

## Natural-Resource Potential of Natural Regions of Ukraine in Modern Terms

Stepan RUDENKO, Valeryi RUDENKO

**Abstract:** *A method of revaluation of natural resources of the physical-geographical regions of Ukraine is provided. Methods to re-estimate the cost of Ukrainian nature resource potential (NRP) are substantiated on the basis of lands' natural yielding capacity provided that crop is rotated and plough land is cultivated only mechanically with no fertilizers. The NRP of Ukrainian landscape complexes was estimated in the aspect of 3 physic-geographical countries, 4 zones, 3 sub-zones, 14 kraiss.*

**Keywords:** *natural-resource potential, cost re-estimation, Ukrainian, natural regions.*

### Introduction

The system of national counting introduced in Ukraine in accordance with international standards is regarded as a total of indices of consistent and mutually supplemental description of the most important processes and economic phenomena, i.e. production, incomes, consumption, accumulation of capital and finances. Gross domestic product, expressed on a regional level as a gross regional product since 2004, occupies a central place in the system of national counting (Statistical Yearbook of Ukraine, 2007).

It seems very important to correlate the analysis of Ukrainian gross regional product development dynamics and its territorial differentiation with the indices of nature resource potential (NRP) estimation in the country's natural regions, thus allowing for first-approximation conclusions with regard to nature-resource efficiency of social-economic development in this or that region.

NRP of the territory, represented by aggregate productivity of mineral, water, land, fauna and natural recreation resources, is essentially inertial and relatively stable in its quantitative and qualitative development. Consequently, re-estimation of a significant part of nature resources on the national level is carried out no more than once a decade or two. The same is valid for ecological-economic estimates of NRP constituents. For example, the last economic estimation of all agricultural lands in Ukraine was carried out as far as in 1987 – 1988. Similar situation is with mineral, water and forest resources. On the one hand, such consuming and large-scale operation requires involvement of significant finances, and, on the other hand, there exists no urgent need for said estimation due to above-mentioned NRP inertness (e.g. average annual stock of water resources in Ukraine stayed practically unchanged in 1980 – 1985 and 2000 – 2005).

Having considered the above, Ukrainian geographers engaged in resource study put the problem of indexation of nature resource cadastre estimates as of the end of the 80s – the beginning of the 90s in the center of their attention. The problem is important for the whole NRP of Ukraine and represents the objective of this publication. Our study of Ukrainian NRP as formed in 1980 – 1992 was highlighted in previous works in rather full detail (Rudenko, 1999, Rudenko, 2007), where the value (volume) of the total nature resource potential of Ukraine in yearly proportion amounted to 53,95 milliard roubles (Rudenko, 1999, p.102). And what should be the cost expression of Ukrainian NRP in prices of 2004 – 2008 in UAH and USD equivalent? What are the nature-resource capacities of the country in the world market today? What are the perspectives of Ukrainian nature use branches development for the next years?

### Methods

To answer these difficult questions, we believe that land resources as a central and most important branch of Ukrainian nature-resource complex, or the land as a basic element of national wealth that would help bring the whole national economics on an external level, should be put on the base of estimation.

Among the scope of scientific approaches to define the value of land potential, or, to be more precise, the potential of agrarian lands of Ukraine (Rudenko, 1999; Baranovski, 2005, Nature-Resource Potential of Stable Development of Ukraine, 1999), the "Price of Land" (Yukhnovski, 2002, p.7) by

I.Yukhnovsky, Academician, and G.Loboda, Candidate of Economic Sciences, deserves, to our opinion, special attention. The authors' definitive idea is that it is essentially important in conditions of unstable economics that "a natural yielding capacity of Ukrainian lands, i.e. the one that could be gained with crop rotation and application of only mechanical processing of plough land with addition of none fertilizers" (Yukhnovski, 2002, p.7) must be made a basis for normative estimation.

According to data available with the Institute of Soil Science and Agro-Chemistry at the Ukrainian Agricultural Academy of Sciences, the natural yielding capacity of grain crop in Ukraine is 26 metric centner/hectare, which is the evidence of essential advantages of this country on the world level. At the same time and taking into account the fact that average indices of yielding capacity in 1995 – 2000 were lower than those of natural yielding capacity, I.Yukhnovsky and G.Loboda suggest that, temporarily and before the reduction of natural yielding capacity, the average normative costs be estimated at the level of 21 metric centner/hectare. The authors specially insist here that the land tax value must not depend upon the agricultural producer's real income, but be estimated proceeding from normative income, i.e., the one that would be gained from each separate plot provided that certain standards of economy are observed. Said principle would stimulate the farmer to improve its land use, since fixed tax will not depend upon economic results.

As calculated by scientists of the Institute of Agrarian Economics at the Ukrainian Academy of Agrarian Sciences, average normative cost price of 1 ton of grain in Ukraine amounts to \$62, whereas its costs \$97. Hence, the value of average normative revenue will be \$73,5/hectare. Having taken this level as a basis at 23,5 % interest rate on deposits for physical persons and the value of absolute rent amounting to \$16/hectare, I.Yukhnovsky and G.Loboda have had the normative starting price of plough land to be \$381/hectare (Yukhnovski, 2002, p.7). At the same time, "having in mind the high interest rate on bank deposit, the estimated average normative price for Ukrainian land in present-day conditions is approximately 10 times lower than its real cost" (Yukhnovski, 2002, p.7). That is, the present-day price of plough land in Ukraine amounts to \$3810/hectare.

Taking into account the fact that the estimate of 1 hectare of lands under perennial planting in Ukraine is approximately 3 times higher, and the same of natural feed land – 2 times lower than the price of the plough land, the normative starting price of the country's potential of all agricultural lands must be at the level of \$159,3 milliard.

We can note here that we speak about the so called capitalized estimation of the potential of agricultural lands. With Ukrainian economics' average normative coefficient of capital investment efficiency equaling to 0,15, the value of land potential in this country in yearly proportion will amount to \$23,9 milliard.

It must be noted that our estimation of the value of starting nature resource potential of Ukraine in current USD equivalent, carried out in 1990s, allowed for evaluation of average annual potential of agricultural lands at the level of \$24,18 milliard (Rudenko, 1999, p. 533). And, as we see now, the Ukrainian "price of land" by I.Yukhnovsky and G.Loboda practically coincides with our results. In this case, the scale of comparability of the potential of the most important country's nature resource seems to be very important, since it is the one that allows, to a certain extent, for application of corresponding conversion coefficients so that we could transform the Ukrainian NRP value in nature-resource prices of the 90s into the same at the present moment of nature use development. We believe that the exchange rate of 1:5 of the USD and the Ukrainian hryvnia could become such coefficient that would help converse cadastre prices of 1990s into those of present day.

## **Discussion**

Thus, the nature resource potential of Ukraine in yearly proportion and at the present-day level of prices for nature resources amounts to UAH 269,76.

In Table 1 the value and the territorial differentiation of the integral nature resource potential and its constituents are presented in the aspect of natural krais, sub-zones, zones and countries as in new (2003) scheme for physic-geographical zoning of Ukraine (Marynych, 2003). Evaluation is grounded on the NRP data available for 500 administrative districts in Ukraine (Rudenko, 1999). The new scheme of Ukrainian physic-geographical regions was applied onto the map of the country's NRP in the aspect of administrative districts. The value of NRP of regional landscape unit whose borders dissected this or that administrative district, were estimated by reticulation method on the basis of territorial indices of payment for the potential of each resource type.

As we see, the descending row of nature-resource wealth in natural countries is as follows: the East-European Plain (9/10 of the Ukrainian integral NRP), the Ukrainian Carpathians – 6,4 %, and the Crimean Mountains – 1,9 %. As regards physic-geographical zones, over the half of Ukrainian integral NRP is accumulated in the Steppe Zone (51,6 %), followed by the Forest-Steppe Zone (22,6 %), the Mixed Forest Zone (9,3 %) and the Broad-Leaved Forest Zone (8,2 %). The Donetsk Krai (14,3 % out of national value), Podolsko-Pridnestrovski Krai (11,6 %), Levoberezhno-Dnestrovsko-Prizovski Krai (10,5 %), Dnestrovsko-Dneprovski Krai (9,48 %) and Poleski Krai (9,3 %) are the most rich with natural productive forces.

## Conclusion

To sum up the above, we can rather clearly trace a general regularity in the development of Ukrainian integral NRP, manifested as the increase of its value and territorial productivity from the north and north-west to the south and south-east, which is in the first place connected with the increase, in the same direction, of the efficiency of mineral, land, and nature recreation resources.

*Tab.1. Nature-Resource Potential of Ukrainian Natural Regions (prices as of 2004 – 2008 )*

| Physic-Geographical Regions               | Potentials value, nominator – milliard hryvnias, denominator – milliard US dollars |                        |                          |                        |                       |                        |                          |
|---|--|------------------------|--------------------------|------------------------|-----------------------|------------------------|--------------------------|
|   | Mineral  | Water                  | Land                     | Forest                 | Fauna                 | Nature recreation      | Integral                 |
| 1   | 2  | 3                      | 4                        | 5                      | 6                     | 7                      | 8                        |
| <b>East-European Plain</b>                | <u>74.154</u><br>14,831  | <u>29.605</u><br>5,921 | <u>114.302</u><br>22,860 | <u>7.83</u><br>1,566   | <u>1.254</u><br>0,251 | <u>20.235</u><br>4,047 | <u>247.38</u><br>49,476  |
| <b>Mixed Forest Zone</b>                  | <u>1.168</u><br>0,234  | <u>5.049</u><br>1,010  | <u>12.475</u><br>2,495   | <u>3.44</u><br>0,688   | <u>0.156</u><br>0,031 | <u>2.715</u><br>0,543  | <u>25.003</u><br>5,001   |
| <b>Broad-Leaved Forest Zone</b>           | <u>1.599</u><br>0,320  | <u>3.269</u><br>0,544  | <u>14.097</u><br>2,819   | <u>1.136</u><br>0,227  | <u>0.080</u><br>0,016 | <u>2.022</u><br>0,404  | <u>22.203</u><br>4,441   |
| <b>Forest-Steppe Zone</b>                 | <u>4.212</u><br>0,842  | <u>7.134</u><br>1,427  | <u>41.548</u><br>8,310   | <u>2.324</u><br>0,465  | <u>0.466</u><br>0,093 | <u>5.209</u><br>1,042  | <u>60.893</u><br>12,179  |
| <b>Steppe Zone</b>                        | <u>67.175</u><br>13,435  | <u>14.153</u><br>2,830 | <u>46.182</u><br>9,236   | <u>0.930</u><br>0,186  | <u>0.552</u><br>0,111 | <u>10.289</u><br>2,058 | <u>139.281</u><br>27,856 |
| <b>Northern Steppe Sub-Zone</b>           | <u>64.509</u><br>12,902  | <u>7.161</u><br>1,432  | <u>28.711</u><br>5,742   | <u>0.742</u><br>0,148  | <u>0.381</u><br>0,076 | <u>6.148</u><br>1,230  | <u>107.652</u><br>21,530 |
| <b>Mid-Steppe Sub-Zone</b>                | <u>1.259</u><br>0,252  | <u>2.346</u><br>0,469  | <u>8.400</u><br>1,68     | <u>0.058</u><br>0,012  | <u>0.067</u><br>0,013 | <u>1.412</u><br>0,282  | <u>13.542</u><br>2,708   |
| <b>South-Steppe (Dry-Steppe) Sub-Zone</b> | <u>1.407</u><br>0,281  | <u>4.646</u><br>0,929  | <u>9.071</u><br>1,814    | <u>0.130</u><br>0,026  | <u>0.104</u><br>0,022 | <u>2.729</u><br>0,546  | <u>18.087</u><br>3,618   |
| <b>Crimean Mountains</b>                  | <u>0.489</u><br>0,098  | <u>0.408</u><br>0,082  | <u>1.739</u><br>0,348    | <u>0.243</u><br>0,049  | <u>0.008</u><br>0,002 | <u>2.129</u><br>0,426  | <u>5.016</u><br>1,005    |
| <b>Ukrainian Carpathians</b>              | <u>1.581</u><br>0,316  | <u>5.261</u><br>1,052  | <u>3.691</u><br>0,738    | <u>3.176</u><br>0,535  | <u>0.016</u><br>0,003 | <u>3.643</u><br>0,728  | <u>17.368</u><br>3,472   |
| <b>Ukraine</b>                            | <u>76.224</u><br>15,245  | <u>35.274</u><br>7,055 | <u>119.732</u><br>23,946 | <u>11.249</u><br>2,250 | <u>1.278</u><br>0,256 | <u>26.007</u><br>5,201 | <u>269.764</u><br>53,953 |

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## Prírodný potenciál zdrojov v regiónoch Ukrajiny

Stepan RUDENKO, Valeryi RUDENKO

**Zhrnutie:** *Prírodný potenciál Ukrajiny v ročnom rozsahu a vzhľadom na súčasnú hodnotu prírodných zdrojov možno vyčísliť na 296,76 UAH. V tabuľke 1 sú prezentované hodnoty a teritoriálna diferenciacia integrálneho prírodného potenciálu a jeho zložiek vo vzťahu k prírodným okrskom, subzónam, zónam a celkom podľa novej schémy (2003) fyzickogeografickej zonácie Ukrajiny (Marynych, 2003). Hodnotenie je založené na údajoch o potenciáli prírodných zdrojov dostupných pre 500 administratívnych okresov Ukrajiny (Rudenko, 1999). Nová schéma ukrajinských fyzickogeografických zón bola aplikovaná na mapu potenciálu prírodných zdrojov podľa administratívnych okresov. Hodnota potenciálu na regionálnej úrovni, ktorej hranice rozdelili tí-ktorú administratívnu jednotku, bola odhadnutá retikulačnou metódou na základe teritoriálnych indexov platieb za potenciál každého typu zdrojov.*

*Možno pozorovať klesajúce poradie prírodného bohatstva podľa prírodných celkov: Východoeurópska rovina (9/10 z integrálneho potenciálu prírodných zdrojov Ukrajiny), Ukrajinské Karpaty - 6,4 % a Krymské pohorie - 1,9 %. Podľa fyzickogeografických zón viac ako polovica integrálneho potenciálu Ukrajiny je zhromaždená v zóne stepí (51,6 %), nasleduje lesostepná zóna (22,6 %), zóna zmiešaných lesov (9,3 %) a zóna širokolistých lesov (8,2 %). Donecký kraj (14,3 % z celonárodnej hodnoty), Podolsko- Pridnestrovský kraj (11,6 %), Lavobrežno-Dnestersko-Priazovský kraj (10,5%), Dnestersko-Dneprovský kraj (9,48 %) a Polesský kraj (9,3 %) sú najbohatšie, čo sa týka prírodných produkčných zdrojov.*

*Možno jasne sledovať všeobecný trend integrálneho prírodného potenciálu Ukrajiny, ktorý sa prejavuje nárastom hodnoty a teritoriálnej produktivity zo severu a severozápadu na juh a juhovýchod. V prvom rade je to spojené s nárastom efektivity minerálnych, krajinných a prírodných rekreačných zdrojov v rovnakom smere.*

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### Adresa autora:

Prof. Valeryi Rudenko, Doctor of Geographical Sciences  
Department of Economic Geography and Ecological Management  
Faculty of Geography at the Chernovtsi National University  
2 Kotsjubynskogo St., Chernivtsi, 58012, Ukraine  
[rudenko\\_valeryi@ukr.net](mailto:rudenko_valeryi@ukr.net)