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SOFT COMPUTING IN DECISION MAKING AND IN MODELING IN ECONOMICS

# A framework to overcome barriers to social entrepreneurship using a combined fuzzy MCDM approach

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**Abstract**
Social entrepreneurs play an essential role in innovative solutions to address the world's most challenging societal problems. Although the value of innovative ideas is undeniable during the new venture creation process, not all creative ideas can be implemented. Many barriers hinder nascent social entrepreneurs from realizing their new ideas. The aim of this study is twofold: (1) to provide a holistic list of barriers that hinder social venture creation; and (2) to determine the solutions to overcome the detected barriers. This study employs an integrated methodology to identify barriers and solutions. First, a comprehensive literature review was conducted to determine the barriers. Following this, essential barriers were identified with the fuzzy Delphi (F-Delphi) method. Next, the weight of each barrier was calculated using the improved fuzzy step-wise weight assessment ratio analysis (IMF-SWARA). Then, fuzzy weighted aggregated sum product assessment (F-WASPAS) was used to rank solutions to overcome these barriers. The findings may help organizations advise nascent social entrepreneurs about potential obstacles, which may help reduce the number of entrepreneurs abandoning their ideas. Furthermore, a comprehensive sensitivity analysis was performed to evaluate the robustness and effectiveness of the results.

**Keywords** Social entrepreneurship · Barriers · Solutions · Fuzzy Delphi · Improved fuzzy SWARA · Fuzzy WASPAS

## 1 Introduction

In recent years, there has been a growing interest in social entrepreneurship. According to the European Commission, over 200 million people are associated with social entrepreneurship projects, and the ecosystem employs more than 40 million people worldwide (Financier Worldwide 2020). Social entrepreneurship can be defined as "creating innovative solutions to immediate social problems and also mobilizing ideas, capacities, resources, and social arrangements required for long-term, sustainable, social transformations" (Alvord et al. 2004, p. 262). Despite the considerable attention, the literature primarily focuses on the success stories of social entrepreneurs (Munoz et al. 2020), and social entrepreneurial exit has not been adequately addressed. However, it is well known that many social entrepreneurs cannot implement their ideas, and an unknown number of ideas are never realized.

Nascent social entrepreneurs (NSE) face numerous barriers during the new venture creation process, which may cause them to quit (Renko 2013). Moreover, social enterprises face additional and often more complex barriers than commercial enterprises (Davies et al. 2019). In the new venture creation phase, there might be some common challenges and problems both business and social entrepreneurs face; however, some additional barriers might be specific to social entrepreneurship (Hoogendoorn et al. 2019). As Cohen and Winn (2007, p. 46) state, some of these barriers may be considered "inherent and at least partially intractable challenges…which tend to be complex, dispersed, global, uncertain, interdependent, and having long-term horizons".

Despite the growing attention on social entrepreneurship, there remains a noticeable gap in literature surrounding the phenomenon of social entrepreneurial

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disengagement. Specifically, the factors or barriers that trigger nascent social entrepreneurial disengagement are underexplored. This is a critical area of inquiry, as understanding these barriers not only enriches empirical knowledge in the field but also refines the theoretical conceptualization of the phenomenon. This study aims to address this gap by delving into these barriers, seeking to shed light on the major challenges faced by social entrepreneurs in their journey to actualize their innovative ideas. By providing a comprehensive guide to these challenges, this study offers important insights for aspiring social entrepreneurs, governments, ecosystem leaders, and policy makers. Moreover, our research goes a step further by identifying potential solutions to overcome these barriers. These solutions, prioritized based on their effectiveness, serve as practical strategies for mitigating the identified challenges, ultimately enabling a more conducive environment for social entrepreneurial activities. In this context, the primary objectives of our study can be outlined as follows:

- To unveil the primary barriers that deter social entrepreneurs from realizing their innovative ideas and potentially hinder the establishment of successful social enterprises.
- To identify and rank the key barriers that may cause nascent social entrepreneurs to abort their entrepreneurial journey prematurely, thereby contributing to the understanding of social entrepreneurial disengagement.
- To discern effective strategies for overcoming identified barriers, and to prioritize these solutions based on their potential impact, thus equipping stakeholders with practical tools for facilitating social entrepreneurship.

Multi-criteria decision-making (MCDM) methods, which offer significant advantages in solving complex social and industrial problems, have attracted considerable attention from researchers (Turskis et al. 2019; Garg and Sharaf 2022). Researchers have adopted various versions of MCDM methods in many applications because of their high accuracy and reliability in real-life problems (Yazdani et al. 2022). However, precise knowledge of real-life problems is often inadequate due to the complications introduced by ambiguity (Ghorabaee et al. 2016). Therefore, Lotfi Zadeh proposed the fuzzy set theory (Zadeh 1965) to capture complex systems' highly ignored nature of ambiguity and uncertainty (Ilieva et al. 2018). The combination of MCDM with fuzzy set theory, known as "Fuzzy multi-criteria decision-making" (F-MCDM), is an effective tool for dealing with such issues (Sumrit 2022).

This study proposes a hybrid multi-criteria decision-making framework using fuzzy Delphi (F-Delphi), improved fuzzy step-wise weight assessment ratio analysis (IMF-SWARA), and fuzzy weighted aggregated sum product assessment (F-WASPAS). Since the classical Delphi method is insufficient due to the difficulty of gathering experts in a single setting and the vagueness and uncertainty in the decision-making process (Ocampo et al. 2018; Padilla-Rivera et al. 2021) the fuzzy Delphi method was utilized to determine the essential ones from many barriers in this study. The SWARA method helps decision-makers in problems where there are conflicting criteria (Ansari et al. 2020). The traditional fuzzy SWARA (F-SWARA) method's limitation is that it does not allow obtaining results in which two criteria have equal fuzzy weights. However, the IMF-SWARA, a relatively recent method, offers an effective way to facilitate the investigation (Vrtagić et al. 2021). This situation is of vital importance in the criterion weighting stage, where the opinions of the decision makers are considered. Consequently, the IMF-SWARA method was used in this study since it provides convenience in the application and requires less calculation than other methods (Mardani et al. 2017). The WASPAS method was introduced (Zavadskas et al. 2012) to increase the accuracy of the ranking of solutions or alternatives (Lin et al. 2021; Rudnik et al. 2021). The WASPAS approach allows researchers to examine and evaluate alternatives against attributes with high reliability (Panpatil et al. 2022). It was used to evaluate the solutions to overcome barriers by integrating fuzzy logic to get expert judgments accurately and to better model uncertainties. In this context, the current paper's contributions can be summarized as follows:

- Provides a comprehensive guide to the potential barriers that nascent social entrepreneurs may encounter.
- Offers a prioritized list of potential solutions to overcome the essential barriers.
- Presents the IMF-SWARA approach, a more reliable weighting method, and an improved version of the traditional fuzzy SWARA, and proposes a hybrid model by combining this weighting technique with the F-WASPAS method.
- In particular, the integration of F-Delphi, IMF-SWARA, and F-WASPAS has not yet been extensively researched (Khalilzadeh et al. 2021). The combined use of these methods in the field of entrepreneurship is a novelty.
- The robustness of the integrated methodology was tested against the criterion weights by assessing the validity of the proposed model through a comprehensive sensitivity analysis. In addition, the findings were compared with other current fuzzy MCDM methods, and the results indicate that the proposed approach is reliable.

The article is organized into five sections. Section 2 presents the literature review. Section 3 covers the research

methodology by explaining F-Delphi, IMF-SWARA, and F-WASPAS. Section 4 provides the application process to determine the essential barriers and solutions. Finally, Sect. 5 concludes by discussing implications, contributions, limitations, and suggestions for future research.

## 2 Literature review

Venture creation is an inherently complex and unpredictable process, with intentions not always translating into actual behavior. Nascent entrepreneurs often encounter numerous barriers due to the complex nature of venture creation (Davidsson and Gordon 2012), and these obstacles "may take longer to resolve than expected" (Van Gelderen et al. 2011, p. 72). Nascent entrepreneurs continuously evaluate ideas and opportunities, considering "whether their efforts should be intensified, redirected or discontinued" (Dimov 2010, p. 1127). As a result of this early evaluation, some potential entrepreneurs may decide not to pursue the venture (DeTienne 2010), and a significant percentage of nascent entrepreneurs do not turn their ideas into reality (Parker and Belghitar 2006). Gartner's (1985) conceptual framework for new venture creation is used in this study to identify the barriers that prevent nascent social entrepreneurs from bringing their ideas to life.

### 2.1 Nascent social entrepreneurship barriers

Gartner's (1985) conceptual framework is widely accepted and used in entrepreneurship literature to explore factors that lead to a new venture's success or failure. Gartner (1985, p. 698) stated that "no new venture creation can be comprehensively described, nor can its complexity be adequately accounted for, unless all of its four dimensions are investigated, and an attempt is made to discover how variables from each dimension interact with variables from other dimensions". Therefore, the barriers were grouped into four categories based on the mentioned conceptual framework. These barriers fall into four categories: entrepreneurial, organizational, process, and environmental.

*The individual (entrepreneur)-related barriers*: Founding a new venture comprises a complex set of activities, and an entrepreneur's ability to organize them is critical for success. As Dimov (2010, p. 1127) stated, "nascent entrepreneurs will be more likely to abandon their efforts as signs of trouble accumulate" and different individuals may reach different conclusions about the feasibility and desirability of the opportunity. Individual-related factors can be examined under human capital and psychological individual differences. Human capital refers to variables such as knowledge, education, skills, and experience (Deakins and Whittam 2000). Previous studies have reported the relationship between human capital and success in exploiting opportunities. Barriers under human capital involve lack of industry experience (Davidsson and Gordon 2012), lack of start-up experience (Delmar and Shane 2006; Dimov 2010), lack of work/management experience (Davidsson and Honig 2003; Uceda et al. 2017), lack of personal funding (Davidsson and Honig 2003; Sharir and Lerner 2006), lack of access to networks (Robinson 2006; De Carolis et al. 2009). Psychological individual differences can be named as: lack of confidence (Sequeira et al. 2007; Dimov 2010), low self-efficacy (Zhao et al. 2005; Dimov 2010; Hechavarria et al. 2012), fear of failure (Arenius and Minniti 2005; Kollmann et al. 2017), risk attitudes (Van Gelderen et al. 2005; Caliendo et al. 2009), different desires and goals related to their future career (Van Gelderen et al. 2011), lack of support from family, friends, close circle (Davidsson and Honig 2003), entrepreneur's belief about the value of the opportunity (Eckhardt and Shane 2003), nascent entrepreneurs may not enjoy the process of venturing, or may even dislike certain parts (Van Gelderen et al. 2011), from the social entrepreneurial process it may be interpreted as some social entrepreneurs may like helping people but not the rest of the process.

*The organization-related barriers*: The businesses that social entrepreneurs aim to establish are characterized by their combination of a social mission and a commercial orientation (Del Giudice et al. 2019). The organization dimension focuses on variables such as the venture's scope of activity, the founding team's composition and structure, and the capital base in different stages (Sharir and Lerner 2006). The significant barriers under this category involve weak efforts by the early team members (Van Gelderen et al. 2005; Renko 2013), being alone/exit of partners (Piva and Rossi-Lamastra 2018; Keles Taysir 2021), difficulties in motivating team members (Austin et al. 2006), difficulties in attracting qualified team members (Bornstein 2004; Austin et al. 2006, 2012; Hynes 2009; Lumpkin et al. 2013), high reliance on volunteers/part-time members (Austin et al. 2006), lack of financial resources (Blanchflower and Oswald 1998; Van Gelderen et al. 2005; Burkett 2010; Nicholls 2010), several studies highlighted the difficulties faced by social entrepreneurs while obtaining financial resources (Purdue 2001; Dorado 2006; Sharir and Lerner 2006; Zahra et al. 2009), insufficient revenue potential (Sharir and Lerner 2006).

*The environment-related barriers*: As Gartner (1985, p. 700) stated, "Entrepreneurs do not operate in vacuums". From the ecological perspective, the environmental conditions play an essential role in the new venture creation because it is the source of important resources. Aldrich (1990) identified that institutional factors such as government policies, political factors, and cultural norms

influence the new venture creation process. As Leeming (2002, p. 265) states, "social entrepreneurs do not have the same infrastructure that business entrepreneurs do, and so they end up 'reinventing the wheel' time and again". The environment-related barriers consist of lack of governmental support (Sharir and Lerner 2006), unsupportive regulations (Kerlin 2012; Andersson and Ford 2017), no specific legal frame, and government politics (Kerlin 2012; Griffiths et al. 2013; Andersson and Ford 2017), difficulties in convincing stakeholders (Renko 2013; Robinson 2006; Teasdale 2012), resistance to social change (Renko 2013; Newth and Woods 2014), lack of social support (Robinson 2006; Sharir and Lerner 2006), lack of clear definition of social entrepreneurship (Hynes 2009; Murillo-Luna et al. 2021), competition/the existence of enterprises and organizations from different statuses with the same purpose (Weerawerdena and Mort 2006), investors' attitudes towards social ventures (Miller and Wesley 2010), social and political pressures to compromise on financial performance (Dees and Anderson 2003).

*The process-related barriers*: The process dimension focuses on how intensely people work in the initial phase. In this process, variables such as identifying needs and opportunities, forming partnerships, obtaining legitimacy and resources, and the ability to withstand market testing are influential on the success of the process (Sharir and Lerner 2006). Therefore, the significant barriers under this category involve lack of proper planning (Sharir and Lerner 2006; Chwolka and Raith 2012), problems with business model (Weber and Kratzer 2013; Camenzuli and McKague 2015), untested and unproven business models (Zahra et al. 2009), products/services that do not meet the needs of the target group (El Ebrashi 2013), focusing on financial performance before social impact (Mair and Schoen 2007; Lumpkin et al. 2013), the complexity of monetizing social value creation (Dees 1998; Mair and Marti 2006; Austin et al. 2012; Mulgan 2006; Pärenson 2011), challenges in measuring social impact (Dees and Anderson 2003; Mair and Marti 2006), hard to satisfy diverse stakeholders (Dees and Anderson 2003; Austin et al. 2006; Tracey and Phillips 2007; Lumpkin et al. 2013), the tension between missions (Dees and Anderson 2003; Tracey and Phillips 2007; Ebrahim et al. 2014).

### 2.2 Solutions to overcome social entrepreneurship barriers

In addition to analyzing the barriers that hinder the realization of social entrepreneurial ideas, it is also essential to explore the solutions that help overcome these barriers, such as establishing training programs on social entrepreneurship and gaining knowledge about the subject (Harris et al. 2013), raising awareness, providing network opportunities (Griffiths et al. 2013; Dufays and Huybrechts 2014), increasing the number of support organizations (Hervieux and Voltan 2018) and incubation centers (Zaidi et al. 2021). As in any venture, market research (Rosca et al. 2020) and stakeholder analysis (Meyer et al. 2020) are also very important for success. Furthermore, government institutions should create a legal structure that fosters social entrepreneurship and offers financial support solutions (Bozhikin et al. 2019). Financial stability, crucial for any business owner, is equally essential for social entrepreneurs for their business sustainability and growth (Stoffers et al. 2018). Table 1 provides an overview of suggested solutions for overcoming barriers to social entrepreneurship. These solutions are derived from a comprehensive review of the relevant literature. Each solution is presented along with the code used to identify it, as well as a list of supporting literature.

## 3 Research methodology

A five-stage methodological approach has been adopted for implementation: (1) revealing social entrepreneurship barriers within the scope of relevant literature and expert opinions; (2) uncovering important barriers by taking fuzzy evaluations with the Delphi method; (3) determining the importance levels of barriers using IMF-SWARA; (4) identifying solutions to overcome these barriers in light of literature and expert opinions; and (5) prioritizing solutions using the F-WASPAS method and sensitivity analysis. The methodological flow chart is illustrated in Fig. 1.

### 3.1 Fuzzy Delphi method

The Delphi method and fuzzy set theory are combined in the F-Delphi method (Karam et al. 2021). This method offers a suitable approach for selecting the more effective ones within a certain group of criteria (Kuo and Chen 2008; Chang et al. 2011; Zhang 2017). Moreover, F-Delphi provides the benefit of reducing the number of interviews and questioning time while providing a more comprehensive expression of experts' information (Bui et al. 2020). The basic steps of the method are as follows (Ocampo et al. 2018; Karam et al. 2021; Padilla-Rivera et al. 2021):

*Step 1 Prepare the questionnaire*: In this initial phase, a comprehensive questionnaire was prepared featuring the 55 sub-criteria that had been previously identified. This questionnaire was systematically developed to present these sub-criteria, which represented potential barriers to nascent social entrepreneurship, to a group of expert decision-makers. Table 2 was specifically designed to assist this group of experts in their evaluation process. The table comprises a linguistic scale that ranges from "Very

**Table 1** Solutions to overcome barriers to social entrepreneurship

| Code | Solution | Supporting literature |
|---|---|---|
| S1 | Increasing the number of social impact investors | Nicholls (2010); Kickul and Lyons (2015); Castellas et al. (2018) |
| S2 | Establishing a legal framework and legislation for social ventures | Altinay et al. (2016); Smachylo et al. (2018); Filatova et al. (2019) |
| S3 | Providing governmental support such as tax advantages and incentives | Stephan et al. (2015); Halberstadt and Spiegler (2018); Terziev and Georgiev (2019) |
| S4 | Developing widespread social entrepreneurship education | Howorth et al. (2012); Weaver (2016); Mercader (2017) |
| S5 | Providing credits, grants, loans, and funds to social entrepreneurs | Stecker (2014); Halberstadt and Spiegler (2018) |
| S6 | Creating networking opportunities | Perrini et al. (2010); Lehner and Kansikas (2012); Mercader (2017), Halberstadt and Spiegler (2018) |
| S7 | Offering finance management training | Howorth et al. (2012); Parekh and Attuel-Mendès (2022) |
| S8 | Offering market research and stakeholder analysis training | Miller et al. (2012); Wronka-Pośpiech (2018), Rosca et al. (2020) |
| S9 | Increasing the number of support organizations such as Ashoka | Hockerts (2006), El Ebrashi (2013); Saleem (2020); Khalid et al. (2022) |
| S10 | Organizing events to share best practices | Chang et al. (2014); Weaver (2016), Usman et al. (2022) |
| S11 | Increasing the number of incubation centers and giving priority to social entrepreneurs | Lyons and Lichtenstein (2010); Prasad and Satish (2018); Saleem (2020); Seda and Ismail (2020); Nascimento et al. (2021) |
| S12 | Raising awareness of potential constraints | Korosec and Berman (2006); Miller et al. (2012); Braga et al. (2014), Lan et al. (2014) |

Important" to "Very Unimportant", offering a methodical approach to classify the significance of each potential barrier. The experts were then tasked with utilizing the linguistic scale provided in Table 2 for their evaluation. This scale facilitated a clear and comparative assessment of the significance attributed to each barrier. Consequently, this method empowered the experts to distinguish and prioritize the barriers based on their perceived relevance and significance in the context of nascent social entrepreneurship.

*Step 2 Collect opinions of the experts using the questionnaire*: A semi-structured questionnaire is presented to the decision-making team, which consists of experts and academics with industry experience. Barriers are evaluated by experts using linguistic parameters. Let $\widetilde{b}_i^k = \left(b_{iL}^k, b_{iM}^k, b_{iU}^k\right)$ represent the relative importance of each possible social entrepreneurship barrier $i$ elicited by the $k$th decision-maker in triangular fuzzy number (TFN). To aggregate judgments of all $K$ decision-makers, Eq. (1) will be used:

$$\widetilde{b}_i = (b_{iL}, b_{iM}, b_{iU}) = \left( \min_k b_{iL}^k, ((1/K)) \sum_{k=1}^{K} b_{iM}^k, \max_k b_{iU}^k \right), \tag{1}$$

where $\widetilde{b}_i$ is the aggregate TFN.

*Step 3 Perform the defuzzification*: Defuzzify $\widetilde{b}_{ij}$ using the center-of-gravity method as shown in Eq. (2).

$$b_i = \frac{b_{iL} + b_{iM} + b_{iU}}{3}, \tag{2}$$

where $b_i$ is a crisp score which denotes the aggregate importance of each candidate social entrepreneurship barrier $i$.

*Step 4 Calculating threshold value and identifying essential barriers:* The threshold value is crucial in determining the level of expert agreement (Ghazali et al. 2019). The geometric mean of the $b_i$ values of each barrier is used to calculate the threshold value "α". If $b_i < \alpha$, then barrier $i$ is not an essential barrier. If $b_i \geq \alpha$, then barrier $i$ is an essential barrier. Considering the threshold value, the final barrier list is obtained as a result of the evaluation.

### 3.2 The improved fuzzy stepwise weight assessment ratio analysis method

SWARA method (developed by Keršuliene et al. 2010), which is based on weight evaluation, determines a preliminary prioritizing of the alternatives with respect to each criterion. This assessment is made by the experts. The relative importance of each option is then calculated for each criterion, and options are ranked correspondingly (Moniri et al. 2021). Unlike other weighting approaches,

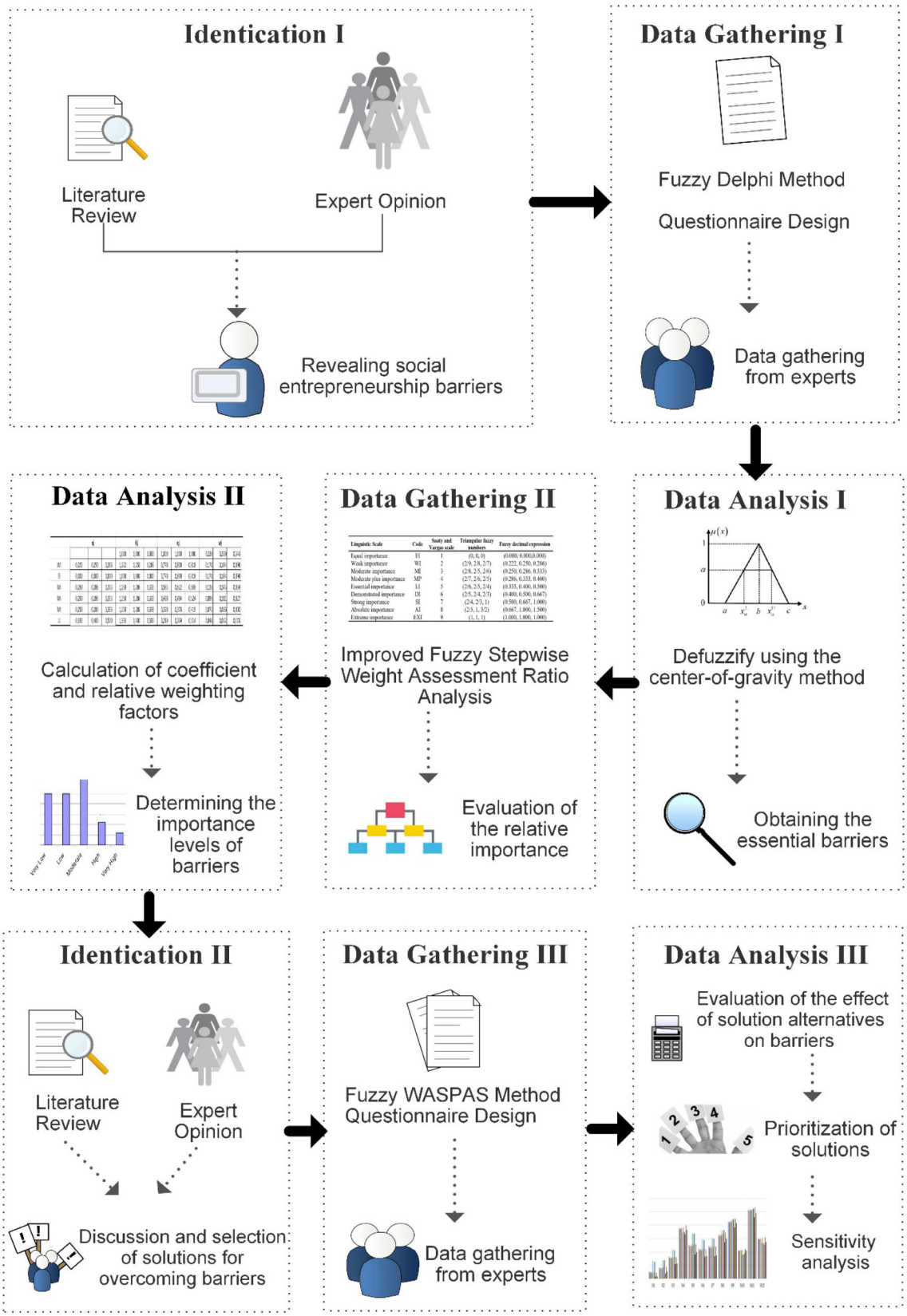



**Fig. 1** The flowchart of the proposed evaluation model

**Table 2** Linguistic evaluation scale, adopted from (Ocampo et al. 2018; Padilla-Rivera et al. 2021)

| Linguistic parameter | Code | Description | Triangular fuzzy numbers |
|---|---|---|---|
| Very important | VI | The barrier is fundamental in NSE | (7,9,9) |
| Important | I | The barrier is very significant in NSE | (5,7,9) |
| Moderate | M | The barrier is moderately significant in NSE | (3,5,7) |
| Unimportant | U | The barrier is insignificant in NSE | (1,3,5) |
| Very unimportant | VU | The barrier is slightly relevant in NSE | (1,1,3) |

**Table 3** Fuzzy comparison scale

| Linguistic scale | Code | Saaty and Vargas scale | Triangular fuzzy numbers | Fuzzy decimal expression |
|---|---|---|---|---|
| Equal importance | EI | 1 | (0, 0, 0) | (0.000, 0.000, 0.000) |
| Weak importance | WI | 2 | (2/9, 2/8, 2/7) | (0.222, 0.250, 0.286) |
| Moderate importance | MI | 3 | (2/8, 2/5, 2/6) | (0.250, 0.286, 0.333) |
| Moderate plus importance | MP | 4 | (2/7, 2/6, 2/5) | (0.286, 0.333, 0.400) |
| Essential importance | LI | 5 | (2/6, 2/5, 2/4) | (0.333, 0.400, 0.500) |
| Demonstrated importance | DI | 6 | (2/5, 2/4, 2/3) | (0.400, 0.500, 0.667) |
| Strong importance | SI | 7 | (2/4, 2/3, 1) | (0.500, 0.667, 1.000) |
| Absolute importance | AI | 8 | (2/3, 1, 3/2) | (0.667, 1.000, 1.500) |
| Extreme importance | EXI | 9 | (1, 1, 1) | (1.000, 1.000, 1.000) |

**Table 4** Linguistic scale for solutions (Agarwal et al. 2020; Yel et al. 2022)

| Linguistic variables | Code | Corresponding fuzzy numbers |
|---|---|---|
| Very low | VL | (0, 0, 1) |
| Low | L | (0, 1, 3) |
| Medium low | ML | (1, 3, 5) |
| Fair | F | (3, 5, 7) |
| Medium good | MG | (5, 7, 9) |
| Good | G | (7, 9, 10) |
| Very good | VG | (9, 10, 10) |

experts may easily participate in this method and make decisions concerning criteria and their prioritization (Işık and Adalı 2016; Sharma et al. 2021). Since crisp SWARA cannot successfully deal with problems involving such imprecise information (Mavi et al. 2017; Sahebi et al. 2020), the F-SWARA method was used in this study to deal with analyzing the barriers. The implementation of the F-SWARA approach to estimate criterion weights by several researchers in recent years in fields such as outsourcing provider selection (Perçin 2019), humanitarian supply chain (Agarwal et al. 2020), risk management (Ansari et al. 2020; Moniri et al. 2021), location selection (Ulutaş et al. 2021), lean supply chain (Sharma et al. 2021), and stakeholder engagement strategies (Khalilzadeh et al. 2021) demonstrates the method's popularity.

The existing F-SWARA approach does not allow decision-makers to accord equal importance to the criteria. The issue with the evaluation scale was adequately addressed by adopting the IMF-SWARA methodology, as proposed by Vrtagić et al. (2021). This adaptation facilitated the derivation of results more reflective of real-world scenarios (Zolfani et al. 2023). The enhanced methodology, which provides a more accurate depiction of expert opinions, has thus far been utilized in a limited number of studies (Zolfani et al. 2021; Matić et al. 2022; Singh et al. 2022; Stević et al. 2022; Vojinović et al. 2022). Moreover, the evaluation scale was expanded to a nine-point scale to ensure the comprehensive encapsulation of all viewpoints. The method for calculating the relative weights of criteria using IMF-SWARA is as follows (Zarbakhshnia et al. 2018; Ansari et al. 2020; Vrtagić et al. 2021):

*Step 1*: Based on the decision-making goal, criteria are organized in descending order, beginning with the most significant and ending with the least essential. The fuzzy scales are displayed in Table 3. The scale derived from Saaty and Vargas (1980), based on the Singh et al. (2022) study, was used to form fuzzy linguistic expressions.

*Step 2*: This procedure begins with the second factor, in which experts provide a score to factor $j$ in relation to the previous criteria $(j-1)$ for each criterion. This ratio

represents how important $\widetilde{s}_j$ value is in comparison to other values.

*Step 3*: Determine the coefficient $\widetilde{k}_j$ as Eq. (3):

$$\widetilde{k}_j = \begin{cases} \widetilde{1}; & j = 1, \\ \widetilde{s}_j + \widetilde{1}; & j > 1, \end{cases} \tag{3}$$

*Step 4*: Calculate the fuzzy weight $\widetilde{q}_j$ as Eq. (4):

$$\widetilde{q}_j = \begin{cases} \widetilde{1}; & j = 1, \\ \dfrac{\widetilde{q}_j - \widetilde{1}}{k_j}; & j > 1, \end{cases} \tag{4}$$

*Step 5*: Computation of relative weighting factors of evaluation units as Eq. (5):

$$\widetilde{w}_j = \frac{\widetilde{q}_j}{\sum_{k=1}^{n} \widetilde{q}_k}, \tag{5}$$

where $\widetilde{\mathrm{w}}_\mathrm{j}$ denotes the comparative weights of $j$ criteria, and $n$ represents the number of criteria.

*Step 6*: Defuzzification of $\widetilde{w}_j$ when criterion weights need to be sorted with crisp values, using Eq. (6):

$$x_{ij} = \frac{\left(x_{ij}^{u} - x_{ij}^{l}\right) + \left(x_{ij}^{m} - x_{ij}^{l}\right)}{3} + x_{ij}^{l}, \tag{6}$$

where $x_{ij}$ is the evaluation of i-th alternative against the j-th decision criterion. A triangular fuzzy number is represented by ($l$, $m$, $u$), where $l$, $m$, and $u$ are the smallest, most promising, and largest possible values respectively.

### 3.3 Fuzzy weighted aggregated sum product assessment method

Weighted aggregated sum product assessment (WASPAS) is a robust MCDM method developed by Zavadskas et al. (2012). This method combines the weighted addition and weighted product models. Numerous scholars have utilized WASPAS for a variety of purposes including supplier selection (Petrović et al. 2019), sustainable development (Turskis et al. 2019), development of sustainable energy sources (Saraswat 2020), risk assessment (Alvand et al. 2021), selection of improvement projects (Rudnik et al. 2021), prioritizing strategies (Zarch et al. 2021). In this study, the WASPAS method was employed to provide higher accuracy (Narayanamoorthy et al. 2021) and precision (Liu 2022) in the decision-making process compared to individual methods. Turskis et al. (2015) and Agarwal et al. (2020) proposed the six steps for the F-WASPAS method. The steps are given below:

*Step 1:* Prepare the fuzzy decision matrix using triangular fuzzy number as shown in Table 4.

Table 4 represents a linguistic scale developed specifically for assessing potential solutions. Drawing from the work of Agarwal et al. (2020) and Yel et al. (2022), this scale comprises seven linguistic expressions, ranging from "Very Low" to "Very Good". Each linguistic variable is paired with corresponding fuzzy numbers to facilitate a nuanced analysis of the solutions.

$$\widetilde{X}_{ij} = \begin{bmatrix} \widetilde{x}_{11} & \widetilde{x}_{12} & \cdots & \widetilde{x}_{1n} \\ \widetilde{x}_{21} & \widetilde{x}_{22} & \cdots & \widetilde{x}_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \widetilde{x}_{m1} & \widetilde{x}_{m2} & \cdots & \widetilde{x}_{mn} \end{bmatrix}, \tag{7}$$

where n = number of criteria (barriers), m = number of alternatives (solutions) and $\widetilde{x}_{ij}$=fuzzy evaluation of the ith alternative against the jth decision criterion.

*Step 2:* Normalizing fuzzy decision matrix.

The decision matrix is normalized and the element of the normalized decision matrix is represented by $\widetilde{\overline{X}} = \left[\widetilde{\overline{x}}_{ij}\right]_{m\times n}$..

$$\widetilde{\overline{x}}_{ij} = \begin{cases} \dfrac{\widetilde{x}_{ij}}{\max\limits_{i} \widetilde{x}_{ij}} & \text{if } \max\limits_{i} \widetilde{x}_{ij} \text{ is preferable, } j = 1, \ldots, n; i = 1, \ldots, m \\ \dfrac{\min\limits_{i} \widetilde{x}_{ij}}{\widetilde{x}_{ij}} & \text{if } \min\limits_{i} \widetilde{x}_{ij} \text{ is preferable, } \ j = 1, \ldots, n; i = 1, \ldots, m \end{cases} \tag{8}$$

*Step 3:* Compute the weighted normalized fuzzy decision matrix.

(a) Calculate the weighted normalized fuzzy decision matrix $\widetilde{\widehat{X}}_q$ for weighted sum model (WSM):

$$\widetilde{\widehat{X}}_q = \begin{bmatrix} \widetilde{\widehat{x}}_{11} & \cdots & \widetilde{\widehat{x}}_{1j} & \cdots & \widetilde{\widehat{x}}_{1n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \widetilde{\widehat{x}}_{i1} & \cdots & \widetilde{\widehat{x}}_{ij} & \cdots & \widetilde{\widehat{x}}_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \widetilde{\widehat{x}}_{m1} & \cdots & \widetilde{\widehat{x}}_{mj} & \cdots & \widetilde{\widehat{x}}_{mn} \end{bmatrix}; \widetilde{\widehat{x}}_{ij} = \widetilde{\overline{x}}_{ij}\widetilde{w}_j. \tag{9}$$

(b) Calculate the weighted normalized fuzzy decision matrix $\widetilde{\widehat{X}}_p$ for weighted product model (WPM):

$$\widetilde{\widehat{X}}_p = \begin{bmatrix} \widetilde{\widehat{\mathrm{x}}}_{11} & \cdots & \widetilde{\widehat{\mathrm{x}}}_{1j} & \cdots & \widetilde{\widehat{\mathrm{x}}}_{1n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \widetilde{\widehat{\mathrm{x}}}_{i1} & \cdots & \widetilde{\widehat{\mathrm{x}}}_{ij} & \cdots & \widetilde{\widehat{\mathrm{x}}}_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \widetilde{\widehat{\mathrm{x}}}_{m1} & \cdots & \widetilde{\widehat{\mathrm{x}}}_{mj} & \cdots & \widetilde{\widehat{\mathrm{x}}}_{mn} \end{bmatrix}; \widetilde{\widehat{\mathrm{x}}}_{ij} = \left(\widetilde{\overline{x}}_{ij}\right)^{\widetilde{w}_j}. \tag{10}$$

*Step 4:* Calculate the values of the optimality function.

(a) The WSM for *i-th* alternative:

$$\widetilde{Q}_i = \sum_{j=1}^{n} \widetilde{\widehat{x}}_{ij}, i = 1, \ldots, m. \tag{11}$$

(b) The WPM for *i-th* alternative:

$$\widetilde{P}_i = \prod_{j=1}^{n} \widetilde{x}_{ij}, i = 1, \ldots, m. \quad (12)$$

Defuzzification of the fuzzy performance evaluation is carried out using center-of-area method, which is the most practical method (Turskis et al. 2019).

$$Q_i = \frac{1}{3}\left(Q_{i\alpha} + Q_{i\beta} + Q_{i\gamma}\right), \quad (13)$$

$$P_i = \frac{1}{3}\left(P_{i\alpha} + P_{i\beta} + P_{i\gamma}\right). \quad (14)$$

*Step 5:* The utility function value $K_i$ of the F-WASPAS method is calculated as follows:

$$K_i = \lambda \sum_{j=1}^{n} Q_i + (1-\lambda) \sum_{j=1}^{n} P_i; \lambda = 0, \ldots, 1, 0 \leq K_i \leq 1, \quad (15)$$

where

$$\lambda = \frac{\sum_{i=1}^{m} P_i}{\sum_{i=1}^{m} Q_i + \sum_{i=1}^{m} P_i}. \quad (16)$$

*Step 6:* Rank the preference order or select the decision alternative (solution), starting from the highest value, $K_i$.

## 4 Application

The objective of this paper is to identify the essential barriers encountered in the social entrepreneurial idea implementation process and prioritize solutions. One of the most important steps to achieve this aim was the selection of experts. Euclid Network's expert database was used to select qualified experts. Euclid Network is the European network that creates a connection between social entrepreneurs, impact-driven leaders, policymakers, researchers, investors, and citizens (www.euclidnetwork.eu). Four experts from Turkey were included in the Euclid Network's expert database in 2021. Two of these experts agreed to participate in the study, and with their guidance, we reached the other experts who attended the survey between September 2021 and March 2022. In total, 13 experts shared their insights on the barriers to social entrepreneurial idea implementation. These experts have experience in diverse areas such as academia; social enterprises; social incubation centers; NGOs; social impact investment; and traditional for-profit companies. Table 5 lists the qualifications of these thirteen experts.

### 4.1 Barrier identification and finalization

First, the barriers determined after the comprehensive literature review were examined together with the expert decision-making group, and the final barrier list was created. At this stage, since the social entrepreneurship literature is relatively young, we considered both the barriers identified in the literature and those that emerged from the experts' opinions. Table 6 offers a comprehensive consolidation of 55 barriers, which have been derived from an extensive literature review. This exhaustive compilation embodies the culmination of our rigorous research process and embraces all barriers identified. Additionally, the table incorporates unique barriers that emerged as a result of insights shared by experts specifically participating in this study.

The F-Delphi method was employed in the preliminary phase of our research to discern the critical barriers. In the process of identifying these essential barriers, 55 potential barriers were evaluated using the linguistic scale presented in Table 2. Prior to being distributed to the experts in the decision-making group, the prepared questionnaire was scrutinized by three academics with substantial experience in social entrepreneurship. This led to improvements in the phrasing of the questions, rendering the questionnaires ready for dispatch to the expert panel.

The calculation outcomes of F-Delphi are shown in Table 7. First, TFNs aggregated using Eq. (1). The aggregates $\widetilde{b}_i$ were then defuzzified using Eq. (2) to obtain the crisp results $b_i$. Following the determination of each $b_i$, $\alpha$ must be set up to calculate the threshold value. The FDM threshold is calculated by the average of all defuzzified weights and estimated as 4.97. As a result, 25 essential barriers were identified, while 30 barriers were not selected. The essential barriers that emerged as a result of the FDM were re-coded and presented in Table 8.

As a result, the decision problem consists of four levels: at the highest level, the objective of the problem is situated. In the second level, the main barriers are listed. In the third level, the sub-barriers are listed. Finally, the evaluation of the solution proposals is expressed at the fourth level of the structure. Figure 2 illustrates the hierarchical assessment model for social entrepreneurship barriers and solutions.

### 4.2 Obtaining weights of the essential barriers using IMF-SWARA

After determining the essential barriers, the stages of assessing the importance levels of the barriers were initiated. Within the scope of the IMF-SWARA method, the decision-making group first evaluated the main barriers. This study grouped twenty-five barriers into four main categories of barriers. Thus, all calculations are carried out in accordance with the main and the sub-barriers. Experts assigned the relative weights to the main and sub-barriers after ranking them according to their importance, using the

**Table 5** The profile of experts

| Expert | Education status | Experience (year) | Experience in social entrepreneurship (year) | Areas of expertise |
|---|---|---|---|---|
| E1 | BSc | 8 | 8 | Project management, entrepreneurship |
| E2 | PhD | 26 | 14 | Management and strategy |
| E3 | PhD | 15 | 7 | Business administration, organizational behavior |
| E4 | Master's degree | 18 | 13 | Cultural studies, innovative models |
| E5 | Master's degree | 13 | 13 | Communication, design, entrepreneurship |
| E6 | Master's degree | 27 | 9 | Experiential learning, experience design |
| E7 | Master's degree | 13 | 7 | Business development, social innovation ecosystem |
| E8 | PhD | 22 | 18 | Social entrepreneurship, gender equality, sustainability |
| E9 | Master's degree | 27 | 15 | Sustainability, design for social impact |
| E10 | PhD | 14 | 7 | Organizational behavior, entrepreneurship |
| E11 | PhD | 15 | 5 | Management, entrepreneurship |
| E12 | PhD | 17 | 4 | Operations management, circular economy |
| E13 | PhD | 24 | 7 | Organizational behavior, human resource management |

fuzzy scale outlined in Table 3. Then, questionnaire forms (Appendix 1) were delivered to all experts individually to collect IMF-SWARA input data. The results from each expert were analyzed individually, and the arithmetic mean was used to integrate these results. As an example, Table 9 presents the evaluations and results of the main barriers by the first expert (E1), while Table 10 presents the evaluations and results of a sub-barrier set by the same expert. A similar procedure was followed for the other experts and sub-barriers.

After experts compared each of the main barriers and sub-barriers, the next step is the calculation of the global weights of barriers. Fuzzy weights of main barriers and sub-barriers were calculated individually through ratings obtained by each expert, and they were then aggregated using the average of weights obtained. Fuzzy barrier weights will be used to evaluate the solutions in the next step. However, to determine the order of importance of the barriers and the essential barriers, the fuzzy weights were also converted into a crisp format using Eq. (6).

Global weights for essential sub-barriers were calculated based on the fuzzy weights assigned by the experts using the IMF-SWARA method. Table 11 presents the calculation results, including the non-fuzzy weights of the main barriers, essential sub-barriers, sub-barriers' local fuzzy weights, sub-barriers' global non-fuzzy weights, and sub-barriers' rank. From the "sub-barriers global non-fuzzy weights column", it is possible to conclude that "lack of financial resources", "lack of work/management experience", "no start-up/entrepreneurial experience", "insufficient revenue potential" and "difficulties in attracting qualified team members" are the most considerable barriers with an overall weight of 6.07, 5.63, 5.62, 5.16, and 4.92%, respectively.

### 4.3 Ranking the solutions through fuzzy WASPAS

In the third round of the survey, the experts were asked to evaluate each solution against the barriers (Appendix 2). F-WASPAS was used to evaluate the solutions presented to overcome the analyzed barriers. In this part, weights obtained from IMF-SWARA were used as an input for F-WASPAS method. F-WASPAS starts establishing linguistic evaluations of solutions. In total, we generated 12 solutions (denoted as S1, S2, S3, … , S12) to overcome the barriers to social entrepreneurship. Decision makers evaluated each solution using a fuzzy linguistic scale (Table 4). As a result of the evaluations, the initial matrix was created (Table 12). Next, the decision matrix is formed by

**Table 6** List of entrepreneurial, organizational, process, and environmental barriers

| Barriers and code | | Sub-Barriers | References |
|---|---|---|---|
| *Entrepreneur* | B1-1 | Lack of work/management experience | Dees (1998); Davidsson and Honig (2003); Van Gelderen et al. (2011); Uceda et al. (2017) |
| | B1-2 | No start-up/entr. experience | Davidsson and Honig (2003); Delmar and Shane (2006); Dimov (2010) |
| | B1-3 | No business education | Davidsson and Honig (2003) |
| | B1-4 | Lack of networks | Davidsson and Honig (2003); Robinson (2006); De Carolis et al. (2009) |
| | B1-5 | Lack of personal funding | Davidsson and Honig (2003); Sharir and Lerner (2006) |
| | B1-6 | Low self-confidence | Van Gelderen et al. (2005); Sequeira et al. (2007) |
| | B1-7 | Risk aversion | Van Gelderen et al. (2005); De Carolis et al. (2009) |
| | B1-8 | Low self-efficacy | Hechavarria et al. (2012); Zhao et al. (2005); Dimov (2010); Chen et al. (1998) |
| | B1-9 | Like helping people but not the rest of the process | Van Gelderen et al. (2011) |
| | B1-10 | Expression of goals related to their future career besides social entrepreneurship | Van Gelderen et al. (2011) |
| | B1-11 | Irrational commitment to the idea | Expert opinion |
| | B1-12 | Low mental resilience | Expert opinion |
| | B1-13 | Lack of support from family, friends, close circle | Davidsson and Honig (2003); Sharir and Lerner (2006) |
| | B1-14 | Social entrepreneur's belief about the value of the opportunity | Eckhardt and Shane (2003) |
| | B1-15 | Not having a global perspective | Expert opinion |
| | B1-16 | Social value creation is not the priority | Expert opinion |
| *Organizational* | B2-1 | Weak efforts by the early team members | Van Gelderen et al. (2005); Renko (2013) |
| | B2-2 | Difficulties in motivating team members | Austin et al. (2006) |
| | B2-3 | Difficulties in attracting qualified team members | Bornstein (2004); Hynes (2009); Austin et al. (2012); Austin et al. (2006); Lumpkin et al. (2013) |
| | B2-4 | High reliance on volunteers/part-time members | Austin et al. (2006); Sharir and Lerner (2006) |
| | B2-5 | Team members' low competence | Expert opinion |
| | B2-6 | Lack of financial resources | Blanchflower and Oswald (1998); Van Gelderen et al. (2005); Burkett (2010); Nicholls (2010) |
| | B2-7 | Lack of physical resources | Expert opinion |
| | B2-8 | Insufficient revenue potential | Sharir and Lerner (2006) |
| | B2-9 | Being alone/exit of partners | Van Gelderen et al. (2011); Piva and Rossi-Lamastra (2018); Keles Taysir (2021) |
| *Process* | B3-1 | Lack of proper planning | Liao and Gartner (2006); Sharir and Lerner (2006); Chwolka and Raith (2012) |
| | B3-2 | Products/services that do not meet the needs of the target group | El Ebrashi (2013) |
| | B3-3 | Prioritizing investors' expectations over the target group's needs | Expert opinion |
| | B3-4 | Focusing on financial performance before social impact | Mair and Schoen (2007); Lumpkin et al. (2013) |
| | B3-5 | Social ventures may take longer to scale | Haugh (2007); Renko (2013) |
| | B3-6 | Untested and unproven business models | Zahra et al. (2009) |
| | B3-7 | Problems with the business model | Weber and Kratzer (2013); Camenzuli and McKague (2015) |
| | B3-8 | Complexity of monetizing social value creation | Mair and Marti (2006); Mulgan (2006); Dees (1998); Pärenson (2011); Austin et al. (2012) |
| | B3-9 | Challenges in measuring social impact | Dees and Anderson (2003); Mair and Marti (2006) |
| | B3-10 | External dependency in key areas | Expert opinion |
| | B3-11 | Hard to satisfy diverse stakeholders | Dees and Anderson (2003); Austin et al. (2006); Tracey and Phillips (2007); Lumpkin et al. (2013) |
| | B3-12 | Tension between missions | Dees and Anderson (2003); Ebrahim et al. (2014); Tracey and Phillips (2007); Smith et al. (2012) |

**Table 6** (continued)

| Barriers and code | | Sub-Barriers | References |
|---|---|---|---|
| *Environmental* | B4-1 | Lack of governmental support | Sharir and Lerner (2006); Hoogendorn et al. (2019); Cavich and Chinta (2021) |
| | B4-2 | Unsupportive regulations | Van Gelderen et al. (2011); Kerlin (2012); Andersson and Ford (2017); Ismail and Johnson (2019) |
| | B4-3 | No specific legal frame and government politics | Kerlin (2012); Griffiths et al. (2013); Andersson and Ford (2017) |
| | B4-4 | Difficulties in convincing stakeholders | Robinson (2006); Teasdale (2012); Renko (2013) |
| | B4-5 | Resistance to social change | Renko (2013); Newth and Woods (2014) |
| | B4-6 | Lack of social support | Robinson (2006); Sharir and Lerner (2006) |
| | B4-7 | Unfavorable economic climate | Temple (2017); Ismail and Johnson (2019) |
| | B4-8 | Deficiencies of an entrepreneurial ecosystem (lack of knowledge and resources to build an ecosystem) | Mulgan (2006); Sharir and Lerner (2006); Leeming (2002); Hoogendoorn et al. (2019) |
| | B4-9 | Distrust in society that the social purpose is sincere | Expert opinion |
| | B4-10 | Lack of clear definition of social entrepreneurship | Hynes (2009); Murillo-Luna et al. (2021) |
| | B4-11 | No/insufficient impact investment | Expert opinion |
| | B4-12 | Unclear definition of social benefit | Expert opinion |
| | B4-13 | Failure to protect intellectual property rights | Expert opinion |
| | B4-14 | Competition/The existence of enterprises and organizations from different statuses with the same purpose | Weerawerdena and Mort (2006) |
| | B4-15 | Investors' attitudes towards social ventures | Miller and Wesley (2010) |
| | B4-16 | No/few examples of successful social enterprises | Expert opinion |
| | B4-17 | Social and political pressures to compromise on financial performance | Dees and Anderson (2003) |
| | B4-18 | Successful social venture examples lead to false expectations | Expert opinion |

aggregating the responses collected from thirteen different experts. Finally, the normalized decision matrix was obtained (Table 13).

The weighted normalized fuzzy decision matrix for WSM was obtained using Eq. (9) as shown in Table 14. Then, for WPM, a weighted normalized fuzzy decision matrix was created using Eq. (10) as shown in Table 15. The center-of-area approach with Eqs. (13) and (14) was used to defuzzify the fuzzy performance assessment. Lastly, Eq. (15) is applied to compute $K_i$, the weighted aggregation of the summation and multiplication parts. Solutions to overcome barriers to social entrepreneurship were ranked based on their $K_i$ values. Table 16 illustrates the results of the F-WASPAS.

The integrated approach demonstrates that the first solution to overcome barriers to social entrepreneurship in emerging economies is "S11-Increasing the number of incubation centers and giving priority to social entrepreneurs. Following this, the most appropriate solutions emerged as "S9-Increasing the number of support organizations" and "S4-Developing widespread social entrepreneurship education.

## 4.4 Sensitivity analysis

Sensitivity analysis (SA) includes scenario-based studies conducted with experts to evaluate the effect of subjectivity that may arise in multi-criteria decision-based studies and the reliability of results (Pamucar et al. 2022; Xiao et al. 2022). This study's sensitivity analysis aims to assess the impact of the barrier weights on the evaluation of solutions to overcome the barriers. For this purpose, thirteen scenarios were created to represent different barrier weights. The first scenario (SC1) implied the reduction of the five most important barriers ("lack of financial resources", "lack of work/management experience", "no start-up/entrepreneurial experience", "insufficient revenue potential", "difficulties in attracting qualified team members") by 10%. In the second scenario, the importance weights of the weakest five barriers ("products/services that do not meet the needs of the target group", "challenges in measuring social impact", "hard to satisfy diverse stakeholders", "unfavorable economic climate", "unclear definition of social benefit") in the original situation were increased by 10%, in the third scenario, the situations in the first two scenarios were applied simultaneously.

The fourth, fifth, and sixth scenarios were constructed similarly to the first three scenarios, but the value was changed to 20%. Finally, a 50% change was applied to the seventh, eighth, and ninth scenarios to test the impact of more radical revisions on the result. In scenarios ten through thirteen, a different strategy was adopted. The tenth scenario involved excluding entrepreneurship-related barriers, with all proposed solutions being evaluated in context of the remaining barriers. In the subsequent scenarios, barriers pertaining to the organization, environment, and process were selectively ignored, and the analyses were then repeated for each distinct scenario. The original case is represented by "SC0", and the barrier weights for the considered scenarios are given in Table 17.

Figure 3 illustrates the results of the sensitivity analysis. The utility function values, represented as Ki in the figure, reveal that "S11-Increasing the number of incubation centers and giving priority to social entrepreneurs" consistently emerges as the top solution to surmount the barriers to social entrepreneurship across thirteen different weight sets. This underlines the robustness of the proposed methodology. The results demonstrate that variations in barrier weights did not impact the primary solution, but it did marginally alter the ranking of the other proposed solutions. This is a common occurrence in evaluations reliant on expert opinions and is reflected in our study.

### 4.5 Comparison analysis

There are several MCDM methods available in the literature. Each approach has its own procedure and is used by considering the characteristics of the complex environment. However, considering the implications of previous studies in method selection, there is no "optimal" technique, and it is unlikely to evaluate the best option, especially in methods based on human judgment. Furthermore, in studies that use MCDM approaches, the comparison of different methods is used to validate the suggested method (Çetinkaya et al. 2022; Yalcin et al. 2022).

This section illustrates the comparative analysis performed to validate the proposed integrated approach. The approaches that are up-to-date and accepted in the literature are selected. To assess the robustness of the results, alternative strategies are evaluated via fuzzy EDAS (Ghorabaee et al. 2016; Stević et al. 2018), fuzzy MABAC (Liang et al. 2019; Zolfani et al. 2021), fuzzy MARCOS (Stanković et al. 2020; Büyüközkan et al. 2021) and fuzzy CoCoSo (Ulutaş et al. 2021; Zavadskas et al. 2021). Table 18 and Fig. 4 compare the final results of solutions obtained from different methods.

The findings demonstrated that "S11-Increasing the number of incubation centers and giving priority to social entrepreneurs" is the most appropriate solution among all methods. As can be seen, the correlation between the approach presented in this study and the fuzzy MCDM methods used in the comparison is quite high. Consequently, reliable results can be obtained with the proposed method. Although there are slight differences in the rankings, it is apparent that the order of the first five priority solutions to be applied mostly remains the same. The F-MARCOS has the least similarity of ranking with F-WASPAS-based integrated approach. It can be said that F-EDAS, F-MABAC, and F-CoCoSo methods also have very close results to the recommended ranking of this study.

## 5 Conclusion

In recent years, there has been a growing interest in social entrepreneurship. Numerous studies focus on social entrepreneurial intention formation due to social entrepreneurs' crucial role in solving problems that governments fail to tackle. Intention is a valuable factor in predicting behavior; however, not all intentions turn into behaviors. During the venture creation process, nascent social entrepreneurs who intend to found a social venture may decide to abandon their ideas and disengage from their intentions. Since many business ideas and opportunities could not be realized, assessing nascent social entrepreneurial barriers is necessary for practitioners, policymakers, and researchers.

There are several important areas where this study contributes to the field of social entrepreneurship. First, this study contributes to existing knowledge of social entrepreneurship by providing a holistic list of barriers that hinder social venture creation. The barriers were grouped into four categories based on Gartner's (1985) conceptual framework. As a result of the analysis, it was revealed that the barriers related to the entrepreneur are more important, followed by organizational, process, and environmental barriers. Considering all barriers and the calculated overall weights, "lack of financial resources", "lack of work/management experience", "no start-up/entrepreneurial experience", "insufficient revenue potential" and "difficulties in attracting qualified team members" have emerged as the most important barriers. The fact that difficulties in attracting financial support are one of the leading research areas in social entrepreneurship (Hoogendoorn et al. 2010) is in line with the findings of this study. It is also stated in the literature that the lack of financial support is a situation that makes it difficult to fulfill the social mission (Pinheiro et al. 2021). Even though social entrepreneurs focus on developing social ideas, achieving financial objectives is essential for venture longevity (Ip et al. 2022). Therefore, "revenue potential" comes forward as an important phenomenon. In addition, it

**Table 7** Aggregate fuzzy judgments and final decision

| Barrier categories | Barrier | Fuzzy weights | | | Defuzzified weight (*b*) | Decision |
|---|---|---|---|---|---|---|
| | | Min | Geometric mean | Max | | |
| Entrepreneur | B1-1 | 3 | 5.15 | 9 | 5.72 | Accepted |
| | B1-2 | 3 | 4.69 | 9 | 5.56 | Accepted |
| | B1-3 | 1 | 3.92 | 9 | 4.64 | Rejected |
| | B1-4 | 1 | 5.00 | 9 | 5.00 | Accepted |
| | B1-5 | 1 | 4.54 | 9 | 4.85 | Rejected |
| | B1-6 | 1 | 6.38 | 9 | 5.46 | Accepted |
| | B1-7 | 1 | 4.85 | 9 | 4.95 | Rejected |
| | B1-8 | 1 | 5.77 | 9 | 5.26 | Accepted |
| | B1-9 | 1 | 4.69 | 9 | 4.90 | Rejected |
| | B1-10 | 1 | 4.38 | 9 | 4.79 | Rejected |
| | B1-11 | 1 | 5.31 | 9 | 5.10 | Accepted |
| | B1-12 | 1 | 5.00 | 9 | 5.00 | Accepted |
| | B1-13 | 1 | 4.23 | 9 | 4.74 | Rejected |
| | B1-14 | 1 | 3.92 | 7 | 3.97 | Rejected |
| | B1-15 | 1 | 4.54 | 7 | 4.18 | Rejected |
| | B1-16 | 1 | 3.77 | 9 | 4.59 | Rejected |
| Organizational | B2-1 | 1 | 4.85 | 9 | 4.95 | Rejected |
| | B2-2 | 3 | 5.00 | 9 | 5.67 | Accepted |
| | B2-3 | 3 | 5.46 | 9 | 5.82 | Accepted |
| | B2-4 | 1 | 4.23 | 9 | 4.74 | Rejected |
| | B2-5 | 1 | 4.85 | 9 | 4.95 | Rejected |
| | B2-6 | 3 | 5.46 | 9 | 5.82 | Accepted |
| | B2-7 | 1 | 5.00 | 9 | 5.00 | Accepted |
| | B2-8 | 3 | 5.46 | 9 | 5.82 | Accepted |
| | B2-9 | 1 | 4.67 | 9 | 4.89 | Rejected |
| Process | B3-1 | 3 | 5.00 | 9 | 5.67 | Accepted |
| | B3-2 | 3 | 6.08 | 9 | 6.03 | Accepted |
| | B3-3 | 3 | 4.69 | 9 | 5.56 | Accepted |
| | B3-4 | 1 | 3.77 | 9 | 4.59 | Rejected |
| | B3-5 | 1 | 3.46 | 9 | 4.49 | Rejected |
| | B3-6 | 1 | 4.23 | 9 | 4.74 | Rejected |
| | B3-7 | 3 | 5.62 | 9 | 5.87 | Accepted |
| | B3-8 | 3 | 5.62 | 9 | 5.87 | Accepted |
| | B3-9 | 3 | 5.62 | 9 | 5.87 | Accepted |
| | B3-10 | 1 | 3.62 | 9 | 4.54 | Rejected |
| | B3-11 | 1 | 5.00 | 9 | 5.00 | Accepted |
| | B3-12 | 1 | 3.62 | 9 | 4.54 | Rejected |
| Environmental | B4-1 | 1 | 3.92 | 9 | 4.64 | Rejected |
| | B4-2 | 1 | 5.46 | 9 | 5.15 | Accepted |
| | B4-3 | 1 | 5.15 | 9 | 5.05 | Accepted |
| | B4-4 | 1 | 4.54 | 9 | 4.85 | Rejected |
| | B4-5 | 1 | 3.31 | 9 | 4.44 | Rejected |
| | B4-6 | 1 | 4.08 | 9 | 4.69 | Rejected |
| | B4-7 | 1 | 5.00 | 9 | 5.00 | Accepted |
| | B4-8 | 1 | 5.00 | 9 | 5.00 | Accepted |
| | B4-9 | 1 | 3.62 | 9 | 4.54 | Rejected |
| | B4-10 | 1 | 4.08 | 9 | 4.69 | Rejected |

**Table 7** (continued)

| Barrier categories | Barrier | Fuzzy weights | | | Defuzzified weight (*b*) | Decision |
|---|---|---|---|---|---|---|
| | | Min | Geometric mean | Max | | |
| | B4-11 | 1 | 5.15 | 9 | 5.05 | Accepted |
| | B4-12 | 1 | 5.00 | 9 | 5.00 | Accepted |
| | B4-13 | 1 | 3.92 | 9 | 4.64 | Rejected |
| | B4-14 | 1 | 3.15 | 9 | 4.38 | Rejected |
| | B4-15 | 1 | 4.23 | 9 | 4.74 | Rejected |
| | B4-16 | 1 | 4.50 | 7 | 4.17 | Rejected |
| | B4-17 | 1 | 4.08 | 9 | 4.69 | Rejected |
| | B4-18 | 1 | 2.85 | 7 | 3.62 | Rejected |

**Table 8** The list of essential barriers

| Code | Essential barriers |
|---|---|
| EB1-1 | Lack of work/management experience |
| EB1-2 | No start-up/entrepreneurial experience |
| EB1-3 | Lack of networks |
| EB1-4 | Low self-confidence |
| EB1-5 | Low self-efficacy |
| EB1-6 | Irrational commitment to the idea |
| EB1-7 | Low mental resilience |
| EB2-1 | Difficulties in motivating team members |
| EB2-2 | Difficulties in attracting qualified team members |
| EB2-3 | Lack of financial resources |
| EB2-4 | Lack of physical resources |
| EB2-5 | Insufficient revenue potential |
| EB3-1 | Lack of proper planning |
| EB3-2 | Products/services that do not meet the needs of the target group |
| EB3-3 | Prioritizing investors' expectations over the target group's needs |
| EB3-4 | Problems with the business model |
| EB3-5 | The complexity of monetizing social value creation |
| EB3-6 | Challenges in measuring social impact |
| EB3-7 | Hard to satisfy diverse stakeholders |
| EB4-1 | Unsupportive regulations |
| EB4-2 | No specific legal frame and government politics |
| EB4-3 | Deficiencies of an entrepreneurial ecosystem |
| EB4-4 | Unfavorable economic climate |
| EB4-5 | No/insufficient impact investment |
| EB4-6 | Unclear definition of social benefit |

has been stated in past studies that previous entrepreneurial experiences can play an important role in the success (Shumate et al. 2014; Kruse et al. 2021). Young generations' interest in social entrepreneurship is increasing, especially in developing countries (Amouri et al. 2021), which leads to considering this barrier. In connection with this issue, a critical barrier that emerged is the difficulties experienced in integrating qualified team members into social enterprises. At this point, besides the perception toward social enterprises, the founder's management and/or leadership characteristics may play a key role.

This study also determines the solutions to overcome the detected barriers. Analysis of the findings indicated that increasing the number of incubation centers and giving

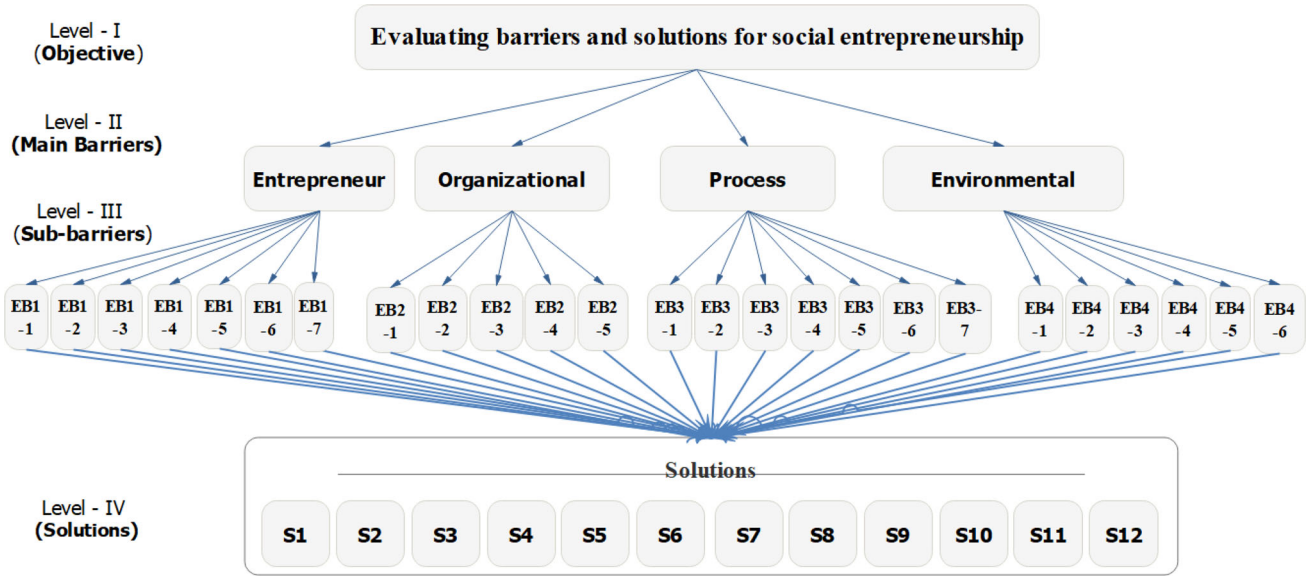



**Fig. 2** Decision hierarchy for ranking the barriers and prioritizing the solutions

**Table 9** Main barriers IMF-SWARA results for E1

| Main Barriers | Code | $\widetilde{s}_j$ | | | $\widetilde{k}_j$ | | | $\widetilde{q}_j$ | | | $\widetilde{w}_j$ | | | $w_j$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EB1-entrepreneur | | | | | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.357 | 0.375 | 0.400 | **0.377** |
| EB2-organizational | LI | 0.333 | 0.400 | 0.500 | 1.333 | 1.400 | 1.500 | 0.667 | 0.714 | 0.750 | 0.238 | 0.268 | 0.300 | **0.269** |
| EB4-environmental | MI | 0.250 | 0.286 | 0.333 | 1.250 | 1.286 | 1.333 | 0.500 | 0.555 | 0.600 | 0.179 | 0.208 | 0.240 | **0.209** |
| EB3-process | LI | 0.333 | 0.400 | 0.500 | 1.333 | 1.400 | 1.500 | 0.333 | 0.397 | 0.450 | 0.119 | 0.149 | 0.180 | **0.149** |

Significant results are shown in bold

priority to social entrepreneurs is the first solution to overcome these barriers. In parallel with the conclusion, it can be stated that there have been studies that express the importance of incubation in the field of social entrepreneurship in the last few years (Sansone et al. 2020; Scutto et al. 2022). The solution that emerged as the second suggestion is to support social enterprises and increase the number of organizations that will fulfill this task. The necessity for better support (Farinha et al. 2020; Manjon et al. 2022) and the issue of increasing the number of such organizations (Bozhikin et al. 2019) are also included in the literature. A culture of support in the country creates a

**Table 10** Essential barriers related to the entrepreneur (EB1) IMF-SWARA results for E1

| Essential barriers | Code | $\widetilde{s}_j$ | | | $\widetilde{k}_j$ | | | $\widetilde{q}_j$ | | | $\widetilde{w}_j$ | | | $w_j$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lack of work/management experience (EB1-1) | | | | | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.254 | 0.274 | 0.302 | **0.277** |
| No start-up/entr. experience (EB1-2) | WI | 0.222 | 0.250 | 0.286 | 1.222 | 1.250 | 1.286 | 0.778 | 0.800 | 0.818 | 0.198 | 0.219 | 0.247 | **0.221** |
| Irrational commitment to the idea (EB1-6) | WI | 0.222 | 0.250 | 0.286 | 1.222 | 1.250 | 1.286 | 0.605 | 0.640 | 0.670 | 0.154 | 0.175 | 0.202 | **0.177** |
| Low self-efficacy (EB1-5) | SI | 0.500 | 0.667 | 1.000 | 1.500 | 1.667 | 2.000 | 0.302 | 0.384 | 0.446 | 0.077 | 0.105 | 0.135 | **0.106** |
| Low mental resilience (EB1-7) | MI | 0.250 | 0.286 | 0.333 | 1.250 | 1.286 | 1.333 | 0.227 | 0.299 | 0.357 | 0.058 | 0.082 | 0.108 | **0.082** |
| Low self-confidence (EB1-4) | EI | 0.000 | 0.000 | 0.000 | 1.000 | 1.000 | 1.000 | 0.227 | 0.299 | 0.357 | 0.058 | 0.082 | 0.108 | **0.082** |
| Lack of networks (EB1-3) | MI | 0.250 | 0.286 | 0.333 | 1.250 | 1.286 | 1.333 | 0.170 | 0.232 | 0.286 | 0.043 | 0.064 | 0.086 | **0.064** |

Significant results are shown in bold

**Table 11** Calculation of global weights of essential barriers

| Main barriers | Non-fuzzy weights of main barriers | Essential sub-barriers | Sub-barriers local fuzzy weights | | | Sub-barriers global non-fuzzy weights | Sub-barriers rank |
|---|---|---|---|---|---|---|---|
| EB1-entrepreneur | 0.330 | EB1-1 | 0.1585 | 0.1695 | 0.1835 | 0.0563 | **2** |
| | | EB1-2 | 0.1577 | 0.1692 | 0.1834 | 0.0562 | **3** |
| | | EB1-3 | 0.1304 | 0.1432 | 0.1577 | 0.0475 | **6** |
| | | EB1-4 | 0.1297 | 0.1429 | 0.1576 | 0.0474 | **7** |
| | | EB1-5 | 0.1225 | 0.1376 | 0.1539 | 0.0456 | **9** |
| | | EB1-6 | 0.0837 | 0.0990 | 0.1150 | 0.0328 | **18** |
| | | EB1-7 | 0.1259 | 0.1387 | 0.1531 | 0.0460 | **8** |
| EB2-organizational | 0.244 | EB2-1 | 0.1488 | 0.1685 | 0.1893 | 0.0411 | **14** |
| | | EB2-2 | 0.1820 | 0.2015 | 0.2231 | 0.0492 | **5** |
| | | EB2-3 | 0.2297 | 0.2482 | 0.2702 | 0.0607 | **1** |
| | | EB2-4 | 0.1523 | 0.1711 | 0.1912 | 0.0418 | **12** |
| | | EB2-5 | 0.1926 | 0.2107 | 0.2323 | 0.0516 | **4** |
| EB3-process | 0.222 | EB3-1 | 0.1480 | 0.1579 | 0.1699 | 0.0352 | **16** |
| | | EB3-2 | 0.1064 | 0.1217 | 0.1378 | 0.0271 | **23** |
| | | EB3-3 | 0.1809 | 0.1914 | 0.2043 | 0.0427 | **11** |
| | | EB3-4 | 0.1882 | 0.1983 | 0.2110 | 0.0443 | **10** |
| | | EB3-5 | 0.1233 | 0.1359 | 0.1492 | 0.0302 | **20** |
| | | EB3-6 | 0.0886 | 0.1030 | 0.1183 | 0.0230 | **24** |
| | | EB3-7 | 0.0771 | 0.0906 | 0.1051 | 0.0202 | **25** |
| EB4-environmental | 0.205 | EB4-1 | 0.1904 | 0.2004 | 0.2128 | 0.0413 | **13** |
| | | EB4-2 | 0.1747 | 0.1867 | 0.2001 | 0.0384 | **15** |
| | | EB4-3 | 0.1564 | 0.1677 | 0.1808 | 0.0345 | **17** |
| | | EB4-4 | 0.1330 | 0.1459 | 0.1598 | 0.0300 | **22** |
| | | EB4-5 | 0.1391 | 0.1515 | 0.1648 | 0.0311 | **19** |
| | | EB4-6 | 0.1334 | 0.1477 | 0.1610 | 0.0302 | **21** |

Significant results are shown in bold

**Table 12** The initial fuzzy decision-making matrix

| Solutions | Barriers | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EB1-1 | | | EB1-2 | | | … | … | … | EB4-5 | | | EB4-6 | | |
| S1 | 0.923 | 2.000 | 3.615 | 0.923 | 2.077 | 3.769 | … | … | … | 7.000 | 8.462 | 9.308 | 2.615 | 3.846 | 5.385 |
| S2 | 1.154 | 2.308 | 3.923 | 1.077 | 2.154 | 3.769 | … | … | … | 4.769 | 6.538 | 8.154 | 3.538 | 5.385 | 7.154 |
| S3 | 1.308 | 2.538 | 4.231 | 1.462 | 2.769 | 4.615 | … | … | … | 4.000 | 5.769 | 7.462 | 2.231 | 3.538 | 5.077 |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| S10 | 1.769 | 3.308 | 5.154 | 2.154 | 3.769 | 5.615 | … | … | … | 2.308 | 3.846 | 5.538 | 3.077 | 4.615 | 6.308 |
| S11 | 2.769 | 4.231 | 5.846 | 3.538 | 5.231 | 7.000 | … | … | … | 3.538 | 5.000 | 6.538 | 2.615 | 4.231 | 6.077 |
| S12 | 3.154 | 4.923 | 6.692 | 3.615 | 5.615 | 7.538 | … | … | … | 1.692 | 3.308 | 5.154 | 2.077 | 3.538 | 5.231 |

positive social climate (Hoogendoorn 2016). Developing widespread social entrepreneurship education has emerged as a strong solution proposal in the medium term.

The findings have interesting implications for policymakers, practitioners, and researchers. First, policymakers should implement specific legal frames and government politics. There is a definite need for clear definitions of social entrepreneurship and social benefit concepts. Moreover, designing support programs for social enterprises and creating funding programs tailored to the needs

**Table 13** The normalized fuzzy decision-making matrix

| Solutions | Barriers | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EB1-1 | | | EB1-2 | | | … | … | … | EB4-5 | | | EB4-6 | | |
| S1 | 0.136 | 0.295 | 0.534 | 0.122 | 0.276 | 0.500 | … | … | … | 0.752 | 0.909 | 1.000 | 0.362 | 0.532 | 0.745 |
| S2 | 0.170 | 0.341 | 0.580 | 0.143 | 0.286 | 0.500 | … | … | … | 0.512 | 0.702 | 0.876 | 0.489 | 0.745 | 0.989 |
| S3 | 0.193 | 0.375 | 0.625 | 0.194 | 0.367 | 0.612 | … | … | … | 0.430 | 0.620 | 0.802 | 0.309 | 0.489 | 0.702 |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| S10 | 0.261 | 0.489 | 0.761 | 0.286 | 0.500 | 0.745 | … | … | … | 0.248 | 0.413 | 0.595 | 0.426 | 0.638 | 0.872 |
| S11 | 0.409 | 0.625 | 0.864 | 0.469 | 0.694 | 0.929 | … | … | … | 0.380 | 0.537 | 0.702 | 0.362 | 0.585 | 0.840 |
| S12 | 0.466 | 0.727 | 0.989 | 0.480 | 0.745 | 1.000 | … | … | … | 0.182 | 0.355 | 0.554 | 0.287 | 0.489 | 0.723 |

**Table 14** The weighted normalized matrix for WSM

| Solutions | Barriers | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EB1-1 | | | EB1-2 | | | … | … | … | EB4-5 | | | EB4-6 | | |
| S1 | 0.007 | 0.017 | 0.030 | 0.006 | 0.015 | 0.028 | … | … | … | 0.022 | 0.028 | 0.034 | 0.010 | 0.016 | 0.025 |
| S2 | 0.009 | 0.019 | 0.032 | 0.007 | 0.016 | 0.028 | … | … | … | 0.015 | 0.022 | 0.030 | 0.013 | 0.022 | 0.033 |
| S3 | 0.010 | 0.021 | 0.035 | 0.010 | 0.021 | 0.034 | … | … | … | 0.012 | 0.019 | 0.027 | 0.008 | 0.015 | 0.023 |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| S10 | 0.014 | 0.027 | 0.043 | 0.015 | 0.028 | 0.042 | … | … | … | 0.007 | 0.013 | 0.020 | 0.011 | 0.019 | 0.029 |
| S11 | 0.021 | 0.035 | 0.048 | 0.024 | 0.039 | 0.052 | … | … | … | 0.011 | 0.017 | 0.024 | 0.010 | 0.018 | 0.028 |
| S12 | 0.024 | 0.041 | 0.055 | 0.025 | 0.042 | 0.056 | … | … | … | 0.005 | 0.011 | 0.019 | 0.008 | 0.015 | 0.024 |

**Table 15** The weighted normalized matrix for WPM

| Solutions | Barriers | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EB1-1 | | | EB1-2 | | | … | … | … | EB4-5 | | | EB4-6 | | |
| S1 | 0.894 | 0.934 | 0.968 | 0.889 | 0.930 | 0.965 | … | … | … | 0.990 | 0.997 | 1.000 | 0.967 | 0.981 | 0.992 |
| S2 | 0.906 | 0.942 | 0.972 | 0.897 | 0.932 | 0.965 | … | … | … | 0.978 | 0.989 | 0.996 | 0.977 | 0.991 | 1.000 |
| S3 | 0.912 | 0.947 | 0.976 | 0.912 | 0.945 | 0.975 | … | … | … | 0.972 | 0.985 | 0.994 | 0.962 | 0.979 | 0.990 |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| … | … | … | … | … | … | … | … | … | … | … | … | … | … | … | … |
| S10 | 0.928 | 0.961 | 0.986 | 0.932 | 0.962 | 0.985 | … | … | … | 0.954 | 0.973 | 0.985 | 0.972 | 0.987 | 0.996 |
| S11 | 0.951 | 0.974 | 0.992 | 0.959 | 0.980 | 0.996 | … | … | … | 0.968 | 0.981 | 0.990 | 0.967 | 0.984 | 0.995 |
| S12 | 0.958 | 0.982 | 0.999 | 0.960 | 0.984 | 1.000 | … | … | … | 0.944 | 0.968 | 0.983 | 0.960 | 0.979 | 0.991 |

**Table 16** Solutions to overcome barriers to social entrepreneurship and their ranking

| Code | Solution | $Q_i$ | $P_i$ | $K_i$ | Rank |
|---|---|---|---|---|---|
| S1 | Increasing the number of social impact investors | 0.461 | 0.393 | 0.426 | **12** |
| S2 | Establishing a legal framework and legislation for social ventures | 0.525 | 0.367 | 0.442 | **11** |
| S3 | Providing governmental support such as tax advantages and incentives | 0.517 | 0.450 | 0.482 | **10** |
| S4 | Developing widespread social entrepreneurship education | 0.610 | 0.570 | 0.589 | **3** |
| S5 | Providing credits, grants, loans, and funds to social entrepreneurs | 0.556 | 0.501 | 0.527 | **6** |
| S6 | Creating networking opportunities | 0.538 | 0.489 | 0.512 | **8** |
| S7 | Offering finance management training | 0.553 | 0.495 | 0.522 | **7** |
| S8 | Offering market research and stakeholder analysis training | 0.596 | 0.536 | 0.564 | **4** |
| S9 | Increasing the number of support organizations such as Ashoka | 0.631 | 0.597 | 0.613 | **2** |
| S10 | Organizing events to share best practices | 0.522 | 0.492 | 0.506 | **9** |
| S11 | Increasing the number of incubation centers and giving priority to social entrepreneurs | 0.676 | 0.640 | 0.657 | **1** |
| S12 | Raising awareness of potential constraints | 0.579 | 0.524 | 0.550 | **5** |

Significant results are shown in bold

**Table 17** Defuzzified barrier weights for different scenarios

| Barrier | SC0 | SC1 | SC2 | SC3 | SC4 | SC5 | SC6 | SC7 | SC8 | SC9 | SC10 | SC11 | SC12 | SC13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EB1-1 | 0.0563 | 0.0507 | 0.0563 | 0.0507 | 0.0451 | 0.0563 | 0.0451 | 0.0282 | 0.0845 | 0.0282 | – | 0.0563 | 0.0563 | 0.0563 |
| EB1-2 | 0.0562 | 0.0506 | 0.0562 | 0.0506 | 0.0450 | 0.0562 | 0.0450 | 0.0281 | 0.0843 | 0.0281 | – | 0.0562 | 0.0562 | 0.0562 |
| EB1-3 | 0.0475 | 0.0475 | 0.0475 | 0.0475 | 0.0475 | 0.0475 | 0.0475 | 0.0237 | 0.0712 | 0.0237 | – | 0.0475 | 0.0475 | 0.0475 |
| EB1-4 | 0.0474 | 0.0474 | 0.0474 | 0.0474 | 0.0474 | 0.0474 | 0.0474 | 0.0237 | 0.0711 | 0.0237 | – | 0.0474 | 0.0474 | 0.0474 |
| EB1-5 | 0.0456 | 0.0456 | 0.0456 | 0.0456 | 0.0456 | 0.0456 | 0.0456 | 0.0228 | 0.0684 | 0.0228 | – | 0.0456 | 0.0456 | 0.0456 |
| EB1-6 | 0.0328 | 0.0328 | 0.0328 | 0.0328 | 0.0328 | 0.0328 | 0.0328 | 0.0164 | 0.0492 | 0.0164 | – | 0.0328 | 0.0328 | 0.0328 |
| EB1-7 | 0.0460 | 0.0460 | 0.0460 | 0.0460 | 0.0460 | 0.0460 | 0.0460 | 0.0230 | 0.0690 | 0.0230 | – | 0.0460 | 0.0460 | 0.0460 |
| EB2-1 | 0.0411 | 0.0411 | 0.0411 | 0.0411 | 0.0411 | 0.0411 | 0.0411 | 0.0206 | 0.0617 | 0.0206 | 0.0411 | – | 0.0411 | 0.0411 |
| EB2-2 | 0.0492 | 0.0443 | 0.0492 | 0.0443 | 0.0394 | 0.0492 | 0.0394 | 0.0246 | 0.0739 | 0.0246 | 0.0492 | – | 0.0492 | 0.0492 |
| EB2-3 | 0.0607 | 0.0547 | 0.0607 | 0.0547 | 0.0486 | 0.0607 | 0.0486 | 0.0304 | 0.0911 | 0.0304 | 0.0607 | – | 0.0607 | 0.0607 |
| EB2-4 | 0.0418 | 0.0418 | 0.0418 | 0.0418 | 0.0418 | 0.0418 | 0.0418 | 0.0209 | 0.0627 | 0.0209 | 0.0418 | – | 0.0418 | 0.0418 |
| EB2-5 | 0.0516 | 0.0464 | 0.0516 | 0.0464 | 0.0413 | 0.0516 | 0.0413 | 0.0258 | 0.0774 | 0.0258 | 0.0516 | – | 0.0516 | 0.0516 |
| EB3-1 | 0.0352 | 0.0352 | 0.0352 | 0.0352 | 0.0352 | 0.0352 | 0.0352 | 0.0176 | 0.0529 | 0.0176 | 0.0352 | 0.0352 | – | 0.0352 |
| EB3-2 | 0.0271 | 0.0271 | 0.0298 | 0.0298 | 0.0271 | 0.0325 | 0.0325 | 0.0136 | 0.0407 | 0.0271 | 0.0271 | 0.0271 | – | 0.0271 |
| EB3-3 | 0.0427 | 0.0427 | 0.0427 | 0.0427 | 0.0427 | 0.0427 | 0.0427 | 0.0214 | 0.0641 | 0.0214 | 0.0427 | 0.0427 | – | 0.0427 |
| EB3-4 | 0.0443 | 0.0443 | 0.0443 | 0.0443 | 0.0443 | 0.0443 | 0.0443 | 0.0221 | 0.0664 | 0.0221 | 0.0443 | 0.0443 | – | 0.0443 |
| EB3-5 | 0.0302 | 0.0302 | 0.0302 | 0.0302 | 0.0302 | 0.0302 | 0.0302 | 0.0151 | 0.0454 | 0.0151 | 0.0302 | 0.0302 | – | 0.0302 |
| EB3-6 | 0.0230 | 0.0230 | 0.0253 | 0.0253 | 0.0230 | 0.0276 | 0.0276 | 0.0115 | 0.0344 | 0.0230 | 0.0230 | 0.0230 | – | 0.0230 |
| EB3-7 | 0.0202 | 0.0202 | 0.0222 | 0.0222 | 0.0202 | 0.0243 | 0.0243 | 0.0101 | 0.0303 | 0.0202 | 0.0202 | 0.0202 | – | 0.0202 |
| EB4-1 | 0.0413 | 0.0413 | 0.0413 | 0.0413 | 0.0413 | 0.0413 | 0.0413 | 0.0206 | 0.0619 | 0.0206 | 0.0413 | 0.0413 | 0.0413 | – |
| EB4-2 | 0.0384 | 0.0384 | 0.0384 | 0.0384 | 0.0384 | 0.0384 | 0.0384 | 0.0192 | 0.0576 | 0.0192 | 0.0384 | 0.0384 | 0.0384 | – |
| EB4-3 | 0.0345 | 0.0345 | 0.0345 | 0.0345 | 0.0345 | 0.0345 | 0.0345 | 0.0173 | 0.0518 | 0.0173 | 0.0345 | 0.0345 | 0.0345 | – |
| EB4-4 | 0.0300 | 0.0300 | 0.0330 | 0.0330 | 0.0300 | 0.0360 | 0.0360 | 0.0150 | 0.0450 | 0.0300 | 0.0300 | 0.0300 | 0.0300 | – |
| EB4-5 | 0.0311 | 0.0311 | 0.0311 | 0.0311 | 0.0311 | 0.0311 | 0.0311 | 0.0156 | 0.0467 | 0.0156 | 0.0311 | 0.0311 | 0.0311 | – |
| EB4-6 | 0.0302 | 0.0302 | 0.0333 | 0.0333 | 0.0302 | 0.0363 | 0.0363 | 0.0151 | 0.0453 | 0.0302 | 0.0302 | 0.0302 | 0.0302 | – |

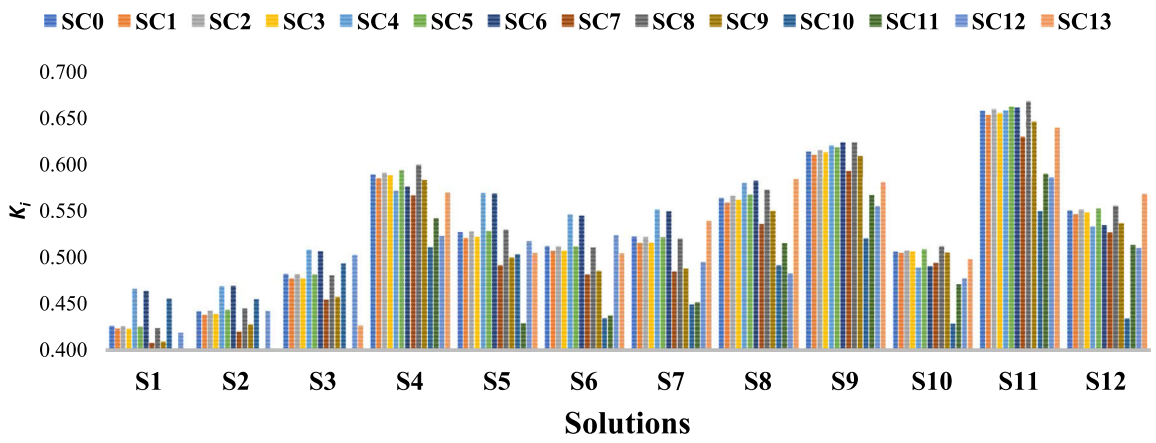



**Fig. 3** Sensitivity analysis of solutions through thirteen scenarios

**Table 18** Comparison of F-WASPAS with other F-MCDM methods

| Solutions | F-WASPAS | | F-EDAS | | F-MARCOS | | F-MABAC | | F-CoCoSo | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Ki* | Rank | $as_i$ | Rank | *Ki* | Rank | *Si* | Rank | $F_i$ | Rank |
| S1 | 0.426 | **12** | 0.130 | **12** | 0.362 | **12** | − 0.099 | **12** | 2.156 | **12** |
| S2 | 0.442 | **11** | 0.403 | **9** | 0.403 | **10** | − 0.027 | **9** | 2.372 | **9** |
| S3 | 0.482 | **10** | 0.375 | **11** | 0.402 | **11** | − 0.035 | **10** | 2.371 | **10** |
| S4 | 0.589 | **3** | 0.727 | **3** | 0.628 | **4** | 0.062 | **3** | 2.661 | **3** |
| S5 | 0.527 | **6** | 0.439 | **7** | 0.477 | **9** | 0.009 | **6** | 2.503 | **5** |
| S6 | 0.512 | **8** | 0.414 | **8** | 0.498 | **7** | − 0.017 | **8** | 2.420 | **8** |
| S7 | 0.522 | **7** | 0.487 | **6** | 0.572 | **6** | 0.001 | **7** | 2.435 | **7** |
| S8 | 0.564 | **4** | 0.656 | **4** | 0.639 | **3** | 0.046 | **4** | 2.595 | **4** |
| S9 | 0.613 | **2** | 0.807 | **2** | 0.641 | **2** | 0.086 | **2** | 2.725 | **2** |
| S10 | 0.506 | **9** | 0.390 | **10** | 0.491 | **8** | − 0.042 | **11** | 2.356 | **11** |
| S11 | 0.657 | **1** | 0.962 | **1** | 0.739 | **1** | 0.141 | **1** | 2.865 | **1** |
| S12 | 0.550 | **5** | 0.618 | **5** | 0.623 | **5** | 0.022 | **5** | 2.473 | **6** |

Significant results are shown in bold

of nascent social entrepreneurs are required. Government support, which is constantly encountered in entrepreneurship research (Kantis et al. 2020; Al Mamun et al. 2021), appears as a point that should be emphasized in overcoming social entrepreneurship barriers in this study. Second, since literature and popular media mainly focus on the success stories of social entrepreneurs, it is essential to present a realistic picture of the social entrepreneurial process. Nascent entrepreneurs need to be informed and prepared with the idea that barriers are also part of the game. This study demonstrates that nascent social entrepreneurs may encounter numerous barriers during the venture creation process. Including these barriers in the social entrepreneurial education system and advising nascent social entrepreneurs about potential obstacles may help reduce the number of entrepreneurs abandoning their ideas. The identified barriers and solutions may serve as a reference for organizations advising and supporting nascent social entrepreneurs.

Finally, several limitations need to be considered. First, the main limitation may be that the expert opinions might not be clearly obtained for the problems that are intended to be solved by multi-criteria decision-making methods. Although this problem was tried to be overcome by using fuzzy logic for all methods in this study, more comprehensive results can be obtained by reaching more participants. Second, this study is conducted in Turkey, where the social entrepreneurial ecosystem is in its early stage; the findings of this study may not be applicable to different contexts since, as Bewayo and Portes (2016) stated, "economic and political institutions determine the nature of social entrepreneurship in any country". However, future studies can use these barriers to compare the experiences of social entrepreneurs from different contexts and fields. In addition, the results obtained by using different

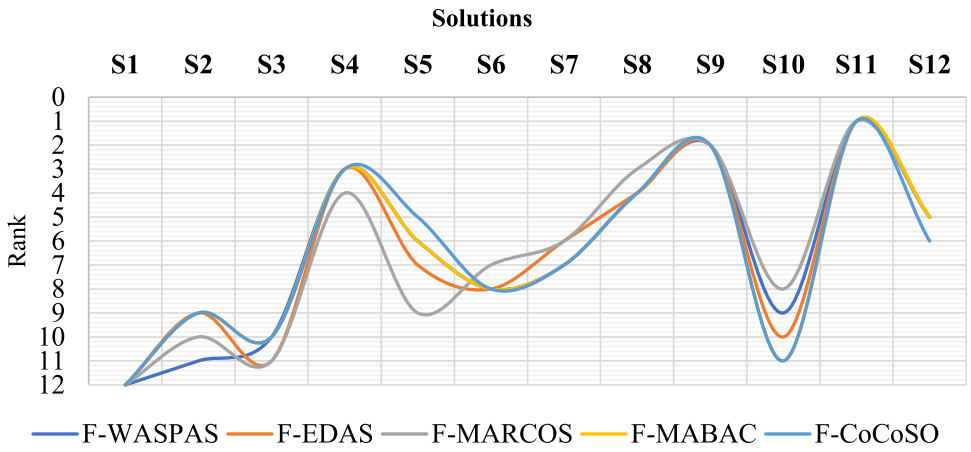



**Fig. 4** Solutions ranking results of different F-MCDM methods

decision-making methods can be compared, and the scope can be expanded by increasing the number of barriers and solution proposals considered.

## Appendix 1

Questionnaire form for expert panel to arrange the barrier in accordance with most important to least important and then assign the importance weight (An assessment of the second set of essential barriers by one of the experts is presented as an example).

See Table 19.

## Appendix 2

Questionnaire to evaluate the impact of each solution on the barriers.

See Table 20.

**Table 19** Ranking of barriers by importance and evaluation of relative significance

| | Barriers | | | | |
|---|---|---|---|---|---|
| | EB2-1 | EB2-2 | EB2-3 | EB2-4 | EB2-5 |
| *First step* | Difficulties in motivating team members | Difficulties in attracting qualified team members | Lack of financial resources | Lack of physical resources | Insufficient revenue potential |
| How important is the role of the following five barriers in "the inability of social enterprises to reach a concrete structure from the idea stage"? | | | | | |
| You can use the options in the cells to specify the order of importance | 5 | 3 | 1 | 4 | 2 |
| (**1**- Most important, **5**- Least important) | | | | | |
| *Second step* | Lack of financial resources | Insufficient revenue potential | Difficulties in attracting qualified team members | Lack of physical resources | Difficulties in motivating team members |
| In the list on the right, according to the order of importance you specified, a "new order" was created automatically | | | | | |
| Compare each barrier with the barrier to its left. You can use the fuzzy comparison scale below | You chose it as the most important barrier. You do not need to evaluate | MP | LI | LI | EI |
| EI-Equal importance | | | | | |
| WI-Weak importance | | | | | |
| MI-Moderate importance | | | | | |
| MP-Moderate plus importance | | | | | |
| LI-Essential importance | | | | | |
| DI-Demonstrated importance | | | | | |
| SI-Strong importance | | | | | |
| AI-Absolute importance | | | | | |
| EXI-Extreme importance | | | | | |

**Table 20** Evaluating the effectiveness of solutions to overcome social entrepreneurship barriers

Indicate your response on a fuzzy scale to rate the impact of particular solutions in mitigating the social entrepreneurship barriers.

To what extent can the "solution" written at the top overcome the "barrier" in the list? Please circle the appropriate expression.
(*VL* – Very Low, *L* – Low, *ML* – Medium Low, *F* – Fair, *MG* – Medium Good, *G* – Good, *VG* – Very Good)

| Barrier | Solution | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 |
| | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL |
| | L | L | L | L | L | L | L | L | L | L | L | L |
| | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML |
| EB1-1 | F | F | F | F | F | F | F | F | F | F | F | F |
| | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG |
| | G | G | G | G | G | G | G | G | G | G | G | G |
| | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG |
| | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL |
| | L | L | L | L | L | L | L | L | L | L | L | L |
| | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML |
| EB1-2 | F | F | F | F | F | F | F | F | F | F | F | F |
| | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG |
| | G | G | G | G | G | G | G | G | G | G | G | G |
| | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG |
| | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL |
| | L | L | L | L | L | L | L | L | L | L | L | L |
| | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML |
| EB1-3 | F | F | F | F | F | F | F | F | F | F | F | F |
| | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG |
| | G | G | G | G | G | G | G | G | G | G | G | G |
| | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG |
| - | - | - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - | - | - |
| | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL |
| | L | L | L | L | L | L | L | L | L | L | L | L |
| | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML |
| EB4-4 | F | F | F | F | F | F | F | F | F | F | F | F |
| | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG |
| | G | G | G | G | G | G | G | G | G | G | G | G |
| | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG |
| | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL |
| | L | L | L | L | L | L | L | L | L | L | L | L |
| | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML |
| EB4-5 | F | F | F | F | F | F | F | F | F | F | F | F |
| | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG |
| | G | G | G | G | G | G | G | G | G | G | G | G |
| | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG |
| | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL |
| | L | L | L | L | L | L | L | L | L | L | L | L |
| | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML | ML |
| EB4-6 | F | F | F | F | F | F | F | F | F | F | F | F |
| | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG | MG |
| | G | G | G | G | G | G | G | G | G | G | G | G |
| | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG | VG |

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## Declarations

**Conflict of interest** The authors declare that there are no relevant financial or non-financial competing interests to report.

**Ethical approval** All procedures performed in this study involving human participants were conducted in strict accordance with the ethical standards of our institutional and/or national research committee. This study also adheres to the principles outlined in the 1964 Helsinki Declaration and its subsequent amendments, or equivalent ethical standards. All participants were provided with comprehensive information about the purpose of the research, the procedures involved, and their rights, including the right to withdraw at any point without any repercussions. Measures were taken to ensure the confidentiality and anonymity of the participants' data.

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