



GENERAL PROBLEMS OF THE MODERN RESEARCH AND INNOVATION POLICY

<https://doi.org/10.15407/scine22.02.003>

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INTERNATIONAL TRAJECTORY OF DEMINING TERRITORIES FROM THE STANDPOINT OF SUSTAINABLE DEVELOPMENT: INNOVATIVE FINANCING AND SPATIAL TRENDS IN WAR AND POST-WAR RESTORATION

Introduction. *The relevance of mine action has increased on a global scale, as extensive territories remain contaminated with explosive ordnance and a growing number of countries bear responsibility for their clearance. In the current geopolitical context, mine action has increasingly been considered not only as a humanitarian and security imperative but also in close conjunction with environmental, climate, social, and economic dimensions. Accordingly, demining activities have been increasingly analyzed within the broader framework of sustainable development.*

Problem Statement. *The effective implementation of demining projects, programs, and institutional instruments across different countries has become increasingly dependent on the integration of key principles of sustainable development. This integration has emerged as a critical factor in ensuring comprehensive recovery, long-term resilience, and spatial transformation of territories affected by armed conflict.*

Purpose of the Study. *The purpose of this study is to analyze international experience in the implementation of major demining projects, programs, and policy instruments in order to identify their effectiveness, limitations, and potential for scaling up. Particular emphasis is placed on sustainable development objectives, innovative financing mechanisms, and spatial trends in the context of war and post-war reconstruction.*

Materials and Methods. *The methodological framework has incorporated process-oriented, historical, and logical approaches, as well as comparative, structural-logical, and dogmatic methods of analysis.*

Citation: Ustymenko, V. A., Rohozian, Yu. S., and Trehub, O. A. (2026). International Trajectory of Demining Territories from the Standpoint of Sustainable Development: Innovative Financing and Spatial Trends in War and Post-War Restoration. *Sci. innov.*, 26(2), 3–17. <https://doi.org/10.15407/scine22.02.003>

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The research has been grounded in the theoretical foundations of regional economics and spatial planning theory, which have enabled a systematic assessment of territorial transformation in mine-affected regions.

Results. *The study has identified key achievements, shortcomings, and opportunities for scaling up demining initiatives implemented by the HALO Trust and the United Nations Mine Action Service. Particular attention has been given to innovative financing mechanisms for mine action in Ukraine. The analysis has revealed both positive and negative trends associated with the implementation of the United Nations Mine Action Strategy 2019—2023, highlighting institutional, financial, and spatial factors that influence its effectiveness.*

Conclusions. *The study has demonstrated that the financing and implementation of mine action measures based on innovation and the principles of sustainable development, and oriented toward measurable outcomes, can play a pivotal role in strengthening cooperation among international, national, and local stakeholders. Such an approach has the potential to significantly enhance the effectiveness of post-war recovery processes and to facilitate the sustainable restoration and spatial reintegration of mine-affected territories.*

Keywords: demining, territories, sustainable development, international experience, mine action, innovative financing, recovery, spatial planning and development.

The issue of mine action has persisted as a global problem for several decades, with numerous countries assuming control of territories that have been mined with a variety of explosive devices. This phenomenon can be traced back to the consequences of two world wars and ongoing armed conflicts that continue to unfold on a global scale. The full-scale invasion of Ukraine by Russia in February 2022 has prompted the international community, along with researchers and experts, to pay increased attention to the issue of ensuring sustainable and spatial development in mined areas. The scale of this issue has resulted in Ukraine being designated as the most heavily mine-affected country in the world. The situation is further complicated by the ongoing hostilities in Ukraine, necessitating a swift and effective response from state authorities and local self-government to address the adverse economic, social and environmental challenges posed by the war [1]. In this regard, it is advisable to analyze the international dimensions of demining by referencing the practices and accumulated expertise of those states and organizations with the most advanced experience in the field. Aspects of sustainable and spatial development planning, including their financing models, may be adapted and applied to Ukraine in order to facilitate the economic recovery of territorial communities, regional entities and the nation at large.

It is important to acknowledge that over the past decade, the international community has increasingly recognized the crucial importance of sustainable development not only for the well-being of society, but also for peace, alongside political and security requirements. There is also growing recognition that effective spatial planning, based on economic recovery and long-term development of territories, contributes to conflict resolution and peace. Concomitantly, economic recovery should not be viewed in isolation, but rather within the broader framework of sustainable development in correlation with its social and environmental dimensions. Spatial planning should be considered as a strategic approach to support the recovery of communities (local level territories) from armed conflicts and crises, using innovative and transformative methods that contribute to the consolidation of peace. The implementation of measures aimed at economic spatial recovery correlates with the further sustainable development of post-conflict areas, so it is crucial to formulate appropriate strategic plans with the above-mentioned emphasis. Concurrently, following the clearance of mines and the subsequent transfer of these territories to local communities for unrestricted use, it is imperative to channel efforts towards the restoration of production assets and critical infrastructure. The success of this initiative depends on the existence of a clearly defined set of strategic documents

containing provisions of spatial planning for the aforementioned territories. In this regard, it is essential to identify novel and innovative sources of funding, the implementation of which would facilitate the restoration of internal support mechanisms for the functioning of business entities and serve as a key driver of the economy of any administrative unit. These measures gain particular importance in an endogenous environment, as international donors increasingly play a pivotal role in the recovery of the territorial economy. Through the provision of long-term financial support, these actors have the capacity to influence the national agenda.

A review of recent foreign research and publications in the field of demining reveals the prominence of certain areas, which are addressed by researchers. These include military and engineering, political and legal, security, and, to a lesser extent, environmental issues. For instance, D. Erias Henao and J. Ospina Perdomo (2020) present the findings of research on humanitarian demining scenarios in the post-conflict period, drawing particular attention to Colombia, while analyzing their features through the legal and political prism [2]. U. Hofmann and P. Rapillard (2017) focus their research on the environmental component of sustainable development, linking it to legal support after demining [3]. Distinguished scholars have elucidated the technical frameworks underpinning demining in the context of humanitarian development. In addition, D. Ambruš, D. Vasić, and V. Bilas (2020) have explored innovative facets of demining [4]. In the course of the literature review, the authors examined studies addressing both the fundamental and applied aspects of using unmanned aerial vehicles and satellite imagery to accelerate the demining of agricultural land. For instance, N. Ibrahim, S. Fahs and A. AlZoubi (2021) conducted a land cover analysis and carried out a survey of explosive remnants of war [5]. It is also important to highlight the lack of comprehensive studies on demining that go beyond the technical aspects of clearance to examine its correlation with broader sustainable development goals. Fur-

thermore, such studies should incorporate an analysis of spatial development trends in demined areas, as it is crucial not only to ensure their physical clearance but also to restore their socio-economic and environmental potential and facilitate their safe use.

The purpose of the study is to analyze the international experience of implementing key projects, programs and other instruments in the field of demining territories, with a view to identifying their outcomes, shortcomings and prospects for scaling up in terms of sustainable development, innovative financing and spatial trends in the context war and post-war reconstruction.

The methodological framework of the article is based on a comprehensive set of general and special research methods and analytical approaches: the process-based approach was used to analyze the provisions of international project instruments; using the historical and logical approaches, data on demining projects were summarized from the perspective of sustainable and spatial development; comparative analysis made it possible to evaluate international projects taking into account spatial development trends in post-conflict areas; structural and logical analysis served as the basis for identifying the prerequisites for researching, implementing and developing innovative financing in demining projects; the dogmatic method was employed in the analysis of legal texts, and it was especially effective in elucidating the formal content of legislative provisions concerning green bonds and public-private partnerships.

IMPLEMENTATION OF HALO TRUST MINE ACTION PROJECTS

The evaluation of the largest mine action program, HALO Trust 2016—2020, which has now been completed, was funded by the Ministry of Foreign Affairs of the Netherlands as part of the Mine Action and Cluster Munitions (MAC) program. The HALO Trust carried out mine clearance in eight projects in different geographical areas: Afghanistan, Colombia, Kosovo, the West Bank

(Palestinian Territories), Somalia, Somaliland, Syria, Ukraine and Yemen. During this period, landmine clearance was carried out, explosive ordnance risk education was developed and assistance was provided to victims to return land to local communities and increase their resilience. A synopsis of the HALO Trust projects implemented in 2016—2020 is provided in Table, which additionally explores the components of sustainable and spatial development of territories.

The independent evaluation, which was conducted from September 2020 to March 2021, aimed to assess the effectiveness of the mine action program according to the Organization for Economic Co-operation and Development (OECD) criteria: relevance, efficiency, effectiveness, coherence, impact and sustainability. Primary data was collected mainly in Afghanistan, Somalia and Somaliland using an integrated community-based approach, while other programs were assessed through research and analysis of information and analytical sources and interviews with key stakeholders [6]. The conclusions are generally positive about the mine action activities of this program, as mine clearance has a direct impact on the physical safety of people, as well as the socio-economic and environmental sustainability of the territories. Mine clearance has significantly increased the physical safety and security of residents. Local communities have returned the vacated agricultural land to productive use through a number of measures. The results of mine action have also generally increased people's access to basic social services, but the environmental component of sustainable development has not been fully addressed.

The situation differs somewhat when examining the components of sustainable and spatial development in demined areas. In Kosovo, the preparation of planning documents for sustainable development commenced only after the majority of areas had been demined. These measures have yielded notable benefits, as evidenced by their integration into the nation's strategic planning for economic transformation, underpinned

by principles of environmental sustainability and green development. A noteworthy advancement in Kosovo's approach to the spatial development of demined areas is the integration of mine action objectives into strategic and spatial development planning documents, including those related to infrastructure and urban aspects. Consequently, these areas have been restored at a faster rate than others, signifying the positive impact of the activities of state and local authorities.

However, it is important to note that the situation in Ukraine is an exception to this general overview of HALO Trust projects. Ukraine currently holds the unfortunate title of being the most mined country in the world. The challenges posed by demining in Ukraine extend beyond the military, security, legal and technical aspects, but also encompass the realm of local level restoration of territories. This restoration is based on sustainable and spatial development, a strategy that is crucial for the long-term recovery and resilience of the affected communities. Due to the ongoing hostilities in Ukraine, it is currently only possible to assess the effectiveness of demining efforts prior to February 2022, which coincided with the onset of the full-scale Russian invasion. Since 2014, the majority of Ukraine's eastern territories, specifically the Donetsk and Luhansk regions, have been subjected to occupation and mining. A significant portion of the territory in these regions has been de-occupied, and following the removal of landmines, the communities have formulated strategies aimed at achieving sustainable growth. By 2022, these communities had initiated public discussions on the formulation of spatial development programs, primarily embodied in urban planning documents. These actions enabled the communities of Donetsk and Luhansk oblasts to attract both international and national funding for the restoration of infrastructure. Nonetheless, it is difficult to assess this from today's perspective, as hostilities have once again intensified, affecting not only the eastern regions but also Sumy, Chernihiv, Kherson, Kyiv, Mykolaiv and Zaporizhzhia oblasts.

Synopsis of HALO Trust Mine Action Projects from the Standpoint of Sustainable and Spatial Development

State	Dates	Description
Afghanistan	01.09.2016— 31.08.2020	Mine action was deployed in several provinces, including Samangan and Balkh. The project was mainly focused on physical security, with a social and fragmented economic component through job creation in areas where the Dutch Ministry of Foreign Affairs funded survey and clearance operations for abandoned improvised mines No provisions for the planning and spatial development following demining have been identified
Colombia	01.01.2017— 31.12.2018	The project received financial support from Dutch colleagues, enabling the HALO Trust to initiate operations in the domains of non-mechanical demining and non-technical surveys. The dissemination of information regarding mine risk to local residents resulted in the establishment of social groups, wherein residents provided assistance to victims in the reconstruction of their homes following demining activities and the acquisition of pets to support their recovery. This may indicate the creation of preconditions for further implementation of the social and economic component of sustainable development of territories. There is a paucity of literature on the planning and spatial development following demining
Kosovo	01.09.2016— 31.08.2020	By the conclusion of the project, Kosovo had expedited the rate of landmine clearance, with the objective of approaching mine-free status. A key element of this initiative entailed a pronounced emphasis on the integration of a gender-mainstreaming approach across all facets of society. Following the completion of demining operations in the majority of these areas, Kosovo initiated the formulation of sustainable development planning documents, which have since been instrumental in shaping the nation's aspirations for a green and sustainable economy Furthermore, endeavors were undertaken to integrate mine action objectives into Kosovo's strategic and spatial development documents, encompassing infrastructure and urban planning
Somalia and Somaliland	01.09.2016— 31.08.2020	The HALO Trust commenced its operations in Somalia in 2015, with a focus on the south-central region of the country. The organization has successfully cleared areas of active hostilities, engaged in community outreach and security risk education, and conducted manual landmine clearance. In 2020, HALO Somalia collaborated with the Geneva International Centre for Humanitarian Demining (GICHD) Gender and Mine Action Unit, which contributed to the gradual adoption of sustainable land management practices in these areas In Somaliland, the foundation has been working since 1999 to achieve mine-free status for the region. HALO's landmine clearance activities in Somaliland are focused on the interior of the region, in areas proximate to the border with Ethiopia There is a paucity of regulations pertaining to the planning and spatial development following demining
Syria	01.09.2016— 31.08.2020	HALO's operations in Syria were conducted through third-party organizations. HALO provided remote control, training and support for deminers from Jordan and Turkey. Activities focused on outreach, risk education and victim assistance. Explosive ordnance disposal activities planned during the project were suspended due to cross-border restrictions caused by the fighting No regulations were identified regarding the planning, spatial and sustainable development after demining

State	Dates	Description
Ukraine	01.01.2017— 13.12.2019	Even before the full-scale invasion in 2022, Ukraine had already become one of the most heavily mined countries in the world. This was largely driven by the armed conflict in Donbas. The situation persisted until 2019. The HALO Trust conducted surveys and explosive ordnance disposal in the Donetsk and Luhansk regions, and informed residents of the mine risk in government-controlled areas. Thanks to the efforts of HALO, the Law of Ukraine “On Mine Action in Ukraine” was adopted in December 2018, and the territories cleared by HALO were transferred to the local communities of the eastern regions in 2019. In addition, HALO collaborated closely with all mine action stakeholders to enhance coordination across the country. Following the demining process, local territories in Donetsk and Luhansk oblasts proceeded to develop their own strategies aimed at promoting sustainable development. The economic, social and environmental components of sustainable development were incorporated into urban planning documents. However, it was only after the full-scale invasion that amendments were made to Ukrainian legislation, mandating that territorial restoration planning be grounded in a comprehensive approach that combines both spatial and sustainable development considerations.
West Bank (Palestine)	01.09.2016— 31.12.2018	With the financial support of the Dutch Ministry of Foreign Affairs, HALO cleared five minefields, which were mainly used for agriculture. This gave impetus to planning for the sustainable development of these areas with an economic focus. The activity was supported by the Georgian, Palestinian and Israeli governments. No regulations on the planning and spatial development after demining have been found.
Yemen	01.08.2017— 31.08.2020	HALO operations focused on training, security capacity building and rapid mine clearance during a large-scale humanitarian crisis, as mine clearance needs were expected to remain high for the next decade. No provisions on planning, spatial and sustainable development after mine clearance have been found.

Note: * compiled by the authors based on data [6].

It is important to note that these measures were initiated only after the full-scale invasion, with amendments to Ukrainian legislation adopted in 2023. These amendments introduced a mandatory requirement for the planning of the restoration of territories to be based on complexity, incorporating both spatial and sustainable development considerations. It is anticipated that this integrated approach will accelerate the restoration of the affected territories and facilitate a timely transition to sustainable development planning.

However, more in-depth study is required to address the issue of financing projects within the framework of a large-scale program, as its implementation has highlighted the need for innovative financing approaches that align with the evol-

ving needs of society. While financial support from international donors is welcomed, it does not represent a long-term solution, as it ultimately depletes their own resources and fails to encourage states to take independent steps toward demining. With the completion of projects and programs, it is critical to reassess the potential of demined areas and formulate strategies for their sustainable and spatial development. This is crucial to ensure the efficacy of economic processes at both the local and national levels of government.

In this context, in 2021, HALO Trust experts proposed a study to the public, which emphasized the importance of developing innovative financing and its implementation in mine action, but did not provide a clear definition of this process [7].

This study was continued in a special report prepared for Ukraine by UNDP experts in cooperation with the Ministry of Economy of Ukraine in autumn 2024. According to this study, innovative financing for mine action is defined as initiatives that utilize financial mechanisms to channel public and private funds to mine action, with the aim of closing the financing gap and complementing existing funding mechanisms in a manner that promotes equity, sustainability, efficiency and effectiveness [8]. A more detailed exploration of this definition reveals that, in general, this form of financing can be considered a pool of mechanisms and methods to ensure strategic and operational measures within mine action. A thorough analysis of the data presented in Table 1 from the perspective of innovative financing demonstrates that only one of the countries examined has practical experience in innovative financing of mine action. Afghanistan serves as an example where representatives of the international community have developed two widely adopted models, namely results-based financing for development and results-based financing for stabilization in the field of mine action. The distinguishing features of these proposed funding models include a pronounced emphasis on outcomes, as opposed to the previous focus on processes, as well as the development and implementation of quantifiable mine action performance indicators. The indicators are designed to assess progress towards sustainable development through the socio-economic stabilization of demined areas, ultimately contributing to the consolidation of peace. These models, together with the innovative financing approaches suggested for Angola, Cambodia and Ukraine, highlight the necessity of a more detailed study in this field. Nevertheless, it is evident that innovative financing is intrinsically linked not only to mine action, but also to the broader objectives of sustainable development.

A recent UNDP report “Enhancing Mine Action Finance in Ukraine” proposes two innovative financing mechanisms that demonstrate significant potential and require in-depth modelling and feasibility analysis: a Sustainability-Linked Bond to

finance both demining and the transition to sustainable agriculture; an Outcome-Based Public Private Partnership that combines finance, concessions and grants for demining and the development of renewable energy (solar) [9].

The first mechanism involves the issuance of bonds by the Government of Ukraine to finance mine action activities and to strengthen efforts in the field of sustainable development (towards a transition to organic winter wheat and no-till agriculture). It is planned to issue bonds in the amount of USD 250 million, with 50% of the proceeds from their sale allocated to mine action, and 50% to sustainable agriculture [9]. It is important to note that in mine action sustainable bonds are intended to fund large-scale projects *with environmental or climate action aspects*, where income generated from the land after clearance could be used to repay the investors [10]. Ukraine has already undertaken certain legislative and other measures to introduce a green bond market. In 2020, the key provisions on green bonds were incorporated into the Law of Ukraine “On Capital Markets and Organized Commodity Markets” [11]. In February 2022, the Government of Ukraine approved the Concept for the Introduction and Development of the Green Bond Market in Ukraine. However, the planned implementation of this initiative in 2022—2023 was hindered by the full-scale Russian invasion of Ukraine. In addition, in 2024, the National Securities and Stock Market Commission adopted the Regulation on the Procedure for the Issuance and Circulation of Corporate Bonds, which defined the specific features of green bond issuance and established the procedure for the use of funds raised through their placement [12]. At the same time, in the context of the legislative requirement that green bonds be used exclusively to finance environmentally oriented projects, the potential legal challenges of their dual-purpose use (for financing both demining and organic farming) become a matter of concern. This issue requires a comprehensive legal analysis, given that, unlike green bonds, sustainability bonds are intended to finance projects aimed not only at

addressing environmental challenges but also at improving living conditions for the population and society as a whole [13].

The second innovative finance mechanism (an Outcome-Based Public Private Partnership) involves the private sector investing in the clearance of areas contaminated with explosive remnants for the construction of solar power plants, while receiving concessions from the state and performance-based incentive payments from donors. To assess the effectiveness of the model, experts propose to construct a 10 MW solar power plant at an estimated cost of USD 10 million. This pilot project is anticipated to attract an additional USD 13 million in private sector funding for demining activities. Depending on the location of suitable land plots, market demand and the availability of investment capital, the scale of the pilot project may be expanded significantly. A key feature of the public-private partnership model proposed in the report is its focus on the development of solar energy, taking into account Ukraine's potential in this sector, as well as its economic efficiency and technological innovation [9]. Although solar energy offers certain advantages for the implementation of this project, it is essential to consider the specific characteristics of renewable energy development in Ukraine as well as the condition of its energy system. According to official data, the National Renewable Energy Action Plan for the period up to 2020 was exceeded nearly threefold in terms of solar energy development, whereas the progress indicators for other renewable energy sources (such as wind, biomass, and others) remain significantly lower. Therefore, further state incentives for the development of this renewable energy sector will be implemented at minimal levels to ensure moderate growth in the installed capacity of solar energy facilities, primarily through generating units of active consumers (National Renewable Energy Action Plan for the period up to 2030, 2024) [14]. For the most effective integration of the mine action and renewable energy sectors, it is advisable to focus on wind energy and bioenergy, for which intensive development scenarios are specifically planned by the government.

On the other hand, Ukrainian legislation on public-private partnerships may contain barriers to the development of a combined partnership model that integrates mine action with renewable energy initiatives. The proposed partnership mechanism requires a thorough examination to ensure its compliance with the legal criteria governing public-private partnerships, including its defining features, applicable sectors, permissible implementation formats, eligible assets and other relevant regulatory provisions. As of today, the Law of Ukraine "On Public-Private Partnership" No. 2404-VI dated 01 July 2010 establishes such criteria [15]. However, on June 19, 2025, a new Law of Ukraine "On Public-Private Partnership" was adopted, the provisions of which, in terms of the relevant criteria, differ significantly from those set out in the previous law. The legal analysis may reveal the need for amendments to the legislation aimed at eliminating the identified barriers or addressing regulatory gaps in the framework governing public-private partnerships related to the demining of Ukrainian territory.

It is noteworthy to emphasize the pivotal role of HALO Trust project tools *in ensuring the sustainable development of demined areas*. In 2022, demining activities contributed to the enhancement of the socio-economic potential of communities, particularly 437 individuals were trained in first aid in the cleared areas and provided with appropriate equipment, thereby contributing to the targeted restoration of the medical sector and the return of residents to safe areas [6]. Primarily, the significance of these projects lies in their impact on people's lives, as any international mine action partner is unable to concentrate exclusively on the demining phase. In this process, the focus should shift towards improving the quality of life, underscoring the importance of restoring the socio-economic potential of communities located near mine-affected areas. This objective can be pursued through all dimensions of sustainable development, but primarily through two key areas:

1. The domain of physical security, which is inextricably linked to the social facet of sustainable development, encompasses the phases of huma-

nitarian demining. It is evident that the majority of the cleared territories worldwide have been mined for decades, resulting in an escalation in the number of civilian casualties on an annual basis. Consequently, addressing physical security issues is indisputably a critical undertaking for each individual project and programs as a whole.

2. The economic dimension includes the clearance of land plots that have transformational potential for economic growth of the territories. In addition to reducing threats to physical security, demining within the projects and the HALO Trust program as a whole has also contributed to the economic resilience of local communities living near demining sites by increasing access to productive use of cleared land. Demining has facilitated the creation of diverse economic opportunities for local communities, primarily through the restoration of land for agricultural use, including both crop cultivation and livestock farming.

Nevertheless, it should be noted that the implementation of these projects has not yet resulted in significant improvements in territorial conditions in terms of sustainable and spatial development within the aforementioned countries. This is largely due to the absence of a clearly defined correlation between demining efforts and local territorial development programs, which have not been effectively implemented. Furthermore, the concept of innovative financing remains relatively nascent at the global level and requires more detailed and country-specific analysis. National capacity and public awareness serve as critical foundations for the effective implementation of various methods, mechanisms and tools that may be successful in one area but fail to produce the expected outcomes in another.

IMPLEMENTATION OF UNMAS PROJECTS IN THE CONTEXT OF MINE ACTION

In the contemporary context of globalization, which is exacerbated by the negative impact of armed conflicts worldwide, several dozen international organizations and foundations are involved in mi-

ne clearance and assistance in this process. Among these organizations, the United Nations Mine Action Service (UNMAS) is recognized as one of the largest and most influential at the global level. Given the substantial international support provided by UNMAS to accelerate demining efforts across various countries, future research should concentrate on analyzing the project and program instruments implemented by this service under current conditions, with particular attention to their potential correlations with sustainable and spatial development. The most recent information and analytical content are recorded as of February 2023, reflecting data analysis for the year 2022 [16].

In total, 21 projects in the field of demining were funded by UNMAS in 2022, resulting in the destruction/deactivation of 109,976 explosive items, including 5,970 landmines, the confirmation of the safety of 159 km² of land and 8,468 km of roads, and the construction of 1 weapons and ammunition storage facility [16]. Furthermore, in 2022, the service provided operational technical support to Ukraine during the full-scale Russian invasion, which was a significant contribution to the country's mine action potential.

A more detailed analysis of these projects is warranted, particularly with respect to their contributions to the restoration of sustainable development and the examination of spatial trends from an economic perspective. In this context, Albania serves as a salient example. The country faced the challenge of demining primarily as a result of the 1999 Kosovo conflict, although its initial experience with landmines can be traced back to the two world wars. Subsequently, Albania implemented substantial political and security sector reforms, with the adoption of a new constitution in 1998 and its accession to NATO in 2009 representing key milestones.

Initial non-technical surveys conducted in the aftermath of the Kosovo conflict identified approximately 15 km² suspected hazardous areas along the Albanian-Kosovo border in the municipalities of Kukes, Has and Tropoe, affecting a total of

39 villages and around 25,000 people [16]. Undoubtedly, the ongoing mining of the territories along the border with Kosovo continues to hinder the socio-economic and environmental development of the region and increases its isolation from the rest of the country.

The report by the Geneva International Centre for Humanitarian Demining (GICHD) and UNDP (2017) provides a basis for analyzing the key measures and actions implemented in the field of mine action in Albania. In 1999, the Ministry of Defense initiated and established the Inter-Agency Albanian Mine Action Committee (AMAC) and the Albanian Mine Action Executive Committee (AMAE), with the latter being set up under the framework of UNDP projects. Despite numerous attempts to orient these institutions not only towards mine action, but also towards sustainable and spatial development, no concrete plan has been developed to clearly institutionalize the AMAE within the existing governmental architecture to help achieve this goal [17].

In addition, Albania has only recently initiated the exploration of innovative financing methodologies, a development that is particularly noteworthy given the country's current need not only to secure sufficient funding but also to advance territorial development. The implementation of mine action tasks using traditional sources is also challenging, as they are predominantly process-oriented rather than outcome-focused. This situation is not conducive to establishing a correlation between mine action and territorial restoration (let alone to planning spatial and sustainable development) and there forecalls for substantial changes.

The role of international project and program instruments in ensuring the sustainable development of demined areas has been significant in this context. Such instruments have enabled Albania to achieve several benefits in the field of demining, including the development of human resources capable of managing the quality and information on demining in accordance with the International Mine Action Standards (IMAS) at the national and local levels [18]. This has facilitated the acce-

leration of demining operations and the development of strategies aimed at restoring the economic potential of affected regions. Moreover, it has facilitated the formulation of plans aimed at ensuring the sustainable development of demined areas. Nevertheless, substantial challenges persist in efforts to restore the social, economic and environmental potential of demined areas. These include the absence of national plans for both demining and spatial development through innovative financing (based on specific and measurable results) that can ensure the long-term implementation of international programs and initiatives with a focus on the economic development of the territories.

The Albanian case study in mine action highlights the importance of structured long-term strategic mine action planning in close cooperation with innovative financing instruments. This should involve a comprehensive and properly implemented mine action strategy, with provisions clearly aligned with the strategic documents aimed at achieving sustainable and spatial development of demined areas. At the current stage of mine action in Albania, as financial resources provided by the international community are nearly depleted, there is a pressing need to assess the potential of innovative financing methods and to develop strategic measures aimed at addressing the ongoing threat posed by explosive remnants in cleared areas, as well as at promoting the restoration of sustainable development in post-conflict regions.

IMPLEMENTATION OF THE UNITED NATIONS MINE ACTION STRATEGY 2019—2023

This document is a significant international instrument in the domain of mine action, the implementation of which is concomitant with the restoration of the socio-economic potential of the affected territories and contributes to promoting sustainability in the areas under study. In the report, the UN Secretary-General refers to the main aspects of the implementation of the UN Mine Action Strategy 2019—2023, noting, among other

findings, the identification of 9198 victims of explosive hazards in 2022 alone. The Syrian Arab Republic recorded the highest number of casualties in countries and territories where the UN is actively engaged in mine action, followed by Somalia and Iraq [19]. Ukraine was not included in the aforementioned list, possibly due to the ongoing hostilities in the country, which preclude a final assessment at this stage. Concurrently, the international community acknowledges that Russia's full-scale invasion has resulted in the mining of huge areas, rendering them hazardous for civilians and agricultural use. This has engendered food security concerns both domestically and internationally.

A key area of the Strategy's implementation is to strengthen protection against the risks and socio-economic consequences of explosive hazards. However, during the reporting period, many countries recorded an increase in the number of casualties in this area. Iraq experienced a reduction exceeding 83% between 2018 and 2022 compared to the preceding five-year period, while the Lao People's Democratic Republic saw a decrease of 20% over the same timeframe. It is evident that several other countries continue to experience an increase in the number of human casualties caused by landmines. In Burkina Faso, the figure rose from 109 in 2019 to 456, in 2022, in the Democratic Republic of the Congo it increased from 31 in 2018 to 129, in 2022, and in the Central African Republic from 21 in 2018 to 52, in 2022. Myanmar also experienced an escalation, with the figure rising from 192 in 2018 to 392, in 2022 [19].

The current situation is further aggravated by the fact that these adverse trends not only undermine the socio-economic conditions within mined areas, but also exert a detrimental influence on neighboring territories, where the prospects for sustainable development remain out of reach. In such areas, the formulation of measures to guide spatial development is also impeded, thereby delaying the restoration of mined territories and underscoring the need to intensify efforts to achieve the sustainable development goals. The question of funding sources should likewise occur

py a prominent place on the agendas of the aforementioned states, since dependence on traditional mechanisms has depleted the resources of international donors (they had already been weakened in the post-COVID-19 context) without yielding substantial outcomes. Consequently, it would be more beneficial for countries to diversify their funding sources and to complement external grants with domestic capacity and awareness, as well as to closely monitor and analyse current demining trends. Such a multifaceted approach, underpinned by clear and measurable results, is pivotal to ensure sustainable development. There is also a need to explore innovative financing mechanisms, conduct a thorough assessment of their potential risks and benefits, and identify models tailored to the specific needs of each country.

Nonetheless, a positive trend is demonstrated by the fact that, in 2022, United Nations funds contributed to the clearance and release of 163 km² of previously mined land, with the largest areas recorded in Iraq, Cambodia and Afghanistan. From December 2021 to April 2023, the United Nations conducted its inaugural humanitarian land clearance operation in the Syrian Arab Republic, encompassing approximately 2 million sq. m. in Daraya, a rural area of Damascus under government control. This initiative has facilitated safe access to land for agricultural use. In Afghanistan, potentially contaminated areas in the provinces of Helmand, Kandahar, Kunduz and Uruzgan, which had been inaccessible due to intense hostilities until August 2021, were surveyed [19].

It has been repeatedly emphasized that the issue of demining goes beyond the mere clearance of explosive ordnance and should be supported by appropriate tools designed to strengthen national and local capacities in this field. Moreover, contemporary trends in this domain underscore the necessity of establishing a clear correlation between demining and sustainable development, the effectiveness of which can be further enhanced using innovative financing models. In Iraq, the UN has pioneered an innovative partnership and funding model, whereby international non-govern-

mental organizations (NGOs) collaborate with national NGOs to provide demining skills transfer and explosive ordnance risk education, culminating in the accreditation of two national NGOs to undertake operational demining.

The role of international project and program instruments in ensuring the sustainable development of demined areas is also worthy of note. The implementation of demining activities during the reporting period contributed to the search for long-term solutions in the context of sustainable development through the restoration of the socio-economic potential of the affected areas. In Ulu (Blue Nile State, Sudan), more than 17,000 individuals were able to return to their homes following the clearance of land and its subsequent handover to residents. This enabled the reconstruction of social infrastructure, improved living conditions for the local population and facilitated the socio-economic development of communities. In Sinjar (Iraq), mine clearance operations in residential areas resulted in safe access for internally displaced persons to their places of origin, which contributed to the creation of new jobs. In Somalia, labor potential has been restored through the employment of over 158 individuals, 30% of whom were under the age of 30, in communities situated along the Ethiopian border, following the demining of these areas. In Cambodia, a series of training programs were conducted with the aim of empowering small entrepreneurs and expanding economic opportunities in communities adjacent to mine-affected areas. These programs covered initiatives such as beekeeping and detergent production [19].

Therefore, the implementation of the UN Mine Action Strategy 2019—2023 has been marked by a series of positive results that are important for mine action worldwide. However, countries should consider leveraging the valuable background provided by the Strategy and investigate the application of innovative financing approaches for mine action through collaborative efforts, as well as evaluate the impact of these activities on affected areas with respect to sustainable development. The socio-economic and environmental impact of mine

action is profound; however, many countries remain insufficiently engaged, continuing to rely on traditional sources of funding [20]. This is problematic, as it is vital for countries to not only demine territories, but also to restore their potential and transform them into a valuable resource. It is clear that mine-cleared lands are becoming increasingly costly, necessitating the exploration of effective management strategies and potential modifications in the spatial development of such areas. These territories possess significant potential for agricultural use, the construction of housing and transport infrastructure, as well as other revenue-generating activities that can contribute to their sustainable development.

The analysis of the main project and program instruments of international organizations in the field of demining, using the Halo Trust projects and UN programs as a case study, has concluded that the implementation of these instruments has been successful. This is due to the relevance of the objectives of the documents for international, national and local demining stakeholders. Furthermore, an analysis of the UN Mine Action Strategy 2019—2023 reveals its positive impact on the identification of long-term solutions for the restoration of the socio-economic potential of affected areas. This has led to a substantial return of residents to their homes, the creation of employment opportunities and the expansion of economic activities in neighboring areas, particularly through the initiation and management of small businesses. Additionally, the Strategy enabled the restoration of critical and educational infrastructure facilities.

Conventional sources of funding are no longer adequate to meet contemporary development challenges, as they are predominantly process-oriented, whereas current policy frameworks increasingly require results-based outcomes. In this context, countries with extensive mine-contaminated territories — particularly Ukraine — should give greater consideration to innovative financing mechanisms, conduct targeted analytical research, and implement pilot projects in this area.

Among the available instruments, Sustainability-Linked Bonds and Outcome-Based Public-Private Partnerships are of particular relevance to Ukraine. Despite their significant potential, it is essential to examine not only the advantages of these mechanisms but also their limitations, including legal, institutional, and regulatory barriers that may impede their effective implementation. These innovative instruments, when applied in combination with traditional financing, should be regarded as complementary approaches that strengthen the linkage between demining activities and sustainable development. Only through such integration can the restoration of demined land be accelerated and its spatial development systematically planned.

The research has shown that the financing and implementation of mine action measures based on innovation and sustainability, and oriented toward clearly defined outcomes, play a pivotal role in engaging stakeholders at the international, national, and local levels. This engagement contributes directly to the recovery of affected areas. The empirical evidence has demonstrated that the use of such instruments can catalyze positive change by promoting rational land use, strengthening physical safety for land users, restoring the social, economic, and environmental potential of cleared land plots, and aligning demining measures with local development programs.

The analysis has confirmed that international project- and program-based instruments can be effective in addressing demining and subsequent territorial restoration, provided that international efforts are coordinated and domestic capacity — particularly in managerial and financial dimensions — is preserved. The study has identified a key drawback of excessive reliance on international donors for demining, namely the establishment of strategic and operational priorities that insufficiently reflect endogenous processes. As a result, these externally driven approaches do not fully contribute to the achievement of national objectives. Furthermore, the research has revealed that many states that rely predominantly on external donors lack robust national planning and budgeting systems, which poses significant risks not only for mine action but also for long-term sustainable and spatial development.

Funding. This paper was prepared and funded under a research grant awarded by the National Academy of Sciences of Ukraine to research laboratories/groups of young researchers for conducting research in priority areas of science and technology (research project titled “Economic and Legal Determinants of Demining the Territories of Ukraine as a Component of National Security in the War and Post-War Time,” 2024—2025).

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Received 12.08.2025
Revised 25.09.2025
Accepted 25.09.2025

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МІЖНАРОДНА ТРАЄКТОРІЯ РОЗМІНУВАННЯ ТЕРИТОРІЙ З ПОГЛЯДУ СТАЛОГО РОЗВИТКУ: ІННОВАЦІЙНЕ ФІНАНСУВАННЯ ТА ПРОСТОРОВІ ТРЕНДИ У ПЕРІОД ВІЙНИ ТА ПОВОЄННОГО ВІДНОВЛЕННЯ

Вступ. Актуальність протимінної діяльності у глобальному масштабі стрімко зростає, оскільки значні площі наразі забруднені вибухонебезпечними предметами, а низка країн є відповідальними за знешкодження останніх. У сучасних умовах це питання потрібно розглядати у взаємозв'язку з екологічними, кліматичними, соціальними та іншими аспектами, спираючись на концепцію сталого розвитку.

Проблематика. Ефективна реалізація проєктів, програм та інших інструментів з розмінування у різних країнах дедалі більше пов'язується з необхідністю інтеграції ключових аспектів сталого розвитку, що стає вирішальним чинником комплексного відновлення постраждалих територій.

Мета. Вивчення міжнародного досвіду реалізації ключових проєктів, програм та інших інструментів у сфері розмінування територій задля з'ясування їхньої результативності, недоліків і перспектив масштабування з урахуванням вимог сталого розвитку, інноваційного фінансування та просторових трендів у контексті війни і повоєнного відновлення.

Матеріали й методи. Методологічну основу становлять процесний, історичний і логічний підходи, порівняльний та структурно-логічний аналіз, догматичний метод, а також низка інших методів. Дослідження ґрунтується на ключових положеннях регіональної економіки й теорії просторового планування.

Результати. Наведено досягнення, недоліки та можливості для розширення проєктів з розмінування, реалізованих організацією *HALO Trust* і Службою ООН з питань протимінної діяльності. Особливу увагу приділено механізмам інноваційного фінансування протимінної діяльності в Україні. Проаналізовано позитивні та негативні тенденції, пов'язані з реалізацією Стратегії ООН з протимінної діяльності на 2019—2023 роки.

Висновки. Фінансування і реалізація заходів протимінної діяльності на засадах інноваційності та сталого розвитку, орієнтованих на досягнення конкретних результатів, можуть відігравати ключову роль у забезпеченні ефективної взаємодії між різними стейкхолдерами на міжнародному, національному та місцевому рівнях, сприяючи ефективному відновленню постраждалих територій.

Ключові слова: розмінування, території, сталий розвиток, міжнародний досвід, протимінна діяльність, інноваційне фінансування, відновлення, просторове планування та розвиток.