with traditional disciplinary teaching, but of demonstrating their complementarity when it comes to addressing global issues, such as deforestation, rural exodus or biodiversity loss.

When it comes to drawing the attention of students and professionals in training to societal issues that concern them directly as students and as citizens, the educational approach, based as it is, on major development questions, resonates with the major themes of the SDGs, and has proved to be relevant. The stated goal is to address notions of sustainable development through the analysis of practical situations, confronting learners with concrete questions, outside academic chairs, which - following the Covid pandemic - are increasingly virtual.

We decided to place reading the landscape back at the centre of our educational approach. Going into the field allows students to grasp the role of the production sectors and their integration in territories, and with the help of supervisors, to forge their own tools for deciphering and evaluating the sustainability of practices. Going into the field to understand, but above all, going there *together*: Summer Schools offer this unique opportunity for collective learning, designed and developed within a group and subsequently assessed by the group, which is deliberately multidisciplinary.

Some university partners take the opportunity offered by Summer Schools to invite lecturers and practitioners from outside, banking on international cooperation. Others may decide to profit from their local roots and contacts with either industry or with groups of stakeholders.

4. VARIOUS SHAPES AND COLOURS

In Indonesia, University Brawijaya organised the UC/TALENT “winter” school in November 2022 in East Java. It addressed the challenge of ensuring the sustainability of plantation systems when cultivation conditions are excellent, i.e. sufficient rainfall all year long, only a short or no dry season, deep rich volcanic soils, social conditions that facilitate innovation and exchanges with the population. Under such favourable conditions, agroforestry-based systems were found to be highly productive, especially for perennial crops. This has been shown to be true even if plantation renewal (after 50-60 years) to ensure the continuation and total reproduction of these systems is a critical issue. Building on this first set of results, the second UC/TALENT Summer School addressed a completely different - but complementary - challenge “Assessing the sustainability of agricultural systems in difficult environments”. Difficult conditions, such as those generally faced in the northeast region of Thailand, include poor soils, a long dry season and limited access to complementary irrigation. Such harsh conditions create specific sustainability challenges.

The Summer School proved to be a suitable format to improve students’ and professionals’ understanding of, in the present case, rural studies, agriculture and natural resources management. The group of students learned to assess the sustainability of local plantation systems facing harder environmental constraints caused by climate change and the necessary extension of cultivation in marginal areas that are increasingly exposed to dry and adverse conditions. Learning was achieved through active methods: practical fieldwork, participatory assessment of

smallholders' plantations, interactive lectures and on-farm surveys.

Another Summer Course organised at USU in Indonesia focused on inclusiveness and sustainability in agricultural development, with a focus on the Indonesian palm oil sector. Palm oil was selected because it is one of the commodities that spark global debates, particularly on burning issues regarding sustainability, such as deforestation. Achieving sustainability in this sector of critical socioeconomic importance will not be possible without the contribution of all the stakeholders involved. The Summer Course consequently brought together 43 students from palm oil producing countries, such as Indonesia and Thailand, and consuming countries, such as Australia and Austria. The topics aimed to cover as many of the different facets of sustainability as possible by inviting six experts from academia, private companies, and the government to the campus.

The experts were asked to deliver specific lectures on sustainability certification, the vectors of deforestation in Southeast Asia, the organisation of supply chains, risk management, the traceability of agricultural/forestry products, and green energy. The course comprised two days of classroom lectures, followed by two days of field visits to oil palm plantations and mills belonging to certified smallholders and to private companies. The students were also given the opportunity to familiarise themselves with the natural countryside surrounding the oil palm/rubber plantations by visiting sites dedicated to the preservation of endangered wildlife, including Sumatran orangutans and elephants, two iconic species which are often considered to be negatively impacted by the development of oil palm cultivation.

After completing the course, the students had a better understanding of the complexity of achieving inclusivity and sustainability in an agro-industrial sector. Most importantly, students also realized that they are also themselves stakeholders, as consumers of tropical commodities such as cocoa, coffee, rubber, or oil palm. As informed consumers and citizens, they can now play an inclusive role in disseminating their understanding of the mechanics leading to a more sustainable commodity.

The Summer School on "Sustainability of agricultural systems in difficult environments" organised in Sakon Nakhon in Northeastern Thailand provided a better understanding of the economic, social, and environmental challenges to sustainability when agricultural production is extended to areas where conditions are suboptimal (for example, where the soils are not the most fertile or where the rainfall is erratic and/or difficult to foresee). Access to water for irrigation can also be limited by various constraints that shape how local cropping systems (annual and perennials) are organised, as well as livestock breeding (cattle and goats). Such constraints will become increasingly frequent in the current context of climate change. In Northeastern Thailand, the expansion of markets for perennials like rubber or orchard fruits also encourages the extension of plantations even in difficult situations. In turn, the expansion of the plantations can challenge their long-term sustainability. Finally, social and demographic conditions and changes in migration patterns can also lead to abrupt decreases in the availability of off-farm labour for small farming enterprises. Since several cropping practices in perennial-based cropping systems, such as weeding, pest control, or the rubber tapping methods required for quality production, are very labour-intensive, they can, in turn, encourage a shift towards more extensive forms of production or create an insecure environment that poses a threat to sustainability.

Another Summer School was organised in May 2022 in Krabi Province in Thailand, a major oil palm plantation area with many and palm oil mills, where both smallholders and estates have traditionally cultivated perennial crops such as rubber and oil palm. The training course provided participants with knowledge and understanding of the oil palm supply chain. It also provided a basis for assessing sustainability at the farm level. Students were asked to assess the context of the development of oil palm in the Province by studying the agro-ecological conditions, and by analysing the landscape, past history, farming systems and typology. Groups of students were asked to work on the various concepts and interpretations of sustainability concepts, and on methods and tools for the assessment of sustainability through the practical experience of field trips, and interviews with farmers who used different farming practices in the same landscape. The course was designed to equip the participants with the capacity of simple sustainability assessment using specific criteria and to build the participants' capacity and skills for data collection, surveys, observations, investigations, and interviews with local smallholders.

Active learning was found pivotal in motivating participants to explore different case studies for field-based assessment of sustainable practices in oil palm plantations. The participants were assigned to groups and particular attention was paid to the diversity of gender, country, and

academic background (agricultural science, economics, etc.). Students prepared a detailed assessment of the training programme at the end of the summer school. Most of the participants agreed the length of the programme (10 days in this case) was appropriate, although several would have preferred to have more time to adapt and complete their data analysis before presenting their results to the farmers. Participants also suggested that discussions could have been included with members of a cooperative in order to give them an idea of the existing networks of producers. They also expressed the need for additional lectures at the start of the training course so that participants who had no basic knowledge would have a common starting point.

The participants would also have appreciated an explanation of the whole methodology at the beginning or at the end of the field trips in order to be able to reuse the methodology on other occasions. A further suggestion made by the farmers during the final presentation was to add a module on pest management. Some students also felt somewhat frustrated, as, because of time constraints, the sustainable practices could not be assessed using quantitative data and a number of participants suggested that preliminary data could have been presented at the start of the course, so that the participants have a good starting point to conduct their sustainability assessments.

5. THE TALENT METHODOLOGY

The TALENT methodology was inspired by the so-called "Agrarian diagnosis" approach which was formalised by the Chair of Comparative Agriculture at AgroParisTech University in Paris during the 1990s (Mazoyer and Roudard, 1997; Dufumier, 1996; Cochet H, 2005; Cochet and Devienne, 2006). The Agrarian Diagnosis approach proved a valuable tool for assessing the intricate and diverse characteristics of agricultural systems. The term "farming systems" was defined as an organised combination of factors and activities for agricultural production, able to serve both subsistence and commercial purposes (Diepart and Allaverdian, 2018). Different factors of production including inputs, land, labour, capital, water, and knowledge, significantly influence the agricultural practices used by individual farmers, leading to the adoption of a variety of crop and livestock systems. Understanding these factors makes it possible to explore the choices behind the decisions taken by farmers. External factors, including political, economic, institutional, and social factors, also exert varying degrees of influence on agricultural systems (Diepart and Allaverdian, 2018).

The principles of Agrarian Diagnosis can be defined as follows:

- Multiscale and cross-disciplinary analysis - This implies different scales of analysis (plot/herd, farm, village, and region) and a cross-disciplinary approach (sociology, agronomy, economics, geography, history). The systemic approach mainly goes from the general to the specific (Dufumier, 1996). In so doing, the questions raised at each scale define the level of detail needed for the following scale of analysis.
- Analysis of farmers' practices - This relies on a key methodological choice to understand why farmers do what they do.
- Systemic analysis - This implies not only focussing on each factor and element of a system but also on their interactions.

The format usually chosen for TALENT Summer Schools (less than two weeks in the field) involves constraints that preclude going through all the individual steps needed to fully encompass an agrarian diagnosis. The main pedagogical choice made by TALENT was to focus on the key principles of an agrarian diagnosis that would allow the students to move from a generic set of sustainability indicators to a specific one, resulting from the analysis of farmers' practices (Figure 1). The following pedagogical sequences were consequently proposed:

1. Presentations and group work on the biophysical, economic and social environment,
2. Historical landscape analysis and production of hypotheses explaining the diversity of farming systems in the study area,
3. Information on sustainability assessment and presentation of potential sustainability indicators,
4. Preparation of survey guidelines and interviews for production and livelihood assessment: building a typology of strategies of change in difficult environments, first series of interview with farmers,
5. Group work on specific sustainability indicators for each type of production system,
6. Second series of interviews with farmers and compiling the data needed

to propose sustainability indicators

7. Preparation of feedback and presentation of the students conclusions to officials and farmers' groups of the region.

The fieldwork deployed during the Summer School involves four main steps. The first and the second steps concerning landscape and historical analysis provide "macro level" information on the diversity of crop and livestock systems. This helps to build a pre-typology to make sure the two series of interviews with farmers will really account for the diversity of situations. The aim of the third and fourth steps is to produce survey guidelines that will help validate hypotheses concerning the diversity of production systems. These steps also help build a detailed and "hands on" set of sustainability indicators based on "micro level" information

collected during field observations and interviews with the farmers.

Conducting semi-structured interviews is not easy and each group of students (3-4 students per group) had only two sets of interviews in which to improve. As the concepts used are quite new (crop and livestock systems, production systems, etc.) the quality of the data collected was low to medium. However, the aim of the TALENT Programme is to give the students a chance to improve their interview techniques and to become familiar with a systemic approach that allows a fine level of understanding of the farmers' reasons for doing what they do. These difficulties relativize the level of knowledge one would expect to be acquired from a complete course entirely dedicated to agrarian diagnosis, i.e. not only being able to give a fine description of a farmer's strategies but also to simulate potential change due to economic, environmental, social factors, among others.

Table 1: A simplified typology of farming systems identified by the Sakhon Nakon Summer School (Thailand)

	Type 1: rice and rubber	Type 2: rice, rubber and cattle	Type 3: cattle and rubber
Description	These farmers only grow rubber and rice, which are complementary in terms of the work schedule but require external fertilizer which is mostly purchased, as the farmers have no cattle	Farmers who grow rubber and rice and raise cattle	Farmers who plant rubber and raise cattle but do not grow rice. As they have no rice straw, they have to grow forage such as Napier grass) They dispose of large amounts of manure that are not required by rubber trees
Area / active family labour	Less than 2.4 ha per active family labour	From 1.12 to 2.4 ha per active family labour	0.56 to 1.6 ha per active family labour
Characteristics of the production system and challenges for sustainability	This type of system is the only one with no cattle. This is challenging for soil fertility management because the way farmers manage soil fertility is key to sustainability.	In this type of production system, farmers have to prioritize the way they use organic manure, as the quantity available on the farm is not enough for both rubber and rice cultivation.	This type of production system is the only one with no rice, but rice straw plays an important role in feeding cattle. The production of grass is the key to this system. Its sustainability depends on the field being fertilized to compensate for the nutrients exported to feed the cattle.
Proposed indicators	Level of organic fertilization for rubber and rice fields: a. The quantity of fertilizer used is higher than average b. The quantity is intermediate c. The quantity is lower than average	Share of organic manure produced on the farm is dedicated to rubber and rice	a. Percentage of total area of the production system dedicated to animal feed (production of grass and other forage?) b. Quantity of animal feed purchased per farm / year

There are three main steps to help the students improve their knowledge and practice of sustainability assessment in difficult environments. The first one is classwork based on presentations with notably the proposal of generic indicators for each of the sustainability pillars. The second one is building a grid of indicators specifically based on the results of the first set of interviews with the farmers. At this stage, students realise how "smart" indicators can be when they are directly linked to the real and varying situations met in the field. The third one consist in filling in the grid of indicators with data they collected and compiled from the two sets of

interviews.

The results, i.e. the quality of the indicators or the reliability of the data, can be improved. At the end of the course, the students realize how much better the results would have been if they had been able to master the methodology from the very beginning. Current TALENT Summer Schools are part of a knowledge and practice acquisition process. Figure 1 below illustrates the type of results obtained, and proposes specific indicators for three different production systems.

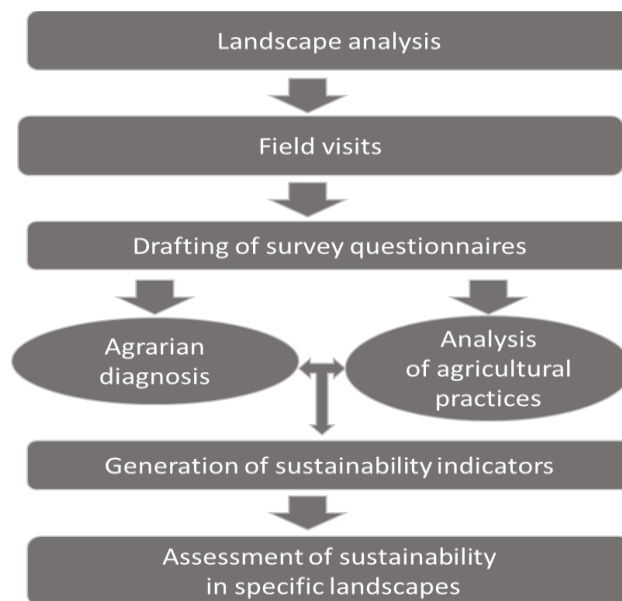


Figure 1: Proposed logical framework for the TALENT/UC Summer Schools.

6. THE LOGISTICS OF SSS

Bringing together students of different nationalities on the ground was the main challenge of the Sakon Nakhon Summer School organised in 2023. The group of students included 51 people of nine different nationalities (32 non-Thais and 19 Thais). The aim of the fieldwork was to have the students discover landscapes and people in selected areas previously identified by the research group from Kasetsart University (KU). The students were divided into 10 multidisciplinary and multinational groups, whose investigations took place in six locations with different agronomic, environmental, and physical characteristics and socioeconomic parameters. Each group conducted site surveys, focusing on both present land use and the history of land use and agricultural change. Access to a diversified panel of farmers who grow different crops and use different agricultural systems enabled the students to build sustainability indicators step-by-step, and to compare real-life situations in different types of farms.

The 2023 Summer School was delivered in a blended mode, starting with online sessions in early July 2023 that were prepared by the Department of Agriculture and Resource Economics and the Institut Agro, Montpellier. These sessions were followed by the core part of the training: a face-to-face class held from July 24 to August 4 that took place mostly in the field. The students were hosted at KU University Campus in Sakon Nakhon, in Northeastern Thailand, from where they were able to go out and investigate sustainability in the surrounding districts. The class ended with two days spent at the main KU campus in Bangkok, where the students presented their results. In this way, the Sakon Nakhon Summer School developed several key principles of the methodology developed by TALENT/UC and its partners. The aim is to train students to learn from the analysis of past and present landscapes, and to compare/hybridise this knowledge with a detailed study of present agricultural practices, and particularly of their environmental, social and economic impacts.

Comparisons of the different study sites scattered around the Sakon Nakhon site provided powerful tools to generate hypotheses concerning the key mechanisms that affect sustainability on the ground. The groups became aware that systems that were previously based on annual crops (rice and cassava), had mainly been replaced by rubber plantations from 2000-2010 following a combination of State and market incentives. This happened at a time when prices for natural rubber were extremely attractive for all stakeholders, including those who were not farming in competitive production conditions (i.e., "difficult conditions" see above). Unfortunately, the drop in market prices that began in 2013 occurred before the rubber trees entered their productive stage.

Today, the strategies the farmers developed when they set up their plantations continue to have an impact on the productivity and sustainability of their plantations. Indeed, farmers who were able to wait until their plantations finally reached the necessary plant stand (8-9 years before the rubber trees could be tapped in these difficult conditions) now have acceptable levels of productivity. Not only are the yields of latex more encouraging although the ageing of the plant stand is slower than in the stands belonging to farmers who were obliged to tap early, several years before the optimum plant stand was reached. The delayed aging has postponed the challenge of plantation renewal, thus leaving the farmers more options.

Nonetheless, plantation renewal will soon represent a huge challenge and will be more difficult to achieve than the first plantation, since forested land is no longer available. However, replanting does appear to be possible when productivity is satisfactory and the farm's activities have been diversified over time, especially with the intensification of cattle production. In contrast, for farmers who have over tapped their trees and/or have not diversified their sources of livelihood, replanting appears impossible. Preliminary results of the 2023 Summer School confirmed that in difficult environments, the sustainability of plantation systems relies on integrating activities not directly linked to the plantation. Diversification and integration with cattle rearing are keys to future sustainability.

7. CONCLUSIONS

After several years of organising Summer Schools that provide education on the sustainable development of plantations in a variety of agricultural contexts in Southeast Asia, we firmly believe in the benefits of this educational tool. With this aim in view, we are encouraging students to develop by themselves a set of specific agro-environmental indicators able to characterise the sustainability of practices in local contexts. The Summer School model combines many of the advantages of off-campus education: it relies on active learning by focusing on the end users of agricultural practices and through direct exchanges with them. Our results

show that despite the limited study period, it was possible to get students involved on the ground, encourage their independent thinking and critical analysis, help them to understand complex real-life situations and propose adequate solutions for more sustainable agriculture.

Summer Schools are also an effective way to test and challenge students about their connection to global challenges illustrated by several key international agreements now governing R&D in agriculture and forestry. The design and on-site implementation of several Summer Schools as part of the TALENT programme provided a rich and diversified educational experience for both students and lecturers. Besides breaking with the routine of traditional lectures, Summer Schools also provide invaluable opportunities to build closer connections between staff and students and for deep discussions about their motives, expectations and wishes for their future job in a different context.

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