

XVII International Congress on Dry Stone

“Dry stone perspectives: challenges after the UNESCO inscription”

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DRY-STONE CULTURAL HERITAGE IN HERZEGOVINA REGION (BOSNIA AND HERZEGOVINA)



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Summary:

In the initial part of this paper, a brief spatial-historical coverage overview of the dry-stone constructions in the Herzegovina region in Bosnia and Herzegovina, is given.

In the central part of this paper, some significant dry-stone structures in Herzegovina region, from (pre) Illyrian times to modern applications, are given.

In the final part of this paper, suggestions for future activities to be taken to protect the dry-stone cultural heritage in Herzegovina region (Bosnia and Herzegovina), are given.

Keywords: *cultural heritage, (Intangible) Cultural Heritage, Herzegovina region, dry-stone construction, dry-stone construction skills, inventory, evaluation, revitalization*

1. INTRODUCTION

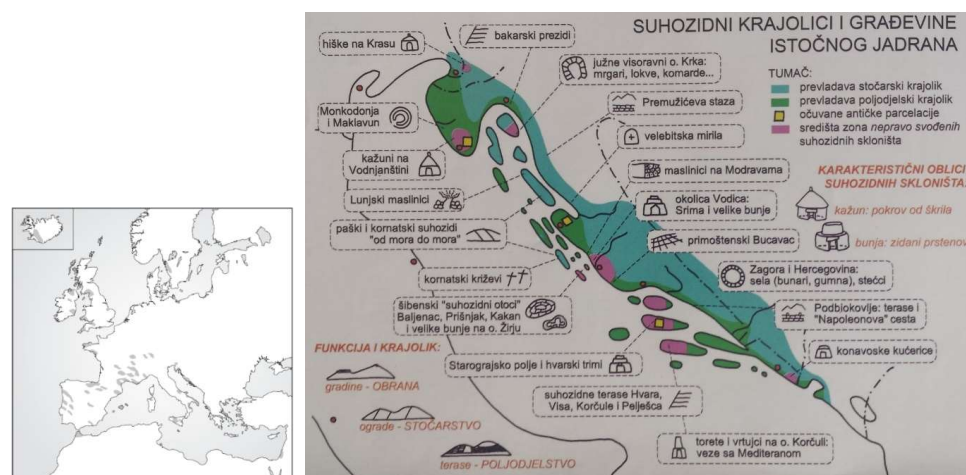
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In the dry rocky areas of the Mediterranean part of Europe, the technique of dry-stone construction has developed, which has a similar cultural value, but is less scientifically and professionally evaluated, compared to the construction with mortars, which is the subject of study at the faculties of architecture and civil engineering.

Maybe nowhere is this construction technique applied so abundantly and comprehensively as in the karst of the eastern Adriatic coast and its hinterland, to which the Herzegovina region belongs. It is the oldest folk architecture, which transformed and humanized the semi-bare stone landscape.¹

According to PhD Filip Šrajner, "the total length of dry-stone walls in the area in Adriatic Croatia area and contact mountainous zones can conservatively be estimated at 100.000-300.000 km, over 40% of Adriatic Croatia's territory lies within 100 m from the nearest wall (almost 90% in the case of some municipalities). The situation is similar in the hinterland to which the region of Herzegovina belongs, i.e. the southern part of Bosnia and Herzegovina (B&H).



Figures 1.-2. Map of the distribution of round dry-stone buildings in Europe (left);² Map of dry-stone landscapes and buildings on the east coast of the Adriatic Sea,

1,, Suhozidne gradnje", https://hr.metapedia.org/wiki/Suhozidne_gradnje

2 Stepinac Fabijanić, T. (2013): „Kažun kao prepoznatljiv element identiteta Istre“, „Histrina, 3, 2013.

which in its hinterland includes part of the Herzegovina region (Sketch: Filip Šrajer)³

2. DRY-WALLED BUILDING HERITAGE OF HERZEGOVINA - PAST

Until the arrival of the Romans, "dry-stone construction" was the only way to build, but even after that. By the middle of the XIX. century, this ground floor construction of a "soft" roof remained the basic way of building outside the "stone masonry" city buildings and secluded "towers". People lived on the brink of survival, so the „dry-stone construction" was the result of what the space offered (pasture) and what man needed (land). Dry-stone construction ceased only with the widespread availability of concrete, and then mechanization in the second half of the twentieth century.⁴

The oldest dry-stone buildings are pre-Illyrian and Illyrian fortifications (forts) and burial piles or tumuluses (piles, stone piles, tomb piles, „unjke“, „zaspe“). There are numerous forts, immovable stone buildings with a dominant geographical position and a system of fortifications. The architecture of the forts was modest compared to the neighboring ancient architecture on the Adriatic coast. Massive stone ramparts were built using simple dry-stone techniques, such as single walls of large stone blocks, and double and multiple are quite rare, with walls of larger stone blocks and interior space filled with small timber.⁵ Embankments on some forts probably represent the remains of dry-stone wall (PhD Ćiro Truhelka).

Dry-stone buildings include megalithic, so-called "Cyclopean" walls, the construction of which was based on the weight of the blocks and the masonry technique. The most famous example of such construction is the Hellenistic city of Daorson near Stolac, the so-called "Herzegovinian Mycenae", a national monument

3 „Gradimo u kamenu - Priručnik o suhozidnoj baštini i vještini gradnje“, 3. izmjenjeno izdanje, „Slobodna Dalmacija“ d.d., Split, 2016.

4 Kulušić, S. (2004): „Trag predaka u kamenu (1. dio): bunje i stanovi: obilježja gradnje „usuho“ na jadranskom prostoru Hrvatske“, „Hrvatska revija: dvomjesečnik Matice hrvatske“, God. 4, 1, 2004.

5 [https://bs.wikipedia.org/wiki/Gradina_\(tvr%C4%91ava\)](https://bs.wikipedia.org/wiki/Gradina_(tvr%C4%91ava))

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of B&H, which was the capital of the Hellenized Illyrian tribe Daors. The central and oldest unit was the dominant Gradina or citadel, which was surrounded by megalithic "cyclopean" walls of huge stone blocks on the only possible approach from the southeast.

In addition to Daorson, in the area from Livno to above Dubrovnik, there are other archaeological sites (cities) that have megalithic walls (Goran Glamuzina).⁶ In some localities, they are composed of the real polygonal technique of megalithic masonry, which in many examples in Greece dates back to the time older than the walls with horizontal rows and bunny blocks such as those in Stolac's Daorson.⁷⁸



Figure 3. Daorson walls whose construction is based on the weight of carved bunny blocks and precise processing of adjacent surfaces, which allows better bonding and earthquake resistance

6 Glamuzina, G. (2014): „Kiklopi iz Kočerina - još jedan drevni kiklopski grad (pra)Ilira pronađen u Kočerinu kod Širokog Brijega“, HERCEGOVINA-GEOARHEO“ portal za prezentaciju, promociju i zaštitu prirodne (biljke i životinje)-geološke (fosili, geo-lokaliteti, stijene) i arheološke baštine u Hercegovini, 2014.

7 Glamuzina, G. (2014): „Ekskluzivno: megalitski (kiklopski) zid s klesanim kamenom na ilirskoj (delmatskoj) utvrdi iznad sela Mokro kod Širokog Brijega“, HERCEGOVINA-GEOARHEO“ portal za prezentaciju, promociju i zaštitu prirodne (biljke i životinje)-geološke (fosili, geo-lokaliteti, stijene) i arheološke baštine u Hercegovini, 2014.

8 Glamuzina, G. (2015): „U planinama iznad Širokog Brijega otkriven 'planinski Daorson' - monumentalni helenistički hram na 900 m.n.v.“, HERCEGOVINA-GEOARHEO“ portal za prezentaciju, promociju i zaštitu prirodne (biljke i životinje)-geološke (fosili, geo-lokaliteti, stijene) i arheološke baštine u Hercegovini, 2015.

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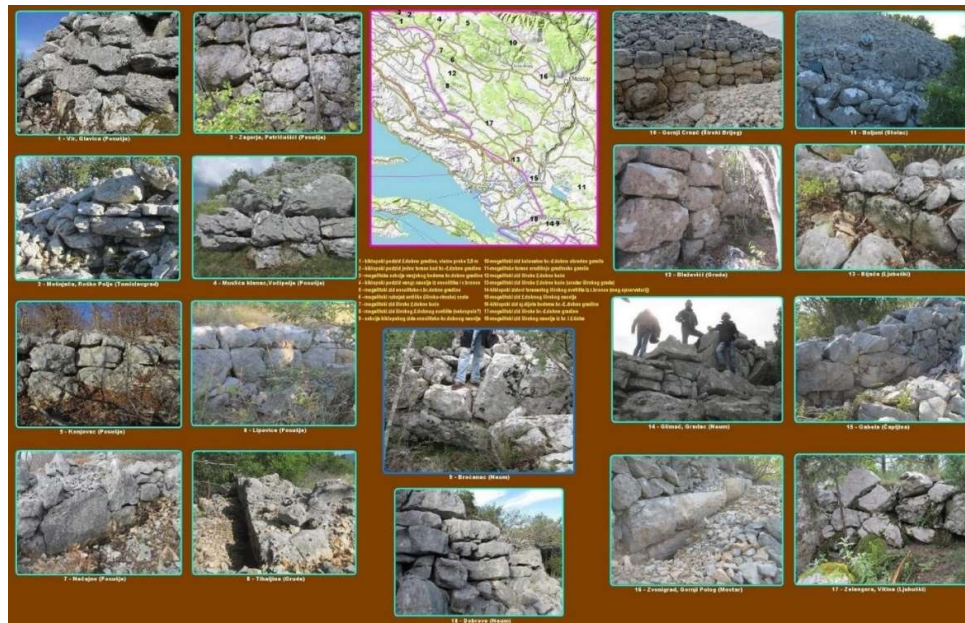


Figure 4. Megalithic walls in various parts of Herzegovina region
(Author: Goran Glamuzina)⁹



Figure 5. Dry-stone pastoral landscape in the Nature Park "Blidinje" with a lake in the background, filled with fences that surround small oases of the most valuable agricultural phenomenon of karst

The art of building of dry-stone walls and dry-stone structures, as the oldest technique of building walls and other stone structures, represents the traditional heritage of this region, and has become one of the fundamental elements of the landscape in our karst areas. The role of free-standing walls, built of quarried stone as the boundaries of rocky pastures and the protection of agricultural areas - a dry-stone pastoral landscape - spread very quickly.

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Figure 6. Dry-stone pastoral landscape of the village of Kijev Do near Ravno, with recognizable amphitheater high dry-stone walls with terraces in the left part of the picture and high dry-stone with gardens in the shape of Olympic circles¹⁰



Figure 7. Sensational aerial shot of the dry-stone pastoral landscape near Tomislavgrad¹¹

¹⁰ Vidović, D., Vukorep, S., Slobodan, V. (2018): „Neispričana priča - Turistička monografija općine Ravno“, općina Ravno, 2018.

¹¹ <https://m.facebook.com/529454433845840/photos/a.530098130448137/1725642867560318/?type=3&source=48>

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With the advent of ownership, the walls not only gained the role of a boundary on the edges of agricultural areas and along roads, and represented not only the boundaries of possessions, but were an obstacle for domestic animals to wander, but also protection from wild animals.



Figure 8. Dry-stone agricultural landscape in village Gornji Mamići near Široki Brijeg¹²

Dry-stone walls enclosures differ in area (from a few square meters to large fields), shape (from regular geometric to amorphous shapes), age (from prehistory to the present day), purpose, altitude, as well as height and type of fence walls (from one stacked row of stones up to several meters).

In addition to dry-stone pastoral landscapes and agricultural landscapes, the third form of dry-stone landscapes consists of **settlements and their environment**.

¹²<https://ljepotehercegovine.wordpress.com/2016/03/29/gornji-mamici-siroki-brijeg/>

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Figure 9. Dry-stone landscape of the hamlet Češljari near Ravno, with dry stone walls, terraces and famous barns above the houses (upper right part of the picture)¹³

Apart from the dry-stone walls, what makes the whole of Herzegovina interesting and different from the continental areas of Bosnia region are the old stone houses, different in construction and architecture, from eastern Herzegovina around Trebinje and Bileća, all the way to the extreme northwestern borders in Kupres and Livno.¹⁴ Outside of settlements, people mostly lived in small dry-stone houses with open fireplaces, which were architecturally simple, just as there was a simple life in and around them. Built on stone and from stone, these houses are a trademark of karst in remote villages and seasonal settlements (“dwellings”).¹⁵ These are small dwellings with a square floor plan, small area and low walls, built dry, where the joints are often subsequently filled with lime mortar on the outside, and lime plaster is applied on the inside and painted with lime to protect against drafts, moisture and insects. While the processing of stones was simpler for commercial

13 <https://opcinaravno.ba/lokaliteti/lokaliteti/>

14 (2017): „Hercegovački fenomen: Suhozid (duvar) i kamene kuće“,

15 „Suhozid Iskonsko umijeće zidanja“, „Dom gradnja“

<http://www.baunet.hr/Clanak/161/suhozid-iskonsko-umjece-zidanja.aspx>

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and auxiliary buildings, the stone for residential houses was better processed. Some of these buildings are pearls of rural architecture and have special value.¹⁶

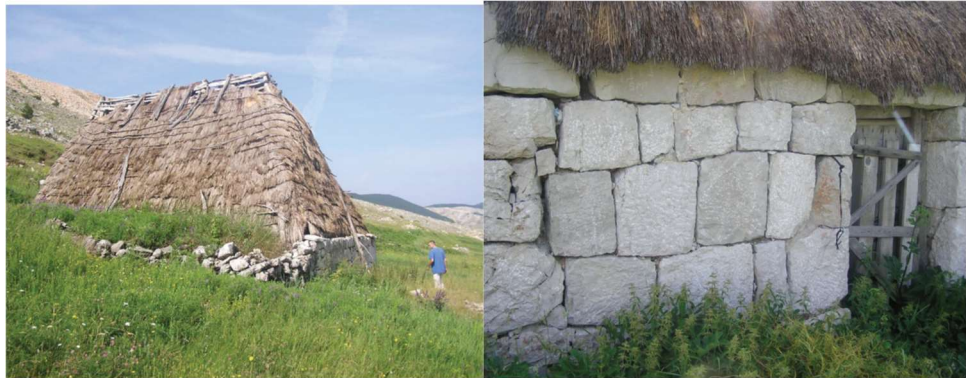
In addition to graves (tumuluses) and forts, various dry-stone walls, and commercial and residential buildings, there are other dry-stone constructions, from retaining walls of roads and railways, water tanks, wells, ponds, oysters, to anti-flood barriers, churches/chapels and tombs, mills, lookouts, lime kilns, hearths, dry-stone bridges, threshing floors, paving roads or settlements, stone coverings, etc.).

Retaining walls of roads and railways are not the result of traditional construction, but belong to public buildings created as engineering projects that took advantage of the superior properties of dry-walls in terms of structural flexibility and the possibility of draining excess water. The most impressive are the carved dry stone walls with which in the XIX. century French and Austrian engineers, in collaboration with local builders, built roads, some of which are still state roads and railways.

¹⁶Šrajer, F., Suić, A., Vidović, H., Kipson, S., Carić, H. (2009): „Meditranska kamena kuća - tehnike gradnje i obnove“, Institut za turizam, Zagreb, elektronsko izdanje, http://www.dragodid.org/materijali/Meditranska_kamena_kuca_2006.pdf

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*Pictures 10.-11. House covered with straw with buried stone parts in a slight natural slope. Part of the front façade with low doors, without other openings (right)
(photo: Ivo Čolak & Mladen Glibić)¹⁷*

Probably the largest dry stone wall in Herzegovina region is the dry-stone wall inside the rock filled concrete faced dam “Rama”, which has a height of 100 m, a crown length of 230 m and a width of 305 m in the foundation joint. The thickness of this dry-stone wall varied between 3 and 8 m, volume 66,000 m³. In terms of height, it certainly is, and perhaps also in terms of the volume of the dry stone embankment...



*Figures 12.-13. Rock filled concrete faced dam “Rama” under construction (left);
Cross section of the dam with dry-stone wall (“3”), located between the upstream reinforced concrete facing (“4”) and the rock embankment of 1,4 million m³ volume (“2”)... (right)¹⁸*

¹⁷Glibić, M.; Čolak, I.; Gotovac, B. (2015): „Konstrukcijske specifičnosti građevina na području Blidinja“, Međunarodni znanstveni simpozij Blidinje 2015, 2015.

¹⁸ (2008): „40 godina HE Rama“, JP „Elektroprivreda Hrvatske zajednice Herceg Bosne“ d.d. Mostar, 2008.

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Along with the retaining walls of old roads, wonderful examples are the monumentally high dry-stone embankments of the railway Gabela (Čapljina) - Zelenika, built in period 1898.-1901. some of which are over 50 m high, and the largest railway embankment is located over a deep ravine Bijela, continuing further over high embankments and retaining walls, and through deep cuts to the railway station Glavska, the easternmost settlement in the Federation of B&H.¹⁹



Figures 14.-16. Monumental dry-stone embankments of the Gabela-Zelenika railway on the Zaplanik-Uskoplje section, Ravno Municipality, with culvert and cantilever steps (above) and in locality Bijela (bottom, left); Bicycle path along the old railway route (bottom, right)²⁰



Figures 17-18. Dry-stone border between BiH and the Republic of Croatia in Zavala-Gorica, municipality of Grude, from 1721 (right), with orthophoto of the old road Grude-Posušje on the left edge of which the border is marked²¹

19 Bodrožić S., Bubalo F., Frangeš G., Renić M., Šrajer F. (2013): „Gradimo u kamenu“ - Priručnik o suhozidnoj baštini i vještini izgradnje“, 2. izdanje, „Slobodna Dalmacija“ d.d. Split, 2013.

20 Đukić, V. (2011): „Biciklisti oživljavaju legendarnog 'Ćiru'“, <https://www.blic.rs/vesti/republika-srpska/biciklisti-ozivljavaju-legendarnog-ciru/4ndfx33>

21 http://os-pucisca.skole.hr/?news_id=39

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As a very interesting but relatively unknown dry stone wall, we emphasize the dry stone border between B&H and the Republic of Croatia (RH) in Zavala-Gorica, Grude municipality, according to the Treaty of Požarevac from 1718, built in 1721, three centuries ago.

3. DRY-STONED BUILDING HERITAGE OF HERZEGOVINA REGION – TODAY (WHAT IS THE CONDITION OF OUR DRY-STONE WALLS?)

Dry-stone architectural heritage has been threatened in recent decades for a variety of reasons. One of them is the lack of maintenance, and harsh climatic conditions in mountainous areas. Photographing residential and commercial buildings in Blidinje in 1995 for the development of the Spatial Plan of the Blidinje Nature Park and re-surveying several years ago showed that most dry-stone buildings collapsed significantly over two decades, especially due to extremely high snow in February 2012. when many roofs were torn down.

There are numerous examples of dry stone walls collapsing and being overgrown with vegetation.

Over the past decades, many dry-stone walls and dry-stone buildings have served as a source of stone as a building material for the construction of new residential buildings.

Prof. Bonacci points out that nowadays the karst landscape is increasingly endangered by human activity. Mass crushing of stone, destruction of dry-stone formations - all with the desire to ensure more intensive agricultural production - are human activities that threaten the quality of groundwater and are slowly turning karst areas into deserts!²¹

Unfortunately, there are also failed reconstructions of dry-stone buildings in various ways, and one of the most common is the use of bonding mortar, which makes the dry-stone structure cease to be...

Such interventions destroy the dry-stone architectural heritage. Ignorance cannot be an excuse for examples of bad practice!!!

4. DRY-WALLED BUILDING HERITAGE OF HERZEGOVINA REGION - (PLANS FOR) TOMORROW

Regarding the activities of the authors of this text in the last several years, they are diverse, from writing articles to acquaint the professional public with the values and problems of dry-stone architectural heritage, through organizing lectures and a round table on dry-stone with accompanying photo exhibition at the 3rd International Symposium " Herzegovina - the land of stone "(2018). Out of 14 graduate/master's theses on the topic of stone at the Faculty of Civil Engineering in the last ten years, 2 were on the topic of dry-stone buildings. For 3 years now, within the course "Building Materials 1", a lecture on the topic of dry-stone construction has been held, and the introduction of an elective course on that topic is planned.

Plans for tomorrow are numerous:

1. **Obtaining permanent protection of the art (skills) of dry-stone construction as an intangible cultural heritage of B&H.** Although this art is recognized in the neighboring Republic of Croatia and on the UNESCO "Representative List of Intangible Cultural Heritage of Humanity", in B&H it is still not recognized and inscribed on the Preliminary Open List of Intangible Cultural Heritage of B&H.
2. **Active action of competent institutions of all levels in order to preserve and restore dry-stone architectural heritage as a material cultural asset:**
 - Publicly promote the values of dry-stone buildings and structures;
 - Launch an initiative for the protection of dry-stone architectural heritage in B&H (cantons, cities, municipalities, associations,...) through the adoption of the Law on Protection of Dry-stone Architectural Heritage as a tangible cultural property of B&H;
 - Provide measures for the protection of dry-stone architectural heritage in the spatial planning documentation of all levels;
 - Develop an Action Plan on the systematic restoration of dry-stone architectural heritage;

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- In cooperation with the cantonal ministries of culture and construction, prepare and update the List of holders of dry-stone construction skills (firms and persons), as capable masons are few today and in high demand;

3. Start with inventory, monitoring and revitalization of dry-stone architectural heritage; To this end, establish an interactive GIS database, open public inventory of dry-stone architectural heritage in B&H. The degree of degradation of dry stone walls and other buildings should be noted through field research. Revitalization should be done by preparing studies and revitalization studies;

4. Educating the general public, as dry-stone construction, as an integral part of the Mediterranean architectural and cultural heritage, should have a more prominent place and become the subject of significant study and public presentation in the future:

- Initiate a public action to warn local people, especially farmers and landowners (whose lack of education is often the cause of degradation) to protect and preserve dry-stone architectural heritage from destruction (public forums and exhibitions of dry-stone photographs);

- For promotional and educational purposes, organize lectures, but also round tables and other gatherings, in cooperation with educational and other institutions (civil engineering / architecture, vocational and other secondary and primary schools), local communities / settlements, and associations;

- Open the website www.suhozid.ba and constantly update with news, pictures, professional articles, projects that are being implemented;

- Publish papers and books related to dry-stone architectural heritage in B&H. The book by the author of this article entitled "Herzegovinian dry-stones 1 - Frozen stone story of former life and attitude towards the environment" will be published soon;

- Present local, national and international strategies for the protection and improvement of dry-stone construction skills in modern practice;

- Explore the possibilities of technologies in terms of research of dry-stone architectural heritage;

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- Gain insight into best practices as well as the potential of dry-stone construction in modern sustainable applications in agriculture, landscaping and infrastructure construction;
- Cooperate with civil society organizations from other countries (CSO "Dragodid" www.dragodid.org and others) in order to exchange experiences related to dry-stone architectural heritage;
- Organize a series of creative educational workshops and trainings (with individual municipalities / local communities / settlements, and associations) on the basics of dry-stone construction, construction methods and types of dry-stone constructions, as well as important features to pay attention to when building and maintaining dry-stone. Along with them, organize work actions for the restoration of dry-stone architectural heritage, through the work of volunteers and users, with the aim of training students for their restoration and protection. We hope that in the foreseeable future we will be able to receive financial support for the maintenance of our own dry stone walls (for example, through the Rural Development Program);
- Start workshops for students of architecture and civil engineering at the Faculty of Civil Engineering, University of Mostar (as future engineers and developers), with the extension of these activities to students of vocational high schools (and some primary schools) to spend several dozen within their school curriculum extracurricular classes to get acquainted with the traditional skill of building dry-stone structures in their schoolyards or some other nearby locations;
- Publicly highlight examples of good practice related to the preservation and restoration of dry-stone architectural heritage, and especially the construction of new ones;
- Publicly highlight and reward examples of modern application of dry-stone construction techniques, from reconstructions, through extensions to the construction of completely new stone buildings, with dry-stone, which are connected to the local environment, but also tradition;

5. Promotion of dry-stone architectural heritage in Herzegovina Region (and beyond), as one of the bearers of regional identity that contributes to economic progress as a tourist attraction, giving guests insight into dry-stone architectural

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heritage as an indispensable part of experiencing our landscape, or "frozen story" of the former man life and environmental management. This would further enrich the area with a different kind of offer and attract tourists focused on cultural heritage, rural areas and sustainable tourism;

6. Importance of dry-stone walls in biodiversity conservation as dry stone walls have always been a valuable eco habitat for various plants and animals (many species of plants, reptiles, mammals, birds, insects, etc.), and humans have always lived deeply connected to the environment;

7. Apply for various projects to be supported by the European Union.



Figure 19. An excellent example of how dry-stone can be applied in modern architecture, which not only pays tribute to this way of historical construction, but also makes the building superbly blended into the environment and visually makes it part of nature, is the family estate Stanić in Bijača near Ljubuški. winner of the CEMEX awards for 20122²²

Due to the movement of the population from certain rural, mostly hilly, parts of Herzegovina Region, the autochthony of the landscape has been preserved, among them the dry-stone buildings and constructions, in which our ancestors invested

22 (2016): „Imanje kojim se ponosi cijela Hercegovina proglašeno najljepšim u BiH“, <http://www.grude-online.info/imanje-kojim-se-ponosi-cijela-hercegovina-proglaseno-najljepsim-u-bih/>

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enormous effort. Therefore, it is the last moment to take care of the architectural heritage, the demolition and removal of which would not leave future generations with a direct knowledge of the past or leave them with rare traces.

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