

DEVELOPMENT OF MINE ACTION IN THE REPUBLIC OF CROATIA

At the very beginning of the Homeland War, the Government of the Republic of Croatia recognized the entire complexity of the problem regarding the demining of the national territory. This problem became the focal point after the liberation of the territory of the Republic of Croatia. For the sake of a safe return of population, and safe life conditions in the liberated area, the demining process received immediate support from the only forces that were ready for such a delicate and complex task, the Croatian Army Forces and the Ministry of the Interior Forces.

The Civil Defence Department of the Ministry of the Interior and the Croatian Army carried out demining in liberated areas with the aim of recovering of certain buildings and terrains, and areas of vital infrastructure. Demining was carried out based on the military demining activities, and without the final quality control of demining. In December of 1995, the command of the UNPF created a Mine Action Centre to support the UNPF operations, but it did not have a mandate to establish a humanitarian demining programme. The United Nations founded the Mine Action Centre UNMAC with its Regional Offices Karlovac, Knin and Daruvar.

The Government of the Republic of Croatia produced an extensive demining plan for the entire national territory that was mine contaminated. On 1 March, the House of Representatives of the Croatian Parliament passed a Law on Demining stipulating that the Ministry of the Interior should indirectly implement the Demining Plan for the area of the Republic of Croatia, and that the demining activities should be carried out by a demining company established or appointed by the Government of the Republic of Croatia. In April, the Republic of Croatia imposed a moratorium on use, production, import, export and storage of AP mines. The Government of the Republic of Croatia issued a Decree on the appointment of a demining company for the performance of demining activities in the mine contaminated areas in the Republic of Croatia, based on which the demining company 'AKD MUNGOS' was established. The Agreement on the Emergency Loan for the reconstruction of infrastructure and demining was signed on 4 December 1996 between the Republic of Croatia and the International Bank for Research and Development (IBRD), and it was confirmed by the Croatian Parliament on 7 February 1997. On 19 December 1996 the Government of the Republic of Croatia founded a Commission for demining issues as an advisory body with the primary task of coordinating, managing and improving the demining system. The Civil Defence, Special Police Forces of the Ministry of the Interior, AKD-Mungos and the Croatian Army were the main actors in the demining of the Republic of Croatia.

In the «AID MEMOIRE» document of 15 January 1997 by the World Bank, the problems related to the above mentioned project were pointed out, and it was officially asked for the establishment of an agency authorized to keep the central data base, to prepare mine clearance maps, and to issue the quality control certificates for mine cleared areas; the nomination of persons authorized to do the quality control of mine cleared areas was also requested. During this period of time, the data on the mine contamination were more extensively collected in UNMAC, more funds were collected for mine action, and the mine problem in the Republic of Croatia was more energetically presented to foreign governments. In December 1997 Croatia was one of twelve signatories of the Ottawa Convention banning the use, production, import, export and stockpiling of anti-personnel landmines. Until the establishment of the Croatian Mine Action Centre, in the time period from 1995 to 1997, the police forces and the AKD Mungos performed the mine clearance of approximately 30 square kilometres.

On 19 February 1998

**The Government of the Republic of Croatia passed a Decree and
established the**

Croatian Mine Action Centre

**with the primary task of planning and implementing demining operations in
the Republic of Croatia.**

In order to perform its main task, CROMAC performed many other related activities: collected and processed data on mine suspected, mined and demined areas and objects, on areas that were cancelled from the mine suspected areas, on discovered and destroyed mines and UXO, and other technical characteristics of mine suspected areas; CROMAC filed all the necessary documents, and organized and kept the data records of all the above: it coordinated the mine risk education, announced tender procedures for demining and project area and/or object survey determined by a plan; it performed general and technical survey of mine suspected areas; marked mine suspected areas; performed quality assurance and quality control; it conducted the training of deminers and auxiliary workers; it kept track of research and development in the demining technology; it coordinated mine and UXO victims assistance, it cooperated with international actors in demining; it evaluated the capacities of demining organizations to perform demining activities.

COMMENCEMENT OF ACTIVITIES AND ACHIEVEMENTS, 1998

In March 1998, the Head of CROMAC together with his three associates started the preparation and creation of basic conditions for the establishment of a functional organization. The staffing began with the end of June 1998. From the establishment of CROMAC till the end of 1998 a functional and effective Mine Action System was established in the Republic of Croatia. In 1998, 14.3 square kilometres were handed over to the community for safe use, which was by far more compared to the mine cleared areas in the preceding years. During the 1998, prices in demining were gradually reduced. Compared to the initial activities of CROMAC, at the end of 1998, the prices per square kilometre were reduced approximately by 25%. By general and technical surveys, and by objective judgement the suspected mined area was reduced from 13 000 square kilometres to 6 000 square kilometres. The quality control of the entire mine cleared area was conducted, for the first time, in 1998, and the quality control results were introduced into the data base on demined areas. During the 1998, the unique standard operating procedures were created and disseminated to all demining companies. This way, all the procedures in the mine clearance system were standardized and precisely defined, which increased the worksite safety, and the objectivity in the quality control and monitoring of companies. The number of mine victims was reduced. The number of mine/UXO victims in the time period from 1995 to 1997 amounted to approximately 500, while, in 1998, it amounted to 99.

ACHIEVEMENTS IN 1999

By cooperating with the counties, the County Demining Plans were completed in all 14 counties. Based on the accurate general survey it was determined that the mine suspected area, which was primarily estimated to 6000 square kilometres, now amounted to 4500 square kilometres. In comparison with 1998, the productivity of mine clearance increased to 65.03 %. The community was provided with 23.6 square kilometres for use. The quality assurance was carried out in the entire area. The Croatian Mine Action Centre introduced and developed its own methodology of technical survey with the aim of reducing the mine suspected areas, and by this method it handed over 9 259 569 square meters of mine cleared territory to the end user.

In order to raise more funds, the lack of which had always been the main obstacle to quicker mine clearance, the Croatian Mine Action Centre established a foundation 'Croatia Without Mines' and signed a contract with the ITF (International Trust Fund for Demining and Mine Victims Assistance) with the aim of doubling the donated financial funds.

CROMAC'S ACHIEVEMENTS IN 2000

The mine suspected area in Croatia was reduced by 500 square kilometres, by general survey, systematic and more precise development of County Demining Plans and marking and fencing activities. **The surface of 33 square kilometres** was handed over to end users through the following activities:

In general and technical survey projects the area of **23.2 square kilometres** was reduced and in demining projects the **area of 9.8 square kilometres** was demined.

In execution of demining operations **1173 antipersonnel mines, 710 antitank mines, and 789 unexploded ordnances were found and destroyed on the surface of 9.8 square kilometres. 219.0 km of mine contaminated and mine suspected area were marked and fenced.** This procedure accurately defined 115.09 square kilometres of mine suspected area.

Croatian Mine Action Centre initialised a change in its structure, from a vertically oriented organisation to a horizontal type of organisation. Decentralization process of certain CROMAC's activities also begun in the year 2000 (Quality Assurance Department). In accordance with the needs identified in 2000 reallocation of responsibilities of the regional offices was made, aiming at more equal covering of counties and more efficient work. The number of mine incidents and mine victims was reduced. There were 67 mine victims in the year 1999. Over the period of 2000 this number was reduced to 22.

CROMAC'S ACHIEVEMENTS IN 2001

The mine suspected area in the Republic of Croatia was reduced to 1.7 square kilometres, through general survey activities, systematic and more precise development of the County Mine Action Plans and multi-criteria analysis. It has been estimated that only 10% of the mentioned area is actually mined, the rest is mine suspected area. Survey was conducted in the area of 82,078,884 square meters. **The area of 42,324,637 square meters was handed over to the community for use** by the implementation of the following activities:

In general survey projects the area of **26,311,976 square meters** was reduced.

In technical survey projects the area of **2,372,647 square meters** was reduced

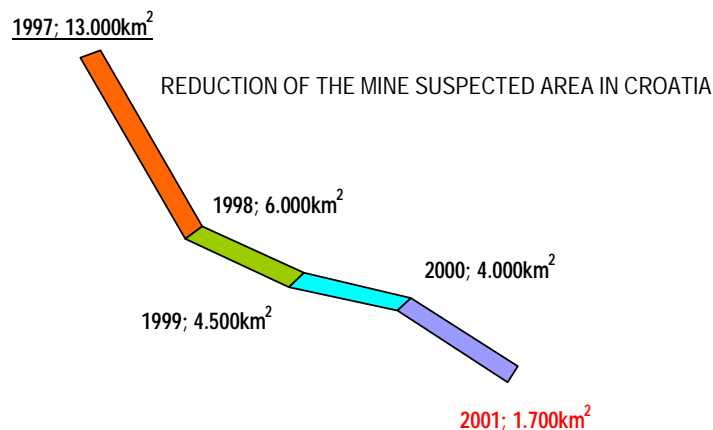
In demining projects the area of **13,640,014 square meters** was demined.

In execution of demining operations, 1877 anti-personnel mines, 1640 antitank mines, (3517 items) and 3,124 items of other unexploded ordnance were found and destroyed.

23 demining companies, the Special Police Forces of the MOI and the Croatian Army Forces were engaged in demining operations in Croatia during the year of 2001. AKD MUNGOS demining company cleared 5,087,016.00 square meters, or 39.7% of the overall area. There were 54 active working sites in Croatia as of 31 December 2001, covering the area of 5,763,065.00 square meters. The contracts were signed for 46 projects covering the area of 2,414,800.00 square meters. Demining companies will be introduced to work in 2002 upon the submission and approval of their demining implementation plans.

FOUR YEARS OF CROMAC'S OPERATIONS

The territory of the Republic of Croatia covers the area of 56,542 square kilometres, out of which 1,700 square kilometres are estimated to be contaminated by mines and unexploded ordnances. The estimation of mine suspected area has been subject to a change. The United Nations Mine Action Centre's initial assessment was that mine suspected area covered 13,000 square kilometres of the Croatian territory. It would be more realistic to say that 1 million mines and unexploded ordnances have been laid in the Croatian territory. The area has been reduced as a result of continued and intense general survey activities, additional information submitted by the Croatian Army Forces, Special Police Forces and Counties' administration. Most recently it has been estimated that the area of 170 square kilometres is covered by minefields. The area of 1,530 square kilometers is the mine suspected area.



Mine suspected areas and minefields are located in 14 out of 21 counties.
 Mine contaminated counties are: Bjelovar-Bilogora, Brod-Posavina, Dubrovnik-Neretva, Karlovac, Lika-Senj, Osijek-Baranja, Pozega-Slavonija, Sisak-Moslavina, Split-Dalmacija, Sibenik-Knin, Vitovitica-Podravina, Vukovar-Srijem, Zadar and Zagreb County.

The most contaminated counties are: Osijek-Baranja, Vukovar-Srijem, Sisak-Moslavina, Karlovac, Zadar and Sibenik-Knin County.

The area with high mine density includes the broad area of the cities located along the former confrontation line: Sisak, Benkovac, Karlovac, Osijek, Vukovar, Petrinja, Pakrac, Lipik and Vinkovci.

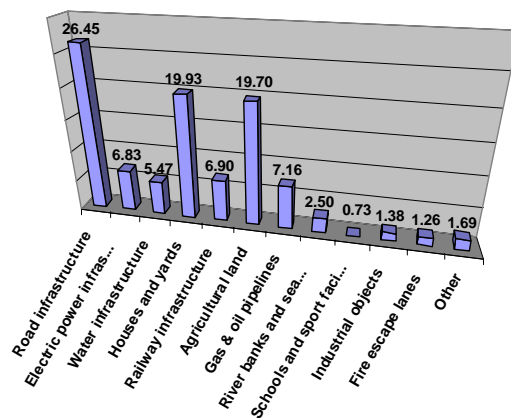
THE AREA HANDED-OVER TO THE COMMUNITY

The objective of mine action in Croatia, according to the National Mine Action Programme in Croatia approved unanimously by the Croatian Parliament on its session on 7 October 2000, is to clear Croatia from mines by 2010. To accomplish this objective, Croatia has to increase both the number and capacity of demining companies, develop and introduce new demining technologies into the mine action system.

The area of 113.22 square kilometres was technically surveyed and cleared over the period of the last four years, and returned to the community for use. A graph is showing an increasing value of the size of the areas being returned to the community. If this trend continues, the objectives defined by the National Mine Action Plan will be accomplished.



STRUCTURE OF MINE CLEARED AREA (%)



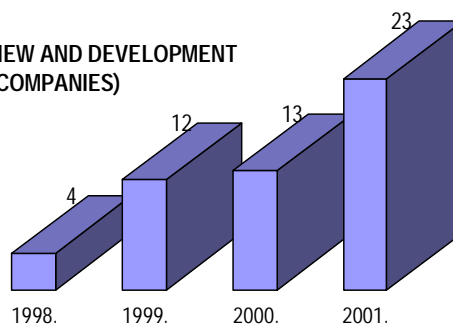
Demining forces

Technical survey activities in Croatia are conducted by licensed deminers with the assistance of demining machines and other demining equipment.

The overall demining capacity of Croatia (23 commercial demining companies) consists of:

- Deminers – approximate number 420
- Auxiliary workers – approximate number 120
- Metal detectors – approximate number 320
- Heavy demining machines – 4 machines
- Medium weight demining machines- 6 machines
- Light demining machines – 8 machines
- Vegetation cutters – 9 machines
- Mine detection dogs – approximate number 40

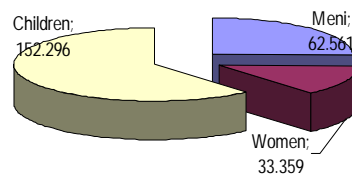
DEMINING CAPACITY REVIEW AND DEVELOPMENT (NUMBER OF COMPANIES)



Mine Risk Education

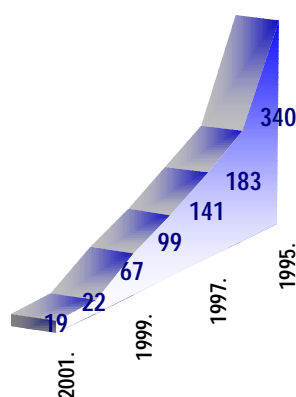
Returnees among other population have to learn to live in the mine threatened environment, as the demining process takes a long time. Therefore, Mine Risk Education is carried out simultaneously with the demining activities. Mine Risk Education has been carried out in Croatia since 1995, initiated by UNICEF and the Ministry of Education and Sport as a part of the campaign for the pilot project in Dubrovnik area. That project eventually evolved into a national project, and was carried out by ICRC (International Committee of the Red Cross) and the Croatian Red Cross. CROMAC has had a role of a coordinator in this activity. The subjects involved in Mine Risk Education in the past 4 years have educated 248,216 persons.

Review of the number of educated persons

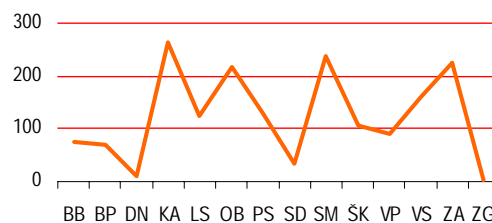


Mine victims

360 mine incidents with 1835 injured persons were recorded in the period from 1991 until 31 December 2001 in the Republic of Croatia. Most frequently, the casualties in the mine incidents until 1995 were military personnel, as it was difficult for civilians to come near the front-line. However, from the fall of 1995, when the war was over and displaced persons started to return to their homes, it is the civilians that have been injured in the mine suspected area. The most endangered have been the men between 25 and 55 years of age, and deminers.



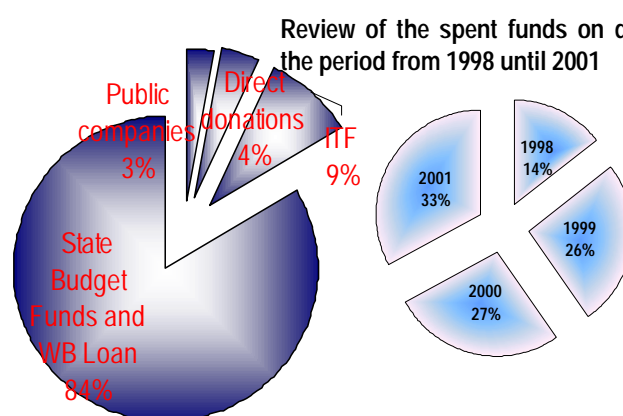
Injuries per county



Financing of demining activities in the Republic of Croatia

Croatian Mine Action Centre based its activities on the state budget funds, World Bank loans, donations and funds from public companies.

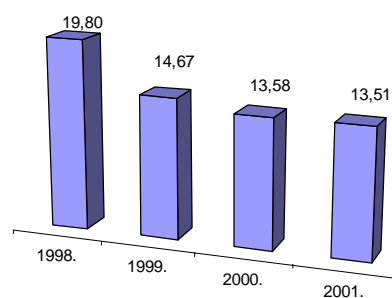
The total of approximately EUR 93,000,000 has been spent for demining operations in Croatia in the last 4 years. The table presented below is showing that the majority of the demining in Croatia is funded from the state budget funds (84%).



Demining prices

The aim of the policy on demining prices is to really pay the price of work trying to maximize the use of all demining methods such as manual, mechanical, mine detection dogs and a combined demining method.

THE AVERAGE ANNUAL DEMINING PRICE (kn)



International Cooperation – an integral and unavoidable part of mine action in the Republic of Croatia

By fulfilling all the commitments that were assumed by signing of the Ottawa Convention, with the development of the Stability Pact for the Southeast Europe, with the transparency of the system, legal provisions, the implementation of international norms and standards, the international cooperation has improved greatly, especially with the governments of foreign countries, governmental, and non-governmental organizations

Years-long partnership has been established with the countries that have been offering their support to the Republic of Croatia over a long period of time, such as: USA, Canada, Norway, Germany, Great Britain, Italy, Switzerland, Austria, Belgium, Japan. The cooperation on every day basis has been achieved with many other foreign countries, too.

With the establishment of the International Organization- Fund for Demining and Mine Victims Assistance in Ljubljana (ITF), the successful cooperation has continued, and the means of doubling the funds donated to the ITF have been created.

The contacts made by CROMAC have resulted in a closer cooperation and support by the European Union at whose initiative the Southeastern Europe Mine Action Coordination body was created from the Committee of Heads of Regional Mine Action Centres and the ITF. First signatory countries have been accompanied by other countries in the region.

The Republic of Croatia and CROMAC have reached the closure of the World Bank Loan for road infrastructure, which has almost completely enabled the finalization of the demining of road infrastructure, and the World Bank has acknowledged the successful cooperation with the Republic of Croatia.

Fund raising activities are mainly related to demining projects, but also to technical support and improvement of CROMAC's overall capacities (machines, equipment, vehicles), and support in financing other activities related to mine action (mine victims assistance, mine risk education, assistance in marking of mine suspected areas and other activities in mine action).

The CROMAC's activities also include the participation in conferences and congresses at regional and global level (Regional Conference in Budapest, Regional Conference on Anti-personnel Mines in Zagreb, III. Regional Conference on Mines in Ljubljana, working tables and conferences on the Stability Pact, regular meetings of the heads of demining centers in the region, constant boards on Ottawa Convention and many other presentations and meetings in the country and worldwide).

SCIENCE AND MINE ACTION

Current International science projects

ARC

The European Commission is financing the ARC project (Airborne Minefield Area Reduction). The project started on 2 January 2001 with the anticipated duration of 30 months, and it has involved 6 partners from European Commission and CROMAC.

SMART

The European Commission is financing the SMART project (Space and Airborne Mined Area Reduction Tools). The project consortium consists of CROMAC and several distinguished European research centers. The project started on 2 May 2001 with the anticipated duration of 36 months.

MEDDS – Nomadics

The MEDDS-Nomadics project (Trace chemical mine detection data collection) is financed by the American Army, which is implemented by its organizations NVESD and CECOM. The companies involved in this project are Mechem, JAR, Nomadics, SAD, NVESD and CROMAC. The Croatian part of the project was signed on 14 September 2001 with the anticipated duration of 1 year. The head of the Croatian part of the project is prof.dr.sc. Vladimir Knapp.

BIOSENS

The European Commission's project BIOSENS IST-2000-25438 is researching the possibilities of using the biological sensors in discovery of mines or explosives. One of the organisation that is in the consortium, SRSA (Swedish Rescue Services Agency) approached CROMAC regarding their need of a special testing polygon for vapour sensors, i.e. biosensors. The Croatian part of the project was signed on 7 February 2002 with the anticipated duration of 30 months. The head of the Croatian part of the project is mr.sci. Nikola Pavkovic.

Dog breeding

PHD (Dog in humanitarian action) is a non-profit organization, established at the end of the year 2000 that has organized and carried out the dog training according to the CROMAC Rules and Regulations. The second generation of dogs is currently finishing their training program. The members of the Scientific Council (prof.dr.sc.M.Bauer) and PHD are involved in the development of the organization and the Rules and Regulations on dog breeding in Croatia.

PELAN

The proposal for the improvement and implementation of the PELAN machine (developed in USA by professor Vourvopoulos, University of Western Kentucky) was prepared at the end of December. The proposal was prepared based on the invitation from IAEA, and then sent to IAEA through the Ministry of Commerce together with its recommendation.

BULRUSH

Technical verification of the sonar system with the consortium EC IST BULRUSH and the preparation of the operative research and evaluation in Kopacki rit with the Canadian support. The head of the Croatian part of the project is prof.dr.sci. Branko Somek.

OUR GOALS

- Mine clearance of the Croatian territory by 2010 continuously developing and improving the demining system
- Summary of all our knowledge and experience and establishment of a scientific institution that will be able to provide help to all countries in the region and wider
- Creation of conditions for development of demining companies, to enable them to be competitive in the foreign markets

Mine clearance of the Croatian territory by 2010 will only be accomplished by developing and full functioning of all mine action components, with particular emphasis to:

- Development of the survey process with a purpose of identification of actually mined areas, that will result in a more accurate preparation of the humanitarian demining projects,
- Development of the methodology and technology of survey activities with a the purpose of area reduction as a part of the process of cancellation of clear areas. (Reduction of mine suspected areas),
- Development of faster, safer and more efficient demining as a part of the mine clearance process, and demining based on technologically improved detection methods and assisted by demining machines,
- Development of marking and fencing activities of mined and mine suspected areas, to prevent mine casualties,
- Development of a comprehensive and more sophisticated Quality Assurance procedure,
- Development and implementation of mine risk education programmes to prevent mine casualties in mine contaminated areas.