

# The Cistern of the Portuguese Fortress of Mazagan (1541-1769)

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*Architecture and War, History of Architecture, Portuguese Cistern, Mazagão (El Jadida, Morocco), Heritage*

## /Abstract

Portugal, a small European kingdom with a small population and few resources, was able to maintain several positions on the northwest coast of Africa over a span of 354 years: Ceuta was the first Portuguese city in the Maghreb (1415), and Mazagan the last to be abandoned (1769). It began as a small protectorate of the Portuguese crown (1486). After the conquest of Azemmour (1513), King Manuel I (1469/1485-1521) deemed it vital to guarantee Portugal's supremacy over the Spanish crown and protect the *Carreira da Índia* from pirates and corsairs who sailed the north and west coast of Africa. But there were other motives. Those aims dictated the transformation of a small lookout post into a bastioned fortress capable of withstanding modern ballistic attacks. Despite the many difficulties, King Manuel's successor endowed the city with the conditions that would allow it to survive in a very hostile territory and far from help: in addition to the construction of the modern defensive structure, the cistern, built between 1541 and 1547, was essential for life inside the city during very prolonged sieges. Mazagan – El Jadida nowadays – has been a UNESCO heritage site since 2004. Mazagan is still beautiful, but ruined and socially depressed. It had the best architects and engineers at the service of the Portuguese crown during the reigns of King Manuel and King João III. There is therefore no shortage of arguments to justify the urgency of a safeguarding project, which is of interest to both Morocco and Portugal, in order to celebrate peace and life, concealing a past of wars and lost lives.

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## Introduction

Portugal, a small European kingdom with a small population and few resources, was able to maintain several positions on the northwest coast of Africa over a span of 354 years. Ceuta was the first Portuguese city in the Maghreb (1415), and Mazagan the last to be abandoned (1769). [Fig. 1]

The African campaign was driven by multiple motives, which were revised over time.<sup>1</sup> The strongholds in North Africa were the “school where the Portuguese nobility went to learn and . . . practise acts of valour,”<sup>2</sup> an opportunity to give free rein to the “ferocious pleasure of destroying, pillaging, burning and taking prisoners”<sup>3</sup> and to rise socially,<sup>4</sup> besides being an exile destination, as was the case of a state secretary for overseas territories, Diogo de Mendonça Côrte-Real (1694 or 1703–71).<sup>5</sup>

## Mazagan I and II: from Protectorate to Coastal Fortress

Mazagan began as a small protectorate of the Portuguese crown (1486). After the conquest of Azemmour (1513), King Manuel I deemed it vital to transform the protectorate into a coastal fortress (1514). The Arruda brothers, Francisco (fl. 1506–47) and Diogo (fl. 1510–31), were the architects chosen to carry out the plan and supervise the work, which attests to the importance the monarch attributed to Mazagan.<sup>6</sup> The new project had a square plan with four cylindrical towers in the corners, following a composite design in vogue for the fortifications of southern European monarchies in the late Middle Ages.

## Mazagan III: the First Modern City in Africa

King Manuel’s successor, John III, was forced to review the Portuguese crown’s ambitions in North Africa after losing Santa Cruz do Cabo Guê (the current Agadir) in 1541. In that year of 1541 Francisco de Holanda (1517-84) returned from his study trip to Italy; in an autograph manuscript he claimed authorship of

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1 For a description and discussion of the purposes as well as the successes and failures of the Portuguese campaign in North Africa during the Discoveries period, see Augusto Ferreira do Amaral, *Mazagão: a epopeia portuguesa em Marrocos* (Lisbon: Tribuna, 2007), 27–9, 37.

2 “He a escola, aonde a nobreza de Portugal hia aprender, e juntamente exercitar as acçoens de seu valor.” *Notícia da grande batalha, que houve na Praça de Mazagão no dia 6 de Fevereiro do presente anno de 1757* (Lisbon, 1757), 1.

3 Joseph Goulven, *Safi: aux vieux temps des portugais* (Lisbon: [s.n.], 75).

4 Amaral, *Mazagão: a epopeia portuguesa em Marrocos*, 30–31.

5 Mário Francisco Simões Júnior, “A Secretaria de Estado do Ultramar e Diogo de Mendonça Corte Real” (Master’s dissertation, Faculty of Philosophy, Letters and Human Sciences, University of São Paulo, 2017), 177.

6 Francisco de Arruda had designed and built with his brother Diogo the Tower of Belém (begun in 1513). Mário Tavares Chicó, “A Arquitectura em Portugal na época de D. Manuel e nos princípios do reinado de D. João III: o gótico final português, o estilo manuelino e a introdução da arte do renascimento,” in *História da Arte em Portugal*, eds. Aarão de Lacerda, Mário Tavares Chicó and Reinaldo dos Santos (Porto: Portucalense, 1942-53), 2:301; A. Nogueira Gonçalves, “A Torre Baluarte de Belém,” *Revista Ocidente* no.67 (1964): 161–176; Rafael Moreira, “Torre de Belém,” in *O Livro de Lisboa*, coord. Irisalva Moita (Lisbon: Livros Horizonte), 175–180.

Fig. 1

Nicolas Sanson (1600-67)  
*Estats et royaumes de Fez et Maroc Dahra et Segelmesse tirés de Sanuto de Marmol etc.*  
Engraving (Paris: chez Mariette, 1655)  
Dim. 40 x 53 cm  
© BnFr

Source: <https://gallica.bnf.fr/ark:/12148/btv1b8595420g#>



a plan for the fortification of Mazagan.<sup>7</sup> But King John III opted for Benedetto da Ravenna (ca. 1485–1556), an Italian engineer in the service of his brother-in-law Emperor Charles V. To that end, he sent João de Castilho (1490–ca. 1551) to the court of Charles V to arrange for the Italian to come to Portugal. Francisco de Holanda's eventual contribution to the project executed by Benedetto cannot be ruled out: both were familiar with the Fortezza da Basso in Florence, a pentagonal bastioned structure designed by Pier Francesco da Viterbo (1470–1535) and Antonio da Sangallo the Younger (1484–1546) and built in the 1530s, the most likely reference for the quadrangular bastioned structure of Mazagan.

Between May and July of 1541, Diogo de Torralva (ca. 1500–66) was at the site to study the best way to set up the new defensive construction. In July, Benedetto da Ravenna, Diogo Torralva and Miguel Arruda (fl. 1533–63) confirmed the plan's feasibility at the site. At the end of July, João de Castilho and João Ribeiro arrived to supervise the work with a team of 1,500 workers recruited in Évora and from ongoing construction at the Convent of Christ in Tomar.<sup>8</sup>

Despite the technical difficulties of carrying out the work, along with the shortage of skilled workers willing to enter combat if necessary, detailed in the letter from João de Castilho to King John III on 15 December 1541, the exterior curtain wall, partly built over a rocky offshore outcrop, was finished by the end of 1542, ensuring more tranquil progress of the interior and exterior work, notably the digging of moats to protect the land-facing curtain walls.<sup>9</sup> [Fig. 2]

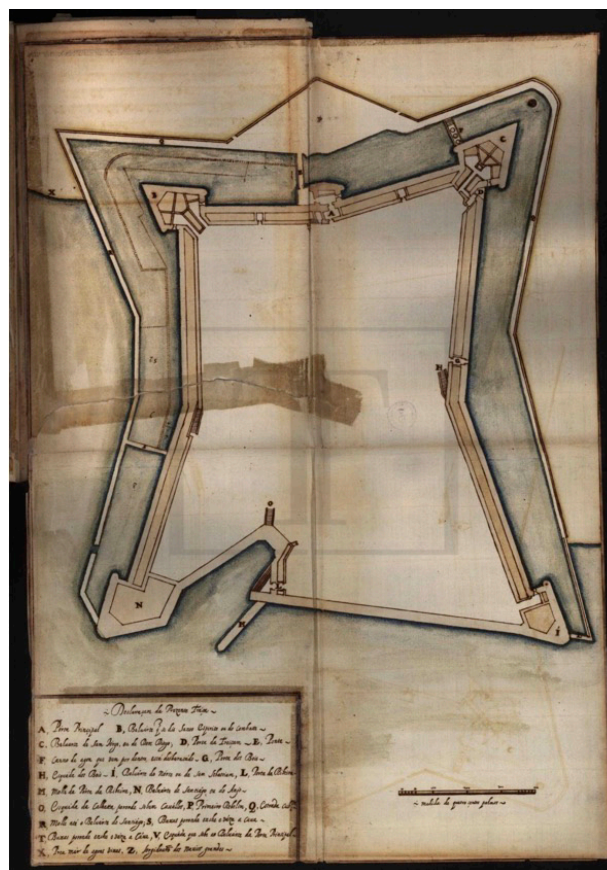
7 Francisco de Holanda, *Da ciência do desenho* (Lisbon: Livros Horizonte, 1985), 32–33.

8 Rafael Moreira, *A construção de Mazagão. Cartas inéditas 1541-1542* (Lisbon: IPPA, 2001), 43.

9 The moats were navigable. They were about 4 m deep; their width varied between 14 (in front of the St Sebastian Bastion) and 37 m (in front of the northern and southern curtain walls). João Barros Matos, "El Jadida [Mazagan] (Morocco)," in *África, Red Sea, Persian Gulf: Portuguese Heritage around the world*, edited by José Mattoso (Lisbon: Calouste Gulbenkian Foundation, 2012), 94.

In coordination with the King, the work was overseen by Luís de Loureiro (ca.1440–1553), a military man with a great deal of experience fighting in African territory who served as governor of Mazagan between 1541 and 1548.<sup>10</sup>

Besides the workers (though not as many nor as skilled as João de Castilho had requested), from the home kingdom came materials, tools and prefabricated items (nails, bricks, woodwork and stone ready to be put in place), thereby maximising the speed of execution and dispensing with any need for local raw materials or labour.<sup>11</sup> Everything came from Portugal by sea and was unloaded from large vessels anchored offshore to other smaller ones able to enter the precinct through the Sea Gate and along a channel to the Manueline citadel that was navigable at high tide.<sup>12</sup> The Rua da Carreira corresponds to that route, which was used during construction of the curtain walls and bastions. When no longer necessary it was filled in. The Sea Gate was walled off (at an unknown date) before the great siege of 1562.<sup>13</sup> [Figs. 3, 4]



During the construction campaign that began in 1541, the Manueline citadel was not demolished, rather it lost defensive functions and gained others, housing nearly all the infrastructure required for the city's life – hospital and Misericórdia (charity institution), prison, gunpowder magazine, warehouses and granaries. [Fig. 5] The governor's palace and the main church were built to the west, next to the citadel precinct.

Under the old parade ground situated inside the citadel a large semi-subterranean cistern was built. [Figs. 6, 7] João de Castilho was responsible for its design and construction, at least until November 1542, when he returned to Portugal by order of King John III.<sup>14</sup>

The cistern comprises a vast chamber with thirteen pillars with Tuscan impostes and twelve Tuscan columns that support thirty-six stone-ribbed vaults lined with solid brick. [Figs. 8, 9] The oldest known description was written by a witness of the 1562 siege:

10 This historical detail is corroborated by the correspondence between various signatories and the King. Moreira, *A construção de Mazagão*, 85–163.a

11 This practice dates back to the founding of the city and fortress of São Jorge da Mina, described by Rui de Pina (1440–1522) in the chronicle of King John II. Helder Carita, *Lisboa manuelina e a formação de modelos urbanísticos da época moderna (1495–1521)* (Lisbon: Livros Horizonte, 1999), 47–48.

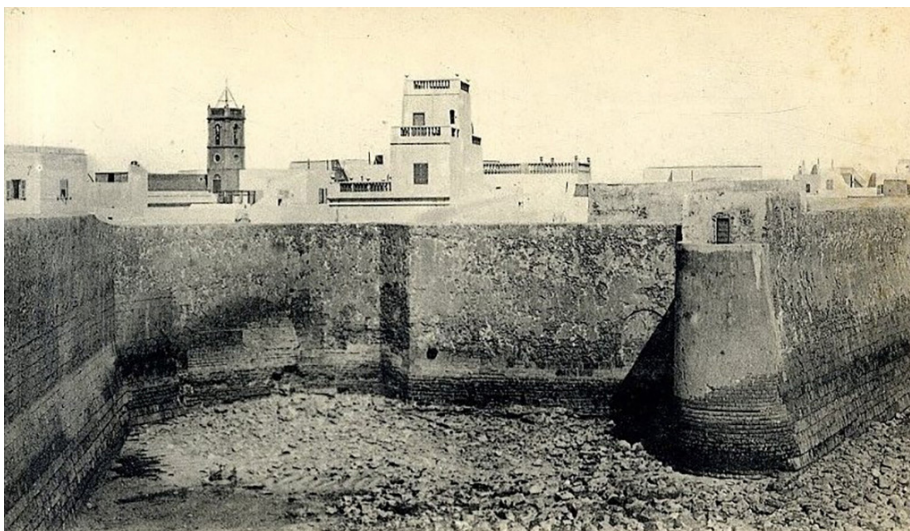
12 The Sea Gate is a round arch measuring 7 x 4.5 m, with the thickness of the rampart (5 m). João Matos, "Del mar contra la tierra: Mazagán, Ceuta y Diu, primeras fortificaciones abaluartadas en la expansión portuguesa: estudio arquitectónico" (PhD diss., University of Seville, 2012), 2:124.

13 Matos, "Del mar contra la tierra," 2:127.

14 Moreira, *A construção de Mazagão*, 64 and 146.

Fig. 2  
Henrique Correia da Silva  
(1560-1644)  
Plan of Mazagan  
1611

Source: Farinha, *Plantas de Mazagão e Larache no início do século XVIII*, 4-5



3



4

The fortress has inside it a very large cistern with a very strong vaulted ceiling supported by thick columns and has a length of one-hundred and seventy palms and width of one-hundred and fifty-five, in square form, and it has a very high tower in each corner, whereby it is between four towers . . . and during the siege it had five-and-a-half palms of water, with each palm amounting to a thousand tonnes, and at the end of the siege, which lasted more than two months, with more than three-thousand people in the town, it had dropped by one palm of water, which was a cause of great wonder, because the water had always been doled out very liberally.<sup>15</sup>

When converted, the dimensions given by Gavy de Mendonça indicate a chamber measuring 38.59 x 35.185 m, or 1,357.59 sq. m.

15 "Tem a fortaleza dentro em si húa cisterna muy grande, & de muy forte abobeda, fundada sobre grossas columnas, & tem de comprimento cento & setenta palmos, & de largo cento & cinquenta & cinco, em forma quadrada, & tem húa torre muy alta em cada canto, de maneira, que fica antre quatro torres, por onde correm hús muros bayxos em contorno de toda a cisterna, como que foy aquelle edeficio de algum alcaide, ou xeque rico, & no tempo do cerco tinha cinco palmos & meo dagua, que monta a mil toneladas o palmo, & acabado o cerco que durou passante de dous meses, avendo na Villa passante de três mil pessoas, saltou hum palmo de agoa, o que se teve por grande maravilha, porque se deu sempre a agoa liberalissimamente." Agostinho de Gavy de Mendonça, *Historia do famoso cerco, que o xarife pos a fortaleza de Mazagam deffendido pello valeroso capitam mor della Alvaro de Carvalho, governãdo neste reyno a Serenissima Raynha Dona Catherina, no anno de 1562* (Lisbon, 1602), 8v–9.

Figs. 3 and 4  
Mazagan  
Sea Gate (walled off and open)  
and to the right the Ribeira Gate  
(views of the landing cove)  
Source: <https://historiasdeportugalemarrocos.com/2016/06/01/oterramoto-de-1755-em-mazagao/#more-6543>

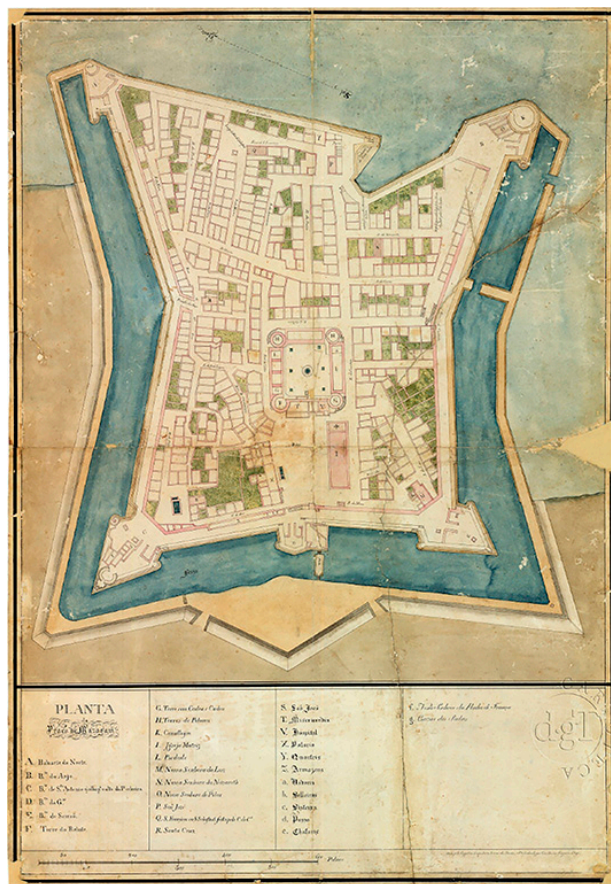
Given the date of Gavy de Mendonça's report and its closeness to when the work was completed (1547), it is unlikely that it had any other use, contrary to what was asserted by Joseph Goulven.<sup>16</sup> Meyrelles do Souto was the first to disagree with Goulven,<sup>17</sup> whose description presents different dimensions than those indicated by Gavy de Mendonça:

It is a chamber 33.65 m long and 34.75 m wide, with walls 3.50 m thick: 25 Gothic stone pillars arranged in 5 rows of five support a series of vaults rising 5 metres above the ground. From the capitals of those pillars 2.50 metres above the floor 8 ribs rise and intersect at the centre of each vault, creating a very pleasant effect. The vaults are filled with ordinary masonry. Twelve of the pillars have round shafts, the other 13 have square shafts.

Light enters the chamber through a circular opening with a diameter of 3.55 m made in the vault ... The floor is paved with red brick ... The cistern is accessed through a 2-metre-high gate that opens onto the upper landing of a broad 11-step staircase, 2.45 m above the ground.<sup>18</sup>

In a letter to King John III dated 16 February 1549, the governor of Mazagan, Captain Tristão de Ataíde (1548–51), suggested to the monarch that the (recently-built) cistern be converted into a church. The proposal is incomprehensible, given the complex politico-military situation on the ground, though it does confirm the potential of this vast chamber, which seems more like a hall church. But the irregular (in both number and placement) distribution of pillars and columns was actually due its practical water storage function. Those irregularities alone would be sufficient to discredit the hypothesis of it having been an armoury.

The Mazagan cistern was fed by underground conduits that brought water from wells outside the bastioned precinct (it is not known how many and where they were located) and also by an opening about 3.5 m in diameter made in the flat roof to collect rainwater, protected by a low stone wall now on the cistern's



16 Goulven, *La place de Mazagan*, 226.

17 A. Meyrelles do Souto, "Quem fez a linda cisterna de Mazagão?," *Revista Ocidente* no.75 (1968): 217–21.

18 "C'est une salle de 33m.65 de longueur sur 34m.75 de largeur, aux murs épais de 3m.50: 25 piliers gothiques, en pierre taillée disposés par 5 rangées de cinq, soutiennent une série de voûtes qui s'élancent à 5 mètres du sol. Du chapiteau de ces piliers partent à 2m.50 du parquet, 8 nervures qui s'entrecroisent au centre de chaque voûte et sont du plus heureux effet. Le remplissage des voûtes est en maçonnerie ordinaire. Douze des piliers sont à fût rond, les 13 autres sont à fût carré. La salle est éclairée par une ouverture circulaire de 3m.55 de diamètre dans la voûte. Surplombant un bassin en pierre dont nous ignorons l'usage auquel était destiné. Le pavage du sol est de briques rouges, longues, entrecroisées et brillantes comme la brique d'Azemour. On accédait à la cistern par une porte haute de 2 mètres qui débouche au palier supérieur d'un large escalier de 11 marches, à 2m.45 au-dessus du sol." Goulven, *La place de Mazagan sous la domination portugaise* (1502-1769), 227-28.

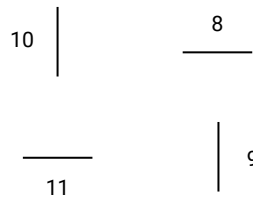
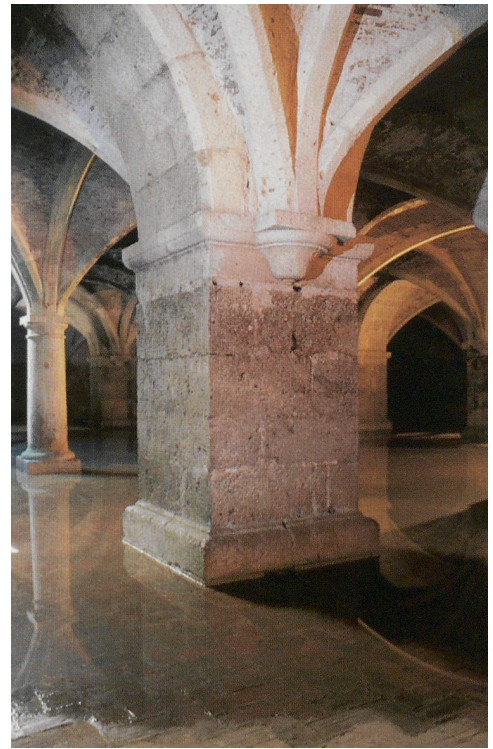
Fig. 5

Simão dos Santos  
Plan of Mazagan  
1730-60  
© Instituto Português de  
Cartografia e Cadastro  
Source: [https://  
historiasdeportugalemarrocos.  
com/2014/03/05/mazagao](https://historiasdeportugalemarrocos.com/2014/03/05/mazagao)



Fig. 6  
 Mazagan  
 Plan at the level of the upper  
 gun positions  
 Source: Matos, "Del mar contra  
 la tierra," 2:166

Fig. 7  
 Mazagan  
 Plan at the level of the  
 casemates  
 Source: Matos, "Del mar contra  
 la tierra," 2:167



inside floor. [Figs. 10, 11] To prevent the structure from collapsing when over-filled, there was an overflow system situated between the Stork Tower and the Alarm Tower. However, all this is still unconfirmed: there is no rigorous survey nor have there been archaeological campaigns to verify the description of the system that brought water to its storage site.<sup>19</sup>

Castilho returned to Portugal in late 1542 by royal order, though the work continued under the supervision of another engineer until 1547 — the date is indicated in a cartouche in the keystone of one of the vaults.<sup>20</sup> [Fig. 12]

Between 1542 and 1550, the Portuguese fortresses at Safi, Azemmour, Asilah and Ksar es-Seghir were abandoned. Tangier and Ceuta were transferred to the

Fig. 8  
Cistern of Mazagan  
Source: Moreira, *A construção de Mazagão*, 202

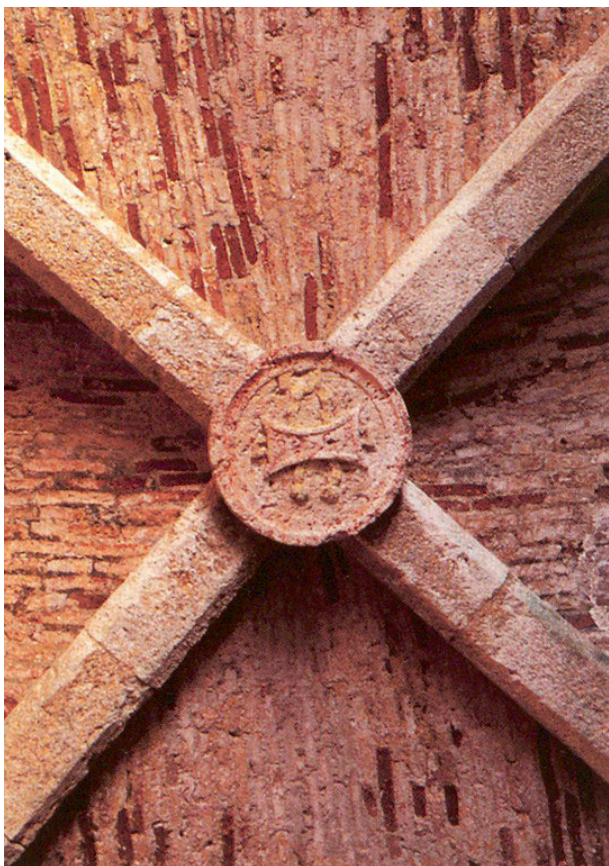
Fig. 9  
Cistern of Mazagan  
Source: Moreira, *A construção de Mazagão*, 203

Figs. 10 and 11  
Cistern of Mazagan  
Source: João Matos n.d.

19 Information from the panel placed by the Ministry of Culture and Communication of the Kingdom of Morocco next the cistern's entrance, on Rua da Carreira.

20 Moreira, *A construção de Mazagão* (Lisbon: IPPAR, 2001), 188.





12 - 13

English and Spanish crowns, respectively in 1661 and 1668, but the stronghold of Mazagan survived, impregnable, though a prisoner of itself and, with no royal order allowing the population and garrison to evacuate, continually dependent on supplies brought from Portugal by sea.<sup>21</sup>

Distance and the unpredictability of outside assistance meant there were many periods of scarcity and even hunger. The only abundant resource was water from the huge cistern and fish the tides brought into the moats, which the soldiers caught by dangling fishing poles from the ramparts above.<sup>22</sup> [Fig. 13]

### The Beginning of the End

Mazagan was the first modern city built in Africa, the first built from the ground up that did not appropriate from pre-existing settlements. It complied with some of the principles that were practiced in many others founded by the Portuguese: as usual, there is a main north-south street, the Rua Direita, though it is not very straight, as often occurs.<sup>23</sup> What is unexpected, however, is that Mazagan's Rua Direita was not the thoroughfare that structured the urban fabric. That function was fulfilled by the Rua da Carreira, running east-west and joining the Governor's

Fig. 12  
Cistern of Mazagan  
Keystone of one of the vaults  
with dated cartouche (1547)  
Source: Moreira, *A construção  
de Mazagão*, 188

Fig. 13  
Mazagan  
Curtain wall between the Angel  
Bastion and the Holy Spirit  
Bastion  
Source: Author 2023

21 The vegetable gardens outside the gates were continually raided and destroyed; those inside the city blocks were insufficient to feed the city's garrison and residents. Amaral, *Mazagão: a epopeia portuguesa em Marrocos*, 27.

22 Mendonça, *Historia do famoso cerco*, 6v–7.

23 Ana Elisabete Martinho Amado, "A rua direita nas cidades portuguesas: leitura tipo-morfológica do elemento urbano" (Master's dissertation. School of Architecture, University of Lisbon, 2012).

Bastion Gate, used as the main landward access, to the walled-off Sea Gate and the smaller Ribeira Gate opening onto the stepped boat landing closer to the breakwater (as indicated in the legend of the 1611 plan [Fig. 2]).<sup>24</sup> The Rua Direita is roughly perpendicular to the Rua da Carreira and is the second street after the citadel on the way to the Sea Gate. [Fig. 14]

In 1562 the city suffered a violent attack and siege, but resisted. Gavy de Mendonça left an impressive description of that episode, including details about the fortification, its firepower and the cistern.<sup>25</sup> And it withstood many other sieges and battles that followed. But one final siege by troops of the Sultan of Morocco, Sidi Mohammed Ben Abdallah, brought the Portuguese presence in Mazagan and the Maghreb to an end: [Figs. 15, 16] on 11 March 1769 King Joseph I issued an order to destroy and abandon the city.<sup>26</sup> The most ruined section was the land-facing curtain wall (next to the Governor's Palace and respective bastion). The St Anthony and Holy Spirit bastions were also largely destroyed. The population fled through the Ribeira Gate, the only one open to the sea.



14

From 15 September 1769 on, the first wave of Mazagan inhabitants were shipped to Brazil to found Mazagão in Amazonia (23 January 1770).<sup>27</sup>

Mazagan in Africa was abandoned between 1769 and 1821 and during that period was called Al-Mahdouma, the Ruined. After 1821 it was resettled under the designation of El Jadida, the New. The cistern was discovered by chance and opened to the public in May 1918; it was classified as a national monument by dahirs [royal decrees] dated 3 November 1919 and 15 April 1924.<sup>28</sup>

On 30 June 2004 it was classified by UNESCO as a World Heritage site.<sup>29</sup> Although the cultural and heritage value of the city of Mazagan was now recognised, this did not have the necessary consequences: the urban fabric, defence

24 António Dias Farinha, *Plantas de Mazagão e Larache no início do século XVII* (Lisbon: Instituto de Investigação Científica Tropical, 1987), 5.

25 See notes 15 and 22 above.

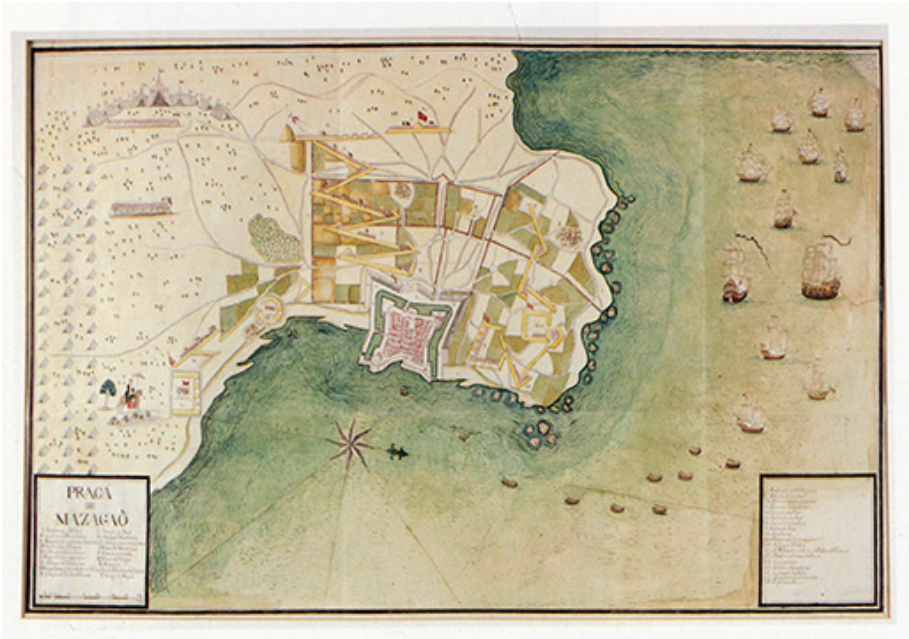
26 The ships arrived in Lisbon between the 21st and 24th of March, 1769. By order of the king, most of the recently-arrived families were lodged in storage spaces of the Jerónimos Monastery and the nobles were authorised to find accommodation in the homes of relatives. Goulven, *La place de Mazagan*, 132.

27 Renata Malcher Araújo, *As Cidades da Amazônia no século XVIII: Belém, Macapá e Mazagão* (Porto: FAUP, 1998), 266, 286–87.

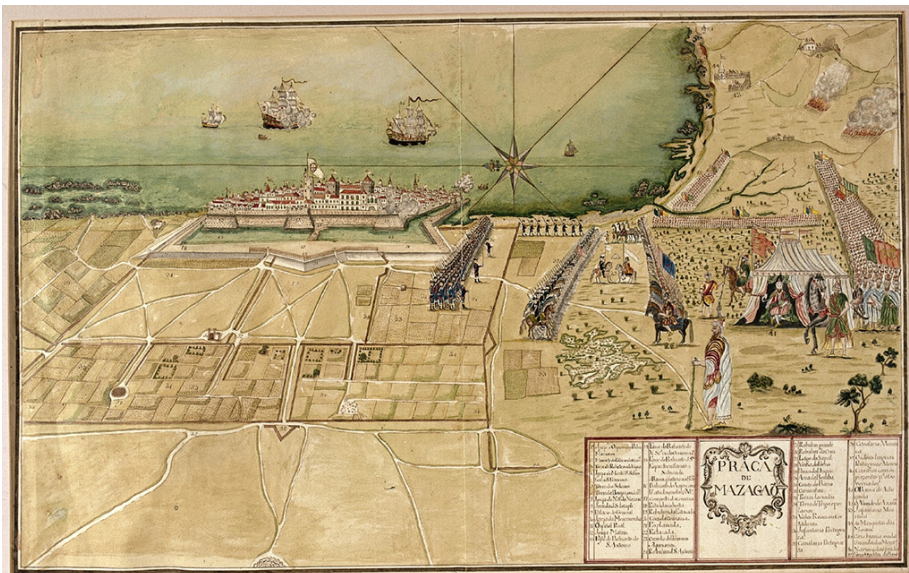
28 Information from the panel at the cistern's entrance placed by the Ministry of Culture of the Kingdom of Morocco.

29 Sacavém Fort Architectural Heritage Information System, "Fortaleza de Mazagão," accessed on 11 March 2024, [http://www.monumentos.gov.pt/Site/APP\\_PagesUser/SIPA.aspx?id=24406](http://www.monumentos.gov.pt/Site/APP_PagesUser/SIPA.aspx?id=24406) (last accessed November 2024).

Fig. 14  
Mazagan  
Landing cove at low tide and  
Ribeira Gate  
Source: Author 2023



15



16

system and cistern still await archaeological campaigns and restoration and rehabilitation work.

Mazagan had the best architects and engineers in the service of the Portuguese Crown during the reigns of Kings Manuel I and John III. It survived the gradual abandonment of all Portuguese positions in Morocco until 11 March 1769. It has not yet been disfigured by mass tourism and consequent gentrification. There are hence sufficient arguments to justify the urgency of a rehabilitation project in the interests of both Morocco and Portugal, to celebrate the site's peace and beauty while reconciling its past history of wars and lost lives.

Translated by **John Bradford Cherry**

Fig. 15  
Mazagan  
1769 siege with deployment  
of troops of Sultan Sidi  
Mohammed ben Abdallah  
Late 18th century (?)  
© Casa da Ínsua  
Source: Moreira, Moreira, A  
construção de Mazagão, 186

Fig. 16  
Mazagan  
1769 siege with deployment  
of troops of Sultan Sidi  
Mohammed ben Abdallah  
Late 18th century (?)  
© Casa da Ínsua  
Source: [https://  
historiasdeportugalemarracos.  
com/](https://historiasdeportugalemarracos.com/)

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