A Fuzzy Comprehensive Evaluation Model for Grid Management Performance of Urban Community Party Building in China ——Take Z Community as an Example

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Abstract: With the rapid development and profound changes of China society, traditional social management is encountering with serious challenges. It has become a trend to innovate the ideas and mode of management. Grid mode produced in the practice of grass-roots management is applied to community Party building. In this paper, a corresponding evaluation index system is constructed by combining literature research, social survey and mathematical models for the first time, which is verified by taking Z community as an example. The results show that the model is feasible and scientific. Finally, in view of the shortcomings, the paper proposes to strengthen the construction of organization team, standardize the operation of model, and perfect the construction of infrastructure and supporting mechanism system, expand the supply of public service.

1. Introduction

Just as proposed by President Xi in the 19th National Congress of the Communist Party of China: It is of vital importance to strengthen the basic Party building and promote the innovation of setting up organizations and carrying out their activities[1]. Under the background of the supply-side structural reform, how to improve the supply quality, expand the effective supply to meet the needs of the masses of people and consolidate the ruling foundation are newly major challenges to the current Party building.

The grid management mode comes into being in time. Chen He argues that grid model is a new method of urban management. Based on the multimedia platform, the Plural-subject are able to communicate with each other immediately by using the modern information network technology, which is conducive to improve the management efficiency [2]. Consequently, the management model is introduced into the Party organization to construct a regional cross-linked network and working mechanism in community [3]. Some scholars proposed to improve the relevant mechanism, integrate the community resources and build a new pattern of service by analyzing the cases of Party building with grid management mode in different regions [4,5,6,7,8]. However, there was no research on the management performance of the mode.

Therefore, the purpose of this paper is to provide a reference for the study of this research field. In the following, the research methods will be explained. The next part is the empirical research of Z community. Finally, the conclusions are drawn.

2. Methodologies and Process

Fuzzy Comprehensive Evaluation Model (FCEM) can transform the qualitative evaluation into the quantitative evaluation by using fuzzy mathematics, which mainly used to make a general evaluation of things or objects restricted by many factors [9,10,11]. Referring to the research results in theory and the concrete evaluation index system used in the practice, the whole evaluation

framework is formed. The analytic hierarchy process (AHP) and fuzzy comprehensive evaluation method are used to analyze the sample data, and finally the evaluation results are obtained. The specific research methodologies and process are shown in figure 1.

Fig. 1. The research methodologies and process

3. Constitution and weight of Evaluation Index system

Table 1. The constitution and weight of performance evaluation index system

First grade indexes (W1)	Second grade indexes (W2)	Total hierarchical arrangement (W1*W2)
U ₁ : Subject construction (0.2106)	U ₁₁ : The coverage of grid (0.0595)	0.01254
	U ₁₂ : The leading ability of political thought (0.3043)	0.06573
	U ₁₃ : The role of fighting bastions (0.1810)	0.03811
	U ₁₄ : The perfection degree of institutional mechanism (0.1286)	0.02708
	U ₁₅ : The work of building a clean and honest party (0.1986)	0.04182
	U ₁₆ : The innovation ability of Party building practice (0.1280)	0.02700

Continued from previous Table

U ₂ : Management service (0.2409)	U ₂₁ : The openness and transparency of Information (0.0559)	0.01347
	U ₂₂ : The standardization of grid management (0.7247)	0.17459
	U ₂₃ : The efficiency in responding to questions (0.0954)	0.02298
	U ₂₄ : The implementation rate of service commitment (0.1462)	0.03523
	U ₂₅ : The number of activities (0.1358)	0.03273
	U ₂₆ : The innovation and pertinence of services (0.1569)	0.03780
	U ₂₇ : The participation of the masses (0.3373)	0.08125
U ₃ : Actual effectiveness (0.4515)	U ₃₁ : The number of reports from social media (0.0598)	0.02698
	U ₃₂ : The effectiveness of solving practical problems (0.0805)	0.03635
	U ₃₃ : The overall satisfaction of the masses (0.5113)	0.23087
	U ₃₄ : The effect of improving the life quality (0.2232)	0.10078
	U ₃₅ : The effect of improving the living environment (0.1252)	0.05655

Consistency ratio of judgment matrix: CR=0.0383 (Because the CR value is less than 0.10, the judgment matrix has a satisfactory consistency).

4. Application of FCEM

4.1 data collection

In order to verify the applicability of the model established in this paper, based on the practice in a community of China, 106 valid questionnaires were collected anonymously in 2017. In the questionnaire, five evaluation grades are set up for each index, which are high, relatively high, general, relatively low and low.

4.2 Data analysis

4.2.1 Establishing the single factor fuzzy evaluation matrix

$$R_1 = \begin{bmatrix} 0.47 & 0.42 & 0.10 & 0.00 & 0.00 \\ 0.28 & 0.58 & 0.14 & 0.00 & 0.00 \\ 0.25 & 0.62 & 0.13 & 0.00 & 0.00 \\ 0.36 & 0.57 & 0.08 & 0.00 & 0.00 \\ 0.54 & 0.40 & 0.07 & 0.00 & 0.00 \\ 0.22 & 0.64 & 0.11 & 0.03 & 0.00 \end{bmatrix}; R_2 = \begin{bmatrix} 0.14 & 0.74 & 0.11 & 0.01 & 0.00 \\ 0.25 & 0.63 & 0.06 & 0.07 & 0.00 \\ 0.19 & 0.72 & 0.08 & 0.01 & 0.00 \\ 0.29 & 0.61 & 0.08 & 0.00 & 0.00 \\ 0.14 & 0.73 & 0.12 & 0.01 & 0.00 \\ 0.15 & 0.72 & 0.10 & 0.03 & 0.00 \\ 0.21 & 0.66 & 0.11 & 0.02 & 0.00 \end{bmatrix}; R_3 = \begin{bmatrix} 0.17 & 0.68 & 0.06 & 0.09 & 0.00 \\ 0.36 & 0.51 & 0.13 & 0.00 & 0.00 \\ 0.57 & 0.30 & 0.09 & 0.04 & 0.00 \\ 0.08 & 0.78 & 0.11 & 0.03 & 0.00 \\ 0.43 & 0.04 & 0.10 & 0.00 & 0.00 \end{bmatrix}$$

4.2.2 Determining the vector set of fuzzy subset

(1) Fuzzy comprehensive evaluation of secondary index

$$B_1 = W_1 \cdot R_1 = [0.339257133 \quad 0.546666821 \quad 0.110452973 \quad 0.003623071 \quad 0],$$

It is normalized to: $[0.339 \quad 0.547 \quad 0.110 \quad 0.004 \quad 0]$, and other results are as follows:

$$B_2 = [0.218 \quad 0.661 \quad 0.084 \quad 0.037 \quad 0], B_3 = [0.422 \quad 0.439 \quad 0.106 \quad 0.033 \quad 0]$$

(2) Fuzzy comprehensive evaluation of primary index: $B = W \cdot R = [0.348 \quad 0.523 \quad 0.101 \quad 0.027 \quad 0]$

(3) The single value of the fuzzy vector

According to the weighted average method, the result is $C = [92.5, 77.5, 62.5, 47.5, 20.0]$, so the single value of the fuzzy vector is as follows:

$$Y = B \cdot C = 80.38$$

The overall evaluation value of the community residents interviewed for the Party building with grid management model in the Z community is 80.38, and the corresponding evaluation grade is "Relatively High."

4.3 Results evaluation

The final result shows that most residents are satisfied with this mode in Z community. In addition, the fuzzy comprehensive evaluation results of the three primary indexes are carried out.

Table 2. The fuzzy comprehensive evaluation results of the primary indexes

First grade indicator	High	Relatively High	General	Relatively Low	low
Subject construction	0.339	0.547	0.110	0.004	0.00
Management service	0.218	0.661	0.084	0.037	0.00
Actual effectiveness	0.422	0.439	0.106	0.033	0.00

On the one hand, as shown in the table2, in the fuzzy comprehensive evaluation of the Party building with grid management in Z community, the highest degree of membership in the three levels is "relatively high", the proportion of which is 54.7%, 66.1% and 43.9% respectively. The second one was concentrated on the "high" grade, accounting for 33.9%, 21.8% and 42.2% respectively. The proportion of respondents rated as "low" was only 4.0%, 3.7% and 3.3%. These results indicate that the majority of respondents have a high degree of acceptance and satisfaction for the grid management mode of Party building in Z community.

On the other hand, the main index items with lower evaluation rank are: the number of reports from social media (9%), the standardization of grid management (7%), the overall satisfaction of the masses (4%), the innovation ability of Party building practice (3%), the innovation and pertinence of services (3%), the effect to improve the life quality (3%). To a certain extent, there are still some problems in the current grid management mode of community Party building. For example, the innovation ability is insufficient and the management is non-standard, so it is necessary to continue exploring a new way to perfect the management model.

5. Discussions and Conclusions

Promoting the mode is helpful to make up for the deficiency in the management and service, promote the rational allocation of resources, ensure the legitimate interests of community residents and consolidate the foundation of the ruling. Faced with the complicated and changeable society, the Party building should keep pace with the development. From the perspective of systematic thinking, the construction, operation and management of the mode need the whole subject to participate and cooperate.

Firstly, it is important to update the idea of management constantly and provide a platform for multiple subjects to participate in the mode under the correct value orientation. Secondly, it is necessary to strengthen the scientific planning of the grid according to the local conditions and innovate the management mode in combination with the current situation and practical experience. Thirdly, In order to realize the supply-side structural reform of community public services, we should adhere to taking the overall situations into account and improving the relevant supporting systems by expanding the supply of public service. Finally, According to the development background of big data, the grid management mode of Party building in community should be transform from management to governance, from uni-direction to synergy and from elaboration to precision, which accelerate the innovation and development of grass-roots Party building.

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