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The Urban Lab of Europe !

# The BRICK-BEACH project Journal N° 2

*Project led by the City of Vélez-Málaga*



**CIRCULAR  
ECONOMY**



# The BRICK-BEACH project

The **BRICK-BEACH** project seeks to use construction and demolition waste to regenerate a disappeared beach in Velez-Malaga through the development of a circular economy model. The project will create a debris treatment plant and will design an innovative process that will allow the output materials to have the granulometry and softness needed to regenerate damaged sandy beaches such as the Mezquitilla beach. Debris from local illegal dumps will be treated and used for the integral beach regeneration and its surroundings, as well for experimenting together with local businesses other innovative circular economy products. An integrated set of socio-economic and environmental restoration programmes will be implemented to complete the beach regeneration. The newly created urban space next to the regenerated beach will also be used as an opportunity to generate new tourism-related as well as environmental leisure services and activities.

## Partnership

- City of Velez-Malaga
- Spanish Ministry of Agriculture Fisheries, Food and Environment
- Andalusian Agency for water and environment
- University of Malaga - 1 higher education and research institute
- Aula del Mar de Málaga - NGO
- Andalusian Association of Business of Construction and Demolition Waste recovery (AGRECA)

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# 1. Executive Summary

This second Journal of BRICK-BEACH project reports on the advancement of the project till March 2019 and focuses on the activities realised in different areas.

- **C&DW Treatment Plant**

In November 2018, Waste Management Plant project was officially submitted to the pertinent regional authorities of environment (Delegación Territorial de Medio Ambiente de la Junta de Andalucía) for analysis and approval. The project also included an environmental impact study and an assessment of the impact on health. The recycling plant includes, in addition to the usual steps of cleaning, crushing and sorting; the washing of waste and the rounding of certain fractions that will be used for the recovery of the “Mezquitilla” beach. In parallel, the University of Malaga made several analyses and laboratory tests to determine the different elements related to the materials that will be used for the filling of the beach. The results at the laboratory level have determined that, both the quality of the sizes and roundness of the bricks and concrete can be considered almost perfect for the intended purpose.

- **Beach Regeneration**

During the period under review, a study was realised on the **regeneration** of the beach of “Mezquitilla” and another on the **dynamics of the coast**. Taking into account those studies and the different options proposed, the alternative selected is the one consisting of two dykes of 120-meter-longs, arranged in parallel to the coast and with a separation between them of 160

meters approximately. Three other studies were developed related to the beach regeneration: - **geotechnical characteristics** of the seabed in front the “Mezquitilla” beach; - **bathymetry** with multibeam probe and - **environmental quality**. In general, the area observed hosts a large amount of life with numerous species and organisms that, in some cases, are under a certain category of protection.

- **Communication**

In January 2019, the launching day of the BRICK-BEACH project took place in the municipality office of “Mezquitilla” and near to the beach, with the participation of representatives of all the target groups established in the area (neighbourhood associations and NGOs), local authorities and project partners, as well as the main media at local and regional level. From February to March 2019, different neighbourhood associations, environmental organisations and fishermen brotherhood were invited to informative and communication meetings with the aim of collecting the main proposals and concerns regarding the planned actions on the “Mezquitilla” beach and surroundings.

Regarding the **challenges and risks** detected, the regional environmental authorities that must issue the corresponding environmental authorization, (Unified Environmental Authorization) before taking any action related to the establishment of the Construction & Demolition Waste (C&DW) plant and the regeneration of the beach, require more time to carry out a more detailed examination of the project before the aforementioned environmental authorization is

issued. Therefore, it is more than likely that there is a delay with respect to the initial programming time for those works. Another element that is affecting the implementation of the project is the past regional and future national and local elections. Last December 2018, regional elections were held in Andalusia with the consequent changes at the level of maximum responsible in the institutions and agencies that have to analyse and approve the authorizations mentioned above. Regarding the national elections, it will take place in April 2019, with the foreseeable changes again in the national agencies that also have to analyse and approve certain licenses related to the project.

Finally, as concern the **conclusions**, the concept and implications of the innovative BRICK-BEACH

circular economy project is well embedded in all project partners. There is a strong commitment of all the parties involved in the good execution of its activities. The administrative management of the project has substantially improved and, during the period covered by this journal, the initial financial management issues have been solved with the incorporation into the team of a financial officer. Important advances have been made in relation to the recycling plant, the regeneration of the beach and the communication aspects. However, C&DW Treatment Plant and the beach regeneration will suffer significant delays due to the need to obtain, prior to the tender of the works, the corresponding environmental permits. Therefore, a reprogramming of the dates, taking into account this situation, is necessary.

## 2. BRICK-BEACH: Another “classic” project?

The concept of circular economy has begun, recently, to be used in the socioeconomic context. A circular economy project involves achieving a comprehensive vision and approach to address a specific problem and apply solutions that include environmental, sustainable, economic, commercial and cultural points of view. This is the main challenge of the BRICK-BEACH project. In fact, for the final **users**, in principle, the result of the project is simply to recover a non-existing beach and obtain quality services around it. For **companies** in the region, it is about to build a plant for recycling waste from construction and demolition, and for the different **administrations** involved prepare and launch the related tenders. In this sense, the role and leadership of the city of Vélez-Málaga is of crucial importance since the integration and coordination of the project in one single clear objective, as well as the administrative capacity to drive it to a successfully end, is one of the most difficult challenges.

As it will be explained later in this journal, once BRICK-BEACH started, several events were organized to present the goal, the purposes and the results of the project. The users are right now becoming conscious **citizens** ready to collaborate and cooperate with the project; the companies, **business partners** willing to

contribute with technical solutions and proposals to overcome the problems the project is facing, and the administration at the national, regional and local levels, **public stakeholders**, part of a project which will have a significant impact in the region and possibilities of replication in other parts of the coast. This new concept of cooperation and partnership is the real engine of the BRICK-BEACH project.

Keeping the momentum among the stakeholders, together with a truly and faithful communication and information mechanism with the NGOs, civil society organisations and citizens in general, is another crucial challenge of the project. The complexity of actions to be realised and actors involved, requires a constant and permanent leadership and coordinative effort from the part of the project managers and institutions responsible. From this point of view, BRICK-BEACH is not “another” classic project to be implemented. As long as this “specificity” and the “innovative” solutions that will be applied to the project are taken into account, the project will achieve its objectives, although it is important to pay attention to certain real and potential obstacles or difficulties to be overcome in the near future, which will be explained in more detail on the following pages.

## 3. BRICK-BEACH UPDATED: What has been done

The previous Journal covered the period from July till November 2018, while the present one covers the period until the end of March 2019. In the first Journal, it was about the deployment of the necessary resources for the implementation of the project from the administrative,

organisational, managerial and communicative points of view. At the same time, different activities were developed related to the elaboration of the recycling plant project, the conceptualization of the beach and surroundings and some communication activities.

### 3.1. A waste recycling plant for a new beach and much more.

During the reporting period (November 2018), the project BRICK-BEACH Waste Management Plant was officially submitted to the pertinent regional authorities of environment (Delegación Territorial de Medio Ambiente de la Junta de Andalucía) for analysis and approval. The project also includes an environmental impact study and an assessment of the impact on health. The construction of such a recycling plant, although framed as one of the key elements of the BRICK-BEACH project for the recovery of the “Mezquitilla” beach, will fulfil a much wider function and is justified also due to the absence of solid waste recycling plants in Vélez-Málaga region. The generation of waste produced by citizens, companies, institutions and activities in the region is huge, with no adequate management centres in the area.

At this point, it is important to mention that, although the project has been submitted to the relevant authorities in a very short period of time thanks to the professionalism and commitment of the partner in charge of this activity (AGRECA), with the support and leadership of the

municipality of Vélez-Málaga, the construction of the plant will be delayed, and, consequently, also the public procurement of the plant, due to different reasons explained below (4. Challenges and Risks opened) in a more detail manner.

The main objective of this plant for the recycling and recovery of construction and demolition waste is to physically transform this waste, producing recycled aggregates that will be used for all types of public and private works. The plant will be a place of reception of construction and demolition waste. It will treat the waste in its entirety and will value a very high percentage of them, by incorporating a washing line for the removal of the plaster that generally adheres to the ceramic material. The recycling plant includes, in addition to the usual steps of cleaning, crushing and sorting; the washing of waste and the rounding of certain fractions that will be used for the recovery of the beach of the “Mezquitilla”, which guarantees environmental sustainability, absence of contaminants, as well as physical characteristics suitable for use in numerous types of works.

More precisely, the process of management of the plant contemplates the following steps:

- a) The material to be treated from demolitions, surplus production of concrete dosing plants and excavations, is transported to the facilities.
- b) The next step will consist in a manual triage for the elimination of plastics, tubes, paper, cardboard, etc., these residues being stored in suitable containers for its later removal by an authorized manager.
- c) Subsequently, a backhoe of chains with hydraulic clamp removes the steel from the concrete, collecting it in a suitable space for its later removal by an authorized management company.
- d) The waste is loaded by a wheel loader in a screen machine that will separate the material with a grain size of less than 20 mm, producing a marketable aggregate for different uses.
- e) The screen machine will have, at its output, a blower that will separate the foreign elements to the residue bulky construction, such as plastics, paper, cardboard, etc., and an electromagnet for separating ferrous materials.
- f) The conveyor belt will then dislodge the material in a secondary impact mill, which will reduce the size of the material to granulometries less than 80/100 millimetres.
- g) After milling, there is an electromagnet that will retain the steel that had entered the mill, separating it from the rest, for its storage in the corresponding deposit.

- h) At the exit of the grinding group, there will be a conveyor belt that will operate until the entry of the screening group of at least 3 cloths, where the classification of the product is carried out.

These products will be commercialized, thus allowing the introduction of these products in the market.

In addition to the process described above, which corresponds to a classic waste management plant for construction and demolition, there will be a parallel line that will have one or more of the outputs of the valorisation process described above as entry. This line will have two basic elements. The first, consisting of a scrubber screw for the coarse fraction with a vibrating screen for the rejection thereof. This equipment will allow separating, mainly, the plaster adhered to the ceramic material. The second element will aim to round off the edges of the aggregates, mainly of ceramic nature. In this way, the installation of a trombone of 8 meters in length is planned, prepared to operate at high revolutions, so that the centrifugal force of the same causes, through the friction of its walls, the rounding of the aggregates and the edge removal.

As a summary, the plant will have two mechanical processes for the reduction of size: shredder clamp on a rotating backhoe and impact mill; three classification elements: pre-screen, screen and trommel; and various cleaning systems: blowers, electromagnets, washing screws, etc., as well as the double function of the trommel for the elimination of edges in aggregates and the elimination of fines.

## 3.2. A laboratory test for the beach material

In parallel to the preparation and presentation of the project of the recycling plant, the University of Malaga, partner of the project, during the period under review, made several analyses and laboratory tests to determine the different elements related to the materials that will be used for the filling of the “Mezquitilla” beach. More specifically, laboratory tests were carried out on the cleaning of the bricks, the leaching of the different materials of the treatment plant and the turbidity of it in an aqueous environment.

The results at the laboratory level have determined that both the quality of the sizes and roundness of the bricks and concrete, as well as the level of turbidity and rounding of the aggregates to be used for the beach can be considered almost perfect for the intended purpose.



## 3.3. A new beach for a new time

Regarding the work to be carried out on the beach itself, the Environment and Water Agency carried out a study on the **regeneration** of the beach of “Mezquitilla” and a study on the **dynamics of the coast**, consisting of an analysis of the maritime climate, the coastal dynamics and the potential of transport and a proposal of alternatives for the protection of the coast.

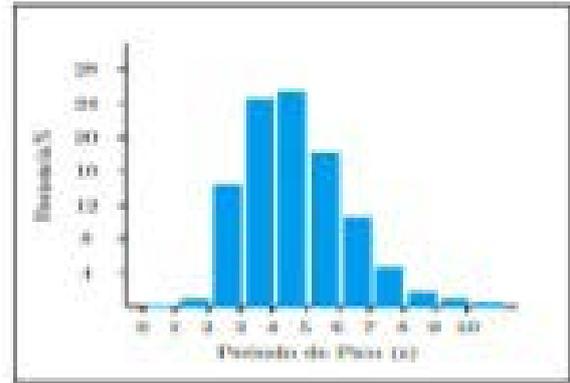
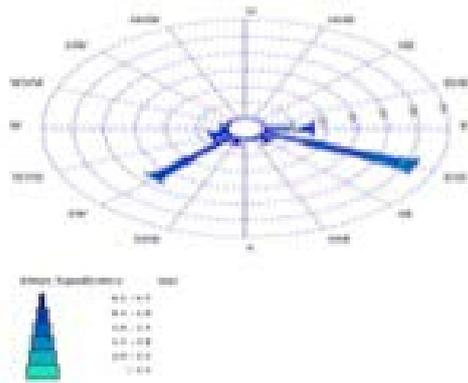
### a) Dynamics of the coast

The waves in the study area are characterized by the numerical reanalysis data in the SIMAR 2036080 point of “Puertos del Estado”, located opposite to the study area. To know the swells that reach the study area and which will be propagated by numerical simulation to the coast, it was consulted the swell roses of simulation node SIMAR 2036080 of numeric obtained by reanalysis, from 01-01-1958 to present (61 years).

The following figure shows the location of the data source.



Observing the figure of the wave rose it can be seen that the waves are concentrated in 2 main directions, the ESE, the most frequent (more than 30%), followed by the SW (over 22%), the rest, only the East is almost 10%. As for the energy of the waves, the most energetic waves are those coming from the ESE.



Regarding the peak period of the swell, in the previous graph it can be seen that more than 90% of the swell has a peak period between 2 and 7 s, it is therefore a matter of waves with short periods, with swells with more than 10 s of period of 1%. As seen in the following table, waves of 1 m or less have periods of 5 s or less, those of 1-2 m are over in 7 s and those over 3 m are mainly of 8-9 s.

**b) Littoral dynamics and potential transport**

The gross and net potential transport has been calculated using the CERC transport formula. This formula is applicable to sands and considers that the transport is proportional to the energy of the swell. The parameters considered are the height of the wave and the angle formed by the direction of the wave at the moment of breaking with

respect to the perpendicular to the coast. This formula is directly related to the FME, which summarizes the mean direction of wave energy. In our case, the coastline in the study section has an orientation that varies between 102° to the North in the far West, and 115° to the North (practically ESE), in the East end.

In the following table, FME-0 is the direction of the average flow of energy in deep water; FME-1 is this direction in each area of interest. The gross P.T.C. is the gross potential transportation capacity and the net P.T.C. is the net potential transportation capacity (expressed in m<sup>3</sup> / year), indicating the positive transport values towards the left looking from the sea towards the land (in this case, positive towards the west and negative towards the east).

Zone	FME-0	FME-1	Gross P.T.C. (m <sup>3</sup> /year)	Net P.T.C. (m <sup>3</sup> /year)
Far West	127,2	191,7	238000	-53000
Central area		192,0	225000	-25000
Far East		195,7	172000	25000

In the previous table, it can be noticed that the direction of the FME varies little in the different zones, arriving the FME from the West in the extreme West and in the central zone, and from the East in the extreme East. That is the reason why the net transport direction changes in that zone. The shape of the beach has been analysed



in the small breakwaters existing to the West of the project area, which are shown below.

To review the historical line of the coast, the photos of the beach were consulted in different periods (from 1956 to 2018). From this examination, it was found that between 1956 and 1977 there were no significant changes. In 1984, there were already some small dams west of the project area. In October 2011, however, the orientation of the beaches fitted between the breakwaters has changed completely, from being supported on the breakwater of the East to be in the West, so the FME between 2009 and 2011 clearly changed. In April 2012, the orientation of the beaches is again the same as it was until 2009, so the address of the FME that has dominated the rest of the time is recovered and it remains until 2018.



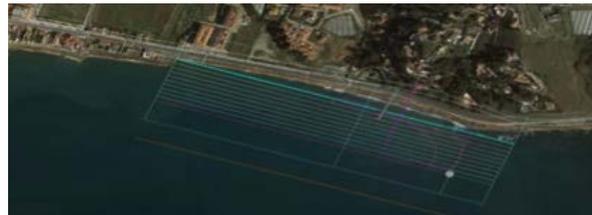
### ***c) Alternative proposals for the protection of the coast***

For the alternative proposals, the long-term module of the SMC software package has been used. Through this module it is possible to design the shape of a beach that will exist depending on the direction of the FME and the position of the coastline. It also allows knowing the position of the long-term equilibrium profile after regeneration and its intersection with the ground. Taking into account the analyses carried out, three possible alternatives are proposed for the regeneration of

the beach. All of them have tried to minimize the visual impact and the stiffening of the coast.

- Alternative 1: Periodic sand contribution without stabilisation works

This alternative consists in creating a beach in the front currently without sand, and to conserve it by means of periodic contributions of material, since the beach is not stable as such, and the coastal drift tends to take the material towards the East. In this alternative, in order not to generate an excessively wide beach on the East end, where it has no support, there is no beach on the West end. The main limitation of this alternative is that the beach would not have lateral support, so the material would be lost and should be regenerated periodically.



*Alternative 1*

- Alternative 2: Construction of breakwater in the extreme East

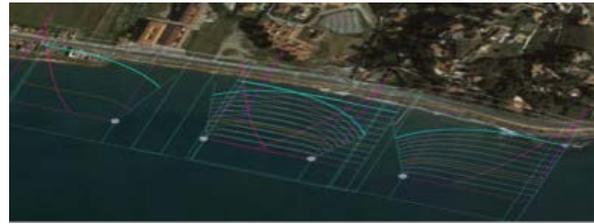
In this case, given that the transport trend is towards the East, in addition to the spillage of aggregates, a breakwater is created at the East end to laterally contain the beach and not have to regenerate it periodically. With this option, the loss of material at the extremes is avoided, but a rocky area is occupied and visual impact is generated since the breakwater must be surfaced throughout the initial stretch to contain the sand.



*Alternative 2*

- Alternative 3: Construction of submerged dikes

In this alternative the stabilization of the beach is obtained by means of the construction of submerged dikes, which diffract the waves in its aftermath, generating a tendency to accumulate sediment in said area, depending on the geometric characteristics of the dikes and its relative position to the coastline. The submerged dykes also have the following advantages over conventional breakwaters or breakwaters: -



Alternative 3

lower construction costs, both in labour and in quantity of material, and - less visual impact.

Taking into consideration the three options/ alternatives, the data concerning the analysis of the contribution volumes are the following:

#### Analysis of contribution volumes

Alternative	Average section (m2)	Beach length (m)	Total volume. Input (m3)	Surfaced beach area (m2)	Submerged beach area (m2)	Emerged (%)
1	69,16	563	38,937,08	7400	41400	15,16
2	178,20	551	98,188,20	22600	51500	30,50
3	237,50	587	139,412,50	31200	52800	37,14

The final evaluation of the three options is as follows:

Alternative	Functionality	Aesthetic	Investment	Environmental harm	Stability of coastal dynamics	Sustainability
1	Red	Red	Green	Yellow	Red	Red
2	Green	Yellow	Yellow	Green	Yellow	Yellow
3	Green	Green	Red	Green	Green	Green

Taking into account the study carried out and the different options proposed, the alternative selected is the number three, consisting of two dykes of 120-meter-longs, arranged in parallel to the coast and with a separation between them of 160 meters approximately.

Another study elaborated by the Environment and Water Agency during the period under review is the one related to the analysis of the **geotechnical characteristics** of the seabed in front the "Mezquitilla" beach, taking into account

the foreseeable location of the dikes mentioned above and its impact on the coast. For this study, the following data were taken into account:

- geophysical study with seismic reflection to determine the thickness of sediment on firm substrate;
- geomorphological study of the area;
- determination of geotechnical parameters of surface sediment samples (granulometry, sample density and organic matter content);

- drilling in rotation from the ground.

The study is completed with geological information available from the surroundings of the study area, and with possible associated geological risks and the location of the dikes.

The final study realised under this heading concerns the **bathymetry** with multibeam probe in the beach of the “Mezquitilla” that serve as geometric basis for the BRICK-BEACH project. More specifically, the work carried out has been the following: - multibeam echo sounder and lasescan; generation of point clouds (MDS, MDT) and three-dimensional model of the surface area taken; generation of isobaths and new marine cartography of the area.

In order to verify the marine **environmental quality** and eventually propose some type of protective measures, three underwater dives were carried out (03.12.18, 08.12.18 and 27.02.19) with an average duration of approximately 75 minutes. In general, the area observed hosts a large amount of life with numerous species and organisms found in some category of protection and some of them of large size. Likewise, a large number of trammel nets; trawl boat masts and octopus traps were detected in numerous rocks, as well as sepia cuttlefish eggs and numerous jellyfish. As the depth of the dive increases, sightings of species in protection categories are more frequent.



*Hipselodoris cantabrica*



*Thuridilla hopei*



*Venus verrucosa*

Finally, it is important to mention that the complexity of the studies that are being developed to obtain a complete overview of the different aspects related to the regeneration of the beach, including the coastal dynamics, implies that, as is the case with the recycling plant, the public procurement related to the work on the beach, dikes and recreation areas, will also suffer delays compared to the scheduled time of the project. In fact, all the studies and analysis of the regeneration of the sea and the coast have to be part of the new beach project that will be submitted to the national environmental authorities that, after examining it, will issue the corresponding authorizations. All this involves a long process before launching the public tender for works and, given the current electoral circumstances, undoubtedly this procedure will affect the time foreseen for the execution of the works.

### 3.4. Communicating with the citizens for a “different” beach

The BRICK-BEACH project will be a success to the extent that stakeholders, users, tourists, traders, fishermen and, in general, all citizens, consider the project as their own and different from the rest of the classic actions on the surrounding beaches. In this sense, the activities of communication, information and citizen participation, directly and through their associations, is one of the fundamental elements of this project. The municipality of Vélez-Málaga together with Aula del Mar (partner responsible for this activity), carried out a series of meetings with business associations, fishermen, civil society, environmental organizations, etc., to explain the details of the project, as well as collect proposals, concerns or comments from those organizations. All project partners are aware of the importance of this activity that will be carried out throughout

the project. The main activities developed during the reporting period were the following:

- **Project launch day**

In January 2019, the launching day of the BRICK-BEACH project took place in the municipality office of “Mezquitilla” and close to the beach, with the participation of representatives of all target groups established in the area (neighbourhood associations and NGOs), local authorities and project partners, as well as the main media at local and regional level. The principal objective was to present the strategy and the general activities of the project. The number of participants was around 50 people, who had the opportunity to raise questions and doubts about the project, which were answered by the authorities and project partners.



- **Meetings with specific groups**

Communication and awareness-raising activities, as well as the gathering of opinions and suggestions from the different groups concerned, have been another of the activities carried out during the review period of this Journal. The general purpose is to contact 67 associations and organize different meetings divided into six groups: Businesses, Environmental, Cultural, Fisheries, Social and Educational.

#### Neighbourhood Association

On February 25, 2019, different neighbourhood associations were invited to an informative and communication meeting with the aim of collecting the main proposals and concerns regarding the planned actions on the “Mezquitilla” beach and surroundings. The associations present at the meeting were: Asociación Virgen del Carmen Aldea Baja; Asociación Sin edades; Asociación de vecinos y vecinas de San José de Vélez-Málaga; Asociación Bahía de Lagos; and Asociación de Mezquitilla. During the meeting, a survey was made to the representatives of each entity on their point of view of the project, which was used to collect measures and proposals and select the most viable through the methodology of “Nominal Group”. Of all the measures proposed by this group, the following were selected as the most voted:

- Location of facilities preferably on the plot, not on the beach.
- Installation of children’s park on the plot.
- Sports activities but outside the beach.
- School of diving.
- Install loading and unloading area for diving material.
- Smoke free beach.
- Poster of good practices on the beach.
- A greater level of surveillance.
- Installation of a centre for interpretation of the marine environment.

#### Environmental Associations

On March 6, 2019, a meeting was held with the environmental associations in which, following the same methodology as in the previous meeting, the representatives of each entity presented their points of view of the project. The associations participating were the following: Ecologistas en Acción, WWF, AMACVA, UICN, SECN and Capitán Planeta. The main concerns and suggestions expressed by the participants can be summarised as follows:

- Insufficient aggregate load in the area to cover the volume needed for the beach.
- Continuity of illegal dumps in the area.
- Need to control discharges before, during and after the decontamination process, as well as before being discharged in the beach.
- Installation of surveillance cameras.
- Obligation to maintain the biodiversity of the environment in perfect state of conservation, as well as the restoration of marine habitats such as, for example, the placement of productive reefs.
- Concern about the vegetation to be used for the work on the plot.
- Pedestrian zone (littoral path), as narrow as possible.
- Interpretation, research and conservation centre (seahorses and serranids), in the plot (a salt water well should be considered to cover needs of these activities).

### Fishermen's brotherhood of Caleta de Vélez

The meeting with the fishermen's brotherhood of Caleta de Vélez was held on March 19, 2019. During the meeting, a conversation was established with the Chief Patron of the Brotherhood on the vision of the fishing community about the project. The main measures, proposals and concerns exposed were the following:

- Dedicate part of the Interpretation Centre to a museum about fishing gear, both past and present, so that the visitor knows the tools, boats, utensils, etc.
- In the place planned for underwater reefs, they are very concerned about the type of material used for their construction (they proposed natural quarry rock), since in previous experiences with breakwaters and other structures, a material was used that damaged the fauna underwater and, therefore, commercial species in these areas is virtually non-existent.

- Concern about the limitation of fishing in the vicinity of the reefs and, therefore, the beach, since in the area, they are currently fishing "chirla" shell and octopus. The coquinas, in the absence of a sandy beach, do not develop at present.
- The collective, in general, is quite reluctant to any type of change, so it is proposed to convene a meeting with them in the own port brotherhood building.



## 3.5. BRICK-BEACH management and participatory approach

After having solved some initial problems regarding the financial **management** of the project in relation to the financial transfer to the different partners, the administrative management of the project can be considered as satisfactory. The communication and transfer of relevant documents is fluid and transparent, as well as the frequency of technical meetings (one per month) with the participation of all partners and the leadership and coordination of the project manager.

The recent incorporation into the project of a financial manager is a very positive aspect that facilitates and guarantees the good financial management of the project. In the area of

communication, the responsible person is continuing taking care of the communication activities of the project, which represents a fundamental element for the good execution of it.

The decision of the project leader to organize monthly meetings with all partners has been one of the most important and positive. The possibility of exchanging all kinds of information, the presentation of the different proposals for the implementation of the works, the debates on the solutions and strategies to solve the different problems, the invitation to these meetings of external experts, as well as the joint **monitoring** of activities, is making the level of **participation**,

commitment and coordination of all partners optimal. It is crucial to keep this dynamic and work methodology given the complexity and innovative characteristics of the project.

Notwithstanding the foregoing and in accordance with the project work plan, there are significant delays in the implementation and execution of

certain tasks, especially those related to work packages 4 (treatment plant), 5 (beach regeneration) and 7 (construction of the plant and restoration of the beach), which is explained in more detail below and which require special attention by project managers and main municipal authorities.

## 4. Challenges and risks opened

The Brick-Beach project is not just “another” project. The innovation of its proposals, the participation of partners from different administrations, the involvement of the civil society in its conceptualization and the intrinsic

complexity of a circular economy project mean that risks and challenges are also up to the expected benefits. These challenges and difficulties can be summarized, at this moment, as follows:

### 4.1. C&DW Treatment Plant and Public Procurement

The C&DW treatment plant is essentially affected by two main activities: the construction and start-up of the plant and the civil works and equipment. So far, the project has been prepared and presented (November 2018) to the relevant regional environmental authorities that must issue the corresponding environmental authorization (Unified Environmental Authorization) prior to any action related to the construction of the plant. Being a project of the characteristics described above, it is very likely that it requires a more thorough examination by said authorities before the aforementioned authorization is issued. This situation is causing a delay in the activities regarding the work plan prepared at the beginning of the project. It goes without saying that the start-up of the recycling plant conditions in a substantial way the execution of the other activities related to the regeneration of the beach and the rest of the actions. It is clear that the public procurement of the C&DW treatment plant is a real challenge and its implementation will suffer an important delay

within the framework of the UIA Initiative calendar. The reasons for this situation can be found in the nature of the work to be carried out (construction of a recycling plant and the relevant environmental authorizations), the different administrations (local, regional and national) involved in these procedures, and the political context related to national, regional and local elections (December 2018, April 2019 and May 2019), which are affecting the normal functioning of the administrations. Despite the knowledge and experience of the project partners in the public works bidding activities, it is evident that to fulfil all the requirements of the environmental authorities, launch the public tender, select the winners and execute the work in the next two years time is much more than a normal challenge.

Under these circumstances and taking into account other elements that are explained below, the most realistic estimation for the start-up and operation of the recycling plant is around first quarter of 2020.

### 4.2. Beach Regeneration Actions and Public Procurement

The actions of regeneration of the beach and its surroundings involve the regeneration of the “Mezquitilla” beach and the works on the beach and equipment of its environment. So far, as explained above, the activities carried out are

those related to the preliminary studies of the works on the coast and the beach, as well as those related to the conceptualization of the beach and its adjacent areas, bathymetry, environmental quality, geotechnical, coastal

dynamics, etc. In the near future, the project for the beach and environmental restoration must be fully elaborated, although, as in the case of the construction of the recycling plant, it is necessary, prior to such works, obtaining the environmental authorization. Thus, affecting the timing for tendering for works and supplies. The consequences are similar to the recycling plant: a delay on the implementation of works of around twelve months. This challenge of public procurement for the beach regeneration, together with the recycling plant, is certainly the most urgent and problematic one to be addressed. The political (new elections, some of

them unexpected) circumstances, as well as its impact in the normal functioning of the administration as regards the related environmental authorisations, are affecting negatively the scheduled timing of the project implementation. In both cases, (recycling plant and beach regeneration) a strong coordination of the partners to advance as much as possible in the different steps to complete the project proposal and the political leadership of Vélez-Málaga municipality is the best and only manner to overcome, as soon as possible, these adverse circumstances.

### 4.3. New elections, delays and leadership

One element that is affecting the implementation of the project is that of the past regional and future national elections. In fact, last December 2018 the elections were held in Andalusia with the consequent changes at the level of maximum responsible in the institutions and agencies that must analyse and approve the authorizations mentioned above. Regarding the national elections, they will take place in the next month of April 2019, with the foreseeable changes again in the agencies that also have to analyse and approve certain licenses related to the project. In this sense, the project leader, being aware of the repercussions that these elections have and can have on the execution of the project, is carrying out measures that could alleviate this situation. Finally, it is also worth mentioning the future local elections that will take place on May 2019

and that, although not in an especially important manner, could affect somehow the good functioning and current leadership of the project. In this context, the success of this project depends to a large extent on the skills and competences of the stakeholders and the leadership traits as defined by the UIA (leadership is about ensuring collaboration through a wide range of people in different departments and organisations). To adequately mitigate this risk, it is also important to increase the knowledge, awareness and commitment to the BRICK-BEACH project, not only of the civil societies organisations, but also of the final beneficiaries and the citizens in general who, at the end, will select the future political and administrative responsible of the project.

### 4.4. Communicating with target beneficiaries

Communicating with target beneficiaries is crucial for the good implementation of the project. Different awareness and communication activities have been developed with, in principle, very positive reactions, relevant contributions

and proposals from the civil society organisations. The impact on the media has also meant an important element to make the project known throughout the coastal coastline at the local, provincial and regional levels. The BRICK-BEACH

project represents a substantial change in the beach “Mezquitilla” and its surroundings. The recovery of a beach that disappeared many years ago, but still remains in the memory of many locals, has awakened memories and nostalgia of past experiences. In this sense, the expectations of all the beneficiaries with respect to the final

## 4.5. Up-scaling

UIA projects are innovative pilot actions and as such can only have a limited impact. The BRICK-BEACH project is an experiment, because the project objectives and activities have not been tried before. However, if the pilot will be successful, the ambition is to scale up the BRICK-BEACH objectives and to introduce the lessons learned along the coast in the relevant regional and national programmes. Both from the point of view of its innovative nature and its potential interest for its integration into regional and national programming, the BRICK-BEACH project has all the fundamental elements to be replicated and expanded on a larger scale. The problem with which this project is faced is not exclusive to its area of action. Quite the opposite. The impact of tourism activity, especially in housing

result are very high and it needs to be handled with rigor and responsibility by the project manager and all partners. It is important to maintain a constant rhythm of information on the development of the project with total transparency regarding the vicissitudes and project execution times.

construction, in the Mediterranean area, including the degradation of beaches, is a constant along the coast in recent decades. In this preliminary stage of project implementation, requests for information from several municipalities interested in the project’s objectives and methodology have already been received. The BRICK-BEACH project, aware of the importance of policy dialogue, has the intention, once the project has reached a more advanced stage, to promote policy meetings with supra-local governments in order to transfer the most relevant experiences at the level of objectives, management and experiences acquired by the project consortium and, eventually, its integration into the corresponding development strategies and support programmes.

## 5. Lessons learnt

Once several months have elapsed since the start of the BRICK-BEACH project, different lessons can be drawn to take them into account in the development of the project.

Designing and implementing an innovative and experimental project such as BRICK-BEACH requires a different way of working both at the public administration level and from the private stakeholders, including the final beneficiaries and citizens in general. BRICK-BEACH has succeeded, till now, to create a positive ecosystem for the project management, awareness and performance. However, this system requires a constant commitment of all parties involved. The principal administration responsible for the project implementation must also maintain a strong leadership, as far as possible, outside of political and electoral vicissitudes together with a stable political consensus.

The first lesson learnt is, therefore, that early investment, with a clear and complete planning structure together with a strong leadership, allows for a truly participatory process and, while reducing resistance to change, transforms the project in an opportunity of empowerment for the community.

Many times has been mentioned the complexity of the BRICK-BEACH project. This complexity can be noticed, among other aspects, in the public

procurement and more precisely in the environmental requirements to be issued by the regional and national authorities for both the recycling plant and the beach regeneration previously to the public tenders. In this respect, the main lesson learnt has been that practical administrative issues and legal aspects should be taken into consideration earliest and in any case before establishing the final project and contractual timeframes. This is a complex bureaucratic process which requires months and, as already mentioned, a stable political context within the public entities themselves.

BRICK-BEACH project is embedded in a wider social, cultural, economic and, sometime, political context. The communication to the civil society organisations in the area is being carrying out in a very participative approach, organising meetings with these organisations based on different subjects. The lesson learnt till present is that the expectations from the residents are very high, especially as concerns the beach regeneration, and that the frustrations can also be important if the project does not respond to the objectives and final results in the time scheduled. Therefore, partners need to be extremely careful in presenting the expected outputs as well as in terms of methodology, attitude and timing.

## 6. Conclusions

The main conclusions for this Journal 2 can be summarised as follows:

- The concept and implications of the innovative BRICK-BEACH circular economy project is well embedded in all project partners. There is a strong commitment and coordination of all the parties involved in the good execution of its activities and, with regard to the final beneficiaries; there is also a high degree of participation in the objectives and activities of it. The regular meetings of the technical group of the project, the important leadership of the municipal authority and the various actions of communication and awareness have definitely contributed to this result.
- The administrative management of the project has substantially improved and, during the period covered by this report, the initial financial management issues have been solved with the incorporation into the team of a financial officer. Noteworthy is the exchange of information and documentation between the interested parties, as well as the participation and proactivity attitude of all of them in the project activities and possible solutions to the different issues, with the support and coordination of the project manager.
- In relation to the recycling plant, the preparation of the project has been carried out to obtain the environmental license with all the relevant elements of a project of these characteristics. At the same time, at the laboratory level, the University of Malaga has carried out tests to determine the best solutions for the small pieces of brick and concrete that will be used for recovering the “Mezquitilla” beach, once treated and cleaned at the recycling plant. The results in the laboratory have been quite positive with a good texture to the touch.
- The projects related to the works and supplies for the coast, the beach and its surroundings must still be elaborated based on the different analyses carried out during this period of analysis. More specifically, on the studies of bathymetry, environmental quality, geotechnical characteristics and coastal dynamics.
- In the area of communication, many activities have been developed during the reporting period. The launch seminar took place end of January 2019 with a large number of participants including media at local, regional and national level, and individual meetings were held with different civil society organisations (neighbourhood associations, environmental organisations and brotherhood fishermen). All the conclusions, recommendations and concerns from the participants will be taken into consideration as far as possible when elaborating the project related to the beach and surroundings.
- With respect to the programming foreseen in the work program of the project, it must be recognized that the beginning of the works and supplies (work package 4, 5 and 7), related to the C&DW Treatment Plant and the beach regeneration, will suffer significant delays due to the need to obtain, prior to the tender of the works, the corresponding environmental permits. Therefore, a reprogramming of the

dates taking into account this situation is necessary.

- Finally, it is relevant to pay attention to certain elements external to the project's own dynamics, such as the regional, national and

municipal elections that have been taking place since last December 2018 and will continue until May 2019 of this year, and which in fact are affecting to the execution of certain project actions.

Urban Innovative Actions (UIA) is an Initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Based on article 8 of ERDF, the Initiative has a total ERDF budget of EUR 372 million for 2014-2020.

UIA projects will produce a wealth of knowledge stemming from the implementation of the innovative solutions for sustainable urban development that are of interest for city practitioners and stakeholders across the EU. This journal is a paper written by a UIA Expert that captures and disseminates the lessons learnt from the project implementation and the good practices identified. The journals will be structured around the main challenges of implementation identified and faced at local level by UIA projects. They will be published on a regular basis on the UIA website.



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