ПОЛІТИЧНІ ПРОБЛЕМИ МІЖНАРОДНИХ ВІДНОСИН

UDK 327:316.32

CLIMATE COMMUNICATIONS OF INTERNATIONAL ORGANIZATIONS AND SUB-NATIONAL SUBJECTS AS ACTORS OF GLOBAL CLIMATE CHANGE SETTLEMENT

КЛІМАТИЧНІ КОМУНІКАЦІЇ МІЖНАРОДНИХ ОРГАНІЗАЦІЙ ТА СУБНАЦІОНАЛЬНИХ СУБ'ЄКТІВ ЯК АКТОРІВ ВРЕГУЛЮВАННЯ ГЛОБАЛЬНИХ КЛІМАТИЧНИХ ЗМІН

КЛИМАТИЧЕСКИЕ КОММУНИКАЦИИ МЕЖДУНАРОДНЫХ ОРГАНИЗАЦИЙ И СУБНАЦИОНАЛЬНЫХ СУБЪЕКТОВ КАК АКТОРОВ УРЕГУЛИРОВАНИЯ ГЛОБАЛЬНЫХ КЛИМАТИЧЕСКИХ ИЗМЕНЕНИЙ

Shevchenko O. V.
PhD (Politics), associate professor, associate professor of the Department of International Mediacommunication and Communication Technologies, Taras Shevchenko National University of Kyiv, Institute of International Relations, e-mail: ovsh@ukr.net

Шевченко О. В.
Кандидат політичних наук, доцент, доцент кафедри міжнародних медіакомунікацій і комунікативних технологій Інституту міжнародних відносин Київського національного університету імені Тараса Шевченка, e-mail: ovsh@ukr.net

Шевченко Е. В.

Кандидат политических наук, доцент, доцент кафедры международных медиакоммуникаций и коммуникативных технологий Інститута международных отношений Киевского национального университета имени Тараса Шевченко, e-mail: ovsh@ukr.net

Annotation. *Resolving the issue of global climate change addresses a number of vital issues, including the identification of participants and the scope of their competences and areas of responsibility. One of the most influential actors are international organizations, in particular the UN and its special structures, programs and projects, whose activities are aimed at tackling global climate change, adaptation and mitigation of the effects of climate change. Such specialized entities include the United Nations Environment Program, the World Climate Research Program, the Global Climate Observing System, the Global Ocean Observing System, and the Intergovernmental Panel on Climate Change. It is emphasized that the application of effective communication tools is an important element in the success of these global climate change response structures. It is shown that in the practice of UN specialized agencies such communication tools as evaluation, special and technical reports, summaries, newsletters, methodological guides, video materials are used; annual conferences, thematic seminars, special information events, etc. are held. In major cases, all information is available to the public in the Internet, as well as in print materials. The author explains the importance of subnational actors, such as cities and regions, in reducing emissions and meeting climate targets that successfully implement regional climate initiatives, which later on serve as a platform for demonstrating, testing and disseminating new, cutting-edge climate challenges. The article demonstrates that the information factor in the work of international*

organizations and subnational actors contributes to the raising awareness among the world community and improving the understanding of the causes and effects of climate change, as well as how countries and communities adapt to the future effects of climate change.

***Key words**: global climate change, UN, IPCC, subnational entities, climate communications*

***Анотація**. Розв'язання проблеми глобальної зміни клімату актуалізує низку першочергових питань, зокрема визначення учасників процесу та обсягів їх компетенцій і сфер відповідальності. Одними з найвпливовіших акторів є міжнародні організації, зокрема ООН та її спеціальні структури, програми і проекти, діяльність яких спрямована на вирішення проблеми глобальної зміни клімату, запровадження дій з адаптації та пом'якшення наслідків зміни клімату. До таких спеціалізованих структур відносяться Програма ООН з навколишнього середовища, Всесвітня програма з досліджень клімату, Глобальна система спостережень за кліматом, Глобальна система спостережень за океаном, Міжурядова групу експертів зі зміни клімату тощо. Наголошується, що важливим елементом успіху діяльності зазначених структур з врегулювання глобальних кліматичних викликів є використання ефективних комунікативних інструментів. Показано, що в практиці спеціалізованих структур ООН використовуються такі комунікативні інструменти як оціночні, спеціальні та технічні доповіді, резюме, звіти, інформаційні бюлетені, методичні посібники, відеоматеріали, щорічні конференції, тематичні семінари, спеціальні інформаційні акції тощо. Як правило, вся інформація доступна у відкритому доступі в мережі Інтернет, а також у друкованому вигляді. Підкреслено важливу роль субнаціональних суб'єктів таких як міста та регіони у зменшенні викидів та досягненні цільових кліматичних показників, які успішно реалізують регіональні кліматичні ініціативи, що стають майданчиками для демонстрації, випробувань і поширення нових, передових технологій вирішення кліматичних викликів. Показано, що інформаційний чинник в діяльності міжнародних організацій та субнаціональних суб'єктів сприяє підвищенню рівня поінформованості світової громадськості і поліпшенню розуміння причин і наслідків зміни клімату, а також способів адаптації країн і громад до майбутніх наслідків кліматичних змін.*

***Ключові слова**: глобальна зміна клімату, ООН, МГЕЗК, субніцальнальні суб'єкти, кліматичні комунікації.*

***Аннотация.** Решение проблемы глобального изменения климата актуализирует ряд первоочередных вопросов, в частности определения участников процесса климата и объемов их компетенций и сфер ответственности. Одними из самых влиятельных акторов являются международные организации, в частности ООН и ее специальные структуры, программы и проекты, деятельность которых направлена на решение проблемы глобального изменения климата, внедрение действий по адаптации и смягчению последствий изменения климата. К таким специализированным структурам относятся Программа ООН по окружающей среде, Всемирная программа по исследованиям климата, Глобальная система наблюдений за климатом, Глобальная система наблюдений за океаном, Межправительственная группа экспертов по изменению климата и др. Отмечается, что важным элементом успеха деятельности указанных структур по урегулированию глобальных климатических вызовов является использование эффективных коммуникативных инструментов. Показано, что в практике специализированных структур ООН используются такие коммуникативные инструменты как оценочные, специальные и технические доклады, резюме, отчеты, информационные бюллетени, методические пособия, видеоматериалы, проводятся ежегодные конференции, тематические семинары, специальные информационные акции и тому подобное. Как правило, вся информация доступна в открытом доступе в сети Интернет, а также в печатном виде. Подчеркнуто важную роль субнациональных субъектов таких как города и регионы в уменьшении выбросов и достижении целевых климатических показателей, которые успешно реализуют*

региональные климатические инициативы, становятся площадками для демонстрации, испытаний и распространения новых, передовых технологий решения климатических вызовов. Показано, что информационный фактор в деятельности международных структур и субнациональных субъектов способствует повышению уровня осведомленности мировой общественности и улучшению понимания причин и последствий изменения климата, а также способов адаптации стран и населения к будущим последствиям изменения климата.

***Ключевые слова**: глобальное изменение климата, ООН, МГЭИК, субницальнальные субъекты, климатические коммуникации.*

Introduction. Adaptation of humanity to global climate change is now regarded as a necessity for solving technical, managerial and communication problems. Managing global climate projects means interaction between many international actors and addresses global climate challenges resolving. Managing climate change adaptation and mitigation is reflected at all levels of government, from local to international. Today, there is a strong understanding of the need for short- and medium-term climate policy based on the long-term forecasts.

Practice shows that current global problems, which are related to global climate change, cannot be solved individually and straightforwardly without the involvement of all stakeholders and the general public. The urgent issue is the development of communication mechanisms that would facilitate the implementation of adaptation strategies, mitigate the consequences, and enhance the adaptive capacity of society and planetary ecosystems. Climate change requires collective action at global level; major changes must be initiated by the most influential international actors, such as international organizations, sub-national actors, and research centers that produce and implement global climate policies at their levels. Climate change is now regarded as a global political challenge, because it has many commonalities with other pressing issues of international policy and how it is addressed by the international community.

Recent literature review. Studies of the risks of global climate change and the role of international organizations and subnational structures in overcoming them are reflected, in particular, in international documents (UN Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, Paris Agreement), materials from UN conferences (UNFCCC)), official publications of the UN specialized agencies (Evaluation reports of the Intergovernmental Panel on Climate Change, UN Climate Change Reports, World Meteorological Organization Research, Global Atmospheric Service, etc.), publications by other UN agencies (including Food and Agriculture Organization, World Food Program, United Nations High Commissioner for Refugees, International Organization for Migration, UN Intergovernmental Commission on Oceanography, UN Environmental Programme), open materials of national meteorological and hydrological services, regional climate centers.

The most extensive publications on this issue are presented in the work of the Intergovernmental Panel on Climate Change under the leadership of R. Pachauri and, in particular, British researchers M. Allen, J. Brum, German V. Kramer, O. Edenhofer, J. Marotzke, and American L. Clarke, K. Field, K. Mach, M. Mastrandrea, B. Preston, Norwegian J. Fuglstwedt, K. Oberin, Australian M. Hofden, S. Power, Russian V. Kattsov and others. These studies look at global causes and possible scenarios for managing global climate change.

Specific areas for tackling global climate change, including contribution of international organizations and research centers are contained in the work of the Spanish researcher XK. Abanades, Japanese M. Akai, American S. Benson, K. Keldeira, R. Doctor, Dutch H. De Koninko, B. Metz, L. Meyer, British P. Freund, D. Gale, E. Palmer and others; the role sub-national actors are in the work of Hsu, A.; Widerberg, O.; Weinfurter, A.; Chan, S.; Roelfsema, M.; Lütkehermöller, K. and Bakhtiari, F.

Information about the role of subnational actors in addressing global climate challenges is also provided in the special reports (Bridging the Emissions Gap, CDP Supply Chain Report 2017, Green Bonds Market Summary, Low Carbon Investment Registry Highlights and others); analytical

reports of research centers (Center for Climate and Energy Solutions, Center for International Climate and Environmental Research, Climate Ark, Harvard Project on Climate Agreements, etc.); specialized communication programs on climate change at Yale University, George Mason University, the Adam Corner British Project and the Adelphi Platform. These documents identify the interplay between global climate and non-climate risk factors and the role of international organizations, sub-national actors and research centers in overcoming them.

However, the new realities of global climate change and the impact of international actors require further exploration of this issue. Unfortunately, the role of international organizations and research centers in the development of global climate change policy and its communicative support has not yet been given sufficient attention in Ukrainian literature. Therefore, the study of these issues is an urgent problem of modern international communication, and their solution will be of considerable practical importance.

The purpose of the study is to identify the communicative tools and technologies used by international organizations and subnational actors as international actors to disseminate climate information and generate awareness and support the global public opinion on their climate initiatives.

Main research results. UN Secretary-General Antonio Guterres called the problem of climate change "a major issue of our time, and its solution is a turning point in history" [13]. According to the Secretary-General of the United Nations, global climate change is the responsibility of all stakeholders, including states, governments, international organizations, subnational actors, corporations, public movements, the scientific community, individuals, the media, etc. This idea is supported by the 2007 Nobel Peace Prize laureate, former Head of the Intergovernmental Panel on Climate Change (2002 to 2015), Rajendra K. Pachauri, who states that "the most driving force behind the implementation of global climate change adaptation and mitigation programs are governments, political parties, the UN, international organizations, corporations and every citizen of the planet" [15].

One of the most powerful structures for mitigating and adapting to global climate change is the United Nations and its structures that take a system-wide approach to addressing climate change. The United Nations Framework Convention on Climate Change (UNFCCC) is a comprehensive mechanism for coordinating international action in response to this problem. The document, which was signed by 154 countries (plus the EU) in Rio de Janeiro in 1992, came into force in March 1994. Its ultimate goal is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would not allow dangerous anthropogenic impacts on the climate system. Such level must be reached within a timeframe sufficient for the natural adaptation of ecosystems to climate change, which will not compromise food production and ensure further economic development on a sustainable basis" [12]. Now, the list of the State Parties to the Convention is almost universal – 197 countries ratified the Convention and became its parties.

In 1995, countries began negotiations to strengthen global climate change responses. Two years later, the Kyoto Protocol was adopted. This document commits developed countries, Parties to the Protocol, to reduce their greenhouse gas emissions. The first commitment period began in 2008 and ended in 2012. The second period began on January 1, 2013 and will end in 2020. The Kyoto Protocol has 192 member states.

The 21st Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Paris in December 2015, concluded a historic agreement to fight climate change and enhance the activities needed to ensure sustainable low carbon development. The Paris Charter relies on the Convention's mandate and unites all peoples for the first time in history in order to take decisive steps to combat climate change, mitigate its effects and assist developing countries. The main goal of the Paris Agreement is to strengthen global climate action so as to keep global temperatures rising to 2°C this century and even try to reduce it to 1.5°C. The Paris Agreement was signed at the UN Headquarters in New York on April 22, 2016, the International Mother's Day, by the Heads of 175 countries. This has become a record number of countries that have signed an international agreement in one day. In September 2019, the Secretary-

General of the United Nations held a Climate Summit to discuss issues in this area. The world leaders gave a presentation on the measures that were taken and the activities planned until the UN Climate Conference to be held in 2020.

A large number of structures, programs and projects have been set up within the UN to address global climate change, adaptation actions and mitigate the effects of climate change. For example, the United Nations Environment Program (UN-Environment, UNEP) is a "leading global environmental organization that defines a global environmental agenda, promotes a coherent implementation of the environmental component of sustainable development within the UN system, and is a credible defender of environmental interests" [14]. The UN Program collaborates with governments, the private sector, civil society, international academia and professionals as well as with other UN bodies and international organizations around the world. It is the main UN body in the field of environment, it defines the policy and coordinates the activities of all organizations of the UN system and beyond in the environment and is responsible for the environmental component of sustainable development. UNEP publishes a large number of reports and newsletters [19]. For example, the Fourth Global Environmental Initiative (DEI-4) is a good example of a report on ecology, development and human well-being, and provides analytical material and information for policymakers and all stakeholders. One of the main ideas of the DEI-4 is to warn humanity that it "lives inappropriately to its wealth." The report notes that the number of people is so large that the amount of resources needed to survive exceeds the available amount. The environmental imperative (or the amount of land required to provide one person's food) is 21.9 hectares, while the Earth's biological capabilities is 15.7 hectares per person.

United Nations agencies are monitoring the environmental impacts of climate change. The UN also supports joint programs to address global climate problems. Such joint programs include, in particular, The World Climate Research Programme (WCRP), The Global Climate Observing System (GCOS) and The Global Ocean Observing System (GOOS) [17]. These programs are funded by the UNESCO International Oceanographic Commission (IOC), the United Nations Environment Program, the World Meteorological Organization and the International Science Council. The activities of the World Climate Research Program (WCRP) contribute to the improvement of the forecasting capabilities of operational centers in extended weather and seasonal weather forecasts and contribute to the prediction of annual, ten-year and long-term variability, as well as to improving the estimation of validity and prospects climate. The WCRP provides the bulk of the scientific input to the Intergovernmental Panel on Climate Change in the process of developing its recommendations, and forms the scientific basis for adapting to climate change and developing mitigation strategies that are implemented internationally and regionally over time. The Global Climate Observation System (GCOS) was established in 1992 to provide the production of observations and information needed to address climate issues and bring them to all potential users. The GCOS is a long-term user-oriented operating system to provide comprehensive observations needed to monitor the climate system, identify and explain climate change, evaluate the effects of climate change and variability, and support research efforts to improve climate understanding and anticipation. It deals with the entire climate system as a whole, including its physical, chemical and biological properties, as well as processes occurring in the atmosphere, oceans, on land and in the cryosphere. The Global Ocean Observation System (GOOS) is an ongoing global system for the observation, modeling and analysis of marine and ocean variables in support of operational maritime services worldwide. GOOS provides an accurate description of the current situation in the ocean, including living resources; provides continuous forecasts of future sea conditions for as long as possible, as well as a basis for climate change forecasts.

In 1988, UNEP and the World Meteorological Organization established the Intergovernmental Panel on Climate Change (IPCC), a UN special unit dedicated to the study of global climate change. The IPCC's role is to evaluate, on a comprehensive, objective, open and transparent basis, available scientific, technical and socio-economic information related to understanding the scientific basis of the risk of climate change caused by human activity, its potential impact and adaptation and mitigation consequences. The IPCC does not carry out research and monitoring of climate-related

data. Its estimates are based on published and peer-reviewed scientific and technical literature. In 2013, the most comprehensive data on anthropogenic impacts on climate change were presented. The IPCC has issued its Fifth Assessment Report, which clearly identified the anthropogenic cause of global climate change.

The IPCC's main information product is the Assessment Report, which presents current and expected changes in the Earth's climate, their impact on natural and economic systems, public health, as well as opportunities to adapt to climate change and mitigate human impact on the global climate. The IPCC Sixth Assessment Report commenced in 2015 and will end in 2022. Each volume of the report has a Technical Summary and a Policy Summary (which is prepared with a minimum of technical terms). The term of preparation of such reports is 5 – 7 years. Numerous national meteorological and hydrological services and related agencies, as well as regional climate centers, the World Meteorological Organization (WMO), the World Climate Research Program, the Global Atmospheric Service and the Global Crioshpere Service, are sources of information for the IPCC report. Information is also provided by a number of other UN agencies, including the Food and Agriculture Organization, the World Food Program, the Office of the United Nations High Commissioner for Refugees, the International Organization for Migration, the UNESCO Intergovernmental Oceanographic Commission and the United Nations Environmental Program. WMO, for example, uses data sets (based on monthly climatological data from observation stations) from the National Oceanic and Atmospheric Administration of the United States of America, the Goddard Institute for Space Research, NASA, Hadley's Center, Meteobureau of the United Kingdom and The Climatic Research Unit (CRU) of the University of East Anglia in the United Kingdom. WMO also uses data sets from the analysis conducted by the European Center for Medium-Term Weather Forecasts and its Climate Change Service within the Copernicus program, as well as by the Japan Meteorological Agency. The combination of observational data with simulation enables the estimation of temperature values at any time, anywhere in the world, even in the polar regions.

In the cycle of the main Assessment Report, special reports, technical reports, methodological reports or methodological manuals can also be prepared, as well as various thematic seminars, based on which the reports are published. Each type of such information products has its own specific. However, they are all based on information from scientific publications. In doing so, IPCC reports should be politically neutral in order to become a basis for policy-making.

The Special Reports highlight a specific topic relevant to the activities of two or three IPCC Working Groups. They also contain a Summary for Politicians. The term of preparation of special reports is 2 – 3 years. A Synthesis Report is also being prepared, summarizing the most important information presented in the reports of all three IPCC Working Groups in the Assessment report, as well as in the special reports prepared in this IPCC work cycle. The Synthesis Report also has its own Summary for Politicians. Sometimes it is decided to prepare a Technical Report that summarizes information on a specific issue that has been presented in other reports – evaluation or ad hoc. For example, the Climate Change and Biodiversity Technical Report (2002) was released in 2002. All types of IPCC information products are available on the organization's public website http://www.ipcc.ch/publications_and_data/. They are also published in hard copy.

The UN's response to global climate change was honored with the Nobel Prize in 2007. Nobel Peace Prize winners were Intergovernmental Panel on Climate Change and former US Vice President Albert Gore. They have been honored with this award for their work in studying and disseminating information on anthropogenic causes of climate change, as well as for developing possible measures to combat such changes.

The UN website also provides a big variety of open information on climate topics. In addition to the IPCC Climate Assessment Report, there is the WMO Greenhouse Gas Bulletin, the United Nations Environment Program Gap Report, the New Climate Economy Report and others [20]. For example, the WMO Bulletin on Greenhouse Gases publishes data on the concentration of greenhouse gases in the Earth's atmosphere, which states that the levels that hold the heat of greenhouse gases in the atmosphere have reached another record. A key report of the United

Nations Environment Program includes a final estimate of the gap in the emission level, i.e. the gap between the expected emission levels in 2030 compared to the targets corresponding to the 2 / 1.5 ° C level. The report emphasizes that the level of global emissions is rising as national commitments to combat climate change prove inadequate. However, the growing indluence from the private sector and the untapped potential of innovation and green finance are creating ways to bridge the gap in emissions. According to the New Climate Economy report for 2018, the next 2-3 years are a crucial period, during which a number of political and investment decisions will be taken that will determine the future of the planet for the next 10-15 years. The document notes that front-runners are already taking advantage of the economic and market opportunities for growth that a new approach offers, while laggards not only lose those opportunities but also put all of us at increased risk. If everyone takes this approach, it can bring in over $26 trln. and make the world more sustainable.

Russian researchers A. Gladilshchikov and S. Semenov believe that "recently, IPCC has been paying much attention to communication strategies. The conclusions of IPCC reports should be communicated to governments, relevant NGOs and the public concerned. It is important to use publicly available terms to point out the importance of these conclusions for different social groups of the population, their current and long-term interests, for future generations" [*Гладильщикова, Семенов,* 2017: 19]. Confirmation of this is the UNDP Special Comprehensive Program on Improving Climate Change and Early Warning Systems for Climate Change and Adaptation to Climate Change in Africa, Asia and the Pacific. Under this program, subregional and regional systems provide disaster preparedness and response based on a model that integrates risk knowledge, monitoring and forecasting components, information dissemination and alert response.

UNESCO, together with other UN agencies, promotes climate change education and public awareness at high-level events, such as the UNFCCC annual conferences within the UN Alliance on Education, Training and Publicity on Climate Change. As part of its program on Climate Change Education for Sustainable Development, UNESCO seeks to help people understand the effects of global warming and increase climate literacy among young people. This program and other innovative educational initiatives, including the Global Action Program, Climate Change Empowerment Actions and the ZOOM Campaign, were presented and discussed at the United Nations Climate Change Conference (COP-22) held in Marrakech, Morocco in November. 2016.

As part of its work on education for sustainable development, UNESCO supports countries in integrating climate change into education, and facilitates dialogue and exchange of experience in the field of climate change education through international expert meetings. UNESCO calls on schools to implement climate change education through a "school-wide" approach. In accordance with this approach, the principles of sustainability are integrated into the management of school premises and equipment, as well as into the structures of management of educational institutions. UNESCO is developing technical guidance and teaching materials, including a six-day online course for Secondary School Teachers on Climate Change. The UNESCO Climate Change Education Center provides stakeholders with free access to hundreds of climate change education resources.

By supporting the capacity-building of journalists and broadcasters on climate change, UNESCO helps Member States raise public awareness and improve understanding of the causes and consequences of climate change, as well as how countries and communities adapt to the future effects of climate change. This work also helps to highlight the activities of governments and companies to counter these threats. An example of this is the publication Climate Change in Africa: A Guide for Journalists [22].

The World Metrological Organization (WMO) works closely with weather forecasters, who are responsible for education and information on climate issues. Their efforts have created a new network "Climate Without Borders", which covers approximately 375 million people every day and aims to "educate, motivate and activate" weather forecasters so that they provide relevant and useful information to relevant audiences. In addition, in partnership with Climate Central, WMO has released a series of videos entitled "Summer in the Cities" that simulate weather in cities around the

world as a result of global warming. These videos are a follow-up to the Weather in 2050 series of television weather reporters presenting weather forecasts calculated in the 2050 weather scenarios [21].

The UN understands that education and public awareness have an important role in enhancing the capacity of communities to mitigate and adapt to climate change, enabling people to make informed decisions. On the other hand, information and education is the first step towards implementing adaptation strategies and mitigating the effects of global climate change. Combating climate change requires the involvement of as many stakeholders and collective action as possible across the globe. Therefore, on December 3, 2018, the climate bot ActNow.bot was launched on the UN's Facebook page at the UN Climate Conference in the Polish city of Katowice. This initiative will allow the public to be informed about the developments and take an action to fight climate change. According to the organizers, "with ActNow.bot, people will be able to better understand what actions they can personally take to combat climate change. ActNow.bot will recommend day-to-day activities, such as going by public transport, eating less meat, tracking the volume of measures taken, which will allow us to assess the impact of collective action at this critical moment in our planet's history" [21]. Another UN-supported information project is the "People's Seat" initiative, in which famouse naturalist and TV presenter Sir David Attenborough invites people to share their thoughts on the need to battle climate change. Thousands of well-known social networks users have already joined this action with the hashtag #TakeYourSeat and shared their ideas with their followers. The campaign is aimed to attract the attention of the general public to the problem of climate change and battling it. People all over the world have the unique opportunity to share their thoughts, which were then featured in a special People's Message read by Sir David Attenborough at the KS-24 Conference in Poland.

Thus, the United Nations system is one of the leading actors in the architecture of international governance for a range of climate change activities. States Parties are required to reaffirm their support for the organizations of the system and to provide them with the resources necessary to develop a consolidated, effective and efficient system-wide climate change strategy that takes into account the processes underway in the implementation of the UNFCCC, and would be consistent with the results of past and future sessions of the Conference of the Parties (COP). The UN also uses traditional and modern tools to convey its position to target audiences.

In addition to international organizations, subnational actors, whose activities often have a decisive influence on state behavior and the international system, play a significant role in settlement of global climate change. On the eve of the Global Climate Action Summit (GCAS) held in San Francisco in September 2018, the UN released an environmental review highlighting the important role of non-state actors in reducing emissions and achieving climate targets. The document emphasized that "non-state actors such as cities, regional governments, companies, investors, higher education institutions and public organizations are increasingly committing themselves to resolutely battling climate change" [14]. The survey notes that "most national governments do not make the stated efforts to improve climate change legislation, as declared in the Paris Agreement, while the efforts of non-state (subnational) entities are becoming increasingly important to achieve the global goals of reducing emissions" [14]. The document shows that over the three years since the Paris Agreement, the framework and pace of climate change efforts among non-state actors has increased significantly. Cities, regions, businesses, civil society and a number of other sub-national actors can take individual and joint action to tackle climate change. Overall, the UN study analyzes the results of more than 183 international cooperative initiatives and thousands of non-state actors located in 7,000 cities, 133 countries, and more than 6,000 private companies.

Certain actions by non-state and sub-national actors concerning climate change are presented in form of commitments, initiatives or goals. As a rule, they refer to a diverse set of management measures that are implemented in parallel with state and intergovernmental arrangements. When such non-state actors are involved in international cooperative or transnational climate management initiatives, they may define their individual commitments or climate actions according to the set of

rules identified by the initiative or program. Typically, these entities undertake to operate in the climate field through a range of networks that combine individual climate commitments or reporting platforms. The criteria for participating in these networks and platforms differ: some networks require participants to fulfill specific obligations, such as reducing greenhouse gas emissions or submitting regular emissions reports; others prefer collective knowledge sharing and capacity building; the third of these are membership-based networks that do not require entities to commit to specific goals. Despite the considerable coverage and analysis of non-state actors' actions on climate action, it is difficult to obtain comprehensive global statistics.

The analysis shows that the participation of individual non-state actors through similar networks has increased since the Paris Agreement. For example, if in 2015 the number of cities that came up with climate initiatives was 7,025 from 99 countries (11% of the world population), in 2017 their number increased to 7,378 cities from 133 countries (16.9% of the world population); in 2015, there were 116 regions from 20 countries (11% of the world population), in 2017 – 245 regions from 42 countries (17.5% of the world population). Similarly, this tendency is relevant for companies and investors, if climate projects were implemented in 2015 by 4,431 companies from 88 countries and more than 400 investors with a total asset portfolio of about US $ 25 trillion, then in 2017 there were already 6,225 companies and investors from 120 countries with a combined portfolio assets about US $ 36.5 trillion. In 2015, 15 of the 20 largest banks in the world participated in such projects, in 2017 – 34 of the 57 largest banks with a total market capitalization of US $ 3.1 trillion. Following the Paris deal in 2017, there are approximately 700 US colleges and universities with a total student population of approximately 1 million and endowment funds of US $ 250bn. participated in climate initiatives [*Hsu, A.* et.al, 2018: 28].

When considering such sub-national actors as cities and regions, there are several networks that integrate urban and regional climate initiatives. Examples of such networks are the Global Covenant of Mayors (GCoM), signed by 9130 cities, covering 775.5 million people worldwide (just over 10% of the world population). All signatories are required to submit separate Sustainable Energy and Climate Action Plans or to reduce their carbon footprint by 40% by 2030 [6]. ICLEI, a global network of regional governments, has developed the Carbonn Climate Registry, which includes more than 1,000 cities and regions from 89 countries (covering 9% of the world's population) and is publicly available at http://carbonn.org/. 110 regional governments from 36 countries in the world (total population 658 million, 18% of the world economy and 3.9 GtCO2 baseline emissions) in 2017 signed an agreement on states and regions and committed themselves to 290 climate actions, aimed at reducing emissions, developing renewable energy sources and energy efficiency that are expected to "lead to an overall (aggregate) reduction of 21.9 GtCO2 between 2010 and 2050 if climate targets are met in time" [10].

According to a Climate Development Program (CDP) survey in 2018, more than 6,300 companies with a total value of more than $ 3 trillion and over 650 investors with assets of $87 trillion support climate protection programs [1]. In 2017, the CDP survey found primary data from more than 4,800 companies, of which 47% reported emission reductions or a target for renewable energy. The 2018 Green Bonds Market Summury showed that $ 74.6 billion of green bonds were issued in the first half of 2018, by 156 issuers from 31 countries [3]. The largest number of green bonds and the largest financial donor to climate projects in energy, construction and land use were companies and investors from the United States and China. The Low Carbon Investment Registry (LCI) currently includes 53 investors from 21 countries, with US $ 50 billion in low-carbon assets [7].

By attracting big non-state and sub-regional actors representing a large number of population of the planet, the implementation of International Co-operative Initiatives (ICI) can lead to significant emission reductions, in circumstanses that achieving climate goals does not contradict with their other goals. In addition to direct emission reductions, international cooperative initiatives can, in particular, work out concepts of local development strategies, stimulate the development and diffusion of technology, and assist in the formulation of additional initiatives and activities. There are several databases that collect information about ICI, the largest of which is the Climate

Initiatives Platform, which is regularly updated, includes clear criteria for analysis and is publicly available. This Platform is supported by UNEP and includes ICI that meet the following criteria: includes several non-state actors involved in voluntary activities and may include States; are intended to reduce greenhouse gas emissions or increase ecosystem sustainability, or may result in greenhouse gas emissions reductions or gas sustainability; have an international scale or potential for significant global impact, and have a focal point [4]. The Climate Initiatives platform currently contains 244 initiatives, 220 of which are related to mitigation of global climate change in more than one country. Over the last two decades, the number of international cooperative initiatives has increased significantly, and the peaks of launching new initiatives are directly related to major climate events such as the COP-15 in 2009, the UN Climate Summit convened by UN Secretary-General Ban Ki-moon in 2014. and COP-21, which took place in 2015 in Paris.

The largest growth of international cooperative initiatives is observed in Latin America and the Caribbean, where the number of ICI has increased from 6 in 2016 to 25 in 2018. In Western Europe, Asia and the Pacific, regional participation is about twice as high as in 2016. Researchers note that global ICI may be more active in regions with relatively low participation in regional ICI such as Southeast Asia and the Middle East. 149 out of 220 ICIs cover several sectors, mainly energy, industry, forestry, transport, agriculture and construction. The choice of the sector often changes according to the needs and capabilities of the regions where they are implemented. Sustainability and agriculture, for example, are most commonly implemented in low- and middle-income countries, while initiatives in the industrial sector are most prevalent in high- or middle-income countries. The percentage of ICI that set quantitative targets, that is, specific, measurable targets, such as reducing emissions by a certain amount to a specific year, or raising funds to strengthen the capacity of certain communities remains low, around 22%. The analysis showed that only 8 initiatives had clear targets for reducing emissions per year. Monitoring, reporting and verification practices remain weak. Many initiatives do not conduct or do not disclose cost estimates or feasibility studies, which creates an additional barrier to assess the feasibility and effectiveness of the project. Only a few initiatives, such as The Bonn Challenge, support an interactive online panel that tracks the commitment of its subscribers and their potential collective progress toward the goal of the initiative.

Non-state and sub-national actors are therefore also contributing greatly to global climate change governance. At the international level, there is particular interest in how much they can contribute to global GHG reductions by 2030 and the extent to which these potential contributions are already included in national climate policies. The activities of sub-national actors on climate change are not limited to quantitative indicators of potential emission reductions. They play an important role in building confidence in national governments in the implementation of climate policy, implement innovative projects, share experiences with other participants in climate processes, i.e. undertake actions that are difficult to quantify.

Research findings from research and education centers, metrological and hydrological services also become the basis for political decision-making and the promotion of global climate change in society. Therefore, such structures can also be identified as actors in addressing global climate challenges. Thus, national meteorological and hydrological services facilitate national climate assessments. As a rule, their documents are used in policy formulation and are informational and advisory in nature. A new report from the US Federal Metrology Bureau explains how climate change impacts the environment, agriculture, electricity, land and water, transportation, health and wellbeing, and the risks that it will cause damage to infrastructure and property rights in the country and how this will hold back economic growth in this century. UK's Metrology Service assessment published on November 26, 2018 warned that by 2070 summer temperatures could be up to 5.4 ° C, summer rainfall could reach 47% and sea levels by 2100 may increase by 1.15 m in London. The report of the Swiss Climate Scenario Service, released on November 13, 2018, notes that the climate in Switzerland becomes hotter and drier, but nonetheless, in the future the country will have to face more strong rains and its famous ski resorts will become less snowy [16].

Powerful resource centers that accumulate information on global climate change are the Center for Climate and Energy Solutions, a non-governmental organization that conducts research related to the development of new energy technologies to tackle climate change; Center for International Climate and Environmental Research (CICERO) – an independent Norwegian Climate Policy Research Center that publishes climate policy reports, news and analysis; Climate Ark is a portal and search engine that provides access to news articles, working papers, government reports and climate change related research; Harvard Project on Climate Agreements, a project sponsored by the Harvard Center for Science and International Relations, provides access to working papers, records and comments of climate negotiation experts.

Among the university's climate change programs are US climate change projects at Yale, George Mason University and Adam Corner's British project. It is worth noting that they are not only conducting research on global climate change, but are also paying much attention to the information aspect, that is, informing the world's public about climate challenges in order to raise awareness of the issue. For example, the Yale University's Climate Change Communication Program conducts research to raise public awareness of global climate change, identify the public's concerns, political preferences and behaviors of ruling political elites, as well as major psychological, cultural and political factors, that affect them. Representatives of the general public, government, media, business, non-governmental organizations are invited to discuss climate issues on the daily national radio program Yale Climate Connections [11]. The results of the research are published in open reports, interactive maps, scientific articles, and are presented during public presentations and private briefings. Yale University's climate research program is used by hundreds of news organizations, including CBS, ABC, NBC, CNN, New York Times, Washington Post, Associated Press, Guardian, Xinhua, and more.

The mission of the Communications Center for Global Climate Change at George Mason University is to develop and implement scientific knowledge that will help society make informed decisions that stabilize the earth's viable climate and prevent further damage from climate change. To achieve this, the Center participates in three broad activities: conducts research in the field of communications; helps government agencies, NGOs, professional associations, and companies apply social science research to improve their grassroots engagement initiatives; and prepares students and communications professionals who will have the knowledge and skills needed to engage the public in climate change projects. For example, under the "Climate Change Program in the American Understanding" national representative surveys are conducted twice a year in partnership with the Yale Climate Change Communication Project from 2008 to study and track public understanding of climate change. Since 2009, in collaboration with the American Meteorological Society, NASA, the Yale Program, the TV project "TV anchors as Climate Educators" has been launched to turn anchors of weather programs into opinion leaders in global climate change. Each week, more than 300 television meteorologists from across the nation receive climate material and experts' explanations of how to use this data to competently inform the public about the effects of climate change. The 2014 "Climate and Health Project" launched in collaboration with leading US medical and nursing societies and related organizations, assesses clinicians' knowledge and experience of the effects of climate change on public health and support interested clinicians to inform the public and policy makers about the impact of climate change on health. Since 2012, the National Park Service and the Environmental Alliance for Urban Ecology have launched a national park program and organized summer internships for students on climate change and its impact on national parks. There are also partnership programs raising awareness of climate change with a large number of government agencies, NGOs and universities in the region, aiming to strengthen their programs to address climate change and promote community resilience [2].

"The Climate Communication" project of Adam Corner's British Research Center brings together scientists and practitioners working to engage the public in climate change. Since 2018, the project has been working in three main areas [9]: auditing the skills and capabilities of UK practitioners on climate change, identifying audiences, networks and co-production channels, and

synthesizing resources through seminars, online meetings and online stakeholder surveys, collaborating with community networks to identify their needs and potential barriers to discuss climate science topics. The results of all the studies are published on the project website.

One of the most powerful centers for research on global climate change in continental Europe is the Adelphi platform, which is supported by the Federal Ministry of Foreign Affairs of Germany. The main objective of the project is "the exchange of information on the environment, climate conflicts and international climate cooperation" [5]. The Adelphi's activities focus on two main areas: climate diplomacy and developing strategies for resilience to global climate change. Climate diplomacy explores the external dimension of global climate change and climate policy, including various regional and thematic approaches, including access to drinking water, global food safety, global climate risks, climate security in the UN, G7 and informing key stakeholders about global climate instability. The second approach is to analyze and highlight approaches and projects to adapt and mitigate the effects of global climate change.

To inform and disseminate knowledge among key stakeholders about a variety of climate policy topics, the Adelphi platform offers several tools, including file documents on the project site about more than 120 environmental conflicts around the world; exhibitions and their Internet version with a demonstration of the dramatic impact of global environmental change, links to conflicts and opportunities for collaboration; video interviews with leading experts and thematic videos; newsletters about the most interesting current events, research, events and initiatives and more. Adelphi receives information on specific climate projects and initiatives from partners around the world. Among the largest partners of the project are the Energy Poverty Research Group (EPRG) of the University of Queensland (British Columbia), the Manipal Advanced Research Group (MARG) of India, the leading African Center Institute Institute for Security Studies (ISS) from South Africa, The Voinovich School of Leadership and Public Affairs at Ohio University, USA; Fund for the Future of Latin America (Fundación Futuro Latinoamericano, FFLA); Center for Non-Traditional Security Studies (NTS) of Asia Pacific at the University of Singapore; Environmental and Security Change Program at the US Wilson Center; Ministry of Foreign Affairs of the Netherlands with "the Planetary Security Initiative" (PSI) and others.

So, scientific research, the activities of international projects and research centers stimulate new developments in energy efficiency, the use of alternative energy sources, startups around the world. However, all of these projects, although quite specific, cover a limited number of people and territories and operate within the limits set by national law.

Conclusions. Today, projects aimed at addressing global climate challenges are being implemented by international organizations and sub-national actors. However, the results of their activities differ in the nature of the decision, the audience reach, the range of used tools, the speed of implementation of climate initiatives and other parameters. Thus, international organizations make mostly advisory types of climate decisions, which are implemented through the establishment and financing of specialized structures, the implementation of environmental projects, the financing of climate researches, the development of recommendations for decision-making by political leaders, the involvement of opinion leaders, and so on. Their implementation speed of climate tools and initiatives is slow. At the same time, one of the most powerful structures that defines global climate policy for mitigation and adaptation to global climate change is the United Nations and its structures that adhere to a system-wide approach in solving climate change issues.

Sub-national and non-state actors' initiatives are increasingly becoming the platform for demonstration, testing and dissemination of new, cutting-edge technologies for addressing climate challenges. They often take action to tackle climate change through a number of networks and initiatives. Over the last two decades, the number of such coalitions has increased significantly. On the other hand, non-state actors cannot act as a dominant actor in overcoming global climate problems due to a number of factors. First of all, non-state and sub-national actors need to gain the support of national governments and ruling parties to carry out their activities. Secondly, the data that would allow a comprehensive assessment of the potential impact of subnational actors on climate change is limited.

The tools served by sub-national actors include, in particular, the adoption of local development programs, regional, city-level action plans, implementation of joint environmental projects and initiatives at local level, involvement of business entities, cooperation with partner cities, dissemination of information and sharing experiences through forums, roundtables, seminars, trainings, websites and more. Given the local nature of projects in practice, they are being implemented fairly quickly.

The results of research and projects of educational institutions and research centers are advisory and informative. The conclusions of scientific developments are the basis for political and managerial decision-making at all levels. Therefore, the target audience of the research centers is quite narrow and segmented. Their tools include, particularly, conducting their own research and disseminating their results to decision-makers, opinion leaders, media means, conducting joint research with partner organizations, disseminating ideas through training courses, developing and disseminating educational literature. It can be concluded that the findings of their studies are implemented in practice at medium speed or even slowly because of a large number of decision-making units at the relevnt structures.

References

1. *CDP Supply Chain Report 2017. Closing the Gap: Scaling up sustainable supply chains,* < https://b8f65cb373b1b7b15feb-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/003/014/original/CDP_Supply_Chain_Report_2018.pdf>.
2. *Center for Climate Change Communication. Programs,* <https://www.climatechangecommunication.org/programs/>.
3. *Climate Bonds Initiative. Green Bonds Market Summary: H1 2018,* <https://www.climatebonds.net/fles/fles/H1%202018%20Highlights_12072018.pdf>.
4. *Climate Initiatives Platform About the Climate Initiatives Platform,* <http://climateinitiativesplatform.org/index.php/Climate_Database:About>.
5. *ECC Platform. About ECC,* <https://www.ecc-platform.org/about-ecc>.
6. *Global Covenant of Mayors for Climate & Energy. ThisiIs a powerful and historic response to climate change,* <https://www.globalcovenantofmayors.org/>.
7. *Global Investor Coalition on Climate Change. Low Carbon Investment Registry Highlights,* <http://globalinvestorcoalition.org/portfolio/summary/>.
8. *Hsu, A.; Widerberg, O.; Weinfurter, A.; Chan, S.; Roelfsema, M.; Lütkehermöller, K. and Bakhtiari, F.* (2018). *Bridging the emissions gap - The role of non-state and subnational actors. In The Emissions Gap Report 2018*. A UN Environment Synthesis Report. United Nations Environment Programme. Nairobi.
9. *The Climate Communication Project,* <https://theclimatecommsproject.org/climate-communicators-a-visual-map/ >.
10. *The Climate Group.* Global States and Regions Annual Disclosure: 2017 Update: How Over 100 States and Regions are Acting on Climate Change, <https://www.theclimategroup.org/sites/default/fles/disclosure_update_2017_digital.pdf>.
11. *The Yale Program on Climate change Communication. About The Program,* <https://climatecommunication.yale.edu/about/the-program/>.
12. *United Nations Framework Convention on Climate Change,* <https://unfccc.int/resource/docs/convkp/conveng.pdf>.
13. *UN: Climate Action Summit 2019,* <https://www.un.org/en/climatechange/un-climate-summit-2019.shtml>.
14. *UNEP: Why does UN Environment matter?,* <http://www.unepcom.ru/unep/unep.html>.
15. *Буняк Р. Нобелевский лауреат: Чтобы спасти Землю, нужно отказаться от мяса, авто и одежды* [Nobel laureate: To save the Earth, you need to abandon meat, cars and clothes], <https://fakty.com.ua/ru/lifestyle/20170911-nobelivskyj-laureat-aby-vryatuvaty-zemlyu-treba-vidmovytysya-vid-m-yasa-avto-ta-odyagu/>.

16. *ВМО Сигналы и последствия изменения климата сохраняются в 2018 году* [Signals and effects of climate change persist in 2018], <https://public.wmo.int/ru/media/пресс-релизы/сигналы-и-последствия-изменения-климата-сохраняются-в-2018-году>.
17. *ВМО Совместно спонсируемые программы* [Co-sponsored Programs], <https://www.wmo.int/pages/summary/cosponsored_summary_ru.html>.
18. *Гладильщикова А.* (2017) *Межправительственная группа экспертов по изменению климата (МГЭИК): цикл шестого оценочного доклада* [Intergovernmental Panel on Climate Change (IPCC): Sixth Assessment Report Cycle], *Фундаментальная и прикладная климатология,* 2: 13–25.
19. *ООН Глобальный обзор действий по борьбе с изменением климата указывает на нарастающую динамику, перемещении бремени, упущенные возможности* [The global climate action review points to growing momentum, displacement burdens, missed opportunities], <https://www.unenvironment.org/ru/news-and-stories/press-release/globalnyy-obzor-deystviy-po-borbe-s-izmeneniem-klimata-ukazyvaet-na>.
20. *ООН Доклады по климату: Ключевые доклады о мерах и решениях в области борьбы с изменением климата* [Climate reports: Key reports on climate change measures and decisions], <http://www.un.org/ru/climatechange/reports.shtml>.
21. *ООН ООН и меры по борьбе с изменением климата* [UN and Climate Change], <http://www.un.org/ru/climatechange/un-climate-action.shtml>.
22. *ЮНЕСКО Образование и информированность в вопросах изменения климата* [Climate change education and awareness], <https://ru.unesco.org/themes/obrazovanie-i-informirovannost-v-voprosah-izmeneniya-klimata>.

УДК 327