

Developing Practical Cooperation through Science

Kazakhstan has been actively engaged within the framework of the NATO Science for Peace and Security (SPS) Programme since 1993.

The NATO SPS Programme enables close collaboration on issues of common interest to enhance the security of NATO and partner nations by facilitating international efforts to meet emerging security challenges, supporting NATO-led operations and missions, and advancing early warning and forecasting for the prevention of disasters and crises.

The current SPS Key Priorities include:

- *Counter-Terrorism;*
- *Energy Security;*
- *Cyber Defence;*
- *Defence against CBRN Agents;*
- *Environmental Security;*
- *Security-related Advanced Technology;*
- *Border and Port Security;*
- *Human and Social Aspects of Security.*

Additionally, the SPS Programme helps to promote *regional security* through scientific cooperation among partners. The Programme also helps to *prepare* interested eligible nations for NATO membership. SPS activities often have a high *public diplomacy* value.

KAZAKHSTAN

Kazakhstan has been involved in a number of SPS activities, focusing on the Key Priorities of **Environmental Security, Counter-Terrorism, and Defence against CBRN Agents**. At present, Kazakhstan is leading three ongoing activities addressing the SPS Key Priorities of Counter-Terrorism and Defence against CBRN Agents. Below are some examples of ongoing and completed activities led by scientists and experts from Kazakhstan and NATO Allies under the framework of the NATO SPS Programme.

Cooperative Activities

VALORIZATION OF BIOMASS WASTE INTO HIGH EFFICIENT MATERIALS FOR CBRN PROTECTION

This ongoing Multi-Year Project (MYP) aims to synthesize low-cost carbon-based nano-porous materials offering sufficient protection from a wide range of toxic chemicals (industrial and military), under severe and wide-range environmental conditions. These materials provide Kazakhstan with the infrastructure and know-how required to fabricate their own respiratory protection filters at an affordable price. It also helps to guarantee a sufficient stock of materials for fast response. This project contributes to the strengthening of the Kazakh Research and Development sector, further utilizing resources and valorising the wastes from growing industrial activities. *This project is led by scientists from Kazakhstan and Belgium. [ref. G5636].*

EARLY DETECTION AND DIAGNOSIS OF EMERGING BIOLOGICAL THREATS

This ongoing MYP brings experts together to develop a novel, portable apparatus for the early and rapid detection of viruses accidentally or deliberately (i.e. bioterrorist attacks) released, in bodily and environmental fluids. The device is capable of producing virus-specific antibodies in response to engineered avipox (fowlpox) recombinants. The development of portable systems is an extremely effective counteraction, as the rapid identification of biological agents might allow medical countermeasures to limit or block an attack. *This project, launched in 2018, is led by scientists from Kazakhstan, Italy, and Albania. [ref. G5486].*

NOVEL BIOLOGICAL AND PHYSICAL METHODS FOR TRIAGE IN RADIOLOGICAL NUCLEAR (R/N) EMERGENCIES - BIOPHYMETRE

In instances of Radiological and Nuclear (R/N) emergencies, early knowledge of the individual absorbed dose levels is of paramount importance to effective medical intervention. This ongoing MYP aims to develop innovative biological and physical methods allowing for the rapid screening and triage of potential victims of R/N emergencies using low-cost and user-friendly analytical procedures. The new method will reduce manual work, cost of the procedure and reagents, as well as the quantity of blood required by subjects, whilst offering the same accuracy in assessments. The system will allow rapid measurements, and is transportable and usable on-site, even by non-skilled operators. *This project is led by Kazakhstan and Italy, with support from Croatia.* [ref. G5684].

CENTRAL ASIAN CONTEXT FACTORS AND COMPREHENSIVE APPROACH TO REGIONAL SECURITY

Understanding local cultures, customs, traditions and the geopolitical situation was the focus of this Advanced Research Workshop (ARW), which aimed to strengthen regional cooperation to address security challenges in Central Asia and Afghanistan. Specialists from military institutions, higher education, research institutions and civil society were brought together to set an agenda for research and policy development, including building trust and tolerance between different groups, ethnicities and nations, and to develop a comprehensive approach to conflict management in the region. *This workshop, led by experts from Kazakhstan and the United States, was held in Kazakhstan from 19 to 21 November 2014.* [ref. G4745].

VIOLENT EXTREMISM IN CENTRAL ASIA: TRENDS, RESPONSES AND POST-2014 SCENARIOS

The rise of terrorism and radicalization is of significant concern to Central Asian countries. This ARW aimed to develop a deeper understanding of the trends and developments in radicalisation leading to violent

extremism in Central Asia, and the impact of the end of the International Security Assistance Force (ISAF) mission in Afghanistan. The 45 participants explored the role of counter-productive government policies (e.g. limits on freedom of expression and movement) and discussed local, regional and global policies that could exacerbate or mitigate violent extremism. *This workshop, led by experts from Kazakhstan and the Netherlands, took place in Kazakhstan from 2 to 3 December 2014.* [ref. G4951].



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ASSESSING TRANSBOUNDARY WATER POLLUTION IN CENTRAL ASIA

Kazakhstan, Uzbekistan, Tajikistan and the Kyrgyz Republic jointly utilise the Syr-Darya river basin and share common issues regarding industrial, agricultural and municipal river pollution. The problem is exacerbated by the poor maintenance of closed or still-operating industrial plants, as well as by cities along the river basin. As a result, joint monitoring and management of water pollution in the transboundary area are crucial. Towards this goal, this MYP, initiated in 2011, brought together these Central Asian republics to conduct an in-depth study of contaminants in the Syr-Darya river basin. Ultimately, it aimed to establish a continuous and self-sustainable monitoring activity to be used as a basis for stronger regional cooperation to tackle water pollution. *This project was led by scientists from Kazakhstan, Tajikistan, Kyrgyz Republic, Uzbekistan and Norway. It was completed in 2015.* [ref. G3945].



The NATO Science for Peace
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