

THE TRANSFORMATIONS OF SELECTED ELEMENTS OF THE GEOGRAPHICAL ENVIRONMENT — HISTORICAL ANALYSIS

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One of the more important problems of contemporary science is finding an answer to the questions: what is the resistance of the environment to the activity of man? What is the real rate of environmental transformations in which we are living? We are interested not only in a concrete point, but also that of space and time. The solution to this problem may have an enormous practical significance as it enables prognosis of the rate and directions of the transformations.

One of the paths leading to the solution of this problem is comparing maps from different time periods. A historical analysis enables us to observe in space, changes in the land management type, settlement, road network and also river network, ranges of swamps and fallows, gorges etc.

It is generally considered that the most intense changes in the geographical environment caused by anthropopressure took place during the last 200 years. This is a truth on a global scale. On the other hand, in the regional and microregional scales, the time of environment transformation is highly varied, and the rate of nature regeneration or degradation is changeable.

In order to present the method, two areas were selected: a fragment of Niecka Nidziańska near Pińczów, and the urban commune of Łomianki near Warsaw. Those are areas with a separate character and developing in different times and in different directions. Niecka Nidziańska belongs to an area of the oldest settlement in Poland. Numerous proofs of that are to be found in several excavations and old written sources. It has been managed for agricultural purposes already during the early

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Middle Ages, and deforested meadows in the valley of the Nida river were used as ducal pastures by Leszek the White in the 12th century. The agricultural character of that region has been maintained until today.

The Łomianki commune lies within the range of direct influence of the large city of Warsaw. The development of settlement on the Mazovia region was far later. It really commenced after the transferral of the capital from Kraków to Warsaw in 1596. The economic activation of that area took place in the 18th, 19th and 20th centuries, in which together with the development of Warsaw increased the number of inhabitants in the direct vicinity of the town. Thus observed were the cutting out of forests, the management of fallows, and subjugation of rivers.

For the last 200 years we have detailed multi-sheet maps for the area of Poland. Every 30 years, new cartographic photographs were more or less prepared, which may constitute a basis for a historical analysis. They have been prepared in accordance with various projections. They have different scales and various keys. In order to be able to investigate changes in the geographical environment, it is necessary to unify the scales and "straighten out" especially the oldest maps. The analysis was conducted by the method of ranges and cartogram of land use stability /Plit 1990/*

The historical background for this analysis is the map of Charles de Perthees from 1783 published in the scale of 1:225,000. It is burdened with serious mistakes in the localization of buildings especially in relation to geographical length. For a direct analysis, the following maps were used:

1/. Spezial Karte von Südproussen mit allerhöchster Erlaubniss David Gilly from 1802 — 1803 at the scale of 1:150,000 for the area of Warsaw.

Karte von West-Gallizien executed by Anton Mayer von Heldensfeld in 1808 at the scale of 1:172,000, for Niecka Nidziańska /Fig. 1/.

2/. Topographic Chart of the Polish Kingdom prepared by the General Quartermaster Department of the Polish Army. Map sheets embracing the studied area were executed in 1830 /for Warsaw/ and 1839 /for Pińczów/, at the scale of 1:126,000 /Fig. 2/.

3/. Nowaja topograficzeskaja Karta Zapadnoj Rossii /dwuwiorstówka/elaborated in the years 1889 — 1891 at the scale of 1:84,000.skartowana w latach 1889 —

* J. Plit "Method of Ranges in Historical Analysis of Transformations in Geographical Environment", *Geographical Review* 1990, vol. 1 /in press/. The various cartographic elaborations were considered as a picture of the state of the environment and economy in the year of elaboration.

Fig. 1. Fragment of "Carte von West Galizien" by Anton Mayer von Heldensfeld (1808)

Slika 1. Izsek iz karte "Carte von West Galizien" Anton Mayer von Heldensfeld (1808)



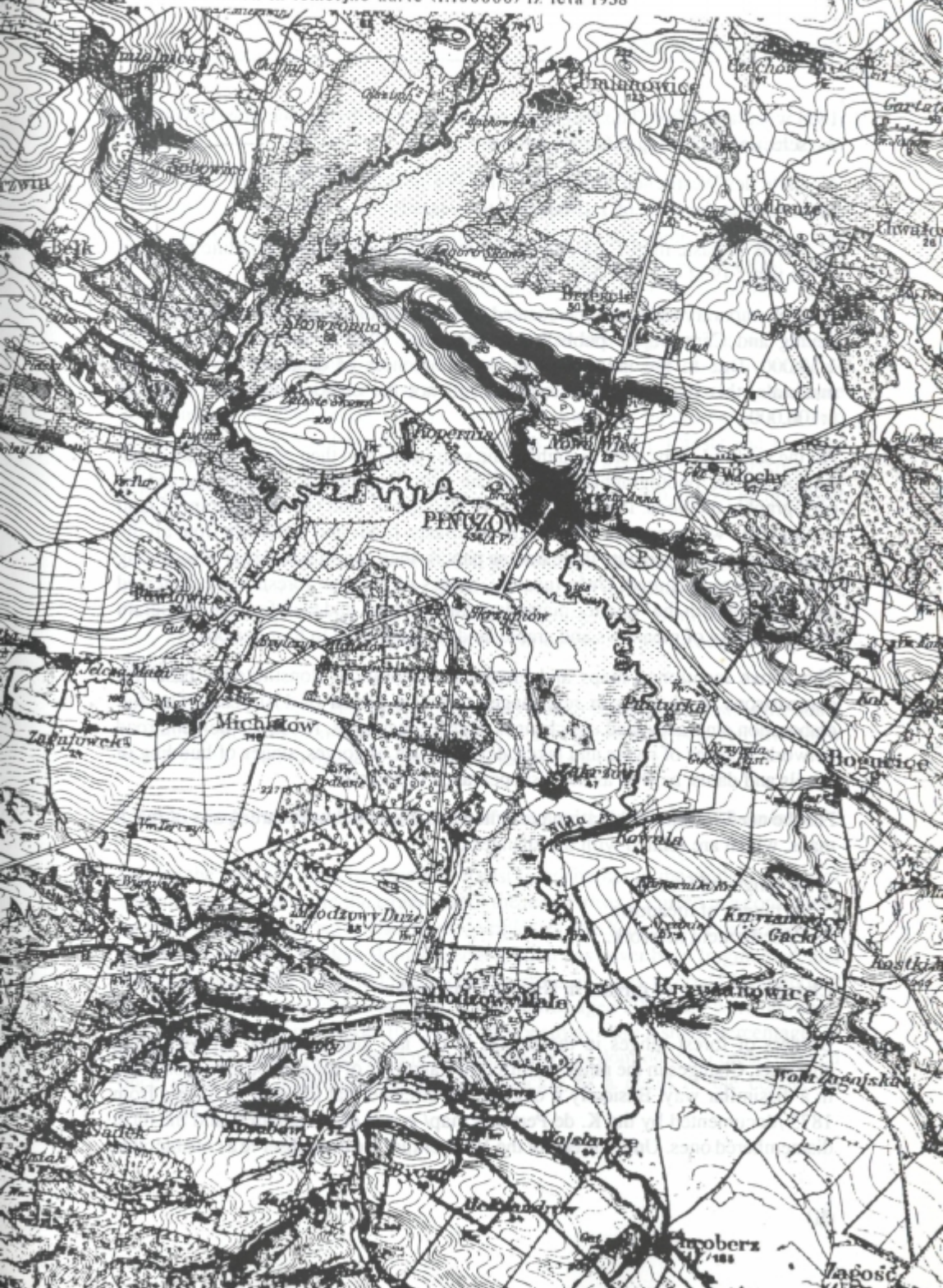
Fig. 2. Fragment of the map "Topograficzna Karta Krolestwa Polskiego" (1839)

Slika 2. Izsek iz karte "Topograficzna Karta Krolestwa Polskiego" (1839)



Fig. 3. Fragment of the basic map (1:100000) from 1938

Slika 3. Izsek iz temeljne karte (1:100000) iz leta 1938



1891 w scali 1:84,000. This map has been used only for the surroundings of Warsaw, the selections covering Pińczów are lost.

4/. Karte des Westlichen Russland — this is a modern version of the “two verst”. Elaborated at the scale of 1:100,000 in the years 1910 — 1915.

5/. Sheets of basic map 1:100,000 of the military Geographical Institute prepared in the years 1932 — 1938 /Fig. 3/.

6/. Contemporary times are represented by a map of the Head Office of Land-Surveying and Cartography published in the years 1976 — 1978 at the scale of 1:50,000. Due to the unification of the minuteness of detail of the compared materials, this map has been selected and not the elaboration at the scale of 1:100,000.

All the selected maps were brought to the same scale and then positives were made on foil by the photographic method. The historical analysis was conducted by cartographic methods. In order to observe changes of land use a cartogram of land use stability was prepared. The ranges of forests, fields and meadows from all the maps were transferred onto three tracing papers, then appropriate areas of repeating land use were hachured. Unfortunately, ranges of reparation forests were indicated only starting with the “quarter-mater department” map, and therefore the cartogram of the stability of meadows and arable lands is simplified to four periods.

The above mentioned maps and historical elaborations constituted a basis for comparisons of changes in real ranges during a period of 170 years. The full elaboration embraces land use changes /forests, meadows, fields/, settlement, road network, courses of rivers and lakes, development of gorges, stages of building of canals and dams, as well as the disappearance of swamps.

For the needs of this elaboration presented and discussed were three pairs of result maps, which are related with the changes of:

- 1/ ranges of forests,
- 2/ ranges of meadows,
- 3/ settlement network.

Change in range of forests in Niecka Nidziańska

Borders of forest ranges in the period of the last 200 years had an oscillating character. Changes in the range on different fragments of the studied area took place in a dissimilar way. Basically it ought to be stressed that the area of forests from 1873 /documented by the K. de Perthees map/ is one of the smallest and the most dismembered ones. Until the end of the 19th century we may observe a considerable

increase of areas occupied by forests as well as a distinct process of linking of forest lands. In the second half of the 19th century the area of forests began to decrease. The areas not only decreased, but also became segmented.

This process was continued in the interwar period in such a way that in 1938 the area of forests was clearly smaller than in 1873; in that time no planting was conducted. After the Second World War there was an increase of forest lands. However, felling was still carried out, but directly after that the areas were again afforested /this is documented by young tree stands indicated on the map/. Changes in the forest areas are presented in a synthetic way in a diagram /Fig. 4/. Already the first view shows that permanent forests occupy an insignificant percentage of the land. They are concentrated in the south of the studied area and mainly embrace the complex of Choberskie Forests. Particular attention should be paid to two permanent although not large forest fragments: alder swamp forests and riparian forests in the Nida valley, not far from Młodzawy, and oak hornbeam forests of the Grabowy reserve. The borders of those complexes have been almost identical for the last 200 years.

The forest complex in the eastern part of the Pińczów Hummock was undergoing a distinct narrowing and moved to the south-west. To the south-east of Jędrzejów there are large forest areas indicated on the cartogram. Apart from small fragments they have been cut out. In this fragment the cartogram shows successive stages of felling.

The largest area, which has been permanently transformed into forest, is the stand of young pine trees planted at the beginning of the 20th century between Michałów and Zakrzew. On old maps this area was a fallow or a pasture.

Changes in Forest Ranges in the Area of Town and Commune of Łomianki.

During the last 200 years the meadow-forest border in the studied area is of a permanent character. In the larger part of the area forests occurred in a continuous or almost continuous way. The dense complex of the Kampinos Forest changed slightly its previous borders along the edges, but it has never been fragmented, and the total area of the forest did not undergo serious changes. It could be supposed that in the whole area forests and coniferous woods aged 200 years were dominating. Unfortunately, trees over 100 years old constitute only a small percentage. In the area of the Kampinos Forest a nest exploitation was dominating. Forests entered once again onto clearing, usually rather quickly as a result of the conducted plantings /Fig. 5/.

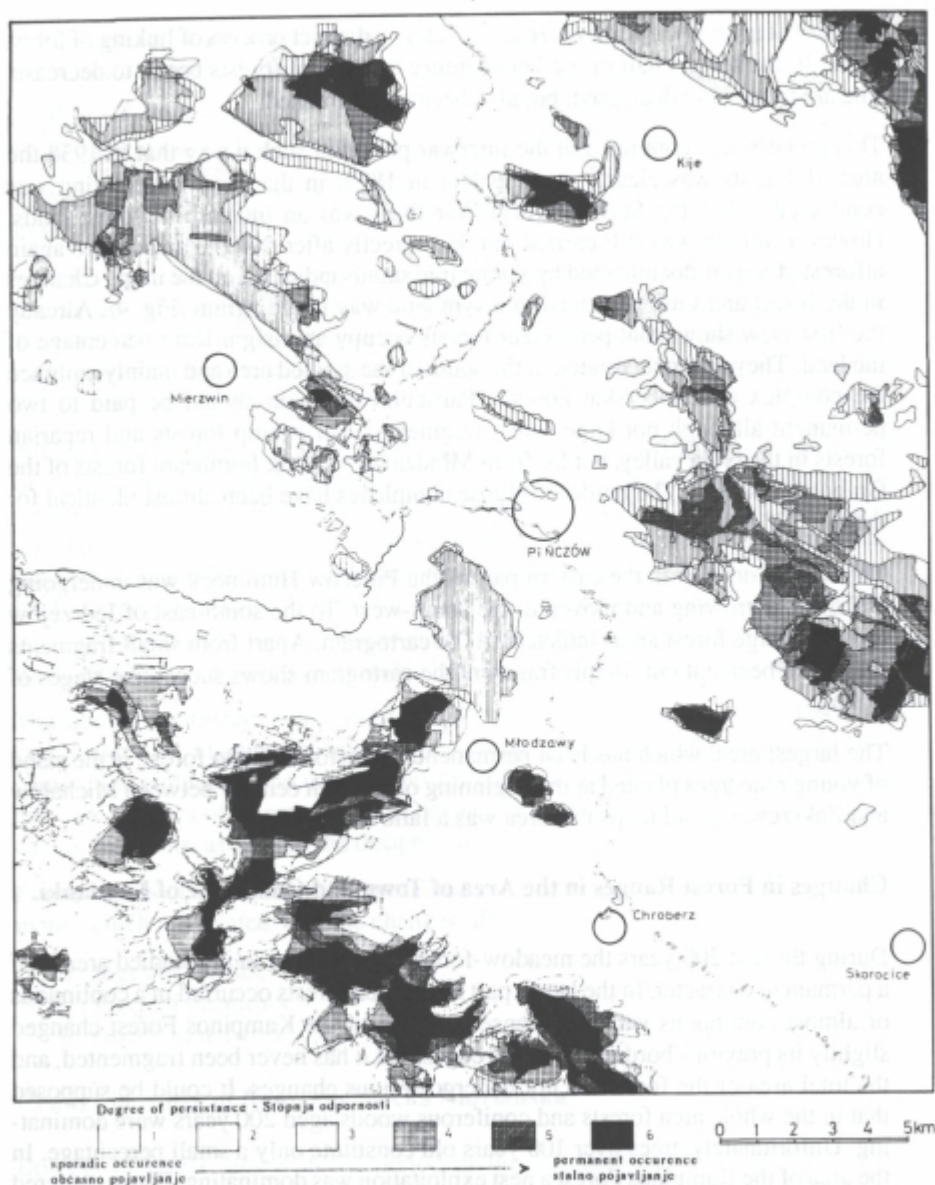


Fig. 4. Forest resistance in Pińczów area
Slika 4. Odpornost gozdov

In certain areas we may observe a rawing back of forests. In a permanent way forests were devastated near Dąbrowa and Dąbrowa Leśna. In those areas are more fertile habitats than in the primaval forest — poor oak hornbeam forests and mixed coniferous forests. The forest has been gradually cut out since 1830 until 1930. The most intense felling took place after the January Uprising. The aim of the felling was for obtaining wood. At the turn of the century a wide tunnel was cut out along the main road /between Młociny, Buraków and Łomianki/. Only small forest fragments were left there. The area has then been again afforested.

Slowly but systematically the forest area in the Vistula river meander decreased, today not even a fragment of it is left there. On the map of D. Gilly from 1803 the whole artificial lake terrace of the Vistula river, up to the depression line surrounding the old river bed were grown over by riparian and oak hornbeam forests. The forests were partly devastated by the inhabitants of the Kępa Kiełpińska estate /situated according to Dutch law at the beginning of the 19th century, and partly destroyed by river floods.

Already on the K. de Perthes map of 1783 there is a large glade around the Wólka Węglowa village. In the village conducted was industrial activity — charcoal was produced here. The successive maps illustrate the widening of the glade. The wasteful cutting out of forests led to the cration of quicksand. The growing over with forest of this area took place very slowly. Only on the map of the Military Geographical Institute of 1932 — 1933 the forest grew again in a considerable part of the glade.

However, the map still presented a small area of quicksand to the north of the village. Further afforestations took place in the post-war period. The present borders of the forest exceed those from before 200 years.

On the area between Sieraków, Pocięcha and Truskaw forest had been cut off in the years 1803 — 1930. The growing of forest in this area took place after 1863, when a battle was fought here between insurgents and the occupying army. The village of Sieraków was burnt down then, and the whole area became significantly depopulated. The present range of the forest is very close to that of 1803. This is a contribution of the established Kampios National Park, which had priority in purchasing deserted agricultural lands, and for a large scale conducts afforestations.

Particular attention should be paid to the wet soil area of Cichowąż, Łąki Strzeleckie and Łąki Sierakowskie. This area is presented on older maps as woodless swamps, and the area of swamps undergoes a reduction — overgrowing in a natural way. In 1861 the construction of the Łasica canal was commenced, as well as the drainage

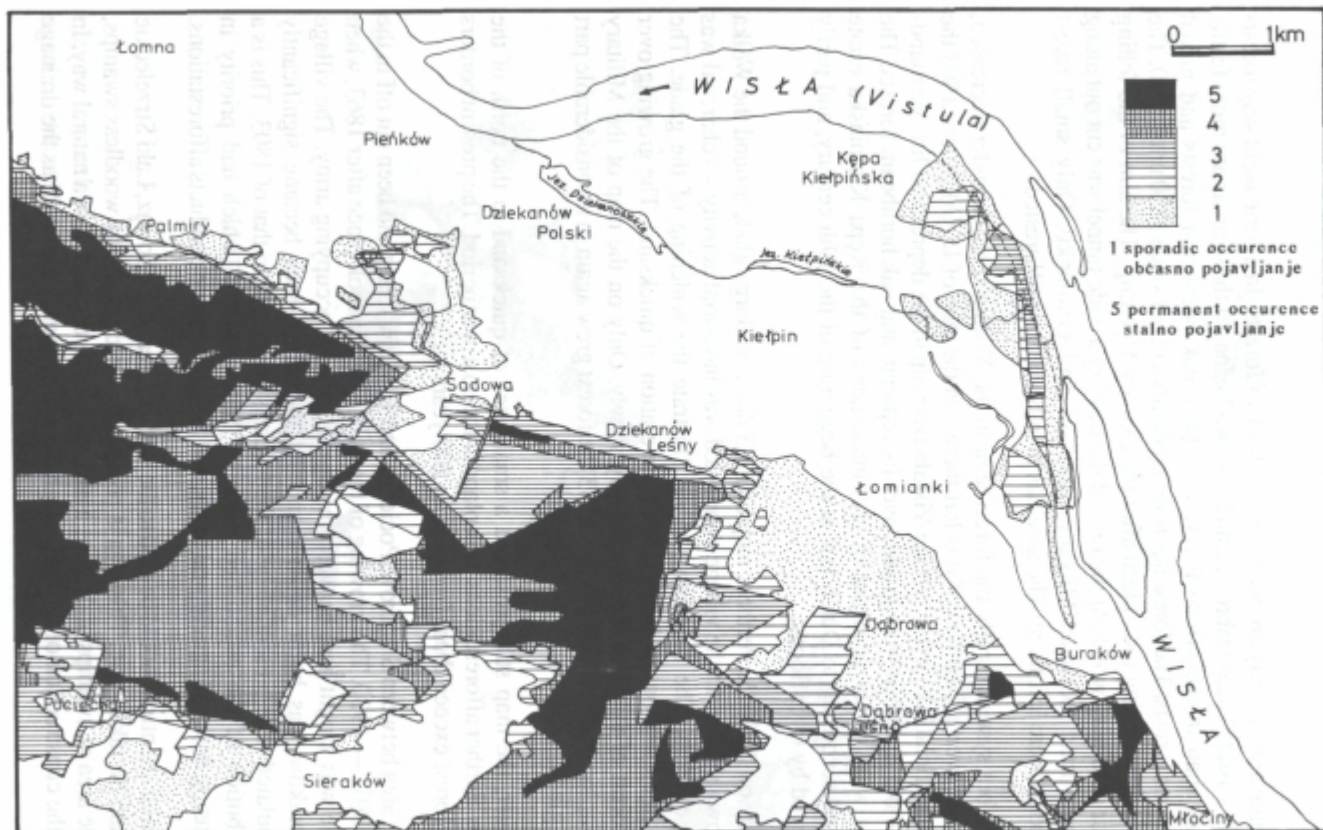


Fig.5. Forest resistance in Łomianki commune
Slika 5. Odpornost gozdov v občini Łomianki

of swamps and bogs located in that part of the forest. The large swamp area decreased significantly, limiting itself exclusively to the fragment of Strzeleckie Łąki and Sierakowskie Łąki. Drained areas overgrew with a wet alder swamp forest or swampy coniferous forests.

A comparison of figures 4 and 5 allows for the observation of a distinctly different picture of transformations in forest ranges — although motives of human activity were the same. Forests were cut out of fertile and very fertile habitats /for example, deforested was the alluvial terrace of the Vistula River, or the Potocki and Turski Hummocks — habitats of fertile oak hornbeam forests and Turski Hummocks — habitats of fertile oak hornbeam forests and oak groves / in order to obtain areas for construction and for agricultural purposes. Less fertile sandy soils were afforested /Wólka Węglowa, Sieraków or Pińczów Hummock, or the area between Zakrzewie and Młodzawy/.

On both maps there is a large permanent forest complex: of the Kampinos National Park protected forests, and Chroborskie Forests /in the past in that area was a large estate of forests destined for hunting/, where conducted in a protective activity of man /Pińczów/.

Changes in Range of Meadows in Niecka Nidziańska

The Nida River valley has been utilized as natural pasture grounds for the grazing of horses and cattle from the early Middle Ages until today. Most probably a riparian forest was once destroyed there. The cartogram of changes in the range of meadows /Fig. 6/ illustrates their permanent character rather well. On the "quarter-master department" map in the valley there were numerous cultivated fields and forests, although they had small areas. The economic development, agricultural intensification, and particularly land reclamation caused an increase in the area of meadows at the cost of bogs, swamps and old river beds. Also observed is the encroachment of cultivated fields onto the edges of the Nida river valley and the side tributaries of the river.

Apart from the valleys of Nidas and Brzeźnica, meadows are not of a permanent character. During 170 years the area of grasslands distinctly decreased. We could also observe the decreasing in the area of meadows and the segmenting of their larger complexes. It seems that the reason for the decrease of their area was due to a reduction of the amount of water in soils connected with the activity of man. Namely hastened was the flows of water through the straightening of the Nida river bed, and drainage caused by the lowering of water level. The intake of water increases due to the growing population number and a bigger number of livestock. Deforestation caused a smaller retention of water in soils.

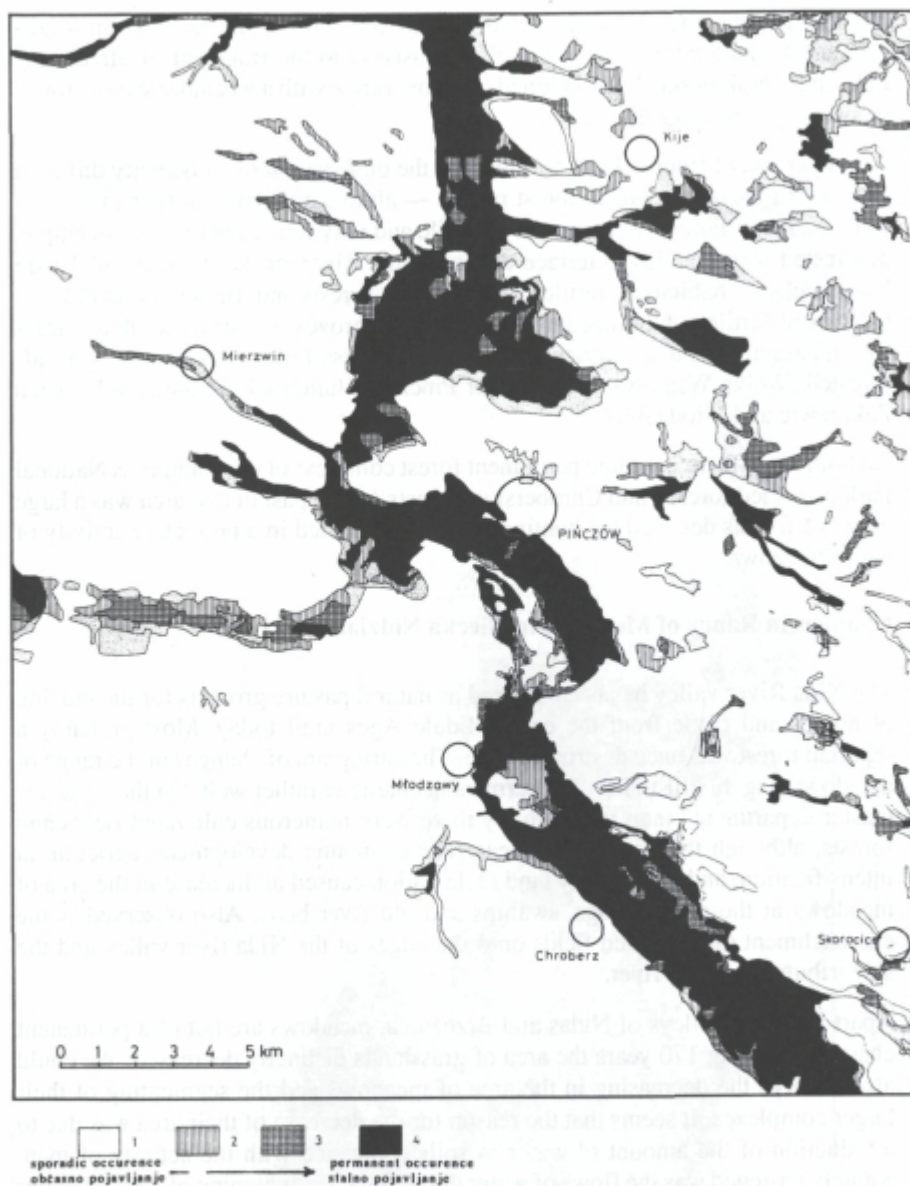


Fig. 6. Persistence of meadows and pastures in Pińczów area
Slika 6. Odpornost travnikov in pašnikov na območju Pińczowa

On the cartogram /Fig. 6/ a distinct character of the south-western map fragments is to be seen, which is devoid of meadows and pastures. This is conditioned by the lithological structure /thicker bedding layers of well permeable loess soil/.

Changes in the Meadows Range in the Łomianki Commune

Meadows and pastures constitute a small percentage of the model area of Łomianki. Their occurrence is concentrated on the flood terrace of the Vistula River along the flows of old river beds. On older maps the meadows area is clearly larger than today. After cutting out the forest, dominating in the river meanders were wetter meadows /this is especially visible on the "quartermaster department" map/. The meadows range has an oscillating character — it increases each time after a major flood, and undergoes a systematical decrease in periods between floods. After the construction of dams the area of meadows distinctly decreased. Only permanent grasslands are in the depression between Dziekanowskie and Kiełpińskie lakes.

It ought to be added that in order to present the dynamics of land use /forests, meadows/the optimal graphical method is a cartogram. Changes in settlement were presented with the help of the ranges method. It illustrates the increase of built-up areas. For the surroundings of Warsaw five periods were presented in order to stress the intensity of urbanization processes. For Niecka Nidziańska, where the demographic situation is fixed for centuries, the drawing has been simplified to two periods.

Settlement Changes in the Niecka Nidziańska

Ponidzie belongs to lands settled a long time ago. The diversified land relief ensured defense possibilities, and fertile soils guaranteed good harvest. The oldest traces of settlement reach Neolithic age. The map from 1839 documents a dense and very uniform distribution of settlement on the whole studied area. Decidedly dominating area dense built-up areas, characterized by a density of buildings crowded together around the central square /market/, near which there was a church, inn or manor. On the map /Fig.7/, on which presented are settlement ranges from the "quartermaster department" map and contemporary topographical map, it is easy to observe changes in the built-up areas. Attention is drawn to the fact that several settlements distinctly decreased their area in the period of 140 years. After the enfranchisement of peasants the village and grange of Skowronne vanished. The inhabitants of the village populated Skowronno Górne and Skowronno Dolne. Founded were villages and hamlets on newly managed lands after the cutting out of forests — especially

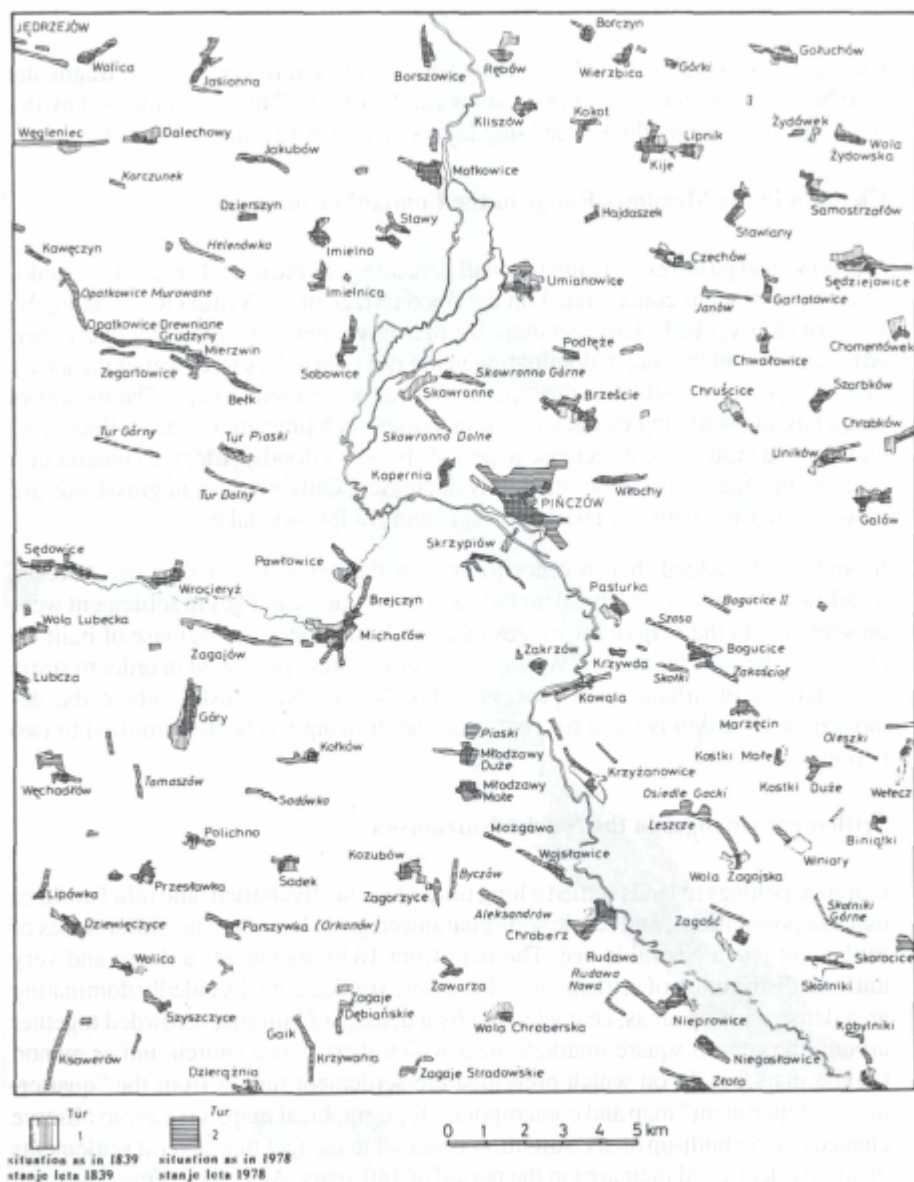


Fig. 7. Changes of settlement pattern in Pińczów area
Slika 7. Spremembe naselbinskega omrežja na območju Pińczowa

to the north of the Mierzawa river. It is characteristic that almost all newly established settlements have the shape of a street village. Also Pinczów significantly increased its area.

The modern shape of estates was clearly influenced by the long history of settlement in the Niecka Nidzińska. Old townplanning solutions of the central square and streets running out of it area still maintained. The contemporary settlement is in a belt form along main transport routes. The network of road connections is of a permanent character. During centuries it became more dense, and surfaces were straightened out and paved.

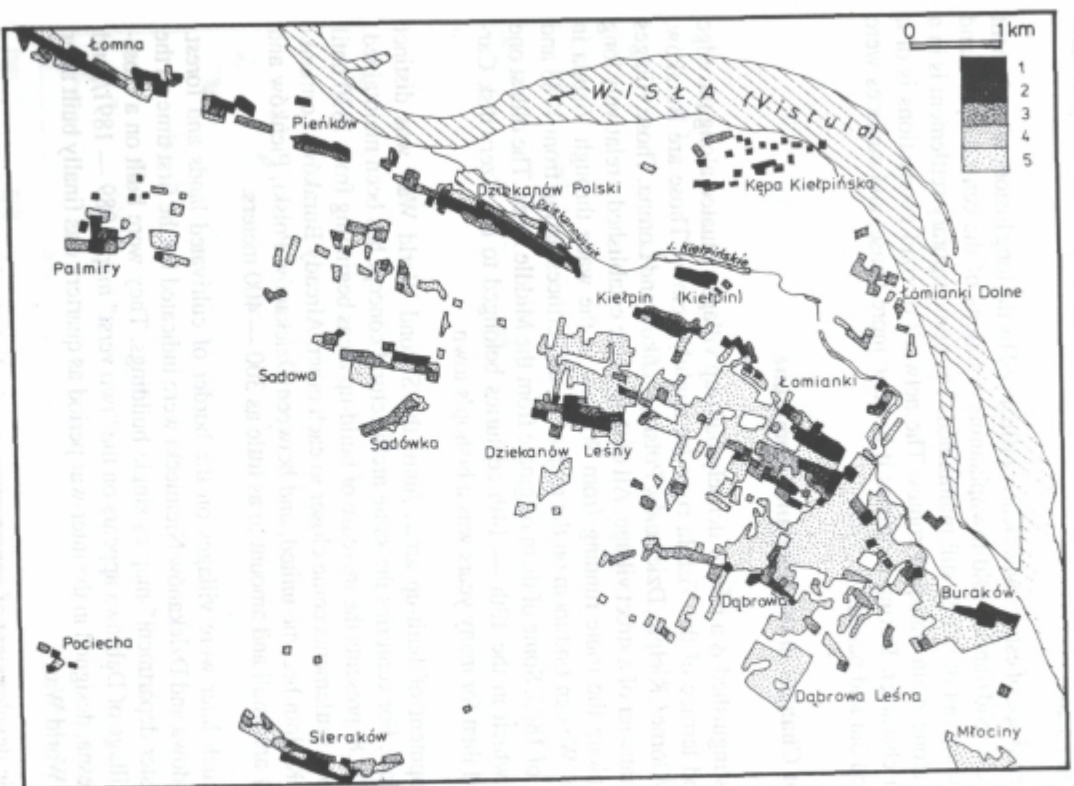
Settlement Changes in the Łomianki Commune

Clearly distinguished is a row of densely built-up villages situated along the edge of the flood terrace of the Vistula river /or slightly below/. Those are Buraków, Łomianki/Górne/, Kielpin, Dziekanów Polski, Pieńków and Łomna. Those villages have the character of a street village. All of them were established a relatively long time ago, along the route running from Warsaw to the wade through Vistula in Zakroczym. We can find them on the map of K. de Perthees dating from 1783 and of D. Gilly of 1803. Some of them originate from the Middle Ages. The oldest one is Łomna, which in the 12th — 14th centuries belonged to the Czerwińsk Carmelites, and then for many years was a bishop's town.

The development of built-up areas /until the Second World War/ was distinct although slow. For centuries the same architectural concept has been maintained. The map /Fig.8/ presents the increase of build-up areas beginning from 1830 until 1974. Various settlements come closer to each other. Already Buraków, Łomianki Górne and Kielpin became united, and between Dziekanów Polski, Pieńków and Łomna they are small and amount to as little as 300 — 400 meters.

Founded much later were villages on the border of cultivated lands and forest. Palmiry, Sadowa and Dziekanów Niemiecki were indicated for the first time on the "quartermaster department" map as single buildings. They were built on a cross-road. The village of Dąbrowa appears on the "two verst" map /1889 — 1891/, and Dąbrowa Leśna, designed in the inter-war period as quarters was finally built after the Second World War.

The dynamic development of construction, particularly in the part situated nearer to Warsaw, may be observed in the second half of the 20th century. An agglomeration in the form of an "urbanplasma" came into being, without any design or any town planning or architectural concept. This may be well seen on the map. The chaotically segmented area quickly spreads onto an increasingly large terrain,



1 situation as in 1830 - stanje leta 1830
 2 situation as in 1891 - stanje leta 1891
 3 situation as in 1913 - stanje leta 1913

4 situation as in 1933 - stanje leta 1933
 5 situation as in 1974 - stanje leta 1974

Fig. 8. Changes of settlement pattern in Łomianki commune
Slika 8. Spremembe naselbinskega omrežja v občini Łomianki

leaving undeveloped islands in the center. The present delimitation of the villages of Buraków, Łomianki Górne, Dabrowa, Dziekanów Leśny or Kielpin is exclusively conventional.

It is characteristic that new building developments very slowly merge with new transport routes. This may be clearly observed on the example of the route shifted and straightened out at the beginning of the 19th century. This is undoubtedly the main transport axis. However, after 150 years the main axis of building development are still old roads.

A different type of building development is characteristic in settlements on the flood terrace of the Vistula river. The village of Kępa Kiełpińska was founded at the beginning of the 19th century, and Łomianki Dolne at the end of that century. They have been both established on the basis of Dutch law, and settled to a large extent by a population of German origin. In this area dispersed housing dominates. Houses were often destroyed by floods. New buildings were usually constructed in new places, and therefore the number of buildings on the map frequently exceeds the actual state.

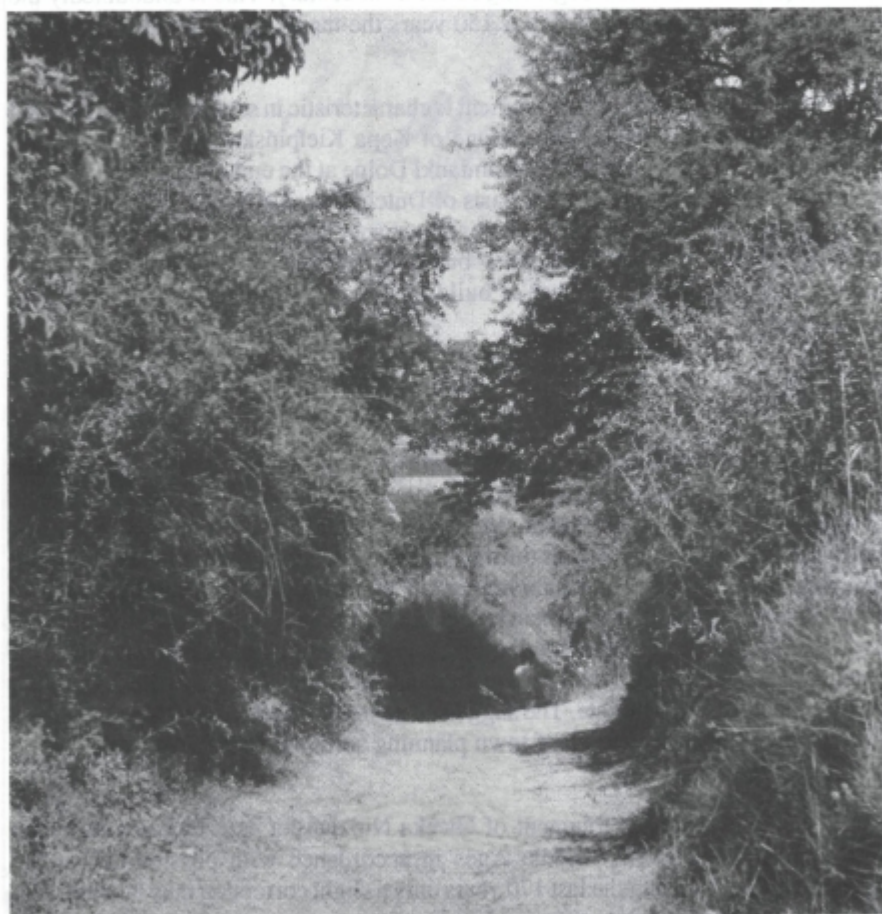
Conclusions

As a conclusion we may state that the historical analysis of maps enables for the observation of a changeable rate of surface transformations of certain components of the geographical environment. Moreover this allows for a determination of stabilization periods and periods of intense transformations. It facilitates the fixing of connections between the intervention of man into the environment and the consequences of that intervention in long periods of time. This particularly concerns hydrographic problems. The conducted analysis provides certain suggestions for conclusions concerning the environment resistance to the activity of man and the ability of nature to regenerate. The suggested generalization require further studies. A large stability was observed of town planning solutions of rural settlements and road network.

It may be stated that the fragment of Niecka Nidziańska near Pińczów has been developed already in the Middle Ages in accordance with possibilities of the environment, and during the last 170 years only a slight correction may be observed.

The Łomianki commune undergoes a dynamic development connected with the direct neighborhood of a large city. This development is exclusively concentrated to the flood terrace of the Vistula River in connection with the environment barrier /river valley/, and limitations related to the neighborhood of the protected area in the Kampinos National Park. The rapid development of settlement after the Second

World War lead as a consequence to the fact that in the year 1989 Lomianki obtained civic rights.



The Lomianki commune undergoes a dynamic development connected with the direct neighbourhood of a large city. This development is connected to the direct traces of the Vistula River in connection with the development of the city. The development is connected to the direct traces of the Vistula River in connection with the development of the city. The development is connected to the direct traces of the Vistula River in connection with the development of the city.

Pińczów: lose ravine

Pińczów: puhliční jarek

Foto: J. Solon

Transformacije na primeru izbranih elementov geografskega okolja — zgodovinska analiza

Joanna Plit

Povzetek

Eden najbolj pomembnih problemov sodobne znanosti je najti odgovor na vprašanje: kakšna je odpornost okolja na človekovo aktivnost ter kako hitro se okolje, v katerem živimo, spreminja. Ne zanima nas samo konkretna dejavnost, temveč tudi prostor in čas. Rešitev tega problema bi lahko bila velikega praktičnega pomena, ker nam bi omogočila napovedovati hitrost in vrste sprememb.

Ena izmed poti, ki vodi k reševanju tega problema, je primerjava kart iz različnih časovnih obdobj. S pomočjo historične analize lahko prostorsko opazujemo, kako so se spreminjali tipi gospodarjenja z zemljo, naselbine, cestno omrežje, pa tudi rečno omrežje, obseg močvirij in še nekateri drugi pojavi.

Na splošno velja, da je človek povzročil najbolj intenzivne spremembe geografskega okolja v zadnjih 200 letih. To v globalu vsekakor drži, po drugi strani pa je v regionalnem in mikroregionalnem pogledu čas za spremembe v okolju zelo različen, stopnja naravne regeneracije in degradacije pa je različno dolga.

Za predstavitev te metode smo izbrali dve območji: del Niecka Nidziańskiego blizu Pińców in mestno skupnost Łomianki blizu Varšave. To sta območji z različnimi razvojnimi značilnostmi. Območje Niecka Nidziańska spada med najstarejše naselbine na Poljskem. Za to trditev lahko najdemo mnogo dokazov v izkopavanjih in starih pisnih virih. Že v zgodnjem srednjem veku se je uveljavilo kmetijstvo. Ko so posekali gozdove, je travnike v dolini reke Nida uporabljal za grofovske pašnike že Leszek Beli v 12. stoletju. Poljedelski značaj tega področja je prevladujoč še danes.

Občina Łomianki leži v območju direktnih vplivov velikega mesta Varšave. Razvoj naselbin na območju Mazovije je bil mnogo poznejši. Gospodarsko se je to območje aktiviralo v 18., 19. in 20. stoletju. Tedaj je istočasno z razvojem Varšave naraščalo

tudi število prebivalcev v neposredni bližini mesta. Zato je tudi prišlo do izsekavanja gozdov, kultivacije ledin in regulacije rek.

Za zadnjih 200 let smo za področje Poljske izdelali več kart z različnimi časovnimi nizi. Približno za vsakih 30 let je bilo na voljo kartografsko gradivo, ki omogoča osnovo za historično analizo. Ker so bile karte izdelane za različne potrebe, imajo različna merila in različne legende. Za proučevanje sprememb v geografskem okolju je bilo potrebno poenotiti merila in zlasti najstarejše zemljevide tudi "prilagoditi". Analiza je bila narejena z metodo ugotavljanja površin in s kartogramom stabilnosti izrabe tal (Plit 1990)*. Različni kartografski izdelki predstavljajo podoba stanja okolja in gospodarstva v letih izdelave.

Vse izbrane karte smo izdelali v istem merilu, nato pa smo s fotografsko metodo izdelali pozitive na foliji. Historična analiza je bila izvedena s kartografskimi metodami. Za preučevanje sprememb v izrabi tal smo pripravili kartogram o njeni stabilnosti. Površine pod gozdovi, njivami in travniki smo iz vseh historičnih kart prenesli na kopirni papir, nato pa šrafirali odgovarajoča območja različnih zemljiških kategorij.

Za potrebe te študije so bili izdelani in predstavljeni trije pari kart, ki prikazujejo naslednje spremembe:

- 1) površin gozdov,
- 2) površin travnikov,
- 3) naselbinskega omrežja.

Primerjava kart št. 4 in 5 kaže spremembe gozdnih površin, čeprav so bili motivi človekove aktivnosti isti. Gozdovi so bili izkrčeni na plodnih in zelo plodnih rastiščih (n.pr. izkrčena je bila aluvialna terasa reke Visle, v Potocku in Turskem hribu so bila izsekana rastišča belega gabra in hrastovi gozdovi), da so pridobili površine za gradnjo hiš in poljedelstvo. Manj plodna peščena tla pa so ostala pogozdena (Wólka Węglowa, Sieraków, Pińcówski hrib ter območje med Zakrzewie in Młodzawy).

Na obeh kartah je obsežen kompleks stalnih gozdov: zaščiteni gozdovi v Kampinškem narodnem parku in Chroberski gozdovi (v preteklosti je bil velik predel teh gozdov nameljen lovu), kjer človek že izvaja zaščitne ukrepe (Pińców).

* J. Plit "Metoda spreminjanja površin pri historični analizi sprememb v geografskem okolju", *Geographical Review* 1990, št. 1 (v tisku)).

Spremembe naselij smo kartografsko predstavili s pomočjo ploskovne ponazoritve površin. Ta prikazuje porast pozidanih območij. Za okolico Varšave smo proučili pet obdobij, da smo lahko poudarili intenzivnost urbanizacijskih procesov. Karte za Niecka Nidzianska, kjer je demografska podoba že stoletja enaka, smo poenostavili na dve obdobji.

Zaključimo lahko z ugotovitvijo, da historična analiza kart omogoča opazovati tempo površinskih sprememb določenih sestavin geografskega okolja. Še več, omogoča celo določanje stabilnih obdobij in obdobij intenzivnih sprememb. Omogoča nam, da opredelimo povezave med človekovim posegom v okolje in med posledicami tega poseganja v daljših časovnih obdobjih. To velja posebno za hidrografske probleme. Izvedena analiza omogoča tudi določene zaključke v zvezi z odpornostjo okolja pred človekovimi posegi in z regenerativno sposobnostjo narave. Predlagane posplošitve zahtevajo še nadaljnje preučevanje. Analiza kart pa je opozorila na večjo stabilnost oblike podeželskih naselij in cestnega omrežja.

Poudariti velja, da je bilo območje Niecka Nidzianskega pri Pinczówu že v srednjem veku razvito v skladu z zmožnostmi okolja in lahko v zadnjih 170.ih letih opazimo samo majhne spremembe.

Občina Łomianki pa doživlja dinamičen razvoj, ki je povezan z neposredno bližino velikega mesta. Ta razvoj je zaradi naravnogeografskih omejitev (rečna dolina) skoncentriran izključno na poplavni terasi Visle. Na drugi strani so omejitve, ki so povezane z bližino zaščitenega območja Kampinoškega narodnega parka. Hiter razvoj naselja po drugi svetovni vojni je pripeljal do tega, da so v letu 1989 Łomianki dobili mestne pravice.