

LET's start a new LETS: Learning from a case study in Brno, Czech Republic

Lukáš Kala, Eva Fraňková, Jan Labohý, Jan Fousek

Envigogika 8 (4) – Reviewed Papers

Abstract:

This paper presents information about the operation of RozLEŤSe, a LETS (Local Exchange Trading System) network, based in Brno, Czech Republic. LETS are complementary monetary systems in which local community networks attempt to emancipate themselves from the international economy by using their own currency. LETS are supposed to promote sustainable development by localising economic relationships. Although several LETS groups were developed in the Czech Republic between 1990 and 2000, all of them vanished during the first few years of the new millennium. RozLEŤSe was built from the remains of one of these former LETS groups. The aim of this study is to evaluate its current operations and to determine possible threats to the future existence of the group. It is a sociological case study examining the socio-demographic characteristics, motivations and organisational operations of the group. We point out some serious threats to the group (lack of supply, growth in negative credit, decrease in trust) and we discuss some possible solutions.

Keywords:

Local Exchange Trading Systems (LETS), community currencies, sustainable development, RozLEŤSe, case study

1. Introduction

In the last two decades, community currencies have become a growing form of alternative monetary systems that exist beyond the control of mainstream economic institutions such as banks or governments. There are more than 4,000 forms of community currencies all around the world (Blanc and Fare, 2012). Community currencies (also called local currencies, here used as a synonym) belong to the broader category of complementary currencies, which is a generic term for alternative exchange systems. There is a wide range of various forms of complementary currencies that "have been springing up in developed and developing countries since the 1990s as a response to social, economic and environmental needs, in the form of skills-exchanges, modern-day barter, green versions of supermarket reward schemes, and even notes and coins" (Seyfang, 2009, p. 141).

From this broad variety of complementary currencies, the so-called Local Exchange Trading Systems (LETS) are among the most popular models. There are about 250 LETS in the world registered in the Online Database of Complementary Currencies Worldwide, servicing almost eight hundred thousand members.¹ Compared to classic barter systems, where services and goods are exchanged directly between participants, LETS are based on an exchange medium in the form of local virtual currency which allows participants to trade member-to-member within the entire community. Technically speaking, LETS represent "membership clubs using a virtual currency created at the moment of transaction as a credit for the seller of a good or service and a debit for the buyer" (Dittmer, 2013, p. 3).

Within a LETS, participants can offer or request goods and services through a website (like Cyclos²), newsletter, notice board, or meetings. Actual transactions are usually negotiated and undertaken between two members of the LETS group where the provider receives some kind of tradable credit³ from the buyer. "Local currency is not issued by a bank but by its members; therefore, this money is theoretically unlimited and economic activity need no longer be restricted by a lack of money" (Caldwell, 2000, p. 4). The system is often managed by volunteers, who are simultaneously participants and administrators.

According to many authors,⁴ LETS have the potential to address current economic, social, and environmental problems, e.g. by building community and local economic networks, supporting alternative values, allowing for the realization of alternative livelihoods, contributing to eco-localization (Dittmer, 2013), creating environmental awareness, resource-sharing (Collom, 2011; Seyfang and Longhurst, 2013), and opening access to goods and services to those who might otherwise be financially excluded or unable to find formal employment (Williams et al., 2001). For these reasons, community currencies (including LETS) have been promoted as tools that can contribute towards all

1 Within this database, 32 initiatives use the "LETS" acronym in their name, 18 describe themselves featuring a LETS type of exchange system, and ten are doing both. For details see http://www.complementarycurrency.org/ccDatabase/les_public.html (2013-01-10).

² Cyclos is software for the administration of online payments for transactions within complementary currency systems.

³ "These local currencies are usually pegged to the national currency and are tracked electronically or by a checkbook system through a centralized administrator" (Collom, 2011, p. 146).

⁴ See Johanisová et al. (2013).

three pillars of sustainable development, as discussed by Seyfang and Longhurst (2013, p. 67).

Despite the fact that LETS groups have such a potential, both internal and external barriers prevent them from achieving the kinds of impact they initially promised (see Seyfang and Longhurst, 2013, p. 73). Some authors have already described the decline of LETS systems, which is usually caused by disagreement about how a group should be operated, an insufficient supply of specific goods and services (e.g., a lack of food and skilled and manual labour), or by geographical distance between members (see Crowley, 2004; Schraven, 2001). Surveys such as that conducted by Williams (2001) have shown that ideology (e.g. environmental) usually attracts the attention of people ready to join LETS, but fails in achieving practical needs and a sufficient number of active members. Crowley (2004), reporting similar results based on investigations in Ireland, suggests three conditions which could prevent the decline of LETS:

"Firstly, that the range of goods and services needs to be expanded, so that people can get what they need from it. Secondly, it needs to become less like an environmentalist club that spreads by word-of-mouth, and a broader membership targeted through local publicity campaigns. Thirdly, there needs to be more equity of payment for work performed by all members so that social inequality is not reproduced within the LETS." (Crowley, 2004, p. 29)."

The same trends observed in Western countries have been described in the Czech Republic, too. During the 1990s, the first complementary currency groups were established by environmental activists in Prague, Brno, and České Budějovice. Jelínek (2012) reports that the main purpose of these groups was to enable and promote environmentally-friendly behaviour more than to meet the everyday needs of their members. These groups vanished at the beginning of the new millennium because of "fatigue of the LETS organizers", "little real economic need for bartering among LETS members", and "other priorities of the LETS organizers, who were closely connected with environmental organizations" (Jelínek, 2012).

After several years without a working LETS group in the Czech Republic, the RozLEŤSe group was established in Brno in November 2010. Subsequently, they started regular trading after adopting the Cyclos software in February 2011, and after two years they had 41 active members.⁵ The aim of this study is to understand how the group currently operates and to analyze potential threats to its future development. In studying the group, we posed the following main questions: 1. Who uses the RozLEŤSe network and how? 2. What are the motivations for their participation in RozLEŤSe? 3. What are the motivations for trading there? 4. How satisfied are participants with the group and trading? 5. What factors or barriers limit access and participating in LETS?

Although the great potential of LETS for sustainable development is often highlighted in the literature (i.e. Seyfang and Longhurst, 2013), so far there has been little discussion about the defects within these systems. This article investigates the operation of the LETS group called RozLEŤSe with a special focus on potential threats. This study allowed us to compare our results with similar research from abroad. It could also provide some useful

⁵ We consider members as „active“ if they trade (almost) every month. The number of active members varies over time, during the last six months of the analyzed period it was between 29 and 41 people. More than half of the members, on the other hand, traded only once or twice during the whole analyzed period (24 months).

information for people who would like to start a new LETS or to improve the work of an existing one.

2. Methods

During spring 2013, several introductory interviews with key contact persons from RozLEŤSe were conducted regarding the history, organizational structure, decision making processes, and activities of the group. Our research project was presented to the group at one of its regular meetings where we proposed our intention to analyze the transactions within the RozLEŤSe group (the main objective of the project), and to carry out a survey to better understand the work of the group (the subject of this paper). Subsequently, access to the transaction data and the distribution of the questionnaires were arranged. The transaction data were analyzed via a transaction network analysis, a methodological tool which allows visualization and inspection of systems with network properties (i.e. complex systems including numerous entities which are linked by specified relations). It allows analysis of basic network properties in the case of LETS, e.g. the number of transaction partners, volume of their trades, topology of the trading relations, etc.⁶

The survey was designed after we obtained data from the transaction network analysis. To present all the results of the transactional research is beyond the scope of this paper. In order to better understand the features of the RozLEŤSe group, we present here only a few relevant numbers: 1. There are 89 members who have traded at least once and about 35 active participants who trade almost every month; 2. the total number of transactions per month ranges from 50 to 100; 3. the amount of cash flow is about 15,000 BRKs⁷ per month; and 4. the most frequently traded items within the group are second-hand goods, services (especially massages and therapy), and processed food.

For this part of the project, the online survey was used to explore the socioeconomic profiles of the members, their history and interactions within RozLEŤSe, their motivations for participation, and their views about the operation of their LETS system. The questionnaire was distributed during June and July 2013. An electronic form with both open-ended and close-ended questions was distributed to all RozLEŤSe members by email, and subsequently a printed version of the same form was distributed during the RozLEŤSe meeting in July 2013. Of the 89 subjects to whom the questionnaire was sent, one third returned the form.⁸ All questionnaires were analyzed both qualitatively (open-ended questions) and quantitatively (close-ended questions).

The questionnaire was designed to: a) identify the socio-economic profiles of the group members, b) determine personal motivations for joining the group, c) determine motivations for trading within LETS, d) evaluate personal participation, and e) evaluate the operation of RozLEŤSe. In order to identify who the members of RozLEŤSe group are, we included several standard socio-demographic questions regarding gender, age, education,

⁶ This specific approach resulted in a complex description of the system and allowed us to identify the key active members. Thanks to that type of data, we could also simulate scenarios of e.g. the removal of key transacting persons from the network. These findings will be published in another paper (see Fraňková et al, submitted).

⁷ BRK is Rozleťse currency and corresponds to the value of the Czech Crown and approx. 4 Euro cents.

⁸ However, we received responses from the majority of active participants (72%). Passive members did not respond at all.

occupation, socio-economic situation, marital status, and household type. Within this section we also asked our respondents: *How many Czech crowns do you spend each month on living? How many BRKs do you spend each month on living? For how long have you been a member of the group?*

Another two sections of the questionnaire were related to personal motivations. Two open-ended questions were posed: *Why did you join RozLEŤSe?* and *What most motivates you to trade within RozLEŤSe?* These questions were followed by statements where respondents expressed their agreement or disagreement:⁹ *To be a member of RozLEŤSe helps me to reduce my dependence on the current economic system. RozLEŤSe contributes to the sustainable development of our society.* The next section of the questionnaire concerns personal participation within the group. We asked respondents the following close-ended question:¹⁰ *In comparison with other members, do you consider yourself rather active or inactive?* This question was followed by three statements where respondents indicated their attitude on the scale as above (see footnote 9): *I have found new friends within RozLEŤSe who I also meet beyond trading; Thanks to RozLEŤSe I can afford goods and services that would normally be unaffordable for me; I have employed my skills and proficiency that I would not be normally paid for.* The last section of the questionnaire relates to the work of the group. The questions were intentionally configured to be open-ended: *Do you consider the frequency of transactions within RozLEŤSe sufficient? For how long is it fair to leave an account in debt? Are you satisfied with the goods and services that are traded in RozLEŤSe? What are the main advantages of RozLEŤSe? What are the main problems of RozLEŤSe?*

Considering the relatively small number of responses we received, we did not create a formalized system for the coding of open-ended questions, we simply grouped those expressing similar positions. The responses to close-ended questions and the responses to statements were analysed on the basis of the frequency of the selected options. We present our findings both in relative¹¹ (only the most frequent responses) and absolute figures.

3. Research findings

3.1. Sociodemographic data

Of the twenty-five respondents, fourteen were female and eleven male. The average age of the respondents was 40 and ranged from 22 to 63. Most of them were younger than 30. Education level, occupation, and household type ranged broadly. Most respondents (16, i.e. 64 %) had a university degree; nine had completed at least some college education. The largest number of respondents (5) worked in the service sector, four were employed in education and academia, four worked in manual professions, four worked in business, three were homemakers, three had artistic professions, and one was retired. Ten

⁹ We use Likert's (1932) scaling method in order to measure either positive or negative response to a statement. The format of possible answers was typical five-level Likert item, where respondents can mark off: 1. Strongly disagree, 2. Disagree, 3. Neither agree nor disagree, 4. Agree, or 5. Strongly agree.

¹⁰ Respondents can choose the answers "yes", "rather yes", "rather no", or "no".

¹¹ The relative frequency is represented by valid percent, i.e., if there is a missing answer, the response is not included in the calculation.

respondents (i.e. 40 %) lived in a family with children or in a household with a partner (7). Others lived in a shared flat, single household or lived with their parents.

The monthly household expenditure of respondents varied; twelve respondents spent up to 10,000 CZK (400 EUR), another seven up to 20,000 CZK (800 EUR), and the remaining three up to 30,000 CZK (1,200 EUR). Monthly household expenditure in BRKs varied also; nine respondents spend up to 200 BRKs, six respondents spent up to 600 BRKs, and two respondents spent more than 600 BRKs per month for their household. On average, the respondents spent 408 BRKs per month in RozLEŤSe, which is about 25 times less than their average household expenses in CZK. In other words, they spent about 3.8 % of their household expenses in BRKs. The average duration of RozLEŤSe membership was 15 months; eight respondents were members from the beginning (25-30 months), while seven respondents were newcomers (participating for less than 6 months).

3.2. Motivations to join the LETS group

Regarding the motivations to join the LETS group, eight respondents became members of RozLEŤSe to meet new and interesting people, and to create and/or participate in a social network.¹² Six people considered LETS to be an interesting, new (or even "sexy") activity, and wanted to support such a project; seven also wanted to explicitly participate in a non-monetary activity, at least partly to escape the current financial system or support alternatives. Four people wanted to exchange with others; and three wanted to share their skills and make use of them.¹³ Often the motivations were mixed: "I have joined RozLEŤSe to be able to barter things, meet creative people, participate in personal connections, and emancipate myself from the system" (housewife, 29 years). Only a few respondents indicated that environmental concerns motivated them to join LETS¹⁴: "I expect that LETS will soon be the only possibility for trading. I'm using the time left to learn and build self-sufficiency" (retired female, 58 years). There were also only a few people (about 10%) who joined RozLEŤSe for economic reasons (none of these respondents was unemployed).

3.3. Motivations for trading

Motivations for trading partly overlapped with motivations for joining the group, although they were more varied. Again, the motivation to meet people, exchange and share were important: "I enjoy my production especially when it is appreciated by others" (locksmith, 48 years). It was accompanied on the one hand with the appreciation of new and interesting/original goods and services (6 people), and on the other hand with the intention to help others (3 people). Environmental motivations were more explicit in this case: "I don't like throwing away old things. I check first if somebody doesn't need something what is superfluous for me, or offer something I need" (masseur, 32 years), while motivation was also briefly stated as "saving the Earth's resources" (labourer, 57 years). Several people also appreciated home-made products, food, and local materials.

¹² Ten respondents (40 %) fully agreed with the statement "I have found new friends in RozLEŤSe with whom I meet also beyond trading", whereas 17 % fully or rather disagreed.

¹³ Regarding the statement "Within RozLEŤSe, I have employed my skills and proficiency that I would not normally be paid for", the sample was split into two groups of the same size agreeing (eight) and disagreeing (seven). Nine (37 %) respondents stayed in the middle.

¹⁴ However, there is strong agreement (75 %) with the statement that LETS contribute to sustainable development.

3.4. Participation in RozLEŤSe

Regarding their participation in RozLEŤSe, eleven respondents considered themselves more active than others, while another twelve felt the opposite. Most of the respondents (17, i.e. 68 %) were fully or rather satisfied with the frequency of transactions within the group. On average, it was fair in their opinion to settle the debts in individual accounts within 7.3 months, with expectations ranging from 2 to 12 months. About one third of the respondents were satisfied with the supply of goods and services within RozLEŤSe, one third was rather discontent and the rest was undecided. Mostly, the varied supply of traded goods was appreciated, but there was a widely reported (11; i.e. 44 %) lack of (local, home-made, organic) food, craft work and manual labour. Most of the respondents (14; i.e. 56 %) were totally or rather happy with the current way of pricing of goods and services, while five saw both its advantages and disadvantages. However, there was also strong criticism of the pricing mechanism present in the group: "I've learned during the three years to negotiate about the price so that there is a balance between giving and receiving. [...] I think the exchange ratio of 1:1 [BRK:CZK] can't work" (masseuse, 32 years). Another respondent (housewife, 29 years), on the other hand, said she would appreciate a "fixed conversion rate between BRK and CZK", whereas yet another (teacher, 40 years) would like to have "a unified pricing of services according to time constraints".

3.5. Evaluation of RozLEŤSe operations

Despite partial disagreements, there was strong agreement among the respondents about the positive aspects of RozLEŤSe. Nearly all of them appreciated the social spirit, personal interactions and alternative direction of the group. Self-sufficiency/independence,¹⁵ local scope, trust and helpfulness were also mentioned several times. The variety of perceived weaknesses was wider and mostly connected to the practice of trading: a lack of activity of some members, a limited supply of goods and services requested by many (home-made food, skilled labor) on the one hand, and an abundance of marginally useful products (trinkets, decorations) on the other. According to a locksmith (48 years), "Many people would like to take, but they give only a little. Those who produce something (e.g., basic foodstuffs) can't be sure they will be able to buy something useful with the BRKs they obtain". A related issue was that members can build up quite a high credit (up to -10,000 BRKs) which enables them to make purchases for quite a long time without selling anything back. also The significant geographical distance between members, and some organizational shortcomings were also mentioned several times as barriers.

4. Discussion

Previous studies have reported that some people are motivated to joint LETS because of the *inclusive potential* of these systems (Seyfang, 2004). Several attempts have been made to describe how LETS empower socially excluded groups by enabling them to apply skills that are not valued on the formal market (Williams et al., 2001). Although we found rather mixed motivations for joining RozLEŤSe, probably the strongest

¹⁵ When asked directly, the majority of respondents (66 %) fully or quite agreed with the statement "By participating in RozLEŤSe, I'm trying to reduce my dependence on the current economic system." One person disagreed, and 29 % stood in the middle.

one was a willingness to be a part of a community.¹⁶ Many of the participants saw it similarly to the *32-year-old masseuse*: "...I saw in LETs mainly the forming of a social network." Surprisingly, this kind of motivation is better for this group because the participants are more interested in providing a service to others (see Collom, 2001, p. 163).

Serious problems included insufficient supply (with regard to food, crafts, and manual labour). Some members of RozLEŤSe showed very low motivation to trade such as the *48-year-old locksmith*. Crowley (2004) refers to a similar situation¹⁷ which developed after membership declined in the West Cork LETS (p. 20). The decline was caused by a lack of useful supply. Although the supply of second-hand items within RozLEŤSe is environmentally friendly, the lack of a supply of basic needs undermines the whole system.

A possible threat to the group could also be the fact that nearly half of the respondents feel more active than the rest. Some members complain about the passivity of the others who do not care about the development of the group, who do not have anything to offer (not even time), and who just profit from the efforts of others. Passive members¹⁸ are usually associated with ideologically motivated individuals who actually do not need to trade, who, besides RozLEŤSe, are involved in many other activities, and who offer second-hand items instead of work or needed supplies. These people pose a significant problem for the stability of the group,¹⁹ especially when they maintain a large negative credit (debt) over the long term. Therefore, "those who produce have no guarantee that they will ever get some goods or services"²⁰ (*locksmith, 48 years.*) Whereas low debt represents a commitment to the group and binds the local community together,²¹ high longer-term debt causes division in the group²².

Previous studies have reported that the great distance between members' residences is also a serious threat because members know each other less, and time spent travelling is not counted.²³ Some members of RozLEŤSe perceive this as a problem. "Even local Brno is quite big and distances between members are relatively large" (*scientist, 60 years*). Not surprisingly, most of the transactions are made at regular meetings of the group and in daily life.

¹⁶ Among our respondents there were 41% who absolutely agree with statement "I have found new friends in RozLEŤSe with whom I meet beyond the trading" and 17% disagree.

¹⁷ "You could get someone to give you a massage, but no-one to dig your garden" (Crowley, 2004, p. 20).

¹⁸ These members who do not participate in operating the group are called by others "closet people" – derived probably from the idiom "to have a skeleton in the closet."

¹⁹ They could cause membership to decline or even the end of the group (see Jelínek, 2012, p.).

²⁰ Douthwaite (1996) describes this as "a serious weakness with LETS because people earning more local units than they can immediately spend stop accepting them so readily and thus damage the system for everyone else" (p.112).

²¹ See Lee (1996, p. 1384).

²² Transaction analysis (not part of this paper) has shown the existence of a "rich club"—a group of relatively active members without whom RozleŤse could not exist.

²³ Crowley (2004) support it with his respondent's statement: "There's no incentive to go all the way to Bantry [30 miles away] to do work for someone you don't know, or who isn't likely to become part of your community. (p. 20)

5. Conclusion

This paper provides an account of the operations of a LETS group in Brno called RozLEŤSe. Its aim is to identify possible threats to the group's existence in the future and to evaluate its current work. This study has shown that the significance of RozLEŤSe for its members is not primarily economic, but social. One of the interesting findings to emerge from this study is that half of the group consider other members passive. It was also shown that the passivity of some members has serious impacts on how the group operates – resulting in a lack of supply, growth of negative credit, and decrease in trust. These results are consistent with those of other studies and suggest that LETS should be a community based not just on ideology, but rather on the exchange of goods and services. Based on the study of the RozLEŤSe group, the authors suggest that for a LETS group to function well all members should know each other and actively trade with everyone else. Goods and services required for day-to-day living should be offered rather than second-hand items of limited use. The group should be local so that members can easily trade on a daily basis.

The case study from Brno showed that regular meetings of the group stimulate trading. These findings may help us understand how a LETS can operate sustainably. Possible models for the sustainable future of complementary currencies (not just LETS) remain an important issue for future research.

6. Acknowledgements

Financial support for this study was provided by a research project "EVAR" (MUNI/A/0764/2012), Faculty of Social Sciences, Masaryk University.

References:

- Blanc, J., & Fare, M. (2012). Les monnaies sociales en tant que dispositifs innovants : une évaluation. *Innovations - Cahiers de l'économie de l'innovation*, 2(38), Retrieved from <http://hal.archives-ouvertes.fr/docs/00/51/83/49/PDF/BlancFareRIUESSLux.pdf>
- Dittmer, K. (2013). Local currencies for purposive degrowth? A quality check of some proposals for changing money-as-usual. *Journal of Cleaner Production*, 54, 3-13. Retrieved from <http://linkinghub.elsevier.com/retrieve/pii/S0959652613001820>
doi:10.1016/j.jclepro.2013.03.044
- Douthwaite, R. J. (1996). *Short Circuit: Strengthening local economies for security in an unstable world*. Dublin: Lilliput Press Dublin.
- Caldwell, C. (2000). Why Do People Join Local Exchange Trading Systems?. *International Journal of Community Currency Research*, 4(1), Retrieved from <https://ijccr.files.wordpress.com/2012/05/ijccr-vol-4-2000-1-caldwell.pdf>
- Crowley, E. (2004). *Local Exchange Trading Systems: Globalising Rural Communities*. Institute for International Integration Studies Discussion Paper. n. 37.. Dublin: Trinity College Dublin. Retrieved from <http://www.tcd.ie/iis/documents/discussion/pdfs/iisd37.pdf>

- Collom, E. (2011). Motivations and Differential Participation in a Community Currency System: The Dynamics Within a Local Social Movement Organization1. *Sociological Forum*, 2011, 144-168.
- Fraňková, E., Fousek, J., Kala, L., & Labohý, J. . Transaction network analysis of Local Exchange Trading System in Brno, Czech Republic.. *Ecological Economics*,
- Jelínek, P., Szalay, Z. E., & . Konečný, A., (2012). Local exchange trade systems in central European post communist countries. *International Journal of Community Currency Research*, 16, 116-123.
- Johanisova, N., Crabtree, T., & Fraňková, E. (2013). Social enterprises and non-market capitals: a path to degrowth. *Journal of Cleaner Production*, 38(38), 7-16. Retrieved from <http://linkinghub.elsevier.com/retrieve/pii/S0959652612000066> doi:10.1016/j.jclepro.2012.01.004
- Lee, R. (1996). Moral Money? LETS and the Social Construction of Local Economic Geographies in Southeast England'. *Environment and Planning.* , 28, 1377-1394.
- Seyfang, G. I. L. L. (2004). Working Outside the Box: Community Currencies, Time Banks and Social Inclusion. *J. Soc. Pol*, 33(1), 49-71. Retrieved from http://www.journals.cambridge.org/abstract_S0047279403007232 doi:10.1017/S0047279403007232
- Seyfang, G. (2009). *The New Economics Of Sustainable Consumption: Seeds of Change*. Basingstoke [England]: Palgrave Macmillan.
- Seyfang, G., & Longhurst, N. (2013). Growing green money? Mapping community currencies for sustainable development. *Ecological Economics*, 86, 65-77. Retrieved from <http://linkinghub.elsevier.com/retrieve/pii/S0921800912004259> doi:10.1016/j.ecolecon.2012.11.003
- Schraven, J. (2001). *The Economics of Community Currencies: A Theoretical Perspective*. . Retrieved from <http://www.jorim.nl/economicscommunitycurrencies.pdf>
- Williams, C. C., Aldridge, T., Tooke, J., Lee, R., Leyshon, A., & Thrift, N. (2001). *Bridges into Work: An Evaluation of Local Exchange Trading Schemes (LETS)*. Bristol: Policy Press.

--

Mgr. Lukáš Kala, Mgr. Eva Fraňková Ph.D., Mgr. Jan Labohý

Department of Environmental Studies, Faculty of Social Studies, Masaryk University, Brno, Czech Republic

Mgr. Jan Fousek

Department of Computer Systems and Communications, Faculty of Informatics, Masaryk University, Brno, Czech Republic