Research Article

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Inclusive rice seed business: Performance and sustainability

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Abstract: A collective action approach to rice seed production is an inclusive method involving the community's active participation at all stages of its execution. This all-inclusive strategy, however, has yet to be thoroughly investigated and published. This study explored how and to what degree an inclusive rice seed business of Gapoktan, based on a collective action approach, might be deployed in a sustainable rice seed company run by community groups. The research comprised the following stages: (1) establishment of a seed production business institution, (2) production of rice seeds, and (3) self-assessment of the performance of the seed production business institution. Institutional data were acquired through a questionnaire that references the European Foundation for Quality Management's (EFQM) methodology. Three dimensions used were direction (purpose, vision, and strategy; organizational culture and leadership); execution (engaging stakeholders; coasting sustainable value; driving performance transformation); and result (stakeholder perceptions; strategic and operational performance). The study suggests essential findings: The organizational structure of rice seed producers formed is complete regarding its operational functions. The rice seeds produced by Gapoktan have met both the volume and quality standards. From a financial perspective, this rice seed production unit is feasible for further development. However, their social orientation is still relatively high and needs to be more profit-oriented. Uniquely, not all members buy and use Gapoktan seeds. As a result, additional efforts are necessary to provide exceptional service to Gapoktan members.

Keywords: rice seed business, inclusive, sustainability, EFQM

1 Introduction

The rice crop harvest in Indonesia covers a vast area of 10,452,672 ha. In 2022, the average productivity was 5.24 tons per hectare [1]. The rice's productivity can still enhance its potential by employing new high-yield varieties (HYV) [2–4]. Until the year 2019, the Ministry of Agriculture released a total of 350 inbred rice varieties. Notably, in 2020, the Ministry of Agriculture introduced 18 additional inbred rice varieties [5]. However, most farmers in Indonesia persist in cultivating rice using long-established seed varieties. Among these, notable examples are the IR-64 from 1986 (12.92%), the Ciherang from 2000 (44.48%), followed by Mekongga from 2004 (6.42%), local varieties (7.65%), and the remaining portion utilizing other inbred varieties [6]. According to Agricultural Statistics and Kumar et al. [7,8], socioeconomic and environmental factors are the key to farmers' adopting new varieties.

Building a seed business is a fundamental effort in the overall development of the agricultural sector. It is because seeds are an irreplaceable factor of production. Alongside other production inputs such as fertilizers, pesticides, labor, and land, they determine the productivity and quality of the

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outcomes [9]. Seeds also limit the productivity and quality of agricultural activities, whether on a large or local scale. High-quality seeds aid farmers' financial success in their farming activities [10]. In this context, the spread of HYV seeds is critical [11]. However, distributing HYV seed is difficult since most seed companies continue to manufacture and promote older types. Farmers depend on seed providers since they can only receive older kinds provided by these producers [12]. Because Indonesia's seed system is still proprietary, it takes time for farmers to embrace new HYVs quickly. To solve the issue of exclusivity, new techniques are required. One of the various adoption techniques is communal and inclusive action.

Collective action represents a pivotal approach strategy widely implemented for small-scale farmers in developing countries [13]. According to Guzmán Luna et al. [14], collective action denotes a joint effort by several individuals to achieve common goals and share benefits through coordination and cooperation among members. The collective action approach through farmer groups, namely "Gapoktan," has long been practiced in Indonesia for agricultural development since the "Bimas" era 1979 until 2022. The total number of "Gapoktan" in Indonesia amounts to 64,522 [6].

The Minister of Agriculture of the Republic of Indonesia Regulation No. 67/Permentan/Sm.050/12/2016 concerning Farmer Institution Development is named Gapoktan. Gapoktan establishment aims are to serve as an agricultural economic institution that functions as (i) a provider of production facilities and infrastructure, (ii) a farming/production unit, (iii) a processing unit, (iv) a marketing unit, and (v) a microfinance unit (savings and loans).

Numerous studies regarding the successful performance of collective action by Gapoktan have been conducted. The factors influencing the success of collective action performance are the duration of operation and the experience of the Gapoktan institution in group activities [15]. Furthermore, the executive's managerial group also influenced by managerial skills, the level of member participation, and competitiveness in carrying out collective action [16,17].

The successful performance of collective action by Gapoktan as a platform for learning and production units has been applied in forest management [18]. In the seed industry, the implementation of a collective action approach through Gapoktan in Indonesia through the "1000 Independent Seed Village (1000 ISV)" program was done from 2015 to 2019. The program can produce seeds to benefit the village community and surrounding areas. However, the program has yet to reach its full potential, indicated by the fact that in 2020, the percentage of farmers using certified seeds remained at 53%, below the set target of 60%. The target set for 2024 is 80% [19,20].

Despite the diverse outcomes in the past and numerous initiatives to regulate group-based seed production, there is empirical evidence regarding the role of farmer groups in producing and marketing quality seeds [21–24]. None of the studies have examined inclusive seed production units using the collective action approach. Given this background, this article explores the extent to which and how inclusive business, employing collective action strategies, can be applied in sustainable rice seed enterprises.

2 Methods

The study was conducted in the Kragan Village, Gondangrejo District, Karanganyar Regency, Central Java Province in 2021–2022. The location selection was based on the consideration that the area is a prominent centre for rice production. The research process comprised the following stages: (1) establishment of a seed production business institution, (2) production of rice seeds, and (3) self-assessment of the performance of the seed production business institution.

The formation of the seed production business institution was carried out based on the identification of issues and needs using the Participatory Rural Appraisal (PRA) and Focus Group Discussion (FGD) approaches, involving relevant stakeholders such as policymakers in Central Java Provincial Government's Department of Agriculture and Plantation, Agricultural Extension Officers (AEO), village officials/community leaders, and farmers. The established seed production business institution has an organizational structure consisting of a general manager, administrative and financial manager, production manager, and marketing manager.

The production of rice seeds was undertaken by seven cooperating farmers on a two-hectare rice field, allocating one hectare each for Inpari 32 and Pepe. Pepe is an existing variety, while the Inpari 32 is a new HYV. Technological innovations in seed production adhere to seed regulations, as indicated in Table 1. Throughout the production process, supervision was conducted by the Seed Certification and Inspection Agency (SCIA) of Central Java Province, encompassing preliminary, vegetative, generative, pre-harvest, processing equipment, and laboratory testing of seeds.

Institutional data are acquired through a questionnaire that references the European Foundation for Quality Management's (EFQM) methodology. The European Foundation for Quality Management has formulated the "EFQM Excellence Model" to guide enterprises in pursuing such domains. The model is the property of the European Foundation for Quality Management (EFQM). Institutional data are collected through self-assessment

Table 1: Seed production technology innovation

Component technology	Description
Varieties	Pepe (existing variety) Inpari 32 (new HYV)
Number of seed	30 kg/ha
Planting space	20 × 20 cm
Dosage of fertilizers/ha	Urea, 200 kg; Phonska, 200 kg; KCL, 100 kg; Chicken manure, 500 kg
Roughing/Plant selection	Removing plant clusters with morphological characteristics differs from seed-producing plants, starting from early and late vegetative stages and early and mature generative stages
Post-harvest and seed processing	Sun-drying until moisture reaches 11%, cleaning, grading, and arranging seeds (stacking) for laboratory testing
Laboratory test	Taking samples and analyzing the moisture content, pure seeds, seed impurities, other varieties, seeds of other plants, and germination

Source: Ministry of Agriculture of the Republic Indonesia, 2020.

to enhance the processes and outcomes of technical and institutional approaches in seed production. Self-assessment, utilized to gauge performance and obtain sustainable strategies, is conducted by employing a questionnaire that adheres to the EFQM, targeting critical informants, including the top management/administrators overseeing rice production, comprising a total of seven individuals, Central Java Provincial Government's Department of Agriculture and Plantation (two individuals), the Central Java SCIA (two individuals), external partners/seed producers (two individuals), and a group of 20 participating farmers. The collected data encompass seven EFQM criteria [25], namely: (1) Purpose, vision, and strategy; (2) Organizational culture and leadership; (3) Engaging stakeholders; (4) Coasting sustainable value; (5) Driving performance transformation; (6) Stakeholder perceptions; (7) Strategic and operational performance (Table 2).

The technical data collected in the seed production unit encompasses the volume of prospective seeds, yield, seed production, seed moisture content, seed purity level, seed impurities, other seed varieties, another seed plant, and seed germination. The economic data collected in the seed production unit include fixed and variable costs, with output data being the seed production itself.

The entire institutional data criteria are analyzed using the EFQM criteria, which are divided into three dimensions: (i) direction (purpose, vision, and strategy; organizational culture and leadership); (ii) execution (engaging stakeholders; coasting sustainable value; driving performance transformation); (iii) result (stakeholder perceptions; strategic and operational performance).

The technical data obtained from the seed production unit are analyzed descriptively. At the same time, economic analysis pertains to the financial analysis associated with input and output values during production. The analysis of the profitability of rice seed production venture employs a formula based on previous research, specifically the study by Suratiyah [26], as follows:

$$\Pi = \mathrm{TR} - \mathrm{TC}. \tag{1}$$

where TR is the total agricultural revenue (IDR/kg) and TC is the total agricultural costs (IDR).

Total costs consist of variable costs (i.e., non-fixed costs) which are expenditures incurred in the seed production process, and fixed costs (i.e., fixed expenses) which are not dependent on the scale of production [27,28]. To evaluate seed production unit, the R/C analysis is employed, which is the ratio of revenue to total costs incurred during the production process, formulated as utilized by Wahyuning Asih [29]:

$$\mathrm{R/Ci} = \mathrm{TRi} - \mathrm{TCi}. \tag{2}$$

where Tri is the total revenue, TCi is the total costs, R/Ci is the feasibility, and Feasible if R/C > 1.

3 Results and discussions

3.1 Description of study area

The area of Kragan Village is 359.97 ha with flat topography and the soil type of Old Grey and Mediterranean Glumosol Association. The land use arrangement comprises 152.07 ha (42.25%) of irrigated rice fields, 161.29 ha of gardens and orchards, 84.24 ha of dry areas, and 77.05 ha of non-agricultural land. The primary source of irrigation for the rice fields is derived from the flow of the Bengawan Solo River, supported by two deep wells and twenty shallow wells, following a rice–rice–rice cropping pattern. This cropping

Table 2: EFQM criteria used to assess seed producer performance

Purpose, vision, and strategy	Organizational culture and leadership	Engaging stakeholder	Coasting sustainable value	Driving performance transformation	Stakeholder perceptions	Strategic and operational performance
1. Builds sustainable relationships with its customers 2. Creates the right environment to attract, engage, develop and retain the best people 3. Ensures support from financial, regulatory and other governing stakeholders 4. Makes a positive contribution to society	1. Builds sustainable relationships with its key partners and suppliers 2. Develops products, services or solutions that are valued by all key stakeholders 3. Promotes its products, services and solutions to relevant stakeholders 4. Provides its products, services and solutions in a sustainable manner 5. Evaluates and improves the overall experience for its key stakeholders	1. Builds sustainable relationships with its customers 2. Creates the right environment to attract, engage, develop and retain the best people 3. Ensures support from financial, regulatory and other governing stakeholders 4. Makes a positive contribution to society	1. Builds sustainable relationships with its key partners and suppliers 2. Develops products, services or solutions that are valued by all key stakeholders 3. Promotes its products, services and solutions to relevant stakeholders 4. Provides its products, services and solutions in a sustainable manner 5. Evaluates and improves the overall experience for its key stakeholders 6. Manages risk effectively	1. Transforms to meet the future needs of stakeholders 2. Acts on the opportunities presented by innovations and new technologies 3. Uses data, information and knowledge to drive improvements in performance 4. Manages its key assets and resources responsibly	1. Measures the views and opinions of its key stakeholders 2. Achieves outstanding levels of satisfaction from its key stakeholders	1. Has a full set of strategic and operational measures 2. Achieves outstanding levels of performance against its strategic targets 3. Uses data and other insights to predict future performance 4. Compares its performance with external organizations

pattern signifies that rice cultivation anticipates being a substantial source of income for the village inhabitants, and the farmers will endeavor to meet the seed requirements for each planting season. The quantity of seeds required for rice cultivation is approximately 4,562 kg per season or 13,686 kg per year. Farmers commonly acquire seeds from suppliers outside the village and sell them in agricultural kiosks within the village and sub-district. The seed varieties farmers purchase do not always align with their needs, depending on the availability of seeds.

The farming institution in Kragan Village comprises seven farmer groups associated with the Tani Mandiri Sejahtera Gapoktan. Thus far, the institutional activities of both Gapoktan and farmer groups in enhancing their capacities have relied solely on government programs. Some previously undertaken activities include the Integrated Pest Management Field School (IPM-FS) and the Integrated Crop Management Field School (ICM-FS). Gapoktan has established an organizational structure along with its management's respective roles and functions, but implementing activities still needs to meet expectations. The organizational structure of Gapoktan merely serves as an administrative prerequisite for an organization, resulting in its administrators' limited role and function. Overall, the performance of Gapoktan remains suboptimal, and there are no productive economic activities that significantly increase the income of the village community. According to Van et al. [30], the relationship between the performance of farmer group organizations and income is still weak, with its contribution relatively low due to the lack of synergy in the support system during the implementation of technical and institutional innovations.

Based on the regional description, Tani Mandiri Sejahtera Gapoktan institution has the potential to become an inclusive seed production unit, serving the farmers' market within the village and its surrounding areas. Undoubtedly, this requires gradual and continuous improvement in performance. According to Yanine et al. [31], an organization can enhance its performance sustainably by conducting self-assessment to promptly identify weaknesses that need improvement and continually develop its achievements.

3.2 Establishing an inclusive seed production institution

The inclusive concept, with a collective action approach employed in the seed production unit, is adapted to field conditions and existing circumstances. It recognizes the potential and opportunities for seed production business development, the strengths and weaknesses of existing farmer groups, and the prevailing local wisdom. An inclusive business strategy entails a long-term contractual partnership between seed producers and users to enhance participation and benefits received [32]. The condition of existing farmer groups is improved by implementing the principles of Total Quality Management (TQM) and conducting self-assessment using EFQM to achieve excellent and sustainable performance (Figure 1). TQM is a management approach focused on continuous process improvement through universal participation [33]. In TQM, quality is determined by the subjective expectations of producers and internal/external stakeholders. TQM is applied in various organizations to enhance product quality and improve customer satisfaction [34,35].

The initial step in establishing a seed production enterprise is obtaining the legal status of a seed production unit by registering the farmer group to receive a recommendation as a seed producer from the Central Java Provincial Government's Department of Agriculture and Plantation. The seed producer number is 12.422/Prd.TP/Kelp/6/20/21, based on Article 8, Paragraph 2 of Minister of Agriculture Regulation No. 12/Armenian/TP.020/4/2018 concerning food crop production, certification, and distribution, becoming a formal seed producer and distributor.

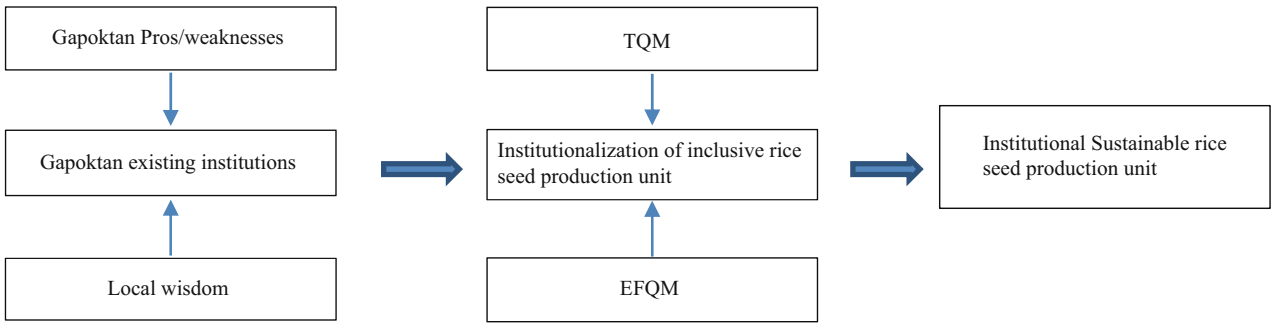

Figure 1: Inclusive model of rice seed production.

The organizational structure comprises a manager, an administrative and financial department, production, and marketing. The age range of the managers is between 30 and 40 years, which is still considered productive according to WHO standards. The educational level of the managers is high school graduates – the executives' selection is based on above-average abilities and socio-economic status within the village community. The manager is a farmer who owns a seven-hectare land and operates a rice milling unit. One of the leadership criteria is having a socio-economic status above the average of farmers [36]. The seed production organization's structure is considered comprehensive, encompassing business functions, and has obtained a recommendation as a seed producer from the Central Java SCIA.

3.3 The business performance of seed production

The Farmers' group has successfully produced 7.300 kg of Inpari 32 and 6.400 kg of Pepe prospective seed (Table 3). According to Wahyuni et al. [37] research findings, the seed productivity reached 5.300 for Inpari 32 and 4.820 for Pepe. Based on the production of seeds and the achievement of yield values, there is still an opportunity to increase production by implementing appropriate cultivation and post-harvest management technologies. Seed productivity has good genetic characteristics under optimal environmental conditions and can provide higher and more sustainable production outcomes [37].

The planning of the volume of seeds produced is closely related to the demand for seeds by consumers. The demand for seeds by users or consumers is analogous to the target seed production. In this regard, producers can predict the potential yield of harvested dry seeds and seed yield. Table 3 shows that the seed production and the tonnage produced have been able to meet the needs of the village community/members. The seed requirement in the village area is 4,562 kg per planting season, which the remaining seeds will be distributed to neighboring villages in need.

In Indonesia, seed distribution must have labels on the packaging bags. The information on the seed label consists of the manufacturer's identity, commodity type, variety name, volume, and seed expiration date [38]. To obtain the seed label, the seeds that have passed the field level undergo laboratory testing at the SCIA. Laboratory testing is a consideration to assess the quality of the seeds, encompassing genetic, physical, and physiological aspects, as well as to determine the equivalence of the seed quality produced with the established seed quality standards. Genetic purity is determined based on field examination results. One consideration for the seed group to meet the necessary quality criteria is passing laboratory testing [39], as stated in Figure 2. The laboratory testing results for the quality of prospective seeds of Inpari 32 and Pepe indicate that all seed quality indicators (maximum moisture content, minimum, pure seed, maximum seed impurities, maximum other variety seeds, maximum other plant seeds, and minimum germination) have higher values than the established standards.

Table 3: Seed production of Inpari 32 and Pepe Extension Seed (ES) class produced at the study site

Description	Varieties		Total
	Inpari 32	Pepe	
Production area (ha)	1.0	1.0	2.0
Prospective seed (kg)	7.300	6.400	13.700
Seed (kg)	5.300	4.820	10.120
Rendement (%)	72.6	75.3	73.9

Financial feasibility analysis is one way to measure success in producing seeds. The financial analysis of cost and profit for the rice seed production unit is observed in Figure 3. The financial analysis results show that the average total expenses incurred in seed production amount to IDR 28955400.00/ha.

The labor cost constitutes the most significant component of expenses utilized in the rice seed breeding venture, accounting for 43.99% of Inpari 32 and 41.99% for Pepe of the total production costs. The percentage of labor costs for rice seed production at the research location is nearly identical to the opinion of Billah [40], stating that the average labor cost for a rice seed production unit range from around 40% of the total production costs. As a proportion of production expenses, the land rental costs for both Inpari 32 and Pepe range between 37.99 and 39.30%. Subsequently, production facility costs account for approximately 15.50%, while the remainder comprises equipment depreciation, water fees, and village contributions. The financial calculations show that the production costs of Inpari 32 amount to IDR 5470.00/kg, whereas Pepe costs IDR 5808.00/kg.

The producer's profit is computed by evaluating the revenue from the rice seed production unit by deducting the total costs in Indonesian Rupiah (IDR). The rice seeds sell at IDR 8000.00/kg at the producer's location. Therefore, the attained profit ranges from IDR 1780.00/kg of Inpari 32 and IDR 1442.00/kg of Pepe. Financial calculations reveal that the ratio between seed production value and costs (R/C) is 1.33 of Inpari 32, indicating that every IDR 1000.00 invested in the rice seed business will yield IDR 1330.00.

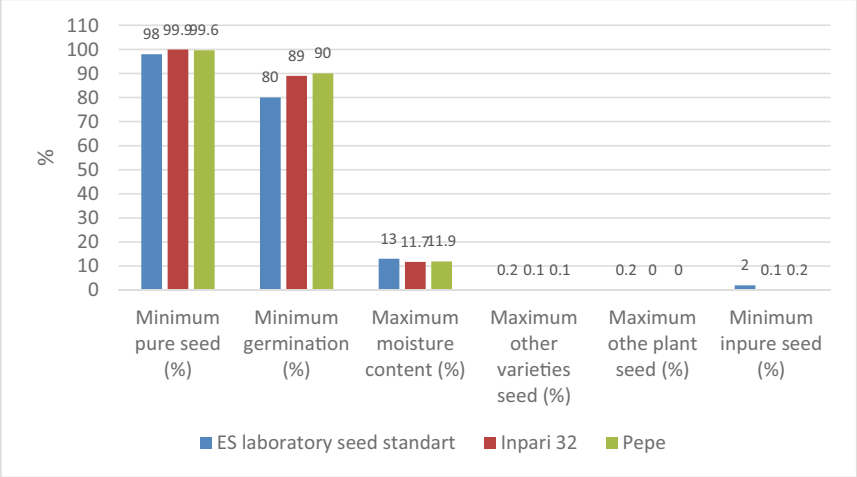

Figure 2: Seed quality of Inpari 32 and pepe based on ES class laboratory test standards.

Similarly, the R/C for the Pepe is 1.24, signifying that every IDR 1000.00 invested will generate IDR 1240.00. In line with the view of Kay et al. [41], a business is considered more efficient if its R/C ratio exceeds the others. The volume of seeds produced has met the needs of regional seeds, and the quality of the seeds produced has met the established standards. From a financial perspective, the rice seed production business is feasible to develop.

3.4 Institutional performance of rice seed production unit

The overall institutional performance of Gapoktan Tani Mandiri Sejahtera in managing the rice seed production unit has yet to demonstrate optimal performance, explicitly reaching a score of 420 out of a maximum of 1,000 points (Table 4). The lowest value is attributed to the criterion of organizational culture and leadership, while the highest value corresponds to the criterion of results.

An analysis is carried out to determine the organization's goal and direction to get in-depth knowledge about the performance and sustainability of the rice seed-producing unit. Have its objectives been achieved, and why was this strategy chosen? How is it executed in realizing the set goals and employed strategies? Lastly, an examination of the current outcomes and future aspirations is conducted. This analysis gauges the extent to which optimal and sustainable performance can be attained while comprehending the existing gaps and potential solutions.

3.5 Analysis of direction

The direction of the rice seed production unit is assessed based on two criteria: criterion 1, encompassing purpose,

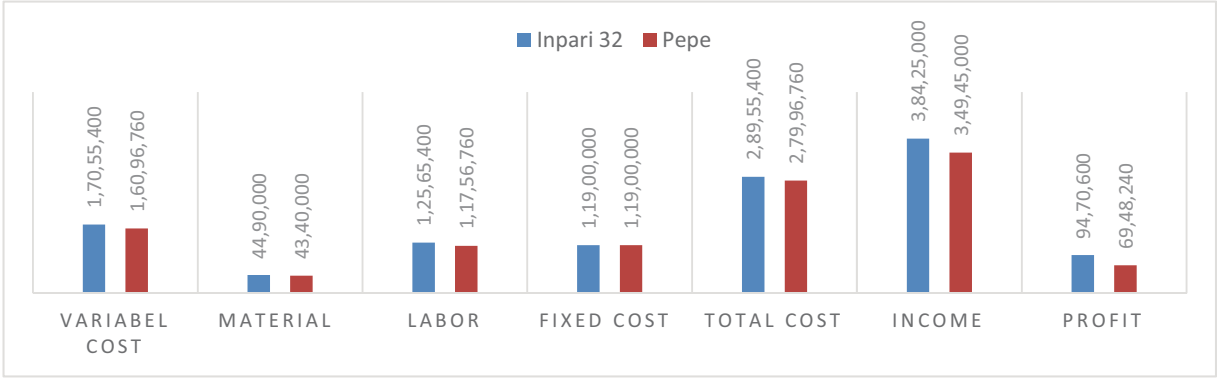

Figure 3: Analysis of the feasibility of rice seed production unit.

Table 4: The total value of EFQM criteria of Gapoktan Tani Mandiri Sejahtera

Criteria	Value	Weight	Score	Maximum score
Purpose, vision, and strategy	47	1	47	100
Organizational culture and leadership	31	1	31	100
Engaging stakeholders	35	1	35	100
Coasting sustainable value	39	2	78	200
Driving performance transformation	35	1	35	100
Stakeholder perception	40	2	80	200
Strategic and operational performance	57	2	114	200
Total		10	420	1,000

vision, and strategy, and criterion 2, involving organizational culture and leadership. These aspects are meticulously captured through empirical indicators, as presented in Figure 4. The purpose of Gapoktan Tani Mandiri Sejahtera is to generate new HYV seeds to fulfill the seed needs of the local community and enhance rice farming productivity. However, the organization has yet to grasp the threats facing this business's development fully. Among the challenges faced are exclusive seed producers in the vicinity. Convincing farmers to refrain from purchasing seeds from these exclusive producers is no easy task. Farmers prefer purchasing seeds from exclusive producers due to their reputation, yields, timely availability, and price [42]. Farmers' purchases of agricultural inputs are impacted by reference groups, essential opinion leaders, family, and friends, according to Haidery et al. [43]. Furthermore, Epriliyanti and Aji [44] show that five new criteria impact farmers' decision to acquire certified rice seeds: technical planting information, product certification validity, seed availability, seed quality, and seed pricing.

The managers and administrators still need to establish a fully business-oriented system, as a social mindset still underpins decision-making. For example, there is no detailed financial record informing expenditure and income. Costs associated with transportation and quality improvement through participation in training and seeking seed sources are not considered. From a financial perspective, this weakness requires attention, as it may further diminish organizational performance. Personal expenses are incurred with uneven profit sharing. According to Kontsevoy et al. [45], every agricultural organization requires economic management, including planning, accounting, cost control, and agricultural output analysis. As for the seed production management system, it is recommended to

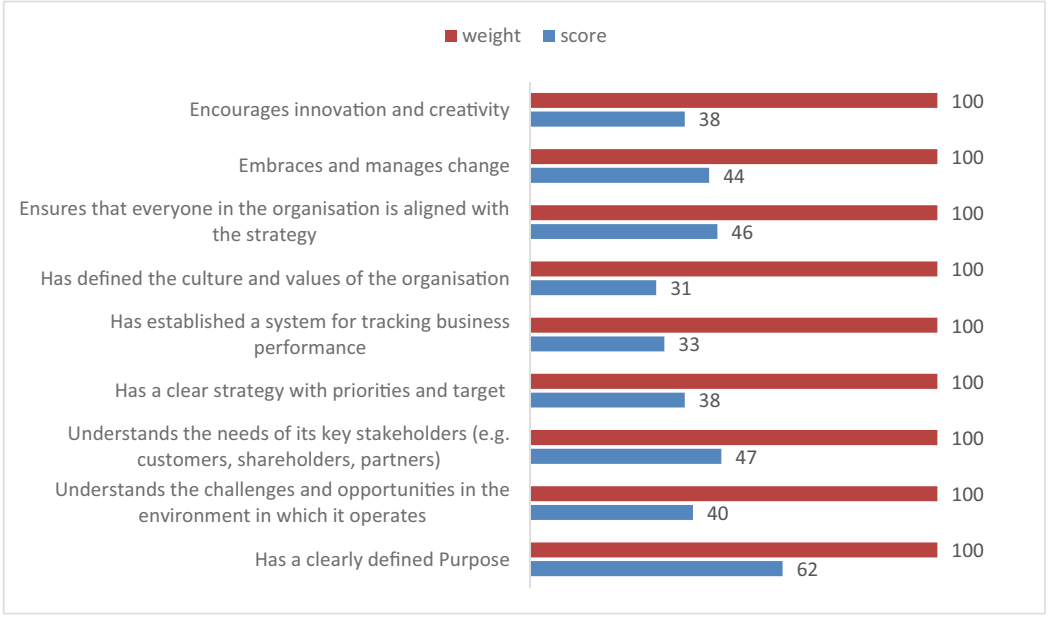

Figure 4: Analysis of direction.

utilize organizational resources rationally. The social orientation remains relatively high, indicating a partial focus on profit.

3.6 Analysis of execution

The execution of rice seed production management is assessed based on criterion 3 (engaging stakeholders), criterion 4 (cultivating sustainable value), and criterion 5 (driving performance transformation), elaborately captured using empirical indicators presented in Figure 5. Farmers residing in the village area are vital stakeholders for the seeds produced by the Gapoktan Tani Mandiri Sejahtera. For an organization to achieve and maintain its excellent performance, it is not merely sufficient to meet or exceed the expectations of stakeholders; it is also essential to identify the critical stakeholders for the success of the businesses, create values of sustainability, and strive to enhance the organization's performance in the present and future [46,47].

Farmers in the village automatically become members of the farmer group, assuming they will utilize the rice seeds produced by the group. However, from the first batch of successfully produced seeds, not all member farmers of the farmer group utilize the locally produced seeds. The utilization rate of Inpari 32 seeds within the village/members is merely 43.86%, while for Pepe, it is 31.95% (Figure 5). The bond as a member of the farmer group only partially binds them to purchase the produced seeds. Cultivating appealing relationships with them to become customers can still be improved through persuasive approaches. Social capital needs to be fostered in the inclusive development of seed production units [48,49].

Prominent figures of the community, village authorities, and the finest farmers in the local region, as well as other forms of government support, can serve as catalysts for adopting inclusive rice seed utilization, through both regulations and practical examples in the field. Gapoktan refers to the philosophy "from us to us" on seed distribution activities. Another aspect that requires enhancement is the positive contribution of seed production to society, such as providing a lower price yet superior quality, facilitating access to seeds utilizing lending them initially through payment after harvest, offering a more affordable price compared to exclusive options, and ensuring a guarantee of quality, particularly in terms of germination (if it does not meet or falls below the specified label, it can be exchanged), and securing the harvest and market assurance. In the event of lower production, compensation should be equivalent to the difference from the previous production. Additionally, improving the relationship with seed suppliers is also crucial. It can be achieved through more systematic planning, ensuring that the need for seed sources is predicted well before the planting season.

Another area that necessitates improvement is the provision of rewards, following the exemplary practices carried out by exclusive seed producers (Figure 6). Establishing a sustainable relationship with partners and leading suppliers [50] is paramount. Surprisingly, not all members of the farming group purchase and utilize the seeds produced by the said group. Consequently, premier services toward the members can still be enhanced.

3.7 Analysis of results

The outcome of rice seed business management is examined based on criterion 6 (stakeholder perceptions) and criterion 7 (strategic and operational performance), which are intricately captured using empirical indicators presented in

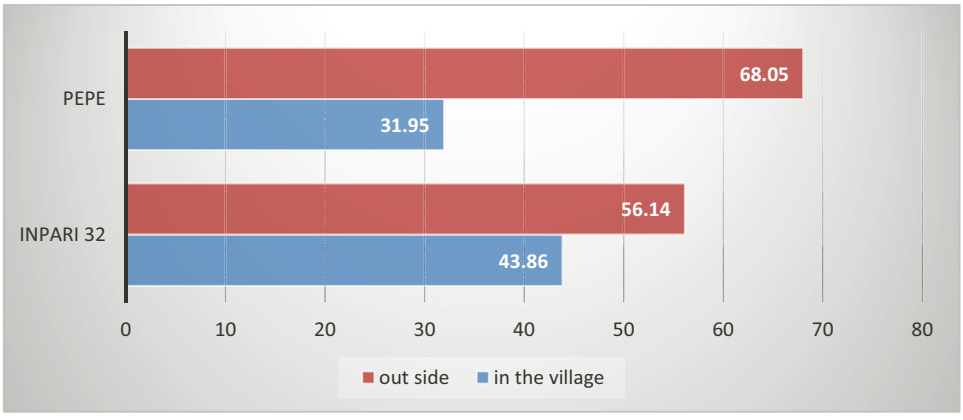

Figure 5: Distribution of rice seeds from inclusive seed production unit.

Figure 6: Analysis of execution.

Figure 7. In essence, the farmers' perceptions as primary stakeholders are affirmative, yet they have not fully recognized the excellence of the seeds produced by Gapoktan Tani Mandiri Sejahtera. This is due to the fact that the newly produced varieties have not been entirely embraced by the farmers. As previously mentioned, the introduction of new varieties requires a process. The role of AEO in promoting the presence of these new HYVs needs to be intensified. Likewise, enhancing the relationship with partners (agents/seeds retailers) for market expansion is crucial. The satisfaction level of stakeholders remains relatively low, as the same offerings could be provided by other seed producers in an exclusive manner. Farmers, as seed consumers, have not yet fully considered the quality of seeds produced by Gapoktan.

Gapoktan's strategic approach involves integrating farmers into the rice seed business at various levels, encompassing roles as consumers, producers, workers, and entrepreneurs. The expansion of Gapoktan's operations centers

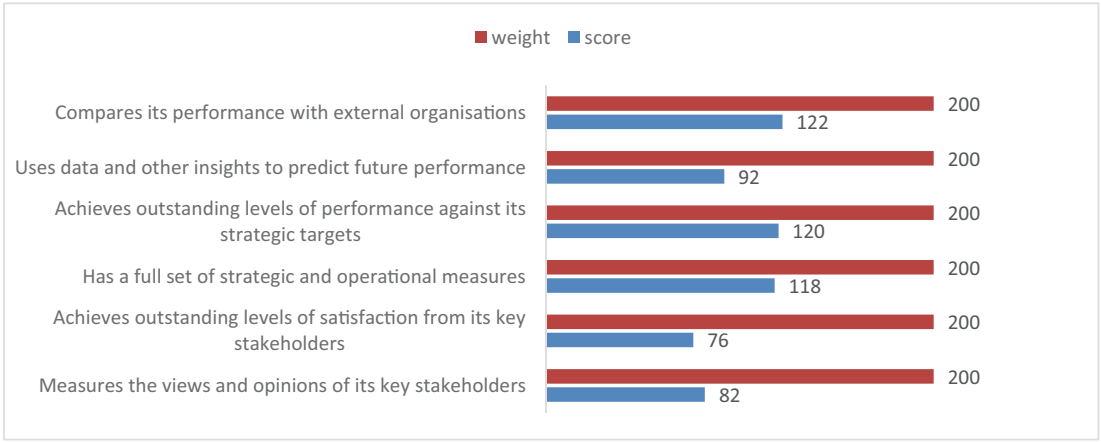

Figure 7: Analysis of results.

on engaging member farmers in the production of rice seeds. This aligns with the perspectives of UNDP [51] and de Haan et al. [52], which highlight that such inclusive business models yield direct societal benefits. Despite Gapoktan's organizational performance not yet reaching its full potential, the organization has shown agility in responding to change. The sustainability of the organization hinges on its capacity to adapt, taking into account societal and environmental norms. This aligns with the views of Johnson and Schaltegger [53] and Mousa et al. [54], emphasizing that organizational sustainability relies on performance at both the meso level (professional associations and regulations) and the macro level (interaction with society and the natural environment). Looking ahead, Gapoktan aims to enhance organizational performance through an inclusive and egalitarian approach towards its members, involving empowerment, participation in various initiatives, and establishing partnerships [55]. Additionally, the organization plans to expand its market by implementing "*the oil flex system,*" with a primary focus on meeting the needs of its members as the central market objective.

4 Conclusions and recommendations

The organizational structure of the rice seed production unit is deemed comprehensive, encompassing its operational functions, and has garnered commendation as a seed producer by SCIA Central Java. The social orientation remains relatively high, yet it has not fully embraced profit-centric pursuits. The seed volume produced has amply satisfied the regional seed demands, meeting the established quality standards. From a financial perspective, the rice seed production unit is deemed viable for further development. Interestingly, not all members of the Gapoktan purchase and utilize the seeds produced by the cooperative. Thus, enhancing premium service toward the members is still feasible. Furthermore, farmers, as the end-users of the seeds, have yet to thoroughly consider the quality of the seeds produced by the Gapoktan. The strategic approach of Gapoktan entails the integration of farmers into the rice seed production unit at multiple levels, involving their roles as producers, workers, consumers, and entrepreneurs. Producing rice seeds is the main way that Gapoktan is going to expand its activities with its members. The long-term sustainability of the inclusive rice seed production unit depends on improving organizational efficacy by treating its members fairly and implementing "*the oil flex system*" to expand the rice seed market.

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