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**LITTORAL LAND USE
COMPETITION AT XEMXIJA
A TOURISTIC AREA IN
THE MALTESE ISLANDS**

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LITTORAL LAND USE COMPETITION AT XEMXIJA: A TOURIST AREA IN THE MALTESE ISLANDS

Introduction: The Maltese Islands: Basic Geographical Parameters

The Maltese Islands are a group of central Mediterranean islands lying 93 km from the southern Sicilian coast and 352 km north of Tripoli on the coast of the North African mainland. The basic spatial and demographic data for the three inhabited islands making up the archipelago show marked differences with Malta having 246,000 people and Gozo 29,000 (Census, 1995).

It has long been recognised that the economic areas that the Maltese Islands should principally promote are tourism and manufacturing. Following the phasing out of the British Military presence (1958-1979) and the granting of independence in 1964 investment in tourism started to gain ground. Figures 1 and 2 give a graphical account of the development of tourism over a seventeen year period. Essentially, it has been a success story especially with the multiplier effects that were generated as a result.

The Islands are endowed with a typically central Mediterranean climate of mild winters, hot summers and warm seas (26°C in summer). A historical heritage bearing witness to the successive political powers that governed the archipelago, archaeological remains dating back seven millennia, and cultural links with Britain and Italy help orientate the Island state towards European identity. All these factors have been important in the development of the industry.

The land/water interface of the largest and the administrative capital of the archipelago, Malta, is very well geared to cater for tourism. Most touristic development takes place along the east coast where a gentle topographic structure, a large number of bays, inlets and promontories and three harbours all along the eastern and southeastern seaboard are among the large-scale physical features that attracted recreational investment. The prevailing climatic conditions along this littoral are also very favourable; only 2.2 per cent of days in the year having inclement weather conditions affecting the eastern shoreline. Thus the development of tourism in Malta was aided by the local topographic, climatic and geomorphological features in addition to cultural conditions. In fact the coastal zone survey of 1989 (Figure 4) indicated that the development of tourism in the islands follows precisely the patterns dictated by the above-mentioned geographical parameters. The Structure Plan, in its deliberations on the recreational aspects also identified the same areas where touristic inputs into the industry prevailed. However emphasis was also laid on locally-generated tourism.

This latter aspect is one of the main issues facing environmentalists and property developers. With the restricted area of the Islands themselves and the consequently very high population density, the land use conflicts are augmented by the rise in the local standards of living. This is reflected itself partly in the purchase of second homes in popular summer resorts and sea craft ownership. The pressures generated by the local tourist property developers with an investment eye on all possible sites have put great pressure on local coastal resources.

As mentioned previously the eastern littoral of Malta is the area where most industrial,

recreational and some residential housing is focused. This situation however lays a particular stress on the locational aspect in that whilst coastal development along the Valletta to Marsaxlokk area is oriented towards the residential/industrial aspect the area to the north from Sliema to Mellieha concentrates on the residential/recreational aspect.

One of these areas is St. Paul's Bay (Fig.3). The bay was formed as a result of tectonic movement that was caused by parallel striking faults trending north east/south west running the whole length of northern Malta (Figure 4). These faults produced the Horst and Graben type of landscape north of the Victoria Lines, with the Pwales Valley located between the two ridges of Wardija and Bajda. The tilting of the island drowned the valleys in the north forming St. Paul's Bay and the Pwales Valley at its hinterland. Thus the large-scale geomorphological structure of the bay is one bounded on either side by rdm features and boulder screes broken at intervals towards the farther end of the bays with low sloping rock. (Figure 5)

Lying on the northeastern seaboard of Malta, this locality has been traditionally associated with being a local summer residential venue for the residents of the northern part of the Island. The only road from Malta to the Gozo ferry terminal passes through it. Initially residential development in the form of one-storey houses lined the littoral landscape, these were either fishermen's lodgings or the summer recreational homes of the wealthier classes from the inland parts of the island. This situation was retained throughout the first part of this century when tourism had not yet flourished. As a result St. Paul's Bay never had a high winter residential population.

Table 1 shows the population changes as reported in successive censuses with the greatest percentage increase registered in the 1931-1948 period. The result of economic stagnation and excessive emigration registered decreases in the 1957 and 1967 census. The demographic situation changed after this with the population in 1985 reaching 4,465 people. This figure almost doubled in 1995 reaching a record high of 7332. This was the result of a number of factors. The availability of land for building purposes encouraged new permanent settlers, especially in the Qawra area, employment opportunities in the recreational sector together with the construction of good roads and other communications helped to increase the population to new levels.

Table 2 illustrates 16 important sites along St. Paul's Bay featured in Figure 6. These are further divided into three categories denoting their coastal length in metres, the main geological structure and the structural geomorphology, that is the type of landform present. It can be noted that where Upper Coralline Limestone is present, the predominant landform is "rdm" or scree slope, whereas where *globigerina* Limestone is present, a shore platform has developed. This difference in landform is partly the result of the different hardness of the rock where Upper Coralline Limestone is harder than *Globigerina* Limestone. The latter erodes more quickly, thus producing a smoother surface. Sharp contrasts in surface form can be evident within a small area, making it extremely interesting for geomorphological investigations.

Table 1
Demographic Development of St.Paul's Bay

Year	Population	% Change
1931	1779	
1948	3440	93.4
1957	3040	-11.6
1967	2788	-8.3
1985	4465	60.2
1995	7332	64.2

Table 2
St. Paul's Bay Littoral: Main Physical Subdivisions

Site (for identification Refer to Figure 6)	Coastal Length (m)	Main Geological Structure	Structural Geomorphology
1. Selmunett	2125	UCL	Islands
2. Rdum il-Bies	670	UCL	Rdum
3. Il-Mignuna	400	UCL	Low sloping rock
4. Mistra Bay	750	UCL	Bay
5. Rdum Rxawn	625	UCL	Rdum
6. Il-Fekruna	250	UCL	Rdum
7. Xemxija	670	UCL	Rdum
8. Ir-Ramla tal-Pwales	350	Alluvial	Low sloping rock
9. Tal-Kamb	300	Globigerina/UCL	Low cliff platform
10. Ghajn Razul/ Ghar tal-Vecca/ Ghar Ghasfur (incl.concrete jetty)	780	UCL	Low cliff platform
11. Rdum il-Mahruq	500	UCL	Rdum/ Low cliff platform
12. Ta'l-Ghazzelin	750	Globigerina	Cliff shore platform
13. Taht it-Torri	375	Globigerina	Cliff shore platform
14. Rdum l-Abjad Jetty	500 327	Globigerina	Low cliff shore platform
15. Bugibba	1250	Globigerina	Steep rock-face shore platform
16. Qawra	1300	Globigerina/LCL	Low sloping rock

Xemxija

The essential element of this paper is to focus on Xemxija (Fig. 6). It was traditionally considered the elite area for summer residences, being the last cluster of buildings in St. Paul's Bay locality. The area can be subdivided physically into a number of units based on the physical characteristics of the shoreline and its hinterland.

The area is best described as lying along part of the northern littoral of the bay. The general N/S trend slopes at 10 degrees, while the East-West general trending line taken from the hilltop plateau to sea level drops 100m over a distance of 150m. This slope has been broken by a terraced effect developed into a terraced rdum/cliff complex. No less than four different topographic levels could be identified in this area, the result of the North-South trending faults (Figure 7).

Geologically, the area is composed of UCL/Blue Clay and Greensand formation (Fig.4) that gives the typical rdum structure where the UCL topples over in boulders over the soft Blue Clay and Greensand underneath. The faulting has also downthrown the UCL to sea-level. Thus the whole area is one of friable rocks, boulder scree and narrow shore platforms at the sea-level end.

The area can be subdivided into a number of units. Figure 8 portrays them cartographically. Each area has its own physical characteristics and development proceeded along different spatial and temporal paths.

1. Hilltop and plateau area.

This is the area developed over the last two decades and investment has taken advantage of the hilltop site to maximize views of the bay and of Mistra Valley (Fig.8). A tourist complex in the form of a village offering the services of a hotel, self-catering apartments, swimming pools, restaurants and sporting complexes is the main feature of this area. The architecture utilised followed the local tradition of louvered windows, arches and wooden beam structures. Aesthetically, it is a pleasing site. Further developments here are concerned with a number of flats and condominiums. This zone is also serviced by a number of restaurants, bars and a self-service store.

This plateau has a history of development spanning three decades. In the late 1950s, British Petroleum Company was given a lease of ca. 30000m² on this hilltop site for the installation of six fuel storage tanks. During the same period a church was also constructed. The tanks were dismantled about 15 years later and the church demolished in 1990 as a result of the unstable rock structure underneath. A new church has been built on the same site.

Afforestation

Acacia, Cypress and Tamarisk trees were planted all around the boundary wall surrounding the perimeter of the fuel installation depot, together with the area leading to the cliff-edge and at the small inlet of il-Fekruna Bay below. The embellishing effect of this 'afforestation project' was in line with similar efforts elsewhere on the island. However the haphazard rubbish dumping negatively affects the pleasing aesthetic qualities afforded by the greening of the hilltop peninsula. Building development on the

landward end of the hilltop is fast encroaching on a number of Punic tombs and the former fuel installation site is used as a Government-owned heavy vehicle storage location interfering with the visual effect posed by the Mistra Valley and highly visible from parts of the tourist complex.

2. Xemxija Hill

The road running roughly parallel to the shoreline is situated at 50m above sea-level and occupies the second level from the hilltop plateau in this terraced landscape. It is a main artery in the northern road network of Malta in that it is a major link to the Mellieha area and the Cirkewwa ferry terminal to Gozo (Fig.8).

All but one of the business outlets are located on the landward side of the road together with a number of residential homes dating to the earlier part of this century. Hilltop residential developments are a more recent addition. The seaward side of the road is lined with the 1960s summer residential buildings, many of which present their back view to the road with their entrance at the lower third level of the terraced Xemxija landscape.

3. Triq il-Fekruna to id-Dawra tan-Nawfragju

This area is subdivided into three units running parallel to the coast (Fig.8). Each unit corresponds to one level of the terracing complex. Practically the whole site is taken up by buildings of flats, terraced houses and villas. Most are used as summer residences for locals and the flats are rented out to tourists seeking holiday apartment lodgings.

4. The Littoral area

The littoral area of Xemxija is the most varied of all, principally because at its immediate proximity to the water's edge there is a high land/sea interaction. This area is characterised by a narrow 670m shore platform which has been highly modified by human interaction. This littoral length can be conveniently subdivided into three sections (Figure 8).

Section A consists of a wide concrete platform constructed specifically to service as a Gozo ferry terminal during inclement weather at the other sites. This area is sheltered from the northwesterly; strong winds from this direction prevent the use of the Cirkewwa terminal. However the upgrading of the Pieta' facilities at Marsamxett harbour obviated the need for use of the services at St. Paul's Bay. This platform is now used as a popular fishing and barbequeing area and a convenient car park for the angling, swimming and boathouse enthusiasts.

Section B is essentially the area lined with boathouse development. Initially constructed underneath the Triq in-Nawfragju, the boathouses were especially intended to garage boats during the winter months. A number of slipways lead from the boathouses to the sea - a distance of about 12 metres. Today these boathouses are used as fully furnished one-roomed apartments for whole families to spend the summer vacation. Water, electricity and other services are provided by the State. The land/water interface has, as a result, been greatly altered and the shore platform modified to cater for

open-air extensions, patios and even vines are grown on trellises at the far end of the stretch. Most of the boathouses are inhabited in the peak summer months.

Section C is apparently the littoral continuation of the boathouse development section but as physical accessibility between the two is precluded due to an indentation in the shore platform the area remained undeveloped. Additionally, the shore/platform is rather narrow to allow for any human use of it except for angling off the rocks. However, recent construction techniques have made it possible for this platform to be turned into a main recreational zone. This complex caters for snack-bar facilities at the upper road level, an intermediate area serving as the kitchen and restaurant facilities and the sea-level zone provides for sunbathing and recreational boating services. The narrow shore platform has been extended by land reclamation and by concreting over. The construction of a wooden platform supported by iron pikes driven into the sea bottom extends further the facilities of the complex. Parts of the platform can also be levered up to act as a swimming pool area.

Adjacent to this recreational complex a new establishment developing on the same lines is under construction. This is the only area along this littoral that is undergoing change at present.

The last part of this littoral zone leads up to the Menqa basin. With just a 6m wide shore platform at the end of section C, tapering to a 0.5m width at the farther end. As it is the area hardly has any investment potential. However a number of stone benches have been placed at irregular intervals. A slipway and small jetty add to the boating facilities.

Problems At Xemxija

1. Accessibility

Physical access to the shore platform below Xemxija Hill can only be achieved by a detour around the whole built-up complex. The terraced nature of the development precludes direct straight-line contact between the top and bottom parts of the zone. The arrangement of the private allotments also precludes contact. Figure 9 shows the type of access possible.

Visual accessibility of the sea view has been greatly influenced by the development. The terracing nature of the area should greatly add to this highly desirable quality in that a sea view should be possible from all sites. However haphazard construction and the uneven heights of buildings have obliterated the sea view of most properties. The classic case in point is the view from Xemxija Hill where development immediately below the road has gone a couple of storeys above the road level behind affecting the view of the Bay.

2. Pollution

The regular declaration by the Ministry of the Environment that the Menqa basin area is unfit for swimming stems from problems associated with sewage overflow and seepage. The high population density in the summer months, the heavy vehicular traffic plying along the main road artery exerting physical pressure on the sewage system

and the presence of families living in the boathouses without the necessary drainage facilities have turned the area into a high risk bathing zone.

The continuous building development taking place also adds to the unpleasant qualities in the form of illegal dumping of building material. The hilltop areas around the former fuel installation, the new church site and the lower end of Xemxija Hill all share this problem.

Car fumes are another problem faced by residents along Xemxija Hill. The steep slope of the hill and the heavy traffic associated with tourist and bus service coaches and vehicles associated with the building industry all make the air in the bottleneck nature of the hilltop area high in carbon monoxide content.

Noise pollution from the same sources, from point sources of recreational complexes playing loud music and the movement of sea craft also adds to the undesirable qualities of the area.

The pollution problems associated with the land/sea interface at the littoral end of the locality are due to oil and fuel slicks on the water surface. The sea area just below Xemxija is the site of a large number of boats and yachts in the summer months. Serviced from the littoral along the whole length of the rocky beach the boats add their oil slicks to the area.

Barbequeing is yet another problem faced by all littoral sites; Xemxija is no exception. Although the very small shore platform limits the number of sites available the three areas identified all bear witness to this pastime in the form of charred leftovers.

The incomplete development of the area has also left a number of sites yet to be built up. Within a completely urban environment these spots constitute an eyesore. In addition these areas are highly prone to be used as dumping areas. Within the highly competitive area of tourism both in the international and local context this situation does not aid in the improvement of the aesthetic qualities of Xemxija.

Conclusion

The physical segmentation of the Xemxija Hill area into a number of component sectors is vital at understanding the dynamics of the whole area. Segmentation aids management and planning in that the physical attributes of each area are crucial for effective environmental management. The flat hilltop plain requires different management procedures from the terraced landscape below it. The activity at the hilltop site, for example, generates clouds of dust as a result of stone dressing and polishing on sites adjacent to the new housing constructions, the dumping of stone chippings and associated construction debris spoils the traditional aesthetic qualities of the holiday complex. Finally development is encroaching on a Punic cemetery. Thus the physical attributes of an accessible hilltop locality is being abused because of its location within an important tourist node, a low slope plateau profile of less than 2 degrees and a hard rock structure minimising the need for quarrying or trenching prior to the laying of foundations. The four storey hilltop properties finally command an unobstructed view of the whole bay, visual accessibility is therefore at a maximum here.

The same cannot be said of the second tier of developments over a terraced landscape. Building development followed the three main levels formed by the faulted landscape, each level accommodating a number of housing blocks. Although building on a terraced landscape should enhance the visual accessibility of residences on every level of the landscape, unplanned development is causing competition for seaviews. Properties developed on the lower terraces rise in front of those built on the higher levels. Cubic architectural forms predominate departing from the traditional Maltese louvered windows, arches and balconies. In fact, typical European style form with large bay windows, wide patios and balconies dominate. Attempts at correcting the aesthetic quality of each unit are seen from utilising the clayey soil pockets remaining within the limestone strata, some of which are fed by natural water seepage; the latter resulting from the blue clay trapping water under the upper coralline limestone formation.

The third main area that can be singled out within the region is the one immediately adjacent to the littoral. The sewage problems in Xemxija are directly felt along this stretch as it is near the water's edge. Development here is ironically highly desirable in that huge investment in the recreational sector proceeds regularly notwithstanding the fact that further progression of buildings will strain the environment even further and augment the sewage overflow problem.

It is apparent that development along Xemxija, as shown in Figure 10, followed the highly accessible areas in the first half of this century. Urban sprawl developed inland with the introduction of new building techniques and modern machinery. The area was exploited to the extent that the topographically rugged areas became foci of development. Construction of apartment is still taking place, destroying garrigue habitats typical of the Upper Coralline Limestone plateau, and reducing the open space available, although pockets of barren rock still remain. Unfortunately this pattern of development is taking place in other parts of the Maltese Islands, given their small size and the competition for space. Careful planning should be devised to safeguard the natural environment, and manage our resources in the wisest possible way.

Glossary

Upper Coralline Limestone - This is a soft, porous and fissured type of rock. It is the youngest of the Tertiary formations of the Maltese Islands, and its main function is to act as an aquifer.

Blue Clay - This term includes a wide variety of clay beds which vary in colour and composition. Clays form an impervious (nonporous) base to the water-bearing Greensand and Upper Coralline formations.

Greensand - It is often found as large detached boulders on the underlying clay slopes. The Greensand formation owes its name to the abundance of minute dark-green, almost black granules, and is not always present between the Clays and the Upper Coralline.

Globigerina Limestone - It is the most prevailing type of rock found in Malta. It presents a terrain of shallow valleys and low ridges. Globigerina Limestone formation is divided into Lower, Middle and Upper subdivisions.

Lower Coralline Limestone - This is the oldest formation exposed at surface on the Maltese Islands. This formation contains the main sea level water table which provides the bulk of Malta's supply of fresh water, and is in many ways lithologically similar to the Upper Coralline Limestone.

Shore platform - This term refers to the extent of topography covering the area from the cliff face to the sea-bed. The morphology of these platforms depends on various factors such as tides, wind action and slope gradient.

Rdum - This refers to a typical Maltese coastal geomorphological landform which features near vertical faces of rock formed either by erosion or by tectonic movements. Their bases are invariably surrounded by screes of boulders eroded from the rdum edges, making some parts inaccessible.

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XEMXIJA: AERIAL PERSPECTIVE

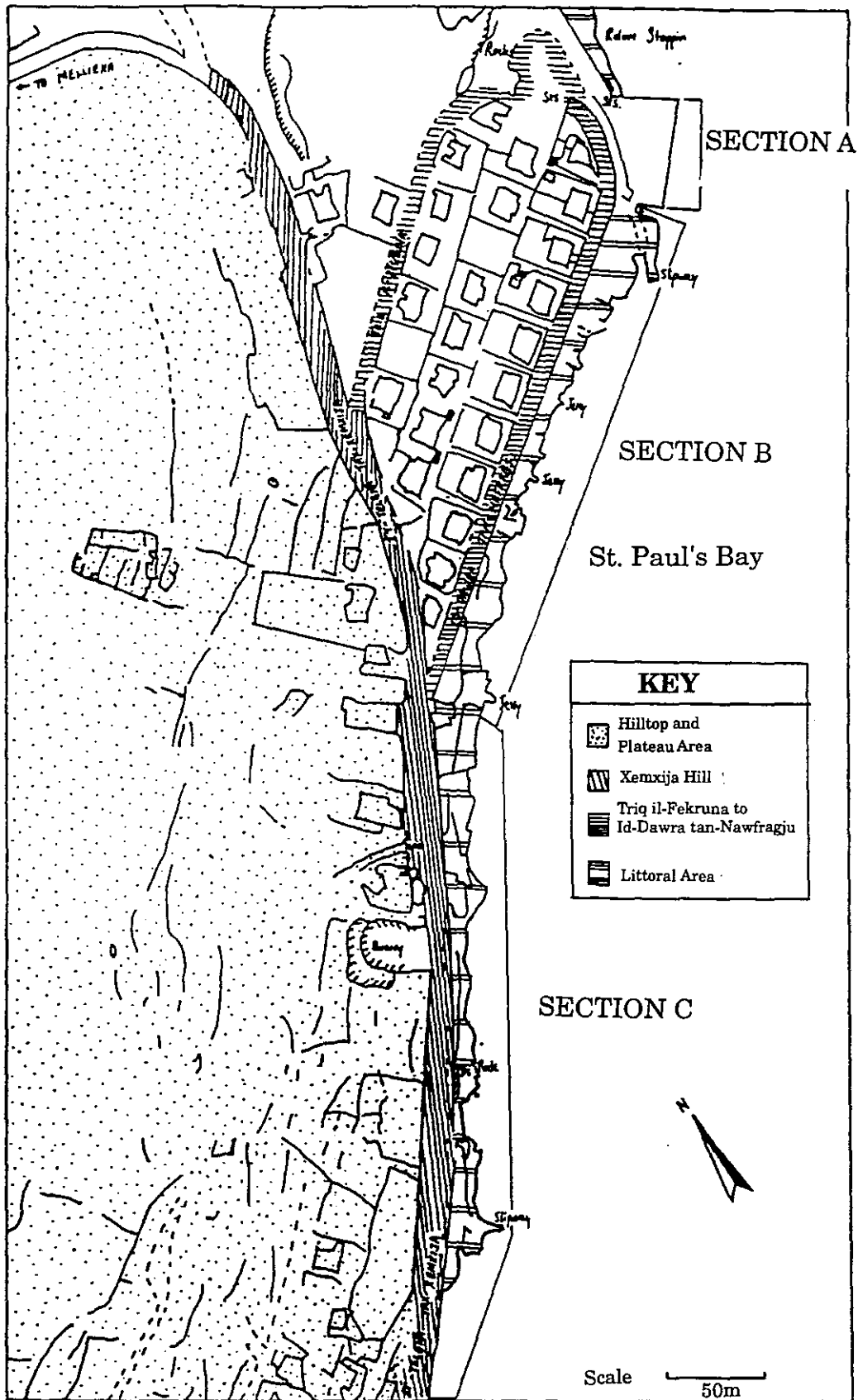
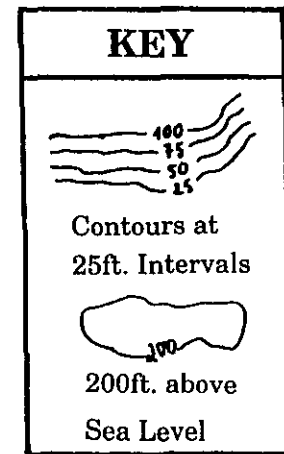
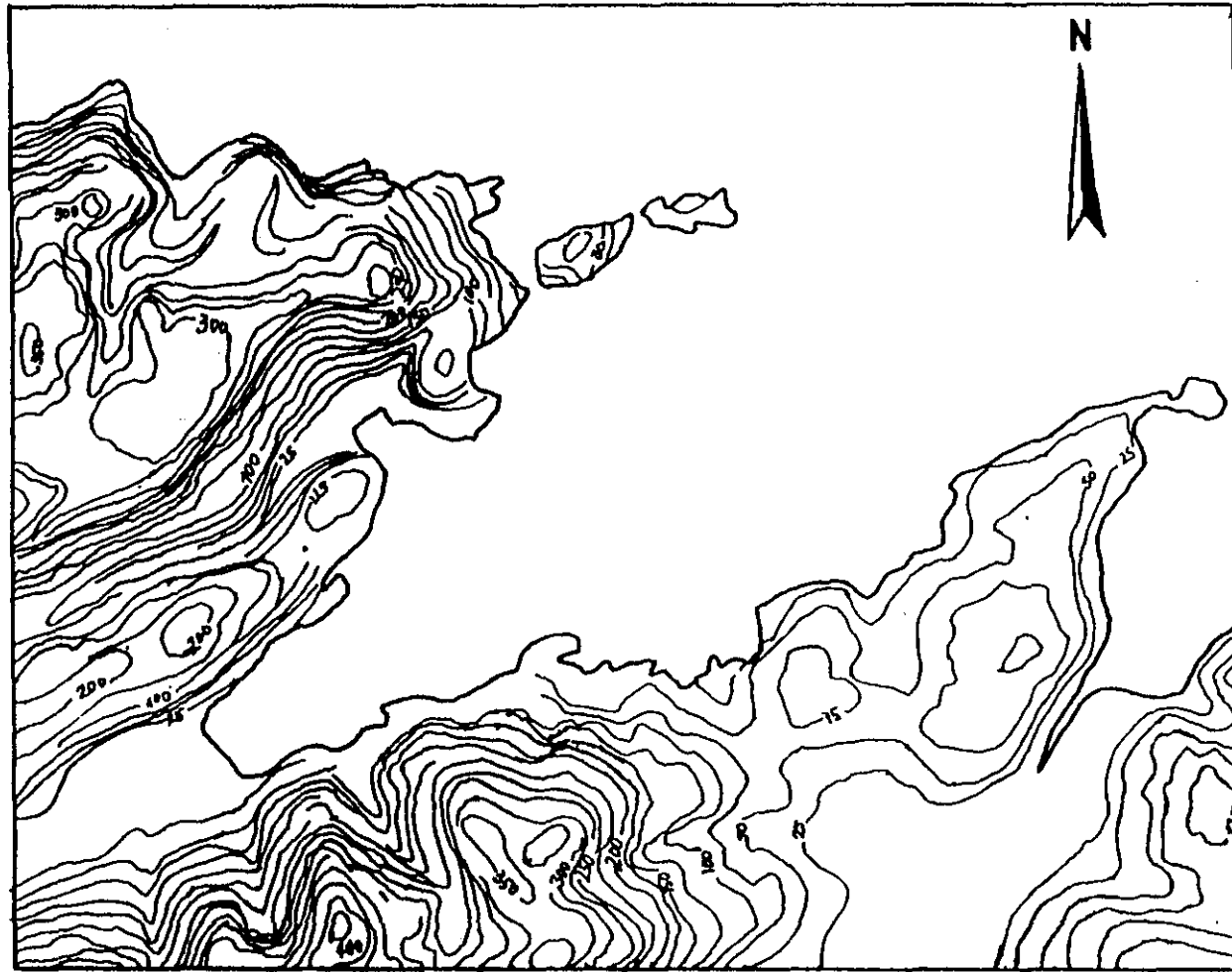


FIGURE 8

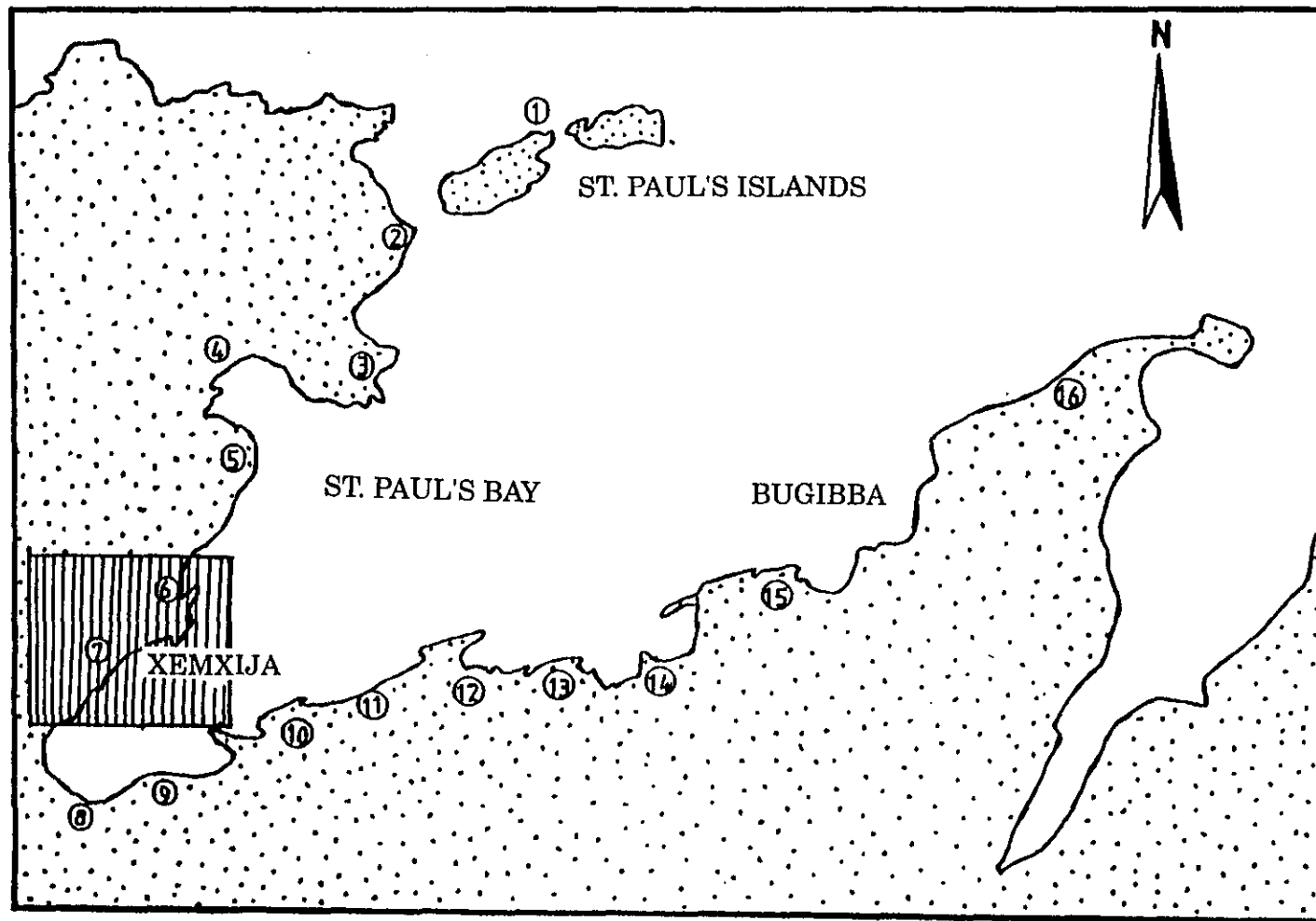
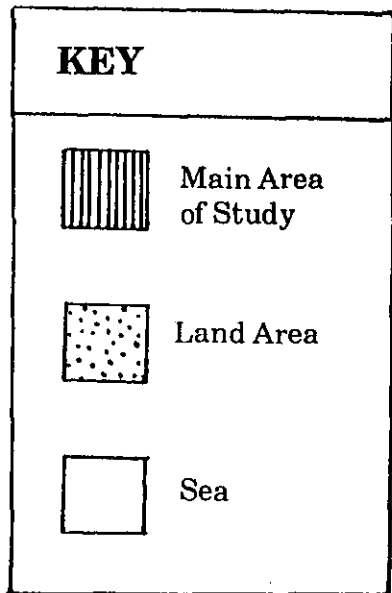
ST. PAUL'S BAY - TOPOGRAPHY



Scale 500
1000m (1km)

FIGURE 7

ST. PAUL'S BAY - MAIN SITES




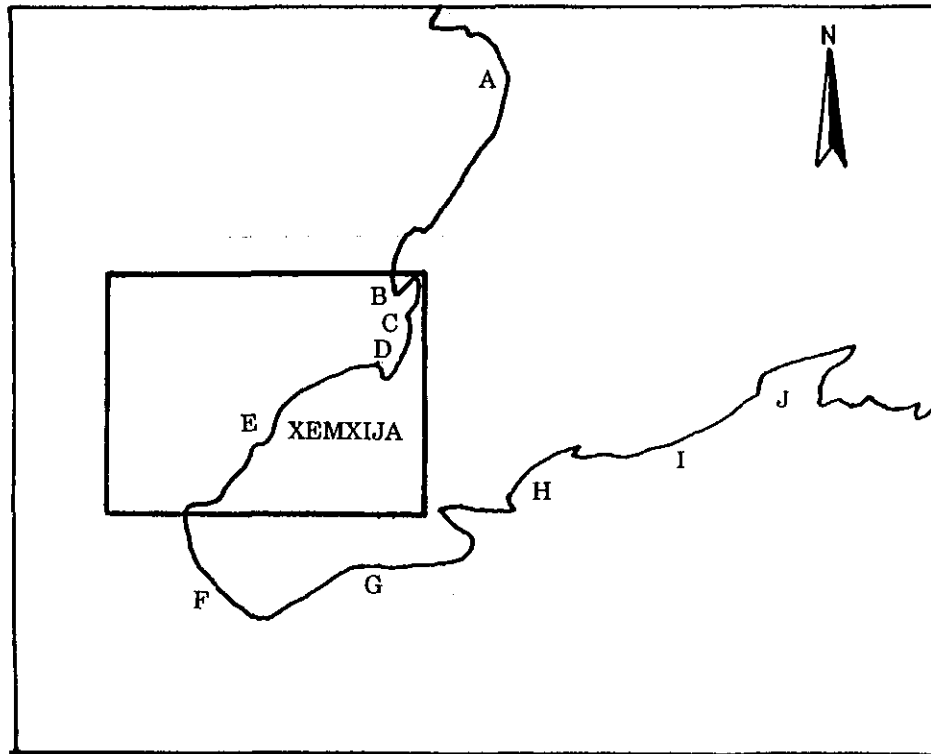
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FIGURE 6

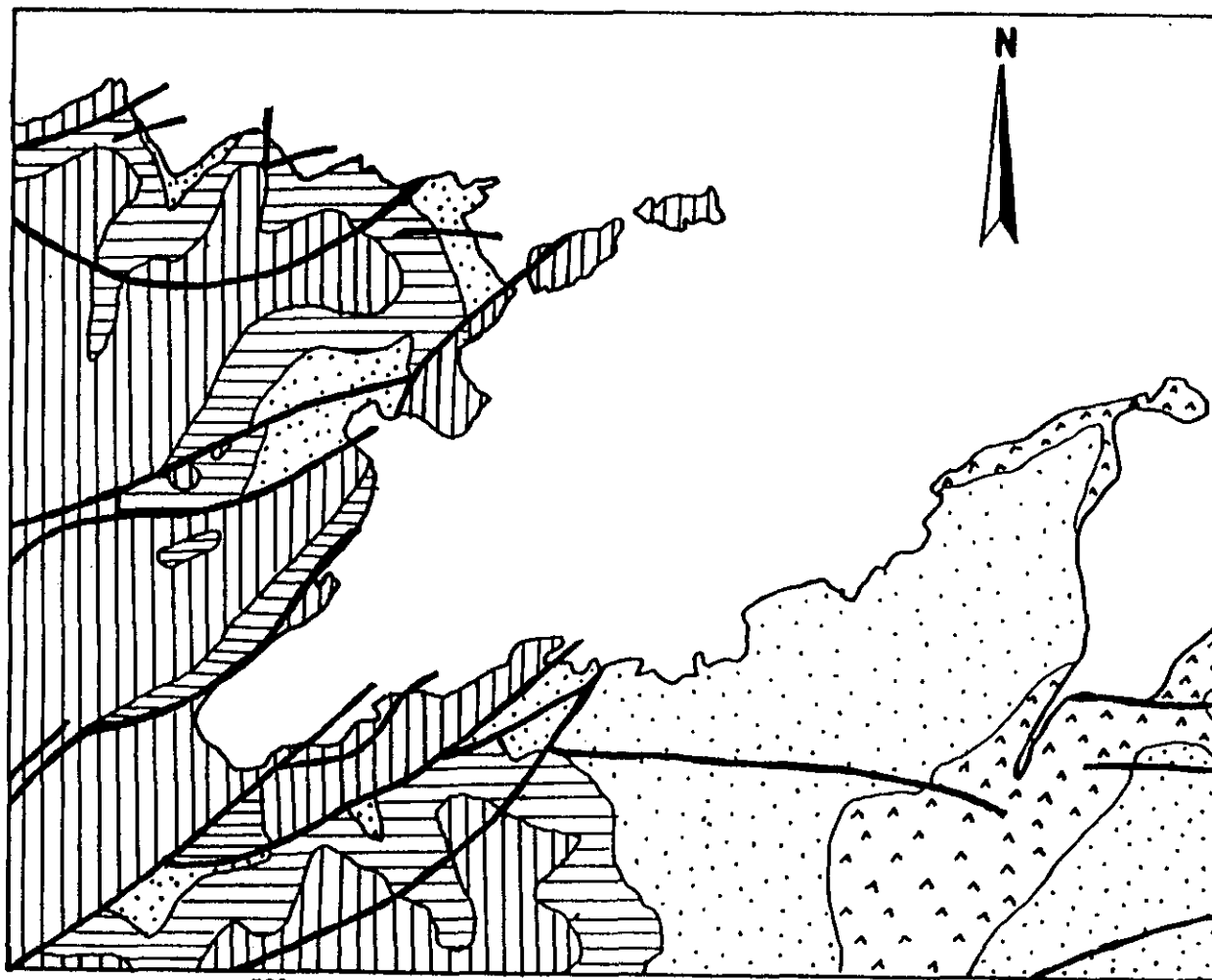
ST. PAUL'S BAY: LARGE SCALE GEOMORPHOLOGY



KEY	
A	- Rdum
B	- Beach
C	- Low sloping rock
D	- Concrete platform
E	- Low sloping rock
F	- Sand
G	- Concrete bank
H	- Caves
I	- Rdum
J	- Low sloping rock

FIGURE 5

GEOLOGY OF ST. PAUL'S BAY



Scale
500m
1000m

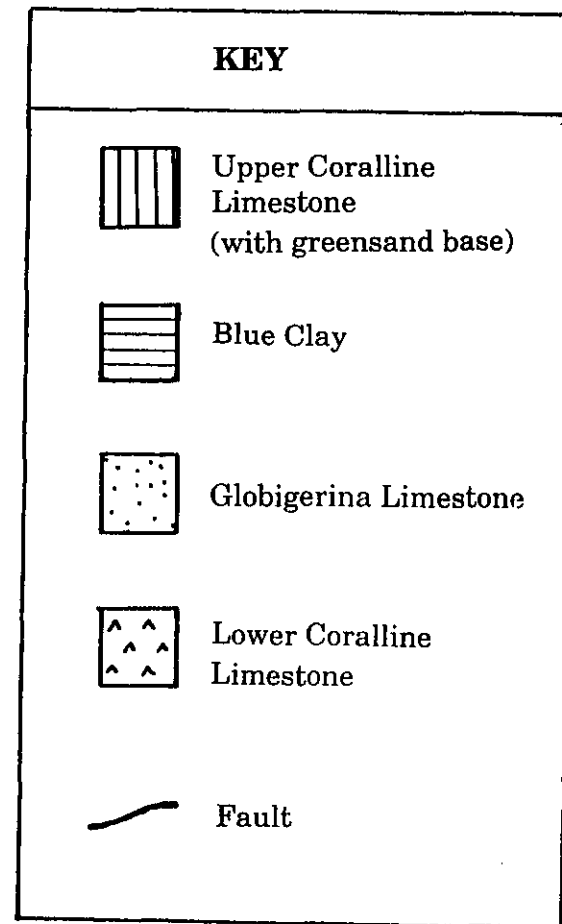


FIGURE 4

LOCATION OF ST. PAUL'S BAY AND XEMXIJA

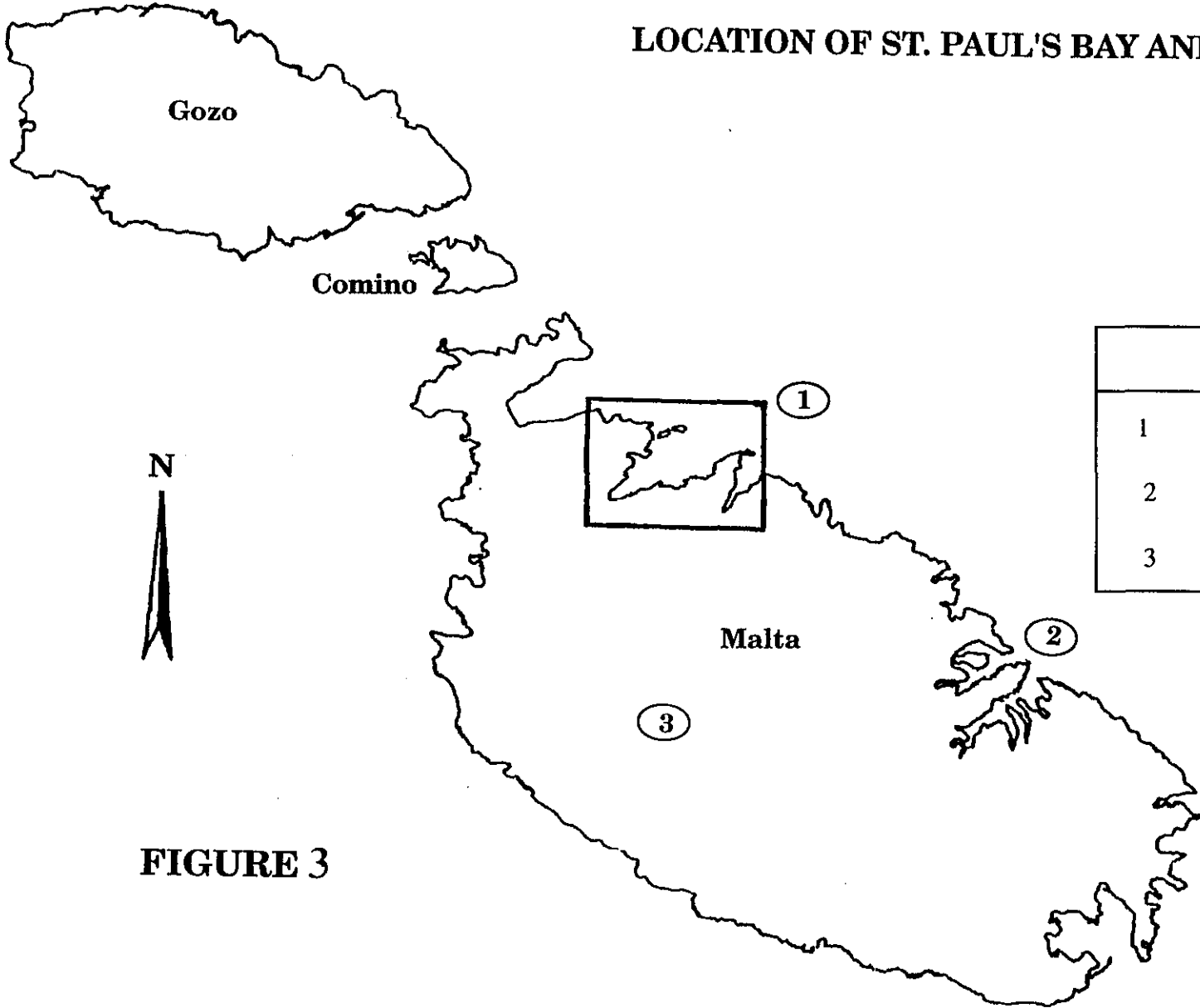


FIGURE 3

THE MALTESE ISLANDS: BASIC TOURISM DATA

FIGURE 1

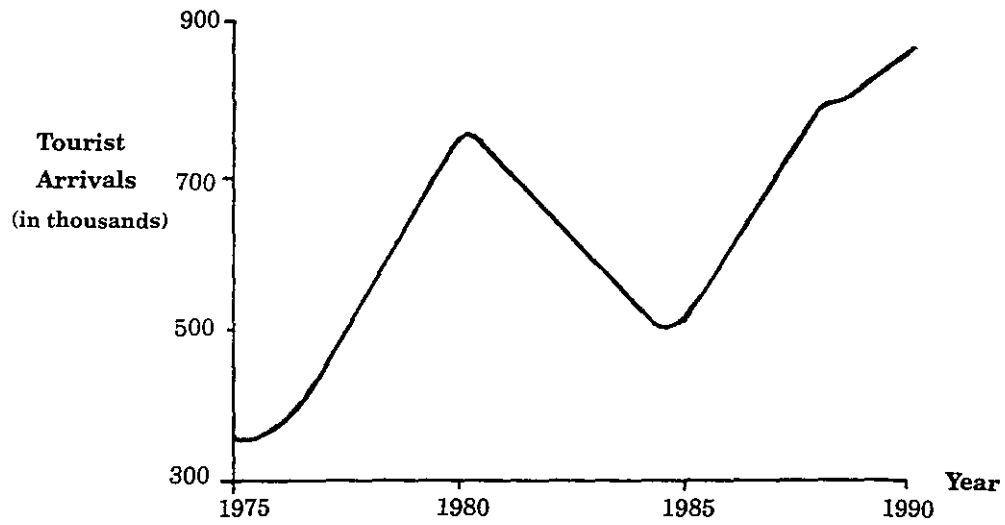
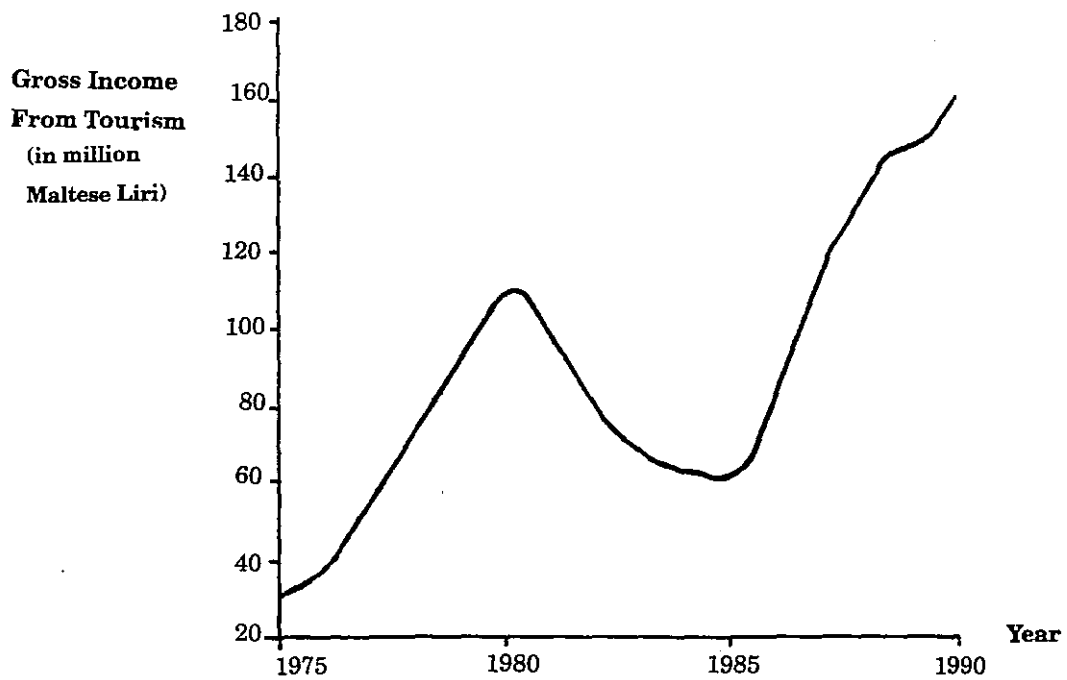


FIGURE 2



Source: National Tourism Organization Malta, 1993. Malta Tourism Statistics, Research and Plannign, Division, NTOM, Valletta, Malta.

XEMXIJA ZONE: ACCESSIBILITY

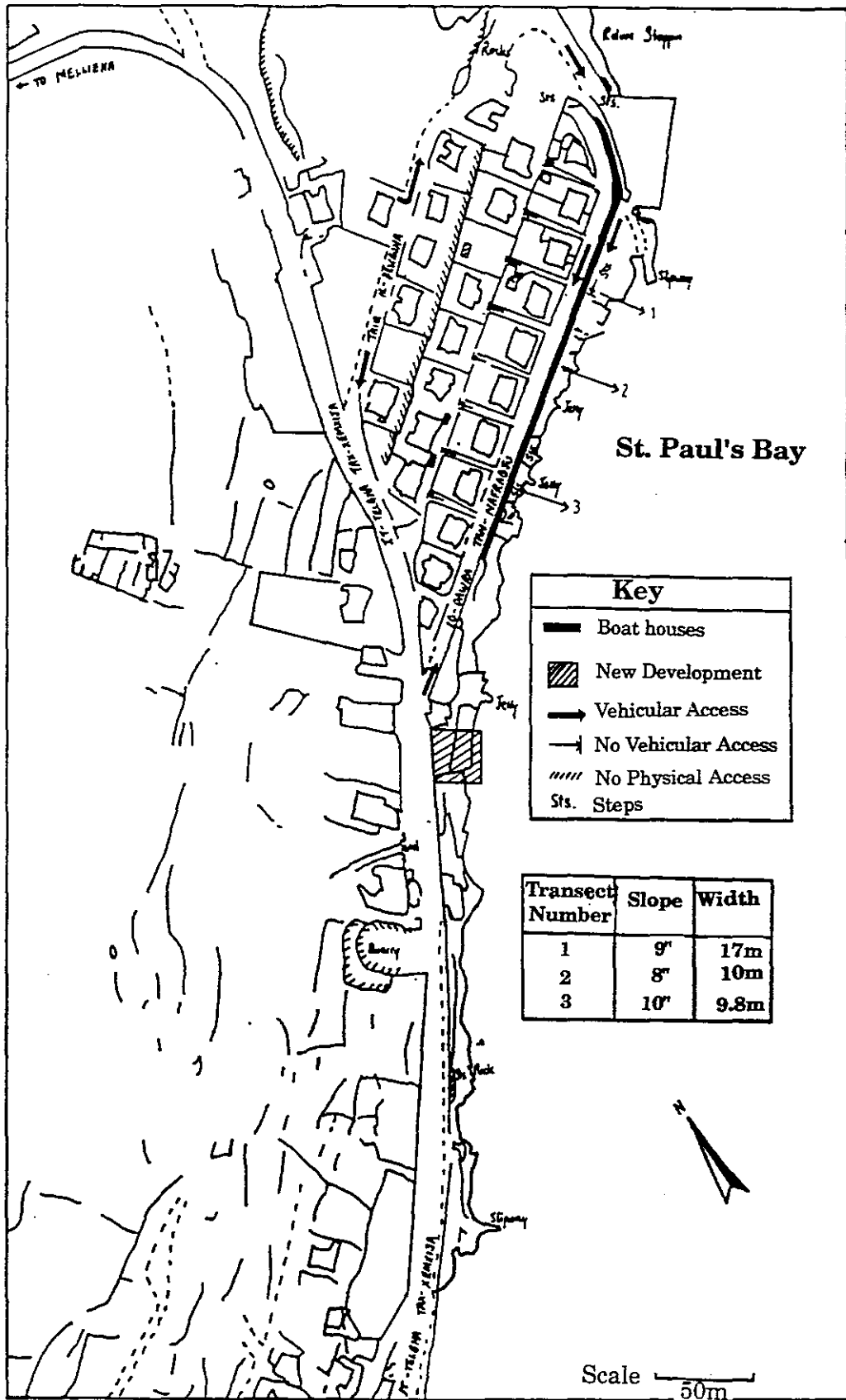


FIGURE 9

ST. PAUL'S BAY

DEVELOPMENT OF THE BUILT-UP AREA

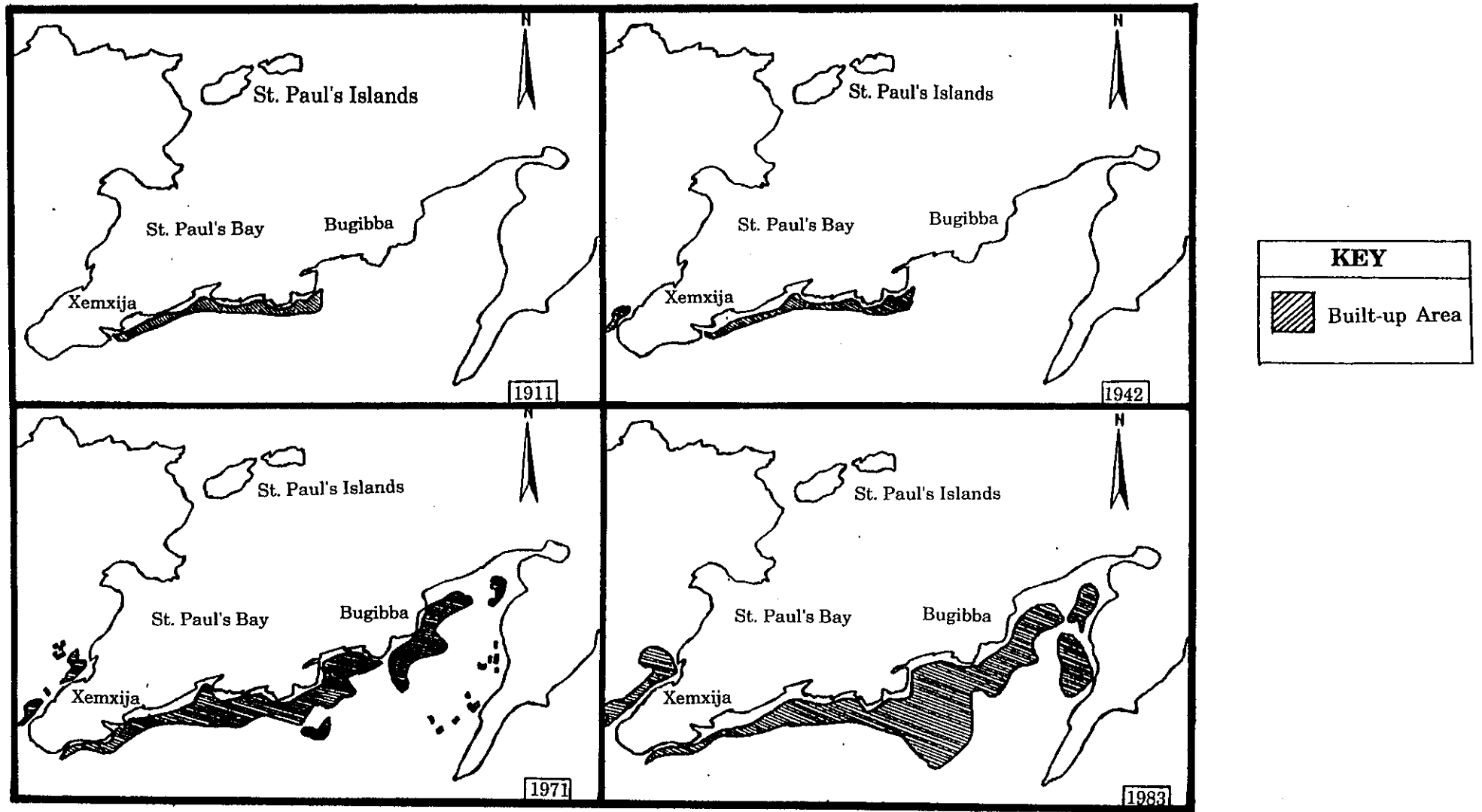



FIGURE 10

Scale  500m