

SUSTAINABLE GROWTH OF VALUE BASED FOOD CHAINS: BALANCE BETWEEN QUALITY DIFFERENTIATION, VOLUME AND ECONOMIC PERFORMANCE

Andreja Borec¹, Jernej Prišenk^{1*}

¹Faculty of Agriculture and Life Sciences, University of Maribor, Pivola 10, 2311 Hoče, Slovenia

*e-mail: jernej.prisenk@um.si

Abstract

Value based food chains (VBFC) are characterized through different type of quality values, often expressed simply as supporting the small scale farmers, improving the farms socio-economic situations and recognized mostly on local or regional level. Further VBFC maximize the social and economic output values for individual chain actors with positive direct and indirect returns to the local economy. If the VBFC wish to expand growth and at the same time maintain the values, the growth has to be sustainable in an economic, social and environmental way. For measuring sustainable growth of VBFC we used three type of food chain features: i) quality differentiation, ii) volume and iii) economic performance.

In this paper the analysis of two different VBFC from Slovenian organic sector is presented. For analyzing both case studies a qualitative method for balancing between indicators of each feature was used.

The results shown how the quality differentiation, volume and economic performance of each analyzed VBFC are balanced and how/and if they are directed towards sustainable growth.

The results are showing that the difference between analyzed VBFC towards sustainable growth exist and the noted obstructions are detected mostly in economic performance of food chain.

Key words: Sustainability, Value based food chains, Balance, Growth process.

1. Introduction

Value based food chains (VBFC) are characterized through different type of quality values recognized mostly on local or regional level as small or medium-scale food chains (according to Woods *et al.*, [13]). Small and medium-sized local organic supply chains

are facing special challenges in today's heavily competed food markets, moving from niche to volume and at the same time securing and maintaining the quality values. This is especially true in organic food chains where the quality values have very important and central role. For the successful maintenance of values along the food chain and for retain sustainable state, the good co-operation and fair distribution of the benefits, including consumers, are crucial (Risku-Norja [9]). Our research is based on case studies approach, carried out on two successful midscale organic food chains from Slovenia. After the literature, we identified the studied food chains as Value Based Food Chain (VBFC). The terminology of VBFC is recently used in European scientific literature after 2010 (Stevenson and Pirog [11], Pirog and Bregendhal [8]). Vacas *et al.*, [12] have further also explained positive direct and indirect economic and social effects of VBFC responsible also for increasing the local economy and community, such as higher farmer's income, lower unemployment rate, "fair price", and good relationships between the actors.

Sustainable growth process and successful development of VBFC are linked to the balance between quality differentiation, volume and economic performance (Münchhausen [5]). Quality differentiation in food chains is commonly conceptualized as raising the minimum standards applies inter alia to environmental protection and animal welfare requirements, leading to a general raising of the quality level for food (Meyer [4]). Volume can be expressed as volume of food products, number of employees or/and turnover present in relevant currency. Economic performance of value based food chains is achieved when the benefits (in terms of financial, material and non-material benefits) belong to all actors in the same share.

According Risku-Norja [9], the useful methodology for identify the balance between these values in VBFC is cross-case analyses (CC analyses). The draft for the

methodology has been taken from cross-country analyses, presented from Melo and Barenstein [3], Lee [2] and Risku-Norja [9]. CC analyses based on the integrated indicators, hanged with weights of importance. Further, it could be upgraded by multi-criteria decision methodology (MCDM) program calls DEX (in details described in Bohanec [1], Rozman *et al.*, [10] and Pavlovič *et al.*, [6]). The program DEX and methodology DEXi is free and available on website: <http://kt.ijs.si/MarkoBohanec/dexi.html>, developed by Slovenian Institute of Josef Stefan. However, results of CC analyze gives clear picture if the balance between values exists or not. With results of DEXi we could further define the shortcomings and after create the instructions for improving the balance.

2. Materials and Methods

Two case studies of value-based organic food chains from Slovenia were taken for the analysis. Both are medium scale food chains, first with milk production and the second with beef meat production. They are located in mountain region. Planika dairy (further Planika) and Agricultural cooperative *Šaleška Valley* (with commercial brand Ekodar for organic beef products; further Ekodar) are the key actors in analyzed food chains and have major role in processing stages.

Cross case analyses of two examined VBFC (in our study named as CC analyses) is based on the integrated

indicators of tree primary values (quality differentiation, volume/growth and economic performance) (Figure 1). Indicators present describing features of the values. CC analyses has been supported by multi-criteria decision methodology (MCDM) approach, and further DEX software has been used.

The input data for CC analysis to gain the values different set of indicators where used. The data for each indicator where obtained with the questionnaires on 24 farms from the mountain areas as well with actor's interviews in different stages of food chains. Interviews were carried out between June and October 2014 and performed from qualified interviewers. The main aim of the questionnaires and interviews were ensuring precise information about formation of food chain in the past, present status and future development plans (Prišenk and Borec [7]).

Figure 2 presents assessment tree for evaluation of values balance. It structures from values (middle of the tree) - further attributes, which are structure from indicators at the second level (left side of the tree) - further sub-attributes. The relative importance of an individual attribute is presented with a weight value. Setting the weights on 33.3% defines the relationship between "Economic performance", "Volume growth" and "Quality differentiation" because they have similar impacts on final result (balance between them) (Figure 3).

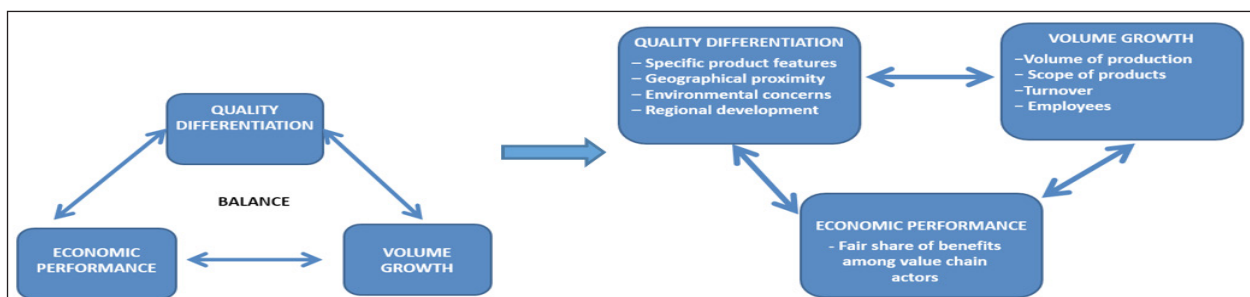


Figure 1. Scheme of country cross-case analyses without (left) and with integrated indicators (right)

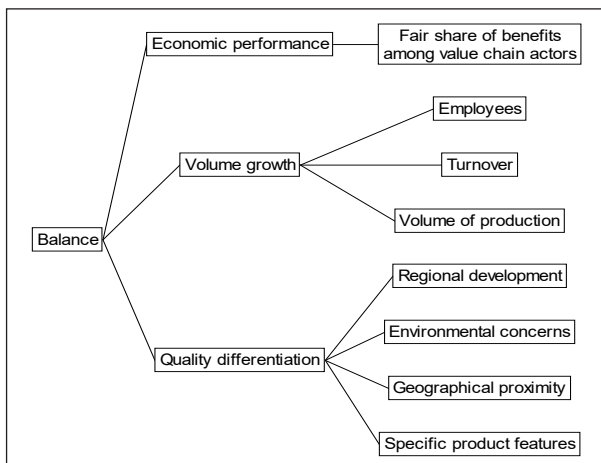


Figure 2. The structure of assessment tree for values balance assessment

Average weights

Attribute	Local	Global	Loc.norm.	Glob.norm.
Balance				
Quality differentiation	33	33	33	33
Specific product features	25	8	25	8
Geographical proximity	25	8	25	8
Environmental concerns	25	8	25	8
Regional development	25	8	25	8
Volume growth	33	33	33	33
Volume of production	33	11	33	11
Turnover	33	11	33	11
Employees	33	11	33	11
Economic performance	33	33	33	33
Fair share of benefits among value chain actors	100	33	100	33

Figure 3. Defined weights for all attributes (indicators)

For indicators, different scales were defined. The results of CC analyses gives clear direction about balance, which can be assessed as balanced, partly balanced or unbalanced. Further for all attributes scales have been defined, such as the scale options for turnover are falling, constant or raising.

3. Results and Discussion

Results show the different balance of values for analyzed case studies. Planika case study has been assessed as balanced, while the balance between values in Ekodar VBFC has been assessed as partly balanced (Figure 4). The DEXi software allows users to identify weak and strong points for all case studies, presented in Figure 5. Ekodar case study has two attributes quality differentiation and volume/growth, which are defined as weak points while the Planika has only one sub-attribute. The number of employees decreasing during the observed period between 2009 and 2014.

Option	Planika	Ekodar
Balance	Balanced	Partly balanced
Quality differentiation	Good	Bad
Specific product features	Yes	Yes
Geographical proximity	Yes	No
Environmental concerns	Take into account	Take into account
Regional development	Take into account	Not to take into account
Volume growth	Good	Bad
Volume of production	High	Medium
Turnover	Raising	Falling
Employees	Falling	Raising
Economic performance	Good	Good
Fair share of benefits among value chain actors	Yes	Yes

Figure 4. Balancing results between values in VBFC

Weak points		Planika
Attribute	Employees	Falling
Strong points		Planika
Attribute	Balance	Balanced
Quality differentiation	Specific product features	Good
	Geographical proximity	Yes
	Environmental concerns	Yes
	Regional development	Take into account
Volume growth	Volume of production	Take into account
	Turnover	Good
	Employees	High
	Economic performance	Raising
	Fair share of benefits among value chain actors	Good
		Yes
Weak points		Ekodar
Attribute	Quality differentiation	Bad
	Geographical proximity	No
	Regional development	Not to take into account
Volume growth	Volume of production	Bad
	Turnover	Falling
Strong points		Ekodar
Attribute	Specific product features	Yes
	Environmental concerns	Take into account
	Employees	Raising
Economic performance	Fair share of benefits among value chain actors	Good
		Yes

Figure 5. Weak and strong points of analyzed case studies

The comparison of results between case studies identify and describes changes in certain basic attributes by one degree upwards or downwards (if possible) that are independent of other attributes (according to Bohanec [1]) (Figure 6). It can be seen that Planika case study has more (three) threats (defined under - 1) as Ekodar case study to fall the final assessment for one degree down. This allows us to advise how to react and which indicator should be further approved to reach the balance between the values.

From the observed results, only one indicator is critical and needs special attention of actors in VBFCs. This is fair share of benefits among value chain actors under "Economic performance". "Economic performance" is the value, which can immediately demolish the balance and threaten the further sustainable growth of VBFCs. The results of CC analyses confirms the fear that before the losing the balance, that fair share of benefits among value chain actors is not taken into account. The business logic is "to produce and process the high-quality and healthy food products only from the milk produced in mountain regions in Slovenia" with contribution to effectiveness, economic performance and efficiency in mid-scale-values-based food chain. The only strategy and management instrument for realizing this goal is "to ensure the higher price of the milk to producer and maintain the target group of "steady consumers".

The balance between quality differentiation, volume and economic performance in Ekodar case study is partly reached. The Ekodar brand is still under the development process, where "Economic performance" can easily threaten balance between values. The quality of food products is their first priority. Ekodar is increasing continuously since selling quantities do not satisfy all of the demands for organic beef in Slovenia. According to the answers in questionnaires, the actors in this VBFC do not have any purpose to accept any quality-differentiating strategy to controlling the balance. The CC analyses shows that this can be huge mistake.

Plus-Minus-1 analysis		-1	Planika	+1
Attribute	Balance		Balanced	
	Specific product features		Yes	
	Geographical proximity		Yes	
	Environmental concerns		Take into account	
	Regional development		Take into account	
	Volume of production	Partly balanced	High	
	Turnover	Partly balanced	Raising	
	Employees		Falling	
	Fair share of benefits among value chain actors	Partly balanced	Yes	
Plus-Minus-1 analysis		-1	Ekodar	+1
Attribute	Balance		Partly balanced	
	Specific product features		Yes	
	Geographical proximity		No	
	Environmental concerns		Take into account	
	Regional development		Not to take into account	
	Volume of production		Medium	
	Turnover		Falling	
	Employees		Raising	
	Fair share of benefits among value chain actors	Unbalanced	Yes	

Figure 6. Comparison results between case studies

4. Conclusions

- The balance between quality, volume and economic performance differentiation in Planika and Ekodar case study is in general and for now reached, although some weaknesses which can unbalance the values and endanger the sustainable growth of VBFCs exist. CC analysis and its results can make a good contribution to actor's decision-making and for further successful and sustainable VBFC growth. Because of its relatively simple usage, the CC analyses is suitable for a wide range of users along the food chain, but in particular, it could be applied to actors and decision-makers in VBFC. Risku-Norja [9] explains that depending on the situation, different strategies can be used to secure the balance between quality differentiation, volume and economic performance.

- Table 1 present different strategies, which may be of interest for analyzed case studies and among them, which strategy/activity should be approved.

Table 1. The presence of strategy for securing the balance between quality differentiation, volume and economic performance in Planika and Ekodar case studies (strategies accorded to Risku-Norja [9])

Strategy	Planika	Ekodar
Increasing the production volume	x	√
Increasing the range of products	√	√
Finding new outlets for products	√	√
Combining food production promotion with other activities/ social activities	√	x
Finding very specific products and/ or specific customers	x	√
Adjusting the focus in quality differentiation	√	√
More focus on growth of networks rather than on growth of single units (multiplicative growth) - cooperatives	√	√
Co-operation with public actors	√	√
Regarding internal organization of the value chain, social conventions with codified rules have been introduced to secure the interests of the producers	√	x

Legend:

√- the strategy exist

x - the strategy does not exist

- In general, in both case studies most of strategies are taken into account. The Planika VBFC should improve the capacity and diversity of production line and Ekodar should pay more attention in promotion activities connected with social events and other informal promotion shapes. Nevertheless, both VBFC are evaluated with positive estimates (Ekodar - partly balanced and Planika - balanced), but there exists the fear of

unsustainable growth if actors will not develop the missing strategies presented in Table 1 with x.

5. References

- [1] Bohanec M. (2008). *DEXi: Program for Multi-attribute Decision Making. User's Manual, Version 3.00*. IJS Report DP-9989. Jozef Stefan Institute, Ljubljana, Slovenia. <URL:http://kt.ijs.si/MarkoBohanec/pub/DEXiManual30r.pdf. Accessed 29 September 2015.
- [2] Lee H. J., Röbbel N., and Dora C. (2013). *Cross-Country Analysis of the institutionalization of health impact assessment*. World Health Organization, Geneva. Switzerland.
- [3] Melo D. L., and Barenstein M. (2001). *IMF Working Paper: Fiscal Decentralization and Governance: A Cross-Country Analysis*. International monetary fund, Washington DC, USA, pp. 31.
- [4] Meyer R. (2003). *Potential for increasing food quality. Working report no. 87*. Office of Technology Assessment at the German Bundestag. <URL:https://www.tab-beim-bundestag.de/en/pdf/publications/summaries/TAB-Arbeitsbericht-ab087_Z.pdf. Accessed 13 October 2015.
- [5] Münchhausen van S. (2014). *Strategies for medium-sized values-based food chains during growth processes*. IFSA Conference Proceedings, Berlin, Germany, pp. 1-16.
- [6] Pavlovič M., Cerenak A., Pavlovič V., Rozman Č., and Bohanec M. (2011). *Development of DEX-HOP multiattribute decision model for preliminary hop hybrids assessment*. Computers and Electronics in Agriculture 75, pp. 181-189.
- [7] Prišenk J., and Borec A. (2015). *Characteristics of value based food chain in organic sector: (case studies from Slovenia)*. Congress smart agribusiness for the society of tomorrow. Poreč, Croatia. <URL:http://orgprints.org/29218/. Accessed 27 September 2015.
- [8] Pirog R., and Bregendahl C. (2012). *Creating Change in the Food System: The role of regional food networks in Iowa*. <URL:http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5105337. Accessed 1 October 2015.
- [9] Risku-Norja H. (2014). *Quality differentiation, volume and economic performance of organic food value chains: preliminary results from a cross country analysis*. Scientific seminar on organic food 2014, Book of abstracts, Mikkeli, Finland, pp. 29.
- [10] Rozman Č., Potočnik M., Pažek K., Borec, A., Majkovič D., and Bohanec M. (2009). *A multi-criteria assessment of tourist farm service quality*. Tourism Management, 30, pp. 629-637.
- [11] Stevenson G. W., Pirog R., Lyson T., Stevenson G., and Welsch R. (Eds). (2008). *Values-Based Supply Chains: Strategies for Agrifood Enterprises-of-the-Middle*. In: Renewing an Agriculture-of-the Middle: Situation and Strategy for the Center of the U.S. Food System, Penn State Press, USA, pp. 119-143.
- [12] Vacas L. R., Münchhausen van S., and Haering A. M. (2014). *Strategies for medium-sized value-based food chains during growing process with a particular focus on the business logic and management*. Organicprints.org. 2014. <URL:http://orgprints.org/24924/7/24924.pdf. Accessed 27 September 2015.
- [13] Woods T., Velandia M., Holcomb R., Dunning R., and Bendfeldt E. (2013). *Local Food Systems Markets and Supply Chains*. Choices, 28, (4), pp. 1-4.