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Construction and demolition waste in Lezha.

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66

Abstract- *Lezha is a city that has its beginnings in 385 BC. The geographical position of the city, together with its surroundings, has made Lezha one of the most important commercial and military-military centers since ancient times. Considering how old it is as a city and how much development it has had over the years, we can say that construction in this city is quite developed. The last 10 years there is an explosion of high-rise buildings near the beach in Shëngjin and in the city of Lezha.*

C&D (construction and demolition) waste are waste generated during the construction time of various facilities and from the demolition of buildings for various reasons. So in Lezha city are present both type of waste. C&D waste materials typically include soils, concrete (which is going to be the material analyzed in this paper), bricks, glass, wood, plasterboard, asbestos, metals and plastics. In the amount of the waste the amount of concrete waste was also affected by the November 26 earthquake because many houses and mansions were damaged and remain non-functional and the only thing that could be done was to collapse. The fact that Lezha is a city with highly developed tourism in both sea, agro-cultural and mountain tourism has made the buildings increase in number or be rebuilt to meet the contemporary requirements of tourist needs. Also it is foreseen by the local institutions of Albania that by 2031 in the city of Lezha to generate 24219 tons per year of inert waste as a consequence of the increase of tourism and the predictions for the increase of the population.

The problem with construction waste, especially concrete, is that although many years pass, the concrete is not degradable, it remains as it was produced and in the place of disposal. By not treating the waste properly many agricultural lands will be turned into landfills with construction waste, we will have an environmental impact and in protected areas, tourist and public spaces for citizens.

This paper focus on an analysis of the C&D waste in the city of Lezha. The purpose of the study is to present the management situation of C&D waste in Lezha and based on this policy to provide some short-term and long-term solutions to solve the problems that come as a result of mismanagement of this waste. Using alternative management routes could result in both environmental and cost savings, also on a better development of tourism.

Introduction- The European Commission considers construction and demolition waste (C&DW) as a priority waste stream because of the large amounts generated and its high potential for reuse and recycling embodied in the composition of the waste. Specific legislation for C&DW has been developed in Europe such as the Directive 2008/98/EC on waste, which focuses on the need of measure the waste

stream and to further develop the material recuperation proficiency of C&DW in the European Union . As indicated by this Directive, the reusing objective of C&DW by 2020 is 70%, and accordingly reusing offices are required to accomplish this objective In view of volume, Construction and Demolition (C&D) waste is the biggest waste stream in the EU. In a lifetime, an normal European resident creates at least



Fig. 1 / Existing small fishing ponds in Shengjin. Source /author

160 tons of C&D squander, a sum which is expanding over the long run. The C&D waste, generated by the EU countries include a wide range of materials, mostly inert such as: excavation materials, road construction and maintenance materials, but also can contain hazardous waste types, which can be present in significant proportions when buildings are demolished or renovated. Denmark, Estonia, Germany and Ireland all recycle over 70% of generated C&D waste, but a minimum 40% of the total recycling is by the recycling of dredging soil, soil and track ballast.

In Albania the situation is slightly different, except for the fact that waste recycling is still unexplored and their treatment is in the very early stages. There are many studies done regarding the waste generated in Albania but studies related to solid waste and especially for waste generated from construction and demolition of various engineering facilities are few. Based on the study NATIONAL SECTORAL PLAN FOR SOLID WASTE MANAGEMENT it is predicted that in Albania from 1986,281 tons/year in 2018 the amount of waste will reach 2288,299 tons/year in 2031, meanwhile in Lezha which will be the case study in this paper the amount of waste is predicted to change from 25,680 ton/years in 2018 to 43,974 tons/year in 2031.

According to Albanian regulations, constructors (producers of inert waste, construction waste and demolition) must pay a deposit to the local government to obtain a construction permit. The deposit is repaid at the moment when the

requirements of the Regulation on Inert Waste are met by the constructor. This action requires a high monitoring capacity, as responsible officials need to know the amount and type of inert waste generated by each construction and demolition activity and monitor the final destination of all these materials.

Although there are several plans, there are laws, different plans for the treatment and management of different wastes in Albania, the situation is still very problematic. Inert waste, some of them are used in construction sites as substitutes for various fillings, some are deposited in landfills that are determined by the government itself or by the municipalities of different cities, but a significant amount is deposited along the roads in different areas. Agricultural but also near rivers or lakes without respecting any criteria.

Case study Lezha- Lezha is one of the cities that generates the largest amounts of waste from construction and demolition of buildings. In the city of Lezha we encounter waste generated from the production of natural raw materials such as gravel, sand or granule in the two main production points such as the Mat river and the quarry at the entrance to Shengjin. The city of Lezha is divided into areas with a different focus on development. The first area is Kune Vain lagoon, this area includes one of the main coastal cities such as Shengjin, which recently has had a very large development which is accompanied by a large boom of buildings with high buildings when we can say that they are buildings with a number of floors



Fig. 2 / C&D waste on the coast along Shengjin-Kune road, Source/ author.

on average 6. The second area is focused on the development of agritourism, which includes Zadrima, Fishta, Ungrej. The third area is historical area and the area characterized by constructions from ancient times to the present day. The last area is the industrial area that we can say is the area that has the largest amount of construction waste.

The solid waste generated are those produced during construction and demolition, but also in Lezha we have waste that comes from the extraction of natural material at the two production points of the river Mat and Mali i Rencit. According to national sectoral plan for solid waste management the amount of waste in Lezhe is predicted to change from 25,680 ton/years in 2018 to 43,974 tons/year in 2031. The amount of waste generated is also affected by natural disasters. The earthquake of November 26, 2019 caused a lot of damage in different cities of Albania where one of the most affected was the city of Lezha. According to the data published on the official website of the municipality of Lezhe, 13 buildings were out of function and collapsed. Many other mansions and many private homes have been in need of reinforcement and restoration.

Lezha is a city that is well structured for waste management in general but encounters some problems in solid waste management. During the site visit, some problems with construction waste were encountered.

Place of solid waste dumps seen in the city of Lezha:

1. Agricultural fields.

2. Side road deposits.

3. Kune Vain lagoon. Although this is a protected area it is not at all protected from illegal dumping of construction waste.

4. Deposits along the road to Shengjin and around the swamp in Shengjin or near the coastline where in some places due to the amount of waste that area has become impossible to be frequented by tourists.

5. Mat river.

Conclusions

Recycling and re-using of C&D waste is the answer of waste management. Proper management of C&D waste and recycled materials – including the correct handling of hazardous waste - can have major benefits in terms of sustainability and the quality of life. But it also can provide major benefits for the EU construction and recycling industry, as it boosts demand for C&D recycled materials.

What can we do with the waste generated by the construction and demolition of engineering works?

The first step is the estimation of C&DW generation and the second step is the multicriteria analysis of the C&DW management alternatives. Results from the estimation of the generation of C&DW in Cantabria using four different ratios of waste per unit area of construction, demolition and renovation activities show important differences in the total amount generated upon the used ratio.

From the field visit an option of reusing solid waste as the city itself is an attractive city for fishing is to use the waste to create small fishing piers. In this case no



Fig. 3/ C&D waste in Kune, Source/ author.

treatment is needed just to collect them and create a path in the sea with gabions. Another option is to recycle C&D waste especially concrete waste. Concrete is recycled by using industrial crushing equipment with jaws and large impactors. After the concrete is broken up, it is usually run through a secondary impactor and is then screened to remove dirt and particles and to separate the large and small aggregate. The small aggregate could be used as aggregate for new recycle concrete, but this must be confirmed by laboratory tests.

Another suggestion is to use the tested C&D waste as a base for roads or as fillers in various facilities.

The benefits of waste management:

- Environmental benefits. A better treatment of waste would bring an improvement of life not only to the inhabitants of Lezha but also to all species living in different lagoons and forests.
- Using recycled material as gravel reduces the need for gravel mining. This would protect natural and cultural monuments of special importance not only for the city but also for the state. An example is the Zogu Bridge over the Mat River. Also the Kune-Vain lagoon.
- Reduced tippage and related freight charges
- Cheaper source of aggregate than newly mined
- Reduction of landfill space required for concrete debris
- Visual benefits
- Increasingly, high-grade aggregate for road construction is available only

at greater distances, increasing the associated economic and environmental cost impacts associated with the longer haulage distances versus using recycled aggregate.

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