

UDC 631.4+502.57

RECLAMATION OF DISTURBED LANDS DAMAGED AS A RESULT OF AMBER MINING

E.V.Butenko, *Candidate of Economic Sciences, Associate Professor*

evg_cat@ukr.net

A.V.Homych, *master*

homichnastya38@gmail.com

V.V.Prohorenko, *master*

vladislavaprohorenko@gmail.com

National University of Life and Environmental Sciences of Ukraine

Annotation. *General data about processes of creation and formation of stocks of amber in the territory of Ukraine are presented.. Background for the problem of illegal amber mining was specified. Illegal amber mining using motor pumps led to destruction of the soil and also to sharp deterioration of their water-physical properties. it is also accompanied by the loss of many available biophilic elements and water-soluble organic compounds, in addition loosing a main substrate for soil microorganisms.. Under such circumstances, traditional methods of soil reclamation by using fast-growing trees are impractical and often impossible.*

The Urgent need to adopt the law of Ukraine "On land reclamation" was argued. I emphasize the need of gradual differentiation of legal terms, such as land plot «ground», «land plot » and also «soil». It was given an important attention of land reclamation issue which were used in mining industry. I proved the main directions of reclamation of industrial peatlands such as: agricultural, forestry, water management, and also recreational environmental and rehabilitation directions. It has showed choosing of direction of use wasted mining must first and foremost be based on ecological and economic rationality of reclamation.

Keywords: *reclamation of damaged lands, direction of reclamation, damaged lands, natural condition of a soil.*

Formulation of the problem. Today, the question of the optimal interaction between people and nature has arisen before the world. Constant efforts to increase

productivity of work to get as much as possible, accompanied by an increase in conflict between human and environment.

Amber minings are also being actively developed in many countries around the world, such as: United States, Canada, Mexico, the Dominican Republic, Italy and Poland. Wonderly, but most amber is mined in the Kaliningrad region of the Russian Federation. Until now, 700 to 900 tons of amber are mined worldwide every year, 400 of which are in the Kaliningrad region. During 2011 - 2021, number of amber production in Ukraine increased sharply, particularly in Rivne, Volyn' and Zhytomyr regions. According to official information, in 2019, 4 tons of amber were mined in our country. For example, a cases of illegal minings are making 120 tons every year and they are still growing.

Today, the reclamation of damaged lands has problem by the fact that there is no single method of assessing the damage to society from the destruction of soil cover and also creation of man-made landscapes. It can be explained that previously, economists did not fully appreciate the role of natural resources in the economic and effects after mining. First of all, these data are getting with a purpose to compare soils in different natural and economic zones of Ukraine, in addition, it is necessary to have a single method of economic valuation of land. This allows you to determine the losses, the damage done to humanity by mining and forces to plan reclamation works after their end.

Analysis of the latest scientific research and publications. Recultivation of damaged and improving of their quality is especially relevant at the moment, course, today, we havent single approach to understanding the problem of land reclamation. Unfortunately, in Ukraine this issue is still ignored. The problem of reclamation of damaged lands are mostly reduced to the solution of two interrelated main tasks- the technical solution of the problem of reclamation of disturbed lands and the formation of a new natural landscape.

First ao all, pg. 171 of Civil Code of Ukraine taking about destroyed lands, which have also completely lost their economic and ecological-economic value, in addition, phytoproductivity of man-made landscapes, which can be noticed at least in

10-15 years and only under conditions of complete overgrowth of lands with vegetation.

In Ukraine, there is a need to deal the problem of mining, which have been studied in the works of Ukrainian scientists: L.V. Daineko[1], A.Y. Sokhich[4], V.V. Horlachuk[2], A.M. Tretyak, V.M. Trehobchuk.

It should be noted that some aspects of the problem of reclamaion of disturbed lands and returning them to the economic sphere with guaranteed minimum of negative impact on the environment, stays not enough studied.

It's creating background for studying this questions in future, such as: essence of the land reclamation process and increase the requirements for it; a procedure for the biological stage of land reclamation; description of the technology of biological reclamation of disturbed lands; comparison of known methods of reclamation.

The aim of the study – returning of damaged lands for economic use, and also to create a warnings of negative effects of changes in natural and territorial complexes on the places where there are mistakes of productive and rationally organized elements of anthropogenic landscapes, and as a result is improving of environmental conditions.

Research methods. During the writing this article, I'd used the following research methods:

Monographic method, which helps to highlight the main ideas about recultivation damaged lands as a result of illegal amber mining, it was covered in articles by: L.V. Daineko, A.Y. Sokhich, V.V. Horlachuk, A.M. Tretyak, V.M. Trehobchuk. The monographic method is indispensable in the detailed study of individual observations selected as the object of special research.

Method of statistical analysis, which I used to collect for the last years of research on the reclamation of disturbed lands. As a result, the main information was structured in the table 'Distribution of reserves and amber production by administrative regions for the period 2019-2021'.

Method of analogy, according to which was made the comparison of market prices for amber in Ukraine and the world, from which we can conclude, that

countries in which amber mining is legal, have a higher market price for gems than in Ukraine, where the process of legalization of amber mining is only in progress.

In the end, I used a method of synthesis, which managed to combine and structure all relevant information for a day, and based on the work of scientists, which helped to analyze changes and combine research into one.

Results of research and discussion. Most interest for the "amber problem", which was not solved for this day, was created in years, when the average price of amber was about 10 thousand dollars per kilogram. There are many discussions in this country about necessity of amber mining legalizing, but at the same time the relevant law has not been adopted yet (Table 1).

Table 1

Prices for amber in Ukraine and the world

Prices for 1kg, \$ grams	State Hemological Center of Ukraine	«shadow market» of Ukraine	China	Europe (Poland)
до 2 g	15-30	10-70	-	100
2-5 g	80-60	100-400	70-500	400-500
5-10 g	168-335	400-700	450-1 200	1 600-2 400
10-20 g	330-660	1 100-1 700	1 000-2 500	3 000-4 000
20-50 g	663-1 325	2 800-3 700	3 000-5 000	5 500-7 000
50-100 g	945-1 890	3 500-4 900	5 000-8 000	8 000-10 000
100-200 g	1 215-2 430	5 000-6 700	6 000-6 500	12 000-14 000
200-300 g	1 590-3 180	6 700-7 300	Special	13 000-16 000
300-500 g	1 670-3 340	Special	Special	Special

Source: Multemediyna platforma innomovlennya Ukrainy «Ukrinform». Link: <http://surl.li/atvdj>.

According to research of scientists, the area of land in need of reclamation is more than 5.5 thousand hectares and needs to restore the soil cover and return to economic use.

For the last two decades, Rivne, Zhytomyr and Volyn regions have been suffering from illegal amber mining activities. Amber is extracted from explored and unexplored deposits, then products are sold or illegal transferring to other countries, and foremost damaged areas are simply left (Pic. 1).



Pic. 1. Photo of the condition of damaged lands

Source: online service of a public organization «Vidkrytyy lis». Link: <http://surl.li/atvgp>.

Mass illegal amber mining using motor pumps is most common in Ukraine.

There is no modern technology for land reclamation, which was damaged in that way
Therefore, even in the case of legal mining, we don't know how to restore a land after their finish of useful circle. (Pic. 2).



Pic. 2. Photo of the condition of damaged lands

Source: online service of a public organization «Vidkrytyy lis». Link: <http://surl.li/atvgp>.

Lands that have been changed in the structure of the terrain, the ecological condition of the soil and in addition the rocks, and after geological prospectings, must be reclaimed. According to the information in Table 3, the area of land mining deposits officially accounted for annually is about 1000 hectares, which need to restore their productive properties.

Table 2**Distribution of stocks and amber mining by administrative regions****Amber, kg**

Name of region	Counts of deposits		2018-2019 y.		*2020-2021 y.	
	All	Still mining	Total	Areas of mining lands	Total	Areas of mining lands
Volyn	4	4	*	4 hectares	*	40 hectares
Zhytomyr	1	1	*	220 hectares	*	250 hectares
Rivne	9	4	2488,24	169 hectares	59855,28	210 hectares
Total in Ukraine	14	9	2488,24	393 hectares	59855,28	500 hectares

* forecasts

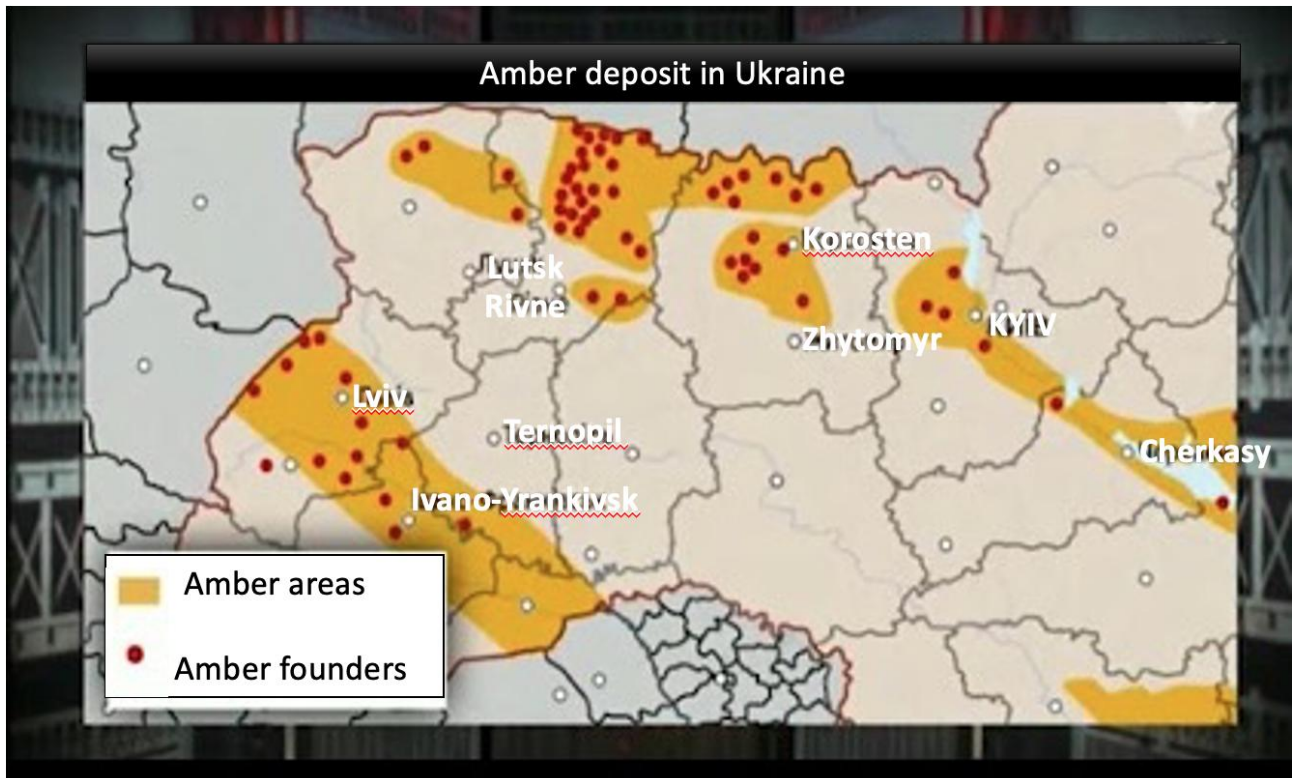
Source: Research and Production Journal of Ecology and Industry. Link: <http://surl.li/axwpp>.

Source: scientific journal «Koshtovne ta dekoratyvne kaminnya». Link: <http://surl.li/atvez>.

However, the most deplorable problem for Ukraine is the illegal extraction of amber on agricultural and forest lands, which disrupts the ecological situation of the territory, causing the loss of these lands for economic use for decades. The area of land already affected by this is estimated at 10 thousand hectares, which require urgent measures for their reclamation.

There are several ways of land reclamation that can significantly affect the condition of damaged lands.

The direction of reclamation is the restoration of damaged lands, primarily for a specific purpose. There are the following ways : agricultural direction; forestry direction; water management direction; recreational direction; construction direction; sanitary and hygienic direction.



Pic. 3. Amber deposits in Ukraine.

Source: monograph G.I. Rudka and S. F. Lytvinyuka “Rodovischa burshtynu Ukrainy ta geologo-ekonomychna otcinka”. Links: <http://surl.li/atvhhd>.

However, keep in mind that the Ukraine ranks the 2nd place in the world with amber reserves, according to its quantity, useful properties. (Table 2, Pic. 3) A regulation of illegal amber mining is an urgent issue, at the same time you need to consider the following:

- it is necessary to increase criminal liability for illegal mining and also a buying amber processes;
- it is necessary to create the amber marketplace and also to create an exchange of amber, which can help to know the total price and sell it in market conditions;
- community interest in legal amber mining;
- open procedure for issuing a license for amber mining under the conditions of mandatory land reclamation.

Land reclamation should be carried out according to the landscape-ecological principle, which also provides for the optimal ratio of different ways of restoration of

disturbed areas, usually the creation of highly productive cenoses, increase and restore the fertility of reclaimed soils. The main goal of the 21st century is to prevent the negative impact of man-made formations on the environment.

Conclusions.

The conclusion of our study is that the state should reconsider the passive attitude to the institution of reclamation and successfully solve the problem of resource conservation and environmental and economic efficiency in mining.

Our results shows that amber mining has a significant impact on the ecological state of the environment, which also requires urgent action to improve the protection of deposits from illegal mining and land degradation at the government level by approving the relevant laws.

It is obvious that the reclamation of disturbed lands is necessary in order to return them to their natural state, so as not to lose valuable land resources and revive the ecological condition of the territories.

References

1. Bedernichek T.Y., Hamkalo Z.G. (2014). *Labilna orhanichna rehovyna hruntu: teoriya, metodolohiya, indykatorna rol'*: Kyiv, Ukraine: Kondor, 180.
2. Halahan T.I. Deyaki metodolohichni ekolo-ekonomichnoi otcinky rekultyvacii porushenykh zemel'. *Available at: https://www.researchgate.net/publication/276886613_Deaki_metodologichni_aspekti_ekologo-ekonomichnoi_ocinki_rekultivacii_porusenih_zemel* .
3. Rekul'tivacyya zemel'. *Available at: <https://kegt.rshu.edu.ua/images/dustan/OZVRR7.pdf>* .
4. Sokhnich A. Y. Derzhavne upravlinya zemel'nymy resursamy v systemi upravlinnia ekonomikoyu Ukrainy: instytuciyniy aspekt. *Available at: <http://dspace.nbu.gov.ua/handle/123456789/140043>*
5. Tymoshchuk I. I. (2016). Konceptual'ni zasady ta napryamy rekul'tyvacii promyslovo vyroblyenykh tofovysch.. *Dshurnal «Efektyvna ekonomika № 2. Available at: <http://www.economy.nayka.com.ua/?op=1&z=4796>*

6. Chabenko M. M. Yurydychna katehoria «Rekul'tivacyya zemel'»: Suchasni naukovo-pravovi pidhody do zakonodavstva. *Informaciya pro vydannia*. Available at: http://www.lsej.org.ua/4_2020/27.pdf
7. Chybryk T. S. (2002). Osnovy biolohichnoi rekul'tyvatsii: navchalnyi Ekatiirenburh: Ural, 172. Available at: <http://hdl.handle.net/10995/28103>.
8. Yurinets V.E. Metod naukovykh doslidzhen'. Kafedra informaciynych system v menedzhmenti ekonomichnoho fakul'tetu Available at: http://ism-lnu.podia.com.ua/wp-content/vidannia/pidr/metod_nauk_dosl.pdf

Бутенко Е.В., Хомич А.В, Прохоренко В.В.

РЕКУЛЬТИВАЦИЯ НАРУШЕННЫХ ПОЧВ, КОТОРЫЕ ПОСТРАДАЛИ В РЕЗУЛЬТАТЕ ДОБЫЧИ ЯНТАРЯ

Аннотация. Приведены обобщенные данные о процессах образования и формирования залежей янтаря на территории Украины. Указаны предпосылки возникновения проблемы незаконной добычи янтаря. Тайная добыча янтаря с использованием мотопомп привела к разрушению структуры почвы, а также без сомнения резкому ухудшению его водно-физических свойств. Он, конечно, сопровождается вымыванием многих доступных биофильных элементов и водорастворимых органических соединений – кроме того основного субстрата для почвенных микроорганизмов. При таких условиях, обычные традиционные способы рекультивации почв с использованием быстрорастущих деревьев нецелесообразны, в основном – невозможны. Аргументирована срочная необходимость принятия закона Украины «О рекультивации земель». Акцентируется на необходимости последовательного разграничения правовых понятий "земля", "земельный участок" и "почва". Важное внимание уделяется вопросу рекультивации земель, которые кроме того использовались в горнодобывающей промышленности. Доказаны главные направления рекультивации промышленно-производимых торфяников, а конкретнее: сельскохозяйственное, также лесохозяйственное, водохозяйственное, кроме

того рекреационное, природоохранное, и реабилитационное. Доказано, что именно выбор направления использования отработанного месторождения, прежде всего, должен основываться безусловно на эколого-экономической рациональности проведения рекультивации.

***Ключевые слова:** рекультивация нарушенных земель, направление рекультивации, сельскохозяйственная рекультивация, лесохозяйственная рекультивация, рекреационная рекультивация, строительная рекультивация, санитарно-гигиеническая рекультивация, водохозяйственная рекультивация.*

Бутенко Є.В., Хомич А.В., Прохоренко В.В.

РЕКУЛЬТИВАЦІЯ ПОРУШЕНИХ ЗЕМЕЛЬ, ЯКІ ПОСТРАЖДАЛИ У РЕЗУЛЬТАТІ ВИДОБУТКУ БУРШТИНУ

***Анотація.** Наведено узагальнені дані про процеси утворення та формування покладів бурштину на території України. Зазначено передумови виникнення проблеми незаконного видобутку бурштину. Розкрито питання незаконного видобування бурштину із використанням мотопомп, яке призвело до руйнування структури ґрунту, а також різкого погіршення водно-фізичних властивостей регіону та супроводжується вимиванням багатьох доступних біофільних елементів та водорозчинних органічних сполук, що є основою для розвитку ґрунтових мікроорганізмів. Проаналізовано традиційні способи рекультивації ґрунтів та встановлено, що ці способи є недоцільними, а здебільшого – неможливими у своїй реалізації.*

Аргументовано термінову необхідність прийняття закону України «Про рекультивацію земель». У статті акцентується на необхідності послідовного розмежування правових понять «земля», «земельна ділянка» і «ґрунт».

Важливу увагу присвячено питанню рекультивації земель, що зазнали негативного впливу та постраждали у результаті видобутку бурштину. Доведено, що саме вибір напрямку використання відпрацьованого родовища насамперед повинен ґрунтуватися на еколого-економічній доцільності проведення рекультивації.

Ключові слова: *рекультивация порушених земель, напрям рекультивации, порушені землі, природний стан ландшафту.*