

## Artículo de investigación

**Theoretical, methodological and statistical problems of studying  
environmental migration**ТЕОРЕТИЧЕСКИЕ, МЕТОДОЛОГИЧЕСКИЕ И СТАТИСТИЧЕСКИЕ ПРОБЛЕМЫ ИЗУЧЕНИЯ  
ЭКОЛОГИЧЕСКОЙ МИГРАЦИИ

Problemas teóricos, metodológicos y estadísticos del estudio de la migración ambiental

Problemas teóricos, metodológicos e estatísticos do estudo da migração ambiental

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Written by:

Artem S. Lukyanets<sup>73</sup>Sergey V. Ryazantsev<sup>74</sup>Anastasia Sergeevna Maksimova<sup>75</sup>Evgeniya Mikhailovna Moiseeva<sup>76</sup>Roman Vladimirovich Manshin<sup>77</sup>**Abstract**

The increase in the number of natural disasters that has been observed in recent decades around the world under the influence of increasing anthropogenic impact on the environment, not only often causes significant damage to the economy and infrastructure of the territories, but also causes people to die and their mass migrations. In the light of these trends, the environmental situation is increasingly becoming the subject of scientific interest of researchers of various specialties: not only climatologists, but also economists and demographers. However, despite the increasing publication activity, in particular, on problems of population migration caused by climate change and environmental problems, there are significant gaps in the theoretical and methodological aspect. Our analysis of the scientific discourse (mostly English-speaking) showed that the discrepancies concern not only the question of which immigrants should be classified as environmental or climate migrants, but also the very term “environmental migrants”, as well as the legal issue of the necessity and legality of providing such persons of refugee status. It has been established that at the moment “environmental

**Resumen**

El aumento en el número de desastres naturales que se ha observado en las últimas décadas en todo el mundo bajo la influencia del creciente impacto antropogénico en el medio ambiente, no solo a menudo causa daños significativos a la economía y la infraestructura de los territorios, sino que también causa la muerte de personas y sus migraciones masivas. A la luz de estas tendencias, la situación ambiental se está convirtiendo cada vez más en tema de interés científico de investigadores de diversas especialidades: no solo climatólogos, sino también economistas y demógrafos. Sin embargo, a pesar de la creciente actividad de publicación, en particular sobre los problemas de migración de la población causados por el cambio climático y los problemas ambientales, existen importantes lagunas en el aspecto teórico y metodológico. Nuestro análisis del discurso científico (en su mayoría de habla inglesa) mostró que las discrepancias se refieren no solo a la cuestión de qué inmigrantes deben clasificarse como migrantes ambientales o climáticos, sino también al término “migrantes ambientales”, así como a la cuestión legal de la necesidad y legalidad de proporcionar a tales

<sup>73</sup> Cand. Sc. (Econ.), Leading researcher, Center for Social Demography, Institute of Socio-Political Research RAS, Moscow (Russia);

<sup>74</sup> Corresponding Member of the Russian Academy of Sciences, Dr. Sci. (Econ.), Prof., Director of Institute of Socio-Political Research RAS, Moscow (Russia);

<sup>75</sup> Cand. Sc. (Econ.), Leading researcher, Center for Social Demography, Institute of Socio-Political Research RAS, Moscow (Russia);

<sup>76</sup> Junior researcher, Center for Social Demography, Institute of Socio-Political Research, RAS, Moscow, (Russia);

<sup>77</sup> Cand. Sc. (Econ.), Leading researcher, Center for Social Demography, Institute of Socio-Political Research RAS, Moscow (Russia)

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refugees” do not actually have and never had refugee status, either in accordance with the relevant UN Convention or in accordance with the national legislation of any country. The article attempts to systematize and analyze the existing theoretical and methodological approaches to this problem and, on its basis, gives recommendations regarding their application. The features of statistical accounting for environmental migrants are established. The main difficulties of identifying and identifying those migration processes that resulted from changes in the environment are identified, since along with natural factors, a combination of other socio-economic factors, such as low living standards or poverty, often influence decision-making on resettlement. The principles that should be followed when organizing environmental migration statistics at the national level are given. Two groups of existing international sources of quantitative data on environmental migration are described: a bibliographic database containing materials and publications on environmental migration, as well as a database of quantitative data that provide information on the number of displaced persons. The relationship between climate change and the impact on the quality of life of the population has been identified. The negative impact of climate change on the level and quality of life of the population was identified primarily in rural areas, which led to an increase in the scale and deepening of poverty, and also caused the migration of the rural population.

**Keywords:** environment, climate change, ecological migration, methodological problems, statistical accounting

personas con estatus de refugiado. Se ha establecido que en este momento los "refugiados ambientales" en realidad no tienen y nunca han tenido el estatus de refugiado, ya sea de acuerdo con la Convención de la ONU pertinente o de acuerdo con la legislación nacional de cualquier país. El artículo intenta sistematizar y analizar los enfoques teóricos y metodológicos existentes para este problema y, sobre su base, ofrece recomendaciones sobre su aplicación. Se establecen las características de la contabilidad estadística de los migrantes ambientales. Las principales dificultades para identificar e identificar aquellos procesos de migración que resultaron de cambios en el medio ambiente se identifican, ya que junto con factores naturales, una combinación de otros factores socioeconómicos, como bajos niveles de vida o pobreza, a menudo influyen en la toma de decisiones sobre el reasentamiento. Se dan los principios que deben seguirse cuando se organizan estadísticas de migración ambiental a nivel nacional. Se describen dos grupos de fuentes internacionales existentes de datos cuantitativos sobre migración ambiental: una base de datos bibliográfica que contiene materiales y publicaciones sobre migración ambiental, así como una base de datos de datos cuantitativos que proporcionan información sobre el número de personas desplazadas. Se ha identificado la relación entre el cambio climático y el impacto en la calidad de vida de la población. El impacto negativo del cambio climático en el nivel y la calidad de vida de la población se identificó principalmente en las áreas rurales, lo que llevó a un aumento en la escala y la profundización de la pobreza, y también causó la migración de la población rural.

**Palabras claves:** Medio ambiente, cambio climático, migración ecológica, problemas metodológicos, contabilidad estadística.

## Аннотация

Увеличение числа стихийных бедствий, которое наблюдается в последние десятилетия во всем мире под влиянием усиливающегося антропогенного воздействия на окружающую среду, не только часто наносит значительный ущерб экономике и инфраструктуре территорий, но и приводит к гибели людей и их массовой миграции. В свете этих тенденций, экологическая ситуация все чаще становится предметом научного интереса исследователей различных специальностей: не только климатологи, но и экономистов и демографов. Однако, несмотря на растущую публикационную активность, в частности, по проблемам миграции населения, вызванной изменением климата и экологическими проблемами, в теоретико-методологическом аспекте имеются значительные пробелы. Проведенный нами анализ научного дискурса (в основном англоязычного) показал, что расхождения касаются не только вопроса о том, какие иммигранты должны быть классифицированы как экологические или климатические мигранты, но и самого термина “экологические мигранты”, а также юридического вопроса о необходимости и законности предоставления таким лицам статуса беженцев. Установлено, что в настоящее время “экологические беженцы” фактически не имеют и никогда не имели статуса беженца ни в

соответствии с соответствующей конвенцией ООН, ни в соответствии с национальным законодательством какой-либо страны. В статье предпринята попытка систематизации и анализа существующих теоретико-методологических подходов к данной проблеме и на ее основе даны рекомендации по их применению. Установлены особенности статистического учета экологических мигрантов. Выявлены основные трудности выявления и идентификации тех миграционных процессов, которые обусловлены изменениями в окружающей среде, поскольку наряду с природными факторами на принятие решений о переселении зачастую влияет сочетание других социально-экономических факторов, таких как низкий уровень жизни или нищета. Принципы, которые следует соблюдать при организации статистики экологической миграции на национальном уровне. Описаны две группы существующих международных источников количественных данных об экологической миграции: библиографическая база данных, содержащая материалы и публикации по экологической миграции, а также база количественных данных, содержащая информацию о числе перемещенных лиц. Выявлена взаимосвязь между изменением климата и воздействием на качество жизни населения. Негативное влияние изменения климата на уровень и качество жизни населения было выявлено прежде всего в сельской местности, что привело к увеличению масштабов и углублению бедности, а также вызвало миграцию сельского населения.

**Ключевые слова:** окружающая среда, изменение климата, экологическая миграция, методологические проблемы, статистический учет.

### Resumo:

O aumento do número de desastres naturais que tem sido observado nas últimas décadas em todo o mundo sob a influência do crescente impacto antrópico sobre o meio ambiente, não só causa danos significativos à economia e infra-estrutura dos territórios, mas também faz com que as pessoas morram e suas migrações em massa. À luz dessas tendências, a situação ambiental é cada vez mais tema de interesse científico de pesquisadores de várias especialidades: não apenas climatologistas, mas também economistas e demógrafos. No entanto, apesar da crescente atividade de publicação, em particular, nos problemas de migração populacional causados pelas mudanças climáticas e problemas ambientais, existem lacunas significativas no aspecto teórico e metodológico. Nossa análise do discurso científico (principalmente em inglês) mostrou que as discrepâncias dizem respeito não apenas à questão de quais imigrantes devem ser classificados como migrantes ambientais ou climáticos, mas também ao próprio termo “migrantes ambientais”, bem como à questão legal de migrantes. a necessidade e a legalidade de fornecer a essas pessoas o status de refugiado. Ficou estabelecido que, no momento, os “refugiados ambientais” não têm e nunca tiveram status de refugiado, seja de acordo com a Convenção da ONU ou de acordo com a legislação nacional de qualquer país. O artigo procura sistematizar e analisar as abordagens teóricas e metodológicas existentes para esse problema e, com base nisso, dá recomendações sobre sua aplicação. As características da contabilidade estatística para os migrantes ambientais são estabelecidas. As principais dificuldades de identificar e identificar os processos de migração que resultaram de mudanças no meio ambiente são identificadas, pois juntamente com fatores naturais, uma combinação de outros fatores socioeconômicos, como baixos padrões de vida ou pobreza, muitas vezes influenciam a tomada de decisões sobre o reassentamento. Os princípios que devem ser seguidos ao organizar as estatísticas de migração ambiental em nível nacional são fornecidos. Dois grupos de fontes internacionais existentes de dados quantitativos sobre a migração ambiental são descritos: uma base de dados bibliográfica contendo materiais e publicações sobre migração ambiental, bem como uma base de dados quantitativos que fornecem informações sobre o número de pessoas deslocadas. A relação entre as mudanças climáticas e o impacto na qualidade de vida da população foi identificada. O impacto negativo da mudança climática no nível e na qualidade de vida da população foi identificado principalmente nas áreas rurais, o que levou a um aumento na escala e aprofundamento da pobreza, e também causou a migração da população rural.

**Palavras-chave:** ambiente, alterações climáticas, migração ecológica, problemas metodológicos, contabilidade estatística.

### Introduction

Since the beginning of the XXI century, under the influence of environmental pollution and global climate change, the number of natural disasters that cause mass migrations has

increased (Pismennaya et al, 2015; Lukyanets, Ryazantsev, 2016). Thus, according to the data of the International Center for Monitoring the Internal Displacement Processes (Internal

Displacement Monitoring Center), over the past 10 years (2008 - 2017), more than 246.4 million people have been forced by natural disasters (mainly floods and hurricanes) resettlement within their own countries (Total annual new displacements since 2003, Electronic resource). Their number is 3.5 times the number of people who left their place of residence in the same period due to armed clashes (70.8 million). At the same time, these statistics do not include information on persons who migrated abroad or made a decision on migration under the influence of slowly progressive environmental changes, such as, for example, desertification. At the same time, authoritative forecasts say that in the future the number of natural disasters and the migrations they cause will only increase (Intergovernmental Panel on Climate Change, 2014, Electronic resource).

In light of these trends, the interest of researchers to this problem continues to grow. According to the calculations of the Global Migration Data Analysis Center (GMDAC) of the International Organization for Migration (International Organization for Migration), the number of scientific publications on resettlement caused by climate change and environmental issues has begun to grow rapidly since the early 1980s. Currently, about 100 papers on this topic are published annually (GMDAC Newsletter Issue No. 11, Electronic resource).

However, despite this, both in the empirical and theoretical-methodological aspects of the study of environmental migration remain significant gaps and discrepancies. In light of these trends, the interest of researchers to this problem continues to grow. According to the calculations of the Global Migration Data Analysis Center (GMDAC) of the International Organization for Migration (International Organization for Migration), the number of scientific publications on resettlement caused by climate change and environmental issues has begun to grow rapidly since the early 1980s. Currently, about 100 papers on this topic are published annually (GMDAC Newsletter Issue No. 11, Electronic resource).

However, despite this, both in the empirical and theoretical-methodological aspects of the study of environmental migration remain significant gaps and discrepancies. First of all, this concerns approaches to the definition of environmental migration and identification of environmental migrants, as well as the methodology of statistical accounting of this type of migration and this category of migrants.

As to the former, in the English-language literature, the terms “environmental migration”, “climate migration”, “ecological migration” and their variations are often synonymous. In addition, there is a lack of clarity in the logic of using the concepts of “migrants”, “refugees” and “displaced persons” in relation to people performing such migrations (Lukyanets et al, 2015).

As to the latter, the main problems of statistical registration of environmental migration at the current stage are the lack of a single consolidated database of information on environmental migration, which is preceded by the complexity of accounting organization and the absence of the need to maintain it in some countries. Currently, individual states are trying to create such an information resource containing data on environmental migration, but it is too early to talk about integrating data into a single space.

### Material and methods

The research topic predetermined the implementation of a number of general scientific methods, such as analysis, description, content analysis, as well as the methods of comparison and analogy, and others. Description in its active form was employed in the table method.

Content analysis implied formalized methods for studying textual and graphical information by means of converting it into quantitative indicators and further statistical processing. The use of this method helped us to reconstruct the scientific and public discourse of the problem under study generated both by numerous research papers and the mass media. Therefore, the repeatability of the results when using the same material by different researchers becomes an important verification mechanism.

Comparison is another important research method of studying any particular type of population movement, which is an exceptionally multifaceted phenomenon and structurally often consists of a whole variety of similar migration flows. This method is particularly relevant when studying environmental migration, since in regard to statistical accounting it is often disguised as economic or humanitarian migration. Thus, using the comparison method allows us to collate the information about the object of the study with the more abundant information about highly researched analogous phenomena in order to identify their similarities and differences.

The method of analogy is closely related to it, as it implies the transfer of knowledge obtained by considering a better studied object to another one, less studied but similar to it in some essential characteristics. The method of analogy is based on such similarity of objects in a number of features which has been established as a result of comparison of these objects.

In the methodological aspect, as mentioned above, a full and comprehensive scientific study of the phenomenon of environmental migration requires both a clear understanding and a tight definition of the concept. It is also necessary solve the problems of statistical accounting of environmental migrants and creating an integrative statistical database for the accurate identification and registration of such resettlers. Completeness of statistical information on migration requires the availability of statistics on the number of environmental migrants relocated within the country, which is the responsibility of national statistical services. If some countries have made a step forward in solving this issue, then in Russia there is no such statistical practice. In addition, the lack of precise definitions of terms directly related to environmental migration, such as "climatic migration", "climatic refugee", "environmental refugee", and "environmentally displaced person", creates difficulties in organizing the recording of such migrations and the comparability of the data obtained at the intercountry level.

1. The following features of the organization of statistical accounting for environmental migration that are not typical for accounting for other types of migrations were highlighted: labor and migration for permanent residence.
2. The lack of uniform boundaries of the object of study, universal definitions of units of observation and registration, necessary for the organization of statistical observations, due to the lack of a single conceptual apparatus in international statistical practice.
3. Dependence on the type and type of factor, which means that different types of environmental migration, depending on the speed of impact of the circumstances that caused them and the degree of danger of these circumstances

for people's lives, dictate different conditions for organizing statistical records. Thus, the complete coverage of immigrants with statistical accounting determines the degree of organization of resettlement (by the state, foundations, public organizations, etc.) and its planning. If we are talking about the planned organized evacuation and the previous preparation of households, then accounting for this category of immigrants is not difficult. Even an unplanned, but organized evacuation allows for post-factum accounting, after moving, while a small number of immigrants remain underestimated. Unplanned and unorganized movement of persons allows one to obtain data on their number only by means of independent attendance at registration points or independent communication via registration channels.

4. Difficulties in forecasting the foci of occurrence, scale of migration, and the number of environmental migrants determine the complexity of organizing their operational accounting. However, the problem can be partially solved through the use of remote accounting and new technologies, which allows to reduce the time of registration, to predict disasters and related movements as much as possible, as well as to quickly organize accounting with minimal costs.
5. When developing and implementing national statistics on environmental migration, all acts of migration should be taken into account, regardless of the scale of the reasons that caused them, which need not be national disasters, and migrations are not necessarily numerous. With long-term observation, it is possible to detect large-scale environmental migration with accumulated results over several years or decades, as well as to identify latent patterns of influence of various factors on environmental migration.

The categories of events and the scale of displacements caused by them are given in the Internal displacement monitoring center (IDMC) Methodology. (Table 1).

**Table 1. The number of displaced persons depending on the scale of the event that caused the displacement**

Event Category	Displaced persons
Small and medium	Up to 100 thousand
Large	From 100 thousand to 1 million
Very large	From 1 million to 3 million
Mega	Over 3 million

Source: Methodological annex of IDMC <http://www.internal-displacement.org/global-report/grid2018/downloads/report/2018-GRID-methodological-annex.pdf> (date of base 10 October 2018)

2. Registration may include migrants who migrate before, during or after the event, as well as the registration itself, may be carried out during the transfer or after it. For example, in drought forecasts, the planned and previously carried out resettlement of the population of the arid area will be identified as environmental migration, and displaced people can register both during displacement by taking into account new arrivals in the inhabited territory, and after displacement by counting actually displaced persons.

3. Data development can be continuous in the case of a long process of migration and the emergence of new acts of movement, so information can be presented at intervals of time: day, month, several months, year, etc. However, in some cases, the development of monthly data does not make sense, since the event that caused the movement occurs at a time, and the movements themselves are rather short, in this case there is a need to make an assessment of the immigrants one-time, i.e. "in connection with the event."

Thus, the methodology for assessing the scale of environmental migration, developed by IDMC, provides two tools for assessing displacements related to conflicts, violence and disasters. The assessment is made after displacement in cases where resettlement is caused by conflicts or incidents of violence, and is both operational data in identifying new cases and data accumulated by the end of the year. If resettlement is caused by a natural disaster, the data are developed once, only for each specific case.

4. When organizing a record of environmental migration, it becomes difficult to identify cause-effect relationships for classifying specific migration events to a particular type.

Difficulties arise in identifying and identifying those cases of migration that resulted directly from changes in the environment, since along with factors of a natural nature, a combination of other socioeconomic factors, such as low living standards or poverty, often influence decision-making on resettlement. In addition, environmental changes can occur gradually, which complicates the task of identifying environmental migration as such.

When organizing environmental migration accounting, it is necessary to clarify which of the factors should serve as the identifier of the migration event: the factor acting first; a combination of all factors, one of which is associated with environmental change; or the final factor, if the whole set of factors act not simultaneously, but sequentially. Let us give a simple example: in a specific area, changes in the environment of a natural or man-made nature, caused drainage of surface waters and worsened the quality of groundwater, which limited the possibilities for obtaining food crops and had a negative impact on agriculture as a whole. This, in turn, contributed to the deterioration of the level and quality of life of the population, an increase in the scale and deepening of poverty, and, as a result, caused the migration of the rural population of this territory, whose main economic activities were farming and receiving not only income but also products for their own consumption. When taking into account the root cause, the migration of the population of a given territory should be considered as related to environmental change (environmental), but the ultimate cause - the deterioration of the standard of living of the population, is of a socio-economic nature.

Despite the fact that there is a possibility of registering both the flow and the contingent of displaced persons, it is much more difficult to identify the environmental migrants contingent,

and, with an unorganized movement, this task becomes almost impossible to accomplish compared to organized movement. At the same time, in the absence of observation, which provides for a complete coverage of the territory of the immigration of immigrants (which can also be determined very approximately), an alternative method that allows to get at least some information about the number of displaced persons is an independent report on the facts of resettlement by migrants themselves.

All of the above confirms the need to introduce the methodology of statistical assessments of environmental migrants, taking into account the particularities of the factors that caused them, since the whole diversity of such migrations and their characteristics, depending on the type of disaster, cannot be covered by a single methodological toolkit.

We also analyzed existing information resources and databases on environmental migration. Among them, bibliographic databases containing information on publications, articles and research projects on climate migration should be highlighted. It:

1. The CLIMIC database, created by the Faculty of Geography at Neuchatel University in 2015. Allows you to get information on the Thomson Reuters platform about scientific publications of any format on climate migration, including switching to a resource containing the full text of a specific publication, often not in open access.
2. The Environmental Migration Portal: The Changing Climate by IOM contains publications and visual-graphic materials published in the IOM, including publications on the results of the MECLEP program (a study conducted in 6 countries on different continents). Most studies address the issue of integrating migration into plans for national adaptation strategies for climate change as an adaptation option.
3. High-End Climate Impacts and Extremes (HELIX) contains about 100 scientific publications assessing the effects of climate change.
4. The Internal displacement monitoring center (IDMC) is devoted to all internal displacements and contains publications on the economic effects of resettlements, relocations within cities, relocations for reasons of slow crises, cross-

border movements and returns, relocations for reasons of crime and violence, development states.5. Часть публикаций ресурса Global Knowledge Partnership on Migration and Development (KNOMAD) также посвящены environmental migration.

As well as a database of quantitative, numerical data containing information on the number of environmental migrants:

1. The database of the Internal displacement monitoring center (IDMC) contains information about persons resettled for reasons of disasters, catastrophes and accidents within countries. Visualized operational data on the number of displaced persons over the past 30 days, as well as the annual dynamics of the countries of the world.
2. Migration Data Portal. The bigger picture contains migration data by cause, including environmental migration. Presented data obtained from IDMC.

Each of these projects has its advantages and disadvantages, which does not allow us to speak of a unified database or a single information space on the problem of global environmental migration, which provides full analytical opportunities for a comprehensive study of the phenomenon.

## Results and discusión

In the Russian-speaking scientific discourse, studies devoted to this problem are still very few and fragmentary, and the generally accepted conceptual apparatus is also in the formative stage, which makes it very difficult for Russian researchers to communicate with each other and with their foreign colleagues. Therefore, in this article we would like to make some preliminary explanations regarding the theoretical and methodological approach we use. When defining concepts, we find it expedient to proceed from their use in English discourse as richer and more established, despite the difficulties caused by the specifics of translating some of them into Russian.

So the most extensive is the concept of "environmental migration". Currently, it is most often used to refer to migrations caused by environmental changes (IOM, Electronic

resource). The complexity of its use in the Russian-language discourse is mainly in the absence of the possibility of a shorter translation. Alternatively, a generalized concept of "climate and ecological migration" can be proposed. At the same time, the use of the concept of "climate migration", ie, "climate migration", is more specific and refers, as a rule, to population movements caused by natural disasters associated with global climate change, such as floods, hurricanes, droughts, extreme temperatures, etc. On the other hand, the notion of "ecological migration," translated as "ecological migration," based on the semantic features of the word "ecology," may refer to resettlement under the influence of factors not directly related to climate change, such as water and air pollution, deterioration of agricultural lands, extinction of plants and animals or man-made disasters. Thus, the above-mentioned concepts are close due to the deep interdependence of environmental degradation and environmental changes, but not always identical.

It is important to note that the basis for the allocation of ecological migration into a separate species should be exclusively its target orientation. For other classification reasons, such migrations can be of any type and form: be international or domestic, legal and illegal, organized and unorganized, voluntary and forced, long-term and short-term.

Especially a lot of discussion revolves around the question of the extent to which resettlement, carried out under the influence of climatic and environmental factors, can be of a "voluntary" nature, in order to attribute them to the type of migration under consideration. Obviously, in the case of rapidly developing catastrophic natural events, this methodological problem is not relevant. However, in a number of studies, it is noted that often the deterioration of the socio-economic situation plays a greater role in shaping the migration patterns of the population than the slowly progressing negative environmental changes that caused it. In other words, resettlement in such a situation is not the only way out of some emergency, but is proactive and aims at improving the quality of life (Renaud et al, 2011).

A recent study for the European Parliament recommends in such cases not classifying migrants as climatic and environmental migrants (Kraler, Chernei, Noack, 2011). In our opinion, to consider whether such movements of the population as climatic and ecological migrations depends primarily on the objectives of each

specific study. However, even supporters of the most apocalyptic scenarios of further transformation of migratory flows under the influence of environmental changes, such as N. Myers, one of the most well-known researchers of this problem, recognized that not always climatic and environmental factors directly lead to population migration (Myers, Kent, 1995).

Proponents of less pessimistic assessments, among which R. Black stands out, noted the importance of these factors in forced migrations as creating additional pressure, but cautioned against considering them as the only or determining factors (Black, 1998). It seems that the most objective approach is the interpretation of negative environmental changes as one of the underlying root causes of resettlements. Otherwise, in a number of cases, the researcher risks not finding any empirical evidence of the existence of such a phenomenon as climate and ecological migration in general.

A distinctive feature of most Western studies on this topic is a rigid focus on the implementation of specific applied tasks, often associated with humanitarian problems. In an effort to emphasize the forced nature of resettlements caused by environmental changes, researchers and public organizations use the word "refugees", or "refugees," in relation to such migrants. This term was introduced quite early - as early as 1976 by L. Brun (Brown, L., Mcgrath, P., and Stokes, 1976), then became widespread thanks to the work written by E. El-Hinnawi in 1985 for the Program United Nations Environment Program (United Nations Environment Program).

However, "climate and environmental refugees" do not actually have and have never had refugee status, neither in accordance with the relevant UN Convention (Convention on the Status of Refugees, Electronic Resource), nor according to the national legislation of any country. Later studies and reports, including the Office of the United Nations High Commissioner for Refugees (UNHCR, the UN Refugee Agency), refer to the undesirability of using the term "refugee" in relation to environmental migrants. In particular, the UNHCR emphasizes that the confusion caused by its use can undermine the existing legal regime designed to protect refugees, officially endowed with this status. Leaving aside the political side of this issue, as well as arguments about the semantics of the word, it is worth noting that the concept of "refugee" in the strict sense is legal. Therefore, in order to avoid a misunderstanding of the status and legal status of environmental migrants, one



should still call them “migrants”, noting, if necessary, that the movement of the population is forced.

The most widely quoted definition of the term “environmental migrants” to date has been proposed by the International Organization for Migration in 2011: “they are not obliged to be able to live or have a rest, or who will be able to live on their country or abroad” (Glossary on Migration, 2011). In the light of the assessments made of the existing theoretical and methodological approaches to the study of the problems of ecological migration, this definition seems to be the most complete and consistent from both the semantic and the conceptual points of view.

The analysis of approaches to the definition of environmental migration and the phenomenon of environmental migrants belongs to the same scientific area as the problem of statistical accounting of this type of migration. In this regard, it is important to focus on the following point. The collection of data on environmental migration should be implemented taking into account the receipt of timely, accurate and internationally comparable information. Timely data acquisition can play a decisive role, since displaced people need help in organizing life and gaining access to basic living conditions in the place of settlement, regardless of the length of stay in it.

A national migrants accounting methodology organized at the national level should take into account and be based on the following principles:

- the need to use digital technologies in organizing and implementing accounting: electronic portals, for self-registration of immigrants, and geo-information technologies for determining the location of camps for immigrants, as well as data on remittances and data of cellular network operators. In addition, the use of modern technologies allows to model the processes of environmental transformation and, as a result, to predict possible scenarios of population movement for 5-50 years ahead (Melde, 2016).
- environmental migration forecasting should be based on long-term state of the environment information, and take into account gradual changes that ultimately lead to migration, as well as information from national or local

environmental monitoring for short-term forecasts.

- the need to integrate environmental migrants accounting methodology into the national migrant accounting methodology in order to avoid double accounting standards. So, for example, in Vietnam, only internal relocations for more than 30 days are subject to registration (Assessing the evidence ..., 2018), thus climate migrations are not mandatory for registration, subject to the duration of residence of migrants in a new place of residence for less than 30 days therefore, the introduction of environmental migrants accounting should be accompanied by changes in migrant accounting in general.

## Conclusion

In our opinion, the International Organization for Migration which now includes 173 countries could play a key role in the coordination and gradual introduction of common methodological principles and approaches to identifying environmental migrants and the phenomenon of environmental migration itself. The main prerequisite for the creation of this organization was the need for a supranational regulator of large migrant flows in Europe triggered by World War II. The 21st century poses new challenges to the entire global community and, accordingly, to all structures within the UN which have been designed primarily to tackle the problems shared by the mankind as a whole. Undoubtedly, climate change and its consequences belong to such kind of dangers.

A number of countries in Southeast Asia and Africa have already confronted with their negative effects in practice, but this menace does not bear a local character and could not be contained by countries’ borders. Potential flows of mass uncontrolled environmental migration are able to provoke a significant demographic and socio-economic crisis in the receiving countries. Moreover, in such case illegal migration is likely to be on the rise, which might exacerbate the already existing problems of the host societies.

At the present stage no country including the most economically developed ones can fully eliminate the threat of adverse socio-economic and demographic development due to the unexpected massive influx of environmental migrants. Therefore, it is in the interests of the global community to develop and introduce

uniform scientific, legal and registration approaches to environmental migration beforehand, since the main potential risk of such kind of population movement is its latent nature especially on the early stages. As mentioned above, due to the absence of a common understanding of this phenomenon and uniform statistical accounting principles, environmental migration can be easily confused with other types of migration, primarily economic, however such migration flows have different mechanisms of development and might grow massive abruptly if ecological situation in certain regions worsens. Taking into account the uncertainty of prognoses concerning further climate change even in the middle term, it might trigger the realization of the worst scenarios and bring any possible negative consequences for the entire world community.

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