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Exploring the Benefits of Fieldwork Courses in the Plantation Management Programme: A Case Study

Nurul Hidayah Mohd Khairlani[1*], Nur Masriyah Hamzah[2], Nur Qursyna Boll Kassim[3], Mohd Shafariza Abdul Manaf[4]

[1]*Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA Cawangan Sarawak, Kampus Mukah, 96400 Mukah Sarawak, Malaysia.*
[2]*Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA Cawangan Pahang, Kampus Jengka, 26400 Bandar Tun Abdul Razak Jengka, Pahang, Malaysia.*
[3]*Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA Cawangan Melaka, Kampus Jasin, 77300 Merlimau, Melaka, Malaysia*
[4]*RND Agro Trading (Nursery Tanaman), Jalan Solok Batu Putih, Solok Duku, 78300 Masjid Tanah, Melaka.*

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ABSTRACT

Fieldwork is an active learning approach that plays a vital role in numerous academic programmes. It provides practical, hands-on experiences that prepare students for real-world professional environments. This research aimed to investigate the benefits of fieldwork courses and their impact on the learning experiences and academic performance of undergraduate students enrolled in the Plantation Management Programme at Universiti Teknologi MARA (UiTM). This study employed quantitative research utilising a survey method. A series of questionnaires was randomly distributed via Google Forms, with responses received from 105 students. Statistical analyses, including descriptive, reliability, and regression analyses, were conducted using the Statistical Package for the Social Sciences (SPSS) version 28 to interpret the gathered data. The study findings reveal that respondents strongly agreed on the benefits of fieldwork, particularly in experiential learning ($\mu = 4.448$), skill development ($\mu = 4.391$), and teamwork and collaboration skills ($\mu = 4.438$). Regression analysis indicated a significant impact on the development of teamwork and collaboration skills ($p < 0.001$). The study confirms that the benefits gained from fieldwork courses include experiential learning exposure, enhanced skill development, and improved teamwork and collaboration skills.

1. INTRODUCTION

Fieldwork is recognised as a significant experiential component that enables students to apply theoretical knowledge in real settings. In higher education, well-designed fieldwork enhances learning by providing authentic contexts that deepen subject understanding and strengthen cognitive development. Previous work indicates that experiential activities enable students to make meaningful connections between knowledge and practice, thus improving learning outcomes (Fuller et al., 2006). Similarly, inquiry-based field

[1*] Corresponding author. Nurul Hidayah Mohd Khairlani *E-mail address*: hidayahkhairlani@uitm.edu.my.

activities enhance students' critical thinking, problem-solving, and communication skills because they actively participate in knowledge construction rather than receiving information passively (Praskievicz, 2022).

Evidence also shows that fieldwork facilitates the development of both technical and transferable skills, which are important for future employability. Field-based tasks enable students to practice discipline-specific skills, such as sample collection, classification, field documentation, and data interpretation, while also developing broader skills, including teamwork, leadership, and interpersonal communication (Scott et al., 2012; Peasland et al., 2019). These skills often become more visible to students when they are involved in designing or evaluating their field activities, demonstrating how fieldwork supports independent learning and reflective thinking. Beyond skill acquisition, exposure to real environments fosters confidence, reduces learning anxiety, and increases student motivation toward disciplinary work, contributing to a more meaningful learning experience (Boyle et al., 2007).

While these benefits have been widely documented across geography, environmental science, and other STEM-related programmes, evidence relating specifically to plantation-based academic programmes remains limited. Plantation-related studies require students to understand operational systems, biological components, and management practices that are difficult to simulate through traditional classroom-based instruction. Hence, experiential learning through fieldwork is a critical element of effective plantation education because it exposes students to real crop environments, plantation structures, and field-level decision-making processes (Curtis and Mahon, 2010). However, empirical research on how undergraduate students benefit from fieldwork within agricultural and plantation-focused programmes, particularly in Malaysia, has not been extensively reported.

Within Malaysian higher learning institutions, Universiti Teknologi MARA (UiTM) has emphasised skill-based education through its HETVET initiative, which aims to produce graduates who are knowledgeable, competent, and industry-ready. The Diploma in Plantation Industry Management integrates academic knowledge with practical training to prepare graduates for professional roles in plantation operations. Among the courses offered, one compulsory component is a structured fieldwork course that exposes students to plantation practices, data collection techniques, problem-solving activities, and engagement with industrial environments. This component is designed to support graduates in demonstrating cognitive abilities, technical competencies, and values that align with industry expectations.

Given the limited empirical understanding of fieldwork outcomes in plantation-based programmes, this study focuses on exploring the benefits of fieldwork for students enrolled in the Plantation Management Programme at UiTM. The findings are important to determine whether fieldwork contributes to academic development, skill readiness, and motivation, while aligning with institutional expectations of practical-oriented, industry-focused education. Therefore, this study aims to assess the benefits gained through fieldwork courses and provide evidence that may inform curriculum refinement and programme enhancement within plantation-based training.

However, this study acknowledges several methodological limitations. First, the research was conducted at a single UiTM branch campus, which limits the generalisation of findings to other institutions or campuses offering similar programmes. Second, although the sample size met the required threshold based on Raosoft calculations, the number remains relatively small and may not capture wider student diversity. Third, the cross-sectional design prevents comparison of skill development before and after fieldwork participation. Finally, the closed-ended structure of the instrument restricts deeper qualitative insight into students' lived experiences. These limitations suggest that future research could incorporate larger multi-campus samples, adopt mixed methods designs, and triangulate survey responses with field assessment scores or supervisor evaluations.

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2. LITERATURE REVIEW

2.1 Experiential Learning and Its Relevance to Plantation-Based Education

Experiential learning plays a critical role in disciplines that require direct interaction with physical environments, including agricultural and plantation management programmes. Fieldwork exposes students to authentic tasks where they observe actual plantation systems, apply theoretical concepts, and make real-time decisions, strengthening both cognitive understanding and practical competencies. Evidence shows that fieldwork enhances learning by enabling students to link classroom concepts to practical contexts. Henry and Murray (2018) reported that students highly value fieldwork as a pedagogical approach, particularly due to the cognitive gains, technical abilities, and transferable and social skills developed through real-world experiences. In plantation-based fieldwork, immersion in activities such as harvesting, field mapping, soil assessment, and facility maintenance encourages active inquiry, problem-solving, and reflective thinking. Fedesco et al. (2020) further noted that field-based learning contributes to student development in ways that are not easily achieved through conventional classroom instruction.

Studies in agriculture and applied sciences consistently report that experiential exposure improves student competencies and attitudes. Sagario and Versano (2023) demonstrated that experiential activities enhanced agricultural students' competencies and motivation toward crop production. Similarly, Bedawy (2017) highlighted that experiential learning strengthens conceptual understanding and supports practical application beyond classroom instruction. Importantly, different forms of fieldwork generate different learning benefits; Peasland et al. (2019) found that lecturer-guided sessions tend to reinforce technical competencies, whereas student-designed investigations cultivate transferable skills and deeper autonomy.

Within the context of plantation operations, experiential activities strengthen students' agency in handling field observations, applying agronomic concepts, and developing on-site decision-making abilities. Collaborations between universities and industry partners further support authentic learning experiences, ensuring that curriculum objectives reflect current operational practices and skill demands. Such collaboration improves industry awareness and makes the transition to the workforce more seamless, particularly in technical fields where workplace readiness is crucial.

2.2 Fieldwork, Employability Skills, and Professional Readiness

Employability encompasses the ability to obtain and progress in employment, supported by personal attributes, core cognitive skills, and process-related competencies (McQuaid & Lindsay, 2005; Yorke, 2005). In agriculture-related industries, critical employability attributes include adaptability, effective communication, decision-making, teamwork, independence, and the ability to work under demanding environmental conditions (Robinson et al., 2007; Suarta et al., 2017). Fieldwork-based learning supports the acquisition of these attributes through direct exposure to workplace norms, structured observation, and reflective practice.

Work-based learning components such as fieldwork, industrial visits, and problem-based assignments have been widely incorporated within higher education institutions to address labour market expectations. Malaysian universities, including UiTM, emphasise experiential learning to align graduate attributes with industry requirements (Nawawi & Anuar, 2024). Evidence suggests that students who undergo structured fieldwork display improved readiness for industry internship, stronger adaptability, and higher confidence in performing discipline-specific tasks (Kassim et al., 2024). Next, according to Mohamad (2025), managerial coaching needs to be conducted as soon as possible to increase employee engagement and skills, which will improve organisational performance. In the plantation management programme, students will be guided by lecturers to ensure that they understand proper plantation management practices. Fieldwork, therefore, functions not merely as an academic requirement but as a significant platform for skill formation and professional identity development.

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2.3 Challenges and Best Practices in Fieldwork Implementation

Despite its recognised benefits, implementing fieldwork presents pedagogical and logistical challenges. Differences between classroom expectations and real field conditions may affect student engagement and learning effectiveness, particularly when instructors lack field-based expertise (Remmen & Frøyland, 2014). Logistical constraints such as equipment requirements, funding, and transportation further complicate implementation (Oktavianto et al., 2024). Safety risks and physical demands, including exposure to wildlife and terrain conditions, are common concerns, especially among students with limited field exposure (Kassim et al., 2024).

Best practices emphasise student-centred approaches and structured inquiry activities to maximise learning outcomes (Remmen & Frøyland, 2014; Praskievicz, 2022). Sequential integration of classroom instruction and field tasks encourages deeper understanding, while reflective monitoring supports metacognitive growth. Inclusivity considerations such as accessible activities, supervision strategies, and safety protocols also enhance participation and learning equity (Lawrence & Dowey, 2021). The use of mobile applications and digital tools has further improved data collection efficiency and reduced logistical constraints, making experiential activities more feasible and scalable (Oktavianto et al., 2024).

3. METHOD

3.1 Approaches

This study employed a quantitative approach to identify the benefits of fieldwork gained by undergraduate students in the Plantation Management programme at Universiti Teknologi MARA Mukah, Sarawak. Surveys were utilised to allow non-intrusive data gathering so that participants could respond at their convenience. In particular, a closed-ended questionnaire was developed and disseminated to 143 undergraduate students via a Google Forms link shared through WhatsApp Messenger. The use of online technology promoted accessibility and convenience for participants. The Raosoft sample size calculator has been widely used in social science research to provide a user-friendly method for determining adequate sample sizes. In this study, 105 surveys were deemed sufficient for a 95 per cent confidence level. Determining an accurate sample size is essential to ensuring the validity and reliability of research findings.

3.2 Instrumentation

The study's questionnaire was divided into two sections: Section A and Section B. Section A gathered demographic information of the study participants, including their age, gender, locality, education level, and previous agricultural experience. Section B featured nine items on the benefits students derived from fieldwork courses. Variables were measured using nominal and ordinal scales, with responses recorded on a five-point Likert scale ranging from Strongly Agree (SA) to Strongly Disagree (SD). Reliability analysis, using Cronbach's alpha, was conducted to assess the internal consistency of items within each section.

3.3 Statistical Analysis

The data gathered from the study's questionnaire underwent various statistical methods, including descriptive analysis, reliability analysis, and regression analysis on SPSS version 28. Data were systematically summarised and interpreted through percentages and means. Additionally, multiple regression analysis was used to identify the most significant factors influencing the benefits of fieldwork that had affected the development of the Plantation Management Programme undergraduate students in UiTM.

4. FINDING & DISCUSSION

4.1 Reliability Analysis

Cronbach's alpha is essential for validating the internal consistency of Likert scale items. This calculation was conducted using SPSS for reliability analysis. The alpha coefficient ranges from 0 to 1, with higher

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values indicating greater scale reliability. Studies have shown that values of 0.70 or higher are generally satisfactory for indicating internal consistency, although the context and number of items can affect interpretation (Taber, 2017).

Table 1 presents Cronbach's alpha values for the variables of this study. A Cronbach's alpha value of 0.944 for the "Benefits of Fieldwork Courses" scale indicated excellent internal consistency. This suggested that all items in this scale were closely related and measured the same underlying construct. It demonstrated a high level of reliability that is deemed acceptable (Bujang et al., 2018).

Table 1. Summary of Reliability Statistics

Variable	Cronbach's Alpha	No. of items
Benefits of Fieldwork Courses	.944	9

4.2 Demographic Profiles of the Respondents

The demographic profiles (Table 2) revealed that the study sample was dominated by young females (54.3%), mostly from rural areas (60%), and having completed only their SPM qualification (68.6%), suggesting that most of them might be recent high school graduates. A smaller portion of the sample had gone on to complete pre-diploma or diploma programmes, indicating a diversity in educational attainment among participants. Many educational institutions have increasingly recognised the importance of gender equity in agriculture and have been creating supportive environments for female students. This includes mentorship programmes, scholarships, and initiatives to increase female representation in agricultural sciences, which may encourage more women to enrol in these programmes (Aguillon et al., 2020). Moreover, age can significantly affect educational achievement, with younger students having different educational needs and outcomes compared to their older peers. Younger age may impact educational achievement at the university level, as mature-aged students show higher academic performance, boosted by self-efficacy and motivation, according to the research findings (Jerez, 2024).

The study participants were mostly in Semester/Part 2 (61.0%) and Semester/Part 4 (35.2%). The distribution indicated that the study mainly focused on students in their earlier and middle stages of academic progress, with very few in Semester/Part 1, 3, or 5. A significant proportion of participants performed exceptionally well (A+ to A-) in the fieldwork courses, particularly in FPA100, where 77.1 per cent scored in the top-grade category. The absence of lower grades suggested that the participants generally grasped the course material well. There were no participants who scored C grades in any of the courses, indicating that failures were rare, with only one student failing each of the FPA100 and FPA150 courses. The 'Not applicable' category was significant for FPA150 and FPA200. The finding indicated that many students had yet to enrol in these courses, which might be due to their semester standing or other course enrolment criteria. Trends in student performance often show that fieldwork-based courses can lead to better grades due to their practical nature, allowing students to apply theoretical knowledge. The study in the United States highlights that undergraduate participation in field courses has improved knowledge, engagement, and academic performance (Shinbrot et al., 2022). The study also showed that grading distribution in HEIs, especially in fieldwork courses, was often skewed toward higher grades, as participants actively engaged with the material in a practical context. Similar to Barlow et al. (2022), this study found that practical experiences contribute positively to their academic achievements and skill development, as participants who participated in fieldwork scored higher on performance evaluations (Barlow et al., 2022).

The data also highlights a notable difference between theoretical (school-based) and practical (fieldwork) experience in agriculture. While only about a third of the study participants (34.3%) had formal education in agricultural science, nearly two-thirds had hands-on experience in farming practices (67.5%). This implied that participants might have gained practical skills outside of formal education, which was essential in fields like agriculture that often rely heavily on experiential learning. This difference could also reflect how agricultural education was structured in various regions, where formal school programmes may

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not always be available. However, students still acquired farming skills through real-world experiences. Many participants had had practical experience, either through family, internships, or community farming, even if they did not formally study agriculture in school. Thus, fieldwork experience may give students a strong advantage when taking part in more hands-on or applied agricultural courses, even without a formal background in the subject. For example, the Farmer Field School in Indonesia provides non-formal education to enhance livelihoods, compensating for the lack of formal education through practical experience in family farming and community-based programmes (Mariyono et al., 2021).

Table 2. Demographic profiles of the study participants (n=105)

Demographic profiles	Category	Frequency	Percentage (%)
Gender	Male	48	45.7
	Female	57	54.3
Age groups	18–20	99	94.3
	21–23	6	5.7
Location of locality	Rural area	63	60.0
	Urban area	42	40.0
Academic Qualification	SPM	72	68.6
	Pre-Diploma	11	10.5
	Diploma from other universities	22	21.0
Semester/Part	Semester/Part 1	1	1.0
	Semester/Part 2	64	61.0
	Semester/Part 3	2	1.9
	Semester/Part 4	37	35.2
	Semester/Part 5	1	1.0
Grades after completing fieldwork courses FPA100	A+ to A-	81	77.1
	B+ to B-	23	21.9
	C+ to C	0	0
	Failed	1	1.0
Grades after completing fieldwork courses FPA150	A+ to A-	37	35.2
	B+ to B-	10	9.5
	C+ to C	0	0
	Failed	1	1.0
	Not applicable	57	54.3
Grades after completing fieldwork courses FPA200	A+ to A-	37	35.2
	B+ to B-	6	5.7
	C+ to C	0	0
	Failed	0	0
	Not applicable	62	59.0
Have an agricultural science background in school	Yes	36	34.3
	No	69	65.7
Have experience in fieldwork farming practice	Yes	71	67.5
	No	34	32.4

4.3 Descriptive Statistics of the Benefits Gained During Fieldwork Courses

Table 3 presents the benefits gained by the study participants in their fieldwork courses. Out of the nine benefits, three were perceived to have high benefits. They were experiential learning (μ=4.448), development of teamwork and collaboration skills (μ=4.438), and skill development (μ=4.391). These findings were in line with some of the previous studies. Findings from Scott et al. (2012) mentioned that the students enjoy fieldwork and value it for its contribution to their learning, lifelong learning, and career aspirations. The students also have richer learning experiences, increased student proactivity, and improved

teacher-student rapport while deepening their understanding of previous learning (Lai, 1999). Fieldwork also provides first-hand experience, enhancing the experiential mode of learning and providing a safe means of extending students' knowledge, attitudes, and skills (Haipt, 1982), as well as providing experiential, sometimes transformative, learning through the immersion of the learner in the field experience (France and Haigh, 2018). As such, fieldwork significantly enhances experiential learning by engaging students in real-world applications, developing critical skills, and positively impacting both the affective and cognitive domains. It improves deeper understanding, enthusiasm, and professional readiness, making it an invaluable component of higher education.

Apart from experiential learning, many of the previous studies also suggest that fieldwork that is supplemented by generic teamwork skills training enhances teamwork and collaboration skills through practical experiences in communication, leadership, peer mentoring, and coordination (Francis et al., 2025). Nyarko and Petcovic (2022) in their study found that the students frequently develop and use communication, leadership, peer-mentoring, teaching, and coordination skills during fieldwork, even without explicit instruction on teamwork. In addition, DeAngelis et al. (2014) stated that collaborative leadership development through teamwork and collaboration in a programme helps emerging leaders develop seven concrete leadership skills, including coping with ambiguity and working effectively across diversity, which is beneficial for the plantation industry management.

Table 3. Responses on Benefits Gained During Fieldwork Courses (n=105)

Item No.	Statements	Percentage (%)					μ	Std. Dev.	Decision
		SD	D	N	A	SA			
1	Fieldwork courses provide students with hands-on learning	0	1.0	10.5	44.8	43.8	4.314	.698	Low benefit
2	**Fieldwork courses expose students to experiential learning**	**0**	**0**	**8.6**	**38.1**	**53.3**	**4.448**	**.650**	**High benefit**
3	Students can develop problem-solving skills through fieldwork courses	0	0	10.5	46.7	42.9	4.324	.658	Low benefit
4	Students are exposed to diverse environments (different plant species, climates, and ecosystems) in fieldwork courses	0	0	12.4	41.9	45.7	4.333	.689	Low benefit
5	Students can build networking opportunities with professionals and experts in the industry	0	0	11.4	55.2	33.3	4.219	.635	Low benefit
6	**Fieldwork courses able to enhance the skill development of the students**	**0**	**0**	**8.6**	**43.8**	**47.6**	**4.391**	**.643**	**High benefit**
7	Fieldwork courses able to increase the understanding of sustainability practices among students	0	0	10.5	48.6	41.0	4.305	.652	Low benefit
8	Fieldwork courses can build the confidence of the students	0	0	15.2	42.9	41.9	4.267	.711	Low benefit
9	**Fieldwork courses able to develop teamwork and collaboration skills**	**0**	**0**	**9.5**	**37.1**	**53.3**	**4.438**	**.663**	**High benefit**

SA = Strongly Agree, A = Agree, N = Neutral, SD = Strongly Disagree, D = Disagree, μ = sample mean, Std. Dev. = standard deviation. Decision: weightage average = 39.039/9 = ***4.338.***

4.4 Multiple Regression Analysis

Multiple regression analysis was used to analyse which of the identified benefits were strongly associated with the career readiness of the students during fieldwork courses in the Plantation Management Programme provided at Universiti Teknologi MARA (UiTM) Mukah, Sarawak. The regression analysis revealed the

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influence of the study's independent variable (i.e., career readiness of the students) on each dependent variable (i.e., experiential learning, skill development, teamwork, and collaboration skills). These coefficients provided insight into how much a change in an independent variable was expected to change the benefit of fieldwork.

4.4.1 The Most Benefits Gained by Undergraduate Students during Fieldwork Courses

According to Table 4, only 'fieldwork courses develop teamwork and collaboration skills' was statistically significant among the three independent variables, indicating a strong and reliable effect of fieldwork on student readiness. Fieldwork is widely recognised as an active learning strategy that plays a crucial role in many academic programmes by providing practical, experiential learning opportunities that prepare students for professional environments (Dogani, 2023; Samuel and Heather, 2022; Kolb, 1984). In fieldwork courses, a key student learning outcome is the development and application of teamwork and collaboration skills (Apriyani & Ayuningrum, 2024; Alwin et al., 2020). Furthermore, Apriyani and Ayuningrum (2024) found that students enhance their teamwork and collaboration skills during fieldwork courses, as these courses require them to work collectively to complete assigned tasks. During fieldwork, students must coordinate responsibilities and share tasks with peers to ensure successful completion, thereby strengthening their ability to function effectively in team-based roles (Tripathy, 2018). This experience enhances students' career readiness, as teamwork and collaboration are essential in professional settings. Additionally, the development of these skills contributes to the improvement of soft skills, including communication, leadership, and problem-solving abilities (Wang, 2024; Arsenijević et al., 2023; Goltz et al., 2008). Nyarko and Petcovic (2022) also found that students utilise a broad range of teamwork skills during fieldwork, such as communication, leadership, peer monitoring, teaching, and coordination. Therefore, fieldwork courses not only enhance students' soft skills but also improve their overall employability in real-world work environments.

Table 4. Regression Analysis Coefficient

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.422	.342		1.236	.219
	Fieldwork courses expose students to experiential learning	.159	.117	.147	1.362	.176
	Fieldwork courses enhance skill development	.089	.111	.082	.808	.421
	Fieldwork courses develop teamwork and collaboration skills	.621	.102	**.589**	6.066	**<.001**

a. Dependent Variable: Fieldwork courses could increase students' career readiness.

5. CONCLUSION

The study's descriptive statistics indicated agreement on the benefits of fieldwork courses, particularly in providing students with experiential learning opportunities ($\mu = 4.448$). Additionally, fieldwork courses had a significant impact on students' skill development ($\mu = 4.391$) as well as their teamwork and collaboration skills ($\mu = 4.438$). The regression analysis further confirmed that the development of teamwork and collaboration skills through fieldwork courses was statistically significant (p-value < 0.001), demonstrating a strong and reliable effect on student readiness. In conclusion, undergraduate students enrolled in the Plantation Management Programme at Universiti Teknologi MARA (UiTM) benefited from fieldwork courses as they gained experiential learning exposure and improved their skills in teamwork and collaboration. These skills are essential for increasing students' career readiness and equipping them for professional environments. This finding can be used for future curriculum design to maintain and enhance the experiential components within agriculture and plantation programs. More teamwork activities, and industry link assessment can be conducted during the fieldwork to increase the skills most valued in the

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workplace. In future, other research can be conducted with other faculties or universities in Malaysia to determine variation in student outcome and to assess the impact of fieldwork courses on employability performance.

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CONFLICT OF INTEREST STATEMENT

The authors declare that this research was carried out without any personal, commercial, or financial gain, and no conflicts of interest exist with the funding bodies.

AUTHORS' CONTRIBUTIONS

Khairlani conducted the fieldwork, compiled the literature review, and supervised the whole article's composition. Boll authored the research methodology and conducted the data entry. Hamzah executed the statistical analysis and interpretation of the findings. Abdul contributed to the compilation of secondary data, created the visual representation of findings, and assisted with editing the paper. All authors contributed essential comments and assisted in refining the research, analysis, and article.

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Nurul Hidayah Mohd Khairlani, PhD is a senior lecturer at the Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA Cawangan Sarawak, Kampus Mukah. She specialises in agronomy with a focus on plant ecophysiology, particularly plant responses to environmental factors. Her research supports sustainable land use and improved crop productivity. She is actively engaged in teaching, research, and community projects related to plantation and environmental management. She can be reached at hidayahkhairlani@uitm.edu.my.

Nur Masriyah Hamzah is a senior lecturer at the Faculty of Plantation & Agrotechnology, Universiti Teknologi MARA Cawangan Pahang, Kampus Jengka. She holds an academic background in plantation management, with expertise spanning marketing, human resources, agricultural economics, agronomy, and quantitative social research. Her research interests focus on the intersection of agriculture, socioeconomics, and sustainable development. She can be contacted at nurmasriyah@uitm.edu.my.

Nur Qursyna Boll Kassim, PhD is a senior lecturer at the Faculty of Plantation & Agrotechnology, Universiti Teknologi MARA Cawangan Melaka, Kampus Jasin. She specialises in soil conservation and management, with a particular focus on peat soils. Her academic and research work aims to enhance sustainable land use practices and improve agricultural productivity in challenging soil environments. She is actively involved in teaching, research, and community engagement projects related to plantation and environmental management. She can be contacted via email at qursyna@uitm.edu.my.

Mohd Shafariza Abdul Manaf is the Manager of RND Agrotrading, a company specialising in plant nursery operations, agricultural farming, and the supply of agricultural materials. He has extensive experience in crop cultivation and agricultural resource distribution, supporting local farmers and agribusinesses with quality seedlings, essential inputs, technical guidance, and training programmes to enhance productivity. His work focuses on strengthening sustainable farming practices and improving agricultural efficiency. He can be contacted at msbam_86@yahoo.com.