The Fortification of Albania 1967 – 1986

Anisa Abazaj

Abstract— After becoming one of the most isolated countries in the world, as a reaction to the risk of attacks and conviction of invasion, in 1967 began the large-scale fortification of Albania. Millions of dollars were spent on the construction of approximately 750,000 reinforced concrete bunkers. Different in size and function the fortifications extend all over the country. After the collapse of communism in 1990, they were abandoned and forgotten. Entire underground cities made up of shelters and tunnels, are today completely left to decay. As the bunkers were built under conditions of great secrecy, in this regard, it is very difficult to find documentation or literature. The objective of the study is to identified and analyze the different typologies of urban shelters in order to evaluate their potential to be revitalized and turn into public spaces providing the much needed space for community services and activities lost during the urban transformation.

Index Terms— Fortification, Bunker, Urban Shelter, Metric Survey, Underground City, Revitalisation, Public space.

1 Introduction

The end of the Second World War regarded Albania alongside the communist countries, with a political style based on the Union of Soviet Socialist Republics (USSR) and later on the Chinese political doctrine. Two main factors have caused the rupture of relations with the USSR, the reforms of Khrushchev reflected in the process of "De-Stalinization" and the Soviet rapprochement with Yugoslavia (at the time the main opponent of Albania). The combination of the ideological, political and economic aspect has prompted Albania to create an alliance with the People's Republic of China [1]. Relations with the People's Republic of China were also interrupted in 1978, when the communist government published in the newspaper "Zëri i Popullit" (The voice of the people) and the Albanian telegraphic agency, the Open Letter proclaiming Chinese leadership as a revisionist and traitor to Marxism-Leninism.

In this way, Albania gradually became one of the most isolated countries in the world, where the ideology of war and the risk of an attack by the eastern or western countries were omnipresent in official propaganda at any time.

As a reaction to this propaganda, the military doctrine of Albania was also developed, which was based on the concept of "people's war", based on the experience acquired during the Second World War. Albania was the only European country that had managed to free itself without the intervention of foreign troops. The popular military art foresaw that all Albania was trained and armed to resist the enemy. The Albanian armed forces were based on the partisan model and were built around infantry units. The integrity and national sovereignty of Albania were intended to protect any part of the territory that also required the protection of entire areas, and thus, arouse the need to create defensive positions throughout the territory of the country [2].

In 1967 after the Albanian dictator Enver Hoxha became convinced that the country could be invaded from one moment to another by foreign forces, Albania began to prepare for a large-scale fortification. The objective was to build a fortified system with the highest degree of resistance to be able to support conventional attacks, biochemical and nuclear ones; to be able to maximize the vigor and fighting technique of multiple enemy fire an enormous effort was made to make up for lost time, since the fortification had to be prepared as quickly as possible [3].

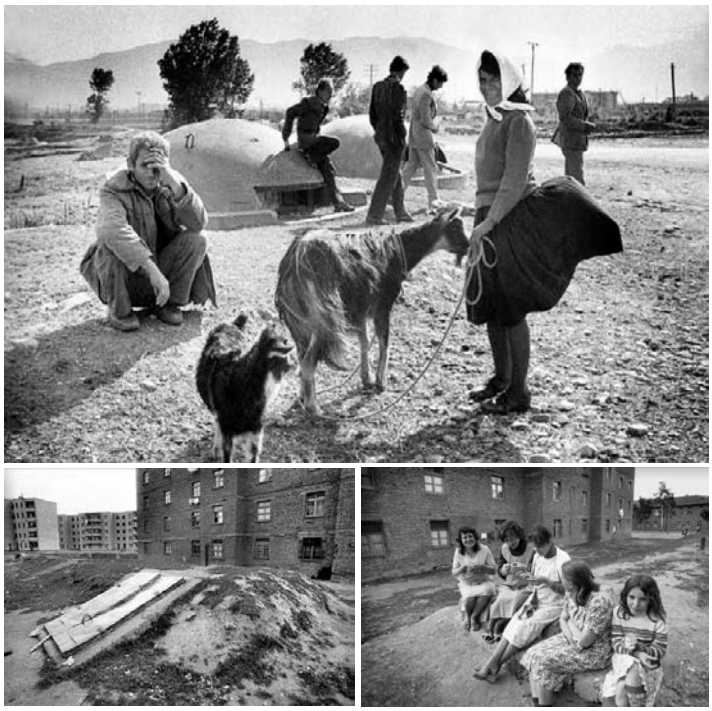


Fig. 1. Poverty and ideology in the period of socialism © Piet den Blanken

• *Anisa Abazaj is currently pursuing a Ph.D. degree program in Science of Civil and Environmental and Engineering at Padova University, Via Marzolo, 9 - 35131 Padova, Italy. E-mail: anisaabazaj@mail.com*

In this context, from 1967 to 1986 the Albanian government implemented a fortification policy, creating programs and plans that led to the construction of hundreds of thousands of bunkers throughout the country. They were built in every possible place, from beaches to mountains, from vineyards to pastures, from villages to cities.

Millions of dollars were spent on the construction of approximately 750,000 bunkers and bomb shelters made of reinforced concrete. Bunker production began immediately and their first test was carried out in 1975. According to the literature of the period, Albanian bunkers were able to withstand all the weapons of the time, and also chemical and nuclear weapons with power up to 20 kilotons [4].

The bunkers were of different sizes and functions: they were for one or two people and barely their sophisticated anti-nuclear bunkers to house the whole government. The most common type of bunker was known as the Fire Center Bunker (Bunker FC); it was formed by a small semi-spherical concrete dome placed on the ground, with a circular base also made of concrete and structural steel, sufficient to protect one or two people who fought from the inside (Fig. 1, 2). From these hemispherical bunkers it was almost impossible to figure out artillery fire and bombs. The FC bunkers were prefabricated and were transported to their final positions, where they were assembled.

They consisted of three main elements: a concrete tunnel, a semi-spherical concrete dome, with a diameter of 3 meters, which had a small opening to shoot, a half cylinder to support the dome and a wider external wall with a radius of 60 centimeters that surrounded the dome. The space between the cylinder and the outer wall was filled with land [4].

At various locations along the coast a large number of FCs were built in groups of three, connected by a prefabricated reinforced concrete tunnel. The system of these bunkers was made in circular form to protect each other through two defensive lines. Tirana, in particular, was protected by thousands of bunkers placed in fifty circles around the city. The bunkers in Albania are all over the country, with an average of 5.7 bunkers per square kilometer. These bunkers were created for the construction of defense lines and each line of defense had a command bunker [5].

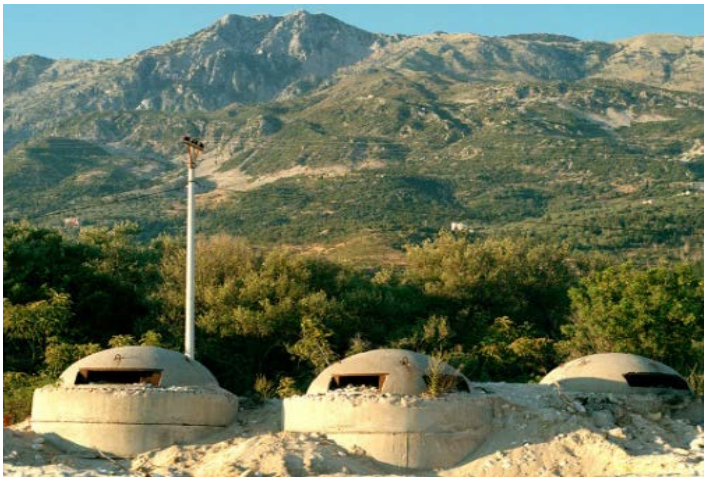


Fig. 2. FC bunkers grouped in three © Alicja Dobrucka

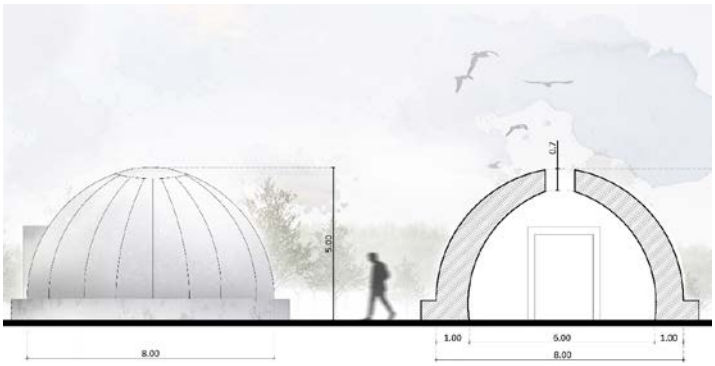
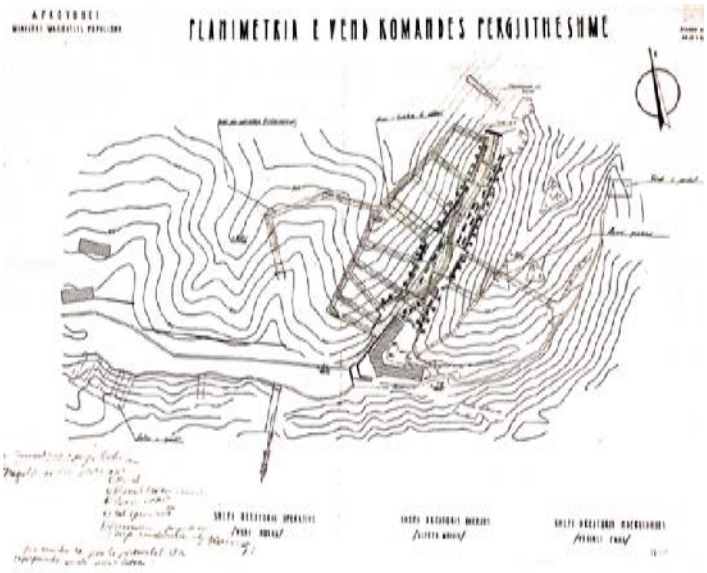


Fig. 3. Section of the PF Buker

In addition to the type of Bunker FC, another type of Bunker that was very widespread was also the Bunker of the Command control, known as Point of Fire or Bunker PF (Fig.3). These bunkers were also prefabricated and assembled on site. They were much larger and heavier than the FC bunkers, with a diameter of 8 meters. PF bunkers consisted of a number of reinforced concrete elements, each weighing eight to nine tons. These elements were joined together on site to form an interconnected and fully massed, with a total weight of 350-400 tons.

There was also a third category of larger special facilities, used for strategic purposes. These large structures in terms of construction were of three different types and were divided into "mountain", "buildings" and "pit". They consisted of complexes of tunnels built in the mountains and in the underground networks of Tirana and had the function of evacuating the leadership of the government in the safe shelters in case of attack. Furthermore, thousands of kilometers of tunnels have been built throughout the Republic of Albania to host political, military and industrial activities (Fig. 4).



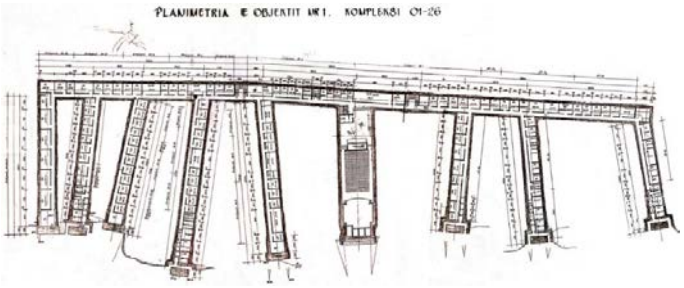


Fig. 4. Plan of the nuclear shelter in the Linza area ©Bunk Art 1

An example of this type is the refuge in Linza, nearby the capital, Tirana, where there is a tunnel network of almost two kilometers, designed to protect members of the Ministry of the Interior and other members of the government from a possible nuclear attack. The construction of the bunker (designed and built to house the entire leadership of the government in the event of chemical or atomic bombing of the Albanian capital) was started in September 1972 and the structural part of the walls was completed on 1 May 1975, while it took another three years to complete the interconnection systems [4].
The tunnel was constructed of concrete and was oval in shape, the typical shape of bunkers. Inside the ovals of the "domes" there were offices and corridors (Fig. 4); the external walls were always in reinforced concrete, while the internal divisions were of brick. The outer wall of reinforced concrete was one meter thick.
The roof of the bunker was covered with a thick layer of land that in some places reached 100 meters. The structure had a total area of 2685 m² and consisted of one hundred and sixty rooms distributed over five levels, including an auditorium that served as the Parliament Hall (Fig. 5). Internal ventilation was carried out by means of machines able to filter the air and, in the event of bombardment, to regenerate it. This was the only structure that had envisaged a room in which the Albanian Parliament could meet in case of war.
The bunker remained in operation for about 20 years, with military and civilian personnel managing telephone and telegraphic communications.

Figura 5. Images of the nuclear shelter in the Linza area ©Bunk Art 1

The goal of the government was to build shelters to accommodate, at their completion, all the inhabitants of Albania. For this reason, in addition to the above-mentioned types of bunkers, with the function of fortification and protection in the event of conventional attacks, the shelter for the protection of the Albanian civil population, inactive during the war, also developed and spread in the case of air or infantry attacks. In fact, in every Albanian residential block underground shelters were built, with reinforced concrete structures.
They vary in size and shape and were mainly located in the basement of new buildings, built with prefabricated concrete panels or bricks, or in the courtyards of residential complexes. Practically, there are underground cities built to protect the country from enemy attacks and they extend everywhere in cities and villages.
The "fortification" plans involved the construction of 221˙143 bunkers, but in reality about 173˙371 were built, or about 1 bunker for every 11 inhabitants, without counting the underground shelters provided for the entire civilian population. The construction period lasted eight years, with an average of 21,000 bunkers built per year, and led to the construction of bunkers in every corner of the Albanian People's Socialist Republic.
As a result of this plan, it is said that Albania has become the most "tunneled" country in the world after North Korea. The bunkers were built under conditions of great secrecy and until a few years ago the information, in this regard, was classified as secret and codified, so it is very difficult to find official documentation.
Thus, the cost of implementing the "fortification" plan used up all Albania's financial resources, neglecting in this way the most urgent needs, such as the need for housing and adequate infrastructure.
These works of war were never used for the purpose they were built and after the collapse of communism in 1990, they were abandoned [6]. Their solid structural made it difficult to remove. Some were eliminated, especially in the cities, but in the countryside most of the bunkers were simply abandoned and are now in a state of degradation. Some of them have been reused for various purposes, including homes, bars, warehouses, animal shelters, homeless facilities, or even museums. The interest, to recover them, has grown in recent years.
One of these was also the central base of the army leadership which today is called BUNK'ART and it is the first museum set up inside the anti-atomic bunkers in the aforementioned area between Linza and Tirana, while BUNK'ART 2 is the anti-atomic shelter in the center of the capital. Carlo Bollino was the curator of both museums (Fig. 6).
While the first BUNK'ART is dedicated to the Albanian military communist history and to the daily life of the Albanians during the regime, BUNK'ART 2 reestablish the history of the Ministry of the Interior in Albania in the years 1912-1991 and reveals the secrets of the political security police, arms of persecution used by Enver Hoxha regime [7].

Fig. 6. (a, b) BunkArt 1, (c) BunkArt 2

The opening of the museum has attracted the attention of many visitors, giving these shelters a completely new function and an innovative vision for their recovery.

2 THE URBAN BUNKERS

As in the rest of the country, even in the city of Tirana, an indefinite amount of underground spaces are hidden; it is an entire underground city made up of shelters and tunnels, different in size and dimensions, and today completely forgotten. These urban fortifications extend everywhere in the cities, under new and existing buildings, under buildings for public and private use, under schools and playgrounds. While the anti-atomic bunkers were designed to meet anti-atomic bomb and anti-gas criteria, the shelters for the civilian population were works designed and built for emergencies against air strikes. Although they had walls of considerable thickness, it must be said that the functions of the civilian shelters were mainly of shelter and protection of the civil population, involved by bombing in the vicinity and the consequent projection of splinters and other elements; however, they were unable to resist direct bombardments. In case the shelter was hit, it would have been destroyed. As such, these facilities were expected to be used for a short period and not for a long stay. Considering that the water layer in the city of Tirana is quite close to the surface, it was avoided to build at significant depths, except in the case of bomb shelters planned for senior officials of the state, where the construction costs were much higher and machinery and equipment specifications were imported from other countries, such as Sweden, Italy, China etc [8].

The lack of maintenance was the main cause of their decline. Today, these works are abandoned and in a state of degradation; moreover, they are often flooded, which causes the decay of the entire building.

Considering that the high cost of dismantling would exceed that of their restructuring and maintenance, also due to the lack of public spaces and services, this architectural and historical heritage, today degraded and forgotten, must be recovered.

The hypothesis is to develop new and different methods of recovery and use, mostly using the existing underground and basement spaces, creating new and complementary spaces for public use (to be dedicated to trade, services, etc.).

Taking into consideration that these works were built under conditions of great secrecy and that until a few years ago it was classified as secret and codified material, surveys of different shelters in the city of Tirana were made in order to identify the various typologies and their current condition.

The following material was collected through metric and photographic surveys and through interviews with designers, structural engineers and citizens. It would be necessary to carry out an investigation in the archives of the Geographical and Military Institute in the Ministry of Defense, however this material is still codified and classified as secret.

Among the urban air-raid shelters for civilians, two different types prevail:

- Anti-collapse shelters in the basement of residential buildings
- Underground or basement shelters in the courtyards of urban centers.

2.1 The Anti-Collapse Shelters in the Basement of Residential Buildings

These structures are located in the basement of buildings constructed during the socialist period. They are found in brick buildings and prefabricated with concrete panels. The layout of this type of shelter corresponds to the layout of the building to which it belongs, following the plan of the building's foundations. The interior spaces were divided into several rooms, some of which were closed with hermetic doors to prevent, in the event of bombardment, all occupants from being exposed to the effect of the explosion. Shelters in the basement of buildings with prefabricated panels had at least one toilet.

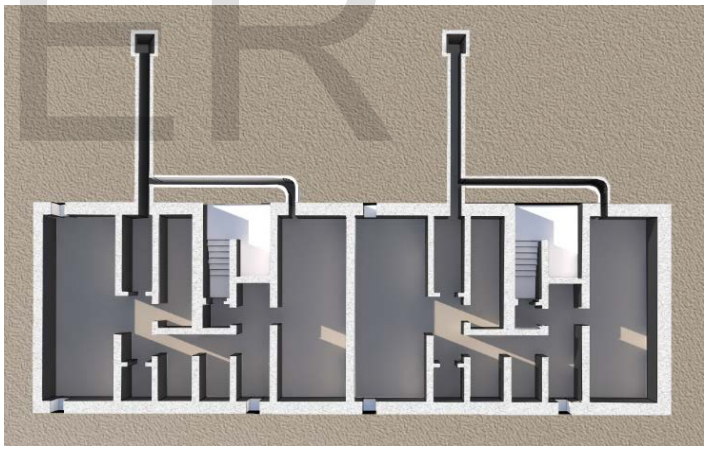


Fig. 7. Anti-collapse shelter in the basement of a building with prefabricated panels

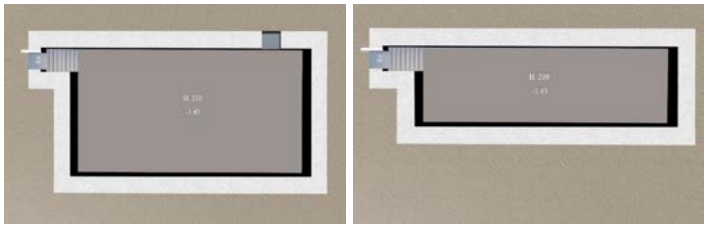


Fig. 8. Shelters in the basement of masonry buildings

The external walls are in reinforced concrete with a thickness ranging from 70 to 100 cm, the internal walls in reinforced concrete are 30 cm thick, while the division walls are in brick or with silicate bricks, with a variable thickness of 15- 20 cm.

The height varies from 190 to 250 cm. The floors of these structures were reinforced to support the weight of the building collapse in case of attacks. Access was via the main staircases, with double reinforced concrete and iron doors (Fig. 9b). Each shelter has four windows, two on each side where the building looked out for light.

Fig. 9 (a) Entering the shelters of the basement of buildings, (b) reinforced door, (c) the element of closing window in case of bombing

Also the ventilation took place through these windows, which had to be equipped with hermetic metal closures (Fig. 9c). In case of bombing, the windows were closed and were used for the aeration of underground tunnels which led to the air exchanger positioned in the courtyard of the building. These tunnels were used as an emergency exit but also to connect several buildings (Fig. 10, 11).

Fig. 10. Openings for ventilation / ventilation of shelters

Fig. 11. Air Exchanger positioned in the courtyard that also served as an emergency exit

These structures were initially designed to perform different functions: in times of peace they had to be used as cafeterias, cellars, etc.; hospitalization for residents in the event of air raids. There were, however, various complications: the isolation, the lack of skills in the specific production in the factory and the absence of suitable equipment for the creation of complex elements. It was therefore not possible to be closed so that they could completely be functional; the function of the shelter itself was thus compromised.

The water in these shelters could be obtained from the building's water system, as well as electricity from the building's electrical system.

This typology was inspired by the Swiss model, one of the countries in which Albanian architects and engineers conducted specialization practices. In Switzerland, the basement is used for different functions, but this system in Albania did not work. The projects of the shelters were not carried out as planned for a series of causes, as for example, to reach the plans in time, the attempt to reduce the costs and the impossibility of realizing complex elements in the factory. This led to the poor functionality of the built structures. These shelters have never been used for designed functions. In the beginning, they were used for neighborhood meetings of the Socialist Party and later on they were completely abandoned. The lack of management was the main cause of their degradation. These spaces today are abandoned in a state of degradation, with amortized and often flooded pipes, which causes the entire building to be collapsed. Thus, the intervention in these structures is urgent.

2.2 Rescue Refugees in the Open Areas of Residential Districts

Simultaneously with the anti-collapse shelters in the basement of residential buildings, underground shelters were also built for the civilian population against air attacks in the open areas of residential neighborhoods. Rescue shelters in open areas or neighborhoods consist of simple structures in reinforced concrete, with a rectangular plan, generally underground or semi-underground, equipped with double reinforced concrete doors and waterproof iron.

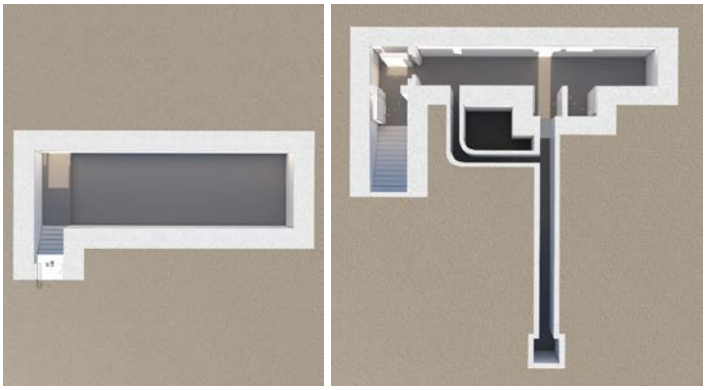


Fig. 12. (a) Shelter in Kavaja Street, (b) Shelter in the district of the Agimi buildings

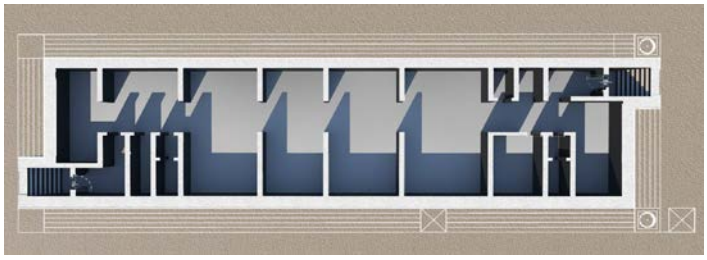


Fig. 13. Shelter in the courtyard of the District Nr. 9

These structures have been designed with the aim of protecting the population in the streets or in unsafe environments in the event of bombing. The interior spaces with a large surface were generally subdivided into several rooms, as already mentioned, to avoid the exposure of all occupants, in the event of bombing.
Their ventilation took place through several mainly cylindrical openings (Fig. 14b) which led to metal opening located in the upper part of the shelters. The construction of these structures was very simple. Electrical, water and sanitation projects were prepared by the Civil Protection Institute (MCR), but most of them were not implemented.

Fig. 14. (a) Entrance, (b) internal spaces, (c) openings for ventilation

These types of tunnels did not withstand direct bombardments and were not resistant to chemical compounds that could easily infiltrate them. There are only few civilian shelters properly built to protect civilians. In some cases, these shelters were connected through tunnels with other nearby shelters. The size of these works varied in relation to the density of the population in the area where they were used.
It is difficult to define exactly how many civilian air-raid shelters have been built in Tirana or in the rest of the country, considering that the area / number of inhabitants changes from case to case. It can, however, be said that they were sufficient shelters for the protection of the entire Albanian population.

3 Conclusion

While the attention on the bunkers has raised in the recent years, an indefinite amount of underground shelters remain hidden and forgotten. As the projects of the shelters were not carried out as planned for a series of causes, these structures are not functional for the designed purpose. Furthermore, these spaces today are abandoned in a state of decay with amortized and often flooded pipes, which causes the entire building to degrade. Thus, the intervention in these structures is urgent. Considering that the high cost of dismantling would exceed that of their restructuring and maintenance, also due to the lack of public spaces and services, this architectural and historical heritage, must be recovered.

The hypothesis is to develop new and different methods of recovery and use, mostly using the existing underground and basement spaces, creating new and complementary spaces for public use. The abandoned shelters can be revitalized into public spaces and serve the residents within neighborhoods with various functions. These forgotten spaces can be embedded and reintegrated in the social life of the city which is suffering from the accelerated urbanization and provide the much needed venues for community services and activities.

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