SELECTION OF MARKETING COMMUNICATION CHANNELS IN AGRIBUSINESS

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ABSTRACT

The aim of this study was to select the best marketing communication channel for a medium-sized agricultural company in the area of the city of Bijeljina by applying multi-criteria decision-making methods. Eight criteria were used for the research, and five communication channels were selected. The research on the importance of individual criteria was influenced by the commercial management of the company in question with their common attitude, i.e. assessment. The Entropy - MABAC method of multi-criteria decision-making was used for the methodology. The results show that the criterion of diversity of new information is the most significant. The best-rated communication channel is the company's good image. The second-best rated alternative is the use of the internet, specifically social media. The results provide a good basis for further research in this area with the aim of determining the factors that influence the choice of future promotion methods and obtaining useful information.

Introduction

Agribusiness plays an important role in the development of a country. To stimulate economic growth, development, and employment, agribusiness needs a well-functioning market. For this reason, the promotion of agricultural products must be encouraged by good marketing strategies. Part of this certainly includes choosing the optimal marketing channel through which the procurement and distribution of final products run smoothly. As Kuzyk (2023) observes, every business today faces the need

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to organize effective collaboration with its marketing environment, especially with targeted consumers. According to him, various marketing communication tools, which are actively developing, aim to help the company grow. With the help of these modern marketing tools, promotion can effectively highlight all the advantages of a new product and clearly position it in the target market, leading to long-term collaboration with the end consumer. Today, functional production is not enough. Additional marketing efforts are needed to ensure the future brand, reputation, and image of a company, especially when it comes to a sensitive economic sector like agriculture. In support of this, Reznik et al. (2020) argue that modern consumers are under constant informational pressure and are not ready to comprehend every piece of information sent to them. According to them, all this limits the demand for products from the agribusiness sector. This is precisely why the choice of marketing channel is one of the most important decisions faced by an agribusiness participant. Well-established marketing channels allow companies to maximize profits and create unique value chains that minimize input costs and other risks.

What is important to emphasize, as noted by Jiuhardi et al. (2022), is that agricultural products have a short shelf life, and to retain their nutritional values, these products need to be delivered to the end consumers as soon as possible (Ndori Queku et al., 2024). For this purpose, various sales channels must be included, involving all stakeholders from the producer to the consumer (Milford et al., 2021). Choosing such an adequate channel helps farmers achieve higher income and maintain economic stability in their operations (Vitković, 2015; Pantić et al., 2022; Khan et al., 2022; Vitković, 2023).

In their earlier research, many authors have dealt with the importance of marketing in agribusiness and agriculture (Hsu, 2012; Jakšić, 2022; Gumirakiza et al., 2014; Kim et al., 2014; Liao et al., 2017; Bauman et al., 2018; Park et al., 2018; Vujanić et al., 2021; Kuzyk, 2019). However, recent studies increasingly incorporate multi-criteria decision-making in the selection of marketing channels. According to Zheng et al. (2021), the choice of marketing communication channel falls under decision-making problems, where the best alternative that meets the given criteria must be chosen. Petković and Užar (2020) research factors affecting the sales channel structure in agriculture using cheese as an example, while Oe and Yamaoka (2023) focus on improving olive oil sales channels in Tunisia. Nedeljković et al. (2023) use the TOPSIS method of multi-criteria decision-making to select marketing channels for a farming company. Ristanović et al. (2022) use the AHP method to analyse sales marketing channels, finding that farmers most often distribute their products through green markets, with price and quality being the dominant factors influencing channel choice. Earlier, using the same methodology, Tošović-Stevanović et al. (2020) found that selling through processing capacities is the best option.

From the foregoing, the application of multi-criteria decision-making in this study emerges, aimed at selecting the most favourable marketing communication channel. This would ultimately lead to an increase in the business success of the subject company and provide a good basis for further similar research on other and similar subjects in agribusiness.

Methodological framework of the research

The previously mentioned multi-criteria decision-making method represents an important tool for selecting the most favourable marketing communication channel for a business entity in agribusiness, and it is also used in this case with a medium-sized agricultural company as an example. The subject company is export-oriented and offers a range of products for planting and plant protection. It is located in the area of the city of Bijeljina in Bosnia and Herzegovina and has about fifty employees, most of whom work in production and packaging. The market is a crucial, decisive segment of its operations, and any irregularity in it directly affects the company's further functioning. In its twenty years of operation, the company has actively used existing communication channels with customers. Trying to follow advertising trends and sources of good practice in procuring necessary raw materials, the company has used and improved a wide range of marketing communications with end users through its commercial department. For this reason, and for the purpose of this research, the following Table 1 shows the currently used marketing channels in the company, whether for procurement or the sale of its final products. These types of communication channels will certainly be used in this work as possible alternatives among which the selection will be made.

Table 1. The method of communication between the company and the market

ID	Type of communication channels	Type of communication
A1	Internet (social media)	Facebook, Instagram, YouTube, Viber groups, WhatsApp groups, other.
A2	TV media	Local, Regional.
A3	Radio media	Local, Regional.
A4	Professional events	International fairs and conferences, Regional fairs and conferences, Local fairs and conferences.
A5	Good image	Direct (personal) promotion and contacts, Previous good cooperation, Recommendations.

Source: Authors

Given the nature of multi-criteria decision-making, it was necessary to formulate, that is, set the criteria on the basis of which the selection will be made. The paper will use 8 criteria based on previous experience in commercial activities. An overview of the criteria is provided in Table 2 below.

Table 2. Criteria used in decision-making

ID	Criteria	Explanation
C1	Accessibility	Giving and receiving information
C2	Reliability	Giving and receiving information
C3	Speed	Time of receiving and giving information
C4	Usability	Possibility of immediate usefulness of obtained information and popularization of given information
C5	Participation	Opportunities in content creation in giving and receiving information
C6	Cost	Cost of obtaining and disseminating information
C7	Variety of new information	Variety of content of new relevant received information
C8	Other	Personal-local devotion to marketing channel

Source: Authors

For the purpose of determining the importance of the given criteria in this paper, we used the Entropy method. The entropy method is an important information weight model and has been extensively used and studied recently (Liu et al., 2010; Zhi-Hong et al., 2010; Durkalić et al., 2019; Pantović et al., 2023). Compared to other similar methods, its biggest advantage is that it greatly reduces the human factor when making a decision, which increases its objectivity. This method estimates value by measuring the degree of differentiation. The greater the degree of dispersion of the measured value, the greater the degree of differentiation of the index and the more information can be derived. According to earlier research in which the Entropy method was used, the results were reliable and effective. (Zhou et al., 2012)

The first step represents the standardization of the measured values based on the following statement (Gorgij et al., 2017; Li et al., 2012):

$$P_{ij} = \frac{x_{ij}}{\sum_{j=1}^{n} x_{ij}}$$

The entropy value of Ei index is defined as (Dong et al., 2018):

$$E_i = \frac{\sum_{j=i}^{n} P_{ij} \cdot \ln P_{ij}}{\ln n}$$

While the final weight by the Entropy method is calculated as (Amiri et al., 2014):

$$w_i = \frac{1 - E_i}{\sum_{i=1}^{m} (1 - E_i)}$$

In the selection of offered alternatives, we use the MABAC method of multi-criteria decision-making (Multi-Attributive Border Approximation area Comparison). He

finds confirmation of his successful use of the MABAC method in some of the earlier research (Pamučar et al., 2015; Pamučar et al., 2018; Nedeljković et al., 2021; Puška et al., 2023). The method was developed by Pamučar and Ćirović (2015). It defines the distance of the criterion function of each of the observed alternatives from the limit allowed value. The reason for using this method lies in the fact that it is relatively new, easy to use, but also insufficiently used in this field of research, and in this way, it is aimed at its further popularization. Its use is explained in the following text through its next steps.

Step 1: The initial decision matrix (X)

$$X = \begin{array}{c} \\ A_1 \\ A_2 \\ \dots \\ A_m \end{array} \begin{array}{c} \begin{array}{cccc} C_1 & C_2 & \dots & C_n \end{array} \\ \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ x_{m1} & x_{m2} & \dots & x_{mn} \end{bmatrix} \end{array}$$

Step 2: Normalization of the element of the initial decision matrix (X)

$$N = \begin{array}{c} \\ A_1 \\ A_2 \\ \dots \\ A_m \end{array} \begin{array}{c} \begin{array}{cccc} C_1 & C_2 & \dots & C_n \end{array} \\ \begin{bmatrix} n_{11} & n_{12} & \cdots & n_{1n} \\ n_{21} & n_{22} & \cdots & n_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ n_{m1} & n_{m2} & \dots & n_{mn} \end{bmatrix} \end{array}$$

a) For benefits type criteria

$$n_{ij} = \frac{x_{ij} - x_i^-}{x_i^+ - x_i^-}$$

b) For cost type criteria

$$n_{ij} = \frac{x_{ij} - x_i^+}{x_i^- - x_i^+}$$

Step 3: Calculation of the weight matrix element (V)

$$V_{ij} = w_i g(n_{ij} + 1)$$

Step 4: Determination of the matrix of boundary approximate surfaces (G)

$$g_i = \left(\prod_{j=1}^{m} v_{ij} \right)^{\frac{1}{m}}$$

Step 5: Calculation of elements of alternative distance matrices from the limit approximate domain (Q)

$$Q = \begin{bmatrix} q_{11} & q_{12} \cdots q_{1n} \\ q_{21} & q_{22} \cdots q_{2n} \\ \cdots & \cdots \cdots \cdots \\ q_{m1} & q_{m2} \cdots q_{mn} \end{bmatrix} \begin{bmatrix} q_{11} & q_{12} \cdots q_{1n} \\ q_{21} & q_{22} \cdots q_{2n} \\ \cdots & \cdots \cdots \cdots \\ q_{m1} & q_{m2} \cdots q_{mn} \end{bmatrix}$$

Step 6: Ranking of alternatives

$$S_i = \sum_{j=1}^{n} q_{ij} \; j = 1,2,\ldots,n \quad i = 1,2,\ldots,m$$

Results and discussion

As previously pointed out, the evaluation of the given criteria will be done through the linguistic scale presented in the following table 3, on the basis of which the initial decision-making matrix will be formed (Table 4).

Table 3. Linguistic scale of values

Evaluation of criteria	Linguistic scale
1	VP-Very poor
2	P-Poor
3	M-medium
4	G-Good
5	VG-Very good

Source: Đalić et al., 2020.

Table 4. Decision matrix

	C1	C2	C3	C4	C5	C6	C7	C8
A1	4	3	5	5	4	4	5	3
A2	3	3	3	4	3	2	3	3
A3	4	3	3	3	4	4	3	3
A4	4	3	3	4	4	4	4	5
A5	4	5	2	3	4	4	2	4
SUM	**19**	**17**	**16**	**19**	**19**	**18**	**17**	**18**

Source: Authors

n the next step, after normalization of the initial decision matrix (Table 5), the final weights of the given criteria will be determined. As we can see in the ranking from the following table 6, the most important criterion is the criterion “variety of new information”. Then follows the criteria “speed of obtaining and providing information”, as well as the criterion “price of obtaining and providing information”. The criterion “availability of information” was rated worst.

Table 5. Normalized Decision Matrix

	C1	C2	C3	C4	C5	C6	C7	C8
A1	0,210526	0,176471	0,3125	0,263158	0,210526	0,222222	0,294118	0,166667
A2	0,157895	0,176471	0,1875	0,210526	0,157895	0,111111	0,176471	0,166667
A3	0,210526	0,176471	0,1875	0,157895	0,210526	0,222222	0,176471	0,166667
A4	0,210526	0,176471	0,1875	0,210526	0,210526	0,222222	0,235294	0,277778
A5	0,210526	0,294118	0,125	0,157895	0,210526	0,222222	0,117647	0,222222

Source: Authors

Table 6. Weights of individual criteria

	C1	C2	C3	C4	C5	C6	C7	C8
A1	-0,32803	-0,30611	-0,36348	-0,35132	-0,32803	-0,33424	-0,35993	-0,29863
A2	-0,29145	-0,30611	-0,31387	-0,32803	-0,29145	-0,24414	-0,30611	-0,29863
A3	-0,32803	-0,30611	-0,31387	-0,29145	-0,32803	-0,33424	-0,30611	-0,29863
A4	-0,32803	-0,30611	-0,31387	-0,32803	-0,32803	-0,33424	-0,34045	-0,35581
A5	-0,32803	-0,35993	-0,25993	-0,29145	-0,32803	-0,33424	-0,25177	-0,33424
$\sum$	-1,60357	-1,58436	-1,56503	-1,59027	-1,60357	-1,58109	-1,56437	-1,58593
E_j	0,99635	0,98442	0,97241	0,98809	0,99635	0,98239	0,972	0,9854
$1 - E_{ij}$	0,00365	0,01558	0,02759	0,01191	0,00365	0,01761	0,028	0,0146
$\sum(1 - E_{ij})$	0,12259							
W_j	0,029774	0,12709	0,225059	0,097153	0,029774	0,14365	0,228404	0,119096
Rank	8	4	2	6	7	3	1	5

Source: Authors

This research somewhat coincides with the research of Ristanović et al. (2022) who established that price is one of the dominant factors, i.e. the criteria that influence the choice of marketing channel itself.

In the following, after obtaining the weighting coefficients of the criteria and for the purpose of choosing the offered alternatives using the Mabac method, we form an initial decision matrix (Table 7), where by normalizing it and multiplying it with the obtained weighting coefficients (Table 8, Table 9) we determine the distance of the alternatives from the approximate range of limit values (Table 10).

Table 7. Decision matrix

	C1	C2	C3	C4	C5	C6	C7	C8
A1	4	3	5	5	4	4	5	3
A2	3	3	3	4	3	2	3	3
A3	4	3	3	3	4	4	3	3
A4	4	3	3	4	4	4	4	5
A5	4	5	2	3	4	4	2	4
Max.	4	5	5	5	4	*2*	5	5
Min.	3	3	2	3	3	*4*	2	3

Source: Authors

Table 8. Normalized Decision matrix

	C1	C2	C3	C4	C5	C6	C7	C8
A1	1	0	1	1	1	1	1	0
A2	0	0	0,33	0,5	0	0	0,33	0
A3	1	0	0,33	0	1	1	0,33	0
A4	1	0	0,33	0,5	1	1	0,66	1
A5	1	1	0	0	1	1	0	0,5

Source: Authors

Table 9. Weight Normalized Decision Matrix

	C1	C2	C3	C4	C5	C6	C7	C8
A1	0,059548087	0,12709	0,450118	0,194306	0,059548	0,287299	0,456807	0,119096
A2	0,029774044	0,12709	0,299329	0,14573	0,029774	0,14365	0,303777	0,119096
A3	0,059548087	0,12709	0,299329	0,097153	0,059548	0,287299	0,303777	0,119096
A4	0,059548087	0,12709	0,299329	0,14573	0,059548	0,287299	0,37915	0,238192
A5	0,059548087	0,254181	0,450118	0,194306	0,059548	0,287299	0,456807	0,238192
Gi	0,052	0,145	0,352	0,15	0,051	0,249	0,373	0,157

Source: Authors

Table 10. Distance of the Alternatives from the BBA

	C1	C2	C3	C4	C5	C6	C7	C8
A1	0,007548	-0,01791	0,098118	0,044306	0,008548	0,038299	0,083807	-0,0379
A2	-0,02223	-0,01791	-0,05267	-0,00427	-0,02123	-0,10535	-0,06922	-0,0379
A3	0,007548	-0,01791	-0,05267	-0,05285	0,008548	0,038299	-0,06922	-0,0379
A4	0,007548	-0,01791	-0,05267	-0,00427	0,008548	0,038299	0,00615	0,081192
A5	0,007548	0,109181	0,098118	0,044306	0,008548	0,038299	0,083807	0,081192

Source: Authors

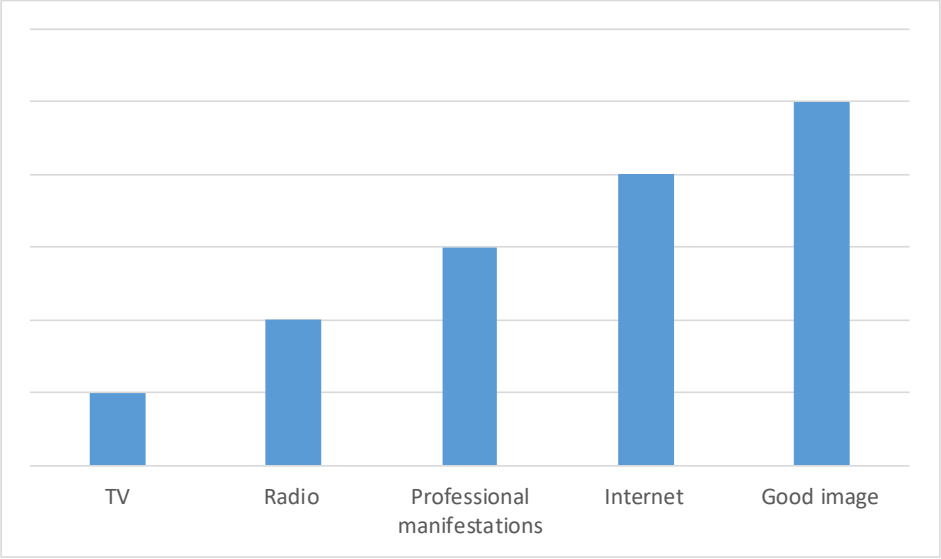
By calculating the coefficient Si, we get the final ranking of the chosen alternatives. (Table 11). We observe that the alternative "good image", which includes previously established relationships and recommendations, is chosen as the best. It is immediately followed by "internet", i.e. social networks as the next important channel of marketing communication. The following Figure 1 gives us a visual representation of the choice of alternatives.

Table 11. Ranking alternatives

Si	Rank
0,224814	2
-0,33078	5
-0,17616	4
0,066886	3
0,471	1

Source: Authors

Figure 1. Marketing Communication Channels Ranking



Source: Authors

Conclusion

Based on the previously presented findings in the study, we can conclude that selecting marketing communication channels in agribusiness is a complex and ongoing task for all companies exposed to dynamic market conditions. In this context, the application of multi-criteria decision-making methods plays a significant role. By applying the Entropy-Mabac decision-making method, we have found that the criterion of greatest importance in this specific case, influencing the choice of marketing channel, is the "variety" of new and relevant information that the company receives and provides. Immediately afterward, great importance is attached to the speed of receiving and providing information, followed by the cost of these services. Considering the importance of these evaluated criteria, "good image," i.e., the company's successful collaboration with clients and service providers, as well as their previous recommendations to others, was selected as the best marketing communication channel in the subject company. Of course, the choice of internet social media as the next important communication channel was expected, given the increasingly advanced technical and technological environment. Surprisingly, TV was rated lower, despite being one of the leading promotion channels for most economic entities until recently. Future research should focus on examining the impact of individual factors influencing the choice of promotion methods and obtaining useful market information, as well as on developing new decision-making methods based on all relevant factors for marketing communication channels.

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