



# The Actual Trends of the Evolution of the Land Use Patterns in Rural Areas of Eastern Poland

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The eastern part of Poland in many areas preserved, nearly intact, traditional land use structure, established in the end of the 19<sup>th</sup> century, in spite of all social, political and economical events of the second half of the 20<sup>th</sup> century. Moreover, in majority of the regions of the South Eastern Poland the presently irrational, low productive methods of land management prevail, resulting from numerous factors, not always easy to explain on the ground of classical political economy.

In the past, the most obvious reasons for lack of change were: very slow progress in attempts to introduce legal instruments enabling transformation of the traditional agriculture into modern, market oriented one, overpopulation of the rural areas, lack of available sources of financial support for modernizing farms, very slow progress in agricultural technology and extreme fragmentarisation of productive land. The causes and consequences of the productive land fragmentarisation – one of the measurable land use structure features – have many aspects and present several interdisciplinary questions raging from social, economical and political to ecological and cultural ones.

The process of fragmentarisation could be discussed in respect to two levels or aspects of this phenomenon.

The geographical land ownership studies in Poland's rural areas concern mainly the result of the long process of coexistence and mutual relations of the large estates and small holdings with special attention paid to the processes of subdivision of farms into smaller property units and following it subdivision of productive land into smaller plots, very often of the shape of very narrow land stripes (fig. 1).

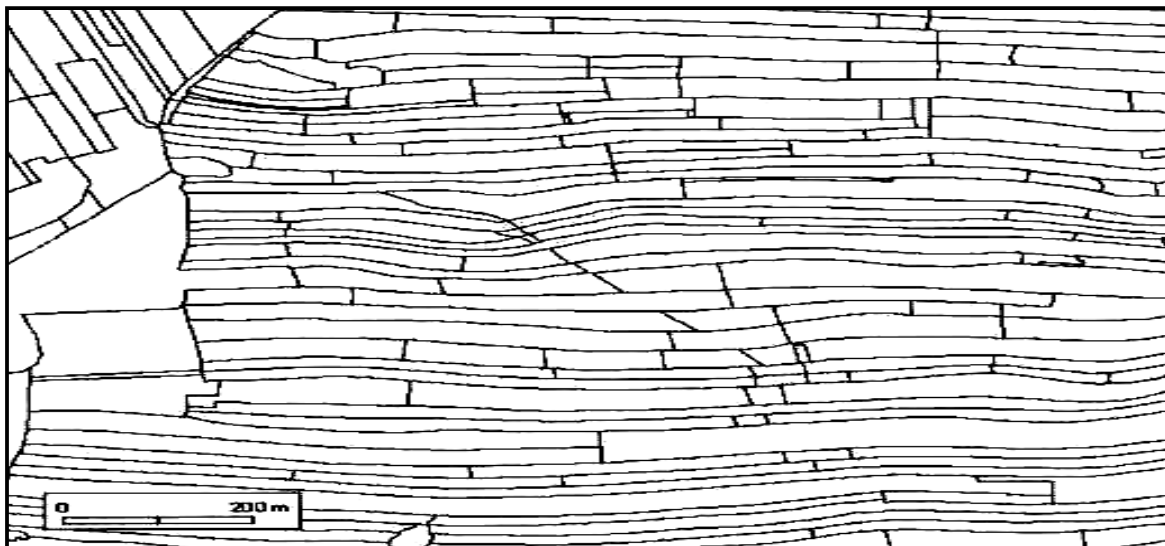


Figure 1. Typical land use pattern – Rostocze Region (after L. Gawrysiak).

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In contrast with other countries of Europe, this situation was not changed during the 20<sup>th</sup> century. Small farms were not integrated into larger productive units under the pressure of economic conditions/as in West Europe, not integrated in cooperative or state great agricultural enterprises as in other countries, where, under Soviet influence private, small farms ceased to exist.

Till the end of “socialist economy” in Poland, paradoxically, the less socialist element of the Polish economy – private farms functioned fairly well. Due to stabilization of government regulated prices and relatively high prices for farm products even owners of small farms were able to achieve relatively good income, sufficient to live on the level nor much different to average town dweller. Numerous farmers of initiative managed to increase their income more or less legally selling directly their products in towns, as there were always shortages of meat, butter, fruits and vegetables of good quality in state owned shops.

Political reasons, especially privileges for smallholders and numerous obstacles in land trade additionally prevented any changes in farmed land property structure. Independently from this relatively good situation of the farmers the slow processes of depopulation of rural areas were advancing, depopulation connected mainly with migrations of young people to still growing industrial, urbanized centres.

From the ecological point of view, the predominant in Poland type of farming of the small holdings – non market oriented, maximally self sufficient and technologically traditional caused that complicated mosaic of small plots were used for very wide variety of crops, including some traditional, presently rarely encountered in the West Europe. As a result in many East Poland regions prevail landscapes presenting dense network of balks and dirt roads subdividing narrow cultivated plots together with dispersed patches of forests and permanent pastures. Such landscapes, apart from their historical values, are characterized by very high level of the biological diversity, stability and resistance in relation to environmental degradation, very often represent also outstanding beauty of the scenery. Moreover, paradoxically, these landscapes could be recognized as presenting examples of sustainable management of natural resources.

Dramatic changes in Poland’s political situation and its economy started quite new economical and social situation of our agriculture development.

After political changes connected with reintroduction to Poland democratic forms of government very fast economic changes followed, changing economical system of the country into free market, capitalist economy. These events have also consequences, which increased significantly difficulties in economical situation of the majority of farms in Poland. The costs of farm equipment and of the necessary chemical products increased, and it become more difficult to sell farm products for good price as the Polish market become open for the cheaper products from abroad.

The process of reorganization of Polish agriculture was started, but transformation is slow and, especially in Eastern Poland, the number of well managed, well equipped large farms is growing very slowly. The present situation is illustrated by the table 1.

**Table 1. The structure of land property in Poland.**

	<b>Thousand of hectares</b>
The total area of Poland	31 268
Agricultural land (arable land, orchards and gardens, meadows and pastures)	18 540
Owned by private farms	15 431

The position of private farming in the Polish agriculture is clearer if we take into consideration that 92,3 % of the total arable land is cultivated by individual farmers, nearly all owners of farms and land. Presently in Poland we have nearly 2 million of private farms, with average area of 7,7 ha, of which agricultural land is 6,9 ha (Statistical Yearbook of Poland 2000).

The size structure of private farms reflects the extreme fragmentarisation of the productive land in Poland (table 2).

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Table 2. The size structure of private farms in Poland.

Farm area in ha	Rate (%)
1.01 – 1.99	22,6
2.00 – 4.99	34,0
5.00 – 6.99	12,7
7.00 – 9.99	12,3
10.00 – 14.99	10,3
more than 15	7,7

The purpose of our study was connected with identification of contemporary changes in the structure and patterns of land use in rural area of Eastern Poland with special attention given to marginal and depopulating areas. In order to study the rural structure evolution in detailed scale we concentrated our attention on the parts of the Lublin Voivodship, where a complex of conditions could stimulate faster appearance of crisis symptoms.

The region where all studied areas are situated, Lublin Voivodship, is considered as one of the most "rural" administration units of the first grade in Poland. Covering a surface of 25 114 km<sup>2</sup> with 2 234 900 inhabitants is placed in the Eastern part of Poland with borders with Republics of Ukraine and Byelorussia. The agricultural land rate is 68,3 % of the total area, of which private farms own 94,7. The large majority of the population is employed in agriculture – 56,8 % (in contrast with other regions of Poland with less than 20 % - voi. slaskie 14,5 %). Forests cover only 22 % of its area.

In order to acquire a wider geographical and historical perspective the changes in rural land structure were confronted with the results of regional overview of the agriculture position and on the detailed studies of land use and settlement changes during last century.

The factors, which (in our conditions) could be treated as responsible locally for retarding or making very difficult modernization or economic and technical development of agriculture were of various character: geographical, ecological and socio-economical.

As geographical factor we consider localization of the rural settlements and cultivated fields close to political border, in areas significantly devastated during II WW.

As ecological factor we consider limitations in development caused by either environmental degradation or by protection measures connected with establishment of different forms of protected areas.

As local socio-economical factor we consider locally significant and negative aspects of the contemporary socio-economical transformations.

All these factors are, to some extent, responsible for difficulties of rural areas prosper development in the whole region, but in some selected areas their influence is better recognizable and during last decade caused measurable changes in the land use structure.

The above listed factors, as primarily responsible for phenomena recognized as symptoms of change in rural structure could be identified in various combinations, where one or sometimes two factors play decisive role and others acting as complimentary ones... A couple of typical ways of evolution of rural structure caused by above mentioned sets of factors could be demonstrated on the basis of our recent detailed studies in selected areas of the region.

### The Political Factor – Land Area in the Sector of the Bug River Valley

As an effect of the civilisational changes (principally politic) of last couple of centuries Bug River Valley ceased to form a regional axis integrating the economy and population centres – it become a barrier separating communities living on the opposite sides of the river. The resulting changes in landscape evolution were studied on the basis of cartographic materials dated on several periods, literature and field studies.

Any large river valley forms an well-integrated natural system, characterized by specific geological conditions, relief forms, water conditions, microclimatic features as well as fauna and vegetation. These features are creating conditions specific for these river valleys forms of human activities, characteristic also for particular cultural situations of its inhabitants. These

systems are, however, strongly related to much larger areas, naturally connected with the rivers – their basins. According to this landscape evolution processes were studied in details within the river channel and flood plain, more generally along the river valley region with additional materials concerning the related sectors of the Bug River Basin.

Natural values of the river valley are influenced directly by hydrotechnical management of the river channel and its flood plain, where in case of the River Bug generally diminishing intensity of human activities was characteristic for last two centuries.

In the Bug River valley region, characterized by minimal percentage of urban and industrial areas the results of human influence on the nature can be directly connected with changes of the structure of land use, expressed by relations among the following the following types of land use: woods and forests, meadows and pastures, arable land and settlements. Actual trends in this phenomenon were studies on the basis of the comparisons of areas of selected types of land use measured on maps dated for different periods during last half century (fig. 2).

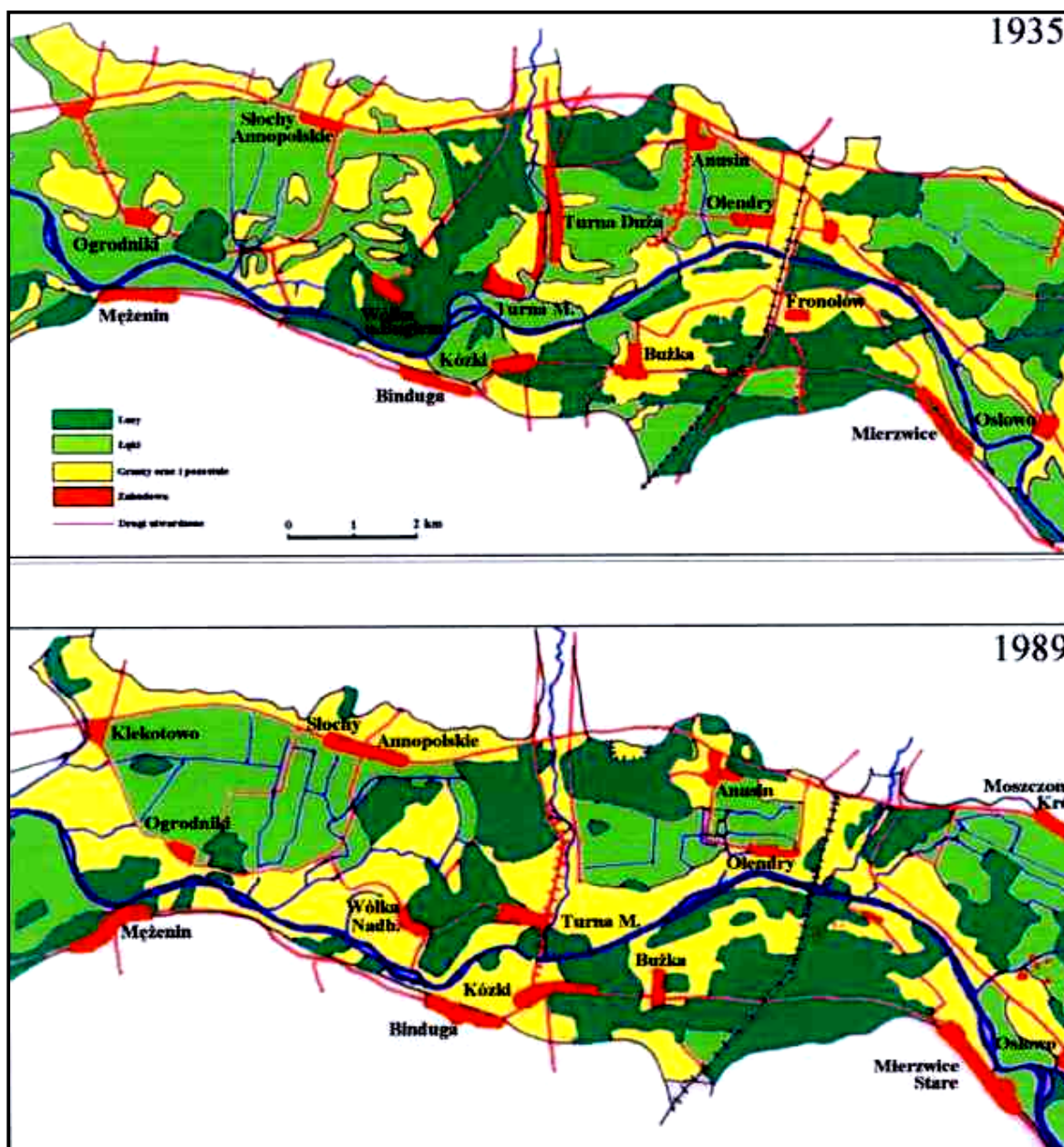


Figure 2. Changes of the structure of land use in the Bug valley region.

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For this study detailed maps covering twelve selected sectors of the valley were used.

The most drastic changes, comparable to these described for The Polish Eastern Carpathians, were registered on the sector of the valley where state border of Poland runs along the river. Their marked increase of forest areas was noted, several villages and communication lines ceased to exist. Less drastic were landscape changes in lower sector of the valley. There generally the rate of wetlands was diminishing, former meadows were replaced on dried artificially river terraces by arable land. The forest areas in this sector of the valley are also generally increasing, but very slowly. New flood controlling dikes and dense network of roads were recently constructed, in some areas groups of summerhouses were added to settlement network.

In general the study has shown that the Bug River valley presents very high level of naturalness and exceptional values of nature and landscape. These values are presently endangered only in few localities, mainly connected with urban and industrial centres outside Poland and with new build communication lines crossing the national border and river.

In some areas, it is possible to treat **ecological problems** as the main factor responsible for transformation of the rural structure. This factor (or rather a complex of factors) affects the conditions of rural structure evolution in many ways, both directly and indirectly. Such situation could be demonstrated on the example of the areas in the neighbourhood of the Roztocze National Park, located in the hilly region, close to the Polish-Ukrainian border.

In this region, in spite of protective measures, durable degradation of some environmental components was registered (intensive soil erosion, forest resources depletion, water conditions degradation, etc.) and on the other hand, due to the consequent economical development difficulties caused by protective regulations rural settlements suffer fast, negative transformations.

Roztocze National Park, established nearly thirty years ago, was the territory where, due to its exceptional natural values, all components of the environment were studied by sequence of research programs. In particular, interesting results were obtained from the studies of the evolution of the water conditions influenced by human activity during last century. Transformations of the water circulation conditions resulting from the changes in the land use structure and type as well as the intensification of the agricultural production are here basic factors.

As a result of systematic observations various kinds of the changes of hydrosphere were noticed in the area of Roztoczanski National Park. Some of them have the character of natural processes usually occurring slowly but due to them, water relations, in unused areas, seem to be stable. The influence of man is marked, above all, by selected phenomena occurring in the consequence of economic activity, and connected with specific forms of water management which takes place in rural areas. The direct changes are the consequence of hydrotechnical works realized in order to secure water supply for the farms, flood control and wetlands drainage and (in the past) water power installations for various uses (mainly grain mills). These activities directly caused changes of the time of circulation, quantity and quality of water.

Transformations of water circulation resulting from the changes of intensification of agriculture production are basic factor of indirect causes of water conditions evolution.

The most drastic transformations (of quantity and quality) concern mainly the surface waters. The interference of man here occurred as a result of forest, wetlands and cultivated areas drainage, building of water storage reservoirs and multiple other activities changing quality of water. In the studied area most of those changes occurred in the south part of Roztocze National Park.

The drainage works caused intensification of the time of water circulation occurrence. Consequent surface retention decrease, acceleration of flow and lowering of underground water table resulted in deterioration of peat deposits and water quality degradation.

The transformations of hydrosphere that were noticed are one of the most significant factors causing huge and far reaching changes in the ecological conditions of human activities. The transformation of natural conditions of water circulation has had a negative influence on the peat bogs plant communities. Part of higher peat bogs were transformed into pine bogs forest, some of the temporary peat bogs considerably constricted their area, the density of the layer of

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trees increased in all groups of peat bogs. Most of these bogs have lost their primary non-forest character.

The lowering of the level of ground waters and the extension of the periods of water shortage in the ground caused the decline of number of aquatic plant species which belong to the group of rare or protected species.

On the other hand the registered increase of watersheds water retention capacity was caused by the growing number of water storage reservoirs (ponds, fishponds, recreation reservoirs etc.). Their influence on environment is generally positive. Due to it there a decline of the volume of storm runoff can be registered, together with marked rise of the low water stages and equalization of the flow.

What is often registered in Roztocze is the reduction of the water storage in higher water bearing levels, which can be detected in lowering of groundwater levels. One of the main reasons for that are more numerous deepwater wells, which are largely built in the rural areas, apart from collective water supply systems.

The danger of changing the quality of water can be various in different segments of the region but for the detected changes the main reason in unregulated water supply and sewage management in rural areas, in particular in those which are situated in the area of high natural and landscape values. The urging problem that needs immediate solution is disproportion between the well-developed water supply systems and the lack of the sewage draining systems and modern wastewater processing plants. As the result the negative transformations occurs locally, especially threatening the protected sphere of Roztocze National Park. All these phenomena affect seriously possibilities of the rural area development in its vicinity by diminishing the values of relative environmental components.

Another kind of the influence of the environmental factor on the rural structure is connected with protective measures concerning protected areas (National Park) and causing numerous limitations and obstacles in the economic activity. In the case of Roztocze National Park the nearly complete elimination of the commercial logging and timber processing for large forest area can be treated as decisive factor for degradation of rural communities for centuries involved in forest resources exploitation (apart from farming). As the example can serve Obroc village.

This village, situated on the clearing surrounded by forests has in 1805 – 259 inhabitants, in 1974 – 568, in 1995 – 552. The agricultural area covers 564 ha, from which 316 ha of arable land subdivided to 1100 plots belonging to 128 owners.

Farm size – 37 – less than 2 ha, 86 2 – 5 ha, 5 more than 5 ha. The present situation, leading to fast depopulation of the village and degradation of its structure illustrates the set of data concerning present professional occupation of the village dwellers:

- |                                     |                         |
|-------------------------------------|-------------------------|
| ➤ 48 active farmers                 | 8,5 % (1970 – 56 %) 8,7 |
| ➤ 134 working elsewhere (commuting) | 24,3 %                  |
| ➤ 120 pensioners                    | 21,7 %                  |
| ➤ 106 unemployed                    | 19.2 %                  |
| ➤ 150 family members (children)     |                         |

It seems that it is necessary to take into consideration both ways of the influence of ecological factors on forming serious obstacles in future development of the agricultural areas.

### The Socio-Economical Factor

The socio-economical factor seems most obvious in initiation and shaping changes of land use structure and agricultural areas landscape. In our opinion this factor is affecting traditional rural areas of Poland in rather special, presently not-spectacular way, as the small, individual farms developed their own, special policy of management very resistant to external, socio-economical factors.

The good example of this situation presents territory of Skierbieszowski Park Krajobrazowy (Skierbieszów Landscape Park), where majority of its area, covered by very good soils, belong to individual farmers. In spite of all dramatic historic events and economical change land use structure and pattern are changing here very slowly.

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The most dangerous for the economic prosperity of its inhabitants is bankrupting of some and the perspective of closing of other regional plants processing farm products / sugar mills, fruit or milk processing plants, meat canneries, and others.

Presently, as the detectable symptom of changes only accelerated process of depopulation was noted.

In official statistics the signs of socio-economical crisis which influence the land use structure are difficult to detect in areas with prevailing private property of farms and low average size of farms. The percentage of abandoned, not cultivated fields in the Lublin Voivodship officially is under 5 % in contrast with some Western Poland voivodships where it surpasses 20 %. There, in the West many former state farms bankrupted, and uncultivated fields, administered now by special government agency are registered.

Results of the out recent extensive field studies and analyses of air photographs are showing that the official statistics are not registering small, dispersed, not cultivated, abandoned plots owned by private farmers.

In recent years however this phenomenon become so intensive as to affect physiognomy of some rural areas being still undocumented by statistics. Our studies proved that it is the beginning of process that deserves further detailed research programs.

Preliminary results of these studies have shown that the process of cultivated land abandonment is related to numerous factors, but the acceleration process of aging of the rural communities (which regional differentiation could be studied on the basis of detailed demographical data) plays here important role.

The pattern of abandoned fields depends strongly on the quality of cultivated land (mainly soil and water conditions), on the distance to the settlement (village or particular farm)/where time and effort necessary to transport agricultural equipment to small, distant plots makes cultivation inefficient, and sometimes also on the distance to the border of protected forest as the protected wild animals are making cultivation difficult and economically unreasonable.

In our opinion described above examples of different ways of the evolution of land use patterns suggest urgent need for more extended and detailed studies of this phenomenon as we may expect the rapid acceleration of rural structure changes in near future.

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