

Marsa Sports Complex
ReNature 2nd Training School: Group 6

Authors

Maria del Carmen Redondo Bermudez

PhD candidate sponsored by the Grantham Centre for Sustainable Futures
Department of Landscape Architecture
The University of Sheffield, UK

Erica Bruno

PhD student
Department of Civil and Environmental Engineering
University of Trento, Italy

Prabhat Joshi

Environmental Engineer
Kathmandu, Nepal

Sara Justino

Environmental engineer with water and wastewater treatment background. Currently based in Macao working as a water quality and safety Manager.

Steven Calascione

Steven is a UK educated management consultant and educator with a specialisation in markets, governance systems and industrial relations. He is currently based in Malta and is working as a lecturer, dissertation supervisor and researcher.

Bruno Flório Lessi

Researcher
Institute of Studies in Education, Health and Conservation (IEESC) - Brazil
PhD in Ecology and Natural Resources
Federal University of São Carlos, Brazil

Study area introduction

Marsa Sports Ground is located in the principal urban area, surrounded by the Grand Harbour conurbation (Figure 1). The north of the site is predominantly commercial while the area to the south is predominantly industrial.



Figure 1. Study area - Marsa Sports Ground

Due to the nature of the site, it is possible to use this area as an element of green infrastructure and such developments are encouraged while incorporating environmentally sustainable measures both in the design of any built structures as well as in open spaces. Sustainable transportation and attractive walking routes are to be incorporated in order for the site to function as a safe connection for cyclists and pedestrians between Qormi and the Grand Harbour.

The Planning Authority has put forward a proposed policy review dividing Marsa Sports Complex on 4 sub-zones - Zones A, B, C and D - as indicated on Map A (Figure 2). The Marsa Sports Complex site shall have a total built footprint of roofed over areas lower than 60,000 sqm and a development density lower than 114,000sqm in gross developable floorspace. Overall, the land uses may include one or a combination of the following primary functions (Table 1).

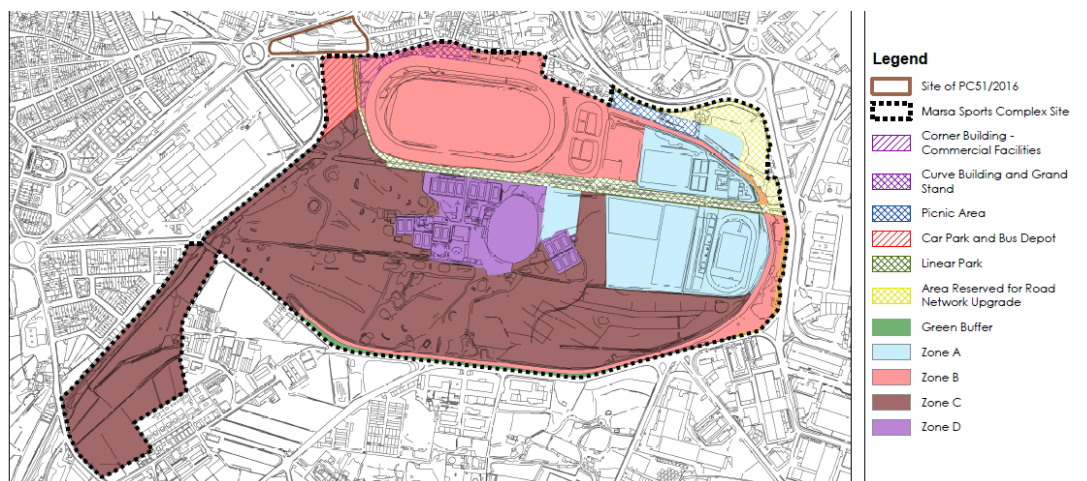


Figure 2. Map A

Sub-Zone	Primary Facilities
Zone A	Facilities for sports and leisure: gymnastics, weightlifting, squash, athletics, football, handball, softball, rugby and both indoor and outdoor archery; Indoor pool; and High-performance training centre with a multipurpose stadium.
zone B	International standard facilities for horse racing (trotter and flat) and equestrian sports (polo, show jumping, dressage), training areas and stables
Zone C	Golf facilities; and Golf academy.
Zone D	Facilities for tennis, squash and cricket.

Table 1: Primary facilities offered in the four sub-zones: adapted from Planning Authority (2020)

Key policy goals

The retrofits and enhancements at the Marsa Sports Complex aims to meet the following goals:

Social and community integration of the several immigrant communities that live in the region with the pre-existing communities.

Air and noise pollution mitigation arising mainly from the bustling traffic in the region.

Sustainable transport and connectivity to ease the mobility and locomotion of pedestrians and cyclists by providing safe corridors and convenient access.

Water management and flood protection since the area around the Complex has flood risks, often as a result of sewer overflows (Malta Resources Authority 2013; Ministry for Resources and Rural Affairs 2012). The interventions should reduce flood risks and promote water management, including efficient water use and reuse.

Biodiversity enhancement by promoting habitable environments for the growth and development of local flora and fauna.

General strategy and Proposed interventions

In order to realize a sport hub accessible, attractive and with high quality standards, we have identified a set of Nature-based Solutions that can address the policy goals identified (Figure 3). These NbS can provide several ecosystem services to citizens and temporary users of the park (Table 2).

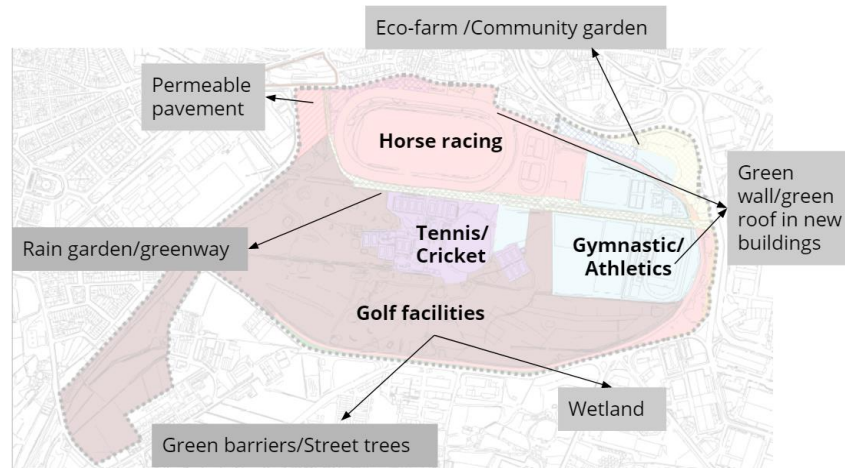


Figure 3. Local of the Nature-based solutions proposed

Green Barriers: The Marsa Sport Complex is located between an industrial area in the south and a predominantly residential area in the north. Realize a green barrier along the southern border of the park, where golf facilities are located, is important to reduce air pollution from the industrial area and noise, which can disturb not only park's users but also the small animal species that live in the large green area.

Permeable pavements: At the north-west end of the complex is a large parking area serving both the sports park and the supermarkets in the surrounding. Here, there is also a bus stop, which presupposes the flow and stay of several people. The problems of large impervious areas are well known: high temperatures that form a heat island and affect human well-being, in addition to high risk of run-off. Therefore, we propose to create a permeable pavement with tree lines.

Eco farm: At the north-eastern side of the complex there is an uncultivated green area where an urban garden could be realised. Due to its proximity to the residential area, the eco farm could be used by citizens and by immigrant communities living nearby. The eco farm is an opportunity for social integration, for sustainable food and biodiversity.

Rain garden: To reduce the risk of run-off, we suggest implementing rain gardens along the channel in the middle of the park. When there is no rainwater, the hollows and irregularities in the ground become an attraction for children to play in.

Greenway: We intend to improve the pathway along the channel to sustainable mobility through the implementation of street furniture and spaces for resting. With a right selection of plant species the greenway can also enhance ecological connectivity.

Green roof: In the east part of the complex, where facilities are located for athletics, we intend to realize new buildings for accommodation and bar/restaurant. To mitigate the visual/ecological impact of the new structures, they will be built with garden roofs.

Wetlands: Golfing areas, despite consisting in large green areas, are not always biodiversity-friendly due to the high level of maintenance and to fertilizer use. Our intention is to realize a "biological golf area" with interventions that can preserve biodiversity, such as for example artificial wetlands.

	Social integration	Flood protection	Energy Efficiency	Biodiversity Enhancement	Air pollution Mitigation	Sustainable Trans.& connec.
Green barriers						
Permeable pav.						
Eco farm						
Rain garden						
Greenway						
Green roof						
Wetlands						

Table 2: Nature-based solutions and their ecosystems services providings

Policy and planning instruments

The successful implementation of the NbS proposed for the Marsa Sports Complex is tightly related to the policy and planning instruments that could promote their uptake. Based on the Proposed Policy Document by the local authority and in line with the Government Objectives and the Strategic Plan for the Environment and Development, seven different types of policy instruments are pertinent for the site. These instruments fall in four categories according to their planning action properties, as follows:

Regulatory: *Zoning regulations, technological requirements, and quantitative targets* - Marsa Sports Complex has been already divided into three zones, according to the main land use and goals of the site. These policy tools restrict the use of the land and the type of infrastructure that can be built in each zone. It is worth noting that a buffer between areas is also pertinent and considered in the Proposed Policy Document, which provides an opportunity to regenerate the local flora and maintain a more naturalistic planting approach. The zoning regulation is applicable to the overall site and is oriented to regulate the sports that can be practiced in each one, but also guides the type of green infrastructure that is suitable (technological requirements). The quantitative targets policy tool is relevant to the golf facilities in zone C, where the golf court is located and an artificial wetland proposed. This area already accommodates local biodiversity, which could be enhanced by the creation of an artificial wetland. Introducing a quantitative biodiversity indicator could, therefore, promote the implementation of the NbS.

Design-based: *Ad hoc design solutions for specific site development* - The zoning of the Marsa Sports Complex is also relevant as a design-based instrument. All four zones within the site have the potential to include environmentally sustainable measures but that translate differently to each. The detailed zoning of the site allowed the proposal to develop an eco-farm, as it sits on a suitable green area for recreation, picnics and social interaction that is already covered by greenery.

Incentive-based: *Subsidies/grants and preferential tax treatments* - Subsidies and preferential tax treatments are encouraged to develop the NbS that would specially have a direct impact on the citizens coming to the site and consuming goods. For instance, for the green walls and roof proposed in the food court areas or the permeable pavement in the parking lot, as these green interventions could be seen as a return to the local economy. Moreover, the subsidies or grants to build an artificial wetland and impede the development of infrastructure that could endanger birds in the golf course should be emphasised, as a bird sanctuary is already located there.

Informative: *Guidelines for public space design* - The proposed NbS should be evidence-based and adapted to the local climate and context. Local guidance on adequate plant species should be followed and considerations to preserve Malta's cultural heritage is encouraged.

Stakeholder analysis

The Żebbuġ-Marsa-Qormi area has been identified as one of the seven main areas at risk of flooding in the Maltese islands (Malta Resources Authority, 2013). An analysis of past flood events between 1979 and 2011 reported 27 major flood events of which 12 affected the Żebbuġ-Marsa-Qormi catchment area (Malta Resources Authority, 2013) giving a recurrence interval of 0.375 years. The consequences of these events range from traffic disruption, damage to public infrastructure and private property and fatalities (Malta Resources Authority, 2013).

A number of EU funded flood relief initiatives have been completed in recent years; namely, the construction of two underground water channels around 560m in length, 4m wide each and 1.25 m high between the end of *Wied is-Sewda* and the beginning of urban development in *Triq il-Wied Qormi*, two large culverts where *Wied il-Kbir* meets *Wied is-Sewda* in the proximity of the Marsa Golf Course and a underground culvert system 3.75 m wide and 1.75 m high under Aldo Moro Road removing obstructions to the regular flow of water (Infrastructure Malta, 2021).

In line with government policy, the potential of incorporating excavation works in the proposed interventions as well as existing disused features such as quarries or natural relief formations for use as run-off storage will be carefully assessed to reduce reliance on reverse osmosis which is associated with high production costs, increased reliance on fossil fuel imports and an unacceptably high carbon footprint (Malta Resources Authority, 2013; Lee Roberts, Marco Cremona and Gordon J. Knox, 2015). According to the Today Public Policy Institute, this has resulted in higher water tariffs, a cost that is ultimately borne by the tax-payer (Lee Roberts et al., 2015). The problem of flooding is a result of fragmented planning following independence in 1964 and driven by sociological and economic factors impacting local morphology and hydrology (Lee Roberts et al., 2015).

Replenishment of groundwater will also help Malta meet its obligations under the EU Nitrates Directive (Department of Agriculture, n.d.)

Conclusions

The Marsa complex is located in the middle of the urban area of the city of Malta and is frequented by a wide variety of people, which has brought different demands. We proposed seven solutions based on nature that would address society's demands, environmental needs that provide well-being and yet were minimally viable for implementation by the government.

Even more important was the discussion and proposal of public policies that we aligned with the objectives and that provide support for solutions like these to be implemented. Thus, policies were

created based on the regulation of activities, ecological design, economic incentives and the generation of information for people.

In the end, regardless of the solutions and policies created, this document can contribute a lot for local authorities to make decisions and can design their policies and solutions that definitely meet the demands of civil society and the local ecosystem.

References

Infrastructure Malta. (2021). Rainwater Flood Relief Project. Valletta: Government of Malta.

Retrieved April 28, 2021, from <https://mtip.gov.mt/en/Pages/WASD/PROJECTS/Rainwater-Flood-Relief-Project.aspx>

Lee Roberts, Marco Cremona and Gordon J. Knox. (2015, April). Why Malta's National Water Plan Requires an Analytical Policy Framework. Valletta: The Today Public Policy Institute. Retrieved April 28, 2021, from <https://parlament.mt/media/90310/doc-43.pdf>

Malta's Planning Authority (2015). Government Objectives and the Strategic Plan for the Environment and Development.

Malta Resources Authority. (2013, May 07). Preliminary Flood Risk Assessment. Malta: Government of Malta. Retrieved April 28, 2021, from https://www.preventionweb.net/files/33946_33946preliminaryfloodriskassessment.pdf

Ministry for Resources and Rural Affairs. (2021, June). A Water Policy for The Maltese Islands. Malta: Government of Malta. Retrieved April 28, 2021, from <https://www.parlament.mt/media/72581/10177.pdf>

Partial Review of the 2002 Grand Harbour Local Plan (Marsa) and the 2006 South Malta Local Plan (Luqa) as amended in 2011, and a Review of the 2006 Central Malta Local Plan for Qormi, as amended in 2013 and 2017; and of the provisions of PC51/16. Project Consultation Draft (2020).