

**DEMOGRAPHIC AND ECOLOGICAL ESTIMATION
OF UKRAINE AND ROMANIA BOUNDARIES
(AS AN EXAMPLE CHERNIVTSI REGION AND SUCHEAVA COUNTRY)**

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Studies showed that there has been a negative change in the demo-ecological situation of researched territory due to the fact that population got much older and there is a lack of young generation which has and will have a strong negative impact on social and economical development of the region. This also gives us a clue to link the increase in morbidity and mortality to the demographical situation.

The correlation strength of causal links between public health and environmental factors reasonably serves as an indicator of environmental conditions. Medical-ecological zoning in Chernivtsy region (7 zones) and in Suchava district (6 zones) with the accent on the cancer pathology (as an indicator), shows the impact on ecological and demographical situation by a row of social-economical, natural and industrial factors. A comparative analysis of environmental and demographic situation was done for individual neighboring subregions, assessment of environmental stress, zoning the entire region in terms of health status.

Key words: territorial demogeoeological system (TDGES), environmental stress, landscape complex, medical and environmental situation.

Introduction. Demo-ecological research of the territory is direction of urgent importance that is developed within social and economic geography, in particular demography. Methods of Complementary (connected) analysis of ecological and demographic parameters of geosystem are not developed enough at present, especially frontier territories that would give an opportunity to define the character and level of environmental influence factors on demographic process, to establish basic regularities of territorial differentiation of population's illness rate and to outline optimal ways for population's vital activity.

Because, the top priority task is working out methodological approaches to ecological and demographic study of geologic systems, improving methodical ways of analysis and strain rating of demo-ecological situation in region. (It should be considered that ecological factors within environment can be dangerous or useful for human.)

Investigation of medical and ecological aspects of human geo-ecology is one of the principal tasks. Health indices of population of definite territory can be indicator of its geo-ecological condition.

The investigation regions are districts of Chernivtsi oblast in Ukraine and district of Romania Sucheava. This territory has different natural and ecological, social and economic, ethnic and social, cultural and historical types of demographic geography systems. Territori investigation is also a part of euro region "Verkhniy Prut", which is a cross-border element of European frontier. The results of ecological and demo-geographical researches can acquire an international significance and become profitable during fulfillment chain of state and intergovernmental programs.

Ecological and demographic analyse.

Object of research is territorial demo-ecological systems (TDES) or demo geo-ecological systems (DGES) of Chernivtsi- Sucheava Euroregion part "Verkhniy Prut".

Theoretical and methodological basis of research are scientific statements, which are made by domestic and foreign academic experts: V. Gutsulyak, S. Duma, V. Dzhaman, O. Topchiyev, V. Barbu, Al. Ungureanu, I. Iosip, K. Nakonechny'j etc. The research is based upon the principles of social geography, geo-ecology, landscape science, demography, medical geography etc. There were applied general scientific and special methods of cognition. Correlational regressive analysis was used to determine the factors of ecological and demographic situation, grade method was used to estimate the level of strain.

Informational basis for preparation of work were archival materials, field research data, fund materials from the Department of Geography "Stefan cel Mare" University of Sucheava and Chernivtsi National University "Yurij Fed'kovych. Scheme1".

Among the methodical ways of definition manmade influence (pressure) on human's life environment the analysis of geo-ecologic coefficient and indices has a wide common use. (Gutsulyak, 2008).

Chernivtsi – Suceava cross-border region is located on geological system borderline of Central and Eastern Europe. It is characterized by substantive diversity of natural and geographic (landscape) conditions. There are two categories of landscapes: Carpathian Mountains, raised plains of Bucovina Carpathian region (Prut- Siret and Sucheava plateau) Dniester -Prut plain. Within them we can distinguish number of zonal types of landscapes: meadow-forest

and forest-steppe (plains), mountain and forest (broadleaf and coniferous-broadleaf forests) subalpine and the alpine meadows (polonina).

The analysis and assessment of the landscape and ecological peculiarities in Chernivtsi sub region showed that ecological state in Prut Dniester part can be estimated as “ subnormal beneficial” and “ low beneficial”. Thus the consolidated figures of pollution (CFP) are greater in region. It is disadvantageous that in many cases (freshwater) ground water of forest – steppe region is hard water(more than 9 mg-equivalent/l) with mineralization up to 1 g/l. In the main, fresh water from centralized water supply satisfies health and safety regulations.

There are more favorable environmental conditions in Prut-Siret sub region of Prykarpattia. Predominance of flushing water regime of geological systems (sufficient rainfall) and presence of considerable forest areas contributed to the sanation of the local landscape from different man-made pollution. In addition, there have been created favorable conditions for the formation of high-quality groundwater (freshwater), that is important to take into account when assessing medical and geographical territory.

In recent years in Chernivtsi - Suceava region develops relatively favorable situation in social and economic relation. The agricultural sector of economy is aimed at manufacturing ecologically clean foodstuff, green production strategy is in progress etc.

It is typical for the industry to return to traditional economic sectors, such as forestry, pulp and paper, textile, food branches. Special attention was paid to tourism sector development.

At the present stage the main source of environmental pollution in the region are exhaust fumes from motor transport, the amount of exhaust emissions are up to 75% from total emissions. Among the human encroachments there are also minor sources of pollution by industrial undertakings and rural industries, but they have tendencies to decrease or complete cessation of functioning.

For the analysis of the demographic situation in Chernivtsi region and in Suceava Country there has been considered the settlement system and has been determined the confinedness of human settlements to landscapes and has been analyzed demographic structure and dynamic processes in both border subregions.

From the perspective of our researches (ecological connections are taken into account) it has been singled out demo geo-ecological zones (DGEZ) that refer to local settlement systems.

Emphasized DGEZ consist of demo geo-ecological systems under which we understand the complex of geological settlement systems, which

environmental condition is caused by the local landscape and anthropogenic factors.

Demo - geographical situation in border subregions (Chernivtsi and Suceava) is quite unstable. Over the last decade there has been a significant decrease in population in Chernivtsi region in comparison with Suceava Country. In Chernivtsi - Suceava region the population is gradually aging, which increases the loading on the working-age contingent(in Suceava county the situation is considerably worse - 99 disabled persons to 100 of working age, compared with 66-100 in Chernivtsi region). The average population density is much greater in Chernivtsi Oblast (111.7 persons / km²) than in Suceava County (89 people / km²). This is because in Suceava county the territory of the mountain is much greater than in Chernivtsi region. However, the rate of urbanization is similar in both sub-regions - 42.1% in Chernivtsi region and 43% in Suceava county. By sex division the situation is almost the same (53.2% women and 46.8% men - in Chernivtsi region and 51% women and 49% men - in Suceava county). The result of researches showed up that the sex - age structure of the population in the region has a significant impact on both internal and external migration flows that change the basic demographics. Nearly 76.9% of immigrants are working age people, whereas the youth (from 15 to 28 years) is more than the half of migrant population. Women are more active in the migration process, where more than two-thirds of women migrates being of childbearing age. Persons that are below working age are exposed to migration movement together with their parents. Overall, for the last 2-3 years has developed positive social situation on the investigated area, that is the best against the background of national showings (Ukraine and Romania). Growth tendency of population is observed in both sub-regions (it is more expressed in Suceava Country). In the region has been recorded positive migration balance starting from 2006-2007.

Indices of mortality and morbidity of population have been analyzed for methodological and ecological assessment of the investigated territory in the region and their territorial characteristics. It has been calculated correlation dependence of these indices – “indicators” and the environment condition. Demo geo-ecological assessment of tension in the region is based on the obtained results. Index increase of total mortality in the direction from south-west to north-east is typical for Chernivtsi subregion.

Highest data were recorded in the area between Prut and Dniester interfluvial area in Kelmenetsky and Zastavna areas (meadow-steppe landscapes). The figures are higher in these districts rather than in

Carpathian region (Glyboka and Storozhynets areas) and the Carpathians (Putyla area). In Chernivtsi subregion the frequency of death from various causes tended to increase during the investigation period (2004-20012). The number of cases of total mortality grew by 12%. In the nosological structure stand out the causes of death from cancer and circulatory diseases, that is associated in some way with the environmental situation.

The index of overall mortality in Suceava Country is 11.8%. Territorial medical and geographic analysis showed that the Suceava Plateau shows more intense indicator of the overall mortality which is 12%, than Suceava Carpathian area 11.5%. Radivtsi basin has terraced landscape complexes with favorable water regime and therefore smaller absorption of polluting substances in the landscape environment, the rate of mortality in this area is 9%. In dynamic terms during 2004-2008, there has been a slight decline in population mortality of County (1-2%).

We conducted medical and geo-ecological regionalization for cancer indicators (morbidity and mortality) and geo-ecological condition of the area (Fig.1). There has been allocated 6 districts in Suceava country: 1 Radivtsi basin, 2 Siret valley, 3 Dragomirna – Suceava, 4 Baia Faltycheni, 5 Suceava Carpathian, 6 Dorna Kaliman (Mountain). There are 7 districts in Chernivtsi subregion : 1) Zastavna-Khotyn, 2) Kelmentsi, 3)Sokryany, 4) Novoselytsya, 5) Vyzhnytsia- Kitsman, 6) Storozhynets-Hertsya and 7)Putyla. Areas are characterized by varying degrees of intensity of ecological demographics.

Indicators of malignancy (on the background of Chernivtsi region) are highest in the districts of Prut-Dniester interflaves and in Chernivtsi (it is 20 % higher compared to the regional level).

On the basis of the conjugate analysis of eco-geological factors (quality of air, water, etc.) medical and demographic parameters (mortality, morbidity) were estimated according to the score system also has been received complex index of medical and environmental situation of some areas.

For this purpose were used environmental indicators of anthropogenic factors also were applied natural and geographic factors (hydro and climate, biogenic, etc.) and the landscape in general, which enabled for the reasonable assess of their impact on the ecological environment. It turned out that forest - meadow landscapes are more favorable for human life compared to forest-steppe and meadow-steppe (both in Chernivtsi and Suceava subregions).

The analysis of tension indicators of medical and ecological situation among the districts showed that in Zastavna meadow-steppe area eco conditions are less

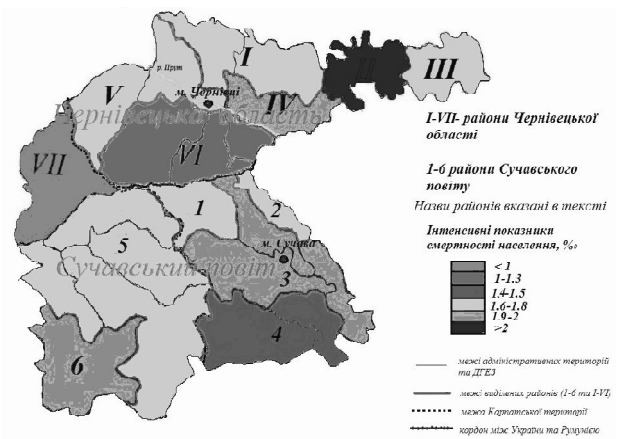


Fig.1 Schematic map districts of Chernivtsi region and Suceava country by the indices of mortality from cancer pathology

favorable— it has 37 points (situation is “slightly strained”) and in Storozhinets region conditions are more favorable— it has 23 points (situation is “favorable”) and Drahomirnes micro district of meadow-forest plateau has got 24 points.

Conclusions

Complex analysis of natural and socio - economic conditions of the territory from the perspective of their potential impact on ecological and demographic situation (as a consequence it affects the population’s health) provided an opportunity to improve the method of estimation of ecological and demo -geographical situation of border areas.

The territory of landscape complex, which is characterized by genetic homogeneity of physiographic conditions (and thus relatively homogeneous influence of these conditions on the population health) used by us as an objective basis for the allocation of demo geo-ecological zones (DGEZ) – the main units of ecological and demo - geographical estimation of the area (in Chernivtsi sub region 19 DGEZ, in Suceava 12 DGEZ).

Calculations of dependence of mortality (and morbidity) from environmental factors confirm small impact of ecological state of territory on population’s health.

The degree of tension of ecological and demographic situation is relating to anthropogenic and natural factors (air quality, drinking water, the area of forest fund lands, type of landscape etc.) The calculated figures confirmed that the most favorable conditions for vital activity of population prevailing on the territory of meadow - forest landscape (including demo geo- ecological complexes) Storozhinets district and Suceava (Drahomirnes) plateau). Total points here are over 20, which correspond to the gradation “favorable.”

Medical and ecological zoning of Chernivtsi region(7 districts) and Suceava Country (6 districts),

with an emphasis on cancer pathology (as an indicator), reflects the impact on ecological and demographic situation of natural complex, domestic household, social and economic factors.

The results of ecological and demographic research allow us to substantiate practical recommendations for improving the quality of environmental components, demographic processes that have been developed in the region, the involvement of border local bodies of both states (Ukraine and Romania) for cooperation and implementation of the relevant optimization projects.

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Думитраш Д.Г., Гуцуляк В.М. Демографічно-екологічна оцінка українсько-румунського прикордоння (на прикладі Чернівецької області та Сучавського повіту). Дослідження показали негативні зміни демо-екологічної ситуації в регіоні, де спостерігається поступове старіння населення та зменшення чисельності молодого покоління, що має сильний негативний вплив на соціально-економічний розвиток регіону. Одночасно спостерігається збільшення захворюваності та смертності на фоні демографічної ситуації.

Кореляційний аналіз причинно-наслідкових зв'язків між показниками здоров'я та екологічних факторів служить індикатором стану навколишнього середовища. Медико-екологічне районування Чернівецької області (7 районів) та Сучавського повіту (6 районів), з упором на онкологічну патологію (як індикатора), відображає вплив на еколого-демографічну ситуацію комплексу природних, господарсько-побутових і соціально-економічних чинників. Метод порівняльного аналізу екологічних та демографічних параметрів геосистем прикордонних територій дає можливість визначити ступінь впливу факторів довкілля на захворюваність населення в межах цілого регіону.

Ключові слова: територіальна демо-екологічна система (ТДГЕС), навколишнє середовище, медико-екологічна ситуація.

Думитраш Д.Г., Гуцуляк В.М. Демографо-екологическая оценка украинско-румынского пограничья (на примере Черновицкой области и Сучавского уезда). Исследования показали отрицательные изменения демо-экологической ситуации, где наблюдается последовательное старение населения и уменьшение численности молодого поколения, что имеет сильное отрицательное влияние на социально-экономическое развитие региона. Одновременно наблюдается увеличение заболевания и смертности на фоне демографической ситуации.

Корреляционный анализ связей между показателями здоровья и экологических факторов служит индикатором состояния окружающей среды. Медико-экологическое районирование Черновицкой области (7 районов) и Сучавского уезда (6 районов) с акцентом на онкологическую патологию отображает влияние на эколого-демографическую ситуацию комплекса природных хозяйственно-бытовых и социально-экономических факторов. Метод сравнительного анализа экологических и демографических параметров геосистем пограничных территорий дает возможность определить влияние факторов окружающей среды на заболеваемость населения в пределах всего региона.

Ключевые слова: территориальная демо-экологическая система (ТДЭС), окружающая среда, ландшафт, медико-экологическая ситуация.