Strengthening women’s entrepreneurship capabilities in the palm cattle integrated farming system

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Abstract. Rural women entrepreneurs play a significant role in economic, social, and sustainable agriculture development aspects, increase the added value of a product, create a thriving community system, and encourage a competitive agribusiness system. One of the agribusiness systems that is developing in Indonesia is palm cattle integration. However, women’s entrepreneurial capabilities in palm cattle integration are still limited due to underlying issues and challenges. Using qualitative techniques, this paper aims to evaluate the women’s entrepreneurship aspects in palm cattle integration and identify the potential strategies to strengthen women’s entrepreneurship skills. The performance of women entrepreneurship is influenced not only by individual-specific factors but also by external factors driven by the organizational factors and the external environments. Organizational factors are related to the agribusiness system in palm cattle integration, including human resources, social capital, operational skills, managerial skills, and technology applications. The external environments include entrepreneurial culture, market opportunity, infrastructure, and government policy. Strategy to strengthen women’s entrepreneurship can be considered through the assistance program and facilitation support. The results offer useful insights for policymakers and stakeholders to address women entrepreneurship issues in accelerating palm cattle integration implementation.

1. Introduction
Rural development requires substantial involvement of all components of society, including women. It is hoped that rural women will not only play an essential role in household management but also in income generation. Strengthen women’s participation is in line with the increasingly diverse and widening spectrum of agricultural activities related to resource management, agribusiness management, and risk management. Consequently, women are expected to develop the willingness to innovate, have an attitude to take risks, build and enhance networks, which are key entrepreneurial skills.

In agricultural development, women entrepreneurs contribute to economic, social, and sustainable development aspects [1]. In the agribusiness system, there is evidence that women entrepreneurs increase the added value of a product [2], create a thriving community system [3], and encourage the achievement of a competitive system [4]. In Indonesia, one important agribusiness system is palm cattle integration. It is an agribusiness model based on a large national oil palm area and a program to meet national beef demand. Women’s role in this system is important, especially in the decision-making process, production, marketing and entrepreneurial activities. However, women’s entrepreneurial skills in palm cattle integration are still limited due to some underlying issues and challenges.
The decision to start and grow a business is partly determined by gender differences in network structure and networking behaviour [5]. Thus a specific analysis and strategy are needed in reviewing the entrepreneurial aspects of women, particularly in the Integrated Crop Livestock System (ICLS). It is imperative to understand these strategies to explore opportunities and obtain potential solutions to the challenges they face, thus improving their capabilities, competence, confidence, and status within the broader rural communities.

The involvement of women in ICLS requires a strong entrepreneurial aspect. As an ICLS model, palm cattle integration is a complex mixed farming model that utilizes crops and livestock through space and time. Therefore, this paper aims to identify women’s entrepreneurship aspect and formulate the strategy to strengthen women’s entrepreneurship in palm cattle integration.

2. Research methods

2.1. Research approach

This study used a qualitative approach implemented in two stages. Firstly, we developed a model to analyze the factors that affect the performance of women entrepreneurship. The model development was informed by evidence obtained through literature review. Secondly, a case study approach was used to test the model and evaluate palm cattle integration’s entrepreneurial aspects.

2.2. Location and time of research

The case study was conducted in two selected regencies in East Kalimantan Province of Indonesia. The Penajam Paser Utara and Paser Regencies are chosen because they exhibit the important characteristics of the ICLS. Data were obtained through group interviews with farmers’ groups which including women farmer participants. Research activities were carried out in 2019.

2.3. Analysis method

Descriptive analytics is used to summarise the findings of the information collected through group interviews. A radar chart is used for assessing performance, such as qualitative evaluation indicators [6]. A radar chart is a diagram that maps the ideal and real conditions to evaluate performance [7]. The analysis consisted of several stages: (1) analyzing factors based on their importance in the context of palm cattle integration, (2) evaluating the current conditions, and (3) setting priority focus based on the largest gap value. The study used a 1-9 rating scale to assess the level of importance, where “1” means not important and “9” is very important, and “1” means very poor, and “9” is very excellent to assess the current condition.

The determination of the strategy for strengthening women’s entrepreneurship in palm-cattle uses a pairwise comparison solution. Rank aggregation via pairwise comparisons is an approach that calculates the ranking of several factors that results can represent all results of comparing outcomes with minimum data disagreement [8]. The analysis was calculated by compiling a pairwise comparison matrix. Comparisons are made of two elements based on their importance. The value used is based on the Saaty Scale (1-9) where “1” means equally important, “3” means the level of importance is moderate, “5” means the level of interest is strong, “7” implies importance, and “9” means very important, while the numbers “2”, “4”, “6”, and “8” “point between the judgments [9].

3. Result and discussion

3.1. Women entrepreneurship issues in palm cattle integration

The entrepreneur owns, initiates, manages, and accepts the risks in an economic venture [10]. Specifically, women entrepreneurs can be defined as women or groups of women who initiate, organize, and operate business activities [11]. Entrepreneurship is opening up non-traditional areas of work for women and linkages to trade opportunities. Thus, women’s entrepreneurship is related to women’s involvement in economic activities and how to relate it to entrepreneurial values that will encourage
agricultural activities as an economic activity that will be sustainable from an economic, social, and environmental perspective.

The motivation of women entrepreneurs can be seen from the push factors and pull factors. The push factors consist of getting a life, getting additional income, supporting the family, fulfilling economic needs, and unemployment. In contrast, the pull factors are knowledge, self-confidence, independence, getting respect, getting recognition, and passion [12].

Referring to the large role of women, women entrepreneurship is an essential aspect of palm cattle integration. One of the problems in palm cattle integration is that the business scale is still smallholder-based farming units, making the benefits of integration as a closed agricultural system difficult to achieve. Ideally, the palm cattle integration is implemented on regional development and economically feasible consisting of business units for oil palm plantation, cattle fattening, organic fertilizers, manufacturing animal feed, and biogas.

The development of the entrepreneurial aspect of women’s participation in palm cattle integration will make the management of oil palm plantations and livestock management work optimally and encourage the integration system to become a business unit with a fulfilled economic scale and operates sustainably. Thus, the gender aspect of palm cattle integration is not only an issue related to women’s participation. More importantly, it is an issue of entrepreneurship capability.

3.2. Women entrepreneurship performance analysis in palm cattle integration

The performance of women’s entrepreneurship is influenced by individual and external factors (table 1). Several internal factors influence women entrepreneurs’ success [13]. Some of which relevant in palm cattle integration are business skills, personal competencies and relationships, experience, education level, psychological characteristics of the entrepreneur, and self-efficacy. Some factors related to skills that determine entrepreneurial skills, including communication skills, human relations skills, technical skills, and innate talents [14]. These business skills will encourage women to lead the field of business they enter and manage them well.

| Aspects                       | Factors                                      |
|-------------------------------|----------------------------------------------|
| Individual Factors            | Business skills                             |
|                               | Personal competencies and relationship       |
|                               | Experience                                  |
|                               | Education level                             |
|                               | Psychological characteristics                |
|                               | Self-efficacy                               |
| External Factors              | Organizational Factors/Agribusiness System   |
|                               | Human resources                             |
|                               | Social capital                              |
|                               | Operational skills                          |
|                               | Managerial skills                           |
|                               | Technology applications                     |
| External Environments         | Entrepreneurial culture                     |
|                               | Market opportunity                          |
|                               | Infrastructure                              |
|                               | Government policy                           |

Entrepreneurial competencies can be measured by looking at conceptual, opportunity, relational, learning, and personal competencies [15]. Experience and level of education are related to the accumulation of knowledge, which will affect women’s insights in decision making. Personality is defined as the entrepreneur’s psychological characteristics, including persistence, determination, patience, resilience, vision, and creativity. Self-efficacy has competitiveness and risk taken.
Externals factors include organizational factors and external environments. Organizational factors are related to the agribusiness system in palm cattle integration, including human resources, social capital, operational skills, managerial skills, and technology applications. External environments include entrepreneurial culture, market opportunity, infrastructure, and government policy.

The entrepreneurial process consists of idea generation, idea evaluation, necessary resource procurement, development, maturity, renovation, and growth [16]. Each step requires a different type and intensity of support. In general, two kinds of support determine palm cattle integration performance: assistance programs and facilitation support. Graphically, the women entrepreneurship performance analysis in palm cattle integration is shown in figure 1.

![Figure 1. Women entrepreneurship performance analysis framework in palm cattle integration.](image)

3.3. Analysis of women entrepreneurship for palm cattle integration implementation in East Kalimantan

East Kalimantan Province is one of the centers for national palm oil development beside Riau, North Sumatra, West Kalimantan, Central Kalimantan, and South Sumatra. The development of oil palm plantations and the target program of increasing the livestock population in East Kalimantan have accelerated the palm cattle integration implementation. It has long been implemented by farmers who have oil palm plantations. Local government support started in 2000 by allocating a budget for its development. This integration system has been further expanded since 2015, using waste from palm oil processing in oil palm sludge and palm kernel meal as a raw material source for cattle feed.

The area of oil palm plantations is concentrated in East Kutai, Kutai Kartanegara, and Paser Regencies. Ownership of oil palm plantations ranges from 0.5 - 10 ha with average land ownership of 2 ha. The average age of the palms is around ten years and cultivated in mineral soils. Livestock assistance has been provided from 2014-2015 to farmer groups. The pattern of cattle management is carried out intensively and confined in a communal pen. Animal feed is given in the form of grass and straw, while
the potential feed that has not been used is palm fronds. There is also an extensive livestock management system whereby livestock are grazed on oil palm plantations. In this model, there is relatively less cattle management activity.

The role of women is getting more significant in the intensive livestock management system. The women’s involvement includes both technical and managerial aspects. From a technical aspect, women are involved in oil palm plantations and livestock management. Some of the activities carried out by women in oil palm plantations are planting, cultivating, fertilizing, or harvesting. In terms of livestock management, women participate in activities such as looking for grass, feeding, cleaning the fences, washing the livestock, and maintaining their health. Most of these activities are usually carried out after the women have completed their domestic household duties.

From the managerial aspect, women are involved in managing income. Women can also make agricultural business decisions, asset management, non-agricultural business management, and decisions related to obtaining credit. However, our findings showed that involvement in managerial aspects is very limited.

Although women are involved both in technical and managerial aspects, the extension activities and technical guidance for the palm cattle integration are designed and mostly aimed at men. No knowledge and technology transfer model has been prepared based on women’s needs and time availability. Besides, women’s palm cattle integration position is still positioned as a complement and support, not the main actor. So that involvement in decision-making is still limited.

Palm cattle integration is an agricultural system that integrates oil palm plantation and cattle management activities in an agribusiness unit. The application of ICLS, based on smallholder plantations and smallholder livestock, such as palm cattle integration, is faced with multiple obstacles that limit its development. The integration of two different activities requires more efficient activity management and worthy risk management. Besides, to achieve economies of scale, it is necessary to incorporate household businesses into the village or region-based businesses. This condition then demands the ability to have collaborative management, resource allocation, scheduling, knowledge sharing, and social capital development.

In this condition, essential factors in determining women’s involvement in entrepreneurship are business skills, self-efficacy, human resources, social capital, managerial skills, entrepreneurial culture, market opportunity, and government policy. Business skills and self-efficacy can encourage women to be involved in a larger portion professionally. Referring to a regionally-based form of business by uniting several farmer groups and other actors, human resources, social capital, and managerial skills determine the success of implementing activities. From the external factors, the driving factors are entrepreneurial culture, market opportunity, and government policy.

In general, business skills, self-efficacy, social capital, operational skills, and managerial skills have a factor with a high level of gap (figure 2). These indicated that the factors are relatively important, but their performance is still weak.

The involvement of women in palm cattle integration is more because of free time after completing domestic tasks. Besides, the role’s contribution so far is still in physical activities in palm cattle integration management. Although cattle are held in communal pens, palm cattle integration remains a household-based activity and has not yet turned into an extensive and integrated business activity. In terms of self-efficacy, the competitiveness factor and the tendency to take risks are still low.

Social capital is defined as networks and shared norms, values, and understandings that facilitate cooperation within or among groups [17]. Social capital helps entrepreneurs overcome resource constraints due to utilizing a network or an institutionalized relationship with mutual recognition between the members involved.
Operational skills and managerial skills are needed in the management of palm cattle integration with a balanced proportion. This requirement is related to the nature of palm cattle integration activities, which unite plantation and livestock business activities in a business unit and integrate farmers’ group activities into an integrated business model.

Study showed that higher gap factors are business skills, self-efficacy, social capital, operational skills, and managerial skills. Based on this, the strategies to strengthen women entrepreneurship for palm cattle integration implementation in East Kalimantan will focus on building knowledge and awareness of women’s entrepreneurship, building women business incubators, ensuring the capacity for the usage of incubators, and developing innovative support services for women entrepreneurs (figure 3).

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**Figure 2.** Women entrepreneurship performance mapping for palm cattle integration implementation.

**Figure 3.** Strategy to strengthen women entrepreneurship for palm cattle integration implementation.
Strengthening women entrepreneurship for palm cattle integration implementation begins with building knowledge and awareness related to entrepreneurship, followed by developing a business incubator that includes women entrepreneurs and positions women’s role in decision-making. It is a strategic step to increase women’s involvement and build women’s entrepreneurship in palm cattle integration. The program or agency provides sponsorship that can effectively accelerate a start-up or business [18]. This program will help new start-ups in the early stages of their development by providing connections, capital assistance, work facilities, training, or mentoring.

4. Conclusion
Palm cattle integration, as an ICLS model, is a complex mixed farming model that utilizes crops and livestock through space and time. From a regional perspective, palm cattle integration demands the ability to have collaborative management, resource allocation, scheduling, knowledge sharing, and social capital development. The involvement of women in ICLS requires a strong entrepreneurial aspect. Women participation in palm cattle integration can be optimized by increasing the entrepreneurial aspect of women.

Individual and external factors influence the performance of women’s entrepreneurship. Externals factors include organizational factors and external environments. Organizational factors are related to the agribusiness system in palm cattle integration, including human resources, social capital, operational skills, managerial skills, and technology applications. External environments include entrepreneurial culture, market opportunity, infrastructure, and government policy.

The strategy to strengthen women’s entrepreneurship can be viewed from two sides: the assistance program and facilitation support. The assistance program includes (1) building knowledge and awareness, (2) training on managerial and technical expertise, and (3) ensuring the capacity for the usage of incubators. Facilitation support includes (1) building women business incubators, (2) building networks, business partnerships, and trade linkages, (3) developing innovative support service, (4) improving the regulatory framework, (5) involving community leaders, and (6) improving access to more favorable financing.

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