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Analysing social innovation decisions under risky circumstances

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Abstract.

Social innovation formulates a constant demand to improve people's well-being, which is also part of the framework for social progress. Accordingly, achieving the intentions of social innovation contributes to leaps in social progress. The aims of this paper to highlight the significant connection between social innovation and social learning by the characterisation of social innovation process, and to present a decision-making method for evaluating social innovation actions in order to serve the best interests of the participants. A well-chosen and implemented social innovation action can have numerous positive impact such as improving the quality of life, mentoring/helping disadvantaged people or building stronger community relationship. The main objective is to help decision-making regarding to social innovation in micro and meso level, as a result of which the best action can be selected for the participants.

Keywords: Social innovation, process-oriented approach, decision-support, AHP

1. Introduction

Nowadays social innovation phenomena are found in every aspect of life (e.g. new educational forms, movements, crowdfunding). Uncountable social innovations have appeared in the last decades. These changes have occurred due to individuals, organizations, foundations and movements in a wider area.

There are many definitions to describe social innovation, because so far there is no final version of it. The internationally accepted concept contains the following elements (Reeder et al., 2012):
- new organizational environment,
- new idea,
- new arrangements,
- new scope of activities,
- new relationships and interactions,
- which give satisfaction to a social need.

Social innovation differs from the traditional approach to innovation. It does not satisfy realized needs with the focus on the market; here, the primary focus is on people (Secco et al., 2016). With the help of social innovation processes, products, services, new approaches can be created in the wider area of different organizations, for example in a co-op, joint business, a for-profit or non-profit corporation. These

organizations can be profitable and effective for the whole society, if the created values mean something important for the target group, which is the society and the community (Marshall & Dolley, 2019).

Arising the social innovation in these fields to be supported by causation with different decision support methods. To determine the applicability framework, it is necessary to investigate the decision support techniques in various levels of complexity and to determine the possible decision points, which supports to draw the inference the applicability of decision support methods in the social innovation process.

2. Literature review

Increasing the well-being was phrased as a key attribute of social progress by the OECD (Pomázi, 2010). This points to the fact that analysing social innovation solutions and best practices will be central question of social development.

The social progress includes the interaction of social and ecological systems, maintaining and ensuring the functioning are equally important. Social innovation fosters the improvement of social system by increasing the individual and social well-being that can be influenced by governmental interventions, economic functions and conditions of culture, besides the society is able to help maintain the appropriate ecosystem (Figure 1.).

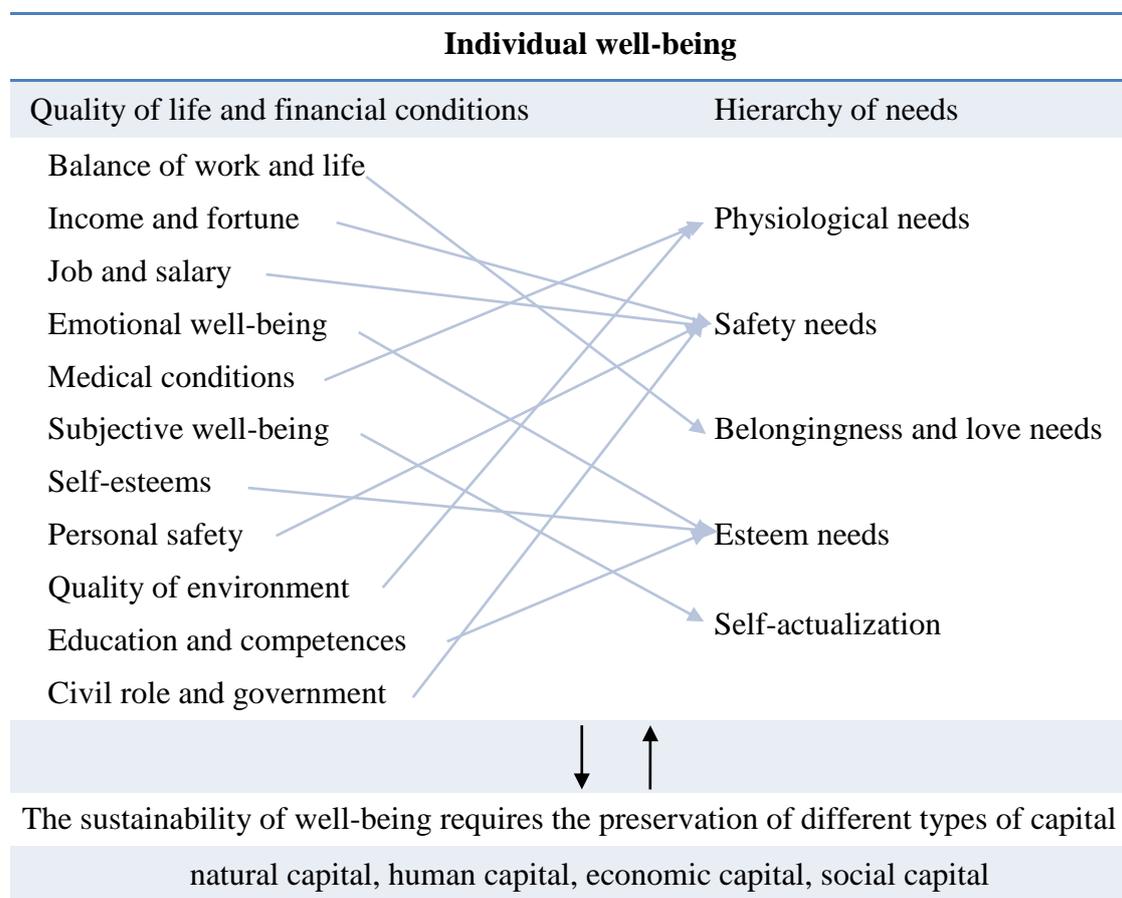*Figure 1: Framework of social progress*
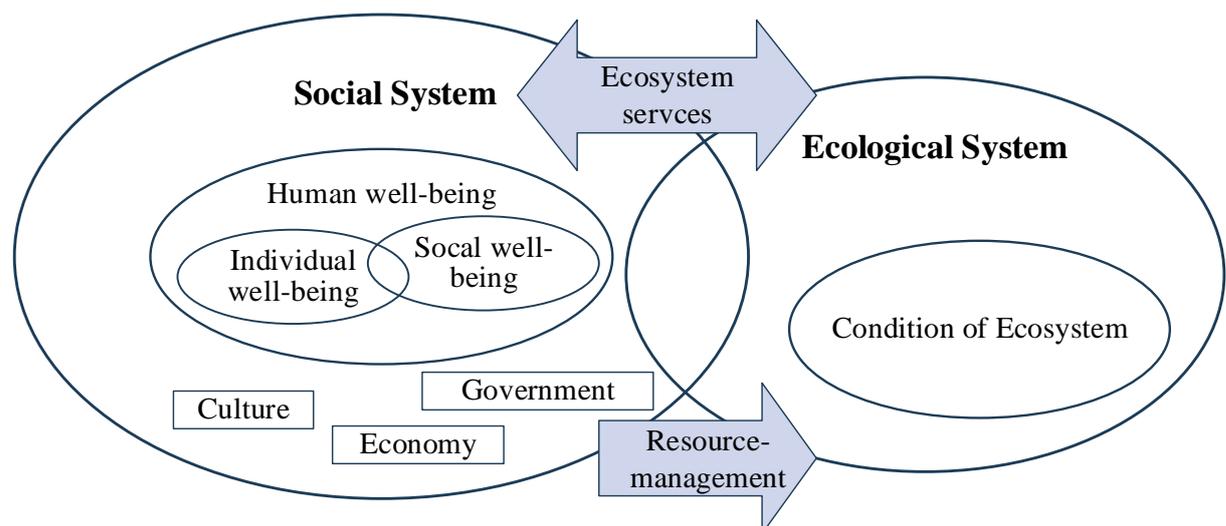
Source: Own edition based on Pomázi, 2010.

The individual and social well-being are in significant relation, determining attributes for each other. Primary conditions of social and community well-being are the supportive established networks, trust and bonding.

The main indexes to determining individual well-being are the level of quality of life and available financial opportunities. Social innovation is able to make guidelines to improve the values for both indexes. The role of social innovation is also important in economic growth by reason of its transboundary effects and self-exciter feature. Not just the social and human capital, but economic ad natural capital can be heightened by its adaptation (Figure 2.).

Figure 2: Characteristics of individual well-being

Individual well-being

Quality of life and financial conditions	Hierarchy of needs

Balance of work and life
Income and fortune
Job and salary
Emotional well-being
Medical conditions
Subjective well-being
Self-esteems
Personal safety
Quality of environment
Education and competences
Civil role and government

Physiological needs

Safety needs

Belongingness and love needs

Esteem needs

Self-actualization

The sustainability of well-being requires the preservation of different types of capital

natural capital, human capital, economic capital, social capital

Source: Own edition based on Kőműves (2018) and Kocziszky et al. (2017)

The process of social innovation is connected to the process of social learning with the context of social change. In both processes there are different learning phases where new knowledge and networks will be essential for the long-term sustainability of the implemented action. Since social learning is in evidence from the initial phase of the social innovation, it is necessary to integrate its elements into the process of social innovation.

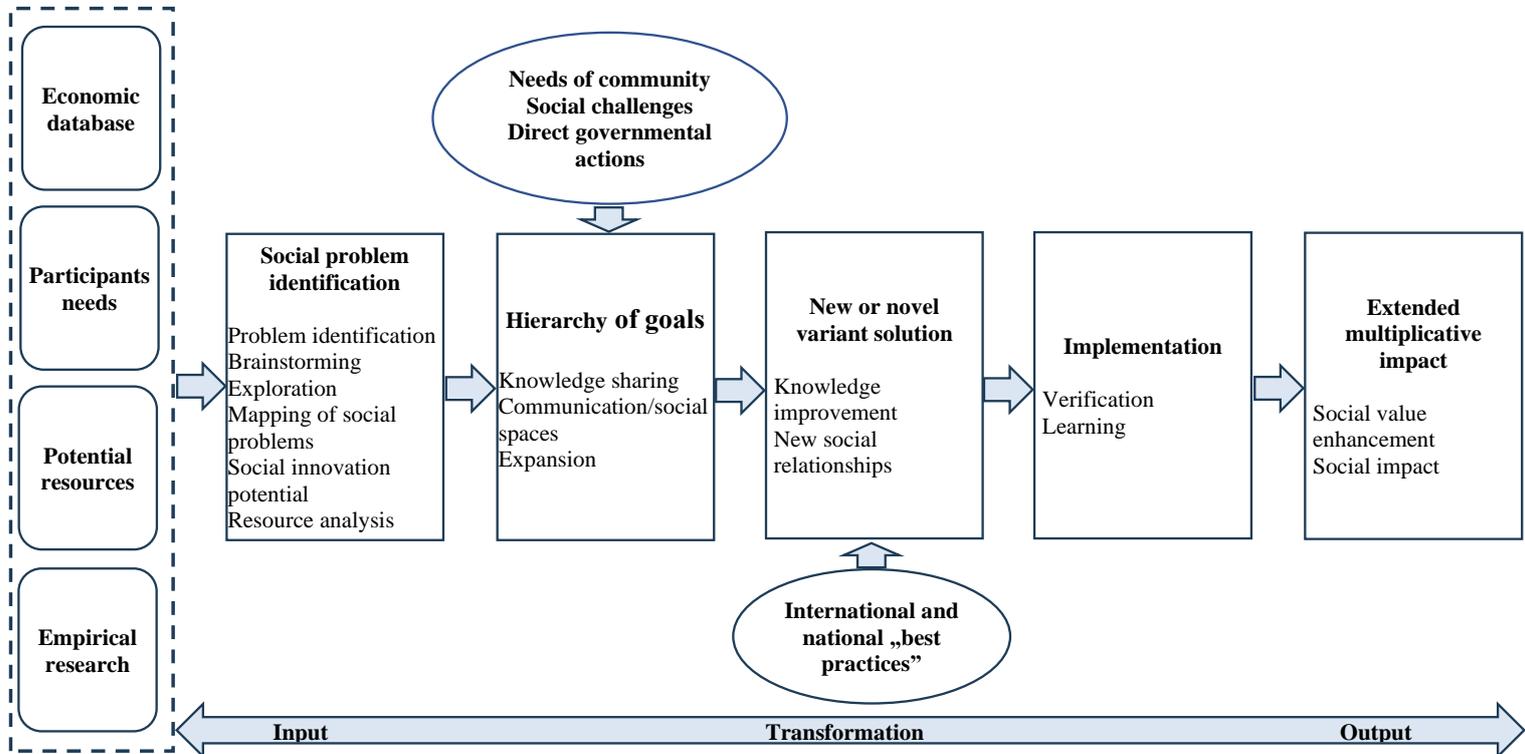The whole process can be described with the input-transformation-output model (Figure 3.).

Figure 3.: Social innovation process with the focus on social learning
Source: Own edition based on Veresné Somosi & Balaton (2020)

Each stage of the process is described in more detail:

Input phase:

- The identification of the social problem can be done by individuals, groups, campaigns, political movements, religious movements, volunteers, attitudes, demographic changes. Personal motivation is also a critical factor, when somebody is concerned in the problem and he/she would like to deal with it.
- Ideas can come from various sources: theories, crises, experiences, specifications, new knowledge from the social spaces.

Transformation phase:

- The evaluation of ideas is based on feasibility and available resources. Analysis of the present and required conditions is essential.
- Ideally, before implementation the chosen idea needs to be tested or prototyped. The test phase might happen in a small sample, community, process, etc.
- With all the necessary resources in place, and if testing is successful, the implementation is begun in cooperation with the partners involved in the process. New knowledge is created, which helps to maintain and circulate the process of innovation.

Output, social impact phase:

- Sustainable practice requires the commitment of the target group; for value enhancement of the implemented social innovation idea, it is necessary for it to take root in the common knowledge.

Measurable indicators need to be specified for rating the phases of social innovation. in this way the special results can be ranked, and it can be decided which approach could be useful to take. Measurable improvement can be factors such as quality, satisfaction, acceptance, understanding, cost reduction and other characteristics.

According to Kaderabkova and Saman (2013), the main dimensions for evaluating social innovation are:

- new value of innovation,
- taking part in the process of social innovation,
- creativity or techniques to develop the new concepts,
- learning mechanism and rating,
- the mechanism of collecting information and knowledge sharing,
- types of co-operation,
- source(s) of finance.

Based on these dimensions, indicators of the social innovation are collected and characterised with potential success and failure factors in Table 1.

Table 1: Social innovation indicators and its potential factors

Social Innovation Indicator	Success Factors	Failure Factors
Previous activities	Successful social activities, former best practice	No former activities
Stakeholders	Acceptance, support, relationships, reinvestment, social responsiveness, participation	Lack of support, quickening, conflicts
Social contribution	Employment, increasing the quality of life, self-help, mentoring, financial stability, transparency	Lack of interest among target group, lack of confidence, underemployment
Local abilities	Participation, supportive atmosphere, infrastructure, active local government, collaboration, local organizations, positive perception, social responsiveness	Conflicts, lack of local government support, difficulties with transportation
Financial aspect	Reinvestment, alternative financial opportunity, crowdfunding, self-financing, voluntary-financing,	Underfunding, lack of grants to apply for, incapability of self-preservation, over-assessment, lack of financial feasibility

Social Innovation Indicator	Success Factors	Failure Factors
	contingency fund	
Legal	Support system, regulatory environment, legal knowledge	Barriers, lack of demandable support
Communication	Active communication, knowledge sharing, externalisation, internalisation, involvement	Infrequent, missing communication, top-down approach without bottom-up
Education	Mentoring, self-learning, training	Lack of learning process
Applied techniques	IT, sustainable technology, low consumption, design thinking	Timing, obsolete technology, lack of optimization, adaptation without testing
Expectations	Supportive approach, reasonable expectations	High expectations without support
Novelty	Competitiveness, successful implementation in another place with similar attributes	Imitation without similar conditions
Networks	Collaboration, voluntariness, supply chain, regular customers with occasional buyers	Competitors
Focus of the social innovation can be:	− disadvantages − holiday − unemployment − health − migration − poverty − ethnics − homelessness − education − indebtedness − art − family − culture − youth chances	− psychosocial damages − local development − regional development − violence − addictions − criminals − justice

Source: Own edition based on Dainiené and Dagiliené (2015), Dziallas and Blind (2019), Smith et al. (2016) and Tohidi and Jabbari (2012)

3. Methodology

The techniques can be used during the social innovation process are limited by reason of variety of social innovation problems and range of available data. Different approaches are needed in each phase of the process for exploiting the social knowledge and supporting individual decision-making. The basis of choosing the appropriate method is provided by the complexity of problem, range of participants and other influencing factors.

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The process can be promoted, and its impact can be measured with properly chosen method. Both qualitative and quantitative information are required for social innovation related decisions, making a constant priority order among influencing factors is beyond possibility, for this reason procedure is needed to manage priorities involving non-numerical correlation in the evaluation.

The application steps of Analytic Hierarchy Process (AHP) as a potential decision support method are presented in the case study. The methodology and framework of AHP are described by Saaty (1987). Choosing the method is explained by the fact that it can be applied in case of both well- and ill-structured problems (Forman, 1993), and for estimating the actual abilities of the place where the social innovation will be implemented.

The aim of the adaptation is to choose the orientation of a social innovation solution which can be applied with the available level of social innovation indicators. It can be applied in the transformation phase of the process. The decision maker - who provides the information needed to select the orientation - is a group or individual who initiate the innovation. In addition, the available resources and experiences from former practices with similar characteristics play an important part to define the criteria (C_1-C_3) which exert influence on the objective. The criteria can be broken down to sub-criteria at second (C_{11}-C_{34}) and possibly other bottom levels because of the deeper structure. The structure of the decision tree is shown in Figure 4.

Figure 4: Decision hierarchy
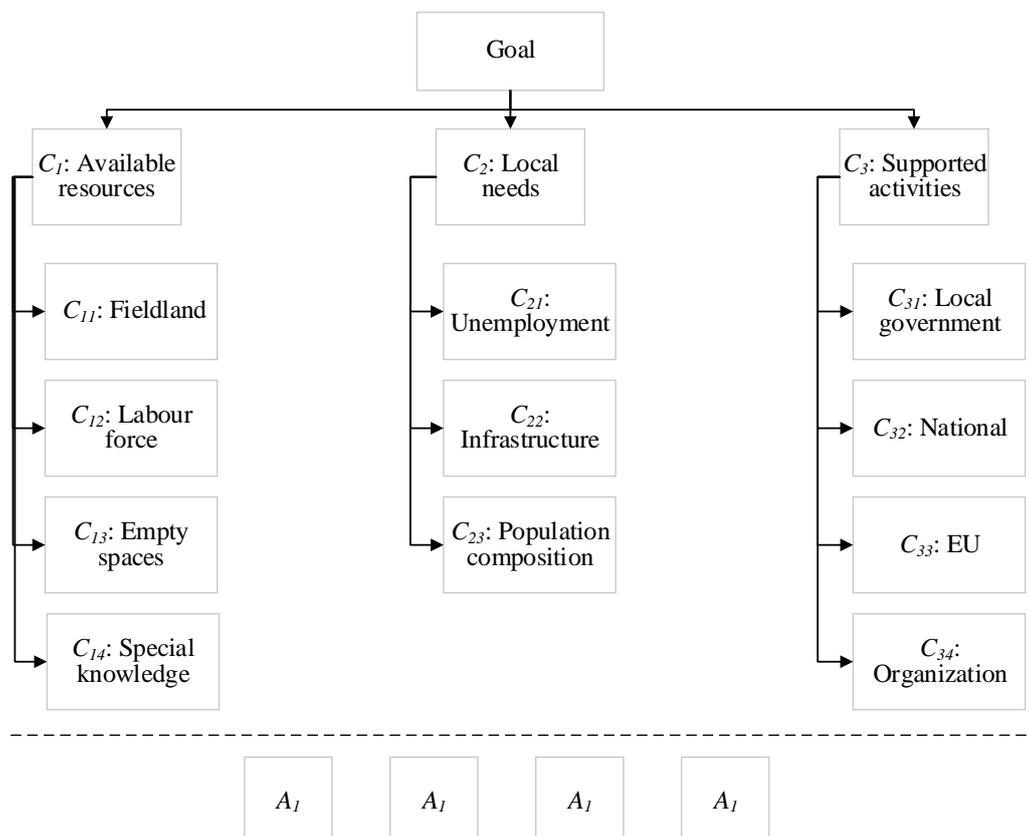
Source: Own edition

The pairwise comparison have to be done by the decision maker, where the criteria are compared with the scale defined by Saaty (1987). The matrices are constructed by the right of pairwise comparison, and the weight vectors (**w**) of the alternatives (A_1-A_4) are calculated from them.

In this illustrative case, the pairwise comparisons were done in individual structured interview. The participant had to indicate the preferred factor from pairs and determine the importance with a number from scale, where the minimum (1) means equally important and maximum (9) means the most important factor. The result matrix shows the relative preference of each factor based on Eq. 1.

$$a_{ij} = \frac{w_i}{w_j} \qquad (1)$$

where a_{ij} is the *j.* element of matrix in line *i.* The expression is equal to the quotient of two values from pairwise comparison, consequently it shows that factor *i.* importance against factor *j.* The matrix is ensued on directly the pairwise comparisons as Eq. 2.

$$\mathbf{A} = \begin{bmatrix} 1 & \cdots & a_{ij} \\ \vdots & 1 & \vdots \\ \frac{1}{a_{ij}} & \cdots & 1 \end{bmatrix} \qquad (2)$$

The relative importance of factors is represented by the elements of the matrix. Determining the consistency ratio (CR) are required to measure consistency. If the value of CR converges to zero, the consistency is presumable (Eq. 3.)

$$CR = \frac{CI}{RI} \qquad (3)$$

where the consistency ratio is equal to the quotient of the consistency index (CI) and the empirical average of consistency index (RI). Its value is considered satisfactory if it is not greater than 0.1. The value 0.1 is an empirical limit and it can be varied depending on the decision situation. Based on the result of pairwise comparisons were done by participants, the values of normalized matrices can be determined, and its weight vectors can be calculated. The elements of weight vectors can be calculated with Eq. 4.

$$\mathbf{w} = \frac{\sum_{i=1}^{n} a_{n_i}}{\sum_{i,j=1}^{n} a_{n_{ij}}} \qquad (4)$$

where the elements of **w** weight vector are defined as the quotient of aggregated sum of rows of the normalized matrix and sum of the elements in the whole matrix.

4. Results

Based on the weight vectors and the aggregated values of bottom criteria, the aggregated sums of weights (S(A_i)) can be calculated. The calculated results are shown in Table 2.

Table 2: Assessment of alternatives

A_i	C_{11} 0.04	C_{12} 0.08	C_{13} 0.06	C_{14} 0.02	C_{21} 0.18	C_{22} 0.09	C_{23} 0.03	C_{31} 0.125	C_{32} 0.225	C_{33} 0.125	C_{34} 0.025	S(A_i)
A_1	0.340	0.110	0.025	0.170	0.120	0.430	0.100	0.750	0.400	0.050	0.080	0,2841
A_2	0.510	0.340	0.250	0.500	0.190	0.080	0.430	0.055	0.200	0.650	0.340	0,2673
A_3	0.030	0.450	0.105	0,130	0.450	0.150	0.210	0.015	0.050	0.040	0.190	0,1698
A_4	0.120	0.100	0.620	0.200	0.240	0.340	0.260	0.180	0.350	0.260	0.390	0,2788

Source: Own edition

Based on the calculation of AHP method, the preference order of the alternatives as: $A_1 \succ A_4 \succ A_2 \succ A_3$. The first alternative can be considered the most useful in the described case. Alternatives can be founding social cooperative, public school/spaces, mentoring system or local products with the characteristics of the area This is a source of income to people who work on it if the sales opportunities are initiated. Producing local products require local particularity or raw material which can be adapted, and the collective work helps strengthening the community cohesion. The third alternative is the worst in the analysed case, its relative performance is 59% of the first one.

Choosing the appropriate method helps to understand the nature and necessity of participants and process of social innovation. Different phases of the process require different tools and techniques to support the implementation. Success factors are required to consider during the whole process, it is essential to attain the expected result. In this study data were provided for the comparison criteria connected to social innovation. The comparisons were performed with the method of pairwise comparison, which gives easier structure and more manageable for the participants. After the comparisons are done, weight vectors can be calculated to show the importance of the criteria, which gives the basis of the ranking. This information shows the priority and thinking of participants. Social innovation requires cooperation during the process, lack of supporting attitude can lead to wrong way the essence of it.

5. Conclusion

Linking social innovation to social learning is essential for the proper understanding of how the entire process works. Social innovation formulates a constant demand to improve people's well-being, which is also part of the framework

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for social progress. Accordingly, achieving the intentions of social innovation contributes to leaps in social progress.

Using different tools and decision support techniques at each phase of social innovation process is needed to explore and choose the right possibility. Exploring available resources and future opportunities is essential for proper evaluation. Flexibly developed decision support system is needed to support each step of the process. Involving the participants is essential for using common knowledge during the process, its formation have to respect for their concept about increasing the quality of life. Knowing the influencing factors of social innovation helps to identify the critical points of the process and planning the right actions for manage them. In early phases using elementary tools are proposed for the survey, such as SWOT, and cause and effect analysis. With the progress of the process, the complexity of applied methods can be risen. Selecting the new social innovation implementation is the most critical part of the process, and adequate decision-making and applied methods are needed for the right choice. An adaptable framework construction is essential to choose a suitable and sufficiently complex decision-making method.

A case study was described the application of AHP, a decision support method which can be applied during the input and transformation phase. This method is useful when the decision maker is capable of weighting consistently the criteria, the adequate knowledge is essential. It should be noted that AHP method can be applied without biases, if interaction cannot be suspected. If supposedly it is, other method, such as Analytic Network Process – ANP, or the reorganization of the criteria is required (Molnar and Horvath, 2017).

Prioritizing the success factors related to social innovation by participants point of view was adequately assisted by using ranking method based on pairwise comparisons. However, there are limitations and preconditions should be known for proper use:

- The sample is not representative.
- The independence conditions were not analysed.
- The real world is often inconsistent.
- Lack of information has large-scale impact of the final rank.
- The absence of mind or lack of experience of participants provide misleading results.
- Reluctance of using the method because of the time it takes and its strong mathematical background.

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