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Agris on-line Papers in Economics and Informatics

Volume V Number 3, 2013

Information Support of Regions – Organic Farming

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Anotace

Příspěvek prezentuje možnosti informační podpory regionů prostřednictvím mapového výstupu v prostředí www aplikace. Představuje aktuální stav řešení mapového portálu s využitím datové základny ekologických farem v ČR. Mapové výstupy jsou zobrazovány pomocí nové verze systému MPRR 2.0 (Mapový portál pro rozvoj regionů verze 2.0) a pilotně zpracovány pro ekofarmy na území Jihočeského kraje. Výsledky řešení představují výchozí data s platností pro rok 2012 (evidence MZe ČR k 31. 12. 2011), která byla validována a zanesena do databáze. Z celkového počtu 516 ekofarem bylo možné ověřit a mapově lokalizovat 472 subjektů.

Klíčová slova

Ekologické zemědělství, www, rozvoj regionů, Google Maps, mapový výstup.

Abstract

The paper strives to introduce opportunities for information support of regions by means of a map output within www application. It presents a recent solution of a map portal using a database of organic farms in the Czech Republic. The map outputs are visualized by means of a new version of the MPPR 2.0 system (Map Portal for Regional Development – version 2.0) and have been processed for the South Bohemian Region organic farms in the pilot stage. The results account for initial data from 2012 (organic farms in the records of the Ministry of Agriculture as at 31st December 2011) that have been verified and recorded in the database. Out of the total number of 516 organic farms in the region, it was feasible to verify, localize and position 472 entities.

Key words

Organic farming, www, regional development, Google Maps, map output.

Introduction

For several decades now, organic farming has constituted a worldwide strategy leading to both sustainable development and environment protection. As a result, it has been endorsed by public. Within the framework of the EU, organic farming has become an integral part of the Common Agricultural Policy and has been systematically subsidized.

The Czech Republic is also dedicated to the development of the organic farming sector. Organic farming contributes to the production of environment-friendly, healthy and nutritious quality foodstuff thanks to its production processes and practices. Moreover, its production is primarily focused on local markets. Selling organic products in their place of origin also encourages regional development as it involves employment opportunities, direct selling (cash circulation in local economy) and other activities provided by organic farms (visits or stays at farms, excursions and tours, various courses and lectures aimed at promoting healthy lifestyle etc.). The above also raises general attractiveness of regions.

Recently, the importance of presenting organic farming has been growing. Individual farmers and organizations or bodies involved in the field strive to promote the products and services while consumers and tourists on the other hand search for information (organic products purchase, eco-agrotourism services etc.).

The development and spread of the Internet and Internet technologies has been bringing the abundance of web presentations entailing a lot

of information and outputs for their users.

However, the quality of the fore-mentioned outputs is quite diverse. Some resources might be eye-catching and attractive but comprise just partial information on the entity (often also inaccurate) or fail to provide sufficient terminological explanation which may lead to confusing consumers‘ confusion.

Another problem might lie in the availability of up-to-date official information required by the public. If the information needed is not available or its quality is insufficient, a room for other entities involved or in the sector remains open. Many factors then influence the quality and relevance of the respective outputs.

Having in mind that map resources (outputs) in the form of web portals are far from being common in both organic farming and agriculture in general, we can observe a lack of information resources related to the issue in question. This speaks for originality of the solution presented in this paper.

The above-mentioned fact might be caused by a lack of appropriate data resources (this argument does not really work for the CR and also other EU countries), by underestimating or not mastering the technologies, often together with the data volume, or, as the case may be, also by a lack of good will or interest to present information in this way.

In global-scale, there exists e.g. an output in the form of a world map „World Map of Organic Agriculture“[9] which can stand for a certain synthetic output for 2011 (Density Equalizing Map). Beyond all doubt, it would be beneficial to animate the individual map components, provide them with a commentary, display the presentation on the web portal etc. Generally speaking, this is the case of a wide range of „static“ outputs. While talking about organic farming, we can mention for instance [2] or [8].

Geographic Information Systems (GIS) or GIS combined with a web portal also offer interesting opportunities related to our issue. However, GIS applications are recently more aimed at collecting spatial data from sensors etc. [4], [12], often as an integral part of web solutions [3].

Materials and methods

Organic farming represents a typical sector where transparent and well-arranged official information should be available since it is strongly subsidised, the farms are run in accordance with Law no. 344/2011 Coll. (Law on organic farming) and are listed on the official list comprising organically farming entities. The farms in question have to comply with continuous inspections and supervision carried out by the Ministry of Agriculture (compliance with Law 344/2011 Coll.) through authorised control bodies. These bodies ensure all the respective checks and certifications.

Therefore, the above list offers a database that is to provide comprehensive official outputs. These outputs should be then optimised for the sake of different users/user groups and subsequently presented in an appropriate way. Unfortunately, just this presentation is completely missing.

The database itself is available on the eAGRI portal only in the form of an .xls grid (The grid can be found as „Celkový seznam osob podnikajících v EZ_201x“.). In the past years, these data served as the basis for the creation and verification of the database. However, the last version published has a different data structure that does not correspond to the original one. On the other hand, a new resource is now available on the eAGRI – Register of Organic Farmers. The register entails an up-to-date survey (continuously updated) and contains also with other properties. Nevertheless, the access is through searching. [7]

If a subject of interest is bound to a concrete area or location, it is very effective to save information in the database of a map portal and present it by means of a map output – in this particular case, a map of organic farms in the Czech Republic.

Organic farming – recent situation

In the Czech Republic, organic farming has been developing since the beginning of the 90‘s and its progress has been determined by the volume of financial means invested in the sector. While monitoring the spread of organic farms, a rather uneven distribution on the territory can be observed. Most organic farms are concentrated to less favourable montane and submontane areas of the Czech Republic. This has a direct impact on their activity and focus. We can therefore observe the predominance of permanent grassland over arable land and other cultures that represent an incomparably lower share in the land resource structure. The South Bohemian region has been chosen as a typical representative of the above attributes and therefore a suitable example to meet the objectives of the present

paper. It has the biggest area of organically farmed land (14.4% of the total organically farmed land in the Czech Republic - as at 31st December 2011[6]) and at the same time the highest number of organic farms (13.4% of all organic farms in the Czech Republic – as at 31st December 2011 [6]). Taking into account the above-mentioned factors, the pilot solution is on purpose validated on the database of the South Bohemian region.

Technical solution – MPRR Map Portal

In order to solve the above-mentioned problem, a universal software solution MPRR (Map Portal for Regional Development) has been created and used. The MPRR is a general solution enabling to work with virtually any database (universal applicability). It can be parameterised to different output forms following the analysis of the issue given or user requirements. The latter features guarantee its wide applicability.

The original MPRR 1.0 solution offered standard basic functions such as e.g. visualizing objects on the map, visualizing basic or more detailed information on the object marked, map-scale change (zoom) etc.

Apart from the above features, the MPRR entails other significant functionalities such as e.g. filtering and sorting the objects visualised according to different criteria, dynamic change in the number of visualised objects etc. While changing the map scale, dynamic change means aggregation of individual objects into cluster groups (zoom out) on one hand, and declustering into smaller subgroups or individual objects (zoom in) on the other hand. This leads to a significantly better clarity of the output – standard map outputs where objects are visualized only on one level often look like a jumble of points in a map. Aggregate object clusters are indicated by the zoom icon with a numeric indication of the exact number of objects included (see Fig. 2 and 3).

In order to realize an up-to-date map output, a new version of a complex SW solution related to geographical object presentation within the World Wide Web has been developed – Regional Development Map Portal version 2.0 (MPRR 2.0).

Results and discussion

As at 31st December 2011, 516 South Bohemian organic farms were registered in the database of the Czech Ministry of Agriculture [6]. This number accounts for almost 13.4% of all organic farms in the Czech Republic while these farms farm approximately 14.4% of the whole organically farmed area in the Czech Republic.

Primary mapping data were generated from this database. The database is compiled by control bodies and organizations while registering and controlling organic farms in the course of the year. Organic farms located in the South Bohemian region according to the database were first checked against the ARES system (Administrative register of economic entities) in order to verify if their economic activities comply with organic farming. Individual farms were then localized in the Google Maps by means of GPS coordinates (6 decimal place accuracy). Out of the total number of 516 organic farms, approximately 9.3% could not have been traced by their address. This was caused mostly by the lack of farm number (i.e. manual localization was not possible too), identical address of the place of business and farm (densely populated built-up area where organic farming is not possible). Unfortunately, specifying data concerning those farms was not possible even after own survey (local inquiry, telephone survey). The remaining 90.7% organic farms (i.e. 472 entities) were successfully localized, used for the map development and depicted (see Fig. 2).

Table 1 and Fig. 1 below can be used for illustrating one of the trends in the organic farms‘ focus, i.e. orientation to permanent grassland. The situation is connected to the pilot stage in the South Bohemian region.

Within the framework of new data collection, a new version MPRR 2.0 (Map Portal for Regional Development version 2) has been developed. The original environment and libraries were retained since their long-term functionality and reliability has been proven and can be taken for granted. MPRR 2.0 therefore runs within the Apache Web Server, MySQL 5 database, Google Maps API version 3, JavaScript, JQuery framework, jQuery plugin bMap 1.3, MarketCluster Library for Google Maps API, JSON technology, PHP Nette Framework, Dibi database layer and Google Maps Icons. Further details can be found e.g. in [11]. Technological aspects of these solutions are provided e.g. in [5], [12], [14].

Furthermore, the database structure has been optimised for a more effective search and classification. Based on the trials, testing and users‘ feedback, the user environment (GUI) has been

innovated too, for instance, visualization of multiple entities on one single address/place of business, speed of visualization etc. Last but not least, the new version offers also enhanced functionality on mobile devices. An example can be seen in Fig. 4.

The final solution displayed in the portal stems from the maximum effort to validate, assemble and complete all data resources, including efforts to find a precise organic farm location and subsequently to position it in the map (data validity and map location accuracy). The map output includes as well a detailed methodology available within the framework of the application.

The new version of the portal (data related to organic farms in 2012, as at 31st December 2011) is freely available on **http://mapy.agris.cz/2012/ekologicke-farmy/mapove-podklady.**

District	"Organically farmed land share [%]"	"Permanent grassland share in organic farming [%]"	"Arable land share in organic farming [%]"	"Permanent cultures share in organic farming [%]"
České Budějovice	11.38	**31.68**	4.19	15.47
Český Krumlov	45.27	**66.94**	4.36	1.29
Jindřichův Hradec	10.61	**27.63**	3.16	8.34
Písek	3.60	**13.19**	0.92	0.06
Prachatice	33.16	**49.06**	3.43	0.83
Strakonice	6.02	**18.67**	0.93	0.04
Tábor	2.17	**8.25**	0.38	0.32

Source: processed on the basis of [1, 6]

Table 1: South Bohemian region – district data as at 31st December 2011 (valid for 2012).

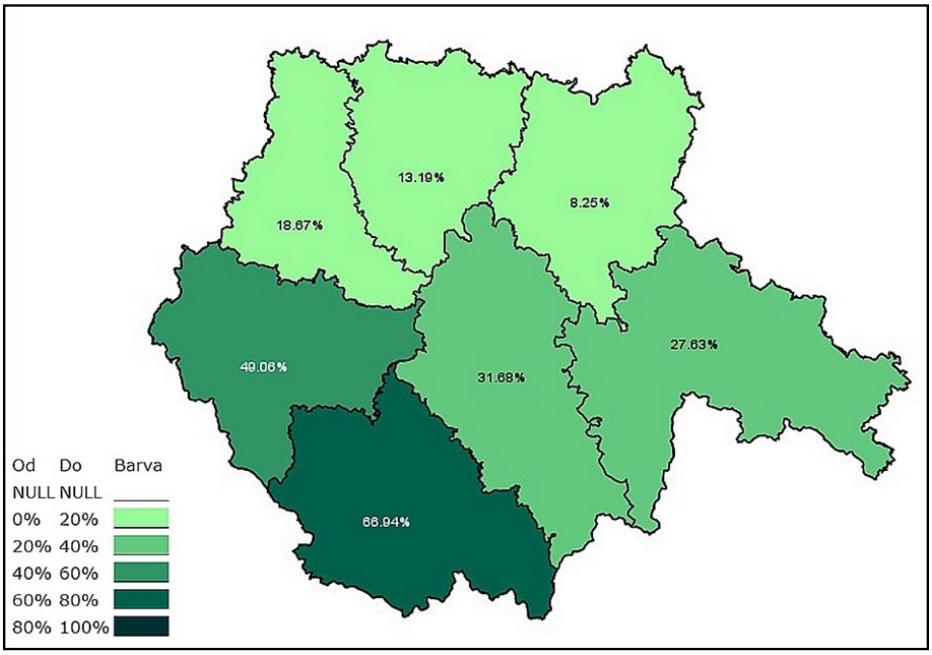
Table 1 – commentary:

Organically farmed land share – share of organically farmed land in the total area of farmed land in the district.

Permanent grassland share in organic farming – share of organically farmed permanent grassland in the total permanent grassland area for the district.

Arable land share in organic farming - share of organically farmed arable land in the total arable land area for the district.

Permanent cultures share in organic farming - share of organically farmed permanent cultures (hop gardens, vineyards, orchards) in the total permanent cultures area for the district.

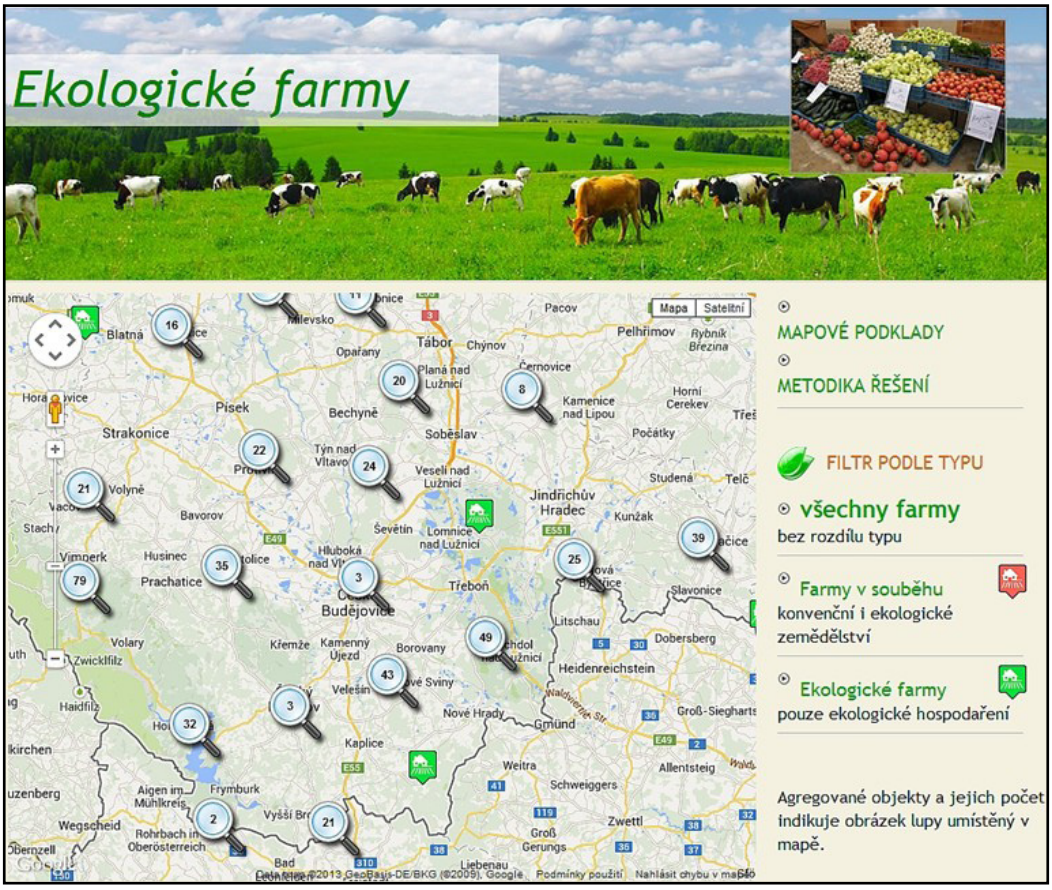


Source: own processing

Figure 1: Permanent grassland share in organic farming (South Bohemian region - districts).

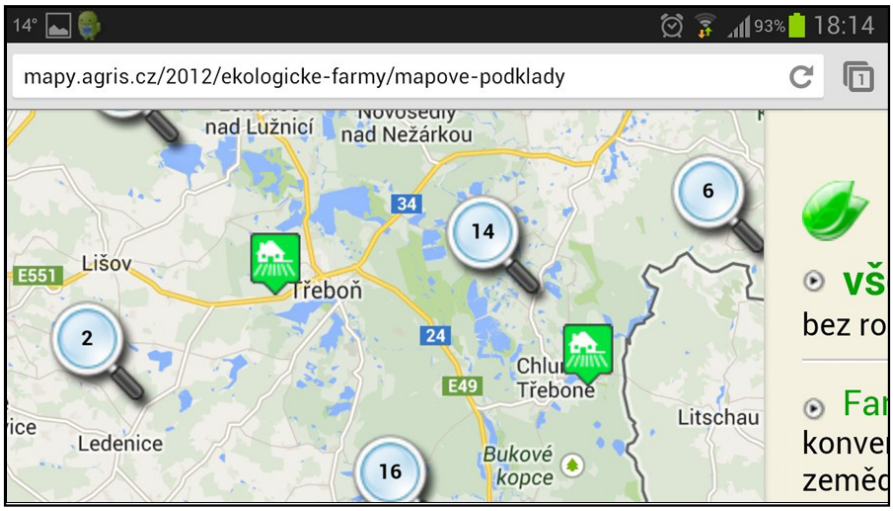
Source: own processing

Figure 2: Overall view of the pilot solution - South Bohemian Region (total number of farms in the database – verified and localised farms).



Source: own processing

Figure 3: Implicit preview of the map portal (Homepage) – South Bohemian Region.



Source: own processing

Figure 4: Detail on a mobile device (Samsung Galaxy S III smartphone, Google Chrome browser).

Conclusions

The presented universal software solution (Map Portal for Regional Development version 2.0) allows users to work with virtually any database and can be parameterised into different outputs following the analysis of an issue given or user requirements. These features among others guarantee its very wide applicability.

While developing the MPRR database, 472 organic farms out of the total number of 516 entities registered at the Ministry of Agriculture have been verified and saved. In other words, 9% of subjects could not have been verified properly (sometimes not even by a local inquiry). It can be therefore estimated that a relatively big group of entities comply formally with the registration requirement and are eligible for subsidies but their organic farming activities are only formal. This issue is most often related to permanent grassland (likewise orchards for instance). It of course does not imply that all subjects registered as meadows, pastures or orchards fall in the aforementioned category.

Taking into account the development dynamics, it would be appropriate to update the database on a yearly basis (or even better continuously). Resources related to newly registered subjects have to be verified, complemented and positioned in the map. At the same time, it is vital to eliminate those subjects that stopped their operation or lost relevant certifications.

When the first original solution was designed and put into practice, there actually existed no map output related to organic farms. That is basically why the solution is supposed to have a great user potential. The portal is intended to be widely used especially by the state administration, professionals in the field (detailed characteristics of the production base), producers - farmers (promoting products and services) and last but not least also by consumers as such (purchasing organic products, exploiting services provided by the farms – accommodation, training etc.). The information and databases can be also made available to control and certification bodies by means of a secured access (login, password). The system could then provide not only detailed information on the individual enterprises but in the extended version also controls/certifications register, their results etc. Another room for use can be found for instance within professional organizations and associations. As we can see, the potential of MPRR is really huge.

For completeness sake, it has to be stated that a relatively interesting web presentation of the PRO-BIO association is now available using similar principles as the MPRR 1.0 for the list of members. It is likely that the solution has been derived from the MPRR 1.0. Nevertheless, the scale is much lower comprising only 51 subjects (members) in the South Bohemian region and the map output is not used to provide an overview of farmers, manufacturers and sellers, which would be undoubtedly more interesting (it provides a mere directory with extended activity description). [10]

Beyond all doubt, the map output over a valid database represents a very promising and comprehensive presenting tool for all information

that would otherwise be hard to share or to find. The MPRR solution can significantly contribute to an effective informational support of regions, i.e. it can support many different kinds of regional activities, including the organic farming sector.

Acknowledgement

The knowledge and data presented in the paper were obtained as a result of the Research Program titled "Economy of the Czech Agriculture Resources and their Efficient Use within the framework of the Multifunctional Agri-food Systems" of the Czech Ministry of Education - Number VZ MSM 6046070906 and 6046070906 and Grant No. 20121057 of the Internal Grant Agency titled „Organic Farming – Map Portal Presentation Opportunities".

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