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The influence of the highway route on the development of patchwork of plots

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Abstract

When defining the patchwork of plots, based on the literature, it lists the types and subtypes, and given their prevalence in the studied villages. Characterized listed types and subtypes the patchwork of plots the adopted villages crossed by the highway, paying particular attention to the fragmentation of the parcels. Particular attention was paid to the occurrence of the patchwork of the outer of plots for the following reasons: firstly – the presence of plots owners do not reside in the surveyed villages (out-of-village owners) and living in the surveyed villages, but with land in other surveyed villages (local non-resident owners), which is an important issue approximately of plots owners to habitat in the complex work of consolidation and exchange of land; secondly – it allows for adjustment of the boundaries of the village, which destroys the highway without immediate execution merge. This should make such a correction using only the exchange of land; thirdly – crossing the village highway of plots prevents access to out-of-village owners and local non-resident owners when their habitats are located on the opposite side thereof. The study of this problem are designed the patchwork table method to both the external patchwork of plots and internal patchwork of plots. Conducting research in this field mapping method was used to present the occurrence of the external patchwork of plots and the internal patchwork of plots on the cadastral maps.

Key words: *cadastral maps, consolidation and exchange land, highway, land divisions, non-resident owners, patchwork of plots*

INTRODUCTION

Agricultural production space of the Polish countryside was shaped by centuries of different historical conditions and legal and socio-economic population living in rural areas [HOPFER 1978; NOGA 1990; WOCH (ed.) 2006], which resulted in a very large patchwork of individual plots.

In Poland it is estimated that we have 3 million hectares of arable land in the patchwork of plots. In this area the largest share of land in a patchwork observed in south-eastern Poland. Despite this, in the current Subcarpathian Voivodeship it merged only 347 villages, with a total area of 278 440 hectares, which represents only 15.6% of the total area of the Subcarpathian Voivodeship [BALAWEJDER 2015].

Produced in this part of Polish the patchwork of plots, it has a very small surface parcels and their dispersal. The average farm in the Subcarpathian Voivodeship consists of a few to several plots of land, registration of which don't exceed 0.30 hectares [Zarząd Województwa Podkarpackiego 2006]. These plots are often misshapen in the lowlands very elongated and without directions. How to show a detailed study [NOGA, BŁAŻ 2011] in the villages of the Subcarpathian Voivodeship percentage rate of lack of access to plots ranges from 50–70% of the total number of plots in the village. In fact, this condition wors-

ens the course of the highway through the village, which is a way of representing the most important nerve of socio-economic, cultural and interpersonal ties. However, it is a foreign element in the landscape of the village, destroying the communication system between the registration plots and habitat, as well as links between functional and spatial localities. That does not mean that the construction of highways in Poland is the most important project bring closer city and state. However, the linear nature of the cover hundreds of kilometers and as the most important investment cuts through a vast number of plots of many of their owners and have a negative impact on the environment.

The aim of the study is to determine the size of the secondary patchwork of plots caused by built A-4 highway. The effects of the highway require special treatment in the work of consolidation and exchange land disposal, both in the natural environment of the area and its land use. The scope of work includes 11 villages crossed by the highway A-4 in the district of Rzeszów.

GENERAL CHARACTERISTICS OF THE STUDIED AREA

By district of Rzeszów highway A-4, crossing areas of 11 villages, as illustrated Table 1.

Table 1. Villages of the district of Rzeszów divided by the A-4 highway

Commune name	Village name	Area		The area of the village resulting from the division by the highway				The area occupied by the highway	
				the area cut off to the north[1)]		the area cut off to the south[2)]			
		ha	%	ha	%	ha	%	ha	%
Świlcza	Bratkowice	4 693	39.7	3 060	65.2	1 513	32.2	120	2.6
	Mrowla	822	7.0	181	22.0	578	70.3	63	7.7
Głogów Młp.	Lipie	534	4.5	524	98.1	5	0.9	5	0.9
	Rogoźnica	254	2.2	187	73.6	47	18.5	20	7.9
	Rudna Mała	1 221	10.3	774	63.4	414	33.9	33	2.7
Trzebownisko	Zaczernie	809	6.9	160	19.8	619	76.5	30	3.7
	Nowa Wieś	302	2.6	134	44.4	149	49.3	19	6.3
	Terliczka	198	1.7	138	69.7	26	13.1	34	17.2
	Łąka	1 039	8.8	38	3.7	952	91.6	49	4.7
	Łukawiec	1 242	10.5	1 230	99.0	0	0.0	12	1.0
Krasne	Palikówka	693	5.9	55	7.9	605	87.3	33	4.8
Total		11 807	100.0	6 481	54.9	4 908	41.6	418	3.5

[1)] The area of the village cut to the north in relation to the highway.
[2)] The area of the village cut to the south in relation to the highway.
Source: own elaboration.

As seen in Table 1 highway divides the surfaces of the village into two parts – north and south, in different sizes depending on the course of their borders. In three villages: Lipie, Łąka and Łukawiec highway mileage doesn't make major destruction spatial land in ways direct their operation, the storm only road links between towns located off the highway. In the remaining 8 villages highway not only breaks the ties between villages, but made in systems of spatial villages and farms destruction involving the interruption of communication links between the homestead and the cadastral plot [BALAWEJDER, MIKA (ed.) 2015]. Shaped by centuries spatial layouts of land are distorted. In particular, it is demonstrated in the villages of ribbon systems, which exist in almost all of the villages of the district of Rzeszów [STELMACH *et al*. 1990]. The biggest destruction highway made in Nowa Wieś, Terliczka, Rudna Mała, Bratkowice and Mrowla. There highway crosses the village into two parts, running through the center of town and dividing it into northern and southern parts. In Nowa Wieś highway separates the village on the northern part, which occupies 44.4% of the rural areas and the south, which occupies 49.3% of the area of the village. Residential buildings are located on both sides of the highway. In Bratkowice a similar situation, since they were divided on the northern part, which occupies 65.2% of the villages and the southern 32.2%. Although in Bratkowice habitat is located in the northern part of the village, but residential buildings are also located on the south side.

DEVELOPMENT OF PATCHWORK OF PLOTS

Shaped spatial structure of land the individual in the historical-legal and socio-economic process in south-eastern Poland underwent transformations, which resulted in a very large patchwork of individual plots.

The concept of the patchwork of plots to land surveying agricultural introduced in 1907, KONCENT--ZIELINSKI [1907]. In subsequent years, different authors in a similar way defined the patchwork of plots [RADWAN 1938; TKOCZ 1971]. More specifically studied the phenomenon described HOPFER [1978] distinguishes additionally patchwork of plots and soil quality classes. Patchwork of plots ownership of land is divided because of administrative boundaries, as a patchwork of plots inner land (occurring inside the villages) and external. Patchwork of plots outer land can be between villages, communes, districts, prov-

inces and even between countries. Owners with land in the patchwork of plots RABCZUK [1968] called non-resident owners. The concept non-resident owners clarified and developed a method of analysis and evaluation NOGA [1977; 1985a, b], assuming for non-resident owners following distinction:

1) out-of-village owners – owners who have their land in the village analyzed (consolidation) and live in other towns;
2) local non-resident owners – owners who have their land outside the village analyzed (consilidation), which is their place of residence.

Morphogenesis that took place in areas of individual plots led to high fragmentation of land parcels and their dispersion in space. With the fragmentation of land in south-eastern Poland was not followed by the development of roads direct service, which research show [BALAWEJDER 2010a, b; NOGA 1977; NOGA, BŁAŻ 2011; NOGA, LEŃ 2010].

In the analyzed villages of the district of Rzeszów, which crosses the highway A-4 dominates the strip type patchwork of plots (7 villages – Bratkowice, Rogoźnica, Lipie, Zaczernie, Łąka, Łukawiec, Palikówka) and three subtypes: strip-ladder (2 villages – Mrowla, Rudna Mała) ladder-strip (Nowa Wieś) and strip-irregular (Terliczka) [BALAWEJDER 2010a]. Type strip patchwork of plots, occurring in the vast majority of the studied area, is presented in Figure 1.

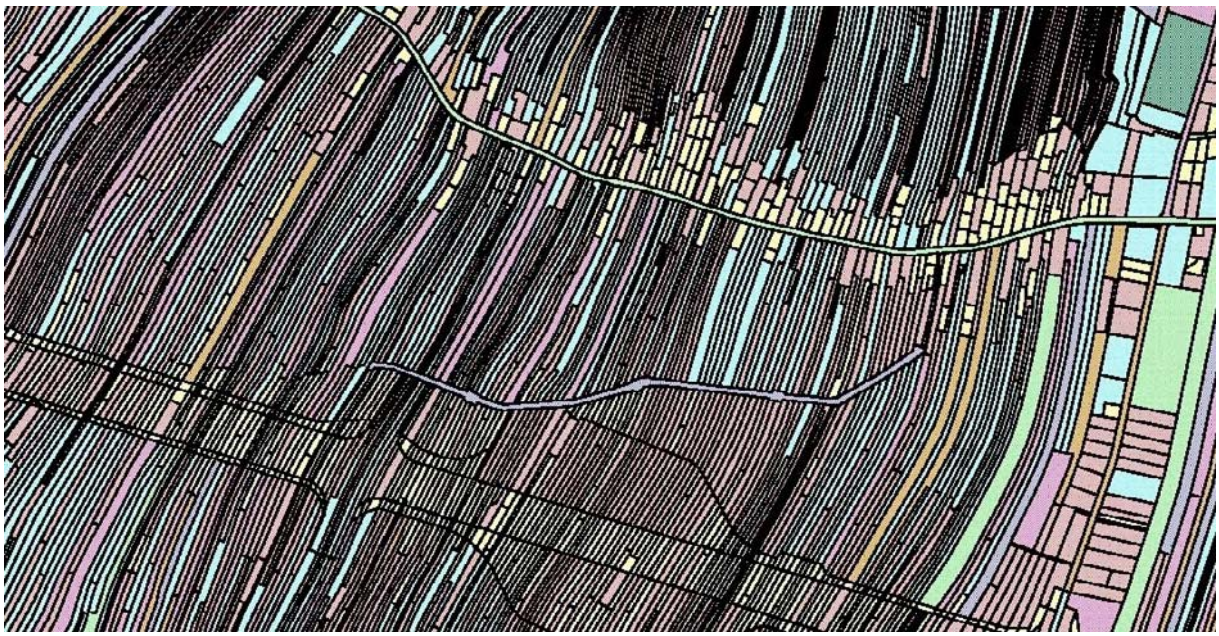

Fig. 1. Fragmentation of land parcels in the area groups – a part of Bratkowice village; source: own elaboration

Fragmentation of individual parcels sector is one of the factors that influence the amount of work farmers and the income from them. The size of the plot, its elongation and shape determine the profitability of agricultural production, and obtained in the analysis of medium-sized surfaces of cadastral parcels in the individual they are below average in force in the European Union [NOGA 2006; SOBOLEWSKA-MIKULSKA 2009].

ANALYSIS OF THE EXTERNAL PATCHWORK OF PLOTS

Patchwork of plots in the village (external and internal) is a phenomenon harmful due to the dispersion of plots not only in villages but also in the municipalities or counties. This fact increases the cost of transportation and commuting times, which indirectly affects the environment. Research has shown that this range [NOGA 2001] dispersion of land in the village or in other villages is characterized by certain regularities of its occurrence. These patterns result from the impact of higher order center (town, community or cultural center). Around these places observed a significant grouping of land non-resident-owners in neighboring villages. The occurrence of local non-resident owners land not observed regularities due to the small area of research. To get the full area of the size of this type of patchwork in the study area should be carried out interviews on all farms.

Using developed by NOGA [1985c] method for the analysis and evaluation of the patchwork of plots, determined the size of its occurrence in the villages crossed by the highway. Specific sizes occurrence land out-of-village owners and local non-resident owners data checkered table (Tab. 2).

In the present table lists the names of the surveyed villages in the columns is characterized surface non-resident owners long distance within these villages land. And in the rows – the villagers have their land in other villages (local non-resident owners). The presence of land non-resident owners long distance includes all owners living in other places. While land of local non-resident owners include their existence only in the surveyed villages. A characteristic feature

Table 2. Size of surface area of non-resident owners plots

Villages where non-resident owners live	The total area in the studied villages, ha											Total:	
	Bratkowice	Mrowla	Lipie	Rogoźnica	Rudna Mała	Zaczernie	Nowa Wieś	Terliczka	Łąka	Łukawiec	Palikówka	ha	%
Bratkowice	X	37.4	8.5	0.7	0.3	0.3	–	–	–	0.7	–	47.9	0.7
Mrowla	29.1	X	3.3	0.1	0.1	0.9	0.4	–	–	–	–	33.9	0.5
Lipie	4.9	1.4	X	0.8	0.6	0.4	–	0.2	–	–	–	8.2	0.1
Rogoźnica	0.2	7.7	10.2	X	10.5	0.9	0.7	0.3	–	0.9	–	31.3	0.5
Rudna Mała	5.4	5.9	2.8	10.1	X	13.7	3.0	–	0.4	0.4	–	41.6	0.6
Zaczernie	0.6	1.0	3.5	1.4	12.8	X	36.1	0.1	4.5	2.4	–	62.3	0.9
Nowa Wieś	–	–	–	–	0.3	14.0	X	2.2	3.1	6.7	0.9	27.1	0.4
Terliczka	–	–	–	–	–	0.2	0.4	X	16.5	13.8	1.0	31.9	0.5
Łąka	–	–	–	–	0.1	0.1	0.3	1.3	X	90.6	11.9	104.3	1.6
Łukawiec	–	–	–	–	–	0.2	0.3	3.7	15.1	X	34.1	53.3	0.8
Palikówka	–	–	–	–	–	–	0.1	–	13.9	9.1	X	23.1	0.3
Rzeszów city	143.5	90.6	81.2	27.5	111.8	90.5	21.7	11.7	43.5	63.7	69.3	755.1	11.3
The others in the community	96.2	42.0	37.9	7.6	20.2	41.4	9.9	12.2	155.6	18.7	54.8	496.6	7.4
The others in the county	172.1	34.7	20.2	1.3	24.6	5.4	1.9	6.7	116.3	47.0	97.4	527.5	7.9
The others in the province	72.9	7.8	1.1	1.8	10.5	7.0	2.9	6.2	45.9	14.5	34.2	204.8	3.1
Outside the province	63.9	9.0	13.7	4.9	10.4	15.6	4.4	2.6	17.1	31.4	17.4	190.4	2.9
Total area of non-resident owners plots	588.9	237.6	182.4	56.2	202.1	190.6	81.8	47.2	431.9	299.7	321.0	2 639.6	39.6
Percentage share of the area of non-resident owners plots in individual plots of the village	32.6	52.3	49.0	33.9	45.6	31.2	38.0	39.5	52.9	28.0	54.5	39.6	X

Source: own elaboration.

of the presence of land non-resident owners is that a high concentration of villages along the diagonal of the respondents as a result of the proximity of the neighborhood. As you move away from each village sizes they are getting smaller and smaller and even disappear.

According to the data (Tab. 2) land out-of-village owners in 11 surveyed villages occupy 2 640 hectares, which constitutes 39.6% of the total land area of individual. In individual villages part of their surface ranges from 28.0% in the village Łukawiec up to 54.5% of the total land area of the individual. This is a very high percentage of the land in the patchwork of plots individual external. At this state strongly influences the impact of the city of Rzeszów. The owners of the city of Rzeszów have total surveyed villages of 755.1 hectares, which represents 11.3% of the total land area of individual. In this area at least land owners from Rzeszów are in the village Terliczka (12 ha), and the highest in the villages Bratkowice (144 ha) and Rudna Mała (112 ha). The residents of Rzeszów in land area due to the individual employment and residence of the inhabitants of these villages in Rzeszów, and in recent years the purchase of land intended for construction.

An interesting phenomenon is the occurrence of mutual land owners surveyed villages. Out-of-village owners have 465 ha (7.0%), and the local non-resident owners 473 ha (7.1%). While the size of land non-resident owners are the facts, the surfaces of land local non-resident owners aren't, because they cover only studied villages. This is evidenced by the presence in the surveyed villages up to 497 ha (7.4%) out-of-village owners villages located in municipalities where there are explored the village. Then there are land from the village of the district of Rzeszów, where rural residents can have land. Other land out-of-village owners in the villages surveyed located in Subcarpathian Voivodeship and outside its borders, occupy 396 hectares, representing 5.9% of the total land area of individual. These are the owners, who inherited the land from their parents, and emigrated, mostly out of college, for work.

The analyzed area of land which is in the external patchwork of plots of the property owners of 5988 and is divided into 9668 plots. At one non-resident owners falls 1.61 plots with an average area of 0.27 ha. This is due to the fact that in the study area is often many co-owners of one parcel. When examining the information in this field in the land register it has been observed many parcels with unclear legal status. Often, one plot has a few or several co-owners. Subcarpathian Voivodeship is a very common phenomenon that the plot doesn't have a regulated legal cod liver oil (not regulated decreases). Plots in hard to reach places (eg. without access) or shapeless plot are grown and one of them is not interested. And even if carried out will decrease it often turns out that it is several co-owners of one parcel with a small area and to share ownership only salvation is a sales and dividing the money. In the study area it was observed carrying out the work in this field.

From the spatial distribution of land out-of--village owners shows that land are scattered through-

out the village area. Their occurrence intensity exposes high incidence of the owners of the city of Rzeszów and in the villages bordering with each other. As seen in Table 2 the occurrence of size local non-resident owners characterized by similar magnitudes in the range of surface plots which have out-of-village owners. This finding is fully correct because their real size obtained in the process of consolidation land. However, this mutual occurrence land local non-resident owners and out-of-village owners is the basis for land closer to the habitat of the owners as a result of the exchange of land. Regardless of this fact, land can be fully utilized for adjusting the boundaries of the village, the route of the highway cuts from the village of small areas. In such cases, the boundaries of the village can be made without the work of consolidation and exchange of land. In addition to the presence of land out-of-village owners from the city of Rzeszów and villages adjacent observed the owners of the county Rzeszów, from the province of Subcarpathian Voivodeship and outside the province.

To sum up the characteristics of the external patchwork of plots should be stated that its occurrence in the surveyed villages not only allows you to adjust the boundaries of the village as a result of the exchange of land. The presence of the patchwork of plots allows for significant land closer to the habitat in the process of land consolidation. And in the case of consolidations and exchange of land non-resident owners the city of Rzeszów and other places should be located on the side of the highway that the town doesn't separate.

ANALYSIS OF THE INTERNAL PATCHWORK OF PLOTS

Internal patchwork of plots is an important factor in determining the economic effects of agricultural production. The dispersion of the parcels in the area of the village extends way into them, causing not only a waste of time, but also fuel, which indirectly affects the environment. In addition, it is one of the factors determining the urgency of making the work of consolidation and exchange of land. In the same realization of complex consolidations, this factor doesn't play any significance. However, given the fact that every large size external patchwork of plots works of consolidation carried out in the south-eastern Polish it is very important. The validity is based on approximately land owners to habitat, and their placement in other villages not covered by merging the highway can't be realized. As proposed in the study NOGA [2001] in the work of consolidation should be used first exchange of land owners located outside the consolidation land. Exchanges can be used not only in the process of consolidation, but also as a separate issue technical and legal NOGA [1999].

Inspection of the inter patchwork of plots is done the same way as an examination of the external patchwork of plots. The study method was applied checkerboard tables and method of its preparation [NOGA 1985c]. It consists in the fact that in place of the name of the village is part of a separate complexes and fields of the village. Based on the separated part of the village and the land registry with index, plots collates all the parcels, which are located outside the complex, where the owners live.

Made in this way, the analysis of the distribution of the parcels owner of a size internal patchwork of plots, which in terms of collecting data illustrate Table 3. As seen in Table, the villagers have their land in its various parts. In total, the internal patchwork of plots the 7951 owners have 2963 hectares, which represent up to 44.4% of land area individual. This area is divided into 9319 parcels. In various villages the size internal patchwork of plots are varied and depend on individual land area. The smallest size of the internal patchwork of plots and the number of owners of

Table 3. Internal patchwork of individual plots in the studied villages

Parameter	Village name											Total
	Bratkowice	Mrowla	Lipie	Rogoźnica	Rudna Mała	Zaczernie	Nowa Wieś	Terliczka	Łąka	Łukawiec	Palikówka	
Number of plots in the individual sector	6 442	2 630	1 481	1 005	3 111	3 718	1 068	633	2 886	3 299	1 654	28 304
Surface of individual plots, ha	1 809	455	372	166	443	612	213	119	817	1 071	589	6 666
Number of owners in the individual sector	3 325	1 338	650	602	2 493	2 163	1 461	402	1 616	2 139	1 171	17 360
Number of plots in the individual sector	2 548	1 067	427	331	866	656	622	189	1 010	1 155	451	9 319
Percentage share of number of plots in the internal patchwork in individual plots of the village	39.6	40.6	28.8	32.9	27.8	17.6	58.2	29.8	35.0	35.0	27.2	32.9
Surface of plots in the internal patchwork, ha	748	202	117	63	236	321	112	54	313	608	189	2 963
Percentage share of plots area in the internal patchwork in individual plots of the village	41.3	44.4	31.5	38.0	53.3	52.5	52.6	45.4	38.3	56.8	32.1	44.4
Number of owners in the internal patchwork	1 056	918	311	256	1 062	205	902	82	836	1 460	863	7 951
Percentage share of the number of owners in the internal patchwork	31.8	68.6	47.8	42.5	42.6	9.5	61.7	20.4	51.7	68.3	73.7	47.4

Source: own elaboration.

plots observed in the village of Zaczernie. Most scattered lands in the village are the owners of the Nowa Wieś.

Observed considerable size the phenomenon of the internal patchwork of plots makes the internal conditions of work and life burdensome. But the fact of the presence of such a large patchwork of plots inside the village is the possibility of liquidation of the local non-resident owners and out-of-village owners calls in the exchange or conversion of land. In the case of the intersection of the village by the highway distribution of land it is much more difficult, since the land they become available. This state depends on the existing patchwork of plots in the village (strip or ladder). The ladder patchwork of plot have access to a public road. The ribbon patchwork of plots cadastral shorter side adjacent to a public road (often paved), and longer stretches for tens of meters. The division of the plot takes place parallel to the road, creating a new plot.

According to the law on the real estate management of property is not admissible if designed to separate land parcels do not have access to a public road. Therefore, very often they land on the patchwork of plots the strip isolated road easement [Ustawa… 1997]. Transport for such separate plots is carried out after their own, often very narrow field.

At the time of construction of the highway is increasing not only the number of plots, but at the same time cut are existing easement road. Lots separated the highway from habitat are without access. Lack of access to plots non-resident owners applies to both local and long distance live on the northern and southern parts of the study villages.

Therefore, the village cut the highway, developed the study of internal patchwork of plots. Study patchwork of plots of land resulting from the intersection of the village highway is shown on the example of the Nowa Wieś.

The villagers were divided into:
- "northern and southern" living and having the plot on the same side of the highway;
- "with northern parcel on the south side" in relation to the highway;
- "southern with land on the north side" in relation to the highway.

Sizes grandiosity separate groups of villagers illustrate the data Table 4, and the spatial distribution of land are presented in Figure 2.

Table 4. Internal land patchwork in Nowa Wieś

Nowa Wieś	Area		Plots		Owners		Average plot area
	ha	%	number	%	number	%	
Grounds of N inhabitants[1)]	73.5	65.6	324	52.1	681	75.5	0.23
Grounds of S inhabitants[2)]	15.1	13.5	144	23.2	145	16.1	0.10
Grounds of N inhabitants owning plots of land in the S	15.0	13.4	70	11.3	37	4.1	0.21
Grounds of S inhabitants owning plots of land in the N	8.4	7.5	84	13.5	39	4.3	0.10
Total	112.0	100.0	622	100.0	902	100.0	0.16

[1)] Part of the village cut to the north in relation to the highway.
[2)] Part of the village cut to the south in relation to the highway.
Source: own work on the basis of data from land and building registration.

Fig. 2. Study of the distribution of plots belonging to the inhabitants of Nowa Wieś (internal land patchwork); source: own elaboration

As the data in Table 4 and Figure 2 to study the village observed a significant deterioration in the patchwork of plots after the construction of the highway. In the study part of the village area located south of the highway is 65.6% (200 hectares) of the entire village, and part of the north is only 33.8% (102 ha). Residents "northern" (681 people) are the owners of 73.5 hectares of land, divided into 324 parcels. In contrast, residents of the "southern" own land with an area of 15.1 hectares, divided into 144 parcels. The difference between the residents "northern possessing land on the south side" and "southern having land on the north side" is small. The same number of inhabitants has a similar number of plots. The spatial distribution of land residents of Nowa Wieś in terms of their surface allows you to determine the possibility of liquidation of the phenomenon of the patchwork of plots of internal land exchange process between individuals, living on the north and south realized in the A-4 highway. The study patchwork of plots the village of Nowa Wieś showed additional problem of land cut off from habitat lane highway with regard to both villagers and owners outside the village studied.

Highway through the village is a new element in the environment. Very often disturbs the harmony. In addition, further increases the length of commuting to land. The size of these journeys are dependent on place of residence of the owners of plots. Highway mileage in the test village, crossing roads to the plots of habitats. As a result of this intersection extends about twice the access to the plots located on the other side of the highway.

To capture changes in the internal patchwork of plots caused by the construction of the highway, follow the study chessboard for homeowners living in villages cut highway. The destruction of the current system of land may be eliminated as a result of a comprehensive consolidation and exchange land and adjusting the boundaries between the examined country and the neighboring village.

CONCLUSIONS

Conducted analysis of the impact of the highway on the development of individual patchwork of plots, in all 11 villages of the district of Rzeszów cut highway, highlighted her very much defect. These defective accumulate over the centuries and resulted from legal, environmental and socio-economic.

Runs through the village of highway has further land fragmentation in the already defective patchwork of plots. From the tests carried out following remarks, comments and suggestions:

1. In all the surveyed villages crossed by the highway A-4, there is a large external and internal patchwork of plots. Occurring dispersion in the parcels of land owners in the surveyed villages and beyond its borders, it is a major impediment to their rational use.

2. Highway through the village, the existing dispersion and fragmentation of parcels included in the paragraph 1 more it deteriorates

3. Depending on the intersection of the village built by the highway is observed diverse destruction in the spatial structure of land. This structure applies not only to the villagers, but the owners outside the village, with their land in the analyzed village (access roads to plots).

4. Making a comprehensive work of consolidation and exchange village land crossed by the highway it should be taken in accordance with the size of the defect in the existing and occurred patchwork of plots.

In summary, it presented the impact of the highway on the development of the patchwork of plots village land has highlighted the extent of this dispersion and fragmentation. Sizes made destruction in the use of space of rural and acting on them, a large patchwork of plots can be wound in a different way than previously done work consolidation land.

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Wpływ przebiegu autostrady na rozwój szachownicy gruntów

STRESZCZENIE

Definiując pojęcie szachownicy gruntów, na podstawie literatury, wymieniono jej typy i podtypy oraz podano ich występowanie w analizowanych wsiach. Scharakteryzowano wyszczególnione typy i podtypy szachownicy gruntów w przyjętych wsiach przeciętych autostradą, zwracając szczególną uwagę na rozdrobnienie działek ewidencyjnych. Szczególną uwagę zwrócono na występowanie szachownicy zewnętrznej gruntów z następujących przyczyn: po pierwsze – występowanie gruntów właścicieli niemieszkających w badanych wsiach (różniczanie zamiejscowi) i mieszkających w badanej wsi, ale posiadających grunty w innych badanych wsiach (różniczanie miejscowi), co stanowi istotne zagadnienie w przybliżeniu gruntów właścicieli do siedliska w procesie kompleksowych prac scalenia i wymiany gruntów; po drugie – pozwala na korekty granic wsi, które niszczy autostrada, bez konieczności natychmiastowego wykonywania scalenia. Powinno dokonywać się takiej korekty za pomocą tylko wymian gruntów; po trzecie – przecinająca wieś autostrada uniemożliwia dostęp do gruntów różniczan zamiejscowych i miejscowych w przypadku, gdy ich siedliska znajdują się po przeciwnej jej stronie. Do badania tego problemu zastosowano metodę tabeli szachownicowych zarówno do szachownicy zewnętrznej, jak i wewnętrznej (czyli tej, która została wytworzona we wsi). Prowadząc badania z tego zakresu wykorzystano metodę kartograficzną zaprezentowania występowania szachownicy zewnętrznej i wewnętrznej na mapach ewidencyjnych.

Słowa kluczowe: *autostrada, mapy katastralne, podziały gruntowe, różniczanie, scalenia i wymiany gruntów, szachownica gruntów*