Determining Success Criteria for Agricultural Social Start-Ups in Indonesia

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Abstract. In recent years, there has been a growing phenomenon in social start-ups, defined as an organization seeking to achieve social missions through market mechanisms. It is difficult for social start-ups to select the most relevant key performance indicators (KPIs) because it is difficult to find a shared impact language to code, classify, and interpret the impact. Existing global social impact metrics focus only on classifying impact performance indicators and lack critical analysis for prioritizing impact performance indicators. This study aims to determine key impact performance indicators for assessing success in agricultural social start-ups in Indonesia. Based on the IRIS metrics developed by GIIN, there are three main impact themes in agriculture: smallholder agriculture, sustainable agriculture, and food security. The three impact themes are divided into 12 strategic goals, where each strategic goal contains impact performance indicators. The analytical hierarchy process (AHP) was then carried out. Prioritization of impact themes and strategic goals is carried out based on expert judgment. The AHP results showed that smallholder agriculture is the most important impact theme to achieve for social start-ups. Five of the 12 strategic goals with the highest priority were explained as candidates of KPIs: the financial health of farmers, better and stable pricing, social equity and justice, farm profitability, and food availability and diversity. The KPIs developed in this study is anticipated to be utilized by stakeholders involved in the agricultural social start-up ecosystems, including practitioners, impact investors, and policy-makers.

Keywords: sustainable social enterprise · social impact · social performance · impact assessment · evaluation

1 Introduction

Businesses are meeting increasing demands to address social and environmental challenges [1]. There has been a new, rapidly developing phenomenon in so-called 'social startup', organizations seeking to achieve the social mission through market mechanisms

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[2, 3]. With an entrepreneurial approach and a social mission at their core, social startups employ innovative strategies to address various social and environmental issues within a for-profit framework [4–7]. Unlike other start-ups formed primarily for commercial reasons, social start-ups aim to create positive social and environmental impacts; thus, they also benefit from a social or environmental cause [7]. They also promote sustainable development and new business models [8].

In 2015, the UN Interagency Task Team (IATT) on Science, Technology, and Innovation for Sustainable Development Goals (SDGs) recognized this new hybrid form of organization as an emerging form with the potential to catalyze the business sector's contribution to achieving the SDGs [9, 10]. Similar to social enterprises, social startups pursue social and environmental goals within a framework that engages in commercial activities [11–13]. At the same time, their innovative solution focus, growth orientation, dynamic business model, financing structure, and global markets place them close to start-ups [7, 14–16].

Social startups often have vague ideas about how their business delivers impact. Whereas they should still be able to demonstrate the connection between their business and the targeted impact; thus, social startups need to measure and evaluate their impact performance. Impact measurement promotes social startups to assess and consider whether or not their business precisely and successfully delivers the intended impact to the beneficiaries in a viable way [17]. There has been an increasing demand for measuring social impact since the growing trend of impact investment has increased. Impact investments are described as investments made to create a positive social and environmental impact that can be measured alongside a compelling financial advantage [18–20]. Impact investments in Indonesia have grown sufficiently since 2013 [21]. More stakeholders, such as mainstream investors, banks, government, and foundations, have been moving quickly into the sector recently, with over USD 307 million in funding for social startup projects in 2019–2020 [21].

Many social startups in Indonesia are found in the agricultural sector and represent the most significant portion (55%) of the opportunity for impact (SDG relative) [17]. The concentration of social start-ups in the agricultural sector is unsurprising. The agricultural sector contributes 14% of Indonesia's GDP [22]. Agriculture is the largest source of employment, with around 30% of the Indonesian labor force (38,78 million people) employed in the agricultural sector [23]. Even though Indonesian agriculture provides a living for millions of Indonesians, it is at a crossroads at this time. Approximately 93% of Indonesia's total number of farmers are smallholders [24]. The majority of smallholder farmers in Indonesia physically and financially fail to take advantage of the financial prospects due to increased global and domestic demand. Farmers typically experience an extensive and dispersed agricultural supply chain; are geographically separated; and lack access to a stable market, financial resources, and essential equipment. Several social startups see the disruption in the sector as business potentials, such as a program for increasing yield, farm-to-fork business models, food manufacturing, and technological advancements in agriculture. Therefore, this paper explores the relationship between social startups and their impact, focusing on the agriculture sector in Indonesia.

Despite the absence of a universal impact measurement tool, practitioners have access to several global frameworks. Unfortunately, prioritizing and synthesizing indicators

into an integrated social impact measurement practice has received insufficient attention. IRIS, GIIRS, SROI, and B-Analytics are the four most commonly applied global impact metrics. Impact Reporting and Investment Standards (IRIS) is a catalog of free-to-use, standardized impact performance metrics created by the Global Impact Investing Network (GIIN). It combines the measurement and reporting of social and environmental impact metrics along with financial performance metrics. Global Impact Investing Rating System (GIIRS) is a third-party rating system that assigns social and environmental impact ratings to companies and funds. SROI is a framework for calculating ROI based on non-financial impact (e.g., social, environmental, and economic outcomes). Meanwhile, B-Analytics is a user-friendly platform for measuring, benchmarking, and reporting impact. IRIS has established a common language by providing open access to over 600 defined metrics and has become one of the most widely used systems for measuring impact [17, 25]. Other alternatives, such as GIIRS, SROI, and B-Analytics, provide evaluation and certification services while requiring a monetary and time commitment [17].

Measuring impact performance is vital as it supports social startups trace whether their business and the intended impact are in line. Existing global social impact measurements present challenges in their implementation, particularly for early-stage social startups. This research utilizes the Impact Reporting Standard & Investment (IRIS) framework to identify impact performance indicators. IRIS offers a database of indicators with standardized definitions applicable to numerous sectors, including agriculture [26]. Since IRIS is merely a catalog, many early-stage social startups struggle to understand and convert the metrics into data and convert them into an informative impact report. In assessing their impact, social startups should keep things straightforward. Because their impact measurements should benefit them and investors, they must select only the most relevant key impact performance indicators aligned with their business [17].

Existing global social impact metrics focused on classifying impact performance indicators and primarily addressed the question of what to measure in agricultural social startups. To the best of our knowledge, the current global social impact metrics do not adequately address the selection, prioritization, and integration of impact performance indicators into the impact performance measurement system. This limitation makes it harder for the organization to make good decisions about performance reviews. To consolidate KPIs into overall performance measurement, further research is required to provide social impact metrics. To address the abovementioned issues, we aim to propose a set of KPIs for the impact performance evaluation of agricultural social startups. Various techniques for selecting and ranking KPIs have been described in the literature. Particularly, the analytical hierarchy process (AHP) has been used to prioritize performance indicators in several performance measurement studies [27–29]. AHP decomposes the issue into categories and subcategories and facilitates decision-making based on experience, intuition, and heuristics. The selection of KPIs was based on practitioner input.

1.1 Selected Impact Performance Indicators and Structure of the Decision Hierarchy

As mentioned in the introduction, to develop a standard language for sharing and comparing effect performance, IRIS metrics give generally agreed definitions of Impact Categories and Impact Themes. It identifies common goals and core metrics organized by theme, establishing a common vocabulary for describing, assessing, sharing, and comparing impact performance. IRIS is organized under the social and environmental Impact Themes that impact investors and startups use to define their strategic objectives, portfolios, and business models. It begins with the neutral, high-level Impact Category, following commonly accepted industrial classification schemes. Within each Impact Category, there are more specific Impact Themes that situate the various ways investors and businesses contribute to impact within that category. Lastly, Impact Themes are a collection of specific and shared Strategic Goals. The IRIS metrics are also aligned with SDGs and targets, respectively.

IRIS metrics for the Agriculture Impact Category are built from Impact Themes and Strategic Goals. Impact Categories within the IRIS metrics are aligned with the industry classes standardized by the International Standard Industrial Classification of All Economic Activities (ISIC). The Agriculture Impact Category classifies the types of Impact Themes as (1) Smallholder Agriculture; (2) Sustainable Agriculture; and (3) Food Security [26]. Impact Themes assist in describing a purpose-driven strategy for contributing to social or environmental impact. Each theme can be used by investors to identify and evaluate investment opportunities, and by enterprises to organize and communicate their work. Impact Themes classify the type of Strategic Goals or approach investors or enterprises may employ to achieve the main social or environmental effects they intend to deliver. Strategic Goals are strategies commonly employed by impact investors or businesses to achieve established social or environmental impact goals. Each strategic goal in the agriculture impact theme is embedded with impact performance indicators. Thus, the determination of key impact performance indicators for measuring the success of agricultural social startups has a hierarchical structure with two levels (impact themes and strategic goals) based on their thematic categories, as seen in Fig. 1 and Fig. 2.

The impact theme (level 1) is the first layer of the hierarchical structure and consists of the three impact themes: smallholder agriculture, sustainable agriculture, and food security. The composition of level 1 is defined below (A1 to A3).

- Smallholder agriculture (A1): marginal and sub-marginal agricultural households whose resources and size are constrained. Smallholder farmers cultivating less than two hectares; low access to technology; limited capital, skills, and risk management; reliance on family labor for the majority of activities; and limited storage, marketing, and processing capacity [30–32]
- Sustainable agriculture (A2): an integrated system of agricultural production practices that seeks to produce adequate amounts of high-quality food while being profitable and environmentally safe [33, 34]. Sustainable agriculture practices include farming activities with environmental, societal, and economic dimensions [35].

- Food security (A3): all individuals always have physical and economic access to sufficient, safe, and nutritious food that satisfies their dietary needs and food preferences for an active and healthy life [36, 37].

The strategic goal (level 2) is the second layer of the hierarchical structure distinguished by the upper level's impact themes. In this study, 12 indicators are separately contained in level 1, and each impact theme in level 1 includes two to six specific and common strategic goals.

We assessed the significance of these impact performance indicators based on the responses of practitioners. The AHP analysis consisted of two stages: in the first, the relative weights of the three impact themes were determined. The second stage involved determining the relative weights of the selected strategic goals for evaluating agricultural social startups' impact performance. A set of KPIs is obtained from the highest-ranked of strategic goals.

2 Methodology

Questionnaire surveys were used to collect data. A multi-case study has been conducted on Indonesian agricultural social start-ups to determine the success criteria for agricultural social startups. Four Indonesian agricultural social startups were chosen due to their fit in identifying and overcoming the barriers encountered by the farmers in conducting a proper agricultural business that contributes to the economic development of farmers. Moreover, all social startups in this study meet other criteria as follows. Organizations seek to pursue social and environmental objectives within a framework that engages in commercial activities [11–13]. They also adopt innovative solutions to various social and environmental problems; have a growth orientation and a dynamic business model [7, 14–16].

The participating social startups (SSs) are referred to as SS-A, SS-B, SS-C, and SS-D due to a non-disclosure agreement. SS-A is an online business selling things like vegetables, fruits, meat, fish, bread, and salad grown organically. SS-B offers fresh cow milk with a creamy taste and daily nutritional needs. Along with the increasing digital service adoption, SS-B is also digitizing business. SS-C produces and processes pharmaceutical salts, industrial salt, and pro-analysis salt; for that reason, they have a close relationship with salt farmers. SS-D is engaged in the livestock activities such as fattening and breeding (sheep, goats, cattle) and offers processed-ready-to-eat meat products. SS-A, SS-B, SS-C, and SS-D run a sustainable farming system that is environmentally friendly, economically viable for farmers, and socially acceptable. Each social startup's targeted problems, proposed solutions, and intended impact are depicted in Fig. 3.

Eight practitioners from four social startups participated in this study, and their responses were evaluated. Their respective job titles were co-founder, human resource manager, and managing partner. At least three years of experience in creating and sustaining social impact in the agricultural sector was possessed by each participant. The surveys were conducted in person and through the completion of the AHP questionnaires.

Level 1	Level 2	Performance Indicator
Impact Theme	**Strategic Goal**	
A1. Smallholder Agriculture	S1. Increasing access to agricultural training and information	Type of training provided by the organization Number of smallholders receiving any training offered by the organization
	S2. Increasing access to better and stable pricing of agricultural products	Smallholders receiving a price premium Price premium received by smallholders Purchase contracts to smallholders Cost transparency
	S3. Increasing access to and use of products and services for agricultural risk mitigation	The financial support offered by the organization Number of smallholders receiving financial support from the organization Non-financial support offered Number of smallholders receiving non-financial support from the organization
	S4. Increasing access to and use of quality agricultural inputs	Smallholders reporting increased agricultural yield Change in average smallholder agricultural yield
	S5. Increasing farm profitability	Smallholders reporting increased income Change in average increased smallholders' income
	S6. The increasing financial health of farmers	Voluntary savings account Change in the average value of savings accounts
A2. Sustainable Agriculture	S7. Improving ecosystem health through agriculture	Certified land area Percent of land sustainably managed
	S8. Improving climate resilience through agriculture	Total greenhouse gas (GHG) emissions avoided and reduced Change in greenhouse gas emissions avoided or reduced
	S9. Improving social equity and justice through agriculture	Smallholders provided new access to products or service
	S10. Improving agricultural water use practices	Area of cultivated land with reduced water use from high-stress regions Change in water consumed: high-stress regions
A3 Food Security	S11. Increasing food availability and diversity	Crops and livestock produced by smallholders Crops and livestock sold by smallholders
	S12. Improving food quality and safety	Certification for product, service, and operational Certified product produced Certified units purchased and sold Client protection policy Amount of pesticides used on land areas directly controlled by the organization

Fig. 1. Composition for selection of success criteria for agricultural social startups

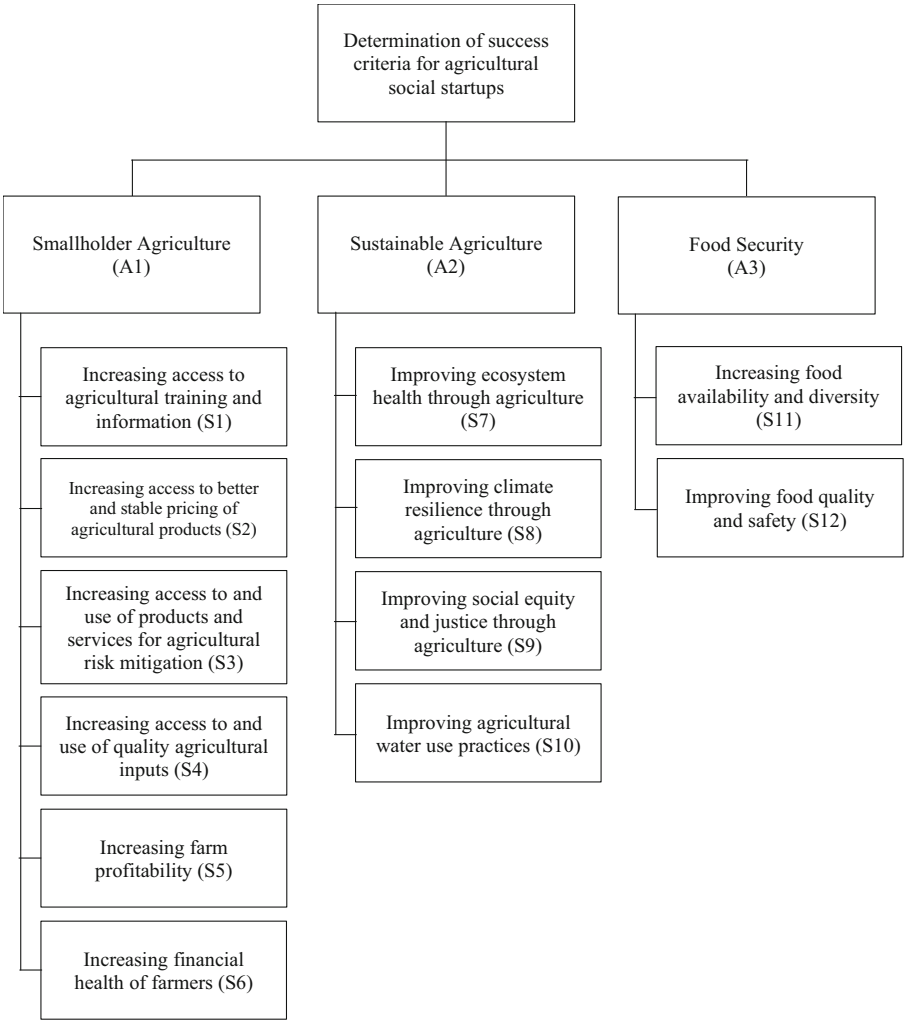

Fig. 2. Hierarchical model for selection of success criteria for agricultural social startups

The questionnaire was created using the standard AHP questionnaire format, which was first proposed by [38]. The questionnaire consists of two parts: pairwise comparison of the relative importance of impact themes and the relative importance of strategic goals of the items. Respondents were instructed to rate the importance of each item using pairwise comparison when completing the questionnaire. The pairwise comparison was conducted using the relative scale values from 1 to 9. The value 1 indicates that the two items being compared are of equal importance, while the value 9 indicates that only one item is of high importance.

3 Results and Discussion

We used Microsoft Excel to calculate the weights. The consistency ratio (CR) value of the AHP analysis for all the matrices was calculated as less than 0,1 (10%), which was within the acceptable range for the validity results. Figure 4 demonstrates the relative weights of the three impact themes of agriculture. Figure 5 and Fig. 6 present the results for the relative weights of the strategic goals within each impact theme. Figure 4 shows that smallholder agriculture was the most critical impact on agricultural social startups (0,585). This was followed by the sustainable agriculture impact (0,282), and the food security impact had the lowest weight (0,132). This indicated that experts in the field deemed that smallholder farmers are still the critical unit to focus on making progress in agriculture to achieve food sustainability and security. [39] confirm that smallholder farmers represent the backbone of the farming sector, especially in low-income countries. A large body of empirical research argues that smallholder farmers are key to global food

Social Startup A (SS-A)
Problems addressed: The lack of affordable organic healthy food in urban Indonesia. Due to limited market access and a lack of training in organic farming and the production of high-value goods, the standard of living of Indonesian farmers is extremely low. The farmers' low income is a consequence of their low-quality produce. **Solutions:** SS-A gives extensive training and support on organic farming. It then purchases organic products from farmers at a price premium. It also provides farm-to-table online groceries that link farmers to markets. **Impact/SDGs targeted:** Increase farmers' income; quality agricultural input; environmentally friendly, increase food security; aline with SDG 1 (No poverty), SDG 2 (Zero hunger), SDG 3 (Good health and well being), and SDG 12 (Responsible consumption and production).
Social Startup B (SS-B)
Problems addressed: Market access is challenging for smallholder farmers. Most of them cannot process

Fig. 3. Agricultural social startups' profile

their milk output because they don't have the required technology to produce premium products. Meanwhile, their market price depends on the quality of the milk. Poor quality has led to poor-income farmers.

Solutions: SS-B partners with dairy farmers to ensure a market and guaranteed income. SS-B attracts consumers to dairy-based products sourced from local dairy milk farmers at a premium price.

Impact/SDGs targeted: Increase in farmers' income, increase awareness of the health benefits of dairy products; aline with SDG 1 (No poverty), SDG 3 (Good health and well-being), and SDG 12 (Responsible consumption and production).

Social Startup C (SS-C)

Problems addressed: Despite being the largest maritime country in the world, pharmaceutical raw material and food ingredient raw materials industries in Indonesia still import salt from other countries. There are also issues of low productivity, lack of added value, and lack of education in salt purity.

Solutions: Provides salt farmers with the financing, expertise, and income security they need to achieve significantly better-living standards.

Impact/SDGs targeted: Increase farmers' income, increase social equity and justice; aline with SDG 1 (No poverty), and SDG 8 (Decent work and economic growth).

Social Startup D (SS-D)

Problems addressed: Indonesia's demand for beef keeps growing, increasing the gap between its low production and high consumption (excess demand). To fulfill this excess demand, Indonesia depends on meat imports. Some challenges in the livestock sector include a long supply chain, old technology, financial problem, low education, market access barrier, and unfair trade,

Fig. 3. (*continued*)

Solutions: Partners with smallholder farmers in livestock fattening and breeding by implementing a sustainable and integrated farming system. SS-D acts as a market regulator, support system, and coaching. SS-D creates added-value products to reach the global market by introducing processed-ready-to-eat meat products.

Impact/SDGs targeted: Increase in farmers' income, increase food security; aline with SDG 1 (No poverty), SDG 2 (Zero hunger), SDG 8 (Decent work and economic growth), and SDG 12 (Responsible consumption and production).

Fig. 3. (*continued*)

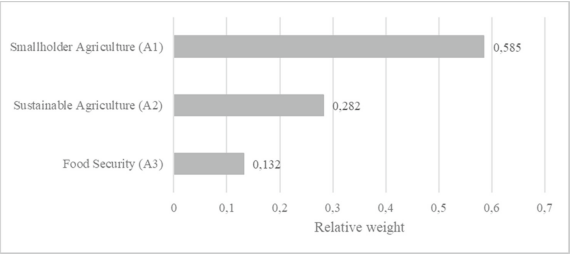

Fig. 4. The relative weights of impact themes to the goal

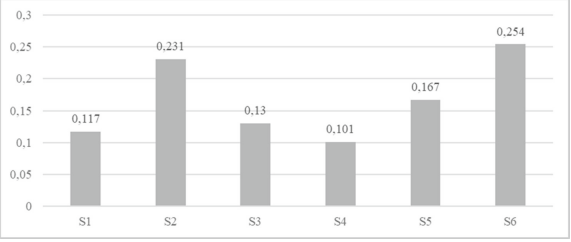

Fig. 5. Relative weights of strategic goals: smallholder agriculture impact theme

security [39–42]. In Indonesia, smallholder farmers are the significant economic agent in the farming sector. They occupy around 89% of the land and make up a large portion of the overall economy [43]. Adopting sustainable agriculture practices is considered a win-win strategy for smallholder farmers because it can simultaneously improve food security [35].

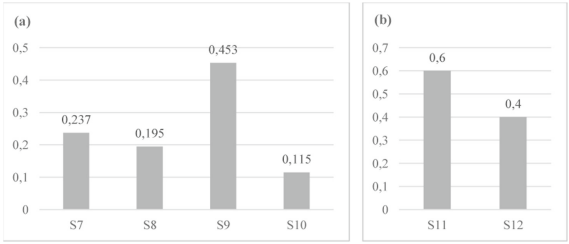

Fig. 6. Relative weights of strategic goals. **Notes**: (a) Sustainable agriculture impact theme; (b) Food security impact theme

Table 1 categorizes the AHP results into three groups: (1) The relative weights of the impact themes; (2) The relative weights of the strategic goals for each impact theme; and (3) The final weights of the strategic goals for the primary goal. The overall ranking of strategic goals showed that increasing farmers' financial health and access to better and more stable agricultural product pricing, with a weight of 0,149 and 0,135, respectively, were the first and second most important strategic goals (included in the smallholder agriculture impact theme). The third highest-ranked strategic goal was improving social equity and justice through agriculture, with a weight of 0,128 (included in the sustainable agriculture impact theme), followed by increasing farm profitability, with a weight of 0,098 (included in the smallholder agriculture impact theme). The fifth-ranked strategic goal was increasing food availability and diversity with a weight of 0,079 (included in the food security impact theme).

Smallholder farmers are a key to ending hunger and undernutrition worldwide, but they are increasingly facing barriers to profitability [42]. Smallholder farmers have faced challenges in their livelihood strategies, such as a lack of human capital and limited access to infrastructure, markets, and technologies [44]. Today smallholder farmers are also becoming more vulnerable to new risks and challenges related to climate change, health, prices, and finances [45]. In this study, the increasing financial health of farmers (0,254), increasing access to better and stable pricing of the agricultural products (0,231), and increasing farm profitability (0,167), were ranked highest among the strategic goals in smallholder agriculture impact theme. Social startups' commitment to treating smallholder farmers as viable businesses is key to unlocking the sector's potential to contribute to a broader development agenda. Enhancing the viability of smallholder farmers could increase agricultural productivity and income, reduce rural poverty, improve food security, and contribute to achieving multiple SDGs.

Compared to conventional agriculture, sustainable agriculture can increase smallholders' productivity and poverty reduction [46]. In this study, improving social equity and justice with a weight of 0,453 scored the highest ranking among the strategic goals in the sustainable agriculture impact theme. Sustainable agriculture prioritizes social equity and justice because it can improve economic outcomes for smallholder farmers. Therefore, social startups in the agriculture sector have to provide a sustainable agricultural practice system to ensure smallholders' income is enough to satisfy their family needs for health, education, and social welfare, thus improving smallholders' social equity and justice [42, 47, 48].

Table 1. Relative weights of strategic goals for each impact theme

Impact themes and strategic goals	Relative weight of impact themes	Relative weight of strategic goals to each impact theme	Final weight of strategic goals to goal (overall prioritization)	Priority
Smallholder Agriculture (A1)	0,585			
Increasing access to agricultural training and information (S1)		0,117	0,068	8
Increasing access to better and stable pricing of agricultural products (S2)		0,231	0,135	2
Increasing access to and use of products and services for agricultural risk mitigation (S3)		0,130	0,076	6
Increasing access to and use of quality agricultural inputs (S4)		0,101	0,059	9
Increasing farm profitability (S5)		0,167	0,098	4
Increasing financial health of farmers (S6)		0,254	0,149	1
Sustainable Agriculture (A2)	0,282			
Improving ecosystem health through agriculture (S7)		0,237	0,067	7
Improving climate resilience through agriculture (S8)		0,195	0,055	10

(*continued*)

Table 1. (*continued*)

Impact themes and strategic goals	Relative weight of impact themes	Relative weight of strategic goals to each impact theme	Final weight of strategic goals to goal (overall prioritization)	Priority
Improving social equity and justice through agriculture (S9)		0,453	0,128	3
Improving agricultural water use practices (S10)		0,115	0,032	12
Food Security (A3)	0,132			
Increasing food availability and diversity (S11)		0,600	0,079	5
Improving food quality and safety (S12)		0,400	0,053	11
Total Weight			1	

Due to the relevance of smallholder farmers, enhancing their production capacities, economics, and social resilience within sustainable agriculture could positively impact food security [42]. Food security is a multi-dimensional concept comprising availability, supply stability, access, and utilization [49]. In this study, the increasing food availability and diversity have received the highest rank with the weight of 0,600 among the strategic goals in the food security impact theme. Most of the attention has been on agricultural intensification as a way to produce more food, but food insecurity in many places is mostly caused by problems with income and distribution [50]. Also, there has been much less research focusing on the contribution of farming diversity toward achieving food security. Evidence shows that more diverse agroecosystems are likely to perform better today and under changing environmental conditions because a broader range of functions and responses to change will stabilize the system [51, 52].

The impact performance indicators for describing success criteria for agricultural social startups include 30 indicators categorized into specific strategic goals according to three main impact themes. The impact performance indicators help assess, evaluate, and compare agricultural social startups' performance in a specific area. Each indicator has a unique function and level of importance. Some indicators will become the most important source of data for enhancing performance and driving agricultural social startups toward success. To identify the success criteria for agricultural social startups, this study proposes key performance indicators (KPIs) comprised of the most significant impact indicators selected from the highest-ranked strategic goals determined by the AHP. The selection criteria ensure that the indicators provide impact investors/startups

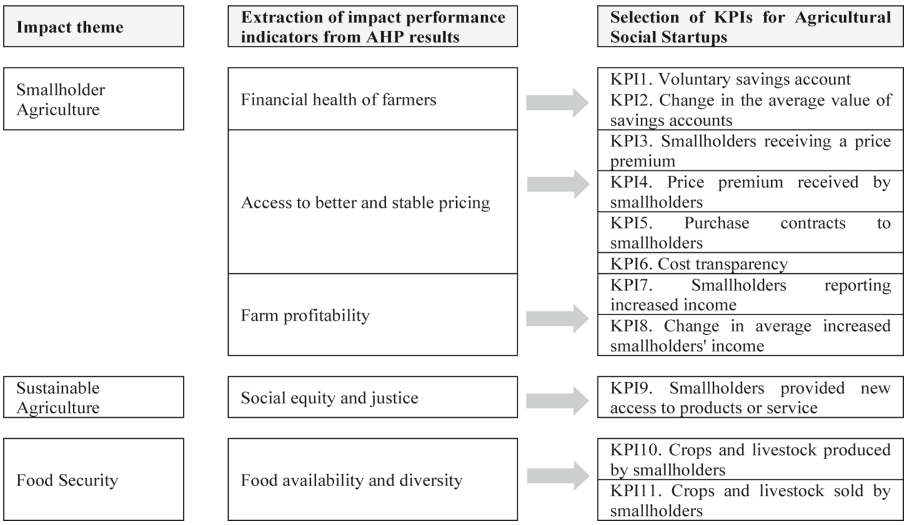

Fig. 7. Extraction of the impact indicators and selection of KPIs for agricultural social startups

with useful and effective information. Based on the AHP results, the KPIs were developed under five strategic goals ranked from 1 to 5 (Table 1), accounting for 59% of the total weight. The KPIs set (Fig. 7) comprises 11 indicators chosen from the 30 indicators, reflecting three significant impact themes in the agriculture industry.

4 Conclusion

This paper presented an AHP-based ranking analysis of hierarchically arranged KPIs in agricultural social startups. It has briefly discussed the current social impact metrics in agricultural social startups' performance measurement system and highlighted the importance of prioritizing impact performance indicators in agricultural social startups. This research developed an impact performance measurement system based on selected KPIs clustered into three major impact themes of agriculture. Practitioners were responsible for the selection and weighting of KPIs. The AHP was applied to the development of the basic impact performance measurement system for agricultural social startups. The proposed measurement system creates a systematic way for managers to decide which KPIs are more important to the goals of a social startup than others. Social startups can identify areas to invest resources to improve strategies and scale their social impacts. Using the practitioners' survey incorporated into the AHP tool, the prioritization of the three impact themes, consisting of a total of 12 strategic goals together with 30 impact performance indicators, was performed. The ranking analysis reveals that smallholder agriculture should be the impact theme primary focus for agricultural social startups. The financial health of farmers, better and stable pricing, and farm profitability are the most important impact performance indicators for this impact theme. Sustainable agriculture ranked as the second most important impact theme, with social equity and justice being the most important indicators for this impact theme. The third important impact theme is food security, where food availability and diversity is the most important indicator.

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