HOW TO IMPRROVE THE CONTRIBUTION OF LOCAL FOOD SUPPLY CHAINS TO THE DEVELOPMENT OF RURAL AREAS WITH DIFFERENT METHODOLOGICAL APPROACHES: A SLOVENIAN CASE STUDY

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ABSTRACT

In mountain regions of Slovenia local food supply chains have a central role in encouraging food production on small farms, in supporting local food networks and in contributing to healthy local economies. Local food supply chains are closely linked with high quality and traditional food products especially in mountain regions. As the important role and significance of local chains are already broadly recognized, recommendations for further successful development of local chains have a crucial role in rural development process. The methodology represented in this paper based on the combination of multi-criteria, SWOT analysis and statistical approach. Results identify the important "bottlenecks" in the production and marketing processes of short and middle local supply chains for ten analyzed mountain food products. Further, some recommendations for local policy makers and farmers are stated. The methodology approach, supported with three different methods, represents the important tool for analyzing short and middle local food supply chains and to ascertain their main characteristics.

Key words: multi-criteria decision models, SWOT analysis, local food products

INTRODUCTION

Despite of many already determinate positive impacts of local (e.g. mountain) food production on rural development process, less research was made on the field of shortcomings which brake down the effective production and marketing system of local food products. As the identifying of bottlenecks along food chains is not an easy task, it is increasingly important to use relevant methodology approach, which could be suitable for all production type (conventional, organic, integer and biodynamic agricultural production) and relative simple for usage with general application possibility. According to some previous researches (Hyde and Maier, 2006; Prišenk and Borec, 2012), multi-criteria analysis (also known as MCA) was described as possible and relevant methodology for such studies. This paper tries to represent the possibilities of upgrading MCA with some other techniques, such as SWOT analysis and statistical approach.

The objective of this paper is the identification of shortcomings of producing and marketing processes of local food, as these may be recognized as important factors hindering the development of the local food concept in Slovenian mountain regions and to present tree relevant techniques for identifying the bottlenecks along food chains. The study was based on ten analyzed local food products (case studies) produced in mountain areas in Slovenia.

MATERIAL AND METHODS

The section materials and methods are structured from three subsections each of them represent different independent methodological approach.

DEX METHODOLOGY

The aim of the DEX-i model in this paper was to assess the production and marketing system of ten local food products with considering different characteristics, such number of farms, social-economic and environmental impacts, technological aspect, agricultural production on the farm, processing process, product sales, organizing of marketing and consumers' characteristics. The model has the "tree" structure represented in Fig. 1.

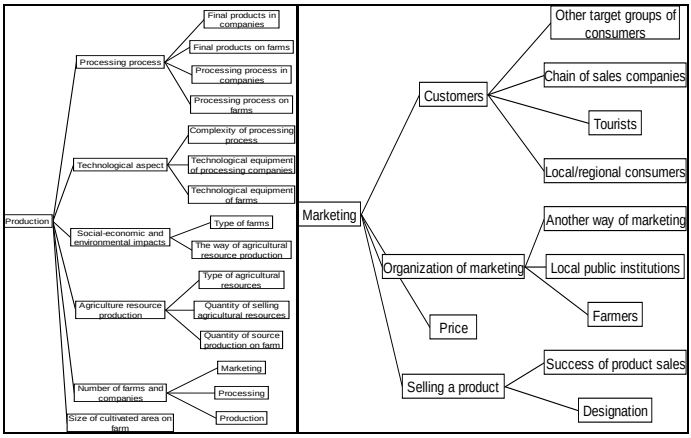

Fig. 1 Hierarchical structure of the production and marketing processes of local food (adapted from Prišenk and Borec, 2012)

SWOT ANALYSIS

DEX methodology allows decision makers to identify the attributes which express the most important influences on the final remark of local food products done by "plus-minus-1" analysis. The "Plus-minus-1" analysis describes changes in each basic attribute for one degree upwards and downwards, independent of other attributes (Bohanec et al., 2008). The results of "plus-minus-1" analysis represent input data for the further building of SWOT analysis. The attributes on the hierarchical tree were transformed into different factors in SWOT analysis. Some of them with higher and average (neutral) grades from "plus-minus-1" analysis are categorized as strengths and opportunities and those with bad and lower grades are categorized as weaknesses and threats (Prišenk and Borec, 2012).

STATISTICAL ANALYSIS

Statistical analysis was used for finding the connections between final local food remarks from DEX and different social and economic factors which have influences on the success of production and marketing system of local food product. The connections were found out with Pearson's correlation coefficient and significance testing (two-tailed) supported by IBM SPSS statistical package. The correlations were tested between production and marketing system and five different social and economic factors, such as tourism on the local level, employment in rural areas, development of rural areas, promotion of rural areas and cross-sectoral cooperation along different actors were included into food chain. Statistical analyses were done on two different significance level *P<0.05 and **P<0.01.

RESULTS AND DISCUSSION

Results are structured in three different sub-sections and explain what decision makers could expect from every separate methodology.

RESULTS FROM DEX-i MODEL

The results obtained from DEX model (Tab. 1) give final remark for every local food products separately. There are three possible qualitative evaluation marks for marketing system and for production system. The best evaluation mark for marketing system is stated as *successful*; while the worst is represented whit *not successful* evaluation. For the production system the best evaluation mark is stated as *large* and the *small* represents the worst one. Between the best and the worst mark are *partially successful* and *average*. However, the significance of different marks and their results in practice are depending on the different criteria in hierarchical tree which are not extra presented in the paper, although are extremely important.

Tab. 1 Evaluation DEX results of marketing system of local food products (according to Prišenk et al., 2013)

Name of food product	Evaluation results of marketing system	Evaluation results of production system
Upper Savinja stomach sausage (dry meat)	Successful	Large
Dried fruit	Partially successful	Small – Average
Solčava sirnek (dairy product from fresh milk)	Partially successful	Small
Rye bread	Partially successful	Small – Average
Cider	Not successful	Small
Bovški cheese (sheep cheese)	Not successful	Average
Tolminc (cow cheese)	Successful	Large
Pohorje pot	Successful	Small
Tarragon cake	Partially successful	Small
Jetrnica (sausage)	Not successful	Average

RESULTS FROM SWOT ANALYSIS

Results from SWOT analysis are represented by Fig. 2. The Number of the factors under strengths is much higher compared with the distribution of other attributes. From the results of SWOT analysis could be obtained, that the farms where local food products are produced are in general in good condition and with modern technological equipment for production or processing. Looking to the factors under the attribute weaknesses it is evident, that the main weaknesses for production and marketing system present the low number of farms turned to the production, processing or sale of local food products.

Fig. 2 Strenghts, weaknesses, opportunities and threaths of production and marekting systems of local food products (according to Prišenk and Borec, 2012)

STRENGTHS:	WEAKNESSES:
- Amount of agricultural production on farm - Purchasing sources - Farm types - Technological equipment on farms - Technological equipment in companies - Complex processing - Designation - Success of product sales - Price - Organization of marketing farmers - Consumers: local/regional consumers - Consumers: tourists - Consumers: other target groups of consumers	- Number of farms: production - Number of farms: processing - Number of farms: marketing - Percentage of sales - Final products on farms - Final products in companies
OPPORTUNITIES:	**THREATHS:**
- Organization of marketing: local public institutions - Organization of marketing: alternative ways of marketing - Consumers: Local shops, supermarkets	- Size of cultivated areas on farm - Processing on farms

STATISTICAL ANALYSIS RESULTS

The statistical analysis results are represented by Fig. 3. The relationship between cross-sectoral cooperation and the marketing systems was significant according to exponential correlation as well as between promotion of rural areas Vs. development of rural areas and employment on rural areas Vs. promotion of rural areas. The level of significance is <0.05 in the last two cases and <0.01 in the correlation between cross-sectoral cooperation and marketing systems.

		Marketing	Production	Tourism	Employment in rural areas	Deveopment of rural areas	Promotion of rural areas	Cross-sectoral cooperation
Marketing	Pearson Correlation	1	,323	,554	,371	,288	,504	,939
	Sig. (2-tailed)		,363	,097	,291	,420	,137	,000
	N	10	10	10	10	10	10	10
Production	Pearson Correlation	,323	1	,236	-,527	-,111	,000	,250
	Sig. (2-tailed)	,363		,512	,118	,759	1,000	,486
	N	10	10	10	10	10	10	10
Tourism	Pearson Correlation	,554	,236	1	-,016	,153	,251	,592
	Sig. (2-tailed)	,097	,512		,964	,673	,484	,071
	N	10	10	10	10	10	10	10
Employment in rural areas	Pearson Correlation	,371	-,527	-,016	1	,548	,701	,374
	Sig. (2-tailed)	,291	,118	,964		,101	,024	,286
	N	10	10	10	10	10	10	10
Deveopment of rural areas	Pearson Correlation	,288	-,111	,153	,548	1	,762	,264
	Sig. (2-tailed)	,420	,759	,673	,101		,010	,462
	N	10	10	10	10	10	10	10
Promotion of rural areas	Pearson Correlation	,504	,000	,251	,701	,762	1	,399
	Sig. (2-tailed)	,137	1,000	,484	,024	,010		,253
	N	10	10	10	10	10	10	10
Cross-sectoral cooperation	Pearson Correlation	,939	,250	,592	,374	,264	,399	1
	Sig. (2-tailed)	,000	,486	,071	,286	,462	,253	
	N	10	10	10	10	10	10	10

Fig.3 Statistical analysis results – Pearson Correlation coefficients and Significance values

CONCLUSIONS

The results of the paper acquired with represented methodological approaches can give clear directions on the main question written in the title of the paper. We could conclude that for farmers, the results of the combination of DEX, SWOT analysis and statistical approach can provide clear direction about the weakest links in the food chain; farmers or local policy can react and pay more attention to specific attributes or factors to improve them – finally improve the short food supply chains.

The main bottlenecks in marketing and production systems of local food products, recognized with the DEX and SWOT analysis, are the low number of actors (farms, processors) involved into both systems. In addition, also no significant production and processing in SMEs are recognized. The general consequence is that the quantity of final products is low. According to the analysis results, the production quantities could be higher, if the private sector would be one of the intermediate actors between production and marketing systems e.g. processing company. The same bottlenecks are recognized also after statistical analysis, where the light cooperation between actors involved into marketing system along food chain present the main obstacle. Solutions like more in deep cooperation between different actors, networking among them and higher involvement of private sector can make good contribution to the promotion of local food not only for the market per se, but also for actors in food chain.

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