AN ASSESSMENT OF THE NEGOTIN WINE ROUTE POTENTIALS - A CASE OF THE RAJAČKE PIMNICE

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Abstract: *The Republic of Serbia has a significant potential for the development of a different kind of tourism and one of them is, certainly, the wine tourism. This type of tourism has good preconditions for further improvement which will result in an increase in the number of visitors in the future. In this paper, the possibilities for the future development of the wine destination called Rajačke pimnice situated in the Negotin wine route is examined. To define the core advantages and disadvantages of the mentioned destination, the best-worst method (BWM) is used. As an outcome of the examination of the scientific articles and literature that deal with the topic of wine tourism, the 9 criteria are specified and submitted to further evaluation. The final results show that special attention should be given to the 3 criteria which are: traffic infrastructure, accommodation and restaurants and a special atmosphere in the winery.*
Keywords: *Best-worst method, wine tourism, Negotin wine route, Rajačke pimnice, Republic of Serbia*

INTRODUCTION

The wine tourism represents a part of tourism that gains significant attention from practitioners as well as researchers these days (Bruwer, 2003; Getz and Brown, 2006; Gomez et al., 2015). Development of this type of tourism could bring a lot of benefits especially to the small wineries because it could enhance its business position and even make loyal customers that will come back in the future (Dodd, 1995). Wine tourism is, usually, seen as a part of tourism dedicated to the wine admirers that have a desire to go to the places where they could taste and buy wine, but the wine tourism is certainly much more than that. The wine researchers conclude that the benefits from wine tourism are significant and go beyond the simple income of the particular wineries. The whole

destination where the wineries are located as well as its offer become more attractive and popular due to wine tourism.

The Republic of Serbia has vineyards and wineries that produce a wine of fine quality. There are four wine routes in the Republic of Serbia and they are: Fruška gora wine route, Palić wine route, Oplenac wine route and, Negotin wine route. The Negotin wine route is situated in Eastern Serbia and it is famous because of the "Rajačke pimnice" that are the old wine cellars in the village called Rajac. This complex includes 270 wine cellars that are from the 18^{th} century. The spirit of the past times is preserved because these old cellars are restored and the new ones are not built because it would damage the aesthetics of the place. The families still produce very good wines and some of them tried to animate the tourism activity. The intensifying of the tourism activity will not have the positive effects only on the wineries but on the whole Eastern Serbia that has a lot of attractions that could be very interesting to the tourists.

Because of enhancing the current tourist position of the Rajačke pimnice it is very important to determine which are the key aspects that should be improved. These aspects could be considered as the criteria and the convenient tool for their estimation is the Multiple-Criteria Decision-Making methods (MCDM). A lot of various MCDM methods have been proposed until now, such as: AHP (Saaty, 1980), TOPSIS (Hwang and Yoon, 1981), PROMETHEE (Brans and Vincke, 1985) ARAS (Zavadskas and Turskis, 2010), WS PLP (Stanujkic and Zavadskas, 2015), and PIPRECIA (Stanujkic et al., 2017). To incorporate the uncertainty of the environment in the decision-making process the appropriate extensions of the MCDM methods are introduced. For the purpose of this paper, the application of the best-worst method introduced by Rezaei (2015) is proposed. Towards determining the aspects of the Rajačke pimnice that requires a full attention by applying the BWM method, the rest of the paper is organized as follows: the computational procedure of the BWM method is given in the second section; the application of the proposed method is presented in the third section; which is followed by a conclusion.

BWM METHOD

Rezaei (2015) proposed BWM method which represents a suitable technique for determining the weights of the criteria. This method is also based on the pairwise comparison of the considered criteria as the AHP method (Saaty, 1980). But, contrary to the mentioned method, BWM

method requires less comparisons, which is one of its key benefits. Besides, the results obtained by using BWM method have a higher degree of consistency. Until now, the BWM method is used for the facilitation of the decision-making process in many areas (for example: Ahmad et al., 2017; Gupta and Barua, 2017; Badi and Ballem, 2018; Rezaei et al., 2018; Yadav et al., 2018; van de Kaa et al., 2019).

The computational procedure of the BWM method could be presented through the following steps.

***Step* 1**. In the first step, a set of evaluation criteria $\{c_1, c_2, c_3, ..., c_n\}$ should be determined.

***Step* 2**. Decision-maker should identify the best criterion which is the most significant and the worst criterion that is the least significant according to his/her opinion.

***Step* 3**. By using the scale between 1 and 9, the decision-maker expresses his/her preference of the best criterion over all the other criteria. In considered case, score 1 represents equal significance between the best and other considered criteria, while score 9 depicts the extreme preference of the best criterion over some other. The vector Best-to-Others (BO) is the result of this step and it is as follows:

$$A_B = (a_{B1}, a_{B2}, a_{B3}, ..., a_{Bn}), \quad (1)$$

where a_{Bj} represents the preference of the best criterion B over criterion j, and the $a_{bb} = 1$.

***Step* 4**. By using the same scale between 1 and 9, the decision-maker expresses his/her preference of the all considered criteria over the worst criterion. The vector Others-to-Worst (OW) is the result of this step and it is as follows:

$$A_W = (a_{1W}, a_{2W}, a_{3W}, ..., a_{nW})^T, \quad (2)$$

where a_{jW} represents the preference of the criterion j over the worst criterion W, and the $a_{WW} = 1$.

***Step* 5**. Determine the optimal weights of the criteria $(w_1^*, w_2^*, w_3^*, ..., w_n^*)$ which have to satisfy the following requirement: for each pair of w_B / w_j and w_j / w_w, the ideal situation is where $w_B / w_j = a_{bj}$ and $w_j / w_w = a_{jW}$. Thereby, the maximum among the set of $\left\{\left|w_B - a_{Bj} w_j\right|, \left|w_j - a_{jW} w_W\right|\right\}$ should be minimized in order to get as close as possible to the ideal solution. The problem could be formulated as follows:

$$\begin{aligned} &\min \max_j \left\{\left|w_B - a_{Bj} w_j\right|, \left|w_j - aj_W w_W\right|\right\}, \\ &\text{s.t.} \\ &\sum\nolimits_j w_j = 1 \\ &w_j \geq 0, \text{for all } j \end{aligned} \tag{3}$$

Problem (3) could be transferred to the following linear programming model:

$$\begin{aligned} &\min \xi \\ &\text{s.t.} \\ &\left|w_B - a_{Bj} w_j\right| \leq \xi^L, \text{for all } j, \\ &\left|w_j - a_{jW} w_W\right| \leq \xi^L, \text{for all } j, \\ &\sum\nolimits_j w_j = 1 \\ &w_j \geq 0, \text{for all } j. \end{aligned} \tag{4}$$

The optimal weights $(w_1^*, w_2^*, w_3^*, ..., w_n^*)$ and ξ^* are defined after resolving the problem (4). The direct indicator of the consistency of the comparisons is represented by the ξ^*. The consistency is higher when the value of the ξ^* is closer to 0 in which case the performed comparisons are more reliable.

APPLICATION OF THE BWM METHOD

In this section, the application of the previously explained BWM method will be presented. For the purpose of the paper, the decision-making process is performed by one decision-maker. The goal is to assess

the potential of the wine destination Rajačke pimnice which is situated in the Negotin wine route in Eastern Serbia. The leading idea is to determine which aspects of the given destination is the most important and should be emphasized in future tourism development. By examining the literature, 9 criteria are defined which are submitted to further estimation. In Table 1 the set of the selected criteria is given as well as their explanation.

Table 1. The specific areas and sustainable indicators

	Criteria	Explanation
C_1	Personnel	Trained, polite and pleasant personnel
C_2	Environment	Beautiful scenery and preserved environment free from pollution
C_3	Traffic infrastructure	Convenient road connections and access
C_4	Tourism attractions and activities	Festivals, events and sport activities
C_5	Reputation	Destination is well-known and distinguished
C_6	Archeological sites in the vicinity	There are archeological sites that could be interesting to the tourists
C_7	Accommodation and restaurants	Destination has adequate tourist facilities
C_8	Souvenirs	Special handmade products and works of art
C_9	Special atmosphere in the winery	The destination contains the spirit of old times

Decision-maker identifies the criterion C_7 - *Accommodation and restaurants* as the best and criterion C_8 – *Souvenirs* as the worst criterion.

Tables 2 and 3 show the comparison vectors.

Table 2. Pairwise comparison vector for the best criterion

Criteria	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9
Best criterion: C_7	3	3	1	2	2	4	1	7	1

Table 3. Pairwise comparison vector for the worst criterion

Criteria	Worst criterion: C_8
C_1	7
C_2	9
C_3	9
C_4	5
C_5	7
C_6	5
C_7	7
C_8	1
C_9	7

By resolving the BWM linear programming model which is represented by equation (4), the final weights of the criteria are determined.

Table 4. The criteria weights and final rank

Criteria	Weight	Rank
C_1	0.0797	3
C_2	0.0797	3
C_3	0.1753	1
C_4	0.1195	2
C_5	0.1195	2
C_6	0.0598	4
C_7	0.1753	1
C_8	0.0159	5
C_9	0.1753	1
Consistency ξ		0.0637

According to the given results, the criteria C_3 - *Traffic infrastructure*, C_7 - *Accommodation and restaurants*, and C_9 - *Special atmosphere in the winery* are in the first place. The criterion C_8 –

Souvenirs is the least significant criterion in the considered case. Performed comparison is quite reliable because the consistency ratio is close to 0 ($\xi = 0.0637$).

The obtained weights of the criteria are also presented in Figure 1.

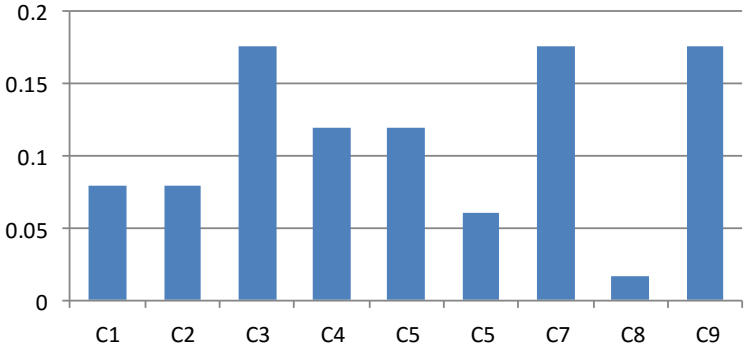

Figure 1. Criteria weights obtained by using BWM method

CONCLUSION

Development of wine tourism represents a chance for the Republic of Serbia to expand and improve its tourism activity. The part of the Negotin wine route, Rajačke pimnice, represents a potential that could give a lot in the future. The goal of this paper was to determine the key issues that should be resolved with the aim of intensifying tourism activity in this destination. With that aim, the 9 criteria are determined and evaluated by using the BWM method. The main reason for applying the mentioned method is because it does not require an extensive number of comparisons and it ensures a high degree of consistency. The obtained results show that special attention should be given to the following aspects: traffic infrastructure, accommodation and restaurants and a special atmosphere in the winery.

The BWM method proved its applicability and usefulness because the obtained results are reliable and appropriate. The main deficiency of the paper reflects through the fact that only one decision-maker performed the evaluation process and the vagueness of the environment is neglected because the computational procedure is based on the crisp numbers. Despite the mentioned shortages, this method is quite useful and gives adequate insight into the considered problem. Suggestions for the future

research goes towards comparing the wine destinations relative to the certain criteria because of getting the complete picture about the position of the certain wine destination on the tourism market.

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