Regional differences in Hungary: the current stage of local food production at the county-level

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Abstract
There is an increasing political interest in Hungary to relocalize food. Previous achievements on the Food Relocalization Index (Ricketts Hein et al., 2006) is used and applied to Hungary to map the local food activity. We focus on different indicators of production to consider the extent of small-scale food-related activity. Biophysical limits (the ratio of agricultural areas) are also considered to reveal areas where funds can be allocated to ensure efficiency. Eastern Hungary has the highest potential for further development as it has relatively high level of food activity and food production capacity.
Keywords: short food supply chains; small-scale farmers; regional differences; Rural Development Program; quantitative analysis

Introduction

In the last years a rapid spread of short food supply chains (SFSCs) was witnessed; and also, an increasing political interest to relocalize food. The latest EU study describing the state-of-the-art of SFSCs in the EU understands them as food chains where the number of intermediaries (most typically retailers) is minimized (ideally to zero); and food production, processing, trade and retail occur within a particular narrowly defined geographical area (Kneafsey et al., 2013).

The local food sector is paradoxical, because its economic significance is inversely related to its political status (Lobley et al., 2013). In the public discourse local food is mostly understood in opposition to the industrial, placeless, seasonless food linked to the global food delivery network. In this respect consumer preference for local food is often considered as an act of resistance to the globalization of food systems. While consumers trust in local farmers and preferences for local food would enable farmers to capture a better proportion of value added, SFSCs are also expected to act as tools of urban regeneration (Janssens and Sezer, 2013) as well as endogenous rural development (Peters, 2012); to maintain local natural resources, communities, knowledge, and traditions (Hendrickson and Heffernan, 2002); to differentiate agricultural production, and to intensify local identity and rural employment through rural tourism (Skuras et al., 2006).

The patterns and processes of SFSCs development in transition countries is particularly interesting as they are not necessarily comparable to that of experienced in the US or Western Europe (Jehlička et al., 2013, Jehlička and Smith, 2011). In fact, there is a limited knowledge about SFSCs as such from the whole region of Central-Eastern Europe. In Hungary, the dominant traditional forms of short food supply (such as farmers markets, market halls, farm shops) are over-dependent on public investments for their sustainable operation, while neo-traditional forms (box schemes, webshops, community supported agriculture schemes, buying groups) reached a rudimentary success in urban and peri-urban areas (Balázs, 2012).

Hungarian policy-making seems to be willing to answer the call phrased by the actors of the originally bottom-up local food movement. The New Agricultural and Rural Development Strategy 2020 created a new vision for sustainable local agro-food systems and promoted relocalization as a policy tool for reconnecting producers with consumers, the city and the surrounding countryside. Exemptions and flexibility rules have been successfully introduced favoring SFSCs developed by small-scale family farmers and small food-enterprises (Balázs, 2012). Within the Hungarian Rural Development Program, a thematic sub-program has been launched on the development of SFSCs to contribute to the implementation of the Multiannual Financial Framework 2014-2020 of the European Union. On the other hand, in contrast with the strong political desire, the number of small-scale producers is decreasing (Balázs, 2012).

In sum, relocalization of food provision has become an important policy goal in national and European scales. However, the discourses on the political as well as the advocacy level about the benefits and potentials of short food supply chains have been proliferating without quantifiable evidence about the sector or the spatial distribution of local food activities. Notable exceptions are Ricketts Hein et al. (2006) which generated an academic discourse on food geographies (Ricketts Hein and Watts, 2010, Watts et al., 2011) and also serves as the starting point of our approach; and an advocacy-driven Locavore Index[1].

The paper's main purpose is to find out how Hungary's food localization policy can be efficient in improving food security. Based on empirical evidence, areas are pointed out where policy-making should intervene in supporting short food supply.

Our work is based on the Food Relocalization Index (*FRI*) of Ricketts Hein et al. (2006). The Index was developed in order to map and reveal the strengths and weaknesses of different aspects of local food activity in England and Wales and also, to decide how representative previous case studies were and to justify further research. SFSCs seem to be heavily context-dependent due to different geographical, socio-economic and cultural characteristics. For instance, some of the composing indictors of the original FRI (such as the Women's Institute co-operative markets) are so typical to the English and Welsh environment (Ricketts Hein and Watts, 2010, Watts et al., 2011), that they cannot be interpreted elsewhere; therefore, the Index is adapted for Hungarian application. Besides mapping current spatial and social patterns of SFSC development, regional differences in terms of biophysical limits are also taken into account to better differentiate between areas with different rural development needs and potential. Thus, the idea that local food knowledge could be best served by relevant evidence provided by qualitative and quantitative analyses is promoted.

Materials and methods

The Index of Food Relocalization of Ricketts Hein et al (2006) is composed of two sub-indices: the production and the marketing sub-index. As our aim is to characterize the current patterns and future prospects of production, the former sub-index is in the focus of this research. There is a variety of potential indicators to quantify the activity of small-scale farmers but only a few of them is available for all the 19 counties and Budapest. The five indicators used are displayed in *Table 1*.

Table 1. The indicators of the Index of Food Relocalization.

Indicator	Rationale	Year	Data source
Number of organic farmers	Many organic farmers utilize SFSCs and many SFSC farmers adopt organic techniques. Similar indicator was used by Ricketts Hein et al. (2006).	2013	HU-ÖKO-01, HU-ÖKO-02
Number of local food producers advertising in the local food directory	Many SFSCs use the online social media. This indicator shows how much the farmers intend to use the increasing online possibilities. Similar indicator was used by Ricketts Hein et al. (2006).	2013	The NGO 'termelőtől.hu' Ltd.
Number of small-scale producers	Small-scale producers are the most likely to use direct marketing channels	2011	Land Information System

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[1] The Strolling of the Heifers Locavore Index created by a Vermont-based non-profit company presents an annual ranking based on the number of farmers markets, food hubs and CSA programs per capita in all 50 states and the District of Columbia.

Indicator	Rationale	Year	Data source
Number of certification schemes	The level of NGO activity is crucial in facilitating local food system development	2013	Hungarian Intellectual Property Office
Number of farms producing food for sale	This way farms that are entirely or partially used for food self-provisioning were excluded this way	2010	General Agricultural Census

Source: own compilation.

Small-scale farming and sales are regarded as the bases of SFSC development. The indicators displayed above focus on different aspects, thus none of them is perfect for diagnosis. The use of several indicators has the advantage that minor shortcomings are ameliorated in order to show general trends. In line with the original methodology, instead of the use of absolute numbers, counties were ranked for each indicator. '1' was given to the county with the highest number to indicate the highest level of engagement.

The 'Index of Food Relocalization with respect to current level of local food activity' (IFR_j) in county j is derived as follows:

$$IFR_j = 100 \frac{R_j}{NC},$$ (Eq.1)

R_j is the sum of individual indicator rank scores for county j, N is the number of indicators and C is the number of cases (counties). Budapest was regarded also as a county, according to the official administrative subdivision in Hungary. Index values may vary from 5.0 to 100 if a county gets 1st (top) and 20th (bottom) scores in every indicator, respectively. Lower IFR_j values indicate higher potential for being involved in the local food movement.

The outcome of the model was compared with the ratio of agricultural areas, RAA_j (data referring to 2010 were derived from the Central Statistical Office) with Pearson correlation. The ratio of agricultural potential shows the biophysical limits that should be taken into account, too, during policy-making. Normal distributions were tested with Shapiro-Wilk, Shapiro-Francia and Kurtosis tests.

During the optimal allocation of the funds, current level and biophysical limits also should be regarded in the same time. As lower IFR_j values show higher potential, the ratio of non-agricultural areas ($RNAA_j$) should be used during quantitative evaluation in order to have similar scaling system:

$$RNAA_j = 1 - RAA_j.$$ (Eq.2)

Thus, Optimal Allocation (OA_j) can be derived as follows:

$$OA_j = IFR_j \times RNAA_j.$$ (Eq.3)

Lower OA_j values reveal areas where funds should be allocated to ensure efficiency.

Results and discussion

Table 2 shows the scores and ranks of the individual indicators of local food production and the Index of Food Relocalization (*IFR*) in the capital and counties of Hungary.

Table 2. The scores and ranks of the individual indicators and the Index of Food Relocalization.

County	Number of organic farmers		Number of local food producers advertising in the local food directory		Number of small-scale producers		Number of certification schemes		Number of farms producing food for sale		*IFR*
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	
Szabolcs-Szatmár-Bereg	146	1	934	5	864	5	2	7	5082	9	**27.0**
Bács-Kiskun	119	2	122	20	1847	2	4	2	13 442	2	**28.0**
Hajdú-Bihar	112	3	542	12	1080	3	1	9	9444	3	**30.0**
Pest	81	6	822	7	598	9	4	2	5464	7	**31.0**
Jász-Nagykun-Szolnok	72	9	654	10	772	6	2	7	19 269	1	**33.0**
Csongrád	49	10	374	15	947	4	5	1	7651	5	**35.0**
Győr-Moson-Sopron	89	4	486	13	564	10	1	9	4175	11	**47.0**
Borsod-Abaúj-Zemplén	87	5	290	16	355	14	3	4	5375	8	**47.0**
Békés	80	8	234	17	2130	1	0	17	9235	4	**47.0**
Tolna	29	16	990	4	732	7	1	9	3079	12	**48.0**
Zala	25	19	1 158	1	332	15	3	4	2644	13	**52.0**
Heves	32	13	598	11	386	13	1	9	5937	6	**52.0**
Veszprém	35	12	1 102	2	267	17	1	9	2103	17	**57.0**
Baranya	40	11	178	18	536	11	3	4	2346	15	**59.0**
Somogy	31	15	878	6	518	12	0	17	4972	10	**60.0**
Vas	26	18	1 046	3	274	16	1	9	2148	16	**62.0**
Fejér	32	13	430	14	626	8	0	17	2608	14	**66.0**
Budapest	81	6	166	19	227	18	1	9	345	20	**72.0**
Nógrád	28	17	766	8	71	20	1	9	1132	18	**72.0**
Komárom-Esztergom	24	20	710	9	212	19	0	17	1005	19	**84.0**
Sum	**1 218**	**-**	**12 480**	**-**	**13 338**	**-**	**34**	**-**	**107 456**	**-**	**-**

Source: own compilation. Data sources of the individual indicators are shown in *Table 1*.

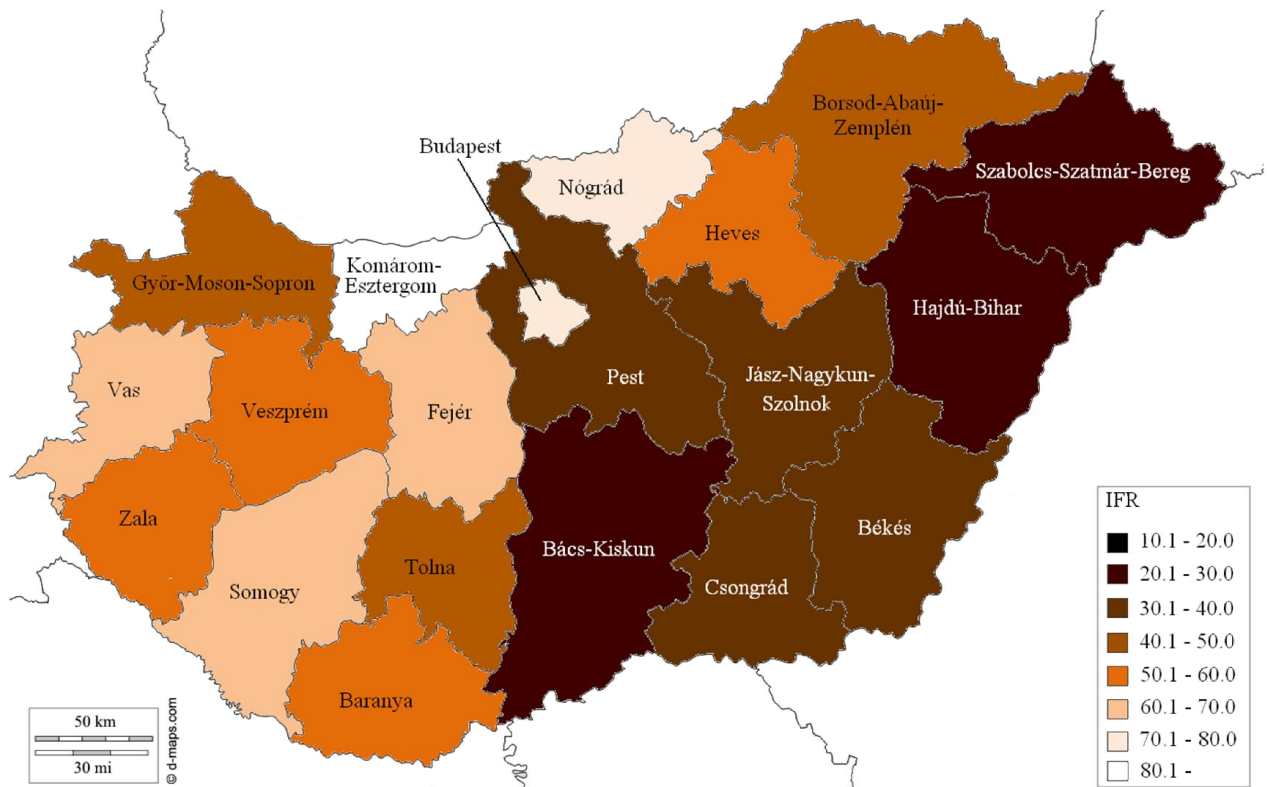Results are visualized in *Figure 1*.

Figure 1. The current level of food production in Hungary. Source: own calculations.

Different indicators of local food production score remarkably different in case of certain counties; which implies an uneven development. For example, Bács-Kiskun County can be regarded as highly developed (compared to other regions), local food activity is relatively wide-spread; but the use of the online and social media is not typical among farmers. Thus, with the aim on the analysis of indicators, realistic policy goals can be set.

The most developed area of Hungary (with respect to GDP) is the capital, Budapest, which has middle or bottom scores for most of the indicators. The eastern part of Hungary seems to have higher potential for development as the foundations (presence of small-scale farmers) are stronger, more typical there. This pattern weakly coincides with the ratio of agricultural areas in the counties displayed in *Figure 2* (R^2=0.2686; p=0.0192; the results of the tests on normal distributions are shown in *Table 3*). The current level may be the consequence of certain geographical characteristics (the Great Plain lies at the eastern-south-eastern part of Hungary) as well as land use traditions. The northern part is hillier, where forested landscapes are much more typical.
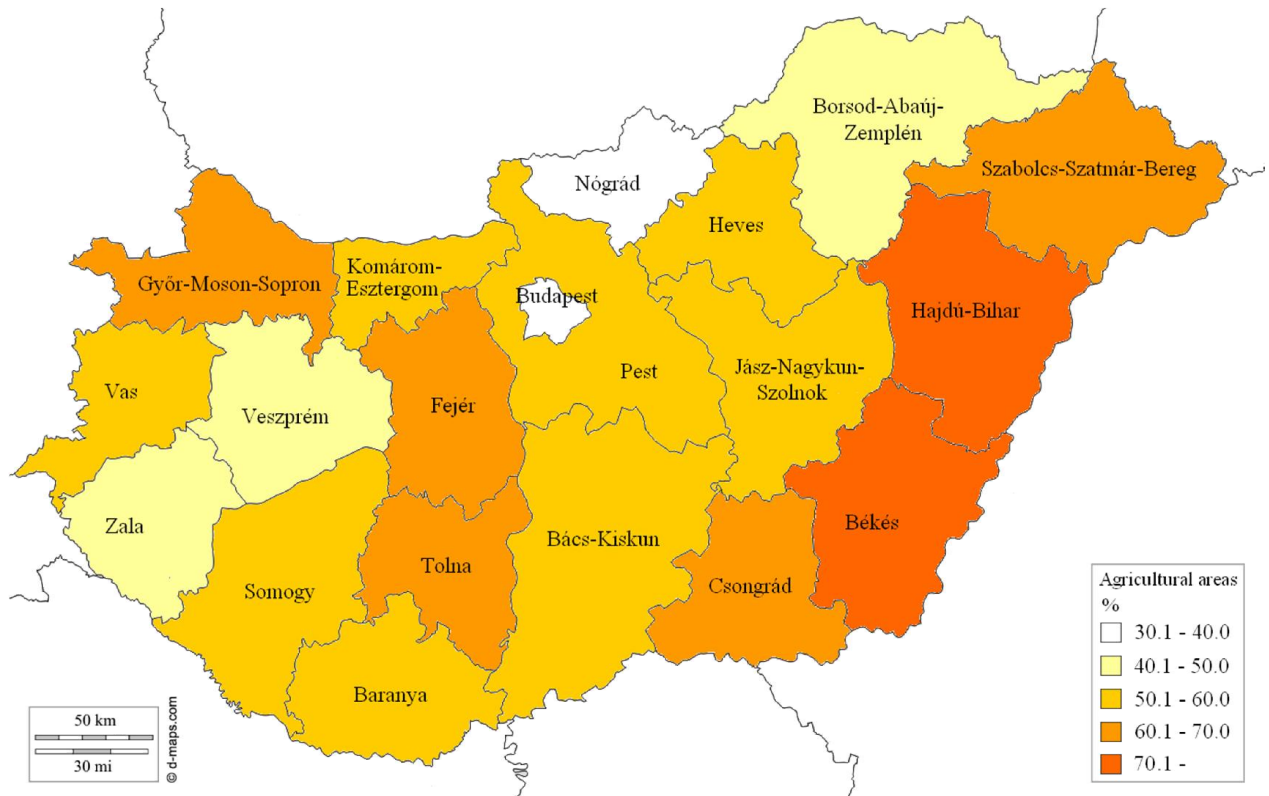
Figure 2. The ratio of agricultural areas in the Hungarian counties and Budapest. Data source: Central Statistical Office. Data refer to 2010. Country average: 57.%.

Table 3.The results of the tests on normal distributions.

	IFR	Ratio of agricultural areas
Shapiro-Wilk p value	0.49025	0.97000
Shapiro-Francia p value	0.63687	0.99117
Kurtosis test p value	0.7027	0.9178

Source: own calculations.

Table 4 shows where the funds should be allocated to ensure efficiency.

County	IFR	RAA	RNAA	OA
Hajdú-Bihar	30.0	0.723	0.277	8.3
Szabolcs-Szatmár-Bereg	27.0	0.645	0.355	9.6
Békés	47.0	0.769	0.231	10.8
Bács-Kiskun	28.0	0.593	0.407	11.4
Csongrád	35.0	0.658	0.342	12.0
Jász-Nagykun-Szolnok	33.0	0.585	0.415	13.7
Pest	31.0	0.531	0.469	14.5
Tolna	48.0	0.692	0.308	14.8
Győr-Moson-Sopron	47.0	0.613	0.387	18.2
Baranya	59.0	0.589	0.411	24.2
Heves	52.0	0.529	0.471	24.5
Fejér	66.0	0.618	0.382	25.2
Borsod-Abaúj-Zemplén	47.0	0.461	0.539	25.3
Somogy	60.0	0.512	0.488	29.3

County	IFR	RAA	RNAA	OA
Zala	52.0	0.424	0.576	29.9
Vas	62.0	0.515	0.485	30.1
Veszprém	57.0	0.438	0.562	32.1
Komárom-Esztergom	84.0	0.547	0.453	38.0
Budapest	72.0	0.375	0.625	45.0
Nógrád	72.0	0.359	0.641	46.2

Table 4. The optimal allocation of funds. Source: own calculations.

The eastern-southern-eastern parts of Hungary reached the highest scores; local food production development should be favored in this area the most.

The analysis reveals some mismatches: areas of which potential remained unexploited. For example, in Komárom-Esztergom County the biophysical characteristics are around the country average, but the current level of production lags behind. It implies that the main limiting factor is the low level of current production in local food system development.

Conclusions

The novelty of this paper is threefold. First, presents the current status of local food system production, the basis of short food supply chains (SFSCs) from a transition country. Second, by applying the Food Relocalization Index (Ricketts Hein et al., 2006) quantitative results are presented for policy-making about the current patterns of small-scale food production in the counties of Hungary. Having quantitative results is a pre-requisite of evidence-based policy planning in the light of the coming EU funding possibilities in the 2014-2020 period. Finally, a new method is proposed to characterize the possibilities of a supporting policy; to help the assessment of the policy success by evaluating where the goals related to SFSCs can be achieved the fastest.

The application of the Index of Food Relocalization in Hungary posed significant difficulties. Similar indicators from statistics could be found in some cases only, and some stayed without the necessary cultural equivalent form, such as the Women's Institute co-operative markets. Similarly to the original study, data availability was a limiting factor. Still, we can conclude that the Index is easily adaptable and it proves to be a valuable tool for mapping local food activity and so it can support policy-making.

Acknowledgements

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