

Gender Inequality and Women's Subordination in the Oil Palm Plantation Sector in Bengkulu Province: A Secondary Data Analysis

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Abstract Gendered labor relations in Bengkulu oil palm plantations remain poorly documented despite women's substantial contribution to plantation work. This study assessed gender inequality, forms of structural subordination and women's access to economic resources across the Bengkulu oil palm sector using secondary data from Statistics Indonesia, the Directorate General of Plantations, policy documents and previous empirical studies. The analysis combined descriptive quantitative analysis, the Harvard Analytical Framework, the Gender Analysis Pathway and source and theoretical triangulation. Smallholder plantations represented an estimated 68.2% of the oil palm area in the compiled data. Women predominated in fertilizing and spraying (>75%) and loose-fruit collection (>85%), whereas men predominated in harvesting (>95%) and loading (>98%). Female labor force participation in major oil palm districts was approximately 49.8-54.0%, compared with 83.8-86.1% for men, while women's involvement in farmer institutions was reported at below 8-15%. Women were also concentrated in casual daily labor with limited formal contracts, social protection and control over land and plantation income. These findings show that gender inequality is embedded in employment status, task segregation, institutional access and resource control, requiring gender-responsive labor protection and sustainability governance.

Keywords: *Bengkulu Province; casual daily laborers; gender equality; oil palm; smallholder plantations*

INTRODUCTION

The oil palm industry plays a strategic role in Indonesia's economic development through state revenue, employment creation, regional development and rural household income. Its expansion has also altered local economic structures and household livelihoods. However, economic benefits are not distributed evenly between women and men. Gender inequality is reflected in the division of labor, employment relations, women's occupational vulnerability and unequal access to productive resources, labor protection and decision-making.

Plantation labor is strongly gender-segregated. Men are commonly positioned as the main labor force for harvesting, which is viewed as physically demanding and is generally associated with higher pay. Women are more often assigned to maintenance activities, including fertilizing, herbicide spraying, pest and disease control and loose-fruit collection (Mehraban et al., 2022; Mulyasari et al., 2023). Although these tasks are frequently categorized as light or unskilled work, they involve substantial physical demands and may expose workers to herbicides, chemical fertilizers and other hazardous materials (Mulyasari et al., 2023; McCarthy and Sitorus, 2025; Sinaga, 2025).

Women's predominantly non-permanent employment status further reinforces gender inequality. Many women work as casual daily laborers (*buruh harian lepas*, BHL), and some are unregistered or effectively invisible in formal employment records. Their economic contributions are therefore not fully recognized in labor systems, while access to social security, occupational safety and health protection, sick leave, maternity leave, menstrual leave and income security remains limited (Sinaga, 2025). Daily wage systems also make women's earnings unstable when illness, pregnancy, household responsibilities or weather conditions prevent them from working.

Women's participation in plantation labor has not necessarily displaced the assumption that men are the principal household earners and women's income is supplementary. This perception can reproduce patriarchal employment structures even when women's earnings are important to household welfare (Sinaga, 2025). In Bengkulu smallholder plantations, wages are commonly calculated according to effective working days, while equipment support and occupational safety and health protection may remain inadequate (Mulyasari et al., 2023). Consequently, women's participation in oil palm employment does not automatically improve their welfare or bargaining position.

Gender differences also occur in resource ownership and decision-making. Expansion of oil palm cultivation may strengthen men's control over production, plantations, land and household income, reducing women's control over farm enterprises and the use of household earnings and limiting their participation in agricultural decision-making (Mehraban et al., 2022; Chalil et al., 2025). Conversely, stronger institutions and partnership arrangements can increase women's participation in income management, record keeping, plantation administration and the adoption of improved agricultural practices (Chalil et al., 2025).

Sustainability certification schemes such as Indonesian Sustainable Palm Oil (ISPO) and the Roundtable on Sustainable Palm Oil (RSPO) were established in response to social and environmental concerns in the oil palm industry. Nevertheless, certification has not consistently produced gender equality at the workplace, and women remain underrepresented in land acquisition negotiations and consultation processes (Vos and Delabre, 2018). Where labor standards are applied and monitored, certification can improve women's working conditions. One reported RSPO case changed women workers' status from casual to permanent daily employment, improving access to social security, sick leave and maternity leave (Sinaga, 2025). Such gains depend on employer commitment, monitoring quality, grievance mechanisms and women's participation in implementation and evaluation.

Research on gender and labor in Indonesian oil palm has examined West Kalimantan, North Sumatra, Riau and East Kalimantan, including gendered work allocation, women's time use, household livelihood change, casual labor vulnerability and certification outcomes (Vos and Delabre, 2018; Mehraban et al., 2022; Rowland et al., 2022). Comparable work in Bengkulu remains limited. Existing Bengkulu studies have not extensively integrated official statistics with explicit gender-analysis frameworks such as the Harvard Analytical Framework or the Gender Analysis Pathway (GAP) (Mulyasari et al., 2023). Methodological fragmentation between econometric or panel approaches and qualitative feminist or political-ecology perspectives has also limited comprehensive interpretation of women's lived employment conditions (Chrisendo et al., 2020; Toumbourou and Dressler, 2020; Rowland et al., 2022; Sinaga, 2025).

Policy-oriented evidence is similarly limited. Relatively few studies have assessed how effectively ISPO, RSPO and regional sustainable oil palm action plans address decent work, social protection, women's resource access, decision-making and income control alongside administrative compliance, land legality, productivity and environmental performance. Comparative evidence between private large-scale estates and smallholder plantations organized through Village Unit Cooperatives (KUD) is also limited.

Accordingly, this study assessed gender inequality in Bengkulu Province oil palm plantations by examining women's access, participation, control and benefits; identifying employment vulnerability, work segregation and structural subordination among women workers and farmers; and evaluating implementation challenges related to ISPO. The study focused on Mukomuko, North Bengkulu, Seluma and South Bengkulu, including women employed as BHL in private large-scale estates and women working as unpaid family labor in smallholder or independent plantations. The analysis was intended to provide contextual evidence for gender-responsive plantation governance, labor protection and sustainability policy.

MATERIALS AND METHODS

Study Approach and Design

This study used a qualitative approach based on secondary data analysis and an integrated document review. The design was used to explore gender relations, forms of subordination and mechanisms of women's marginalization in the oil palm plantation sector of Bengkulu Province. The exploratory-descriptive approach synthesized macroeconomic indicators from Statistics Indonesia, sectoral and spatial information from technical government agencies and findings from prior empirical studies. Because the study relied on secondary sources, it did not directly observe site-level socioeconomic conditions.

Data Sources and Collection

Secondary data were collected through document review and searches of official publications. Three main source groups were used. First, official statistical data included Bengkulu Province in Figures for 2022-2025, the National Labour Force Survey (Sakernas), gross regional domestic product, land-cover and demographic information and district-level Gender Development Index and Gender Empowerment Index indicators for Mukomuko, North Bengkulu, Seluma and South Bengkulu. Sakernas data were used to examine labor force participation by sex, the proportion of casual daily labor and the structure of major employment.

Second, sectoral sources included Indonesian Plantation Statistics and oil palm data from the Directorate General of Plantations, Ministry of Agriculture, the Bengkulu Regional Action Plan for Sustainable Oil Palm (RAD-KSB) and inventory information on Cultivation Registration Certificates (Surat Tanda Daftar Budidaya, STDB). Third, policy and empirical documents included national and regional regulations, Presidential Regulation No. 44 of 2020 concerning ISPO, Bengkulu regulations concerning RAD-KSB, labor regulations, peer-reviewed articles, research reports from non-governmental organizations and case studies of women plantation workers in Sumatra.

Data Analysis

Descriptive analysis was used to summarize land tenure and employment conditions from Statistics Indonesia and the Directorate General of Plantations. Data analysis had three stages. First, available indicators were disaggregated by sex, including labor force participation, weekly working hours and employment status. Second, proportions and ratios were used to characterize women's participation in informal plantation employment, including comparisons between women employed as BHL and permanent workers and between major oil palm districts and the provincial gender development profile. Third, cross-tabulation was used to examine the relationship between women's casual employment status and the relative shares of smallholder plantations and private large-scale estates. The overall analytical workflow is summarized in Figure 1.

Qualitative Gender Analysis

Two complementary gender-analysis frameworks were applied: the Harvard Analytical Framework and GAP. The Harvard activity profile was used to describe the allocation of work between women and men throughout the oil palm production cycle, including land preparation, nursery work, maintenance, fertilizing, harvesting and loose-fruit collection, together with the allocation of working time. The access and control profile was used to examine differences between women and men in access to and control over plantation resources.

GAP was then used to assess four dimensions: access, participation, control and benefits. Access covered opportunities to obtain occupational safety and health facilities, personal protective equipment and technical training. Participation assessed women's involvement in decision-making in KUD, farmer groups and plantation worker organizations. Control examined women's ability to manage farm-household income and make decisions concerning fresh fruit bunch sales. Benefits covered the distribution of employment benefits, including BPJS Employment social security, employment security, maternity protection and reproductive rights.

Data Validity and Triangulation

Source triangulation and theoretical triangulation were used to strengthen the validity and reliability of the secondary qualitative analysis. Macroeconomic statistics from Statistics Indonesia were compared with sectoral reports from the Ministry of Agriculture and findings from micro-level qualitative studies. Theoretical triangulation contrasted empirical patterns with ISPO principles under Presidential Regulation No. 44 of 2020 and the theory of the sexual division of labor. No primary data were collected from human or animal subjects.

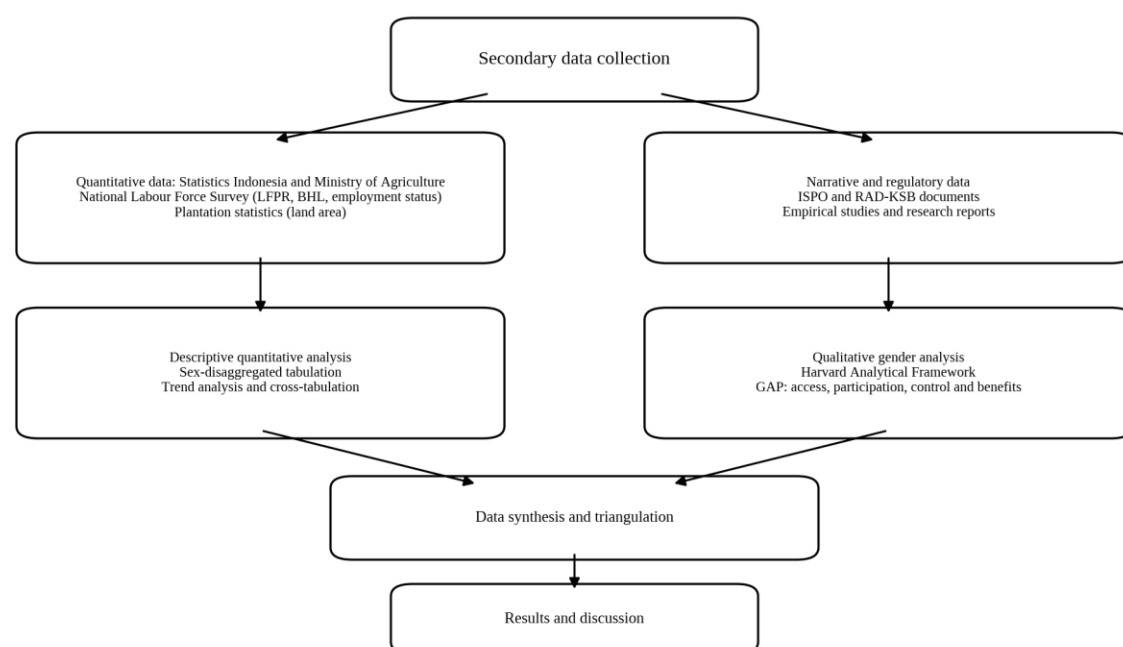


Figure 1. Secondary data analysis workflow integrating descriptive quantitative analysis and qualitative gender analysis

RESULTS AND DISCUSSION

Landholding and Employment Profile

Data from Statistics Indonesia and the Ministry of Agriculture indicate that Bengkulu Province contains several hundred thousand hectares of productive oil palm plantations, concentrated in Mukomuko, North Bengkulu, Seluma and South Bengkulu, and that the sector absorbs a substantial share of local labor. The plantation profile also reveals gendered differences in land control, work allocation and employment status (Table 1).

Table 1. Oil palm plantation profile and gender implications in Bengkulu Province

Plantation indicator	Bengkulu characteristic/profile	Gender implication
Land tenure dominance	Dominated by smallholder plantations (PR) and private large-scale estates (PBS)	Most land ownership certificates are registered under male household heads.
Task segregation	Men: harvesting, loading and heavy clearing. Women: fertilizing, spraying and loose-fruit collection.	Women's work is categorized as "light", resulting in lower or daily-based wages.
Employment status	Permanent employees versus casual daily laborers (BHL)	Women are concentrated in BHL status without formal employment agreements or contracts.

Note: BHL = casual daily laborer (buruh harian lepas); PBS = private large-scale estate; PR = smallholder plantation.

Smallholder plantations accounted for an estimated 215,000 ha, or 68.2% of the approximately 315,500 ha represented in the compiled data. Private large-scale estates accounted for approximately 92,000 ha (29.2%), while state-owned estates accounted for about 8,500 ha (2.6%) (Table 2). In smallholder plantations, land certificates were predominantly registered under male household heads and women frequently contributed as unpaid family workers. In private estates, women were heavily represented in maintenance work and were predominantly employed as BHL. State-owned estates had more formal employment structures, but women remained minimally represented at staff and managerial levels.

Table 2. Estimated oil palm plantation area by management type in Bengkulu Province

No.	Management type	Land area (ha)	Percentage (%)	Gender access and control characteristics
1	Smallholder plantations (PR)	~215,000	68.2	Land certificates are predominantly registered under male household heads; women frequently work as unpaid family labor.
2	Private large-scale estates (PBS)	~92,000	29.2	Women are highly represented in maintenance activities, predominantly with BHL employment status.
3	State-owned large-scale estates (PTPN)	~8,500	2.6	Employment is more formal, but women remain minimally represented at staff and managerial levels.
Total		~315,500	100.0	

Note: BHL = casual daily laborer; PBS = private large-scale estate; PR = smallholder plantation; PTPN = state-owned plantation enterprise. Source: Processed from Directorate General of Plantations and Statistics Indonesia data for Bengkulu Province (compiled data, 2023-2025).

Gender segregation was also evident in plantation tasks (Table 3). Men accounted for more than 95% of harvesting and more than 98% of loading work, with reported weekly work ranges of 35-42 hr and 30-40 hr, respectively. Women accounted for more than 75% of fertilizing and spraying work and more than 85% of loose-fruit collection, with reported weekly work ranges of 25-35 hr and 20-30 hr, respectively. Men's harvesting and loading were commonly paid on a tonnage basis, whereas women's maintenance activities were more often compensated through daily or weighed-output systems. The gendered allocation of tasks also produced different occupational risks: heavy physical loads were concentrated among men, while women faced chemical exposure during fertilizing and spraying as well as physical fatigue and biological hazards during loose-fruit collection.

Table 3. Gender segregation and weekly work allocation in Bengkulu oil palm employment

Activity	Dominant sex	Work time/wk	Status	Wage basis	OSH risk
Harvesting (egrek/dodos)	Men (>95%)	35-42 hr	Permanent/piece-rate workers	Tonnage basis (Rp/kg)	Physical injury and heavy-load risk
Loading fresh fruit bunches	Men (>98%)	30-40 hr	Piece-rate workers	Tonnage basis (Rp/kg)	Back injury risk
Fertilizing and spraying	Women (>75%)	25-35 hr	BHL	Daily flat rate	Toxic chemical/pesticide exposure
Loose-fruit collection	Women (>85%)	20-30 hr	BHL/family workers	Daily/weighed output	Physical fatigue and insect/snake bites

Note: BHL = casual daily laborer; hr = hour; OSH = occupational safety and health; Rp = Indonesian rupiah; wk = week. Source: Synthesis of empirical Bengkulu plantation data and Statistics Indonesia employment indicators.

District-level indicators further suggest substantial gender gaps in economic participation and farmer institutions (Table 4). Estimated male labor force participation ranged from 83.8% to 86.1% across the four major districts, compared with 49.8-54.0% for women. Women's reported involvement in farmer groups or KUD was very low, ranging from below 8% in Mukomuko to below 15% in South Bengkulu. These patterns indicate that women's contribution to plantation labor is not matched by equivalent institutional participation or control over productive assets.

Table 4. Gender and development indicators in major oil palm districts of Bengkulu Province

Oil palm district	Gender Development Index	Male LFPR (%)	Female LFPR (%)	Women's participation in farmer institutions/KUD
North Bengkulu	~91.2	~85.4	~52.1	Very low (<10%)
Mukomuko	~90.8	~86.1	~49.8	Very low (<8%)
Seluma	~89.5	~84.2	~53.5	Low (<12%)
South Bengkulu	~91.5	~83.8	~54.0	Low (<15%)

Note: KUD = Village Unit Cooperative; LFPR = labor force participation rate. Source: Processed from Statistics Indonesia gender indicators and Sakernas (compiled data).

The Bengkulu pattern is consistent with evidence from other Indonesian oil palm landscapes, where gendered work allocation can combine productive participation with limited resource control and unequal recognition (Rowland et al., 2022; Sinaga, 2025). Women in Bengkulu were frequently positioned as family workers or supplementary labor and had limited control over land and income. Their concentration in BHL employment also restricted access to contracts, social security, leave and occupational safety protection, reinforcing inequalities in economic benefits, job quality and decision-making space (McCarthy and Sitorus, 2025; Amandaria et al., 2026).

Gender Analysis Pathway Matrix

Women and men may contribute comparable working time to family-managed oil palm plantations, yet control over fresh fruit bunch transactions with oil palm mills or local collectors remains concentrated among men. The institutional pathway shown in Figure 2 illustrates how membership criteria based on land documentation can translate into unequal access when certificates and plantation documents are registered primarily under men's names. The resulting gaps in access, participation, control and benefits are summarized in Table 5.

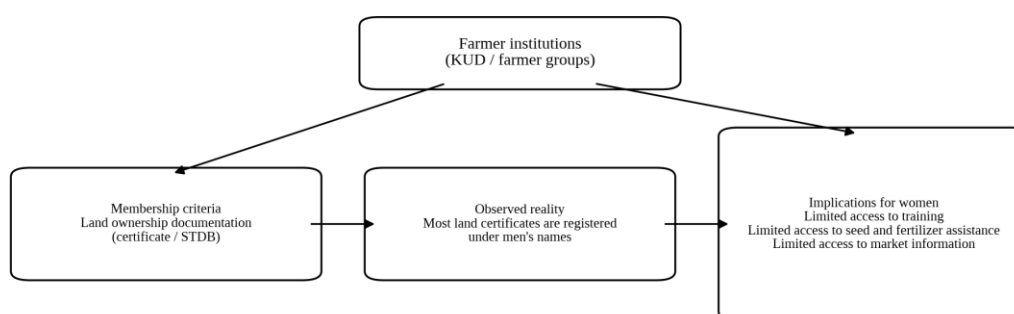


Figure 2. Pathway of gender inequality in access to oil palm farmer institutions in Bengkulu Province

Table 5. Gender gap matrix for the Bengkulu oil palm sector

Dimension	Men's condition	Women's condition	Main inequality/issue
Access	Direct access to land certificates, bank credit, technical training and KUD.	Limited access because legal land ownership documents are not held in women's names.	Exclusion from capacity-building programs and seed/fertilizer assistance.
Participation	Attend and make decisions in KUD/farmer-group and mill-related meetings.	Rarely invited; when present, often assigned consumption/logistical roles.	Institutional marginalization and weak representation of women's voices.
Control	Control fresh fruit bunch sales, income receipt and plantation investment.	Control largely limited to routine household expenditure.	Limited financial autonomy from plantation work.
Benefits	Greater employment security, BPJS Employment coverage and harvest bonuses.	Vulnerable BHL status, without adequate menstrual/maternity leave protection or standard PPE.	Unfair labor practices affecting women workers.

Note: BHL = casual daily laborer; BPJS = Indonesian social security system; KUD = Village Unit Cooperative; PPE = personal protective equipment.

Access gaps were evident in land certificates, bank credit, technical training and KUD membership. Men generally had direct access to these resources, whereas women were disadvantaged when they did not hold legal land documents. This could exclude women from capacity-building programs and assistance for seed or fertilizer. Participation gaps were also institutional: men were more likely to attend and make decisions in KUD, farmer-group and mill-related meetings, while women were rarely invited or were confined to consumption and logistical roles when present. Similar gendered exclusions from negotiation and formal decision-making have been reported elsewhere in oil palm development (Vos and Delabre, 2018; Amandaria et al., 2026).

Control over fresh fruit bunch sales, receipt of income and plantation investment was also concentrated among men. Women's control was commonly limited to routine household expenditure, despite their involvement in maintenance, fertilizing, spraying and loose-fruit collection (Mehraban et al., 2022; Rowland et al., 2022). The benefits dimension reflected similar inequality. Men were more likely to have secure employment status, BPJS Employment coverage and harvest-related bonuses, while women were more vulnerable to BHL status, low wages, limited leave, inadequate personal protective equipment and insufficient occupational safety protection. These conditions were compounded by unpaid domestic responsibilities (McCarthy and Sitorus, 2025; Sinaga, 2025).

Overall, the gender gap followed a connected sequence: restricted access to productive and institutional resources reduced women's participation, limited their control over production and income and ultimately produced unequal economic benefits and labor protection. This pattern indicates that gender inequality in Bengkulu oil palm plantations is structural rather than confined to individual job assignments.

Challenges to ISPO Implementation

ISPO implementation presents both an opportunity and a challenge for improving oil palm governance in Bengkulu. Certification addresses legality and environmental sustainability while also requiring attention to worker protection, non-discrimination and stronger smallholder institutions. The main challenges identified in the source documents were incomplete legal documentation, certification costs, weak farmer institutions and limited facilitation. Local governments therefore have an important role in data improvement, administrative assistance, financing, audit preparation and oversight of social and labor standards.

Land Legality and Cultivation Registration Certificates

Land tenure certainty and legality were major obstacles to ISPO compliance among independent smallholders. Certification requires valid evidence of land tenure or ownership and plantation administration documents. However, some smallholder plantations had incomplete documentation or overlapping land-use claims involving forest areas. The issue also had a gender dimension because land and plantation documents tended to be registered in the name of the male

household head. This limited women's recognition as owners or plantation managers and constrained their ability to register land, obtain financing or participate independently in group ISPO certification.

Formalization of Employment and Occupational Safety and Health

ISPO compliance requires companies and smallholder institutions to provide decent working conditions, including occupational safety and health, social security and protection from gender discrimination. Women involved in spraying and fertilizing were nevertheless frequently employed as BHL without written employment agreements or adequate labor protection. Certification therefore requires worker registration, written contracts, fulfillment of occupational safety and health and social-security rights and adjustment of employment status to the nature and continuity of the work. Although such formalization supports sustainability and worker protection, it may face resistance when it is perceived to increase operating costs (Pramudya et al., 2022; Reich and Musshoff, 2025).

Farmer Institutional Capacity

For independent smallholders, ISPO certification is commonly organized through grower associations, farmer groups or KUD. In major Bengkulu oil palm areas, including Mukomuko, North Bengkulu and Seluma, farmer institutions still faced weaknesses in administration, member records, document management and fulfillment of certification requirements. Women's limited participation in leadership and decision-making compounded these constraints by reducing their access to information, training, financing and certification benefits. Stronger institutional capacity and more inclusive, gender-responsive governance are therefore required.

Government Support and Institutional Facilitation

Bengkulu Governor Regulation No. 4 of 2024 established the Bengkulu Province Regional Action Plan for Sustainable Oil Palm for 2023-2024. The policy was intended, among other purposes, to accelerate STDB issuance for independent smallholders, facilitate mapping of smallholder plantation boundaries and strengthen institutional capacity and gender perspectives in oil palm supply-chain management. Because the implementation period ended in 2024, evaluation of its results and follow-up policy are needed to sustain plantation legalization, spatial mapping and gender mainstreaming.

Provincial and district governments can also use oil palm revenue-sharing funds (Dana Bagi Hasil Sawit, DBH Sawit) to support independent smallholders in meeting ISPO requirements. The funds can support land data collection and mapping, plantation legality requirements and farmer-group management. They can also be directed toward occupational safety and health training, safe pesticide use and provision of personal protective equipment, particularly for women engaged in spraying and fertilizing.

District agriculture or plantation agencies, including those in North Bengkulu and Mukomuko, can work with civil-society organizations and farmer associations such as APKASINDO and FORTASBI to establish and strengthen an Internal Control System (ICS) at KUD or grower-group level. Before external audits, the ICS can support member registration, internal inspection, documentation and monitoring of compliance with ISPO principles and criteria. Gender-responsive indicators should include employment security, occupational safety and health, social-security participation, non-discrimination and safe grievance mechanisms for women workers.

The evidence therefore points to three interrelated barriers to ISPO implementation in Bengkulu: land legality, protection of women workers and weak farmer institutions (Pramudya et al., 2022; Putri et al., 2022; Supriatna et al., 2024). Incomplete documents, land overlap and male-dominated land registration restrict women's recognition and smallholder access to certification and financing, while approaches focused only on formal legality may not address customary and local agrarian issues (Dharmawan et al., 2021; Mulyasari et al., 2023). Weak administration, member records and women's limited involvement in farmer organizations further constrain certification; more inclusive certification requires stronger farmer groups, facilitation, fiscal support through DBH Sawit and coordinated government action (Nurfatriani et al., 2022; De Vos et al., 2023).

CONCLUSIONS

Structural gender inequality remained evident in the oil palm plantation sector of Bengkulu Province. Although women contributed substantially to production, their position was shaped by unpaid domestic responsibilities, field-level occupational pressures and inadequate legal and employment protection associated with BHL status. Women were concentrated in maintenance activities, had weaker access to land documentation and farmer institutions and had less control over plantation income and decision-making. These conditions limited access to reproductive and labor rights, including menstrual and maternity leave, social security and occupational safety protection.

Improvement requires three complementary actions. First, women's labor protection should be strengthened through clearer employment status, written contracts, social security, pay equity, maternity protection and occupational safety and health measures. Second, gender equality should be integrated into ISPO and RSPO implementation through gender-responsive audits, safe grievance mechanisms, protection against discrimination and violence and meaningful participation of women in decision-making. Third, government agencies, plantation companies, certification bodies, worker organizations, farmer groups, KUD and civil-society organizations should coordinate to strengthen women's legal protection, welfare, institutional participation and bargaining position in Bengkulu oil palm governance.

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