Economic sciences

UDC 633.88:338.24(477)

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SOCIO-ECONOMIC IMPACT OF WILD MEDICINAL PLANT HARVESTING ON THE DEVELOPMENT OF DEPRESSED REGIONS OF UKRAINE

Summary. *Relevance of the study is driven by the need to enhance the socio-economic potential of Ukraine's depressed regions through the involvement of local populations in the wild medicinal plant harvesting sector. The aim of the article is to comprehensively examine this activity as a factor of sustainable local development. The methodology is based on the analysis of statistical data, regulatory frameworks, and institutional practices. The results demonstrate a positive impact on employment, household income, and social inclusion. Scientific novelty lies in the integrated assessment of efficiency factors in the wild-plant sector. Conclusions confirm the importance of supporting certification, cooperation, and local infrastructure. Research prospects include the integration of harvesting into regional recovery strategies.*

Key words: *wild raw materials, rural employment, local development, organic certification, cooperation, natural resources, post-conflict economy.*

Statement of the problem. In the current conditions of socio-economic transformation of the depressed regions of Ukraine, there is an urgent need to find alternative areas of development that would combine the preservation of natural potential with the possibility of creating new sources of income for the local

population. One of these areas is the harvesting of wild medicinal plants, which has a significant but underutilized potential for sustainable local development. In many rural communities where access to traditional forms of employment is limited, the informal economy associated with the collection of plant materials becomes the basis for survival. However, the lack of systemic support, certification infrastructure, and transparent sales channels significantly limits the socioeconomic efficiency of this type of activity.

The issue of harvesting wild-growing raw materials is of particular relevance in the context of strengthening food and pharmaceutical security, enhancing export potential, and implementing sustainable development goals. A scientific understanding of the impact of this activity on the economy of regions with low levels of social mobility allows not only to identify hidden reserves of the territories, but also to lay the groundwork for integrating nature management into local development strategies. At the same time, the practical realization of this potential faces a number of challenges: illegal or excessive collection, loss of biodiversity, lack of environmental education among collectors, and the absence of effective mechanisms for legalizing and stimulating employment in this area.

Thus, the study of the socio-economic impact of harvesting wild medicinal plants in the context of regional development is important both from a theoretical point of view, to understand the role of the resource sector in the peripheral economy, and from a practical point of view, to formulate effective management decisions focused on the development of a green economy, strengthening social capital, and balanced use of natural resources.

Analysis of recent research and publications. The analysis of modern research on the socio-economic impact of wild medicinal plants (WMPs) collection on the development of depressed regions of Ukraine reveals four interrelated content areas.

The first area covers the assessment of the resource potential and ecological sustainability of DLR populations. The work of Y. V. Havryliuk and D. S.Sharay

found that significant fragmentation of habitats in the Luhansk region requires the introduction of regular monitoring and limits on biomass extraction [1]. V. Sahaidak, L. Pererva, L. Gomlia and co-authors show that the degradation of meadow habitats in Poltava region is already affecting the species composition and productivity of harvesting lands [2]. E. V. Mishenin, M. Y. Vysochenska, N. V. Palapa and others emphasize that the post-war recovery of the market of medicinal raw materials is impossible without a combination of ecological and economic zoning and support of local communities [3]. O. Mykhailenko, B. Jalil, L. J. McGaw and co-authors emphasize that growing climate risks require "new" strategies for adaptive management of FOL resources to preserve their social and pharmacological value [4]. Further research in this area should be aimed at mapping the most vulnerable populations and developing bioindicators of resistance to climate and anthropogenic stress.

The second area focuses on social inclusion and diversification of income sources. S. Petrukha, N. Petrukha, N. Alekseienko, and others have shown that the formation of value-added clusters around the HRH increases employment and financial sustainability of small communities [5]. M. Dziamulych, T. Shmatkovska, S. Petrukha and co-authors show that agritourism based on the branding of local flora provides seasonal jobs and stimulates the development of service infrastructure [6]. I. Salamon, M. Kryvtsova, M. Stricik, and P. Otepka demonstrate on the example of Slovakia that the sustainable use of PGR correlates with the growth of household income and social cohesion in rural areas [7]. It is advisable to expand quantitative estimates of the multiplier effect of collecting RWA for low-income households and develop mechanisms for the formal integration of seasonal activities into the formal economy.

The third area concerns regulatory and institutional support. T. Kovalenko states that conflicts between environmental and economic regimes in mountainous areas block the legal collection of raw materials [8]. A. Vetchenko highlights how the legal vacuum in the Chernihiv region after the hostilities leads

to chaotic, unregulated resource extraction [9]. T. Mirzoieva, O. Tomashevska, and N. Gerasymchuk argue that the introduction of certification and traceability mechanisms is a critical condition for compliance with the principles of sustainable development [10]. T. Mirzoiieva and O. Nechyporenko show that the instability of the regulatory framework and the lack of quality systems limit the export of medicinal raw materials [11]. Further research should be aimed at harmonizing Ukrainian legislation with the EU requirements for wild-growing herbal products and creating open registers of harvesting sites.

The fourth area covers cultural and ethnobotanical aspects. N. Stryamets, M.F. Fontefrancesco, G. Mattalia and co-authors show that traditional practices of using VLR in Bukovyna and Roztocze form cultural identity and are passed down between generations [12]. G. Mattalia, N. Stryamets, A. Grygorovych and others reveal significant differences in knowledge between the Romanian and Ukrainian communities of Bukovyna, which leads to different models of economic use of plants [13]. B. Keegan emphasizes the symbolic role of flora in maintaining the psychosocial resilience of the Ukrainian population during the war [14]. Studies on digital documentation of ethnobotanical knowledge and integration of cultural heritage into regional economic recovery programs are promising.

Despite the existing research in the field of medicinal plant cultivation, the issues of adapting the principles of organic farming to the specifics of cultivation of these crops, in particular in marginalized and post-conflict areas, remain insufficiently studied. The limited empirical data on the profitability of organic production in different organizational forms, as well as the lack of attention to the impact of agricultural technologies on the quality of raw materials and the ecological balance, create gaps that hinder the development of the sector. Regulatory and logistical barriers also remain poorly understood from a practical perspective.

The proposed study fills these gaps through a comprehensive analysis of both environmental and agrotechnological factors, as well as socio-economic aspects of organic production of medicinal crops. Particular attention is paid to assessing the effectiveness of organic approaches depending on the scale of the farm, as well as to the development of practical recommendations based on international standards, sustainable development requirements, and opportunities for expanding export potential.

The purpose of the article: The purpose of the article is a comprehensive study of the socio-economic potential of harvesting wild medicinal plants in depressed regions of Ukraine as a factor of sustainable local development, taking into account environmental constraints, market trends and opportunities for social integration of the poor.

To achieve this goal, the following tasks were set:

1. To analyze the resource potential and scale of harvesting wild medicinal plants in vulnerable regions of Ukraine, as well as to assess the economic benefits for local communities.

2. To determine the impact of regulatory, environmental and infrastructure factors on the efficiency of procurement activities and identify barriers to their scaling.

3. To develop practical recommendations for improving the socio-economic efficiency of harvesting, taking into account the principles of sustainable environmental management and cooperation.

Summary of the main material. One of the few sectors that retains its economic viability even during a full-scale war is the harvesting of wild medicinal raw materials (WMR). In many communities, which according to the regulations of the Ministry of Reintegration of the Temporarily Occupied Territories of Ukraine are classified as territories affected by hostilities, there is structural unemployment, limited investment activity, and degradation of traditional

agriculture [15]. Under these conditions, seasonal collection of DWR becomes an affordable form of self-employment and a source of basic economic stability.

Military actions have caused significant disruption of agricultural landscapes and the loss of some cultivated land, which has increased pressure on natural ecosystems - forests, pastures, meadows - as a source of wild-growing raw materials [16]. At the same time, Ukraine retains a strong natural potential: the area of land covered by forest vegetation is more than 8.9 million hectares [17]. In 2023, the government introduced an electronic system for issuing special permits for the use of forest by-products, which helped to reduce the time for issuing permits, reduce shadow activities, and better account for raw materials [18]. At the same time, the organic certified harvesting segment is gradually growing, as evidenced by the activity of operators such as RESOURCE TRADE AGENCY, LLC [19] (Table 1).

Table 1

Dynamics of the development of the medicinal raw materials sector in Ukraine, 2016-2023

Year	Collection volume, thousand tons	Exports, thousand tons	Domestic market capacity, thousand tons	Organic raw materials in exports, %.
2016	1,27	0,43	0,84	26
2017	1,38	0,48	0,90	28
2018	1,51	0,58	0,93	30
2019	1,57	0,72	0,85	30
2020	1,60	0,81	0,79	35
2021	1,63	0,86	0,77	37
2022	0,95	0,44	0,51	39
2023	1,58	0,81	0,77	40

Source: compiled by the author based on [20]

The dynamics of key indicators confirms the growing role of the HRH sector in the structure of the country's agricultural economy. In 2016-2021, the volume of collection increased by almost 30%, and exports doubled, indicating a steady increase in market demand. The positive dynamics was interrupted in 2022, when the total collection fell by more than 40% and exports dropped to the level of 2017. This decline was due to the destruction of logistics, loss of access to land, and temporary paralysis of certification procedures [20].

At the same time, the figures for 2023 demonstrate a high level of adaptive capacity of the sector: the harvest volume recovered to 1.58 thousand tons, exports increased to 0.81 thousand tons, and the share of organic raw materials reached a record 40%. This trend indicates the gradual integration of Ukrainian operators into premium export structures, supported by both external demand and internal institutional changes [18; 19]. The potential of the sector as a tool for economic rehabilitation of the affected areas allows us to consider it as a target area of regional employment policy and bioeconomy.

The collection of wild medicinal raw materials (WMR) plays an important role in the structure of the local economy of communities that have been destroyed or are geographically isolated: it creates seasonal jobs, provides off-farm income, and stimulates the development of microbusinesses. In communities in different regions of Ukraine, the number of seasonal participants can reach hundreds of people per season, and the share of women among them can be up to 70%, which is confirmed by both field observations and ethnobiological studies [21; 2 22] (Table 2).

Table 2

Socio-economic impacts of timber harvesting in war-affected and/or remote forested communities

Economic aspect	Summarizing the impact	Main beneficiaries
Seasonal employment	High demand for manual labor during the harvest season - without investment	Women, youth, pensioners, IDPs
Diversification of income	Additional revenues to compensate for agricultural risks	Low-income families
Local added value	Development of cooperatives, mini-dryers, organic chains	Family businesses, small farms

Source: compiled by the author based on [21]

Harvesting wild medicinal raw materials provides not only a short-term financial benefit, but also stimulates deeper social and production changes in rural communities. In regions with high levels of depopulation and the effects of warfare, this activity is an important compensatory strategy, especially for women, pensioners and internally displaced persons. According to UNDP estimates, in border and forested areas, an average of 15-30 kg of raw materials per season is collected per collector, which, in terms of the wholesale price of 25-40 UAH/kg, allows for about 10,000-18,000 UAH of seasonal income [21]. According to an ethnobiological study, such income in peak weeks can exceed the daily wage of unskilled labor in the region by 2-2.5 times, and the involvement of women reaches 70% due to the possibility of combining this employment with childcare or elderly relatives [22].

In addition, the organization of local drying, packaging, and primary standardization of raw materials (e.g. nettle, mint, St. John's wort, elderberry) allows communities to move from selling raw materials in a "green" form to forming small batches for organic export. Zhivana Organics demonstrates an example of this practice in remote villages in the Carpathians, where certified

batches of dried elderberries are sold for 600 UAH/kg, three times more expensive than on the domestic market. This allows participating families to receive up to UAH 20,000 per season, even with moderate collection volumes [23]. Thus, the harvesting of DLR in modern conditions is not only a tool to support survival, but also a starting platform for the formation of elements of sustainable rural microbusiness based on bioeconomic principles.

Regulatory, environmental and infrastructural factors form the basis for the functioning of the wild medicinal raw materials harvesting sector in Ukraine (Table 3). In the context of military operations, their influence has significantly increased, in particular in terms of resource availability, permitting procedures and processing profitability. An important trend has been the growing role of organic certification (Wild Collection, Organic Standard [24]), which not only opens up export opportunities but also stimulates local processing.

Table 3

The impact of legal, environmental and infrastructural factors on the harvesting of wild medicinal plants

Factor.	Potential impact on the efficiency of procurement activities	The main challenges in the current environment
Regulatory and legal	Electronic permitting reduces time to market; certification opens up access to premium markets	Bureaucratic barriers in traditional procedures; restrictions on access to forest lands in border and military zones
Environmental	FairWild certification contributes to the conservation of medicinal species populations and biodiversity	Soil contamination, flooding, mining; loss of land as a result of hostilities
Infrastructure	Availability of dryers, warehouses and logistics centers reduces costs and losses during collection and storage	Destruction of roads and bridges complicates logistics; lack of local certification centers in central and eastern regions

Source: compiled by the author based on [18]

Following the implementation of CMU Resolution No. 483 (2023) [18], in some communities in western Ukraine, the timeframe for obtaining a special permit for the use of forest resources was reduced from 14-18 days to 7-9 days, which allowed for faster clearance of export consignments of dried chamomile flowers and blueberry leaves. This became possible due to the digitalization of procedures within the framework of the general policy of organic sector development, as provided for by the Law of Ukraine No. 2496-VIII [25].

The share of certified products in the structure of wild-grown raw materials exports to the EU continues to grow, which confirms their higher competitiveness [19].

The environmental situation in the southern and eastern regions of the country, in particular after the destruction of the Kakhovka hydroelectric power plant, has led to the loss of access to some of the traditional rose hips, St. John's wort and hawthorn collection areas. According to the United Nations Environment Program (UNEP), up to 30% of such areas may require decontamination or relocation of collection sites [21].

The infrastructure capacity of communities plays a key role. In a number of communities in Lviv and Zakarpattia regions, local drying facilities with heat treatment and packaging capabilities were established with the support of organic certification programs, which reduced harvesting losses and allowed for higher prices. In September 2024, the export of Ukrainian dried nettle leaves (Urtica urens) to India was recorded through the Tridge platform, which indicates the relevance and demand for this type of raw material [26].

Despite the proven effectiveness of harvesting activities as a source of seasonal employment and a tool for mobilizing internal community resources, its positive impact remains fragmented and limited in geography. One reason for this is the lack of institutions capable of scaling up successful practices. Most examples of economic benefit are based on the initiatives of individual enterprises or NGOs, while support mechanisms from state or regional policies remain

inaccessible to rural communities. In addition, many communities lack the basic management capacity to organize harvesting activities as part of a local development strategy, which means a lack of knowledge, specialists, and long-term plans. In addition, demand from processors is often unpredictable or does not cover regions with limited logistics. This makes it impossible to create stable supply chains and hinders the formation of added value at the community level. Thus, the socio-economic potential of wild collection has not yet been transformed into a large-scale model for the development of depressed areas, remaining a local and unstable phenomenon.

Given the potential of wild medicinal raw materials as a factor in stabilizing depressed regions, it is advisable to focus the development of this sector on a combination of social engagement, economic profitability and environmental sustainability. First and foremost, the key is to create local value-added production chains that include not only harvesting, but also drying, packaging, and, if possible, primary processing. This allows to keep most of the profits at the community level, create additional jobs, reduce product losses and improve the quality characteristics of raw materials. The best organizational tool for implementing such models is a cooperative approach that ensures horizontal integration of pickers, sharing of dryers, certification services and transportation infrastructure.

To increase the competitiveness of wild products, it is necessary to gradually integrate organic production standards and certification of wild plants under schemes such as FairWild or Organic Standard. The introduction of such standards not only opens up access to premium markets, but also creates a culture of responsible harvesting, which involves monitoring the state of the resource base, rotation of sites, and biodiversity conservation. At the same time, it is recommended to stimulate training programs based on NGOs or agricultural clusters that would provide initial training in phytoregional management, the

basics of certification, primary accounting, and basic economics of small harvesting enterprises.

At the state level, effective steps could include support for simplified models of permitting seasonal collection in communities, tax incentives for certified collecting associations, and the development of digital platforms for labeling, accounting, and traceability of raw materials. In the context of post-war reconstruction, these activities can not only provide temporary employment, but also lay the groundwork for a long-term strategy of sustainable local development based on the rational use of natural resources.

Conclusions. The study has shown that the harvesting of wild medicinal raw materials in Ukraine has significant potential for the socio-economic development of depressed regions. It contributes to seasonal employment, income diversification, activation of women's labor and preservation of traditional knowledge. In the context of the war, this activity takes on additional importance as a source of local economic stability.

It has been established that the key constraints are limited access to resources in the border and affected areas, poor infrastructure, complex certification procedures, and a lack of professional staff. The low institutional capacity of communities prevents the scaling of successful practices, and the market remains fragmented and opaque.

To increase the efficiency of harvesting activities, it is recommended to introduce cooperative models with a short value chain, integrate organic certification, develop local infrastructure, educational programs, and digital traceability tools. Particular attention should be paid to creating conditions for legalizing the collection, taking into account environmental responsibility and social inclusion.

Prospects for further research include analyzing the effectiveness of cooperation models in different regions, assessing the impact of export orientation

on communities, and developing mechanisms for integrating procurement activities into regional post-war recovery policies.

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