

Strategies and measures for preserving rural and increasing suburban primary schools in the district of České Budějovice, Czechia

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Abstract: *Many rural primary schools in Czechia are currently struggling with low numbers of pupils. On the other hand, in near hinterlands of Czech cities there are insufficient numbers and capacities of primary schools due to the ongoing residential suburbanisation related to the great increase in the numbers of schoolchildren there. The objective of the article is the creation of general strategies and measures for preserving rural primary schools and increasing suburban primary schools, also through the optimization of spatial arrangement of these schools and school catchment regions. Strategies and measures are tested in the rural and suburban hinterland of city of České Budějovice (South Bohemia) after monitoring and comparing of the territorial distribution of primary schools, their catchment regions, the number of pupils in the classrooms of schools, and the schoolchildren populations in the settlements. In the suburban hinterland, the creation of new incomplete lower primary schools and the transformation of incomplete lower primary schools into complete (lower and upper) primary schools were planned. In the rural hinterland, the expansion of the catchment regions of rural/small town complete primary schools is assumed, as well as the enlargement of single-classroom rural incomplete lower schools by other classrooms.*

Keywords: *rural school, suburban school, village school, school district, rural stability, Czechia*

Introduction

One of the current issues faced by primary schools in Czechia and other post-socialist Eastern and Central European (CEE) countries is insufficient use of school capacity and the closing down of primary schools in depopulation peripheral rural areas on the one hand, and on the other overloading and shortage of primary schools in population-growing suburban areas around cities and larger towns due to the post-socialist boom in residential suburbanisation. Kučerová and Kučera (2009), Berdashkevich and Vlasov (2010), Bułkowska and Chmurzyńska (2011), Kovács (2012), Mendel (2012) and other authors mention the lack of interest from CEE state governments (in Czechia, Russia, Poland, Hungary, etc.) in the rescue of primary schools in peripheral rural areas characterised by a lack of pupils, the importance of these schools for the local communities or difficulties following from lengthy commuting to far away primary schools in towns. Piskáčková (2010), Bajerski (2011), Benáčková (2011) and other authors report problems with the overcrowding of primary schools in suburban zones of the big CEE cities with population-growth at the beginning of the new millennium. Keserű (2013) describes this in secondary education in the suburban zone around Budapest.

The *objective of this article* is the creation of spatial and non-spatial strategies and measures for preserving rural primary schools and also for increasing suburban primary schools. These strategies and measures will then be used in the rural and suburban hinterland

of city of České Budějovice (South Bohemia). After the review of literature in this article, section introducing relatively specific primary education and schools in Czechia follows. The following methodological section presents the study area, methods and data used. Another section describes the characteristics of rural and suburban primary schools in the study area. The texts in the next section of the article (which describe general strategies and measures for preserving rural and increasing suburban primary schools) are then used in the final section focus on preserving rural and expanding suburban primary schools in the study area.

Preserving rural and expanding suburban primary schools in literature

The theme of the spatial arrangement of primary schools in rural areas is not very common (Talen 2001). Comparisons between countries are complicated by the fact that both the vertically-system and spatial arrangement of primary and secondary schools (education) differ between countries, reflecting the nation-specific historical development and present of educational systems and geographic environments. Hargreaves, Kvalsund and Galton (2009) or Kučerová (2008) wrote about the necessity of understanding local contexts in such comparisons.

A couple of articles focused on small rural primary schools in British and Nordic countries were published together in 2009 in the *International Journal of Educational Research*. Aberg-Bengtsson (2009) discusses the problems arising from the gradual disappearance of small rural primary schools in Sweden, Kalaoja and Pietarinen (2009) in Finland. Slee and Miller (2015) described the relationship between closing small rural primary schools and the decline of rural areas in Scotland. Dowling (2009) considers the particularities of these schools and their quality of education in Scotland, Hargreaves, Kvalsund and Galton (2009) or Kvalsund (2009) in Norway. Walker and Clark (2010) or Bagley and Hillyard (2015) studied the free choice of parents between a local small rural primary school and a far away town complete primary school in families living in the English countryside. There are also several studies dealing with the definitions and modelling of catchment areas of primary schools – Marique et al. (2013), Boussauw, van Meeteren and Witlox (2014) and others.

In individual post-socialist CEE countries, these issues are under discussion in publications written in the national languages largely without links to international and European research debates. However, there are several exceptions. Kučerová and Kučera (2009, 2012) and Kučerová, Bláha and Kučera (2015a) analysed changes in the territorial distribution of primary schools in Czechia with an emphasis on rural schools, especially small village schools. Berdashkevich and Vlasov (2010) draw attention to the neglect of rural primary schools and their teachers by regional governments in Russia. Mendel (2012) describes the efforts of the local community to rescue the small village primary school in Lipnica in northern Poland. Kovács (2012) dealt with a similar theme in the municipality in the wider hinterland of Budapest. Musil (2009) wanted to support small village primary schools by including them in the planned system of community centers in peripheral rural areas of Czechia.

Other authors have produced literature on the spatial overlaps of catchment regions of the segregated primary schools in the urban and suburban environment – Noreisch (2007) and others. In the post-socialist CEE, attention is focused on the segregation of primary schools with Roma pupils in rural and urban areas – Nekorjak, Souralová and Vomastková (2011) or Kovács (2012). The extensive migration of especially young families with children from cities and larger towns to their suburban hinterlands connected with the insufficient capacity and density of primary schools in these hinterlands is currently visible in post-socialist countries of Central Europe (Ouředníček 2007, Piskáčková 2010, Bajerski 2011, Benáčková 2011).

Primary education and schools in Czechia

Primary (elementary) education in Czechia includes five years of education for children aged 6-10 in *lower stage of complete or incomplete primary school* and four years of education for children aged 11-14 in *upper stage of complete primary school*. There are also a few small special primary schools for the handicapped and otherwise disadvantaged pupils. In Czechia there are not many private primary schools yet – Church schools or schools with special teaching methods (e.g., Waldorf-type). These schools are located in cities where they can represent an alternative to public primary schools (Švecová 2000). So far, they only represent 2% of all primary schools (Kučerová and Kučera 2012).

Complete primary schools (CPS) are bigger for they include lower and upper stage primary school (education) and thus the numbers of pupils and also classrooms are higher there. At the upper stage of primary school every school year must have at least one classroom (a total of at least four classrooms). *Incomplete primary schools* (IPS) are smaller for they only include the lower stage of primary school (education). These schools can have one classroom per school year (5 classrooms), or classrooms with associated school years (1, 2, 3 or 4 classrooms for 5 school years). The first case represents incomplete primary five-classroom schools (IPS5), while the second case represents incomplete primary 1-4 classroom schools (IPS1-4; also called "small-village primary schools"). In towns and cities, big CPS (twice or more times 9 classrooms) prevail, also IPS5 can be found there, rarely. In rural towns, there are usually smaller CPS. Small CPS may also be found in rural areas where IPS5 and IPS1-4 prevail, though.

In the period of socialism and beyond, the territory of Czechia was continually covered by administratively defined *catchment regions* on lower stage of complete or incomplete primary schools and on upper stage of complete primary schools, making the link between schoolchildren from individual settlements and individual primary schools clear. Recently, this system has become looser, though. Many municipalities without a school have no contract with municipalities with school and thus find themselves outside the official school catchment regions (Kučerová, Bláha and Kučera 2015a). In addition, parents of schoolchildren do not have to respect these official regions anymore and can choose a "non-catchment" primary school. The arrangement of official primary school catchment regions can therefore slightly differ from the actual arrangement of these regions.

Czech primary education and primary schools underwent changes after 1989 when leaving socialism. The legal and economic connection of the primary school with the municipality has been renewed – now the municipality funds primary school, sends its representatives to the school board and financially supports the technical operation of the school building (ACT 2016). The municipality is liable for assuring conditions for the primary education of its schoolchildren in the primary school in its territory or in neighbouring municipalities. The state (the Ministry of Education and its regional branches) sends subsidies to individual primary schools for educational activity subject to the number of pupils. The subsidies are mainly used for teachers' salaries. This subsidy usually represents about 70% of the total costs of the primary school. *State standards of minimum number of pupils per classroom* exist in Czechia. At least 17 pupils per classroom should be available in an CPS (on average for the school as a whole) and at least 10 pupils per classroom should be gathered in the small-village primary school type IPS1 (DECREE 2012). If the standards threshold number of pupils is not met, the municipality (or a group of municipalities) must then pay the part of the state subsidy for the missing pupils from the municipal budget. This is a rather large amount of money, especially for small village municipalities.

As mentioned above, a municipality finances from its budget technical operation of the school building, which represents about 30% of the total costs of the primary school. A municipality without its own primary school may execute a school contract with another muni-

cipality with primary school on joint financing of technical operation of the primary school and this municipality then can send their pupils to this school. A municipality with primary school may refuse pupils from municipalities without these contracts. As mentioned above, many municipalities without primary school rely on their pupils being admitted to primary schools in the surroundings municipalities, because these schools dispose with free capacity and these municipalities obtain at least the state subsidy for these pupils. The system is therefore rather suboptimal and unjust.

Decreasing birth rates, especially after 1989, have led to a decrease in school-age children in Czechia – 1,457,000 (1961), 1,299,000 (1991) and in 2016 only 983,000 (data from the census). Depopulation of rural areas (villages and rural small towns) was particularly strong between 1961 and 1980 due to migration to towns. Over the last two decades, the *depopulation of peripheral rural areas* and the *population growth of suburban areas* around cities (at the expense of these cities) can be observed – Musil and Müller (2008), Kubeš and Kraft (2011), Novotná et al. (2013) and others. These processes have been reflected in the declining number of rural primary schools, especially rural incomplete primary schools – Fig. 1. The number of complete primary schools in cities and other towns has increased due to the emergence of primary schools with a special focus. This article is about primary education and schools – therefore, the adjective "primary" may be omitted in the following text.

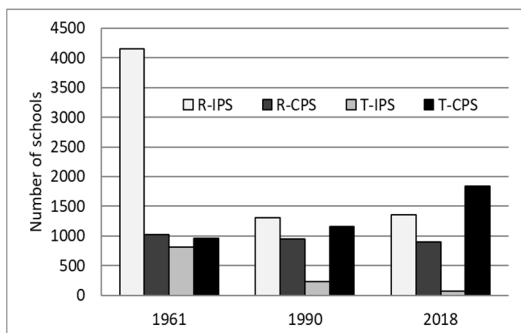


Fig. 1. Number of primary schools in Czechia – 1961, 1990 and 2018; Source: Kučerová and Kučera (2009) for 1961 and 1990, MSMT (2019) and own calculations for 2018; Notes: R-IPS or R-CPS – incomplete or complete primary schools in municipalities of up to 3000 inhabitants, T-IPS or T-CPS – incomplete or complete primary schools in municipalities of over 3000 inhabitants.

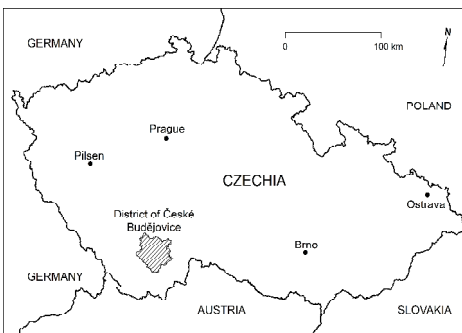


Fig. 2. Location of the study area – the District of České Budějovice

Study area, methods and data

The *study area* – the district of České Budějovice – covers 924 km² and has 155,000 inhabitants (2017). It is organised around the regional city of České Budějovice in the central part of the South Bohemian Region (130 km south of Prague) – Fig. 2 and 3. South Bohemia is a relatively peripheral and less populated area within Czechia, but these characteristics does not apply so much to the study area that is located in the wider hinterland of the regional city of České Budějovice. The study area includes the *city* of České Budějovice, 6 *rural towns* and many smaller settlements (172 altogether). Part of these settlements were defined as *outer suburbs* (48 suburbs), others are *semi-suburbs* or *villages*. The suburbs mostly have new suburban houses, suburban migrants (who came from the city to settle in the suburbs) and economically active people commuting to work in the city. Most suburbs are situated in the *suburban hinterland* (zone) around the city of České Budějovice (Fig. 3). Several suburbs,

rural towns and more villages are located on the *rural hinterland* (zone) of this city. While the population of the city of České Budějovice has shrunk in the last 18 years due to suburban migration (from 98,500 to 91,500), the population of its suburban hinterland has been growing (+17,000 inhabitants). The rural town populations have been slightly growing and the village populations have slightly decreased – Kubeš (2015).

The analysis of the spatial arrangement of schools and their catchment regions in the study area use *data* and other information from several sources – from the National register of schools (INDEX 2016) and from the school websites (the numbers of pupils and classrooms). Further data were obtained by interviews and through e-mail contacts with school headmasters and school officials (actual arrangement of the school catchment regions) as well as from field research at the schools. The numbers of school-age children in individual settlements were obtained from the census and ongoing registrations of inhabitants.

Map in Fig. 3 was created on the basis of these data. It shows the locations of complete and incomplete schools and their catchment regions on lower and upper stage, and also locations for optimization (red rings and numbers). It is possible to distinguish complete and incomplete *rural schools* in villages, complete *rural-town schools* in rural towns (underlined names), complete and incomplete *suburban schools* in suburbs (inside the suburban zone) and complete and incomplete *city schools* in the city of České Budějovice. The next phase of the work was compiling the statistics of classroom pupil numbers at the individual schools and types of schools, as well as the numbers of schoolchildren in catchment regions of these schools – see summary in Tab. 1.

General strategies and measures for preserving rural schools and increasing suburban schools in Tab. 2 and Tab. 3 are based on non-standardized interviews with staff in primary education in the study area and the whole of South Bohemia, cited literature and the analysis carried out in the study area. Only repetitive strategies and measures in the responses of interviewed people and in the literature, as well as unambiguous findings from the analysis, have been included in the tables. Some of them were then applied in the study area (Tab. 4).

Rural and suburban primary schools in the study area

Due to the population size and significance of České Budějovice, its continuously built-up area is served by 15 *city schools* (39.5% of the total number of 38 schools in the study area), namely 12 city CPS and 3 city IPS5. The city schools situated in České Budějovice are big as far as the numbers of pupils attending them (Tab. 1). They are attended by 67.9% of all schoolchildren living in the study area. The catchment regions of the České Budějovice city schools cover most of the suburban hinterland and even part of the rural hinterland of this city – In the north and south of the study area (Fig. 3). In addition, in České Budějovice there are five small private CPS, four very small special CPS for handicapped pupils and four general middle schools actively providing also primary education for gifted pupils aged 11-14.

Each rural town in the study area operates a CPS type school (Zliv, Hluboká nad Vltavou, Švětín, Lišov, Ledenice and Kamenný Újezd). These six *rural-town schools* have developed catchment regions also stretching into the rural and suburban hinterland of city of České Budějovice – Fig. 3. There are 9 *suburban schools* in the suburbs (3 CPS, 4 IPS5 and 2 IPS1-5). There are a mere 8 *rural schools* left in the villages (2 CPS and 6 IPS1-4). In the north-east and south of the study area density of CPS is lower, there is a lack of IPS visible in parts of the rural and suburban hinterland – Fig. 3. The catchment region of the České Budějovice city CPS schools stretch quite far from České Budějovice, especially in the south-western and southern direction – Fig. 3. The commuting times of pupils from these far away areas (settlements) are quite long and sometimes even involve changing buses or trains. All this must be understood in the context of the spatial arrangement of the settlements, the schoolchildren, the schools, their catchment regions and public transport connections. The Ministry of Education

of Czechia has issued standard defining the requirements for the minimum numbers of pupils in classrooms of individual types of schools – 17 pupils per classroom for CPS, 15 for IPS5 and IPS4, 14 for IPS3, 12 for IPS2 and 10 for IPS1 (DECREE 2012). Merging of different school years in one classroom is only allowed at the lower stage of school (IPS or CPS). Exceptions to the standard numbers may be obtained for short terms only. Another option is to finance the missing pupils from the municipal budgets. Some rural municipalities in the study area use subsidies from the operation programmes of EU for these purposes. All schools in the study area still meet the standard requirements but some are already approaching the bottom limits – for example, the rural-town CPS in Ledenice and the rural CPS in Strýčice (luckily they have rather higher numbers of pupils at the upper stage of school), or the rural IPS1 in Doudleby (Tab. 1). Some schools addressed the decreasing numbers of pupils by cancelling parallel classrooms with the same school year.

Tab. 1. Statistics of pupils, classrooms and schoolchildren by types of public primary schools – the District of České Budějovice (2016)

Type of primary schools (number of schools)	Lower stage of primary schools			Upper stage of primary schools		
	Number of pupils		Number of school- children in school catchment regions	Number of pupils		Number of school- children in school catchment regions
	Total	Per classroom		Total	Per classroom	
Selected school						
City CPS in ČB (12)	4683	23.4	4409 ¹ +619 ² +114 ³	3038	23.7	3770 ¹ +1158 ² +203 ³
City IPS5 in ČB (3)	303	18.9	303 ¹ +60 ² +0 ³	-	-	-
Rural-town CPS (6)	1105	21.3	1219	739	21.1	1050
Suburban CPS (3)	585	20.2	664	320	21.3	531
Suburban IPS5 (4)	424	20.2	464	-	-	-
Suburban IPS1-4 (2)	82	16.4	131	-	-	-
Rural CPS (2)	201	20.1	183	158	19.8	178
Rural IPS1-4 (6)	173	15.7	253	-	-	-
Rural-town CPS Ledenice ⁴	104	20.8	133	74	18.5	106
Rural CPS Strýčice ⁴	87	17.4	77	63	15.8	61
Rural IPS1 Doudleby ⁴	11	11.0	29	-	-	-

Notes: Explanation of the types of primary schools (CPS, IPS5, IPS1-4, IPS1) is in the section Primary education and schools in Czechia; ^{1,2,3}Numbers of schoolchildren from the city of České Budějovice⁽¹⁾ and from the suburban⁽²⁾ and rural⁽³⁾ zone in the catchment region of schools localised in České Budějovice. ⁴Example of a school with insufficient number of pupils.

City schools in the city of České Budějovice „suck“ schoolchildren from suburban hinterland, as well as from rural hinterland of city (Tab. 1; compare the "number of pupils in schools" and "number of schoolchildren in school catchment regions" by types of schools). However, part of the absorbed rural schoolchildren might rescue some small-village schools (rural IPS), rural CPS and rural-town CPS near their places of residence. In the case of some suburbs, school commuting to the České Budějovice is acceptable but in case of others, building new suburban schools of the CPS or IPS5 type should be considered. The mayors of suburban municipalities support the construction of these schools, especially in around the suburbs of Šindlový Dvory and Srubec with a large population growth (Kubeš 2015).

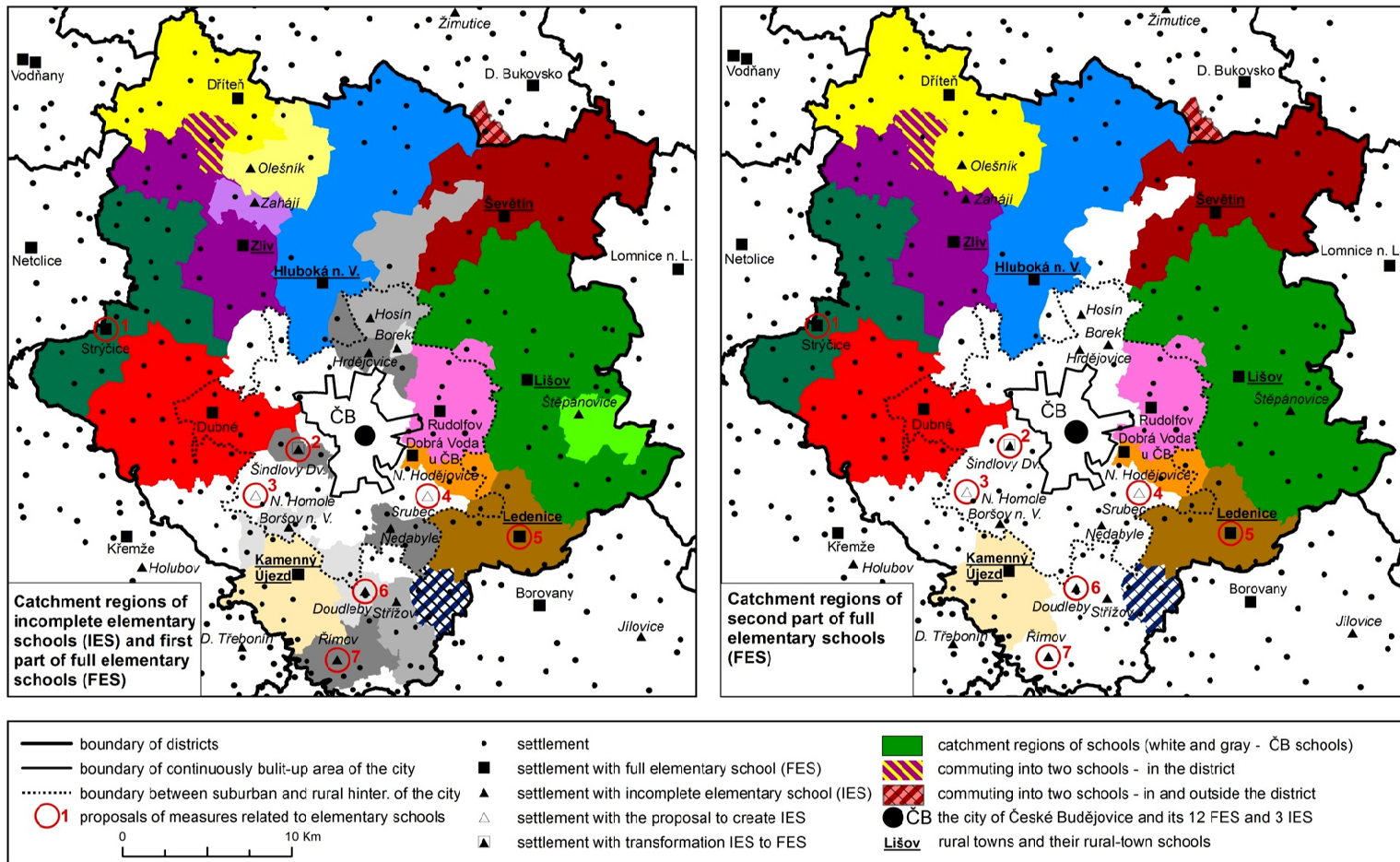


Fig. 3. Primary schools, their catchment regions and optimization measures in the District of České Budějovice (2017)

Where pupils have no school in the place of their residence and the nearest bus or train stop for commuting to school is 4 or more km away, the public administration must then establish school buses to take these pupils to school. Regarding the relative density of the small settlements in the study area, this task is quite demanding. The analysis of public transport options in the study area found that the possibility of local schoolchildren commuting to/from school is not addressed in 27 settlements. Another problem is that in some places pupils can only use a single morning connection to commute to school (this is case in 74 settlements), and some of these connections leave their settlement much too early (as they also assure commuting of adults to work). Another problem may be returning home from school, where the return connection is also only one (10 settlements), as younger pupils ending their school days earlier must then wait for the older pupils with longer school days.

General strategies and measures for preserving rural and increasing suburban primary schools

Non-spatial strategies and measures

In addition to the municipal office, the church, a small grocery shop, a pub, and a rural school, at least in the form of small-village school IPS1-4, is a basic service for local residents (e.g., Hargreaves, Kvalsund and Galton 2009, Kučerová and Kučera 2009). The school is connected with and serves the local community (Emmerová 2000, Kučerová, Bláha and Kalaoja and Pietarinen 2009, Autti and Hyry-Beihammer 2014, Kučera 2015a and others). But in a small rural school, and especially in a small-village school, the costs per pupil are higher than in bigger city schools. This is also often the argument for closing small-village and other small schools (Kučerová, Bláha and Pavlasová 2015b). The absence or abolition and difficult accessibility of the school is one of the reasons for the departure of families with children from rural areas. The state and regions should support these schools more. *Decrease in the state standards minimum number of pupils per classroom in small schools and other financial and organizational support for these schools from the state, county and district contributes to the social stability of villages, rural municipalities and rural areas (a1; Tab. 2).*

In Czechia pupils commute to school by regular public bus and train, whose timetables are partly adapted to the needs of the commuting schoolchildren (complex optimisation of the connections is performed by the officials of counties). However, there are still small villages without public transport connection, with insufficient numbers of connections or inconvenient routes or timing of the connections for commuting to/from schools (Kubeš and Kraft 2011 and others). In some settlements even the youngest pupils have to get up very early, sometimes change train or bus, spend a long time on the way to/from school and wait long for the return connection after school. *Financial and organizational support for transport connections for commuting of all pupils to/from schools by state and regions is necessary (a2).* On the other hand, preserving rural schools and building new suburban schools reduces the unpleasant commute to remote town and city schools. Pupils can also commute to rural schools by bike (in a case of short distances and availability of non-busy local roads) which is also beneficial for their health (see the analyses in Johansson, Hasselberg and Laflamme 2012, Marique et al. 2013). The municipality can also organize school transport. *State subsidised municipal vans can transport pupils commuting to school together with transport of seniors and handicapped citizens for the purpose of visits to their doctor, an authority and other services (a3).*

Rural school usually "devours" 20-30% of the municipal budget (for technical operation of the school building financed by the municipality). Rural municipalities operating a school may be recommended the economically beneficial connection of school, nursery, lending library and similar municipal institutions into a single whole (with one headmaster, one janitor, one

school kitchen and dining room, preferably under one roof). *Rural (and suburban) municipalities should strive for the cost-saving operation of their school, for example by merging municipal institutions including school (a4).*

Closing small-village schools is sometimes excused by the lower quality of education provided by them, but with lack of credible evidence for this statement – Aberg-Bengtsson (2009), Bułkowska and Chmurzyńska (2011) or Kovács (2012). Annual repetition of the same information to pupils of more school years sitting in a common classroom may be an advantage (e.g., Aberg-Bengtsson 2009). Teaching qualities, skills, experience and results of teachers in small-village schools are very need (see Boylan and McSwan 1998). They have to teach more than one subject and be able to manage more pupil generations in a classroom, which requires selection of an adequate proportion of direct and independent school work (Hargreaves, Kvalsund and Galton 2009, Howley, Wood and Hough 2011). *Teachers and headmasters of small-village schools should have a special university education or complementary education targeted at their hard school work (a5) and their earnings should correspond to the demands placed on them (a6) – see Bułkowska and Chmurzyńska (2011). Unfortunately, they must also manage the huge school "paperwork". It is recommended to establish a district institution helping headmasters in small-village schools with school administration and with grant projects (a7).*

Tab. 2. *Non-spatial strategies and measures for preserving rural and increasing suburban primary schools*

<p>a1 Decrease in the state standards minimum number of pupils per classroom in small-village schools (mainly IPS1, IPS2, ...) and in small rural CPS</p> <p>a2 Financial and organizational support for the transport of pupils to/from rural schools by state and regions</p> <p>a3 Purchase of municipal vans for the transport of pupils from settlements to rural school and back</p> <p>a4 Economically advantageous merging of several municipal institutions including the rural school into one</p> <p>a5 Creating a special field of study or course at Faculties of Education preparing teachers for small-village schools (IPS1-4)</p> <p>a6 Increase in wages for teachers in small-village schools (IPS1-4)</p> <p>a7 Creating a district institutions helping headmasters in small-village schools (IPS1-4) with school administration and with grant projects</p> <p>a8 Persuading of parents living in rural areas about the quality of education and social environment in small-village schools and other rural schools and about sending their children to these schools</p> <p>a9 Cancellation of parallel classrooms with the same school year in (rural) schools</p> <p>a10 Reduction in the number of classrooms at the lower stage of (rural) schools by combining multiple school years into one classroom</p> <p>a11 Increasing the capacity of existing suburban schools by adding parallel classrooms with pupils of the same school year</p>
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Notes: Explanation of the types of primary schools (CPS, IPS1, IPS2, IPS1-4) is in the section Primary education and schools in Czechia.

Parents make decisions about choice of school prior to entering their children to school. They often refuse to put their children in the local small-village school and rather send them to a far away city or town school. They justify that by the alleged higher quality of education in urban schools (which is questionable, see above), where their children can also specialise in foreign languages or maths (Boussauw, van Meeteren and Witlox 2014). Small-village schools generate valuable social bonds between pupils of different ages in a shared classroom as well as between pupils and their teachers. Education in these schools can utilise the proximity of nature, landscape and local folklore traditions – see also Kvalsund (2009). *It is necessary to convince parents of schoolchildren living in rural areas about the quality of education and social environment in small-village schools (a8).* Literature mentions an inte-resting question

of parent decision-making when they select a school for their children after a recent move from urban environment to village (Kovács 2012, Bagley and Hillyard 2015) in the context of the process of counter-urbanization. If these families prefer a rural lifestyle then they usually prefer the local small-village or another rural school and support the school in various ways (findings from the Prachatice district, Walker and Clark 2010).

Organizational measures within individual schools are available when the state standard of pupils in the classroom is not met. *The cancellation of parallel classrooms with the same school year in school (a9) or the reduction of the number of classrooms at the lowest stage of school by merging more school years into one classroom (a10)* are commonly used measures.

Schools in suburban hinterlands of cities with a big increase in child population are overloaded (Benáčeková 2011 or Piskáčeková 2010 around Prague, Bajerski 2011 around Poznań). *The capacity of existing suburban school in suburban zone of city should be increased by adding parallel classrooms with the same school year (a11)*. However, the inflow of young families into the suburbs is already falling and the suburban populations will age too. The need for increased capacity of suburban school can be temporarily resolved by "container school-rooms" or by temporary use of empty buildings in the school surroundings.

Spatial strategies and measures

Spatial strategies and measures (Tab. 3) for preserving rural schools with pupils' deficiency consist of – *enlargement of a catchment regions of rural schools (b1)* in order to obtain additional pupils at the expense of schools with a sufficient number of pupils, *downward transformation of a rural CPS to rural IPS (b2;* but there is a problem with the placement and commuting of pupils in the upper stage of another school), *creation of a spatially structured over-municipal rural school integrating several spatially-separated teaching places (former rural schools) in several villages into one school institution (b3;* owned by an association of municipalities; only costs for the headmaster are saved, it is organizationally demanding) and *special transformation and cooperation of two neighbouring rural CPS into an IPS and a cooperating school with just upper stage classrooms (b4;* difficult to provide school transport – commuting).

Tab. 3. *Spatial strategies and measures for preserving rural and increasing suburban primary schools*

b1 Extension of catchment regions of (rural) schools
b2 Downward transformation of (rural) complete schools (CPS) to (rural) incomplete schools (IPS)
b3 Creation of over-municipal (rural) schools (IPS or CPS) integrating several spatially separated teaching places in settlements into one institution
b4 Special transformation and cooperation of two neighbouring (rural) complete schools (CPS) with insufficient numbers of pupils into an incomplete school (IPS) and a cooperating school with just upper stage classrooms
b5 Creation new (suburban) schools and catchment regions for these schools
b6 Upward transformation of (suburban) incomplete schools (IPS) to (suburban) complete schools (CPS)
b7 Improvement of the spatial and temporal arrangement of school transport connections

Notes: Explanation of the types of primary schools (CPS, IPS) is in the section Primary education and schools in Czechia

Spatial school strategies and measures for suburban hinterlands of cities with a big increase in child population consist of – *opening a new suburban school (b5;* most often in the form of IPS5) and creation of a new catchment region for this school or *upward transformation of a suburban IPS to suburban CPS (b6;* + relevant catchment region). *The improvement of spatial and temporal arrangement of school bus and train connections (b7)* for the transport of pupils from individual settlements to schools and back can also help rural and suburban schools.

Strategies and measures for primary schools in the study area

Several concrete spatial measures for preserving rural schools and increasing suburban schools in the study area have been developed in the form of table (Tab. 4, localisation through red circles in Fig. 3). These measures are based on the current spatial arrangement of schools and their catchment regions in the study area and on the occupancy of these schools, their stages and their classrooms by pupils (see chapter describing schools in the study area), on the spatial arrangement of schoolchildren at the age of the lower and upper stage of primary education (school) in individual settlements (data from the census and the continuous registration of the population), and on the basis of the above-mentioned spatial and non-spatial strategies and measures.

Tab. 4. *Spatial measures for preserving rural and increasing suburban primary schools in the District of České Budějovice (2017)*

No. Settlement+school (type, type)	Main problem	Measure (code)
1. Stryčice (village, rural CPS)	The lack of pupils at the upper stage this CPS	Extension the catchment region to the southeast (b1) or transformation to IPS (b2) – the neighboring CPS will provide the upper stage of primary education
2. Šindlový Dvory (suburb, suburban IPS5)	Commuting of older school- children to the upper stage city CPS ¹	Transformation to CPS (b6) and creation catchment region for upper stage of this CPS
3. Nové Homole (suburb, no school)	Difficult commuting of schoolchildren to the upper stage city CPS ¹	Creation a new suburban IPS5 (b5) and creation its catchment region
4. Srubec (suburb, no school)	Difficult commuting of schoolchildren to the upper stage city CPS ¹	Creation a new suburban IPS5 (b5) and creation its catchment region
5. Ledenice (rural town, rural-town CPS)	The lack of pupils at the upper stage this school	Extension the catchment region to the northeast and southwest (b1)
6. Straňany (village, small-village IPS1)	Difficult commuting of schoolchildren to the upper stage city CPS ¹	Transformation into economically and organizationally more appropriate IPS2 – parents must be persuaded to give their children to this school (a8)
7. Římov (village, small-village IPS1)	Difficult commuting of schoolchildren to the upper stage city CPS ¹	Transformation into economically and organizationally more appropriate IPS2 – parents must be persuaded to give their children to this school (a8)

Notes: The codes for primary schools (CPS, IPS, IPS1, IPS2 and IPS5) and the codes for spatial measures (b1, b2, b5, b6, a10) are explained in the text. ¹These big CPS are located within České Budějovice.

The sustainability of the measures outlined in the Tab. 4 will depend on the demographic and migration development of school-age children in settlements around schools. Birth rate has risen slightly and suburban migration has declined somewhat in recent years here. The financial requirements for the proposed measures will not be so great because the schools in Šindlový Dvory, Straňany and Římov have unoccupied classrooms, so building expansions will not be necessary here. Enlarged and new suburban schools receive pupils from large schools in České Budějovice. Only the extension of the catchment region of the school in Stryčice could have a negative impact on the occupancy of the school in Dubné.

Conclusions

Closing rural schools, especially small-village schools, has been visible in Czechia since the 1960s. Due to the continuing depopulation of peripheral rural areas and falling birth rates, this issue is further deepening. The zones around cities have experienced a boom in residential suburbanisation in the last 20 years and there is a need for new schools there.

Statistics of pupils and classrooms in individual schools and their types as well as statistics of schoolchildren in settlements of school catchment regions were processed in the district of České Budějovice (Tab. 1). Almost two dozens of general non-spatial and spatial strategies and measures for preserving and development of rural schools and extension suburban schools are proposed in this article (Tab. 2, Tab. 3). Data on the mean numbers of pupils in classrooms of schools (separately for the lower and upper stage of schools), the numbers of pupils commuting to these schools from other school catchment regions, general strategies and measures and another information were used to optimize the spatial arrangement of several rural and suburban schools and their catchment regions in the study area (Tab. 4, Fig. 3). It is however necessary to keep the link between the lower and upper stage of schools in the territory and to arrange adjustment of public transport timetables to facilitate commuting to schools.

Closing a small-village or other rural school may save municipal costs but also impairs the quality of social environment in the village and whole rural municipality. Closing a school is usually an irreversible act (Miller 1995, Kvalsund 2009, Kučerová, Bláha and Pavlasová 2015b). The result may be spatial social exclusion resulting from the difficulty to reach far away services, in this case primary schools (Musil and Müller 2008 or Kubeš and Kraft 2011; cf. Talen 2001, Kalaoja and Pietarinen 2009). This exclusion is also linked to the concept of social injustice or inequality of access to public services, in this case primary schools (Farrington and Farrington 2005). The state and the self-governing units have to decide whether to subsidise and otherwise support peripherally situated small-village and other rural schools with low numbers of pupils and thus to maintain social stability of the territories in question or not. Likewise, rural communities usually want to maintain these schools and take care of them. The question is to what extent this support may be provided and what further drop in the number of schoolchildren can be expected. Unfortunately, the prognosis of the development of the number of schoolchildren (CSU 2018) is not favourable.

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