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Re-development of a former military training area – The case of Brdy told from a local actors' perspective

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Abstract

Military training areas (MTAs) are special spatial units. Closed and inaccessible for the general public, they have been shaped by long-term military use of various potential type and intensity. Following the suspension of operation, some MTAs fell derelict and buildings and infrastructures on it become brownfields. Local municipalities will have strong interests and will care about the re-development options – either in utilising potentials or in preventing competitions. We take a Czech example and use in-depth semi-structured interviews to investigate the how local actors perceived and influenced the re-development perspectives of the former MTA Brdy, Czech Republic. This case is interesting, because international and national politics in as much as different groups of local stakeholders played significant roles in creating opportunities and for holding or pushing a re- or new development on the military brownfield land. Next to the results of the qualitative interviews with local stakeholders, we include analysis of available statistical data and information about the case study municipalities. Our contribution gives an insightful investigation about the role that local actors played in determining new uses of the former MTA in uncertain and unstable socio-economic and political conditions typical for post-communist and developing countries.

Highlights

The use of military training facilities is influenced by geopolitical and strategic interests
Networking of actors is important for finding opportunities for new development of former military areas
A renewal of historical memory contributes to developing a new local identity.
The protection of the environment and biodiversity in military training areas is highly desirable.
Redevelopment of former MTAs bring specific types of challenges to stakeholders.

Keywords

Qualitative interviews; local actors; military geography; Czech Republic; military brownfield;

1 Introduction

Military training areas (MTAs) are specific forms of land. Often fully inaccessible for the general public, military usages resulted in special geographies, where military activity often impacted largely on the physical and social landscape in which it is embedded. At the same time, on-site MTA usage forms are often close to nature and (at least indirectly) linked to wildlife protection by military orders (Woodward, 2004). During the 20th century, many MTAs were created. The absolute number as well as the size of MTAs increased over time. This was the results of a rapid development of various new weaponry, including weapons of mass destruction (Vogel, 2007), with destructive on-site impacts (causing various forms of contamination) also having increased by conventional weapons (Burmaoglu and Saritas, 2017). Globally, the area of the MTAs is estimated at least at 50 million hectares; however, the actual figure is more likely closer to 200 million hectares (Zentelis et al., 2017).

After decades of operation, the operation of several MTAs was suspended in the years after the end of the Cold War. Many such areas no longer served their purpose and have become underutilized brownfield land. Brownfields can be characterised as derelict and underused sites that are often contaminated. These sites regularly contain remains of buildings and other facilities reflecting their previous uses, offering no immediate prospect of re-development; revitalisation normally requires coordinated intervention by stakeholders (cf. CEN, 2014). Brownfield revitalization is considered to offer sustainable alternatives to greenfield – undeveloped land – development (Bartke and Schwarze, 2015). Different groups of local stakeholders play very important roles in searching for new ideas and opportunities for re-development of un- or underutilised land (Frantál et al, 2015b; Harclerode, 2015; Rizzo et al., 2016).

This article gives an insightful investigation about the role that local actors played in determining new uses of the former Brdy MTA in the Czech Republic, thereby offering broader insights for the re-development of military brownfields in particular in uncertain and unstable socio-economic and political times as they were typical for post-communist and developing countries.

We presuppose that the role of local actors for the re-development of former MTAs (and related military brownfields) is significant. We investigate the former MTA Brdy in the Czech Republic as a case study. MTA Brdy was created in 1927 as a military artillery shooting range. Beginning of 2016, operation of the MTA was suspended. The territory covers an impressive area of 26,000 hectares, which was divided in public administrative terms between 27 neighbouring municipalities after suspension of operations.

Our investigation reveals the role played by various local actor groups in searching military and non-military re-development opportunities of the Brdy MTA and related military brownfields. We first provide some general characterization of MTAs before presenting results of interviews and data analysis of the case study. The final section concludes.

2 General characteristics of military training areas (MTAs)

The creation of MTAs was usually linked to a displacement of the local population, causing the occurrence of ghost towns and villages. Such processes caused more or less active protests and conflicts (Dudley, 2013).

The concept of military geographies (e.g. Woodward, 2004; Pearson et al., 2010; Coates et al., 2011; Dudley, 2013; Seidl, Chromý and Habartová, 2010; Hercik et al., 2014) points to the uniqueness of military land development as “white” areas on planned and regulated land development.

Operating MTAs impacted the local and regional development. Negative impacts were caused not least as the land within the MTA’s demarcation is usually excluded from the regional economic system and creates a barrier for through traffic causing increased peripheral positions of neighbouring sites (Havlíček et al., 2018). On the other hand, MTAs have been beneficial for some regions, because military activities generate demand for local and regional economic goods and services, establishing jobs in the respective sectors. As

Woodward (2004) emphasizes, military patronage may be directed to local shops, bars and restaurants, which may in turn depend solely or almost entirely on military personnel as their customers.

From an environmental perspective, MTAs are usually very valuable (Lindenmayer et al., 2016; Skokanová et al., 2017; Forejt et al., 2017). A rich body of literature proposed improvements of the environmental management (e. g. Zentelis et al. 2017; Fox et al. 2017; Guimarães et al. 2017). The isolation from industrial and general public use as well as from major cutting infrastructures often allowed a rich biodiversity to unfold. Notwithstanding, various military activities on MTAs caused the occurrence of serious environmental problems, often resulting in complex soil and groundwater contamination being very complicated and expensive to assess and remediate (Voie et al., 2006).

The suspension or a significant reduction of military activities can cause many socio-economic problems in a MTA's region. As the demand for MTA oriented services and products diminishes, unemployment is rising often significantly. Military brownfields appear. Their probability of re-use depends on the location, in particular the vicinity to the regional centre and main transport infrastructure (Frantál et al., 2013). MTA brownfields are usually located in low populated areas – as a result their redevelopment potential is less compared to military brownfields in urban areas, e.g. barracks, with higher population density (Frantál et al., 2015a; Martinát et al., 2016).

Former MTAs often have characteristics of megasites (Schädler et al., 2012) being often complexly contaminated in soil and groundwater (petroleum substances, ammunition). The remediation even at a hazard defence level requires huge – often uncertain – investments. The regeneration process of military brownfields is often complicated by fact that military brownfields have on average a larger size in comparison to brownfields of other origins (Osman et al. 2015). Cooperation of the different groups actors is very important for successfully redevelopment of all types of brownfields (Alexandrescu et al. 2014, 2017) and it could be presupposed that this type of cooperation and networking among actors is also important both for protection of environment and biodiversity in the former MTAs and for post-military development projects that aim at improved socio-economic development of the region.

Recent research on brownfield redevelopment emphasizing the necessity to consider a regional perspective to identify and select future redevelopment plans (e.g. Limasset et al., 2018; Alexandrescu et al., 2017; Bartke et al., 2016 and Pizzol et al., 2016) is thus of relevance for MTA redevelopment. Notwithstanding, a site specific perspective and active involvement of actors is crucial at the regional and local levels (Alexandrescu, 2016a, 2016b; Bleicher and Groß, 2010; Hartmuth et al., 2008).

3 Methods and materials

We use interviews and analyse available information and data related to the Brdy MTA and 34 municipalities located in the neighbourhood of this MTA. Since the decision to suspend the MTA's operation in 2012, the studied area experienced complex discussions focused on opportunities of re-development after the reduction of military functions and the establishment of a landscape protected area.

The main objective of our research is to identify the most important challenges from the perspective of local actors and their role of influencing the re-development. The MTAs development was also discussed in detail in Czech media. For this reason, responses to this issue were examined in the mainstream media, specifically newspaper articles, radio and television reports. In addition, available statistical data was used and the information from municipal websites, which were analysed to prepare interviews with actors related to the studied municipalities. In the case study area, a field survey took place in June 2017 and July 2017, during which 20 semi-structure in-depth interviews were hold with selected actors, who were identified as being important for municipal development – 10 interviews were held with elected representatives of municipalities (mayors or members of the municipal council) and 10 interviews were held with other key-informants for local development (e.g. local entrepreneur, school representatives and NGO) (cf. Tab. 1 for a brief characterization of the interviewed).

In a systematic procedure, we firstly contact partners from municipalities (mayors and members of municipal councils if mayors did not accept our invitation to interviews), which were influenced by MTA Brdy. These partners were asked to recommend other active stakeholders from the non-municipal sector, who actively participate on development issues of municipalities in the case study area. The objective was to cover the variety of ideas from respondents with various backgrounds and different views about the local development. Each interview lasted for circa one hour.

Tab. 1: Overview of selected local partners for interviews (anonymous style)

Type of partner for interview	Age category	Number of years spent in the case study area	Gender
Mayor 1	31-40 years	17	M
Mayor 2	41-50 years	13	F
Mayor 3	51-60 years	23	M
Mayor 4	61-70 years	19	F
Mayor 5	41-50 years	15	M
Member of the municipal council 1	21-30 years	9	M
Member of the municipal council 2	31-40 years	12	F
Member of the municipal council 3	41-50 years	14	F
Member of the municipal council 4	51-60 years	19	F
Member of the municipal council 5	61-70 years	21	M
Representative of school 1	41-50 years	9	F
Representative of school 2	51-60 years	14	M
Local businessman 1	31-40 years	12	F
Local businessman 2	21-30 years	8	M
Local farmer 1	41-50 years	15	M
Local farmer 2	51-60 years	17	M
Representative of civic association	31-40 years	11	F
Representative of the Military forests and estates	41-50 years	12	M
Representative of the Catholic church	51-60 years	13	M

Source: Own research

4 Local actors' perception of re-development of the former Brdy MTA and surrounding municipalities

In 2012, the government of the Czech Republic decided to suspend the MTA Brdy operations. After interesting and disputed alternative, it was decided to protect the area against unregulated development by establishing the Brdy Protected Landscape Area. In the following, we report about these development based on the key-informant interviews and analysis of public data about the case study area.

4.1. General description of the case study area's population development and location

Our case study area covers not only the former MTA Brdy but includes municipalities in its surroundings. We include the administrative units with small number of inhabitants. These were impacted by depopulation in the last century (based on last census data before World War I and last census data in 21st century) with only four municipalities (Strašice, Mirošov, Příbram and Jince) with an increase of inhabitants in the period 1910 - 2011 (Tab. 2). The lowest number of inhabitants was recorded in the year 1950 as result of World War II and expulsion of original German population from Czechoslovakia in the post-war period, when many Czech families left their homes to settle in former German areas.

Investigating the long-term population development of the Brdy MTA, it becomes evident that the territory had low population density before military activities started in 1927. The data illustrates the effects of two displacement phases: (1) the first wave was caused by the German Army during the Second World War. – After the war, the territory had been settled again, but the pre-war population was not achieved in the post-

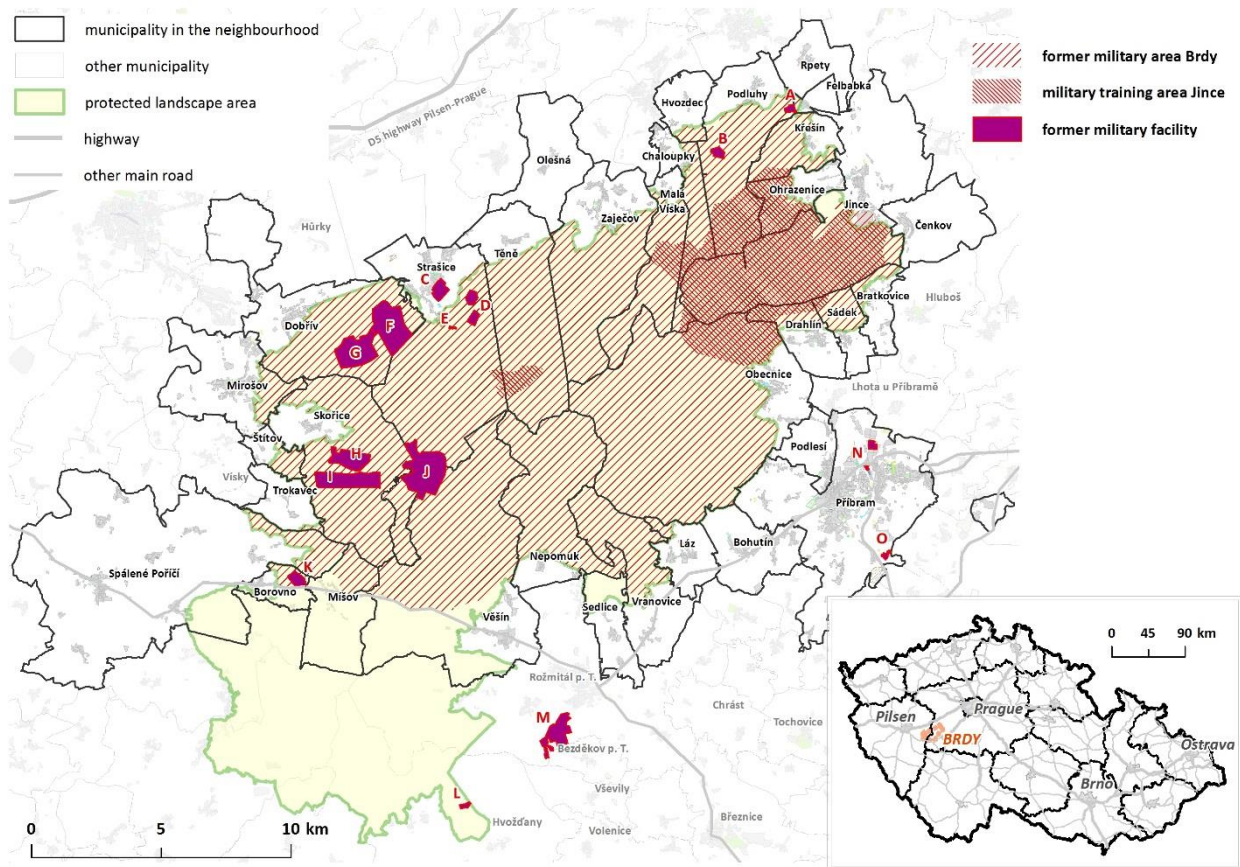
war period; (b) a second wave was enforced by the Communist regime in 1952. It caused another massive decline in the local population.

The case study area, which has been influenced by military activities (e.g. existence of military barrack and other services necessary for operating for needs of MTA Brdy) for many decades, is located in the south-west direction from Prague. Municipalities in the north-western part of territory have currently an advantage of a better connection via highway to Prague and Pilsen and further to Bavaria in Germany (Fig. 1).

Tab. 2: Population development in Brdy case study area in period 1910-2011

Territorial units (MTA Brdy and surrounding municipalities)	Area (km ²)	Number of inhabitants										Population increase or decrease 2011/1910 (%)
		1910	1921	1930	1950	1961	1970	1980	1991	2001	2011	
MTA Brdy*	260,09	1,789	1,616	1,448	772	179	101	187	51	44	27	-98.5%
Bohutín	8,43	1,822	1,480	1,339	991	1,399	1,296	1,344	1,397	1,487	1,630	-10.5%
Borovno	2,30	280	249	218	176	157	150	140	114	92	92	-67.1%
Bratkovice	3,00	768	702	660	504	463	403	338	255	259	308	-59.9%
Čenkov	9,01	643	654	623	610	570	541	419	373	381	405	-37.0%
Dobřív	12,15	1,397	1,364	1,492	1,537	1,508	1,496	999	1,007	1,063	1,226	-12.2%
Drahlín	3,64	853	734	719	507	480	470	420	459	500	535	-37.3%
Felbabka	1,52	305	335	310	253	266	267	264	216	223	255	-16.4%
Hvozdec	3,83	511	528	508	424	403	374	292	213	214	249	-51.3%
Chaloupky	1,80	780	720	694	546	480	434	398	362	381	508	-34.9%
Jince	15,08	1,348	1,265	1,592	1,260	1,941	1,870	1,633	2,195	2,227	2,147	59.3%
Křešín	1,91	326	277	263	193	168	142	134	112	103	112	-65.6%
Láz	4,66	909	817	767	566	583	490	494	483	536	573	-37.0%
Malá Víska	1,16	264	277	228	154	153	149	125	93	91	99	-62.5%
Mirošov	11,53	1,635	1,729	1,771	1,826	1,875	1,849	2,218	2,045	2,237	2,343	43.3%
Mišov	7,66	327	319	285	229	229	185	139	114	121	103	-68.5%
Nepomuk	2,49	523	477	402	287	325	277	178	232	185	201	-61.6%
Obecnice	5,50	1,858	1,653	1,590	1,217	1,251	1,206	1,131	1,111	1,182	1,219	-34.4%
Ohrazenice	2,45	597	497	425	283	277	257	207	214	234	290	-51.4%
Olešná	10,68	604	590	651	549	582	537	485	432	412	414	-31.5%
Podlesí	4,38	1,302	1,035	1,450	992	1,084	1,032	934	837	848	1,002	-23.0%
Podluhy	4,78	749	710	785	702	711	660	682	562	590	633	-15.5%
Příbram	33,41	20,826	17,703	15,464	13,614	26,803	29,993	35,123	36,898	35,886	33,084	58.9%
Rpety	5,94	492	480	466	422	391	346	358	404	426	465	-5.5%
Sádek	1,86	441	381	347	267	238	202	189	185	227	221	-49.9%
Sedlice	5,69	517	497	422	339	337	268	226	203	207	231	-55.3%
Skočice	3,74	652	630	586	312	370	322	290	233	231	236	-63.8%
Spálené Poříčí	54,52	4,200	4,109	3,925	3,203	3,191	2,811	2,817	2,584	2,512	2,660	-36.7%
Strašice	7,93	2,256	1,974	1,905	2,263	2,189	2,362	2,309	2,208	2,466	2,505	11.0%
Štítov	1,30	147	157	160	92	91	86	54	57	54	59	-59.9%
Těně	4,91	560	506	472	341	360	316	267	242	234	262	-53.2%
Trokavec	4,23	407	388	383	217	224	178	143	132	105	87	-78.6%
Věšín	17,06	1,436	1,380	1,139	851	908	830	715	657	613	659	-54.1%
Vranovice	6,23	564	547	452	418	373	348	292	258	248	287	-49.1%
Zaječov	7,03	2,001	1,920	1 896	2,576	1,677	1,565	1,415	1,359	1,345	1,406	-29.7%
Total	531,90	54,089	48,700	45,837	39,493	52,236	53,813	57,359	58,297	57,964	56,533	4.5%

Fig.1: Location of the case study area and impacts of suspended MTA Brdy on municipalities in the surroundings



Source: Own processing

4. 2. Reduction of military activities in the Czech Republic and their impacts on the case study area

Before 1989, the intensity of MTA operations was higher in the Czechoslovakia than it is currently in the Czech Republic. The Czechoslovak army was organised following the Soviet model. In 1989, it had about 200,000 soldiers. Moreover, in the period between 1968 -1991, there were about 70,000 Soviet soldiers in the country who also used the Czech MTAs. On the territory of the current the Czech Republic, military activities have been significantly reduced in the period since 1989. This can be derived from the numbers of soldiers – while there were circa 53,000 soldiers in Czech army in 1993, the number of soldiers in the Czech army declined to 11,000 by 2003. Since that year, the numbers of professional Czech soldiers has been increasing again to circa 30,000 soldiers by January 2018. The reasons stated for the re-militarisation are increased international security risks of terrorism and a threat of perceived rising imperial tendencies in certain countries.

Also the re-development of the former MTA Brdy was influenced by these trends.

First, the reduction of armed forces led to the creation of military brownfields (examples given in Fig. 2). Some military brownfields cover quite extensive area and they can be redeveloped only step by step – for example some parts of the military brownfield in Strašnice have been successfully redeveloped, but other parts are waiting for new investments (Fig. 3).

Fig. 2: Examples of military brownfields in the case study area – former military barrack from Rožmitál (left) and former shooting range from Kolvín (right)



Author: T. Krejčí

Fig. 3: Aerial image of military areal in southern part of Strašice in 2003 (left) and state of new development included solar power plant in 2018 (right)



Source: left - <https://mapy.cz/> ; right – Google Maps

Second, the increasingly unstable international security situation, influenced the former MTA Brdy as well, prominently exemplified by ambitious plans to create a US military radar station in Brdy. First consideration to build the radar site date back to 2002, when a missile defence strategy was discussed during the visit of the Czech Defence Minister Jaroslav Tvrdík in the USA (Mašťálka et al., 2012). Detailed plans for locating the military radar in Brdy were discussed intensively in the period 2007-2009. This period is described by Hynek (2013: 374) as “golden period of bilateral cooperation between the Czech Republic and the United States”, because George W. Bush’s presidential administration had strong interests in stationing an X-band radar in the Czech Republic as a part of the so-called Third Pillar of the US Ballistic Missile Defence (BMD) system. The main result of negotiations of two countries was an agreement on establishing a US ballistic missile defence radar site in the Czech Republic, which was signed in 2008 (Agreement....., 2008). This agreement, however, did not enter into force. In September 2009, the new Obama administration informed the Czech government that plans of the previous Bush administration including the military radar in Brdy

were cancelled, explaining that the US had decided to use alternatives to address global security threats (Mašťálka et al. 2012).

Several representatives of municipalities around the Brdy MTA played an important role in organising protests against the plans to create an US military radar in Brdy. For example, the mayor of the municipality of Trokavec, which is located in the neighbourhood of the site, where the US radar was planned to be erected, is described in the documentary film *“Czech Peace”* as *“a nightmare of the Czech Army and spokesman of the League of Mayors against Radar”* (Klusák and Remunda, 2010). In Trokavec, in March 2007, the first municipal referendum was held in which 71 of 72 voters refused the US military radar operations. This inspired other municipalities where referenda or local polls were held. Also there, the overwhelming majority of voters rejected the plans for a US radar station. The municipal referenda were important for the networking of different types of actors and because they also initiated discussions focused on possible future development of their municipalities.

In August 2007, the so-called League of Mayors against the Radar was signed by 22 mayors from municipalities that had a direct border with the Brdy MTA and 15 mayors of municipalities from the wider neighbourhoods (Mašťálka et al., 2012). The protests were also broad to the attention of the European policy makers as shown in Figure 4. Notwithstanding, it must be noted that not all mayors of the neighbouring municipalities were against the US plans. Some supported the project despite the mainly negative perception of their local citizenry, because these majors saw the chance of obtaining new funds for the development of their municipalities. The government of the Czech Republic tried to convince municipal representatives to support the project by promising the creation of a special subsidy fund for 22 municipalities around the foreseen radar site – with a budget of 1 billion Czech Crones of which a quarter devoted especially to the development of municipal infrastructures, e.g. sewage treatment plants, water supply systems, sewage systems. At the same time, the Czech government, as part of a funded public relations campaign, pointed out the possible positive future impacts of US investments for the development of municipalities and the region as a whole. However, this episode of a special national fund for the municipalities in Brdy finished in a classic post-communist style: after municipalities elaborated specific project plans for solicitation of these funds, a new government was elected which felt no longer committed to fulfil the promises to the region given by the previous government. The discussions related to the radar station worsened the general conditions for future networking and cooperation of local actors, because these plans created conflicts and personal barriers amongst some of them.

Fig. 4: Selected mayors from the Brdy Region in Brussels in February 2009



Source: Mašťálka, Neoral and Cironis (2012: 183)

4.3. The role of local actors in searching of new post-military development opportunities after suspension of the Brdy MTA

The failure of the US military project in Brdy caused a counter-reaction. In January 2012, the Czech government decided to suspend the Brdy MTA and to reduce the four remaining MTAs (Březina, Boletice, Hradiště and Libavá) with the rationale that the present professional armed forces of the Czech Republic do not need such large training areas. The suspension of the Brdy MTA significantly impacted the municipalities in the neighbourhood, because there was a change of functions in the area in the form of a reduction of military functions on one side and an increase of other functions, as for example environmental and recreational ones. In addition, the area of the Brdy MTA was divided administratively among 27 municipalities (Tab. 3) and the former MTA became a part of a new landscape protected area.

A noteworthy fact from the point of view of the actors related to municipal self-government was undoubtedly the decision that the protected landscape area of Brdy was established on an area of 345 km², which included not only the area of the former MTA with its size of 260 km² but also parts in its vicinity. It must also be noted that one part of the Brdy territory remained after the suspension of MTA operations in the hands of the Czech army – military activities continue in Jince training ground and a site called “America”. Nevertheless, the military functions of the area have clearly been reduced, and the issues of environmental protection (e.g. protection of water resources, protection of biodiversity), development of different types of tourism, and management of agriculture and forestry lands have become more important in the discussions of the local stakeholders. In this context, it is necessary to emphasize that not all local actors share the same development goals. Naturally, this causes conflicts among the different groups of actors.

Table 3: Suspension of the MTA Brdy and its impact on the surroundings municipalities (state 1st January 2015 and 1st January 2016)

Territorial units (MTA Brdy and surrounding municipalities)	Number of territorial units 1 st January 2015	Number of territorial units 1 st January 2016	Area 2015 (Km2)	Area 2016 (Km2)	Increase/decrease of area (Km2)	Increase/decrease of area (%)	Population on 1 st January 2015	Population density on 1 st January 2015 (Number of inhabitants/Km2)	Population on 1 st January 2016	Population density on 1 st January 2016 (Number of inhabitants/Km2)
MTA Brdy	1		260.1	0.0	-260.1	-100.0%	27	0.1		
Bohutín	1	1	8.5	8.5	0.0	0.0%	1,726	203.5	1,743	205.5
Borovno	1	1	2.3	3.3	1.0	42.1%	89	38.7	90	27.6
Bratkovice	1	1	3.0	4.0	1.0	32.2%	322	107.3	316	79.8
Čenkov	1	1	9.0	9.0	0.0	0.0%	381	42.2	380	42.1
Dobřív	1	1	12.1	27.1	15.0	123.8%	1,286	106.1	1,279	47.1
Drahlin	1	1	3.6	5.9	2.3	62.0%	535	147.0	538	91.3
Felbabka	1	1	1.5	1.7	0.2	11.6%	283	186.2	283	166.5
Hvozdec	1	1	3.8	4.5	0.6	16.6%	254	66.5	259	58.1
Chaloupky	1	1	1.8	6.6	4.8	265.4%	509	282.8	506	77.0
Jince	1	1	15.1	36.6	21.6	143.2%	2,247	149.2	2,253	61.5
Křešín	1	1	1.9	6.3	4.3	226.6%	111	58.1	114	18.2
Láz	1	1	4.7	5.2	0.5	10.4%	603	129.1	609	118.3
Malá Víska	1	1	1.2	10.2	9.0	783.4%	88	76.5	92	9.0
Mirošov	1	1	11.5	13.6	2.1	18.1%	2,232	193.4	2,210	162.1
Míšov	1	1	7.7	9.9	2.2	29.0%	103	13.4	113	11.4
Nepomuk	1	1	2.5	20.1	17.7	715.2%	186	75.3	189	9.4

Obecnice	1	1	5.5	51.5	46.0	844.1%	1,274	233.8	1,270	24.7
Ohrazenice	1	1	2.5	5.6	3.1	126.9%	284	115.9	280	50.4
Olešná	1	1	10.7	10.7	0.0	0.0%	421	39.4	409	38.3
Podlesí	1	1	4.4	4.4	0.0	0.0%	1,107	252.7	1,097	250.5
Podluhy	1	1	4.8	16.7	12.0	250.2%	651	136.2	653	39.0
Příbram	1	1	33.5	33.5	0.0	0.0%	33,160	991.3	33,058	988.3
Rpety	1	1	5.9	5.9	0.0	0.0%	485	81.8	494	83.3
Sádek	1	1	1.9	4.2	2.4	126.3%	221	118.8	225	53.4
Sedlice	1	1	5.7	5.7	0.0	0.0%	258	45.1	266	46.5
Skořice	1	1	3.7	23.8	20.0	535.0%	245	65.5	267	11.2
Spálené Poříčí	1	1	54.5	57.8	3.3	6.1%	2,693	49.4	2,710	46.9
Strašice	1	1	7.9	34.8	26.9	339.4%	2,462	310.5	2,477	71.1
Štítov	1	1	1.3	2.6	1.3	101.9%	62	47.7	63	24.0
Těně	1	1	4.9	20.8	15.9	323.5%	269	54.8	272	13.1
Trokavec	1	1	4.2	4.4	0.2	4.0%	93	22.0	94	21.4
Věšín	1	1	17.1	41.1	24.1	141.0%	687	40.3	701	17.1
Vranovice	1	1	6.2	13.9	7.6	122.5%	313	50.2	310	22.4
Zaječov	1	1	7.0	22.3	15.2	216.5%	1,436	204.3	1,422	63.9
Total	35	34	531.9	531.9	0.0		57,103	107.4	57,042	107.2

Source: Malý lexikon obcí České republiky – 2015 and 2016 (<https://www.czso.cz/csu/czso/maly-lexikon-obci-ceske-republiky-2015> <https://www.czso.cz/csu/czso/maly-lexikon-obci-ceske-republiky-2016>)

In the environmental protection area, the most controversial issues are related to the management of the former MTA landscape. Along the military activities, time led to the evolution of remarkable and valuable biotopes. The biodiversity within the former and current MTAs has been the subject of a number of several studies (e.g. Luft et al., 2014; Guimarães et al., 2017), but it should be remembered that local actors as represented by the mayors of neighbouring municipalities are not primarily interested in the protection of biodiversity as such. They often aim at utilising the natural capital for the benefit of their communities and citizens. In other words, the former MTA is perceived as a resource pool (e.g. water sources) or as barrier of development because of environmental protection regulations. From a biodiversity point of view, the most valuable biotopes in Brdy are heaths. After suspension of the military training activities, management was needed to safe the status in the form of controlled fires – a method which is also used in former military training areas in Germany to care about non-forests ecosystems (Wanner and Xylander, 2003). On the contrary, major threats are uncontrolled fires, as the overwhelming majority of the former MTA is afforested. For this reason, most of the 27 municipalities with enlarged territory were forced to buy (with support of special subsidies and funds) new fire-fighting technology (e.g. new high-capacity tanks).

In 2012, in connection with the planned suspension of the Brdy MTA, some mayors have expressed concerns about the sources of drinking water. Příbram and the neighbouring municipalities take 80% of their consumption of drinking water from the former Brdy MTA and they suspected that the re-development can negatively influence water quality. Finally, the central government decided that the ownership of the water resources in Brdy is transferred to the surroundings municipalities. Some mayors were not satisfied with the state of the water infrastructures, which can be illustrated by a statement from one of the mayors saying: *"The Czech Army have not invested much money in the water pipes, it only corrected what was flowing."*

The mayors of the 27 municipalities that increased the area of their territories also expressed their concern that the former MTA could become the object for too many unwanted developers. For this reason it was decided to change the municipal plans in such a way that the new territories of the former MTA were defined as areas, where the creation of both residential and non-residential constructions is prohibited. To

create new municipal plans, municipalities could apply for a special subsidy fund from the Rural Stabilization and Reconstruction Programme.

Tourism is often a first consideration for the re-use of natural landscapes – including the development of related infrastructures. In the case study, the attention of actors has been focused not only on the unique natural sights but also on a restoration of the historical awareness, which can be very important in terms of shaping a new regional and local identity (e.g. Marques et al., 2015). Because the territory of the former MTA is rather extensive, the focus has been on the creation of a network of bicycle paths. Their concept respects the demand of most local actors for no new constructions on the former MTA, allowing still for the location of technical infrastructures, as for example new parking places (Fig. 5), and tourist facilities as restaurants, accommodation, information centres. However, the propagation of tourism activities was not in unison. For example, some actors (e.g. owners of accommodation facilities) supported investments to winter tourism activities (e. g. creation of new ski slopes, regular creation of cross-country skiing tracks), while other actors, as for example owners of forests, highlighted the need to use winter seasons for the removal of wood, and a third group of actors representing self-government were afraid of pollution impacts to the water sources. For successful resolving these conflicts, an intensive communication was necessary. The concept of the cycling track network convinced most actors by building a good connection to the surrounding municipalities and being usable by hikers, too.

In order to restore the historical awareness, two educational trails have been created: the first one with the title "*In the Footsteps of the Czechoslovak Artillery*" presents to visitors the surroundings of the most famous artillery training areas and the infantry cabin on Jordan. The second educational trail with the title "*Traces of Displaced Brdy Municipalities and Settlements*" has as main attraction the Central Brdy Museum in Strašice and the hunting lodge of Tři Trubky. Another tourist attraction reminiscent of the previous military use is the atomic museum in a building after the Soviet army (Fig. 5 - right). In this context, it is necessary to appreciate that there are also facilities, which remember of the negative historical experiences with the displacement of populations (Fig. 6). This could be very important not only for development of tourism activities at abandoned sites (Navrátil et al, 2018; Klufová and Šulista, 2018) but being cornerstones of local history and serving as a memorial for persons and their descendants, who have own experiences with displacement.

To prepare an opening of the Brdy MTA for visitors, municipal representatives repeatedly appealed to the representatives of the Czech army to carry out fast pyrotechnic cleaning of the area in order to eliminate potential hazards for both tourists and local inhabitants. The army completed the pyrotechnic cleaning of the entire open area in December 2017.

Marketing activities, in particular various events, aimed at increasing the visibility of the former Brdy MTA. A prominent example is the "Day of the Czech Army" (Fig. 7). Also non-military events are organised, for example the sport event "Running Race Forests Brdy" or the activities for mountain bikers "Trans Brdy". The development of tourism has become one of the main drivers for intensifying the cooperation between municipalities and other local actors. It led to a high representation of small municipalities as this cooperation has been developed within the ambition and framework of inter-municipal cooperation and local action groups. In addition, a promotion company was set up with the task to conceptually manage the development of tourism in the newly established Brdy landscape protected area, in agreement with the municipalities and other groups of stakeholders in the region.

Fig. 5: New opportunities for tourists – new parking facilities in Kolvín (left) and new unique atomic museum with exhibits reminiscent of the Cold War in a former military buildings built in the past by the Soviet Army located near the municipality Míšov (right)



Source: Left – Tomáš Krejčí, Right- http://plzen.idnes.cz/v-brdech-se-verejnosti-otevre-unikatni-atomove-muzeum-p12-/plzen-zpravy.aspx?c=A130816_153738_plzen-zpravy_sou

Fig. 6: Memorial place of former settlements in Kolvín (left) in former MTA Brdy and detail information with the statement “At this place was a farmhouse No. 10 – family Frühauf....the family was evicted in 1941 by Germans (Nazi).....the farmhouse was finally demolished in 1953 (by Communists)Honour to their memory. Family Frühauf and their relatives.....September 2017” (right)



Author – Tomáš Krejčí

Fig. 7: Ground Day of the Czech Army increase visibility of former MTA among tourists - the tanks training area near municipality Strašice with 50,000 visitors (June 2016)



Source: http://plzen.idnes.cz/bahna-2016-den-pozemniho-vojska-strasice-dh2-/plzen-zpravy.aspx?c=A160623_122309_plzen-zpravy_pp

Agriculture and forestry are of considerable importance. The ownership of agricultural and forest land remained unchanged, as the main owner the military forests and estates (a company owned by Czech state) owns 309.2 km², with 284.7 km² consisting of forest areas (VLS 2017: 9). The management of such large forests also requires the cooperation in different areas between different actors, including forest owners in surrounding municipalities. Critical topics include, for example, the issue of the elimination of bark beetles, which was discussed in detail in the Czech Republic's case of the Šumava National Park (Zýval et al., 2016), but currently it is also necessary to fight against spreading bark beetles in the former Brdy MTA and across the Czech Republic in other regions, because Czech monoculture forests are heavily affected by climate change impacts of increasing average temperatures and periods of droughts. Close and regular cooperation between owners and managers of forests and of farms with municipalities are necessary - for example regarding the protection of forests against fires and enforcement of tourists to comply with the safety and environment protection regulations.

4.4. Opportunities and threats related to the future development of former Brdy MTA

A final section of the interviews with the local actors focused on the identification of opportunities and threats that may affect the development of communities in the case study area in the future.

Local actors stressed opportunities especially as being related to the promotion and further development of tourism activities. Interestingly, this is because most of them are persuaded about the high value of the natural wealth of the Brdy landscape protected area. However, potential negative consequences of too massive tourism was not expressed.

In some municipalities with a better transport connection to large cities (Prague, Pilsen), the interviewees emphasized the development potentials for demarcating land for construction of new residential houses for new inhabitants – and thus local tax payers, who commute to the larger cities.

Asked about the biggest threat, some actors mentioned the aging of the population in some municipalities, especially in the small ones without basic services. This could lead to depopulation in the future. To counter this threat, interviewees emphasize the importance to invest into the transport infrastructure and into public transport system service, because effective commuting is understood to hold the migration of young, educated and skilled inhabitants from the case study area. Such depopulation problems are not unique to the Brdy area and have been discussed in many peripheral rural regions in EU countries (Kebza, 2018; Bański et al., 2018; Meijer and Sysner, 2017; Paniagua, 2008). The basic demographic data of the municipalities in the Brdy case study area (Tab. 4) indicate that the population grew slightly in most municipalities in the period 2012-2016. However, many of the municipalities are characterised by a relatively high proportion of

persons aged 65 and more. In this context, many representatives of the self-government stressed issues related to the care of the elderly. Topics such as setting up homes for old people, arranging lunch delivery and saving shopping opportunities became some of their most important issues at municipal level. Given the high share of seniors, it may be expected that some municipalities will face strong depopulation in the future. Actors from small municipalities criticised the lack of a basic infrastructure (shops, pubs, school and health facilities, and post office) as problems which could discourage potential new inhabitant from creating new houses in these settlements. Some representatives of the municipalities, in which school facilities are still located, also pointed to the threat that the aging population causes a decrease of the number of pupils, which means an increased risk of closure of these school in the rural municipalities.

Table 4: Current demographic data and information about municipal amenities

Territorial units (MTA Brdy and surrounding municipalities)	Population 1 st January 2012	Population 1 st January 2015	Population and municipal amenities 2016								Population increase/decrease 2012-2016 (%)
			Population 1 st January 2016	In age 0 - 14 years (abs.)	In age 0 - 14 years let (%)	In age 65+ years (abs.)	In age 65+ years (%)	Post office (yes = 1, no = 0)	School (yes = 1, no = 0, *=school for 1-4 classes)	Doctor (yes = 1, no = 0)	
MTA Brdy	31	27									
Bohutín	1,703	1,726	1,743	290	16.6	292	16.8	1	1	0	2.3
Borovno	89	89	90	10	11.1	26	28.9	0	0	0	1.1
Bratkovice	312	322	316	54	17.1	57	18.0	0	0	0	1.3
Čenkov	390	381	380	46	12.1	65	17.1	1	0	0	-2.6
Dobřív	1,255	1,286	1,279	196	15.3	233	18.2	1	*	1	1.9
Drahlín	536	535	538	74	13.8	115	21.4	0	0	0	0.4
Felbabka	266	283	283	55	19.4	58	20.5	0	0	0	6.4
Hvozdec	257	254	259	39	15.1	66	25.5	0	0	0	0.8
Chaloupky	476	509	506	73	14.4	104	20.6	0	0	0	6.3
Jince	2,257	2,247	2,253	373	16.6	282	12.5	1	1	1	-0.2
Křešín	110	111	114	13	11.4	26	22.8	0	0	0	3.6
Láz	590	603	609	115	18.9	107	17.6	0	0	1	3.2
Malá Víska	90	88	92	11	12.0	24	26.1	0	0	0	2.2
Mirošov	2,194	2,232	2,210	290	13.1	533	24.1	1	1	1	0.7
Mišov	113	103	113	16	14.2	17	15.0	0	0	0	0.0
Nepomuk	202	186	189	24	12.7	44	23.3	0	0	0	-6.4
Obecnice	1,270	1,274	1,270	196	15.4	213	16.8	1	1	1	0.0
Ohrazenice	272	284	280	41	14.6	50	17.9	0	0	0	2.9
Olešná	403	421	409	57	13.9	89	21.8	1	0	0	1.5
Podlesí	1,048	1,107	1,097	187	17.0	184	16.8	0	0	0	4.7
Podluhy	634	651	653	105	16.1	140	21.4	0	0	0	3.0
Příbram	33,793	33,160	33,058	4,699	14.2	6,327	19.1	1	1	1	-2.2
Rpety	479	485	494	72	14.6	83	16.8	0	0	0	3.1
Sádek	223	221	225	27	12.0	44	19.6	0	0	0	0.9
Sedlice	229	258	266	40	15.0	47	17.7	0	0	0	16.2
Skořice	245	245	267	33	12.4	51	19.1	0	0	0	9.0
Spálené Poříčí	2,675	2,693	2,710	424	15.6	494	18.2	1	1	1	1.3
Strašice	2,470	2,462	2,477	361	14.6	393	15.9	1	1	1	0.3
Štítov	57	62	63	9	14.3	10	15.9	0	0	0	10.5
Těně	265	269	272	33	12.1	53	19.5	0	0	0	2.6
Trokavec	91	93	94	5	5.3	17	18.1	0	0	0	3.3

Věšín	667	687	701	124	17.7	111	15.8	1	*	0	5.1
Vranovice	298	313	310	62	20.0	41	13.2	0	0	0	4.0
Zaječov	1,417	1,436	1,422	201	14.1	279	19.6	1	1	1	0.4
Total	59,419	59,118	59,058	8,355	14.1	10,675	18.1				-0.6

Source: Počet obyvatel v obcích k 1. 1. 2012 (<https://www.czso.cz/csu/czso/pocet-obyvatel-v-obcich-k-112012-izjb59u5xn>) and Malý lexikon obcí České republiky 2016 (<https://www.czso.cz/csu/czso/maly-lexikon-obci-ceske-republiky-2016>)

5. Conclusions

The intensity and use of MTAs is changing in time and these changes can cause uncertainties among local actors living in the neighbourhoods of these military training areas. In the 21st century in the Brdy case study area, local actors were impacted by the suspension of activities at the MTA and formed strong opinions about another military re-development in the form of a US military radar facility. Perceptions were related to promises of both Czech and US investments to the region. However, the change of the US geopolitical and strategic visions and the resignation of the US military project in Brdy changed the situation drastically. New challenges for local stakeholders materialised as the Brdy MTA was suspended and its territory was divided among the municipalities in the surroundings.

In the post-military era, the local actors were intensively searching for new development opportunities. Local actors had to cope with the fact that – while in the past development of their municipalities was limited due to military activities – new limits of development are determined by a complexity of factors including environmental restrictions. Especially the concept of protection of landscape protected areas versus residential and non-residential constructions.

All developments in the 21st century in the Brdy case study area could be marked as rapid turbulence that are typical of post-communist democracies (Klicperova-Baker and Košťál, 2017). In conclusion, the rapid turbulences of the 21st century recall the rapid turns of the 20th century with two displacement phases of the local inhabitants during the increase the of military training area implemented by Germans in World War II and Stalinists in 1953, and the stationing of the Soviet Army in the period after August 1968. Although it is, of course, possible to appreciate that in the 21st century the conflicts among actors with the different development goals in the different areas (tourism development, environmental protection, regeneration of military brownfields) were resolved in a less-conflict and democratic form in comparison to the previous 20th century.

Overall, our case tells interesting stories about the local actors' role in site revitalisation and its specificity given a military use context. We find that ambitions and goals are mixed and that communication is important to understand and to negotiate goals. Such communication will be the basis for identification of locally meaningful and beneficial re-development options. Notwithstanding, overall the redevelopment potential will still depend also on superregional factors, such as national and international politics or the national and international connection to main infrastructures.

References

- Agreement between the Czech Republic and The United States of America on establishing a United States ballistic missile defence radar site in the Czech Republic (2008): [online] Available at: http://www.aic.cz/cms/Agreement_EN.pdf
- Alexandrescu, F.M., Pizzol, L., Zabeo, A., Rizzo, E., Giubilato, E., Critto A., 2016a. Identifying sustainability communicators in urban regeneration: Integrating individual and relational attributes. *Journal of Cleaner Production* in press. <http://dx.doi.org/10.1016/j.jclepro.2016.09.076>
- Alexandrescu, F.M., Rizzo, E., Pizzol, L., Critto A., Marcomini, A. 2016b. The social embeddedness of brownfield regeneration actors: Insights from social network analysis. *Journal of Cleaner Production* 139 (2016) 1539e1550.
- Alexandrescu, F., Klusáček, P., Bartke, S., Osman, R., Frantál, B., Martinát, S., Kunc, J., Pizzol, L., Zabeo, A., Giubilato, E., Critto, A., Bleicher, A. (2017): Actor networks and the construction of applicable knowledge: the case of the

- Timbre Brownfield Prioritization Tool, *Clean Technologies and Environmental Policy*, 19(5), 1323-1334, doi:10.1007/s10098-016-1331-8
- Alexandrescu, F., Martinát, S., Klusáček, P., Bartke, S. (2014). The path from passivity toward entrepreneurship: Public sector actors in brownfield regeneration processes in central and eastern Europe. *Organization & Environment*, 27(2): 181-201
- Bański, J., Degórski, M., Komornicki, T., & Śleszyński, P. (2018). The delimitation of areas of strategic intervention in Poland: A methodological trial and its results. *Moravian Geographical Reports*, 26(2), 84-94.
- Bartke, S., Filip Alexandrescu, Bohumil Frantál, Stanislav Martinát, Josef Kunc, Robert Osman, Lisa Pizzol, Alex Zabeo, Elisa Giubilato, Andrea Critto, Alena Bleicher Targeted selection of brownfields from portfolios for sustainable regeneration: User experiences from five cases testing the Timbre Brownfield Prioritization Tool. *J Environ Manage.* 2016 Dec 15;184(Pt 1):94-107. doi: 10.1016/j.jenvman.2016.07.037.
- Bartke, S., Schwarze, R. (2015): No perfect tools: Trade-offs of sustainability principles and user requirements in designing tools supporting land-use decisions between greenfields and brown-fields, *Journal of Environmental Management* 153, 11–24, doi: 10.1016/j.jenvman.2015.01.040
- Bleicher, A., Groß, M., 2010. Sustainability assessment and the revitalization of contaminated sites: operationalizing sustainable development for local problems. *Int. J. Sust. Dev. World* 17(1), 57–66, doi: 10.1080/13504500903488263
- Burmaoglu, Serhat, Ozcan Saritas, Changing characteristics of warfare and the future of Military R&D, *Technological Forecasting and Social Change*, Volume 116, 2017, Pages 151-161, ISSN 0040-1625, <http://dx.doi.org/10.1016/j.techfore.2016.10.062>.
- Bryson, P.J. (2008): "State administration" vs. self-government in the Slovak and Czech Republics, *Communist and Post-Communist Studies*, Volume 41, Issue 3, September 2008, Pages 339-358
- CEN (2014): Glossary of Terms for Holistic Management of Brownfield Regeneration (GoT-HOMBRE). CEN Workshop Agreement 74. <https://www.cen.eu/work/areas/env/Pages/WS-74.aspx>.
- Coates, P., T. Cole, M. Dudley, and C. Pearson 2011Defending Nation, Defending Nature? Militarized Landscapes and Military Environmentalism in Britain, France, and the United States. *Environmental History* 16(3): 456–491.
- Dudley Marianna (2013) Traces of Conflict: Environment and Eviction in British Military Training Areas, 1943 to Present, *Journal of War & Culture Studies*, 6:2, 112-126, DOI: 10.1179/1752627213Z.00000000011
- Frantál, B., Kunc, J., Nováková, E., Klusáček, P., Martinát, S., Osman, R. (2013): Location Matters! Exploring Brownfields Regeneration in a Spatial Context (A Case Study of the South Moravian Region, Czech Republic). *Moravian Geographical Reports*, 21 (2), 5-19.
- Frantál, B., Greer-Wootten, B., Klusáček, P., Krejčí, T., Kunc, J., Martinát, S. (2015a). Exploring Spatial Patterns of Urban Brownfields Regeneration: The Case of Brno, Czech Republic. *Cities*, 44, 9-18.
- Frantál, B., Kunc, J., Klusáček, P., Martinát, S. (2015b). Assessing Success Factors of Brownfields Regeneration: International and Inter-stakeholder Perspective. *Transylvanian Review of Administrative Sciences*, 44E, 91-107.
- Forejt, Michal , Jan Skalos, Anna Pereponova, Tobias Plieninger, Jaroslav Vojta, Markéta Šantrůčková, Changes and continuity of wood-pastures in the lowland landscape in Czechia, *Applied Geography*, Volume 79, 2017, Pages 235-244, ISSN 0143-6228, <http://dx.doi.org/10.1016/j.apgeog.2016.12.016>.
- Fox, William E., Zenon Medina-Cetina, Jay Angerer, Patricia Varela, Ji Ryang Chung, Water Quality & natural resource management on military training lands in Central Texas: Improved decision support via Bayesian Networks, *Sustainability of Water Quality and Ecology*, 2017, ISSN 2212-6139, <http://dx.doi.org/10.1016/j.swaqe.2017.03.001>.
- Glivicka, J. (2009): We are winning! Civic Protest Is Meaningful [online] Available at: http://www.nezakladnam.cz/en/1714_we-are-winning-civic-protest-is-meaningful
- Guimarães, H., Braga, R., Mascarenhas, A., Barros Ramos, T. (2017): Indicators of ecosystem services in a military Atlantic Forest area, Pernambuco—Brazil, *Ecological Indicators*, Volume 80, September 2017, Pages 247-257, ISSN 1470-160X, <https://doi.org/10.1016/j.ecolind.2017.05.030>.
- Havlíček, M., Skokanová, H., Dostál, I., Vymazalová, M., Pavelková, R., Petrovič, F. (2018): The consequences of establishing military training areas for land use development—A case study of Libavá, Czech Republic, *Land Use Policy*, Volume 73, Pages 84-94, ISSN 0264-8377, <https://doi.org/10.1016/j.landusepol.2018.01.039>.
- Harclerode, Melissa, Debora Reanne Ridsdale, Dominique Darmendrail, Paul Bardos, Filip Alexandrescu, Paul Nathanail, Lisa Pizzol, Erika Rizzo. Integrating the Social Dimension in Remediation Decision-Making: State of the Practice and Way Forward. *Remediation Journal*, published by John Wiley & Sons, Inc). <https://doi.org/10.1002/rem.21447>

- Hartmuth, G., Huber, K., Rink, D., 2008. Operationalization and contextualization of sustainability at the local level. *Sustain. Dev.* 16(4), 261-270, doi: 10.1002/sd.377
- Hercik, J., Šimáček, P., Szczyrba, Z., & Smolová, I. (2014). Military brownfields in the Czech Republic and the potential for their revitalisation, focused on their residential function. *Quaestiones Geographicae*, 33(2), 127-138. Hynek, Nik, Vit Stritecky, The rise and fall of the Third Site of Ballistic Missile Defense, *Communist and Post-Communist Studies*, Volume 43, Issue 2, 2010, Pages 179-187, ISSN 0967-067X, <http://dx.doi.org/10.1016/j.postcomstud.2010.03.002>.
- Kebza, M. (2018). The development of peripheral areas: The case of West Pomeranian Voivodeship, Poland. *Moravian Geographical Reports*, 26(1), 69-81.
- Klicperova-Baker, M., Košťál, J. (2017): Post-communist democracy vs. totalitarianism: Contrasting patterns of need satisfaction and societal frustration, *Communist and Post-Communist Studies*, Volume 50, Issue 2, June 2017, Pages 99-111, ISSN 0967-067X, <https://doi.org/10.1016/j.postcomstud.2017.05.002>.
- Klufová, R., Šulista, M. (2018): Perceptions of Czech rural life by its inhabitants in connection to tourism, *Deturope*, Volume 10, Issue, 1, Pages 5-32.
- Klusák, V., Remunda, F. (2010): Czech Peace extended trailer [online] Available at: <https://vimeo.com/3131924>
- Limasset, Elsa, Lisa Pizzol, Corinne Merly, Annette M. Gatchett, Cécile Le Guern, Stanislav Martinát, Petr Klusáček, Stephan Bartke. Points of attention in designing tools for regional brownfield prioritization, *Science of The Total Environment*, Volumes 622–623, 2018, Pages 997-1008, <https://doi.org/10.1016/j.scitotenv.2017.11.168>.
- Lindenmayer, David B., Christopher MacGregor, Jeff Wood, Martin J. Westgate, Karen Ikin, Claire Foster, Fred Ford, Rick Zentelis, Bombs, fire and biodiversity: Vertebrate fauna occurrence in areas subject to military training, *Biological Conservation*, Volume 204, 2016, Pages 276-283, ISSN 0006-3207, <http://dx.doi.org/10.1016/j.biocon.2016.10.030>.
- Luft, L., Neumann, C., Freude, M., Blaum, N., Jeltsch, F. (2014): Hyperspectral modeling of ecological indicators – A new approach for monitoring former military training areas, *Ecological Indicators*, Volume 46, 2014, Pages 264-285, ISSN 1470-160X, <http://dx.doi.org/10.1016/j.ecolind.2014.06.025>.
- Meijer, Marlies Josefine Syssner, Getting ahead in depopulating areas - How linking social capital is used for informal planning practices in Sweden and The Netherlands, *Journal of Rural Studies*, Volume 55, October 2017, Pages 59-70, ISSN 0743-0167, <https://doi.org/10.1016/j.jrurstud.2017.07.014>.
- Martinát, S., Dvořák, P., Frantál, B., Klusáček, P., Kunc, J., Navrátil J., Osman, R., Turečková, Kamila, Reed, M. (2016): Sustainable urban development in a city affected by heavy industry and mining? Case study of brownfields in Karviná, Czech Republic. *Journal of Cleaner Production* 118, 78-87
- Mašťálka, J., Neoral J., Cironis P. (2012): Boj o kótu 718 Kronika protestu občanů ČR proti výstavbě amerického radaru v Brdech 2007-2009, vydáno za podpory klubu GUE/NGL v EP, 302 s. [online] Available at: <https://www.ulozto.cz/l29TgGd8z/boj-o-kotu-718-s-barevnou-prilohou-pdf>
- Navrátil, J., Krejčí, T., Martinát, S., Pasqualetti, M. J., Klusáček, P., Frantál, B., Tocháčková K. (2018): Brownfields do not “only live twice”: The possibilities for heritage preservation and the enlargement of leisure time activities in Brno, the Czech Republic, *Cities*, Volume 74, Pages 52-63, ISSN 0264-2751, <https://doi.org/10.1016/j.cities.2017.11.003>
- No Bases Initiative (2006): [online] Available at: http://www.nezakladnam.cz/en/425_about-the-initiative
- Marques, S., Lima, M.L., Moreira, S., Reis, J. (2015): Local identity as an amplifier: Procedural justice, local identity and attitudes towards new dam projects, *Journal of Environmental Psychology*, Volume 44, 2015, Pages 63-73, ISSN 0272-4944, <http://dx.doi.org/10.1016/j.jenvp.2015.09.007>.
- Osman, R., Frantál, B., Klusáček, P., Kunc, J., Martinát, S. (2015): Factors affecting brownfield regeneration in post-socialist space: The case of the Czech Republic. *Land Use Policy*, vol. 48, 309–316.
- Paniagua, Angel The environmental dimension in the constitution of new social groups in an extremely depopulated rural area of Spain (Soria), *Land Use Policy*, Volume 25, Issue 1, 2008, Pages 17-29, ISSN 0264-8377, <http://dx.doi.org/10.1016/j.landusepol.2007.02.001>.
- Pearson, Chris, Peter A. Coates, and Tim Cole, eds. 2010 *Militarized Landscapes: From Gettysburg to Salisbury Plain*. London ; New York: Continuum
- Pizzol, Lisa, Alex Zabeo, Elisa Giubilato, Andrea Critto, Petr Klusáček, Bohumil Frantál, Standa Martinát, Josef Kunc, Robert Osman, Stephan Bartke. Timbre Brownfield prioritization tool to support effective and sustainable brownfield regeneration. *JOURNAL OF ENVIRONMENTAL MANAGEMENT* Volume 166, 15 January 2016, Pages 178–192. <https://doi.org/10.1016/j.jenvman.2015.09.030>
- Rizzo; Erika, Paul Bardos; Lisa Pizzol; Elisa Giubilato; Andrea Critto; Antonio Marcomini; Claudio Albano; Dominique Darmendrail; Gernot Döberl; Melissa Harclerode; Nicola Harries; Paul Nathanail; Carlos Pachon; Alfonso

- Rodriguez; Hans Slenders; Garry Smith. COMPARISON OF INTERNATIONAL APPROACHES TO SUSTAINABLE REMEDIATION. *Journal of Environmental Management*, Volume 184, Part 1, 15 December 2016, Pages 4-17. <https://doi.org/10.1016/j.jenvman.2016.07.062>
- Schädler, Sebastian, Maximilian Morio, Stephan Bartke, Michael Finkel, (2012): Integrated planning and spatial evaluation of megasite remediation and reuse options, *Journal of Contaminant Hydrology*, Volume 127, Issues 1–4, Pages 88-100, ISSN 0169-7722, <https://doi.org/10.1016/j.jconhyd.2011.03.003>.
- Seidl, T., Chromý, P., Habartová, P. Perceptions of marginality: The role of administration and other stakeholders in issues of future development of Czech military training areas (2010) *Acta Universitatis Carolinae, Geographica*, 45 (2), pp. 89-100.
- Skokanová, H., Havlíček, M., Klusáček, P., Martinát, S. (2017): Five military training areas – five different trajectories of land cover development? Case studies from the Czech Republic, *Geographia Cassoviensis*, XI, 2017/2, p. 201-213, https://geografia.science.upjs.sk/images/geographia_cassoviensis/articles/GC-2017-11-2/2017_2_Skokanov%C3%A1_et_al_final.pdf
- Vogel, H. Weapons of mass destruction, WMD, *European Journal of Radiology*, Volume 63, Issue 2, 2007, Pages 205-213, ISSN 0720-048X, <http://dx.doi.org/10.1016/j.ejrad.2007.03.037>.
- Voie, Øyvind Albert, Kjetil S. Longva, Arnljot E. Strømseng, Arnt Johnsen, Risk assessment of white phosphorus in military training areas, a probabilistic approach, *Toxicology Letters*, Volume 164, 2006, Pages S139-S140, ISSN 0378-4274, <http://dx.doi.org/10.1016/j.toxlet.2006.06.292>.
- VLS (2017): Brdy – the only mountains in Central Bohemia, [online] Available at: https://www.vls.cz/media/content/brochure/index.html#brochure-vls_en/page/8-9
- Zentelis, R., Lindenmayer, D., Roberts, J.D., Dovers, S. (2017): Principles for integrated environmental management of military training areas, *Land Use Policy*, Volume 63, April 2017, Pages 186-195, ISSN 0264-8377, <https://doi.org/10.1016/j.landusepol.2017.01.025>.
- Zýval, Vladimír, Zdenka Křenová, Pavel Kindlmann, Conservation implications of forest changes caused by bark beetle management in the Šumava National Park, *Biological Conservation*, Volume 204, 2016, Pages 394-402, ISSN 0006-3207, <http://dx.doi.org/10.1016/j.biocon.2016.11.001>.
- Wanner, Manfred, Willi E.R. Xylander, Transient fires useful for habitat-management do not affect soil microfauna (testate amoebae)—a study on an active military training area in eastern Germany, *Ecological Engineering*, Volume 20, Issue 2, 2003, Pages 113-119, ISSN 0925-8574, [http://dx.doi.org/10.1016/S0925-8574\(02\)00124-6](http://dx.doi.org/10.1016/S0925-8574(02)00124-6).
- Woodward, Rachel, 2004, *Military Geographies*. RGS-IBG Book Series. Wiley.