



Croatian army and natural disasters

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Abstract

The Banovina area was severely damaged by the powerful earthquake that hit the region in December 2020. The Croatian Army justified the trust of the public and proved to be a highly efficient and trained organization, able to provide immediate aid to those who need it. It promptly made its material and human resources available to the survivors. With its capacities, the Croatian Army can effectively respond to the consequences of such a catastrophe. On the very first day, 250 members of the CAF were deployed to the area, and 350 others followed, together with 400 reserve personnel. Engineer forces began clearing up the streets to ensure mobility and repair damaged roads. Sixty-four trucks and working machines were used to transport 109 housing units to people whose homes had been damaged or destroyed. Also, 217 containers were transported and installed for the temporary accommodation of the civilians. In military facilities, 406 victims of the quake were offered accommodation. Heated tents with 20 beds were set up at various locations. Unmanned aerial systems were used to map the area and provide footage of damaged dykes. In synergy with civilian institutions, the Croatian Army mightily and effectively responded to the consequences of this catastrophe.

Key words: Croatian Army, engineer forces, natural disaster, earthquake, civil institutions

1 Introduction

We have recently witnessed the overlap of two major natural disasters – a series of earthquakes and a pandemic. An **earthquake** is a sudden and transient vibration of the ground caused by the collapse of the rocks (*collapse earthquakes*), magma movement (*volcanic earthquake*), or tectonic shifts (*tectonic earthquakes*) in the lithosphere and Earth's mantle [1]. A **pandemic** (from Greek *πανδημία* "all people": the outbreak of a disease that has spread across a large region – multiple countries or continents – and grown to a worldwide scale. In the past, millions of people died of bubonic plague, cholera, and Spanish flu pandemics. In the 21st century, the World Health Organization declared the swine flu (2009) and the COVID-19 pandemics (2020) [2].

In 2020 Croatia was hit by strong earthquakes and the COVID-19 pandemic. Of course, nobody expected it. Lives were lost, and material damage is still being assessed. The impact of those natural disasters on people's health and everyday life has been immeasurable. The series of powerful earthquakes damaged or destroyed many buildings and homes, alongside cultural, religious, educational, and health facilities in Zagreb, Petrinja, Sisak, and Glina. Hundreds of people became homeless overnight. The work of numerous institutions has either stopped or slowed down. As the earthquakes caused major damage to numerous schools and higher education institutions, pupils and students could not continue their education. In such circumstances, the Croatian Army, with its human and material resources, was among the first to provide assistance to Croatian citizens and civil government institutions. Members of the Croatian Army applied the knowledge they acquired through their education and training to perform their regular tasks.

2 Structure of the Croatian Armed Forces

Support to civilian institutions is a mission with which the Armed forces provide support to civilian institutions and population in the crisis management process and when confronted with various types of risks and threats that are not of classical military nature. It is realized through support to the police and other governmental bodies, through support in search and rescue and support to civil society. Support operations are carried out in synchronized operation with all subjects of the operational environment and harmonized with their missions and goals [3].

The role of every army is to look after and defend sovereignty of the state, its entirety and territorial integrity. Due to global warming and increase of the natural disasters, the role of the army has become bigger and its mission is to provide support and assistance to civilian institutions and population. When civilian services are not sufficient for assistance to population, the army becomes involved. Within its structure, the army contains competent and trained manpower, material and technical assets and mechanisation necessary for solving such problems. Organisational structure has been harmonized

with use of the military unit in personnel sense, technical equipping and trained capabilities based on competencies. Engineer units of the Croatian army have gained their competences and capabilities at military and civilian institutions of higher education and capabilities through practising and engagement/participation in various missions.

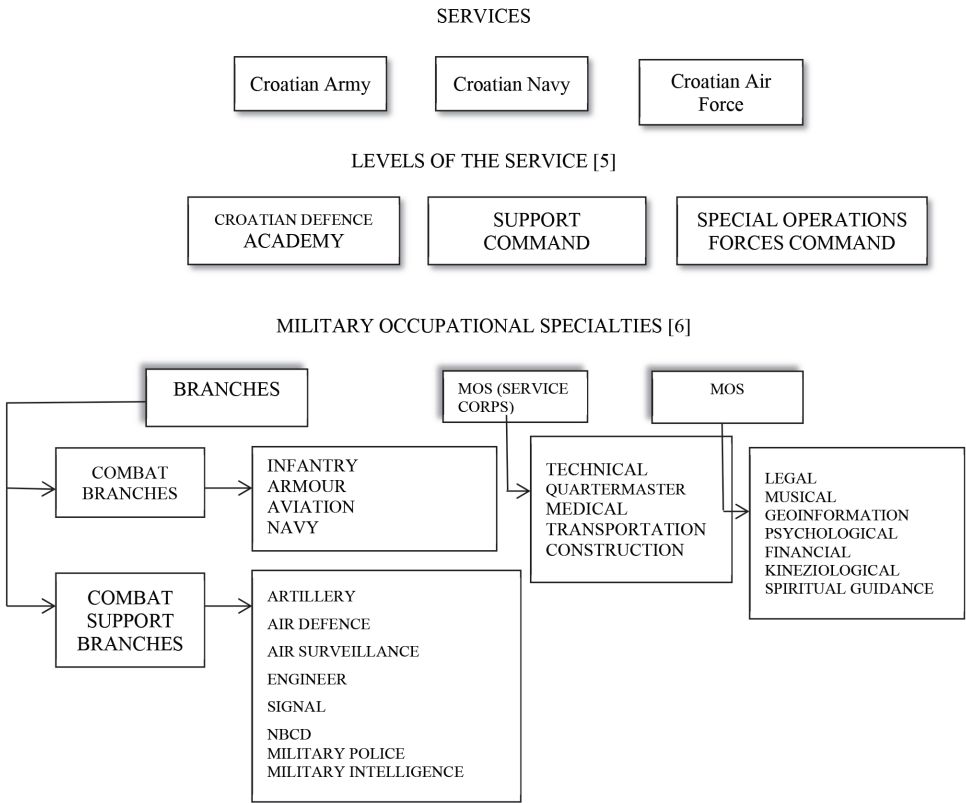


Figure 1. Structure of the Croatian Armed Forces [4]

Within its structure, Croatian army has available competent manpower and military equipment that can respond to any threat and challenge adequately, quickly and successfully. For basic engagement, depending on the character and type of natural disaster, adequate unit is employed that, within its competencies, contains a response to given mission (engineer branch for all types of construction operations, veterinary branch for terrain sanitisation from animals, medical Branch for assistance in health care system, signal branch if establishing of the communications is required etc.).

3 Engineer units

The word engineer branch originates from a Latin word *inseminator*, that means creator, inventor, the one who manufactures. The work is derived from the word *ingenium*, that means sagacity, aptitude, genius [5].

Engineer branch is a combat support branch of the CAF trained and equipped for implementation of the key tasks of the engineer combat support.

Engineer branch is a basic holder of the engineer support. It carries out its tasks together with other units of the services, branches, corpses and occupations and with specialized civilian companies, depending on natural suitability of the land and on ordered and prepared territory for requirements of the implementation of operations.

Assignment of the engineer branch is primarily engineer support of the CAF, implementation of demining tasks and training of the engineer branch, as well as developing and maintaining of the capability of providing support to civilian institutions. This is particularly emphasized because in one part NATO also "emphasizes increased need for engineer engagement in providing support to institutions of civilian authority" [6].

In conformity with the level of equipment [7] and the level of training, the primary use of the engineer unit is within operational activities [8] on tasks of rescue from ruins, removal of ruins (manually, in a mechanical manner or with explosives), participation in putting out fire, removal of explosive devices and material. Within the task of technical assistance through engagement of soldiers and engineer mechanisation on extensive works, assistance in sanitation and clearing up of the terrain and on other auxiliary works, according to request of the crisis staff. Within logistical activities they would be engaged in construction of temporary accommodation facilities, preparation and planning of infrastructure for construction of camps, as well as construction and repair of the communications.

Engineer branch as combat support branch takes part in planning, repair and construction of all works on low buildings and in the area of operation with explosives and in other specific activities. It has its organisational structure and Headquarters and does nothing without orders from superior commanding officers.

In order to involve engineer units, actions are carried out under decision of the Defence Minister that is based on Defence Act [9].

Table 1. Capabilities in a work day [11]

Basic engineer unit	Carrying out of the earthworks		Clearing up	Installation of containers	
	Repair and maintenance of roads	Construction of temporary roads		Manipulation up to 10 m	Manipulation up to 50 m
	up to 3 km (clearing up of deposits up to 150 m ³ and backfilling of the gravel up to 150 m ³).	up to 1,2 km (earth road with naturally stabilized roadway 3 m wide in soil from 1st to IVth category with average dig - of the bank up to 20 cm high).	up to 900 m ³ (combination of manual and machine work).	from 3 to 6 containers per hour u	up to 3 containers per hour

4 Engagement of the Croatian army

Earthquake hit Zagreb in March 2020 and in December 2020 the area of Petrinja, Sisak and Glina. Nature showed our powerlessness but entire nation of the Republic of Croatia got on its feet to help the stricken area. Croatian army showed again its readiness to help population. On the first day of the earthquake 250 members of the Croatian army were involved with accompanying mechanization and motor vehicles. Another 400 members were in reserve. After the first day 350 members of the Armed forces were assigned to all set tasks. Engineer units started carrying out set tasks, in conformity with their organizational structure and all prescribed protocols. Engagement of the engineer units was immediately directed to clearing up roadways in order to reach suffering population. In conformity with the existing and prescribed procedures for an assigned task – rescue and removal of the earthquake consequences, this task was carried out in an organized manner and according to estimated requirements for manpower and mechanization, employing over 64 cargo motor vehicles and machines. After civilian capacities arrived, carrying out of the forthcoming tasks was initiated in an organized and planned manner, strictly taking account of the priorities and time that was needed to solve set tasks quickly and effectively. Continuous presence of the expert officers and NCOs at site of the works made possible to assess need for the number of manpower, quantity and type of the necessary mechanization. Croatian army has been trained and organized to carry out a task with minimal capacities and as rapidly as possible, regardless of the weather conditions and scope of the works (shifts and technique were organized for unhindered operation).

5 Clearing up

Engagement of the Croatian army in the area affected by earthquake was based on clearing up roadways within urban settlements. Task groups of ten to fifteen members were formed with accompanying working machines and cargo vehicles for clearing up. They cleared up and drove away over 800 m³ of material on daily basis.



Figure 2. Reconstruction of roadways – manually

In view of extensive damages in the surrounding villages, Croatian army was involved on reconstruction of the existing roadways, as well as on their widening in order to deliver aid to the population there. Task groups were formed of up to ten members with construction machines and cargo vehicles, reconstruction was carried out and heaping out of the field and temporary pathways to make possible access to households in a total length of over fifty kilometers.



Figure 3. Reconstruction of the roadways mechanically – with machines; a) in settlements; b) out of the settlements

6 Installation of the container houses

Given that it has available men and technique for manipulation of the containers, the army was tasked to deliver container houses to courtyards of the survivors. Members of the Armed forces with their technology, Kalmar crane and loading-unloading trucks for transportation of the containers, installed 109 housing units in courtyards and transferred over 217 container houses.



Figure 4. Installation of the container houses

Reconstruction of dykes

With experience, knowledge and technique Croatian army helps civilian structures to fight floods and in works of reconstruction of dykes. They fortified dykes in total length of 380 meters.



Figure 5. Reconstruction of the dyke

With its efforts in the first moments after the disaster, as well as with continuous presence, Croatian army instils a dose of security and optimism and that also helps population in an indirect manner.

7 Conclusion

It is entirely clear that specific tasks in rehabilitation of the terrain and removal of the consequences of the natural or technical-technological disasters will be carried out by specialized, equipped and trained units of the Croatian army and engineer units are exactly the one from which it is expected to do so. Engineer units of the Croatian army are involved in cases when civilian capacities are not sufficient or missions are such that require special assets and equipment these units are the only one that have them available, particularly when quick reaction is required. Participation in protection and rescue missions in areas hit by disaster is not a regular mission of the unit. That is, regardless how much the unit has been preparing for such situation, an extraordinary mission for the unit. At that point focus of all activities in the following period is transferred to extraordinary operational missions that also have to be planned in detail in order to be implemented with success.

Capabilities for implementation of non-military missions in our country include assistance of the civilian institutions and population in crisis management and response. In the case of accidents and disasters, humanitarian operations, activities of protection and rescue on land, at sea and in air, or rather capabilities of the Croatian army provided for dual civil-military usage, are based on the Long-Term Development Plan that provides clear outlines for a new profile of the Croatian army.

Armed forces were growing up during Homeland War and have high social reputation based on successfully implemented, historically important mission of defence and liberation of our country, with provision of appropriate resources. In the future Croatian Armed Forces will continue to be one of the foundations – the foothold of security, stability and development of the society. Having opened to the civilian society, respecting democracy and freedom of men, Croatian army is not only an instrument for implementation of the missions and tasks, but also one of the key elements and factors, as well as an indicator of identity of the state and of the society.

Only a competent, expert, trained and equipped army, with deep feeling toward its country and people can successfully respond to all set missions and challenges. Engagement in assistance to civilian structures that is regulated by the Defence Act and with the LTDP, has become a priority-commitment of the Croatian army. Nowadays, closer contacts with population are one of the basic missions and motives of existence of the Croatian army.

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